The Respective Racial and Ethnic Diversity of US Pediatricians and American Children

Jeffrey J. Stoddard, Mary Ruth Back and Sarah E. Brotherton

Pediatrics 2000;105;27-31
DOI: 10.1542/peds.105.1.27

The Respective Racial and Ethnic Diversity of US Pediatricians and American Children

Jeffrey J. Stoddard, MD*; Mary Ruth Back‡; and Sarah E. Brotherton, PhD‡

ABSTRACT. *Background.* **Much effort has been directed toward increasing the training of physicians from underrepresented minority groups, yet few direct comparisons have examined the diversity of the racial/ethnic backgrounds of the physicians relative to the patient populations they serve, either currently or into the future. This has been particularly true in the case of pediatrics, in which little information has emerged regarding the racial/ethnic backgrounds of pediatricians, yet evidence points to ever-growing diversity in the US child population.**

Objective. **We embarked on a comparative analysis to examine trends in the racial and ethnic composition of pediatricians vis-a-vis the patient population they serve, America's infants, children, adolescents, and young adults.**

Methods. **Data on US pediatricians sorted by racial/ethnic group came from Association of American Medical Colleges distribution data and is based on the cohort of pediatricians graduating from US medical schools between 1983 and 1989 extrapolated to the total number of pediatricians actively practicing in 1996. Data on the demographic diversity of the US child population came from the US Census Bureau. We derived pediatrician-to-child population ratios (PCPRs) specific to racial/ethnic groups to measure comparative diversity between and among groups.**

Results. **Our results show that the black PCPR, currently less than one third of the white PCPR, will fall from 14.3 pediatricians per 100 000 children in 1996 to 12 by 2025. The Hispanic PCPR will fall from 16.9 in 1996 to 9.2 in 2025. The American Indian/Alaska Native PCPR will drop from 7.8 in 1996 to 6.5 by the year 2025. The PCPR specific to the Asian/Pacific Islander group will decline from 52.9 in 1996 to 26.1 in 2025. For whites, the PCPR will increase from 47.8 to 54.2 during this period. For 1996, each of the 5 PCPRs is significantly different from the comparison ratio. The same is true for 2025. For the time trend comparison (between 1996 and 2025), there is a significant difference for each ratio except for American Indian/Alaska Native.**

Conclusion. **The racial and ethnic makeup of the US child population is currently far more diverse than that of the pediatricians who provide their health care services. If child population demographic projections hold true, and no substantial shifts transpire in the composition of the pediatric workforce, the disparities will increase substantially by the year 2025.** *Pediatrics* **2000;105:27–31;** ***affirmative action, diversity, manpower, workforce.***

ABBREVIATIONS. IMG, international medical graduates; PCPR, pediatrician-to-child population ratio; GME, graduate medical education; USMG, US medical graduate.

Over the past 4 decades, much public policy effort has been directed toward increasing the enrollment of individuals from historically underrepresented minority groups into medicine and other health professions.[1] More recently the academic medical community in the United States, under the leadership of the Association of American Medical Colleges, has embarked on a concerted effort to promote increased racial and ethnic diversity in American medical schools.[2]

These policy initiatives have been founded on a series of several key observations: first, that health status among minority groups in the United States lags behind that of the white population; second, that the access of minorities to medical care is compromised; third, that the observed disparities in access to health services is attributable at least in part to a shortage of providers in minority communities; fourth, that minority group health professionals are more likely than their nonminority group counterparts to render care to underserved, predominantly minority communities; and fifth, that increasing the numbers of underrepresented minority group physicians will improve overall health status.

Clear disparities in population-level health status among racial and ethnic groups in America have been demonstrated. Multiple health status indicators reflect diminished health status among blacks and Hispanics in comparison to whites.[3–5] Concurrently, the use of physician services remains consistently lower among minority populations.[3,4,6,7] The disparities in the total number of visits to physicians according to race have been shown to extend to children and adolescents.[6,8–11]

Examination of aggregate physician-to-population ratios by racial and ethnic group reveals substantial disparity. Whereas blacks, Hispanic Americans, and Native Americans together comprise 23.6% of the total US population, they together account for only 12.4% of entering medical students.[1] Moreover, the rate of growth in minority populations in the United States is out pacing the rate of growth in minority physician supply.[12] Racial and ethnic minority groups are the fastest growing segments of the US population, com-

From *Children's Hospital of Philadelphia and Kids First-Hockessin, Hockessin, Delaware; and the ‡American Academy of Pediatrics, Elk Grove Village, Illinois.

Received for publication Apr 26, 1999; accepted Sep 10, 1999.

Address correspondence to Jeffrey J. Stoddard, MD, Kids First-Hockessin, Stone Mill Office Park, 722 Yorklyn Rd, Suite 100, Hockessin, DE 19707. E-mail: stoddard@email.chop.edu

prising nearly 20% of the total population in 1990 and expected to increase to 25% by the year 2000.[13] Nonwhite youth will account for fully one third of the child population (infants, children, and adolescents <19 years of age) by the year 2000.[13]

Evidence also exists that indicates that geographic locales with largely non-white populations are more apt to be medically underserved. For example, recent data show that rural areas with predominantly black or Hispanic populations have very few physicians per capita, lower even than the national average for nonmetropolitan areas.[14] Communities with large numbers of black or Hispanic residents are 4 times more likely than other areas to experience a shortage of physicians, regardless of the economic status of the community.[15]

With respect to practice patterns on graduation from medical school, evidence exists to support the contention that physicians from the underrepresented minority groups (defined as black, Hispanic, and American Indian/Alaska Native) are more likely than white physicians to enter primary care specialties, to provide care to patients from minority group backgrounds, and to practice in underserved communities.[2,15–19] It is also noteworthy that the existing literature suggests that minority physicians disproportionately serve persons from their own racial or ethnic group, but not necessarily persons from racial or ethnic minority groups other than their own.[17,20] Black physicians are almost 6 times as likely to provide care to black patients as nonblack doctors, and Hispanic physicians are more than twice as likely to provide health services to Hispanic patients as are non-Hispanic physicians.[15] Moreover, black physicians practice in areas where black residents average 32% of the population, and Hispanic doctors practice, on average, in areas with 43% Hispanics.[15] This could suggest that minority physicians show a higher likelihood of locating in areas where they are apt to see patients from similar racial/ethnic backgrounds as themselves, or that minority patients preferentially seek care from physicians who share their racial/ethnic background, or both.

Literature that examines the correlation between patients' self-reported race/ethnicity and the race/ethnicity of the physicians they identify as their regular providers has revealed considerable congruity. For example, Moy and Bartman[20] examined the impact of race/ethnicity on the matching process between patient and physician. These authors found that, at the population level, minority physicians (relative to nonminority physicians) disproportionately provide care to minority patients. Other evidence has established that racial/ethnic congruity between physicians and patients is indeed strong and relatively specific according to racial/ethnic group.[21] Specifically, this work demonstrated that individuals of racial/ethnic minority group backgrounds, although less likely overall to identify a usual health care provider in comparison to whites, are significantly more likely than whites to identify a usual provider of minority racial/ethnic background. Furthermore, this effect was found to be most pronounced for the matching process between Hispanic patients and Hispanic physicians but also held true for blacks.[21]

In this analysis, we examine the respective diversity in racial/ethnic backgrounds of pediatricians and the children to whom they provide health care services, both currently and into the foreseeable future.

METHODS

We developed a model of pediatric workforce diversity by applying information from the Association of American Medical Colleges on the racial/ethnic distribution of pediatricians who graduated from US medical schools between the years 1983 and 1989 (Robert A. Haynes, PhD, personal communication) to the number of USMG pediatricians in 1996 who practiced either in office-based settings or as full time hospital staff members.[22] Pediatricians in residency or fellowship training were excluded from the model, as were all international medical graduates (IMGs). Next, we took the results from the extrapolation model and applied them to create future workforce diversity projections. Our projections of the ethnocultural distribution of the pediatric workforce of the future are built on the following assumptions: 1) that the total or aggregate number of pediatricians will remain approximately constant over the next 20 years; 2) that the racial/ethnic mix of pediatricians practicing in future years will approximate that of the cohort of pediatricians who graduated from US medical schools between 1983 and 1989 (ie, that no major changes will occur in the ethnocultural distribution percentages of future cohorts); and 3) that IMG pediatricians will not appreciably alter the distributions.

Our racial/ethnic distribution estimates of the US child population are based on projections published by the US Census Bureau.[23] Race/ethnicity specific pediatrician-to-child-population ratios (PCPRs) were constructed according to categorizations of race/ethnicity as presented in the Association of American Medical Colleges physician workforce data and the Census Bureau demographic data. These ratios were calculated based on our estimated numbers of pediatricians per 100 000 children across racial/ethnic-specific groups, ie, we converged the estimated numbers of children and pediatricians by racial/ethnic category to construct the ratios.

Statistical Analysis

χ^2 tests were used to compare the PCPR for each racial/ethnic group to the PCPR for all others for 1996 and for 2025. For the comparisons between 1996 and 2025, the Breslow–Day test for homogeneity of odds ratios was used to compare the PCPR change during that interval for each demographic group, with year as the third variable.

Finally, we modeled the numbers of pediatricians (expressed as a percent increase from the current numbers) across the demographic categories that would have to enter practice to achieve PCPR parity across the categories (using the white PCPR as an arbitrary benchmark).

RESULTS

American black, Hispanic, and Asian/Pacific Islander children will increase in both absolute and relative terms over the next 25 years, whereas white children will decrease in both absolute and relative numbers (Table 1). The population of black children will increase modestly in numbers, rising from 15% of the total US child population in 1996 to 16% in 2025. The growth of the Hispanic child population during that period will be steeper, rising from 14% to 24%. US children of Asian or Pacific Islander heritage will more than double in number between 1996 and 2025, rising from just 4% of the child population to ~7%. During this period, white children will decline in absolute terms and shrink from 66% to 53% of the US child population (Table 1). These trends are depicted graphically in Fig 1.

TABLE 1. Number* (Percentage) of US Children by Racial/Ethnic Group[23]

	1996	%	2000	%	2005	%	2010	%	2025	%
Black	10 706	15	10 605	15	11 014	15	11 265	16	12 741	16
Hispanic	10 431	14	11 033	16	12 467	17	13 741	19	19 085	24
American Indian/Alaskan Native	714	1	697	1	714	1	736	1	856	2
Asian/Pacific Islander	2746	4	3071	4	3563	5	4030	6	5573	7
White	48 282	66	45 376	64	44 208	61	42 738	59	42 528	53

* In thousands.
Percentages are rounded to the nearest whole integer and so total may not equal 100%.

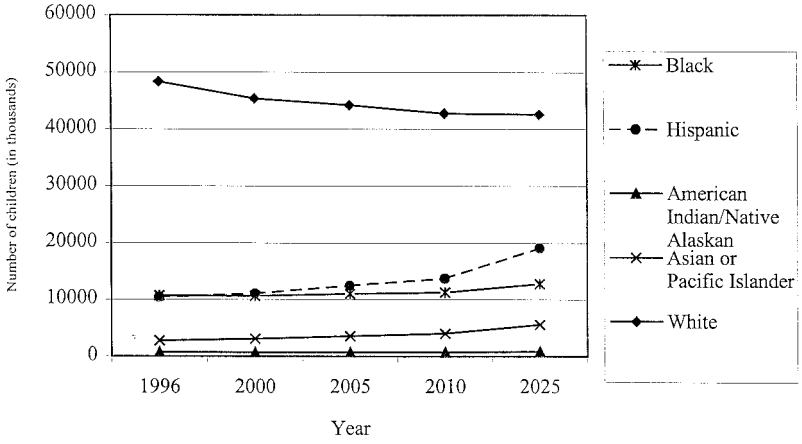

Fig 1. Number of children 0 to 17 years of age, 1996–2025.

Our model of steady-state pediatric workforce diversity coupled with the projected demographic trends of the child population presents a picture of growing disparity in the demographic group-specific PCPRs (Table 2). For example, the black PCPR, currently less than one third of the white PCPR, will fall from 14.3 pediatricians per 100 000 children in 1996 to 12.1 pediatricians per 100 000 children by 2025. The Hispanic PCPR will fall even more sharply, dropping from 16.9 pediatricians per 100 000 children in 1996 to 9.2 pediatricians per 100 000 children in 2025. The American Indian/Alaska Native PCPR, currently only one sixth that of the white PCPR, will drop slightly (from 7.8 in 1996 to 6.5 by the year 2025). The PCPR specific to the Asian/Pacific Islander group will drop in half, declining from 52.9 in 1996 to 26.1 in 2025. For whites, the PCPR will increase from 47.8 to 54.2 during this period (Table 2). For 1996, each of the 5 PCPRs is significantly different from the comparison ratio ($P < .001$). The same is true for 2025 ($P < .001$). For the comparison between 1996 and 2025, there is a significant difference ($P < .001$) for each ratio except for American Indian/Alaskan Native. The PCPR trend projections are shown graphically in Fig 2.

TABLE 2. Race/Ethnicity-Specific PCPR, 1995–2025 (Pediatrician/100 000 Children)

	1996	2000	2005	2010	2025
Black	14.3*	14.5	13.9	13.6	12.1*‡
Hispanic	16.9*	15.9	14.1	14.1	9.2*‡
American Indian/Alaskan Native	7.8*	8.0	7.8	7.6	6.5*
Asian or Pacific Islander	52.9*	47.3	40.8	36.0	26.1*‡
White	47.8†	50.8	52.1	54.0	54.2†§
Overall ratio	38.2	39.4	38.7	38.4	34.5

* PCPR is significantly lower than the PCPR of all other groups combined ($P < .001$).
† PCPR is significantly higher than the PCPR of all other groups combined ($P < .001$).
‡ PCPR for 2025 is significantly lower than the PCPR of all other groups combined, compared to 1996 ($P < .001$).
§ PCPR for 2025 is significantly higher than the PCPR of all other groups combined, compared to 1996 ($P < .001$).

Taking the 1996 PCPR of 47.8 for the US white population as a benchmark, the requisite increases in numbers of pediatricians (expressed as a percentage increase from the current workforce) that would be required to match the benchmark across racial/ethnic groups for the various years are derived (Table 3). These estimates demonstrate the sharp increases in minority pediatrician numbers, which would be required if the United States were to set as a policy goal meeting the PCPR benchmark of 47.8 pediatricians per 100 000 children and thereby achieve parity across population groups.

DISCUSSION

Our results show that the infants, children, adolescents, and young adults of the United States are currently far more diverse with respect to race/ethnicity than the pediatricians who provide their health care. Our results suggest, moreover, that—unless major strides are made to enhance the diversity of the pediatric workforce—the discrepancies in the racial/ethnic mix of the 2 groups will substantially widen over the next quarter century. This projected growing disparity will stem primarily from the anticipated population growth among nonwhite children in the United States over the next quarter century.

As is true with any forecasting exercise, the model we constructed is only as good as the assumptions on which it is built. We readily acknowledge that most (if not all) of the assumptions built into our forecasting model can be challenged. For example, evidence indicates that the total number of active pediatricians

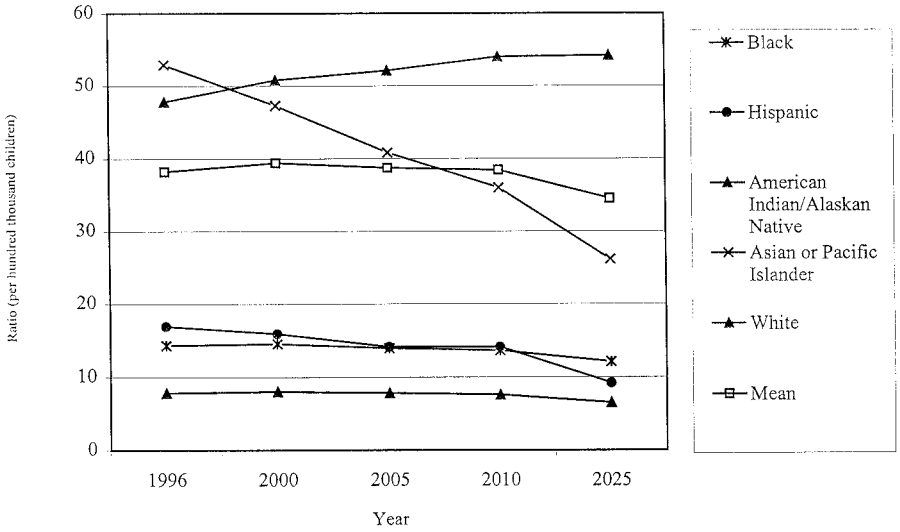

Fig 2. Race/ethnicity specific pediatrician to child population ratios, 1996–2025 (expressed as pediatricians/100 000 children).

TABLE 3. Required Increase in Number of Pediatricians to Match 1996 Ratio for White Population

	1996	2000	2005	2010	2025
Black	235%	232%	244%	252%	298%
Hispanic	185%	201%	240%	275%	421%
American Indian/Native Alaskan	513%	498%	513%	532%	634%
Asian or Pacific Islander	−9%	2%	18%	33%	84%

in the United States is not—in contradistinction to our model's assumption—holding steady in the aggregate, but rather increasing rather sharply.[24] From 1970 to 1996 the total number of pediatricians increased 191%, substantially outpacing the relatively flat growth in the US child population during that period. Growth in the pediatric workforce during this period was most pronounced between 1990 and 1996 when a >30% increase was observed in the numbers of active pediatricians.[24] Whether such a growth rate will be sustained or be curtailed is a matter of speculation and will be heavily influenced by federal graduate medical education (GME) policy and immigration trends. However, we deem continuation of the recent growth trajectory unlikely, especially in light of the legislative changes made at the federal level in 1997, which effectively cap the total number of GME positions.

Our model excludes IMGs because reliable data are not available pertaining to their racial and ethnic diversity. In 1996, IMGs comprised ~29% of US pediatricians.[24] Evidence indicates that growth in the IMG pediatrician pool has been steep, growing over 300% between 1970 and 1996.[24]

Although no reliable data are available that pertain to the race/ethnicity of all IMG pediatricians practicing in the United States, some recent data pertaining to the racial and ethnic distribution of first-year residents (of all medical specialties) recently appeared.[25] These data indicate that first year residents who are not US citizens (including IMGs who are not US citizens) are slightly more diverse demographically than are first year residents who are US citizens.[25] Data specifically pertaining to residents in GME programs indicate that Hispanic and Asian/Pacific Islanders are represented in higher percentages among IMGs than among US medical graduates (USMGs), whereas blacks and American Indian/Alaskan Natives are represented in higher percentages among USMGs than among IMGs.[26] These data additionally indicate that IMGs in GME programs are more likely than their USMG counterparts to be of Indian subcontinent or Middle Eastern origin. Additional data are sorely needed to examine trends among IMG pediatricians with respect to their practice characteristics.

Affirmative action has the potential to alter the diversity of the pediatric workforce of the future. Few now doubt that the concerted and deliberate policies and initiatives affecting gender representation among US medical school matriculants over the past 4 decades have dramatically altered the gender distribution of US pediatricians. The data presented in Table 2 strongly suggest that, to date, affirmative action based on race/ethnicity has not been nearly as effective as has affirmative action based on gender. Recently, various administrative, legislative, and judicial actions have reversed or adversely affected affirmative action efforts.[1] Thus, to the degree that race and ethnicity might be less likely or less able to be considered in medical school acceptance decisions and residency program rank listings, the projections we report are conservative and may underestimate the true future minority PCPR declines.

The concept of racial/ethnic group-specific PCPRs is controversial, and the validity as well as the utility of such PCPRs are open to debate. We endeavor to report demographic group-specific PCPRs in this analysis only as measures of representativeness at the population level. Broad-based measures such as PCPRs that are specific to racial/ethnic group can uniquely allow for assessment of disparate represen-

tation among health professionals across population subgroups. Great care must be taken not to misinterpret such measures. For example, race-specific PCPRs are not intended to imply that pediatric care either is or should be segregated along racial lines. Neither should the PCPRs we report be misinterpreted to have any relevance to individual level physician–patient relationships, eg, the PCPRs in this report bear no relation to panel sizes. Inasmuch as the PCPRs we report are derived from national-level data, they should not be interpreted as having any applicability to small-scale geographic analyses or specific health care market assessments. Thus, great caution must be exercised in using racial/ethnic group-specific PCPRs to gauge provider supply/requirements mismatch in workforce analyses.

Yet even in light of these cautionary considerations, it must be acknowledged that race/ethnicity has been shown to be an independently important predictor in the selection of a physician, after controlling for other socioeconomic factors. This suggests that the racial matching may be the result of actual physician and/or patient preferences (possibly reflecting cultural competence). This has clear policy implications because it suggests that demand for minority physicians is, in part, independently determined by racial/ethnic make-up of society regardless of economic class.

The major limitation of our study is that our model of pediatric workforce diversity is based on a limited cohort of young, USMG pediatricians. Better and more comprehensive estimates of pediatric workforce demographic diversity unfortunately do not exist. Moreover, virtually no reliable data exist pertaining to the racial/ethnic make-up of IMG pediatricians practicing in the United States.

Our findings suggest that the goal of equal representation according to race/ethnicity among pediatricians in the United States remains elusive and seems to be an increasingly challenging policy goal. Insofar as racial preferences seem to matter as determinants of physician–patient matching, our results demonstrate the disparate diversity of physicians and patients should be considered as we plan to meet the needs of an increasingly racially diverse population.

ACKNOWLEDGMENTS

We thank Sandra Tomany, MA, for her assistance with statistical issues, and Stephen Keith, MD, Elena Fuentes-Afflick, MD, MPH, Walter Tunnessen, Jr, MD, for their helpful suggestions on an earlier version of this manuscript.

REFERENCES

1. US Department of Health and Human Services. *Council on Graduate Medical Education Twelfth Report: Minorities in Medicine*. Washington, DC: US Department of Health and Human Services, Public Health Service, Health Resources and Services Administration; 1998
2. Petersdorf RG, Turner KS, Nickens HW, et al. Minorities in medicine: past, present and future. *Acad Med*. 1990;65:663–670
3. Council on Ethical and Judicial Affairs. Black-white disparities in health care. *JAMA*. 1990;263:2344–2346
4. AMA Council on Scientific Affairs. Hispanic health in the United States. *JAMA*. 1991;265:248–252
5. Pappas G, Queen S, Hadden W, et al. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *N Engl J Med*. 1993;329:103–109
6. Kleinman JC, Gold M, Makuc D. Use of ambulatory medical care by the poor: another look at equity. *Med Care*. 1981;19:1011–1029
7. Blendon RJ, Aiken LH, Freeman HE, et al. Access to medical care for black and white Americans, a matter of continuing concern. *JAMA*. 1989;261:278–281
8. Butler JA, Winter WD, Singer JD, et al. Medical care use and expenditure among children and youth in the United States: analysis of a national probability sample. *Pediatrics*. 1985;76:495–506
9. Guendelman S, Schwalbe J. Medical care utilization by Hispanic children: how does it differ from black and white peers? *Med Care*. 1986;24:925–940
10. Lieu TA, Newacheck PW, McManus MA. Race, ethnicity, and access to ambulatory care among US adolescents. *Am J Public Health*. 1993;83:960–965
11. Freeman HE, Blendon RJ, Aiken LH, et al. Americans report on their access to health care. *Health Aff*. 1987:7–18
12. Kehrer BH, Burroughs HC, eds. *More Minorities in Health*. Menlo Park, CA: Henry J. Kaiser Family Foundation; 1994
13. Davis BJ, Voegtle KH. *Culturally Competent Health Care for Adolescents*. Chicago, IL: Department of Adolescent Health, American Medical Association; 1994
14. Kindig DA, Yan G. Physician supply in rural areas with large minority populations. *Health Aff*. 1993:177–184.
15. Komaromy M, Grumbach K, Drake M, et al. The role of black and Hispanic physicians in providing health care for underserved populations *N Engl J Med*. 1996;334:1305–1310
16. Lloyd SM, Jr, Johnson DG. Practice patterns of black physicians: results of a survey of Howard University College of Medicine alumni. *J Nat Med Assoc*. 1982;74:129
17. Keith SN, Bell RM, Swanson AG, et al. Effects of affirmative action in medical schools, a study of the class of 1975. *N Engl J Med*. 1985;313:1519–1525
18. Penn NE, Russell PJ, Simon HJ. Affirmative action at work: a survey of graduates of the University of California, San Diego, Medical School. *Am J Public Health*. 1986;76:1144–1146
19. Cohen AB, Cantor JC, Barker DC, et al. Young physicians and the future of the medical profession. *Health Aff*. 1990:138–148
20. Moy E, Bartman BA. Physician race and care of minority and medically indigent patients. *JAMA*. 1995;273:1515–1520
21. Gray B, Stoddard JJ. Patient-physician pairing: does racial and ethnic congruity influence selection of a regular physician? *J Community Health*. 1997;22:247–259
22. Randolph L. *Physician Characterisitics and Distribution in the US, 1997-1998 Edition*. Chicago IL: American Medical Association; 1997
23. Bureau of the Census, US Department of Commerce. *Statistical Abstract of the United States: 1997*. 117th ed. Washington, DC: US Government Printing Office; 1997
24. American Academy of Pediatrics, Committee on Pediatric Workforce. Workforce policy statement. *Pediatrics*. 1998;102:418–427
25. Libby DL, Zhou Z, Kindig DA. Will minority physician supply meet US needs? *Health Aff*. 1997;16:205–214
26. Apendix II—graduate medical education. *JAMA*. 1996;276:739–748

The Respective Racial and Ethnic Diversity of US Pediatricians and American Children

Jeffrey J. Stoddard, Mary Ruth Back and Sarah E. Brotherton

Pediatrics 2000;105;27-31
DOI: 10.1542/peds.105.1.27