Report to the Task Force on the Care of Children by Family Physicians

The Robert Graham Center: Policy Studies in Family Medicine and Primary Care

In collaboration with :

American Academy of Pediatrics Center for Child Health Research

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"It is not enough, however, to work at the individual bedside in the hospital. In the near or dim future, the pediatrician is to sit in and control school boards, health departments, and legislatures. He is a legitimate advisor to the judge and jury, and a seat for the physician in the councils of the republic is what the people have a right to demand."

Abraham Jacobi, 1904[1]

"There is plenty of room on pediatric turf for a variety of breeds devoted to the health of children. Unless some vigorous modifications of training programs takes place, pediatricians will not remain among them."

Abraham B. Bergman, 1974[2]

Executive Summary

Introduction

In early 2003, the American Academy of Family Physicians (AAFP) was presented with evidence documenting substantial growth in the proportion of medical care of children provided by pediatricians relative to family physicians. Substantiation of these findings, both from national data and member surveys, led the AAFP Board to create a Task Force on the Care of Children by Family Physicians that was to advise the Board on how to address this trend, and commission the Robert Graham Center as an external research consultant to the task force. The overarching purpose of this study is to provide a contemporary analysis of child healthcare workforce data and draw conclusions to direct further studies and recommendations for the AAFP. The primary question to be answered is:

"How has the role of family physicians in medical care for children changed, and what are the potential causes and consequences of these changes?"

This question does not reflect a singular interest in the role of family physicians or who provides care for children, but reflects a broader interest in improving children's health and healthcare.

Background

A literature review revealed that most children receive healthcare in physicians' offices, most often provided by pediatricians and family physicians. There has been considerable growth of the physician workforce that cares for children even as birth rates have fallen in the United States (Table 1). As of 2004, there is one pediatrician in direct patient care for every 1600 children, nearing or exceeding some measures of sufficiency on a population level (Table 2). There is also one family physician or general practitioner in direct patient care for every 3,200 people in the United States, many of whom care for children. The number of NPs and PAs caring for children is not certain, but it is likely to be at least as great as the number of pediatricians—a fact relatively unacknowledged in most workforce

studies. While there are indications of shortage of some pediatric subspecialties, subspecialization may not be a pressure-relief valve for the pediatric workforce. There is also good evidence of a shortage of mental health providers for children. The growth of the pediatric workforce has largely occurred in areas of affluence and in urban or suburban areas, leading to wide variations in pediatrician-to-population ratios and increased dependence on family physicians by rural and underserved populations. Despite a possible surplus of physicians to care for them, demographic and economic variations influence access to care and whether children receive healthcare at all.

Table 1: Growth of Direct Patient Care Physicians (MD and DO) in the United States, 1981-2001

	Family Medicine & General Practice	General Pediatricians	All Physicians	US Crude Birth rates*
1981	54,013	20,051	323,385	15.8
1986	60,311	24,128	378,516	15.6
1991	67,078	30,080	450,438	16.2
1996	77,185	35,202	524,209	14.4
2001	85,656	41,753	574,746	14.1
% Change	+59%	+108%	+78%	-11%

Data Source: AMA Masterfiles; Analysis by the Robert Graham Center, 2004.
* The crude birth rate is the number of births in the U.S. in the given year divided by the total population and multiplied by one thousand

Table 2: The Number of Direct Patient Care Physicians (MD and DO) in the United States in 2004

	Family Medicine & General Practice	General Pediatricians	Pediatric Subspecialists	All Physicians
Physicians in Specialty	91,627	45,998	16,306	620,627
People per Physician*	3,202	1,572	4,434	472
Physicians per 100,000 People*	31.2	62.8	22.3	211.52

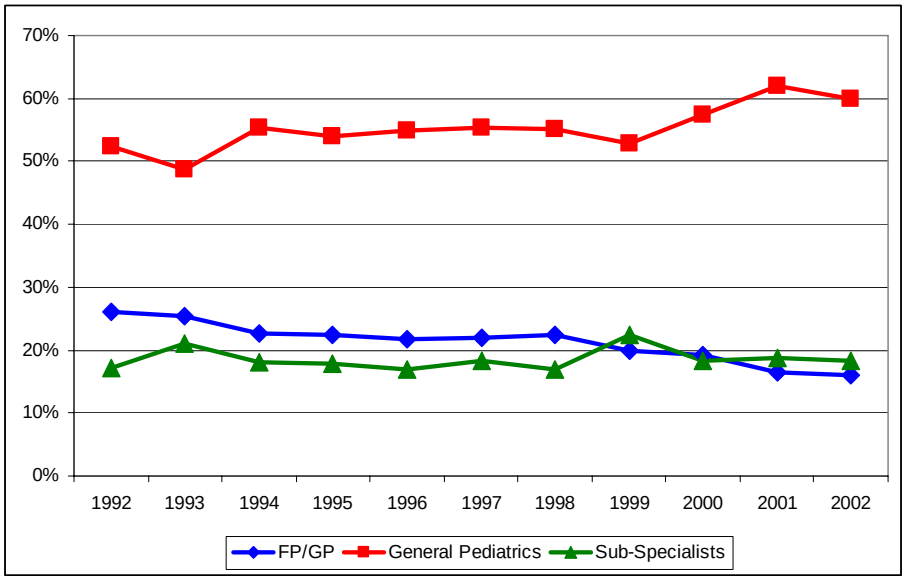
Data Source: 2004 AMA Masterfile, U.S. Census Bureau; Analysis by the Robert Graham Center, 2004.
* People of all ages used for Family Medicine & General Practice, only children are used for Pediatricians.

There is evidence of a clear and consistent erosion of the proportion of care being provided for children by family physicians relative to that of pediatricians, but also for care provided to other populations, as well. For children, this erosion may be due in part to differences in care guidelines that increase visit frequency or volume to pediatricians relative to family physicians. Other potential explanations for the decline in the proportion of visits to family physicians could not be substantiated by existing literature or studies.

New Analyses

New analyses confirm a shift in the care of children away from family physicians (Figure 1); however family physicians still provide care for as many as one-in-five children of all ages and may provide more care than pediatricians for adolescents (Table 3). The striking shift in visits by adolescents, not only away from pediatricians but to specialties other than FP and pediatrics may reflect natural transitions as children age. There has been a reduction in child visits per family physician of as much as one-third over the last 10 years (Table 4). Family physicians have also experienced a decline in adult visits relative to a decade ago, but have realized growth in adult visits over the last 5-8 years (Table 4). Changes in adult visits do not conclusively suggest that adult visits are "crowding-out" children visits and may just be a response to reductions in the latter. The proportion of care of children provided by family physicians in rural and underserved communities has been more stable and is generally larger than in other demographic areas. *Despite these trends, nearly one-third of children for whom a usual source of care can be named, name a family physician*.

Figure 1: Trends in care of children by physicians - Percentage of children (below 18 years) visits



Data Source: National Ambulatory Medical Care Surveys, 1992-2002; Analysis by the Robert Graham Center, 2005.

Table 3: The share of the care of children by physicians, 2002

	Estimated visits by children	FP/GP	General Pediatricians	All other Physicians
Total visits	166,684,897	21%	53%	26%
MSA status				
Non-MSA	29,811,818	34%	40%	26%
MSA	136,873,079	18%	55%	26%
Age Groups				
0-5 yrs	75,002,527	16%	73%	11%
6-12 years	49,149,355	25%	47%	29%
13 - 17 years	42,533,017	26%	24%	50%

Data Source: 2002 Medical Expenditure Panel Survey (MEPS) Office-Based Medical Provider Visits data file; Analysis by the Center for Child Health Research, 2005.

Table 4: Trends in the share of the care of children by physicians – Average annual number of office visits per physician

	Child visits per Family Physician (FP/GP)	Child visits per General Pediatrician	Adult visits per Family Physician (FP/GP)
1993	642	2,336	2,759
1994 - 96	569	2,446	2,320
1997 – 99	521	2,169	2,443
2000 - 02	429	2,347	2,521
Rate of change 1993 to 2002	-33%	0%	-9%

Data Source: National Ambulatory Medical Care Surveys, 1993-2002; Analysis by the Robert Graham Center, 2005.

Changes in demand are difficult to predict, but the growth of providers of children's healthcare is clearly outpacing the present and expected growth of the U.S. population, raising valid concerns about a physician workforce surplus.
There may be enough providers of healthcare for children in the U.S. workforce to meet accepted ratios of population to provider, but their distribution is skewed, leaving certain populations and settings underserved. In addition to a larger proportion of visits for rural children, family physicians care for a disproportionate share of uninsured and publicly insured children. Uninsured children and those living in medically underserved areas are more likely to have continuous healthcare relationships with FPs than with pediatricians. Despite significant growth in the number of clinicians caring for children and the decline in uninsured children, one in ten children still experience unmet healthcare needs, and one-in-three children without insurance have unmet healthcare needs. Public insurance has been a safety net for many children in the more stagnant economic climate since 2000, but the number of uninsured children may soon rise again given state and federal efforts to reduce Medicaid costs.

Annualized expenditures for children of all ages except the oldest of children are higher for pediatricians than for family physicians. This may reflect variation in number of visits made by children or differences in complexity of care. It is not clear from national surveys whether there are financial disincentives for providing clinical care to children despite ample anecdotes. There are some differences in

average per-visit expenditures that may reveal a financial bias against caring for children covered by Medicaid, but not for children with private insurance. Despite these findings, and evidence that family physicians' willingness to take Medicaid is declining, children without insurance or with Medicaid are still more likely to be cared for by family physicians. Further study is required to determine whether financial disincentives are contributing to erosion of FP's market share of children's healthcare. There are substantial differences in the provision of preventive services, with family physicians providing less adequate preventive care to children, but there is no evidence that this difference has any effect on parent or guardian satisfaction. From national surveys, economic, quality, and satisfaction differences appear to have little bearing on changes in family physician's role in caring for children. There is no clear evidence that provision of vaccinations does either.

The Future of Family Medicine report reminds us that the role of the FP remains unclear to most Americans. There is no empiric evidence whether this lack of clarity has affected the proportion of child visits to family physicians or not.

Conclusions

FPs see a smaller proportion of children relative to 10 years ago, with the exception of rural and underserved or "safety-net" sites, where family medicine's role in providing healthcare to children appears to be stable. Family physicians still provide 16-21% of visits and are the named usual source of care for one-third of the child population. While this trend is likely to be due to many factors, "saturation" of the market with more easily identified child healthcare providers may be a dominant factor. Despite a potentially real surplus of physicians for children, millions of children still lack adequate access to care in the United States.

In light of a diminishing role in children's healthcare and an increasingly competitive environment for the same, family medicine is left with several options:

1) Relinquish clinical care for children to pediatricians and focus on working with internal medicine to meet the increased healthcare demands of an aging adult population.

2) Relinquish most clinical care for children and focus on preparing a segment of the family physician workforce to care for children in rural and underserved sites. This would at least partially fulfill family medicine's mission of caring for these populations of children whose access to care might otherwise be in serious jeopardy.

3) Compete head-to-head with pediatricians, NPs and PAs for a shrinking child healthcare market, relying on the new model of practice to achieve sufficient brand-recognition and value to recapture market share.

4) Seriously engage pediatricians, NPs, and PAs in meaningful collaboration to build a new model of practice that benefits from all sets of skill to provide better care in a family and community focused environment. This option would seek to increase access and a robust set of services to millions of children who are left wanting despite a surplus of services. This collaboration could involve joint or combined training, and aggressive joint advocacy for improved services, both clinical and in the community.

Pediatrics and family medicine are seeking revision of their professional roles and relationships with people and communities. These professional efforts converge with a shrinking market for providing care to individual children, and an increased need to help resolve the behavioral, genetic, and environmental determinants of health that are largely framed in the context of family and community. Family medicine has a rare opportunity to:

- REFOCUS its energies upon delivering the highest possible quality of healthcare for children in a new model of practice

- EMBRACE pediatric educators and colleagues as partners instead of competitors in an effort to redesign and train the child healthcare workforce of the next century

- REMAIN committed to caring for America's most vulnerable children through our critical role in rural settings, medically underserved areas, and the care of the uninsured

- REALIZE the special capacity of FPs to care for children in the context of family and community as they were trained, and

- RECAPTURE the perception and aura of the family physician's generalist predecessors in this special relationship to the American public.

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Introduction

In early 2003, the American Academy of Family Physicians (AAFP) was presented with evidence documenting substantial growth in the proportion of medical care of children provided by pediatricians relative to family physicians. Substantiation of these findings, both from national data and member surveys, led the AAFP Board to create the Task Force on the Care of Children by Family Physicians that was to advise the Board on how to address this trend. In June 2004, the Commissions on Education, Healthcare Services, and Quality and Scope of Practice formed an ad hoc working group that identified potential factors influencing the apparent decline in the care of children by family physicians. In January 2005, the Robert Graham Center accepted a commission as an external research consultant. The overarching purpose of this resulting study is to provide the Task Force on the Care Of Children by Family Physicians with a contemporary analysis of child healthcare workforce data and draw conclusions to direct further studies and to form recommendations for the AAFP. The primary question to be answered is:

"How has the role of family physicians in medical care for children changed, and what are the potential causes and consequences of these changes?"

Embedded within this primary question are many other issues, e.g. the validity of the relative changes in family medicine's role in caring for children; the potential effects of pediatric workforce changes; the potential effects of payment policies, training changes, maternity care changes, and inter-specialty turf or market battles. The primary question was thus broken into a series of questions to be addressed through secondary analyses:

1. Has family medicine's market share of care for children changed in the last 10 years?
2. What is the current primary care profile of healthcare for children?
3. What are population growth implications vs. physician workforce growth for family medicine's role in healthcare for children (birth through 18 years old)?

4. Does perceived relative financial disincentive explain family medicine's reduction in caring for children?
5. If FP residents had a fourth year of training, how many would want additional training in children's health?
6. Are there measurable, meaningful differences in health outcomes or costs when family physicians rather than pediatricians are the usual source of care for infants and children?

This study comes at a propitious moment when Family Medicine is creating a new model of practice, and when pediatricians are reexamining their mandate for caring for children in the context of communities and families.[3;4] The Future of Family Medicine project identified core values, a New Model of practice, and a process for development, research, education, partnership, and change with great potential to transform the ability of family medicine to improve the health and health care of the nation. At nearly the same time, the American Academy of Pediatrics (AAP) Task Force on the Family offered a comprehensive plan for the AAP and pediatricians to assist families to function well and meet the needs of their children, recognizing that this role expansion would require modifications in pediatric practices to accommodate changes in the characteristics and circumstances of families that are served. This convergence of efforts by family and pediatric physicians offers an opportunity to examine where these specialties may learn from each other. This study examines the profile of outpatient healthcare for children in the United States and also opens the potential for collaboration clinically, in advocacy, and in communities.

The American Academy of Pediatrics' Center for Child Health Research collaborated on this study with contribution to the study design and interpretation by Michael Weitzman, MD and George E. Fryer, PhD. This collaboration underlines this study's concern for improving the healthcare of children regardless of who cares for them.

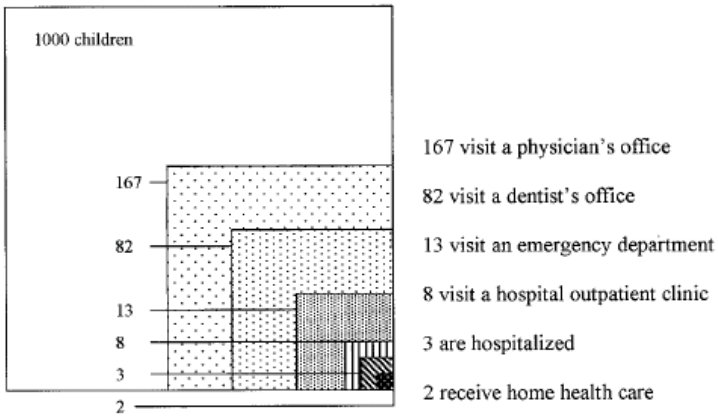
Background

The following synthesis of existing literature provides a review of the existing evidence regarding the ecology and changing profile of healthcare for children. It also covers recent workforce studies about the healthcare workforce for children. The review was conducted in response to our research questions, both to see if our questions had been answered and whether or not other questions should be examined.

The Ecology of Healthcare for Children in America

This effort begins purposefully focused on how children seek and receive care in the United States. The 1996 Medical Expenditure Panel Survey revealed the ecology of care for children, revealing that of 1000 children aged 0 to 17 years, on average each month 167 visited a physician in the office setting, 82 visited a dentist, 13 received care in an emergency department, eight visited a hospital-based outpatient clinic, three spent time as an inpatient in hospital, and two received professional health services in their home (Figure 1).[5] There was considerable variation by age, race, ethnicity, family income, education of the head of household, insurance status, and whether a child had a usual source of care. The sites of care where the variation was smallest were the emergency room and hospital inpatient wards. Variation in outpatient physician visits was greatest for insurance status (children with insurance had 86% more visits than those without insurance), education of head of household (91% more visits for degree beyond high school vs. no degree), and usual source of care status (194% more visits for usual source of care vs. no usual source of care).

Figure 1: Participation in medical and dental care in a typical month for 1000 children aged 0 to 17 years



Modified with permission, Journal of Pediatrics

Variations in the ecology of healthcare for children do not reveal ideal patterns of care; however, the variation may represent considerable disparities in access to healthcare and real opportunities for child healthcare providers to address unmet needs. These differences should be considered in the context of physician workforce surpluses, deficits, and market share.

Changes in the Profile of Healthcare for Children

Published evidence supports the claim that the profile of medical care for children within the ecology of healthcare is changing. Within five commercial HMO and point-of-service plans in a large multi-state health organization, data for all care provided to children between 1993 and 2001 was examined for changes in care provided for three common diseases frequently managed in primary care (asthma, constipation, headache), and one with greater potential for subspecialty referral (heart murmur).[6] This study found that for children under 18 years old, care provided by medical generalists (general internal medicine, FP, GP) declined from 30.4% to 26.8%, care provided by pediatric generalists increased from 48.7% to 53.5%, care provided by medical specialists decreased from 18.1% to 16.2%, and care provided by pediatric specialists increased from 2.3% to 3.5%. There were similar changes in visits, with visits

per 1000 annualized member-months declining for medical generalists from 619 to 514, and increasing for pediatric generalists from 994 to 1,024 for the same time period.

In 2004, the American Academy of Family Physicians commissioned the Robert Graham Center to review prior physician workforce studies, characterize the current family medicine workforce, and assess the supply, demand and need for family physicians in the next 5-15 years. The study was organized to include information about other primary care professionals, and to incorporate the views of workforce policy experts from these professions.[7] The study was done in collaboration with the Center for Health Professions at the University of California, San Francisco, and was informed by an advisory board of physician workforce experts from a variety of specialties and professions. The study included analyses relevant to the child healthcare workforce.

The Graham Center Workforce Study found that, between 1997 and 2002, generalists who see adults and children had a decline in the proportion of visits made by children (Table 1). To the extent that these generalists can be assumed to be family physicians, this may confirm the decline in care for children found by Freed.[6] The Graham Center Study also found a decline in the proportion of care provided by family physicians and general practitioners for people of all ages in the U.S. (National Ambulatory Medical Care Survey data) but did not isolate the proportion of care provided for children.

Table 1: Number of Children in 1997 and 2002 Who Saw or Talked with a Physician by Physician's Specialty in the Preceding 12 Months

Number of Children	Specialist	Generalist	Generalist Who Sees Children and Adults
1997 71,359,353	8,485,838 (11.9%)	55,748,247 (78.1%)	27,586,530 (38.7%)
2002 72,969,942	9,638,254 (13.2%)	57,906,158 (79.5%)	23,119,539 (31.7%)

Data Source: 1997 and 2002 National Health Interview Survey; Analysis by the Robert Graham Center, 2004.

The Child Healthcare Workforce

In 2004, the number of physicians who spend the majority of their time in direct patient care in the U.S. and who routinely care for children may be as much as 153,931 (Table 2). This precision of this figure is most limited by whether the included family physicians care for children. The best data from the AAFP suggests that 88% of family physicians provide healthcare for children.[8] There is a family physician or general practitioner for every 3,202 people and a general pediatrician for every 1,572 children. The number of children per general pediatrician is remarkably close to needs estimates made by the Future of Pediatric Education II (FOPE II) even though these estimates do not account for care provided by family physicians, nurse practitioners or physician assistants.[9] These respective workforces have grown remarkably faster than the birth rate, which decreased by 11% between 1981 and 2001 (Table 3).[7] Extrapolations of the adjusted needs model developed by the Graduate Medical Education National Advisory Committee (GMENAC) in response to a charge from the Secretary of the Department of Health and Human Services, suggest that the U.S. already enjoys a surplus of physicians providing general child healthcare but has very focused "need" of a few subspecialties (Table 4).

There are roughly an additional 114,000 primary care nurse practitioners (NPs) and physician assistants (PAs), many of who provide care for children. It is difficult to know how many NPs practice in family medicine and pediatrics since there are no centralized NP data, however the American Nursing Credentialing Center has 3,004 nurses certified as Pediatric Nurse Practitioners and 33,288 nurses certified as Family Nurse Practitioners.[10] Less than 5% of PAs work in general pediatrics and pediatric subspecialties, while nearly 30% work in family medicine--a total of nearly 18,000.[11] It may not be possible to know with certainty how many NPs and PAs care for children, but it is likely to be at least as great as the number of general pediatricians.

Table 2: The Number of Direct Patient Care Physicians (MD and DO) in the United States in 2004

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Table 3: Growth of Direct Patient Care Physicians (MD and DO) in the United States, 1981-2001

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*The crude birth rate is the number of births in the U.S. in the given year divided by the total population and multiplied by one thousand

Table 4: GMENAC Estimated Numbers of Persons* Required To Support Specific Physician Specialties, Projected To 2004

Medical Specialty	# of Child Care Physicians‡	# of Persons per Physician*	# of Persons Who Could be Served per Physician
Child Psychiatry§	7,236	40,543	27,000
FP/GP	106,101	2,765	3,968
General Pediatrics	54,760	5,358	7,900
Pediatric Allergy§	236	1,243,167	271,000
Pediatric Cardiology	1,739	168,691	212,000
Pediatric Endocrinology§	749	391,836	304,000
Pediatric Hem-Onc§	1,541	190,369	148,000
Physical Medicine & Rehab	7,789	37,668	76,000
Pediatric Nephrology	463	633,188	696,000
	180,614		

Data Source: Medicus Partners; Analysis by The Robert Graham Center, 2004.
‡ All physicians in specialty, not just direct patient care
* Only includes children for pediatric specialties (0-17 years old)
§ Relative need for more physicians of this specialty

In 2004, Shipman et. al. also addressed the question of the adequacy of the supply of general pediatricians using a benchmarking model.[12] The report did not consider care provided to children by Nurse Practitioners (NPs), Physician Assistants (PAs), physicians in training programs, and physicians working less than 20 hours per week in a clinical capacity. They assumed:

- Six percent of pediatricians enter teaching, research, and administration.
- All U.S. citizens and permanent residents stay in the workforce as do 75% of international medical graduates.
- An upper age limit of 75 for clinically active generalists.
- Average weekly work hours and stable productivity levels specific to age and gender.
- A projection of percentage of visits by children to pediatricians by age: 83% of 0-4 year olds, 72% of 5-9 year olds, 57% of 10-14 year olds.

Their analysis, which was conducted with adjustments and sensitivity analyses for age and gender of physicians, GME growth, retirement rates, population growth, market share, and the changing demographics of the U.S. population, projected a significant supply expansion of pediatricians "in all probable

scenarios" compared to the 2000 benchmark of 49 pediatricians per 100,000 children. Their model projected that the number of general pediatricians would increase 64% by 2020 from the year 2000, while the child population is only projected to expand 9%, so that by 2020 there would be 72 general pediatricians per 100,000 children (one for every 1,386 children). The model showed that even if the annual number of new pediatric trainees was halved, retirement rates doubled, or older pediatricians' productivity was reduced by 30-50%, the growth of the general pediatric workforce would still outpace that of the child population.

The report offered options to maintain current patient volumes including expanded services, including young adult care and/or competing for a greater share of the children currently cared for by non-pediatricians. For family medicine, this option suggests increased competition for the under-18 population. Alternatively, any shortage of family physicians might be offset by the oversupply of pediatricians if FPs were willing to see fewer children and more adults needing a primary physician.

In 2000, the FOPE II Project completed a 3-year effort to update the original task force and policies of 1978.[13] This expert panel made many notable suggestions of relevance to family medicine. The report suggests that despite continued potential for competition between pediatricians and family physicians, there will be new opportunities to implement cooperative models, particularly in underserved areas. This report also reaffirmed the recommendation that every child have a "medical home"— an "approach to providing continuous and comprehensive primary pediatric care from infancy through young adulthood." Based on mid-range U.S. Census Bureau projections, the report authors recommended that there be 55,800 physicians in primary care pediatric practice in 2010, and about 3000 pediatric residents beginning training each year. Stockman notes that in the early 1970s, 6000 children per pediatrician (general and subspecialists) was thought to be appropriate; 4000:1 was thought appropriate in 1980; and 2000:1 was deemed appropriate in 1990. He notes

that FOPE II recommendations represent a ratio of 1200-1400:1.[14] FOPE II did not consider family physicians in the context of children per physician ratios. It is worth noting that a ratio of 1200:1 is similar to ratios reported for primary care physicians in staff model HMOs and to what has been recommended as a rational ratio for family physicians elsewhere.[15]

A common concern in pediatric workforce literature of the last decade is that the disproportionate growth of the general pediatric workforce may reflect a decreased or insufficient number of trainees who choose to subspecialize. To examine whether a pediatric subspecialist shortage existed, 18,274 subspecialists across 17 fields were surveyed as part of FOPE II.[16] Of the 65% who responded, the majority were based in academic medical centers; only 4% were rural (range 2-7%); and only 9% worked in community hospitals (range 0-24%). In 15 of the 17 specialties, a majority felt that there would be no need for additional subspecialists in their geographic area for at least three to five years (behavioral-developmental and emergency medicine were the exceptions). More than two-thirds (71%) reported facing competition in their geographic area; however only 14% had seen a decline in referrals and few reported modifying their practices in response to competition. The authors conclude that the "burgeoning supply of pediatric subspecialists in practice is a major contributing cause for the competitive pressures over and above pressures imposed by managed care."

Studies of individual subspeciality groups or of different respondents have yielded different opinions. In 2004, a survey of pediatric cardiac intensive care unit program directors found that many training positions were going unfilled and there was a general opinion that a shortage of pediatric cardiac intensivists loomed.[17] In response, Chang acknowledged the potential shortage and, in addition to creating incentives for more trainees in pediatric cardiac intensive care, suggested that multi-disciplinary team development, hospitalists, and physician-extenders might be other solutions.[18] A survey of children's hospitals found a general vacancy rate for pediatric subspecialty positions of 11.1%, in

2001.[19] The most commonly reported vacancies were neurology and gastroenterology, anesthesiology, pulmonology, diagnostic radiology, and pediatric surgery. The most frequently cited reasons for vacancies were: a) an overall shortage of qualified candidates; b) competition among providers; and c) low pay relative to job demands. The year prior (2000) the AAP FOPE II Pediatric Subspecialists of the Future Workgroup reported that, "the number of clinical subspecialists is roughly in balance, and, in some cases, at risk for exceeding resources for support." [15] However, the AAP does not have a specific policy about subspecialty workforce needs.

Pediatric department chairs point out that declaring there to be a present or projected surplus of child healthcare physicians assumes that these physicians will continue to work as they currently do, and with the populations that they currently do. They argue that these assumptions risk leaving nearly a quarter of children with inadequate access to care, a workforce unprepared to deal with the growing number of special-needs children, unnecessary restrictions on subspecialty care, and a workforce that does not reflect the country's ethnic and cultural diversity. They also express concern that declarations of adequacy or even surplus may further diminish students' interest in pursuing careers in caring for children.[20]

Distribution of the Child Healthcare Workforce

Freed, et al. were intrigued by Dr. Richard Cooper's trend models revealing strong correlations between growth of the general physician workforce and growth in per capita income.[21] Wishing to understand whether pediatricians followed similar trends, they examined the number and distribution of pediatricians both nationally and state-by-state relative to the population of children and economic conditions within each state between 1980 and 2000. They plotted real inflation-adjusted Gross Domestic Product (GDP) per capita against the number of active, pediatric medical physicians per child 0 to 14 years of age. They found that the number of pediatricians increased 140% between 1978 and 2000, during which time the population of children (0 to 14

years of age) grew much more slowly, such that the relative number of pediatricians per 100,000 children more than doubled from 49.8 to 106.2. The pediatrician workforce growth was highly correlated with national per capita GDP but rose at an even faster rate. Despite a more than doubling of pediatricians per 100,000 children since 1978, Freed et al. found that pediatrician state-by-state distribution remains very uneven with ranges of 165 pediatricians per 100,000 children in Massachusetts to 28 per 100,000 in Idaho. This distributional unevenness is explained in part by pediatricians' increasing likelihood of locating in states with higher per capita income. The noted variation in likelihood of pediatrician location is similar to that noted by Lebaron, et al, who also found that pediatrician-location was largely predicted by rising family income.[22] Freed notes that the failure of market forces to produce more level distributions despite considerable growth in the pediatric workforce is counter to Newhouse's predictions in the 1980s.[23] They conclude that even if the number of pediatricians in the U.S. continues to rise the trend toward geographic concentration will continue. In contrast, the family physician workforce has different distributional patterns, tending to distribute like the population.[24;25] This is one reason why rural and other underserved populations are much more dependent on family physicians.

In a related editorial, Chesney notes that no single method of modeling is sufficient to accurately predict workforce needs. He acknowledges past efforts to do demand- and needs-based modeling, specifically the Kaiser Permenente's Portland, Oregon HMO model suggested 11.9 pediatricians per 100,000 population was sufficient to meet need. Chesney suggests that we should try to understand trend analysis, not as a measure of need or demand, but as a means of estimating what is likely to happen with the pediatric workforce pipeline.

Subsequently, Freed et al sought to use Cooper's physician workforce trend models to create projections of the pediatric physician workforce with the assumption that sustained economic expansion is the dominant factor driving healthcare use and the physician workforce.[27] To this end, they used similar

methods to try and develop a predictive model and tested its accuracy retrospectively. Again, they did not include FPs, NPs, or PAs. Their model found that despite a doubling of the pediatrician-to-population ratio between 1978 and 2000, the number of pediatricians "required" in 2010 would be higher than the number expected, based on historical trends. They note that the model's accuracy is greatest when predicting 10 or fewer years into the future, but suggest that it reveals a potential shortage of pediatricians relative to expectations in 2020. They suggest that this finding may be supported by changes in how the pediatricians will work, specifically that improvements in technology and the care of very ill newborns will drive demand for pediatric subspecialists, and that the growing list of preventive services for children will increase demand for primary care pediatricians. They conclude cautiously saying that they "do not imply that the previous or current supply of pediatricians is appropriate for the nation" but leave this to society to decide.

Caring for Rural and Underserved Children

Randolph and Pathman conducted a descriptive cross-sectional analysis of successive AMA Masterfiles in five-year intervals between 1981 and 1996.[28] They found that despite a 72% increase in the number of pediatricians (19,739 to 34,100) rural pediatrician-to-child ratios remained well below those of urban ratios, and only in counties with populations of 25,000 or more did the rural pediatrician-to-child ratio increase meaningfully. By 1996, the percentage of recent pediatric residency graduates opting for rural practice had declined by half (14.6% to 7.4%). Pediatrics graduates choosing to practice in rural Health Professional Shortage Areas (HPSAs) had fallen even farther and by 1996, only 123 pediatricians were practicing in rural, whole-county HPSAs. The authors conclude that it may not be feasible for pediatricians to practice in counties below 25,000 population. Perhaps most relevant to family medicine, they found that International Medical Graduate (IMG) and female pediatricians were consistently less likely to practice in rural areas. This final trend may continue given that the pediatric workforce is increasingly made up of women, and may

also influence the family medicine workforce, which has a high proportion of female and IMG trainees.

The Graham Center Workforce Study found that rural and safety net or underserved populations were more dependent on family physicians and general practitioners than were other populations (Table 5) and that only these physicians meet GMENAC's estimates of need in rural areas. There is sufficient child population in rural areas to support nearly 2000 more general pediatricians. However, the GMENAC findings are based on need assessments made more than 25 years ago and may not be valid for 2005. Regardless of contemporary validity, one of the issues made more clear by GMENAC's findings is that a workforce configured exclusively for children likely requires a larger general population than does family medicine. For instance, updated GMENAC estimates suggest that a community would need nearly 8,000 people to support the services of a general pediatrician, and nearly 700,000 people to warrant a pediatric nephrologist.[7] These findings suggest that family physicians who can care for the entire age and gender spectrum may be the only type of physician viable in smaller communities.

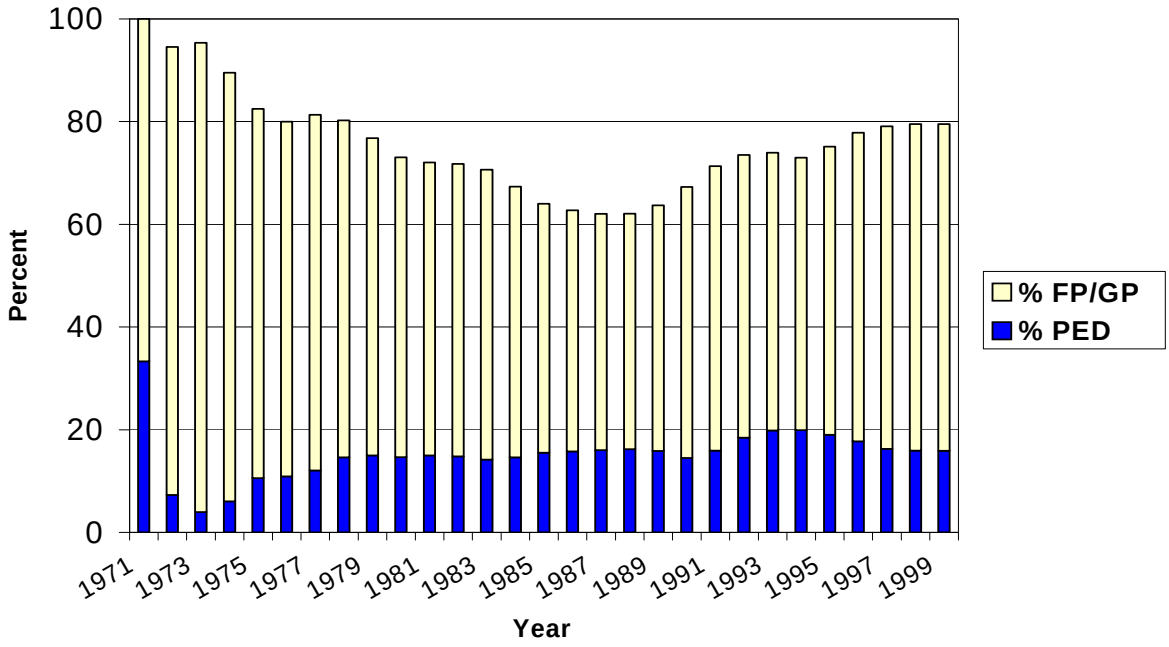
The National Health Service Corps (NHSC) is likewise dependent on family physicians and general practitioners in very underserved, often rural communities (Figures 2, 3, and 4). The Nations' community health centers, a large source of healthcare for the underserved and uninsured, have both pediatricians and FP/GPs, but are much more heavily dependent on the latter. In 2003, 3,048 full-time equivalent FP/GPs conducted 12,143,000 adult and child patient encounters in community health centers.[29] In contrast, 1189 FTE general pediatricians conducted 4,810,000 patient encounters.

Table 5: The Number of Active Direct Patient Care Physicians (MD and DO) in Rural (Non-MSA) U.S. Counties, 2004*

	Family Physicians & General Practitioners	General Pediatricians	Pediatric Subspecialists	All Physicians
Physicians in Specialty	20,946	4,680	1,021	71,866
People per Physician§	2,940	3,288	15,072	857
Physicians per 100,000 People§	34.0	30.4	6.6	116.7

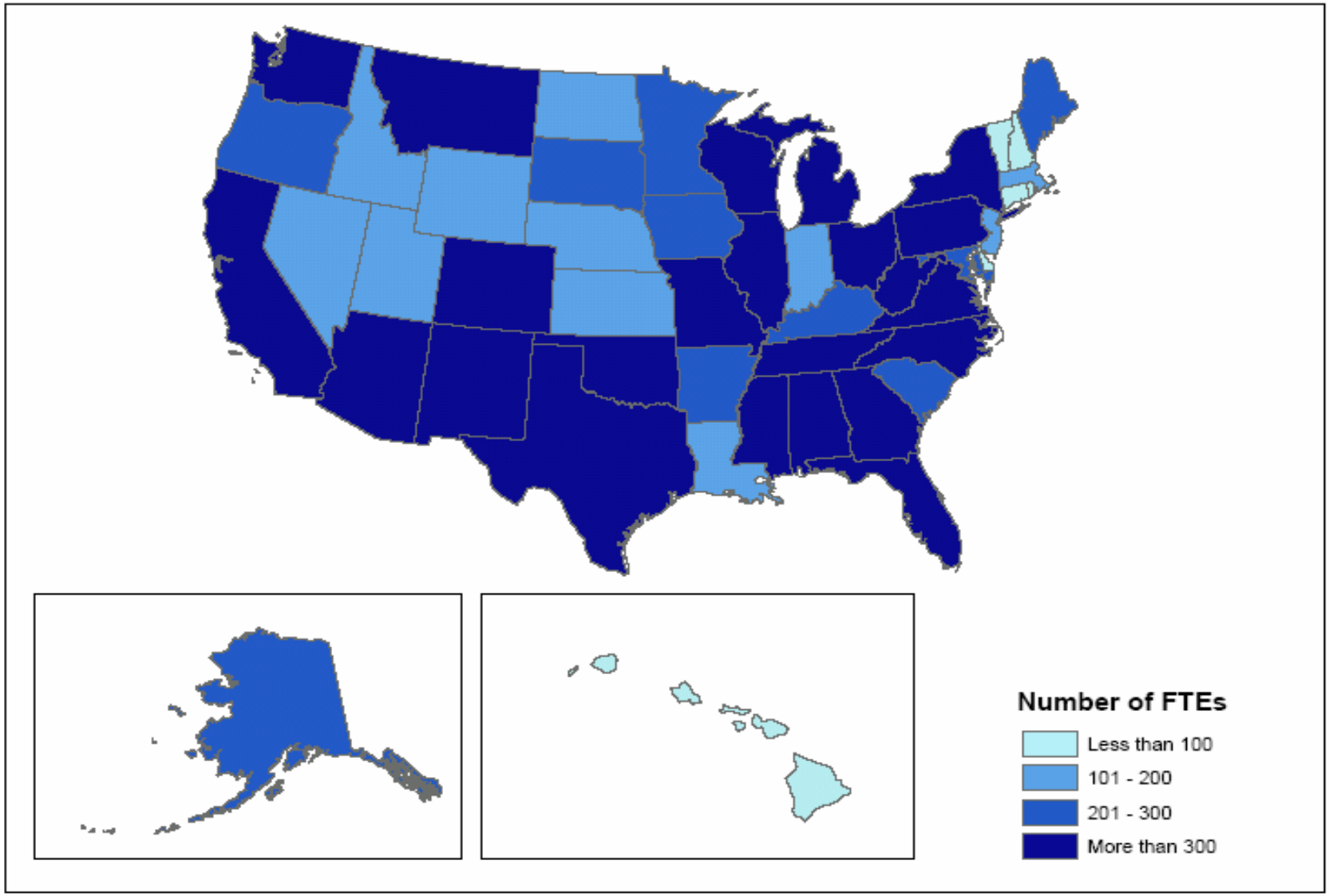
Data Source: 2004 AMA Masterfile; Analysis by the Robert Graham Center, 2004.
*Excludes physicians in residency training
§Only includes children for pediatric specialties (0 – 17 years old)

Figure 2: Family Physician and Pediatrician Percentages of NHSC Physician Workforce



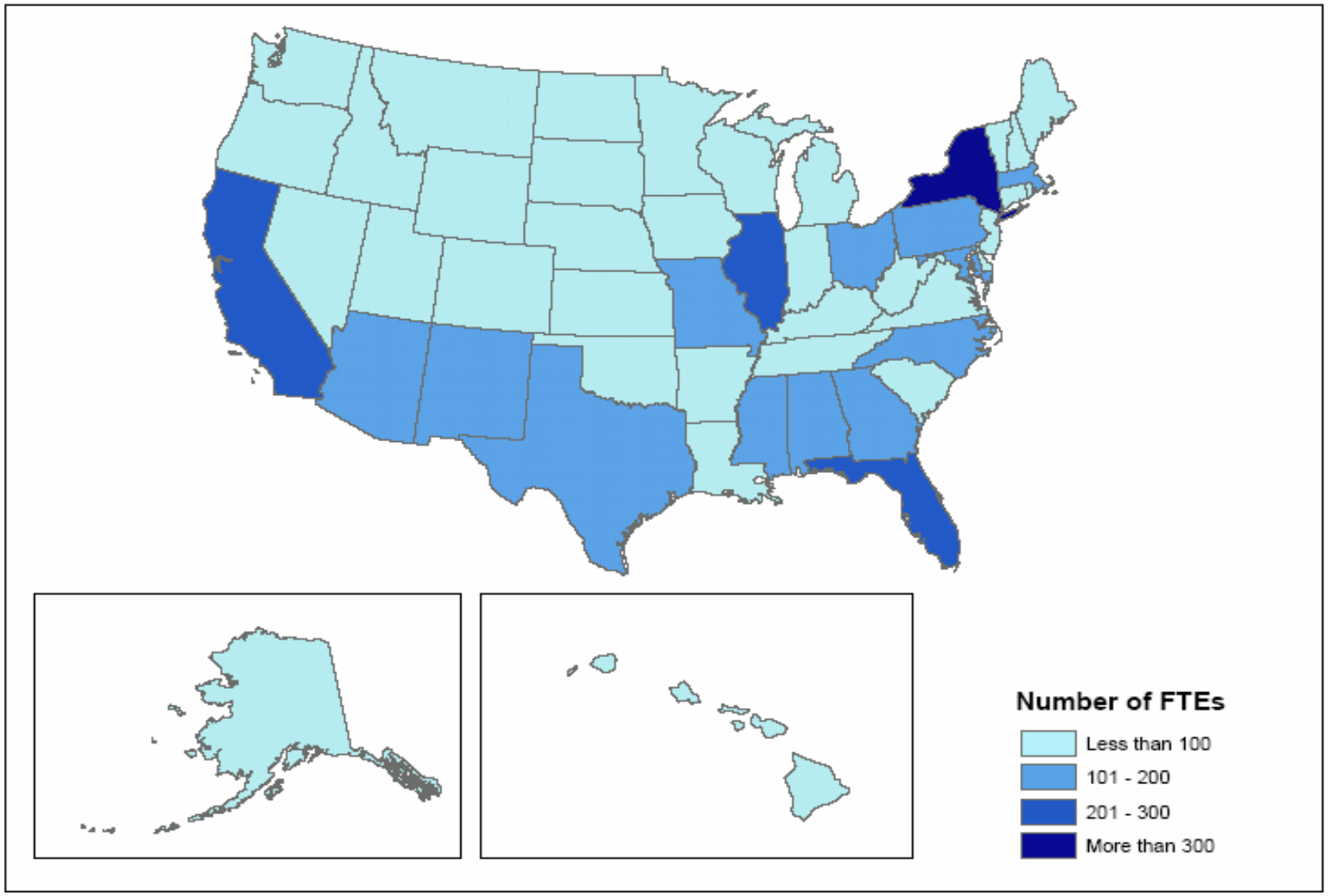
Data source: NHSC historical workforce data; Analysis by the Robert Graham Center, 2005.

Figure 3: Family Physician / General Practitioner FTEs at NHSC Sites, 1970-1999



Data Source: National Health Service Corps
Prepared by the Robert Graham Center: Policy Studies in Family Medicine and Primary Care

Figure 4: Pediatrician FTEs at NHSC Sites, 1970-1999



Data Source: National Health Service Corps
Prepared by the Robert Graham Center: Policy Studies in Family Medicine and Primary Care

Children's Mental Healthcare

There is significant variation in the availability of children's mental health services across states that is not explained by population sociodemographics but is more likely due to state policies or healthcare market characteristics. California, Florida, and Texas have the highest rates of unmet need; Colorado, Massachusetts and Minnesota have the lowest. Within states there are also disparities in access to mental health services for children with the highest need, predominantly black and Hispanic children in low-income families.[30] Problems with children's access to needed mental health services may not be soluble in primary care, but are certainly an advocacy need for both family medicine and pediatrics.

Does Vaccination Coverage vary by Physician Specialty?

In discussing the potential questions for this study, some task force members theorized that decisions about whether to provide vaccinations might either affect delivery of care to children, or be an effect of decisions about caring for children. An ecologic study from 1997 looked at state-level associations between: 1) vaccination sites and coverage (percent of children immunized); and 2) physician concentrations by specialty.[22] They confirmed previous evidence of huge variations in pediatricians per population (6-fold differences across states, only 3-fold differences for family physicians). After controlling for many potential confounding or contributing factors to the associations, they found that a greater number of pediatricians, family physicians and general practitioners per 1000 children were all positively associated with a state having more vaccination sites/1000. They report that this association was stronger for pediatricians than for family physicians, but their data show that it is highest for the number of general practitioners per 1000 people (beta-coefficient more than twice that for pediatricians, +1.194 vs. +2.515). Associations between physician specialty and proportion of infants vaccinated in the private sector was more significantly associated with rising numbers of pediatricians per 1000 people but the association was weak for all three specialties. Likewise for vaccination coverage, the association was significantly positive for increased numbers of

pediatricians per 1000 people but only weakly so. In summary, having more primary care physicians, particularly general practitioners, is associated with having more vaccination sites per 1000 infants. There are also weakly positive associations between having more pediatricians and vaccination coverage, particularly in private offices, but the state-level ecologic frame and significant variations in pediatrician workforce size put these associations at high risk for confounding.

Do Differences in Guidelines or Practice Explain Market Share Shifts?

A potential explanation of market share shifts is that pediatricians see children more often or operate to different guidelines that dictate visit differences. In a recent article reviewing the evidence behind many screening recommendations for children, Moyer and Butler found a dearth of evidence for most screening recommendations, and tremendous variation across professional and governmental recommendations.[31] For example, they state,

> "The number of behavioral counseling recommendations that have been made by different organizations is very large. In this review, 17 counseling interventions were recommended by >2 agencies, many of which apply to several age groups. For each of the 29 recommended well-child visits, Bright Futures suggests between 80 and 100 discrete counseling interventions. Hundreds of other counseling recommendations are included in policy statements and committee reports of organizations such as the AAP."

We don't know if differences in prevention or screening recommendations explain differences in the number of visits made by children to pediatricians vs. family physicians, but the probability is quite high given the substantial variation between the specialties. This variation may also represent inadequate delivery of recommended preventive services by family physicians, excessive delivery of services by pediatricians, or both.

Does a declining rate of prenatal care result in reduced care of children?

The Graham Center previously found a substantial decline in prenatal care by family physicians between 1980 and 1999 in all geographic regions of the U.S., falling overall from 17.3% of prenatal visits to 10.2%.[32] Using Maine as a test-case state, it was found that despite reductions in prenatal care, family physicians still provide nearly one-third of all newborn care. The proportion of care depended on insurance coverage and location, with increasing proportions of care for newborns covered by Medicaid (35%) or without insurance (42%), and for small hospitals (50%) and rural communities (35%). It is not known how generalizable the Maine experience is to the national level.

Recent Policies or Proposals of Note for Family Medicine and Pediatrics

There are a few recent policies or proposals published by the two specialties that may influence their respective roles in caring for children, and that may offer mutual opportunities. In 2003, the American Academy of Pediatrics Task Force on the Family was asked to, "help guide the development of public policy and recommend how to assist pediatricians to promote well-functioning families."[4] The task force came to two "overriding" conclusions:

1) children's outcomes are strongly influenced by how well their families function; and, 2) there is much that pediatricians can do to help nurture and support families. There were many, additional recommendations about the training and support needed to permit pediatrician's ability to practice "family pediatrics."

At least one family-related issue, recommending smoking cessation to parents, remains a difficult subject for some pediatricians, but most parents are receptive to hearing this message from their child's physician.[34] Providing care to people other than the primary patient within a single visit is not an uncommon occurrence, and is in fact reported to happen in 6-18% of visits to family physicians.[35;36] This is one direct example of providing care in the context of families, and for family physicians nearly a quarter of these "secondary visits" involves providing care to parents of a patient.

In 2005, the Community Pediatrics Training Initiative and the AAP Committee on Community Health Services called for a re-engagement of the pediatrics' role in the health of communities.[33;37] Satcher suggests that pediatricians are unable to sufficiently address health conditions precipitated or exacerbated by social, community, and environmental factors and will remain stymied until they expand their role beyond providing healthcare to individual patients.[37] He specifically offers that the shrinking child-to-pediatrician ratio may be an opportunity for pediatrics to redefine itself and involve itself in more of the advocacy roles suggested by Dr. Abraham Jacobi 100 years ago.[1] Family-oriented care and community-focus are obvious areas of potential collaboration with family physicians.

Family medicine is likewise seeking to revise key elements of its relationship with people in the United States.[38] A study done in preparation for The Future of Family Medicine report found that, "patients are confused about primary care terminology and rarely, if ever, make conscious decisions among primary care specialties."[39] This study suggests that parents may not recognize that pediatricians and family physicians are different. People participating in the study had a difficult time understanding what a family physician did. One respondent said, "I don't have kids – why would I go to a family physician?" A general lack of understanding of FPs scope of practice may further compound any effects of reduced prenatal and newborn care.

Background Summary

As with adults, the overwhelming majority of children receive healthcare in physician's offices, most often from a pediatrician or family physician. There has been considerable growth of the physician workforce that cares for children even as birth rates have fallen in the United States. As of 2004, there is one pediatrician in direct patient care for every 1600 children, nearing or exceeding some measures of sufficiency. Some sources suggest that 11.9 general pediatricians per 100,000 children is sufficient, yet by 2020 there may be as many as 72 per 100,000. There is also one family physician or general practitioner in direct patient care for every 3,200 people in the United States, many of whom care for children, with the greatest dependency on their services in rural areas and safety net sites. The number of NPs and PAs caring for children is not certain, but is likely to be at least as great as the number of general pediatricians—a fact relatively unacknowledged in most workforce studies. It is unclear how growth of the pediatric workforce has affected need for pediatric subspecialists, and while there are some indications of shortage of some subspecialties, subspecialization may not be a pressure-relief valve for the pediatric workforce. There is good evidence of a shortage of mental health providers for children. The growth of the pediatric workforce has largely occurred in areas of affluence and in urban or suburban areas, leading to wide variations in pediatrician-to-population ratios and increased dependence on family physicians by rural and underserved populations. There is also important variation in whether children receive healthcare at all, and despite a possible surplus of physicians to care for them, there are disparities in children's access to healthcare.

There is existing evidence of a clear and consistent erosion of the proportion of care being provided for children by family physicians relative to that of pediatricians, and it will likely continue without intervention. Erosion of family medicine's share of visits is not isolated or specific to children but is occurring across most populations in the United States. The erosion of family medicine's proportion of visits by children may be explained partially by differences in care guidelines that influence visit frequency or volume by children. No evidence could be found that choices about vaccinations have changed patterns of children's healthcare by family

physicians. There is insufficient evidence to surmise that family physicians' reductions in prenatal or obstetrical care has affected their role in caring for children, limited evidence suggests that this may not be the case but a definitive answer will require further study.

Pediatrics and family medicine are seeking to revise their professional roles and relationships with people and communities. These efforts converge with a shrinking market for caring for individual children and a pressing need to respond to behavioral, genetic, and environmental determinants of health in the context of family and community.

New Analyses

Has family medicine's market share of medical care for children changed in the last 10 years?

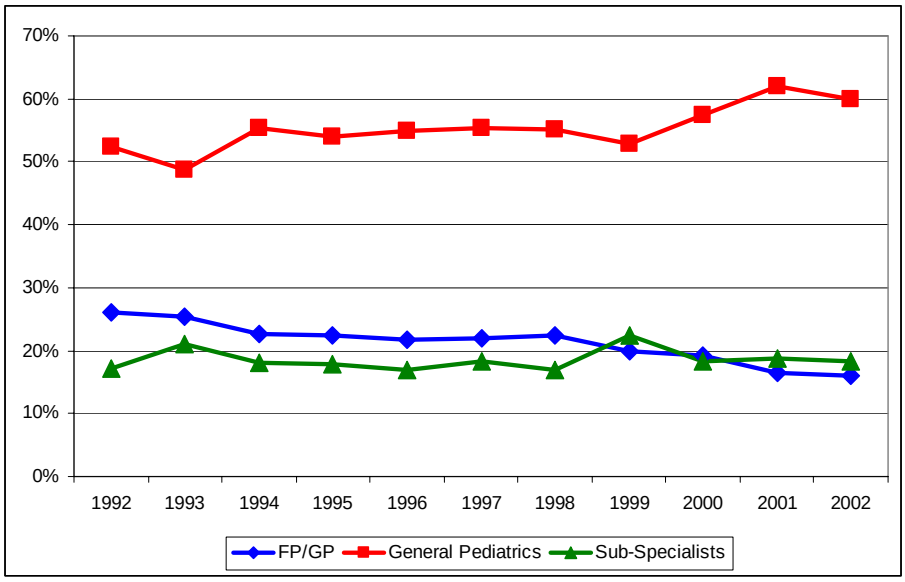
National Ambulatory Medical Care Survey (NAMCS) data suggests that there has been a significant decline in the proportion of care that family physicians provide for children falling from one-in-four to about one-in-six between 1992 and 2002 (Table 6, Figure 5). The decline in care for children for family physicians has corresponded with significant growth in care provided by general pediatricians, and small gains for pediatric subspecialists and other physicians. The decline in proportion of care corresponds with a 44% decline in visits made per 100 children to family physicians and a potential decline of 33% in child visits to family physicians (Tables 7 & 8).

Table 6: National overall trends in the share of the care of children by physicians, 1992-2002

	Estimated visits by children	FP/GP share	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1992	175,112,000	26%	52%	17%	4%
1993	147,412,000	25%	49%	21%	5%
1994	142,811,000	23%	55%	18%	4%
1995	145,342,000	22%	54%	18%	6%
1996	153,056,000	22%	55%	17%	6%
1997	154,103,000	22%	55%	18%	4%
1998	163,385,000	22%	55%	17%	5%
1999	130,376,000	20%	53%	22%	5%
2000	156,572,000	19%	57%	18%	5%
2001	157,914,000	17%	62%	19%	3%
2002	175,352,000	16%	60%	18%	6%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Figure 5: Trends in care of children by physicians, 1992 - 2002



Data Source: National Ambulatory Medical Care Surveys;
Analysis by the Robert Graham Center, 2005.

Table 7: National overall trends in the number of children's office visits per 100 children

	Family Medicine (FP/GP)	General Pediatricians	Sub-specialists	All other Physicians
1992	69.0	139.0	45.7	11.1
1993	55.6	107.3	46.5	10.4
1994	47.7	116.5	38.2	8.0
1995	46.9	112.8	37.5	12.1
1996	47.1	119.9	37.0	13.9
1997	47.9	120.4	39.6	9.4
1998	51.4	126.2	38.9	12.3
1999	36.3	95.7	40.7	8.6
2000	41.9	124.5	39.6	10.7
2001	36.0	134.8	40.8	5.9
2002	38.6	144.2	43.9	14.0

Data Source: National Ambulatory Medical Care Surveys, 1992-2002;
Analysis by the Robert Graham Center, 2005.

Table 8: Trends in the share of the care of children by physicians – Average annual number of office visits per physician

	Child visits per Family Physician (FP/GP)	Child visits per General Pediatrician	Adult visits per Family Physician (FP/GP)
1993	642	2,336	2,759
1994 - 96	569	2,446	2,320
1997 – 99	521	2,169	2,443
2000 - 02	429	2,347	2,521
Rate of change 1993 to 2002	-33%	0%	-9%

Data Source: National Ambulatory Medical Care Surveys, 1993-2002; Analysis by the Robert Graham Center, 2005.

The decline in visits by children to family physicians does not seem to be due to the "crowding effect" of additional visits by adults to family physician offices. From 1993 to 2002, there were declines in both adult and child visits (per physician) to the offices of family physicians, although the number of adult visits to family physicians have increased in the last five to eight years (Table 8). In contrast there was practically no change in the average annual number of visits to the offices of general pediatricians from 1993 to 2002.

The decline in care provided by family physicians to children has occurred largely in urban and suburban areas (Metropolitan Statistical Areas, or MSAs) where the percentage has fallen from 21% to 14%--lower than that of pediatric subspecialists and just twice the percentage of care provided by internists, surgeons and other physicians (Table 9). The percentage of visits made to the offices of family physicians and general pediatricians in non-MSAs has remained relatively unchanged since 1992 with general pediatricians providing nearly half of visits for children, and family physicians providing more than one-third (Table 10). Family physicians' share of visits for children under five years of age has fallen from 22% to 13% (pediatricians' rising from 65% to 75%), for 5-13 year-olds from 27% to 15% (pediatricians' rising from 52% to 70%), and for 14-17 year-olds, 30%-21% (pediatricians' rising from 37% to 45%) (Tables 11, 12, and 13). Family medicine's share of preventive and acute care visits have declined relative to general pediatrics; however, both family physicians and

general pediatricians have ceded a share of care for children with chronic illnesses to pediatric subspecialists (Table 14, 15, and 16). More detailed age group data is presented in the Appendix tables in Appendix A.

Table 9: Trends in the share of the care of children by physicians in MSAs, 1992 – 2002

Year	Estimated annual visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1992-93	116,057,000	21%	54%	21%	5%
1994-96	123,183,000	18%	58%	19%	5%
1997-99	125,806,000	18%	57%	20%	5%
2000-02	139,754,000	14%	62%	19%	4%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Table 10: Trends in the share of the care of children by physicians in non-MSAs, 1992 - 2002

	Estimated annual visits by children	FP/GP share	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1992-93	26,167,000	40%	42%	16%	3%
1994-96	23,887,000	42%	37%	15%	6%
1997-99	23,482,000	40%	39%	17%	4%
2000-02	23,526,000	36%	42%	16%	7%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Table 11: Trends in the share of the care of children below 5 years old by physicians, 1992 - 2002

	Estimated annual visits by children	FP/GP share	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1992-93	76,986,500	22%	65%	11%	4%
1994-96	69,740,000	18%	69%	9%	5%
1997-99	67,506,000	17%	70%	9%	4%
2000-02	74,512,000	13%	75%	8%	4%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Table 12: Trends in the share of the care of children 5 to 13 years old by physicians, 1992 - 2002

	Estimated annual visits by children	FP/GP share)	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1992-93	8,956,500	27%	52%	17%	5%
1994-96	8,021,000	24%	58%	14%	4%
1997-99	7,381,000	14%	69%	15%	3%
2000-02	8,003,000	15%	70%	13%	2%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Table 13: Trends in the share of the care of children 14 to 17 years old by physicians, 1992 - 2002

	Estimated annual visits by children	FP/GP share	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1992-93	75,319,000	30%	37%	29%	6%
1994-96	69,309,000	27%	40%	27%	6%
1997-99	74,401,000	26%	39%	29%	6%
2000-02	80,764,000	21%	45%	29%	5%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Table 14: Trends in the physician share of the care of children for acute care visits, 1992 - 2002

	Estimated annual visits by children	FP/GP share	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1997-99	86,217,000	24%	56%	15%	5%
2000-02	86,043,000	20%	62%	14%	4%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Table 15: Trends in the physician share of the care of children for preventive care visits, 1992 - 2002

	Estimated annual visits by children	FP/GP share	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1997-99	36,009,000	18%	69%	9%	3%
2000-02	43,759,000	16%	74%	5%	5%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

Table 16: Trends in the physician share of the care of children for chronic care visits, 1992 - 2002

	Estimated annual visits by children	FP/GP share	General pediatricians' share	Sub-specialists' share	All other Physicians' share
1997-99	24,791,000	17%	29%	47%	7%
2000-02	28,814,000	11%	32%	53%	5%

Data Source: National Ambulatory Medical Care Surveys; Analysis by the Robert Graham Center, 2005.

The Medical Expenditure Panel Survey (MEPS) is another important national survey that allows us to look at the profile of childrens' healthcare with children as the unit of analysis rather than visits (NAMCS samples physicians and then weights visits to give national estimates). Until 2002, MEPS did not permit analyses of visits by specialty, but for this single year it is possible to compare the profile of children's care with the profile of visits offered by NAMCS. Unfortunately, since MEPS only did this for 2002, it does not afford a longitudinal look at changes in visits. MEPS estimates just 9 million fewer visits by children to physicians offices than NAMCS (5% difference). MEPS data demonstrate a higher percentage of care provided by family physicians to children in 2002 than NAMCS (21% vs. 16%), reduces the percentage of care done by general pediatricians (53% vs. 60%), and is similar in the percentage of care delivered by other physicians (26% vs. 24%) (Table 17). MEPS is similar to NAMCS in its inadequate capture of care provided by NPs and PAs (NAMCS doesn't sample NPs or PAs and it lumps NP visits with nurse visits; MEPS

hierarchically assigns care to physicians if physicians and NPs/PAs are involved in a patient's care). MEPS, like NAMCS reveals that family physicians provide a higher percentage of care for children in rural areas, approaching that of general pediatricians, and a larger percentage of visits for 13 – 17 year-olds. For this latter group, adolescents, MEPS also shows that just over half of care shifts to physicians other than FPs and general pediatricians.

For children who name a person as their usual source of care (rather than a facility) all but four percent name a family physician or general pediatrician (Table 18). The percentage who names family physicians rises to one-third for all children, and nearly half for children living in more rural areas. There is also a significant gradient across ages such that FPs are the usual source of care for just 20% of children between birth and 5 years of age, but nearly 50% for adolescents (13 – 17 years old). It is also worth noting that while half of adolescent office-visits are made to physicians other than FPs or general pediatricians, "other" physicians are named as the usual source of care for just seven percent of adolescents (Table 18). The large shift in adolescents' visits to specialties other than FP or pediatrics relative to who they name as their usual source of care could be appropriate but may also signal a transition period in which children with chronic illnesses may be particularly vulnerable.

MEPS and NAMCS data provide substantively different conclusions but are sufficiently similar to conclude that these trends for children's visits are likely real. Continued comparisons of these two national health surveys over time may be useful to understand the changing profile of healthcare for children.

Table 17: The share of the care of children by physicians, 2002

	Estimated visits by children	FP/GP	General Pediatricians	All other Physicians
Total visits	166,684,897	21%	53%	26%
MSA status				
Non-MSA	29,811,818	34%	40%	26%
MSA	136,873,079	18%	55%	26%
Age Groups				
0-5 yrs	75,002,527	16%	73%	11%
6-12 years	49,149,355	25%	47%	29%
13 - 17 years	42,533,017	26%	24%	50%

Data Source: 2002 Medical Expenditure Panel Survey (MEPS) Office-Based Medical Provider Visits data file; Analysis by the Center for Child Health Research, 2005.

Table 18: The distribution of "usual source of care" for children

	Estimated number of children	FP/GP	General Pediatricians	NP/PA	All other Physicians
Total	21,262,658	34%	62%	<1%	4%
MSA status					
Non-MSA	3,702,243	47%	50%	<1%	3%
MSA	17,560,415	31%	65%	<1%	4%
Age Groups					
0-5 yrs	7,516.678	20%	78%	<1%	2%
6-12 years	7,840,611	35%	61%	<1%	3%
13 - 17 years	5,905,369	49%	44%	<1%	7%

Data Source: 2002 Medical Expenditure Panel Survey (MEPS); Analysis by the Center for Child Health Research, 2005.

What are the implications of population growth vs. physician workforce growth for family medicine's role in caring for children?

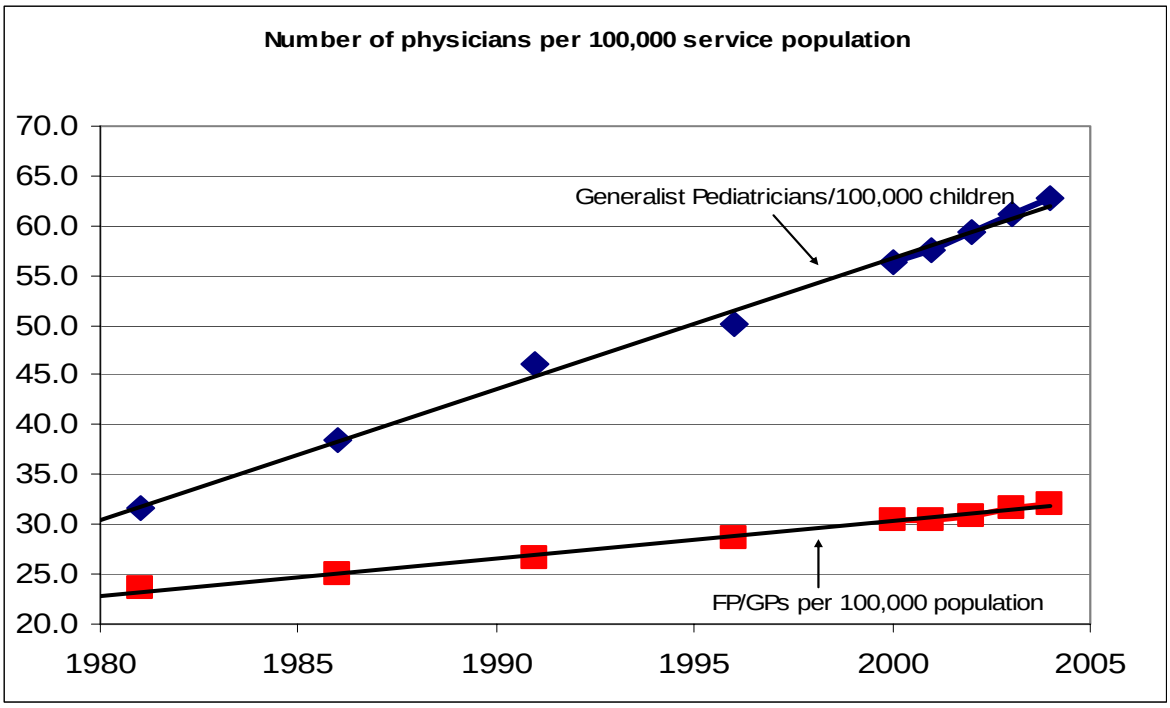
The annual general pediatrician population grew at seven-times the rate of the U.S. population between 1981 and 2004, and the family physician workforce grew at nearly five-times the rate (Table 19). Over that time, the general pediatrician per 100,000 children ratio doubled, and the family physician per 100,000 children grew by one-third (Figure 6). The rate of growth of the U.S. child population is expected to slow even further, without any expected decline in the growth rate of the physician workforce that cares for them.

Table 19: Annual Growth Rate of General Pediatrician and Family Medicine Workforces relative to the U.S. Population, 1981 - 2004

	Number of Generalist Pediatricians	Number of Children (0-17)	Number of FP/GPs	Number of Adults and children
1981	20,051	63,213,000	54,013	229,466,000
1986	24,128	62,865,000	60,311	240,133,000
1991	30,080	65,111,000	67,078	252,153,000
1996	35,202	70,226,000	77,185	269,394,000
2000	40,692	72,294,000	85,867	281,422,000
2001	41,753	72,604,000	87,016	285,094,000
2002	43,184	72,847,000	89,021	287,974,000
2003	44,633	73,043,000	92,096	290,810,000
2004	45,994	73,277,000	93,833	293,655,000
Average annual rate of change	**3.6%**	**0.5%**	**2.4%**	**1.1%**

Source: AMA Masterfiles, U.S. Census Bureau; Analysis by the Robert Graham Center, 2005.

Figure 6: General Pediatrician and Family Medicine per 100,000 Population Change, 1980-2005



Source: AMA Masterfiles, U.S. Census Bureau; Analysis by the Robert Graham Center, 2005.

The percentage of poor and near poor children under 19 years of age who were uninsured decreased by approximately 25% from 1998 to 2003, and the total number of children without insurance declined from 13.2% to 10.2%.[40] Despite these improvements, more than 1-in-10 children remain uninsured and as many experience unmet healthcare need in a given year (Table 20). In 2002, 7.3 million children had no usual place to go for healthcare.[41] For the poor and near poor, unmet need remains a bigger problem (Table 20). From 1998 to 2003, there was a 15% increase in public insurance coverage such that the proportion of children covered by public insurance rose from one-in-five to more than one-in-four (Table 21). The greatest increase in public health insurance coverage was among children who were near poor; that rate more than doubled from 22.5% in 1998 to 46% in 2003. Among near poor children, those who were uninsured were more likely to have unmet medical need (35.5%) than those with public (9.4%) or private coverage (14.4%).

Table 20: Children's poverty status vs. insurance coverage, relationship with a usual source of care, and unmet need, 2003

	Private	Public	Uninsured	Have USC	Unmet Need*
All Children	63.2	27.8	10.2	94.2	9.2
Poor	15.6	70.1	16.1	88.8	13.7
Near Poor	39.5	46.0	16.3	91.4	15.5
Not Poor	86.3	9.5	5.2	93.3	6.4

Data Source: Combined Family Core, Sample Adult, and Sample Child components of the 2003 National Health Interview Survey. Analysis by the Robert Graham Center, 2005

*_Unmet medical need_—a positive response to any of the following questions: ''DURING THE PAST 12 MONTHS was there any time when [you/someone in the family] needed medical care, but did not get it because [you/the family] could not afford it?'' ''DURING THE PAST 12 MONTHS, [have/has] [you/anyone in the family] delayed seeking medical care because of worry about the cost.'' ''DURING THE PAST 12 MONTHS, was there any time when [child's name] [you] needed any of the following, but didn't get it because you couldn't afford it: prescription medicines, mental healthcare or counseling, or dental care?''

Children who are categorized as ''poor'' had a family income below the poverty threshold (ratio less than 1.0). The ''near poor'' category includes children in families with incomes of 100% to less than 200% of the poverty threshold. The ''not poor'' children had a family income that was 200% or more of the poverty threshold or higher.

Table 21: Percentage of children under 19 years of age with public health insurance, by type of public insurance, 1998–2003

Year	Medicaid	State Children's Health Insurance Program	Military Healthcare	Medicare	Other State Programs	Other Government Programs
1998	79.0	§	11.0	2.1	5.9	3.2
1990	78.2	5.0	9.8	1.7	4.9	1.5
2000	74.4	8.5	9.7	1.6	5.6	0.7
2001	66.1	16.0	8.2	1.1	8.6	0.7
2002	68.2	16.4	7.5	0.7	7.3	0.7
2003	66.2	18.9	7.3	0.8	7.0	0.7

Data Source: National Health Interview Surveys, 1998–2003. Analysis by the Robert Graham Center, 2005

§ Information on the State Children's Health Insurance Program was not collected separately in 1998.

NOTE: A child can be counted in more than one type of public coverage in one year.

Does perceived relative financial disincentive explain family medicine's reduction in caring for children?

One possible explanation offered for the fall in the percentage of care provided by family physicians is that caring for children is not as lucrative as caring for adults. In 2002, there was very little difference in the median expenditure per visit for

children compared to adults, regardless of insurance or rural/urban status (Table 22). There are some notable differences for mean expenditures: expenditures for care of non-rural children and those with insurance other than public insurance is higher than for adults; however, care for rural and uninsured or publicly insured children is lower than for adults. The lack of a median difference and the potentially more lucrative of insured children do not support the hypothesis that erosion of family medicine's proportion of care is financially driven.

Children who have public insurance have lower median and average annual expenditures for healthcare than do those without insurance, those with private insurance, or those with any insurance (Table 23). Children who receive care in primary care have median annual healthcare expenditures that are half of those for children who do not receive medical care in primary care. Median annual expenditures for children in rural communities are not higher than for children living in metropolitan statistical areas.

Children are much less likely than adults to be uninsured or to be covered by public insurance, and are 26% more likely to be covered by private insurance. Children are two-thirds less likely than adults to see a dentist or to visit a primary care physician (Table 24).

Compared to children without a usual source of care, children with a usual source of care are much more likely to have private insurance and much less likely to have no insurance; they are less significantly more likely to visit a primary care physician (Table 25). Children whose usual source of care is a family physician are more likely to have no insurance or public insurance than those that have another usual source of care. Those whose usual source of care is a pediatrician are more likely to have private insurance and less likely to be uninsured or to be covered by public insurance. Children whose usual source of care is a hospital ER are slightly more likely to be uninsured, much more likely to be covered by public insurance, and two-thirds as likely to have private insurance as those who have another usual source of care.

Children who visit primary care physician offices are relatively more likely to have public insurance and less likely to be uninsured or have private insurance (Table 26). They are also more likely to be cared for by a pediatrician or an emergency room. Children without insurance or public insurance are significantly more likely to have a family physician or an emergency room as their usual source of care than a pediatrician (Table 27). Conversely, those children with private insurance are significantly more likely to see a pediatrician. Privately insured children are more likely to have a usual source of care than un- or publicly-insured children but are least likely to have primary care visits.

There is little difference in median, per-visit expenditures between family physicians and pediatricians; however there is a nearly 50% difference in the average, per-visit expenditures for publicly insured children vs. privately insured children (Table 28). Average, per-visit expenditures for children are 33% lower than for adults (Tables 22 and 23). The differences in average expenditures may suggest financial disincentives for physicians in choosing to care for children with Medicaid insurance. Mean and median expenditures for visits made by children to general pediatricians are comparable to those made to family physicians; however annual expenditures for children who see family physicians are two-thirds those for children who see pediatricians (Table 29). Given that per-visit expenditures are not different, the difference in annual expenditures is likely related to the number of visits made per child.

A substantially greater percentage of family physicians have closed their practices to new Medicaid patients compared with pediatricians (Table 30). Similarly, the percent of pediatrician practices open to all Medicaid patients is substantially larger than the number of family physician offices. These comparisons appear to be relatively stable which makes the previous findings, that patients with Medicaid have a higher probability of seeing a family physician, interesting. It could suggest that family physicians are polarized in their willingness to take Medicaid patients, or perhaps that some family physicians' practices are "saturated" with Medicaid and cannot afford to take additional Medicaid. In either case, further reductions in

Medicaid payments to physicians could put access to family medicine at further risk and realize further reductions in the proportion of care to children that they provide.

Table 22: Expenditure per visit for children and adults, 2002

	No Insurance	Has Insurance	Public Insurance	No Public Insurance	Private Insurance	No Private Insurance	Primary Care Visits	MSA residence	Non-MSA residence
Median expenditure per visit									
Children	$47	$65	$58	$68	$70	$56	$56	$65	$65
Adults	$50	$65	$60	$65	$65	$58	$59	$65	$58
Average expenditure per visit									
Children	$76	$140	$97	$148	$153	$93	$90	$134	$144
Adults	$111	$136	$132	$136	$137	$129	$104	$138	$126

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center, 2005.

Table 23: Annual Healthcare Expenditures for Children and Adults by Type Of Insurance, Dental and Primary Care Visits, and Rural Vs. Urban, 2002

	No Insurance	Has Insurance	Public Insurance	Private Insurance	Dental Visits	No Dental Visits	Primary Care Visits	No Primary Care Visits	MSA residence	Non-MSA residence
Median annual expenditure										
Children	$638	$676	$441	$725	$552	$723	$423	$943	$671	$679
Adults	$579	$1,650	$1,890	$1,607	$1,234	$1,690	$1,022	$1,859	$1,692	$1,335
Average annual expenditure										
Children	$1,056	$1,915	$816	$2,227	$1,305	$2,144	$807	$2,388	$1,995	$1,453
Adults	$1,870	$3,074	$3,811	$2,901	$2,065	$3,193	$1,923	$3,427	$3,243	$2,128

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center, 2005.

Table 24: Children's Risk for not Having Insurance Coverage and Care Experiences Relative to Adults, 2002

	No Insurance	Public Insurance	Private Insurance	Dental Visits	Primary Care Visits
Relative Risk if child*	0.64	0.86	1.26	0.37	0.75
Relative Risk if adult	1.05	1.01	0.98	1.12	1.03

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center, 2005.
*Risk of not having insurance or specified care relative to adult

Table 25: Child's Usual Source of Care and Relative Risk of Insurance Coverage, Dental Visits, and Primary Care Visits, 2002

	No Insurance	Public Insurance	Private Insurance	Primary Care Visits
Relative Risk if No USC	1.11	1.02	0.96	**0.99***
Relative Risk if have USC	0.27	0.59	2.37	**1.22***
RR if USC is FP/GP	**1.07***	**1.01***	**0.98***	0.95
RR if USC is a Pediatrician	0.88	0.94	1.09	1.07

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center, 2005.
* p< 0.01

Table 26: Relative Risk for Insurance status, having a usual source of care, and type of usual source of care for children who Do vs. Do Not visit dentists and primary care physician's offices, 2002

		No Insurance	Public Insurance	Private Insurance	No USC	USC is FP/GP	USC is Pediatrician	USC is Hospital ER
RR	if made Primary Care service visits	**0.98***	1.14	0.89	**0.93***	0.89	1.11	1.42
RR	if No Primary Care service visits	**1.04***	0.83	1.18	**1.14***	1.23	0.86	0.68

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center, 2005
* p< 0.01

Table 27: Relative Risk for Children by Insurance Status for Type of USC, Having Dental Visits, or Having Primary Care Visits, 2002

		No USC	USC is FP/GP	USC is Pediatrician	USC is Hospital ER	Primary Care Visits
RR	if No Insurance	1.11	**1.02***	0.98	**1.01***	**1.00***
RR	if have Insurance	0.27	0.70	1.83	**0.88***	**1.06***
RR	if has Public Insurance	1.15	**1.01***	0.95	**1.38***	1.07
RR	if No Public Insurance	0.66	**0.96***	1.25	0.48	0.78
RR	if has Private Insurance	0.54	**0.91***	1.32	**0.52***	0.81
RR	if No Private Insurance	1.34	**1.03***	0.92	**1.42***	1.07

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center, 2005

* p< 0.01

Table 28: Expenditures Per Child Visit by Physician Specialty

	Family Physician (FP/GP)		General Pediatrician	
	Mean	**Median**	**Mean**	**Median**
Total visits	$84	$58	$84	$60
MSA status				
Non-MSA visits	$80	$55	$77	$59
MSA visits	$85	$60	$86	$61
Age groups				
Less than 5 yrs	$88	$57	$83	$60
5 to 13 years	$81	$56	$84	$60
14 to 17 years	$85	$61	$90	$65

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center, 2005

Table 29: Annual Expenditures for Child Visits by Physician Specialty

	Family Physician (FP/GP)		General Pediatrician	
	Mean	**Median**	**Mean**	**Median**
Total visits	$276	$166	$408	$257
MSA status				
Non-MSA visits	$312	$189	$355	$247
MSA visits	$261	$159	$416	$258
Age Groups				
Less than 5 yrs	$363	$236	$508	$354
5 to 13 years	$256	$157	$304	$171
14 to 17 years	$227	$146	$289	$156

Data Source: 2002 Medical Expenditure Panel Survey. Analysis by the Robert Graham Center. 2005

Table 30: Acceptance of New Medicaid Patients: FP/GP vs. Peds, 1996-2001

	1996-1997		1998-1999		2000-2001	
	FPGP	PED	FP/GP	PED	FP/GP	PED
Does not accept new Medicaid patients	15,411 (25%)	4535 (15%)	15,740 (26%)	4183 (12%)	18,166 (29%)	4463 (13%)
Accepts some new Medicaid patients	13,998 (23%)	6841 (23%)	12,228 (20%)	6489 (19%)	12,902 (20%)	5683 (17%)
Accepts most new Medicaid patients	5881 (10%)	3368 (11%)	7059 (12%)	4399 (13%)	6333 (10%)	3834 (12%)
Accepts all new Medicaid patients	25,365 (42%)	15,386 (51%)	25,630 (42%)	18,589 (55%)	26,272 (41%)	19,288 (58%)

Data Source: Community Tracking Survey, Analysis by the Robert Graham Center, 2005

Prevention and Satisfaction

Another factor that could potentially explain family medicine's declining role in caring for children is a decline in parent satisfaction, perhaps in response to perceived differences in quality. Family physicians in general deliver fewer recommended preventive services to children compared with pediatricians, even for those services agreed to by both specialties (Table 31).[42] However, there are no significant differences in satisfaction reported by parents or guardians of children as a result of this disparity.[43]

Table 31: Percent of Children Receiving Preventive Services or Advice from their Usual Source of Care

Preventive Service or Advice	Within 1 year		Within 3 years	
	FP/GP (%)	General Pediatrician (%)	FP/GP (%)	General Pediatrician (%)
Weight Measured (0-17 yrs old)	**75.5**	**85.2**	**94.5**	**97.9**
Checked Vision (3-6 yrs old)			**56.6**	**64.7**
Checked Blood Pressure (2-17 yrs old)	**53.9**	**50.4**	**66.1**	**67.4**
Advised Dental Check-up (2-17 yrs old)	**30.4**	**35.5**	**43.0**	**50.2**
Advised to Eat Healthy (2-17 yrs old)	**30.6**	**42.8**	**45.2**	**59.8**
Advised Exercise (2-17 yrs old)	**20.3**	**24.8**	**28.2**	**37.3**
Advised Safety Seat (≤40 lbs)	**43.0**	**51.9**	**58.1**	**61.1**
Advised Booster Seat (>41, ≤ 80 lbs)	**11.1**	**20.3**	**26.4**	**37.1**
Advised Seat Belt (>80 lbs)	**15.3**	**21.6**	**27.8**	**44.1**
Advised Bike Helmet (2-17 yrs old)	**17.9**	**28.7**	**27.8**	**42.7**
Advised No Smoking in House(0-17 yrs old)	**26.9**	**36.5**	**42.2**	**46.9**

Source: 2002 Medical Expenditure Panel Survey, Analysis by Center for Child Health Research, University of Rochester, 2005.

If FP residents had a fourth year, how many would do extra pediatrics training?

A survey done of a sample of third-year Family Medicine residents in 2002 asked about their willingness to do a fourth year of training and under what circumstances. The respondents said that they would definitely or probably be willing to train for an additional (fourth) year for more training in child (53%) or adolescent care (47%).[44] Family medicine currently offers certificates of added qualification in adolescent medicine, geriatrics, and sports medicine, but none for caring for pre-adolescent children.

Findings

Has family medicine's market share of care for children changed [decreased] in the last 10 years?

If so, does relative financial disincentive explain family medicine's reduction in caring for children?

Using data from the NAMCS for the period of 1983-2003, we found similar reductions in the proportion of visits for people of all ages to family physicians, with small gains made by general pediatricians, general internists and subspecialists. This study also found a decline in the number of people seeing generalists who care for both adults and children using NHIS data from 1997-2002. The 2002 MEPS offers slightly different proportions of visits, but in the same general direction. There is consistency across these three data sources that confirm a shift in the care of children away from family physicians. The role of family physicians in rural communities is much more stable at slightly more than one-third of all visits.

The relative median per-visit expenditures for children covered by Medicaid does not differ substantially from other insurance products for children, and does not differ substantially from expenses for adults. However there are potentially important differences in average expenditures (33% higher for adult care) that may help explain the erosion of family physicians' share of children's visits. It may also help explain a lower willingness to take Medicaid among family physicians despite a disproportionate reliance on family physicians by the Medicaid-covered population. There is little objective evidence about whether or not decisions to provide vaccinations are related to changes in who provides care to children. The study we reviewed suggested that variations in how many and where pediatricians practice make family physicians and general practitioners important sources of vaccinations for many children. Other potential explanations will require new, primary data-collection studies.

What is the current primary care profile of healthcare for children?

There is large variation in the location of pediatricians, with recent increases in more affluent areas, declines in poorer and more rural areas.[21;22;27;28] In addition

to caring for more rural children, family physicians care for a disproportionate share of uninsured and publicly insured children. The number of uninsured children declined between 1998 and 2003 despite an economic downturn, largely due to successes in the State Children's Health Insurance Program, but will likely rise again as many states are currently cutting Medicaid funding and eligibility.[45;46] Despite significant growth in the number of clinicians caring for children and the decline in uninsured children, one in ten children still experience unmet healthcare needs. One in three children without insurance have unmet healthcare needs. Many children forego dental care each year, many of whom do see a physician.

The pediatric literature is unclear about the relative shortage of pediatric subspecialists. Recent studies suggest that there may be enough pediatric subspecialists but that they are academically and regionally concentrated. However there are notable exceptions, and there are certainly far fewer subspecialists in rural or community settings. If assumptions about need established 25 years ago still apply, shortages remain for several pediatric subspecialties. If these careers can be made more attractive, particularly in less academic or urban environments, it may reduce oversupply of the general child health workforce and better address the subspecialty care needs of children.

What are population growth implications vs. physician workforce growth for family medicine's role in providing healthcare to children?

By nearly every measure of need, the U.S. already enjoys a surplus of physicians who care for children. Population growth is slowing while physician workforce growth continues unabated, so this surplus is likely to increase over the next two decades. Considering that the growth of the pediatrician, family physician, NP and PA workforces all outpace changes in the population of children, there is likely to be further erosion of family medicine's role absent intervention.

If FP residents had a fourth year, how many would do extra pediatrics training?

Nearly half of third year family medicine residents would consider a fourth year if it included more training for caring for children and adolescents.

Are there measurable, meaningful differences in health outcomes or costs when family physicians are the usual source of care for infants and children? If differences exist, do they explain family physician's loss of child healthcare market share?

There are some substantial differences in annualized expenditures for all ages except the oldest of children. This may reflect variation in number of visits made by children to both settings. There are substantial differences in the provision of preventive services, with family physicians providing less adequate preventive care to children, but there is no evidence that this difference has any effect on parent or guardian satisfaction. These economic, quality, and satisfaction differences appear to have little bearing on changes in family physician's role in caring for children.

Conclusions

FP's see a smaller proportion of children relative to 10 years ago, with the exception of rural and underserved or safety-net sites, where family medicine's role in providing healthcare to children appears to be stable. While this trend is likely to be due to many factors, "saturation" of the market with child healthcare providers may be a dominant factor. In the context of increased competition for children's healthcare, the Future of Family Medicine report reminds us that the role of the family physician is not clear to most Americans.

Uninsured children and those living in medically underserved areas are more likely to have continuous healthcare relationships with FPs than with pediatricians. There are enough providers of pediatric care in the U.S. workforce to meet accepted ratios of population to provider, but their distribution is skewed, leaving certain populations and settings underserved. While changes in demand cannot be predicted, the growth of pediatric providers is clearly outpacing the present and expected growth of the U.S. population, permitting valid concerns to be raised over a pediatric workforce surplus.

It is not clear from national surveys whether there are financial disincentives for providing clinical care to children. There are some differences in average per-visit expenditures that may reveal a financial bias against children covered by Medicaid, but not for children with private insurance. Despite these findings, however, children without insurance or with Medicaid are still more likely to be cared for by family physicians. Further study is required to determine whether financial disincentives are contributing to erosion of family medicine's market share of children's healthcare.

Parents of children with FPs as usual sources of care are less likely to report receiving standard preventive counseling than those with USCs who are pediatricians. However, FP USCs see their pediatric patients less often in the first five years of life than do pediatrician USCs. Higher annual expenditures and provision of preventive services may both be related to increased visits per year

and do offer explanation for market share trends; however, neither appears to cause satisfaction differences for parents/guardians. There is no clear evidence that provision of vaccinations does either.

In light of a diminishing role in children's healthcare and an increasingly competitive environment for the same, family medicine is left with several options:

1) Relinquish clinical care for children to pediatricians and focus on working with internal medicine to meet the increased healthcare demands of an aging adult population.

2) Relinquish most clinical care for children and focus on preparing a segment of the family physician workforce to care for children in rural and underserved sites. This would at least partially fulfill family medicine's mission of caring for these populations of children whose access to care might otherwise be in serious jeopardy.

3) Compete head-to-head with pediatricians, NPs and PAs for a shrinking child healthcare market, relying on the new model of practice to achieve sufficient brand-recognition and value to recapture market share.

4) Seriously engage pediatricians, NPs, and PAs in meaningful collaboration to build a new model of practice that benefits from all sets of skill and compassion to provide better care in a family and community focused environment. This option would seek to increase access and a robust set of services to millions of children who are left wanting despite a surplus of services. This collaboration could involve joint or combined training, and aggressive joint advocacy for improved services, both clinical and in the community.

Recommendations

Pediatrics and family medicine are seeking revision of their professional roles and relationships with people and communities. These professional efforts converge with a shrinking market for providing care to individual children, but with an increased need to help resolve the behavioral, genetic, and environmental determinants of health that are largely framed in the context of family and community. To make the greatest contributions to the continued care of children in America, family physicians should:

REFOCUS their energies upon delivering the highest possible quality of healthcare for children in a new model of practice. The new model, outlined in the Future of Family Medicine reports would provide patient-centered, asynchronous care, employing the best team and information technology to provide high-quality care. Such a practice could easily incorporate pediatricians who bring family and community focus to the team.

The New Model practice could bring pediatricians, family physicians, NPs, PAs and other healthcare team members together to organize care around families rather than just individual patients.

EMBRACE pediatric educators and colleagues as partners instead of competitors in an effort to redesign the child healthcare workforce of the next century. From early in training, students and residents would learn in a redesigned model about clinical, family and community skills in caring for children. Many residents and educators appear to be prepared to extend training to improve their skills and experience in providing medical care to children

A common initial training pathway could include the first two years of residency training. Pediatric faculty could work side-by-side with FP faculty in precepting FP residents, contributing to their competency and confidence in caring for children—

especially for sick kids and newborns. The two specialties could develop validated competency measures and advocate for greater innovation leeway with residency review committees so long as competency was achieved.

Family physicians should also actively work with pediatric colleagues in joint advocacy for improvements of access to care, and interventions that occur outside clinical settings but that improve the behavioral, family, and community factors that affect health. The next major gains in children's health in the United States will not occur within traditional clinic settings but will still require the leadership of both specialties.

REMAIN committed to caring for America's most vulnerable children through our critical role in rural settings, medically underserved areas, and the care of the uninsured. Rather than letting real and perceived financial disincentives to caring for these populations, FPs should cherish this critical role and fight for payment models (universal coverage, physician scarcity bonuses, Medicaid HPSA designation payments, etc.) that protect access to care and a medical home for all children.

REALIZE the special capacity of family physicians to care for children in the context of family and community as they were trained, AND…

RECAPTURE the very positive perception and aura of family medicine's generalist predecessors and their relationship with the American public.

This will result in part from successful re-branding of the specialty of family medicine as comprehensive, continuous, and compassionate healthcare providers for children, their families, and their communities in the eyes of the patients… and the payors. It will also result from the production of FPs who are confident, competent child healthcare providers.

References

1 Burke EC. Pediatric history: Abraham Jacobi, MD: The man and his legacy. Pediatrics 1998; 101(2):309-312.

2 Bergman AB. Pediatric turf. Pediatrics 1974; 54(5):533-534.

3 Future of Family Medicine Project Leadership Committee. The Future of Family Medicine: A Collaborative Project of the Family Medicine Community. Ann Fam Med 2004; 2(suppl_1):S3-32.

4 Schor EL, American Academy of Pediatrics Task Force on the Family. Family pediatrics: report of the Task Force on the Family. Pediatrics 2003; 111(6 Pt 2):1541-1571.

5 Dovey S, Weitzman M, Fryer G, Green L, Yawn B, Lanier D et al. The ecology of medical care for children in the United States. Pediatrics 2003; 111(5 Pt 1):1024-1029.

6 Freed GL, Nahra TA, Venus PJ, Schech SD, Wheeler JR. Changes in the proportion and volume of care provided to children by generalists and subspecialists. Journal of Pediatrics 2005; 146(1):14-19.

7 Green LA, Dodoo MS, Ruddy G, Fryer GE, Phillips RL, McCann JL et al. The physician workforce of the United States: A family medicine perspective. 2004. Washington, DC, The Robert Graham Center. 10-1-0004.

8 American Academy of Family Physicians. 2005 Facts about Family Medicine. American Academy of Family Physicians. 2005.

9 Gruskin A, Williams RG, McCabe ERB, Sten F, Strickler J, Mulvey HJ et al. Final report of the FOPE II pediatric subspecialists of the future workgroup. Pediatrics 2000; 106 (suppl)(5):1224-1244.

10 American Nursing Credentialing Center. Number of PNPs and FNPS. Personal communication

11 American Academy of Physician Assistants. 2004 AAPA Physician Assistant census report. 2004. Alexandria, VA, American Academy of Physician Assistants.

12 Shipman SA, Lurie JD, Goodman DC. The general pediatrician: projecting future workforce supply and requirements. Pediatrics 2004; 113(3 Pt 1):435-442.

13 The future of pediatric education II. Organizing pediatric education to meet the needs of infants, children, adolescents, and young adults in the 21st century. A

collaborative project of the pediatric community. Task Force on the Future of Pediatric Education. Pediatrics 2000; 105(1 Pt 2):157-212.

14 Stockman JA. Workforce issues in general pediatrics and the pediatric subspecialities: Pediatric Diplomates. A newsletter from the American Board of Pediatrics. Pediatrics 2005;1-3.

15 Hart LG, Wagner E, Pirzada S, Nelson AF, Rosenblatt RA. Physician staffing ratios in staff-model HMOs: a cautionary tale. Health Affairs 1997; 16(1):55-70.

16 Stoddard JJ, Cull WL, Jewett EA, Brotherton SE, Mulvey HJ, Alden ER. Providing pediatric subspecialty care: A workforce analysis. AAP Committee on Pediatric Workforce Subcommittee on Subspecialty Workforce. Pediatrics 2000; 106(6):1325-1333.

17 Stromberg D. Pediatric cardiac intensivists: are enough being trained? Pediatric Critical Care Medicine 2004; 5(4):391-392.

18 Chang AC. Manpower shortage in pediatric cardiac intensive care: how can we undo this Gordian knot?. Pediatric Critical Care Medicine 2004; 5(4):414-415.

19 O'Leary K, Katz G, Hollander F. The shortage of pediatric subspecialists: What can children's hospitals do? National Association of Children's Hospitals and Related Institutions. 2005.

20 Felice ME, Dunston FJ, Jones MD, Chesney R, Stapleton FB, Fiser DH et al. Pediatric workforce projections and unintended consequences. Journal of Pediatrics 2004; 145(1):1-2.

21 Freed GL, Nahra TA, Wheeler JR, Research Advisory Committee of the American Board of Pediatrics. Relation of per capita income and gross domestic product to the supply and distribution of pediatricians in the United States. Journal of Pediatrics 2004; 144(6):723-728.

22 LeBaron CW, Massoudi M, Stevenson J, Lyons B. Vaccination coverage and physician distribution in the United States, 1997. Pediatrics 2001; 107(3):E31.

23 Newhouse J, Williams A. The geographic distribution of physicians: Is the conventional wisdom correct? 1982. Santa Monica, CA, RAND.

24 Cooper RA, Getzen TE, McKee HJ, Laud P. Economic and demographic trends signal an impending physician shortage. Health Affairs 2002; 21(1):140-154.

25 Fink KS, Phillips RL, Jr., Fryer GE, Koehn N. International medical graduates and the primary care workforce for rural underserved areas. Health Affairs 2003; 22(2):255-262.

26 Chesney RW. How many pediatricians? Pitfalls in analysis and possible approaches. Journal of Pediatrics 2003; 143(5):550-552.

27 Freed GL, Nahra TA, Wheeler JR. Predicting the pediatric workforce: use of trend analysis. Journal of Pediatrics 2003; 143(5):570-575.

28 Randolph GD, Pathman DE. Trends in the rural-urban distribution of general pediatricians. Pediatrics 2001; 107(2):E18.

29 U.S. Department of Health and Human Services Bureau of Primary Health Care. Bureau of primary health care section 330 grantees uniform data system (UDS): Calendar Year 2003 Data: National Rollup Report (including grant specific rollups). 2003. Rockville, MD, U.S. Department of Health and Human Services.

30 Sturm R, Ringel JS, Andreyeva T. Geographic disparities in children's mental health care. Pediatrics 2003; 112(4):e308.

31 Moyer VA, Butler M. Gaps in the evidence for well-child care: A challenge to our profession. Pediatrics 2004; 114(6):1511-1521.

32 Guirguis-Blake J, Fryer G, Deutchman M, Green L, Dovey S, Phillips R. Family Physicians' declining contribution to prenatal care in the United States. American Family Physician 2003; 67:17.

33 Committee on Community Health Services. The Pediatrician's Role in Community Pediatrics. Pediatrics 2005; 115(4):1092-1094.

34 Winickoff JP, Tanski SE, McMillen RC, Klein JD, Rigotti NA, Weitzman M. Child health care clinicians' use of medications to help parents quit smoking: A national parent survey. Pediatrics 2005; 115(4):1013-1017.

35 Flocke SA, Goodwin MA, Stange KC. The effect of a secondary patient on the family practice visit. Journal of Family Practice 1998; 46(5):429-434.

36 Orzano AJ, Gregory PM, Nutting PA, Werner JJ, Flocke SA, Stange KC. Care of the secondary patient in family practice. A report from the Ambulatory Sentinel Practice Network. Journal of Family Practice 2001; 50(2):113-116.

37 Satcher D, Kaczorowski J, Topa D. The Expanding Role of the Pediatrician in Improving Child Health in the 21st Century. Pediatrics 2005; 115(4):1124-1128.

38 The Future of Family Medicine Project. Future of family Medicine: Qualitative FFM data slides. The Future of Family Medicine Project . 2005.

39 The Future of Family Medicine Project. Future of Family Medicine selected quantitative and qualitative research finding. FFM Project. 2005.

40 Cohen RA, Bloom B. Trends in health insurance and access to medical care for children under age 19 years: United States, 1998-2003. Advance data from vital health statistics; no. 355. 4-15-2005. Hyattsville, Maryland, National Center for Health Statistics.

41 Butler M. Children's usual soruce of care: United States, 2002. Statistical Brief #78. 2005. Rockville, MD, Agency for Healthcare Research and Quality.

42 Merenstein D, Green L, Fryer GE, Dovey S. Shortchanging adolescents: room for improvement in preventive care by physicians. Family Medicine 2001; 33(2):120-123.

43 2002 Medical Expenditure Panel Survey. 2001. Rockville, MD, Agency for Healthcare Research and Quality.

44 Duane M, Dovey SM, Klein LS, Green LA. Follow-up on family practice residents' perspectives on length and content of training. J Am Board Fam Pract 2004; 17(5):377-383.

45 Ku L. CDC data show Medicaid and SCHIP played a critical counter-cyclical role in strengthening health insurance coverage during the economic downturn. 2003. Washington, D.C., Center on Budget and Policy Priorities. 10-8-2003.

46 Kaiser Commission on Medicaid and the Uninsured. Enrolling uninsured low-income children in Medicaid and SCHIP. #2177-04. 2005. Washington, D.C., Kaiser Family Foundation. 3-1-2005.

Appendices

Appendix A: Detailed Tables on Trends in the share of the care of children (1992 – 2002)

Appendix B Advisory Committee Members

Appendix C Task Force on the Care of Children

Appendix D Select References from Pediatric Workforce Literature

Appendix E Abbreviations

Appendix A: Detail Tables on Trends in the share of the care of children (1992 – 2002 NAMCS data), analyses by the Robert Graham Center, 2005

Appendix Table 1: Trends in the share of the care of children below 5 years old by physicians in MSAs, 1992 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1992	59,626,238	15%	71%	10%	5%
1993	52,122,776	18%	65%	13%	4%
1994	53,502,377	16%	71%	10%	4%
1995	60,764,180	13%	73%	10%	3%
1996	67,790,822	15%	71%	8%	7%
1997	65,730,985	14%	75%	8%	3%
1998	59,254,419	15%	73%	8%	5%
1999	49,535,532	13%	70%	12%	5%
2000	56,894,088	9%	78%	8%	5%
2001	73,355,699	10%	79%	9%	2%
2002	70,138,215	9%	77%	8%	5%

Appendix Table 2: Trends in the share of the care of children 5 to 13 years old by physicians in MSAs, 1992 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1992	6,398,807	27%	54%	15%	5%
1993	6,568,259	16%	59%	18%	7%
1994	5,736,248	23%	58%	13%	6%
1995	6,889,580	21%	65%	12%	2%
1996	8,343,160	21%	58%	15%	6%
1997	7,353,617	14%	72%	11%	3%
1998	8,111,613	9%	79%	10%	2%
1999	4,625,405	17%	52%	28%	3%
2000	6,255,288	12%	69%	18%	1%
2001	8,244,824	14%	74%	11%	1%
2002	7,468,950	11%	71%	15%	3%

Appendix Table 3: Trends in the share of the care of children 14 to 17 years old by physicians in MSAs, 1992 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1992	53,802,783	27%	38%	29%	5%
1993	53,594,727	22%	40%	32%	6%
1994	56,321,926	23%	43%	29%	5%
1995	58,680,212	22%	44%	28%	6%
1996	60,459,712	23%	44%	27%	7%
1997	63,420,547	20%	43%	30%	7%
1998	69,844,016	23%	45%	25%	7%
1999	60,771,583	24%	37%	34%	5%
2000	63,701,781	20%	43%	32%	5%
2001	93,311,122	17%	42%	40%	1%
2002	90,225,273	17%	42%	40%	2%

Appendix Table 4: Trends in the share of the care of children below 5 years old by physicians in non-MSAs, 1992 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1992	25,327,848	29%	61%	8%	2%
1993	16,896,251	40%	48%	9%	3%
1994	13,093,749	31%	62%	7%	0%
1995	10,207,583	46%	34%	5%	15%
1996	8,934,659	37%	53%	8%	2%
1997	9,446,577	47%	39%	11%	3%
1998	15,220,635	43%	48%	7%	2%
1999	8,614,460	18%	68%	8%	6%
2000	17,630,571	33%	59%	3%	4%
2001	5,079,104	50%	38%	7%	6%
2002	11,343,608	28%	61%	4%	7%

Appendix Table 5:: Trends in the share of the care of children 5 to 13 years old by physicians in non-MSAs, 1992 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1992	2,966,029	37%	42%	20%	1%
1993	1,979,486	48%	38%	14%	0%
1994	1,294,836	42%	47%	11%	0%
1995	1,042,650	34%	40%	17%	10%
1996	1,416,169	49%	32%	17%	2%
1997	661,244	39%	41%	19%	0%
1998	920,205	19%	65%	12%	4%
1999	1,438,626	19%	70%	9%	2%
2000	1,890,038	38%	47%	5%	9%
2001	336,985	21%	27%	8%	44%
2002	1,305,574	22%	72%	7%	0%

Appendix Table 6: Trends in the share of the care of children 14 to 17 years old by physicians in non-MSAs, 1992 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1992	26,990,622	44%	35%	18%	3%
1993	16,250,360	44%	24%	27%	5%
1994	12,861,672	41%	38%	21%	1%
1995	12,766,973	51%	17%	19%	13%
1996	12,439,102	53%	20%	22%	5%
1997	11,809,794	59%	16%	22%	3%
1998	15,169,387	40%	25%	29%	6%
1999	10,641,535	33%	39%	20%	7%
2000	17,087,231	45%	33%	17%	5%
2001	11,052,451	37%	16%	40%	7%
2002	14,430,740	37%	36%	23%	4%

Appendix Table 7: Trends in the share of the care of children below 5 years old for acute illness by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	42,403,221	19%	71%	7%	3%
1998	44,803,173	22%	67%	6%	5%
1999	31,981,156	15%	69%	10%	5%
2000	38,047,598	15%	74%	7%	4%
2001	38,286,011	11%	80%	7%	2%
2002	40,681,858	14%	73%	7%	6%

Appendix Table 8: Trends in the share of the care of children 5 to 13 years old for acute illness by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	5,199,504	18%	72%	8%	3%
1998	5,728,167	13%	78%	6%	3%
1999	3,428,807	20%	62%	17%	1%
2000	4,258,675	19%	64%	13%	4%
2001	4,709,297	18%	72%	5%	5%
2002	5,132,917	17%	72%	9%	1%

Appendix Table 9: Trends in the share of the care of children 14 to 17 years old for acute illness by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	43,378,019	31%	41%	22%	5%
1998	47,302,990	29%	45%	19%	7%
1999	38,440,221	30%	40%	26%	4%
2000	43,961,109	28%	45%	22%	5%
2001	53,123,965	17%	45%	28%	10%
2002	55,740,529	18%	47%	25%	10%

Appendix Table 10: Trends in the share of the care of children below 5 years old for prevention by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	24,103,096	18%	79%	1%	2%
1998	21,125,473	18%	76%	3%	3%
1999	19,150,467	12%	82%	3%	3%
2000	26,599,043	16%	77%	1%	6%
2001	29,813,695	16%	81%	2%	1%
2002	30,842,649	11%	83%	1%	5%

Appendix Table 11: Trends in the share of the care of children 5 to 13 years old for prevention by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	1,669,381	12%	79%	7%	2%
1998	2,349,844	4%	90%	6%	0%
1999	1,214,322	26%	67%	2%	4%
2000	2,005,115	27%	68%	2%	3%
2001	2,520,406	14%	81%	6%	0%
2002	1,812,377	9%	75%	9%	7%

Appendix Table 12 Trends in the share of the care of children 14 to 17 years old for prevention by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	14,053,599	22%	46%	24%	8%
1998	17,312,361	24%	54%	17%	5%
1999	12,716,528	27%	50%	18%	5%
2000	14,454,418	27%	50%	16%	7%
2001	21,349,019	12%	51%	28%	9%
2002	20,005,613	14%	49%	28%	10%

Appendix Table 13: Trends in the share of the care of children below 5 years old for chronic illness by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	7,695,140	14%	49%	33%	4%
1998	7,464,569	16%	46%	30%	8%
1999	5,630,894	14%	27%	47%	13%
2000	8,102,835	8%	57%	27%	7%
2001	7,017,468	7%	37%	49%	7%
2002	7,831,041	11%	51%	31%	7%

Appendix Table 14: Trends in the share of the care of children 5 to 13 years old for chronic illness by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	967,827	15%	44%	34%	7%
1998	915,832	8%	46%	46%	0%
1999	1,153,253	7%	26%	62%	5%
2000	1,686,471	7%	57%	35%	1%
2001	1,103,935	2%	51%	45%	2%
2002	1,274,336	0%	54%	44%	2%

Appendix Table 15: Trends in the share of the care of children 14 to 17 years old for chronic illness by physicians, 1997 – 2002

Year	Estimated visits by children	Family Medicine share (FP/GP)	General Pediatricians' share	Sub-specialists' share	All other Physicians' share
1997	16,105,708	17%	25%	50%	8%
1998	18,698,204	20%	20%	53%	8%
1999	18,833,788	17%	24%	53%	6%
2000	20,585,541	17%	26%	53%	4%
2001	31,541,528	22%	16%	59%	3%
2002	31,408,288	22%	19%	57%	2%

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Appendix D: Select References from Pediatric Workforce Literature

#	Author(s)	Journal	Year	Topic	Findings
1	Freed et al	Pediatrics	2004	Pediatric Work-force Changes	From 1993-2001: Care for kids < 18: ↑ among pediatric generalists, ↓ among medical generalists
2	Lebaron	Pediatrics	1997	Vaccination Rates/ Sites	An ↑ in PCPs, particularly generalists yields ↑ vaccination rates, and ↑ sites of coverage
3	Shipman	Pediatrics	2004	Pediatric Work-force Changes	• Projects significant oversupply of pediatricians by 2020 • 64% ↑ in general pediatricians vs. 9% ↑ in child population
4	FOPE II	Pediatrics	2000	Future Of Pediatric Education: Planning for 2010	• 55,800 Peds 1º care docs needed by 2010 • We should train 3000 new pediatric residents/year by 2010 • No shortage in pediatric subspecialists exists
5	Randolph, Pathman	Pediatrics	2001	Rural Pediatric Workforce	• 72% ↑ in Pediatricians, 1981-96, but rural Peds:Child Ratios ↓↓ • % Peds grads opting for Rural care: 50% ↓ • IMG's / ♀ less likely to go rural, ↑-ing % of Peds grads
6	Stockman	Pediatric Diplomates Newsletter	2004	Peds Physician/ Child Ratios	Recommended appropriate pediatrician:child ratios ↓ over 1970-2000, from 6000:1 to current 1200:1 (resembles staff-model HMO ratio)
7	Felice et al	Pediatrics	2004	Concerns with projecting Peds Workforce surplus	• Pediatric chairmen: Projecting pediatrics workforce surplus dangerous • Assumes no change in work performed/population served • May risk 25% of kids having no Peds 1º care access
8	Freed et al	Pediatrics	2004	Peds Workforce Distribution & Income	• Pediatric workforce growth highly correlated with per capita GDP • Distribution by state very uneven, despite ↑-ing Peds:Child ratios • Peds do & will cluster in states with highest per capita GDP

#	Author(s)	Journal	Year	Topic	Findings
9	Chesney, R.	Pediatrics	2003	Editorial – Predicting Peds Workforce Needs	• Reiterates current maldistribution of pediatricians, underinsurance of children (>12 million lack basic health insurance) • Suggests no single modeling method can predict workforce needs
10	Freed et al	Pediatrics	2003	Predicting Pediatric Workforce Needs	• Uses Cooper's trends model to predict Peds workforce needs: • Despite 2-fold ↑ in peds:population ratio, # pediatricians required in 2010 will still be higher than # of pediatricians expected; 'shortage' by 2020
11	RGC 1-pager#14	American Family Physician	2003?	Declining prenatal care & FP care of children	• Prenatal care ↓ among FPs: Does care of children follow suit? • Maine as test case: FPs still provide 1/3 of all newborn care • Rate of FP care ↑ for rural, small, or Medicaid-dependent sites
12	Dovey et al	Pediatrics	2003	Ecology of Medical Care for Children	• Despite robust physician workforce for children, glaring disparities exist in health services use and outcomes • Less physician use by black, Hispanic, and uninsured children
13	Sturm et al	Pediatrics	2003	Mental Healthcare & Children	• Significant variation in children's mental health service access • Mostly explained by policy and market characteristics

Appendix E: Abbreviations

AAFP	**American Academy of Family Physicians**
FOPE II	**The Future of Pediatric Education II**
FP	**Family Physician**
FPGP	**Family Physician or General Practitioner**
GDP	**Gross Domestic Product**
GMENAC	**Graduate Medical Education National Advisory Committee**
HPSA	**Health Professional Shortage Areas**
IMG	**International Medical Graduate**
MEPS	**Medical Expenditure Panel Survey**
MSA	**Metropolitan Statistical Area**
NAMCS	**National Ambulatory Medical Care Survey**
NHIS	**National Health Interview Survey**
NHSC	**National Health Service Corps**
NP	**Nurse Practitioner**
PA	**Physician Assistant**
USC	**Usual Source of Care**