ABSTRACT. Unprecedented transformations in the financing and organization of child health care are driving change in the practice of pediatrics at a remarkably fast pace. The health care needs of children also are evolving, reflecting changing disease patterns, new technologies, and shifting socioeconomic and demographic characteristics of children and families. Changes in the financing and organization of child health services catalyzed by managed care and legislative initiatives need to be responded to proactively by the pediatric community. Yet, the anticipated health care needs of children also must be addressed as models for both pediatric training and practice in the future are developed. This article summarizes briefly these changes in health care services and in child health needs, addresses training implications, and discusses several initiatives the pediatric community is undertaking to develop guidelines for training pediatricians for the 21st century. Pediatrics 1998;101:746–752; child health status, health care delivery.

ABBREVIATIONS. MCO, managed care organization; SIDS, sudden infant death syndrome; FOPE II, Future of Pediatric Education II.

The practice of pediatric primary care is changing rapidly. Evolving childhood disease patterns, shifting demographics, and advances in diagnostic and treatment technologies all have had recent impacts. Political and financial forces in the past decade have also coalesced and acted as catalysts to drive change in practice. These forces have included national legislative efforts, financial initiatives in the private sector, and the reorganization of health care delivery with an emphasis on managed care and cost containment.

Leaders in the pediatric community interested in resident education have desperately needed 1) a better understanding of changes in the financing and organization of child health services, 2) projections about the health care needs of children over the next several decades, and 3) consensus on where pediatric education should move to keep pace with these changes. This supplement to Pediatrics assumes an important role for the pediatric community by delineating the impact of managed care on the organization and delivery of child health services. This paper provides an overview for the supplement and addresses how political and financial forces as well as the current health care needs of children are acting to alter pediatric primary care. We also highlight several proactive steps the pediatric community is taking to ensure that the educational programs of the present meet the needs of pediatric trainees and their patients and families, now and in the future.

CHANGES IN THE FINANCING AND ORGANIZATION OF SERVICES TO CHILDREN

The past 20 years have witnessed unprecedented shifts in the financing and organization of child health services. The most prominent drive for these has been a mounting concern about health care costs. The health care industry in the United States saw tremendous growth in expenditures over the second half of this century. Cost-based payments to providers and hospitals stimulated remarkable advances in the treatment of disease, but also encouraged the expansion of physical plants and technology. Health care costs made up >10.8% of the Gross Domestic Product by 1985 and 12.6% by 1990 (Figure).1

Attempts to control costs in the 1980s included diagnoses-related groups, utilization review, and the increased use of the ambulatory setting for evaluations, minor procedures, short-term therapies, and surgeries. It was not until the early 1990s, however, that a national agenda was clearly discernible, demanding control of skyrocketing health care costs. This agenda was spurred by employers responsible for employee health benefits as well as by state and federal governments.

The election of President Clinton in 1992 and the development of his Health Care Reform Task Force pushed the concept of the management of costs through market-based competition. Managed care organizations (MCOs) were increasingly seen by corporate America as a means of controlling costs, standardizing care, and by extension, improving quality. Although the Clinton plan was ultimately tabled, the use of managed care was catapulted into high gear by the mid-1990s. Estimates are that >45 000 000 patients in the United States were covered in managed care plans by 1993.2

Affected by the same spiraling costs as private insurers, state Medicaid programs also increasingly looked to managed care to control costs. By 1996, 13 million Medicaid recipients were covered through Medicaid managed care or statewide waivers in 41 states; the numbers are increasing rapidly.3 This movement to mandatory Medicaid managed care will have a major effect on the delivery of health care services to children.
Medicaid is the single largest insurer of children. In 1995, 25% of all US children (23.4 million) were enrolled for at least part of the year in Medicaid. Medicaid is anticipated to cover more children in the future for two reasons. First, many businesses have decreased or eliminated health insurance coverage for dependent children. Second, >10 million children are estimated to be uninsured. The recent passage of federal legislation to fund children's health insurance, Title XXI, will shift the responsibility for these children to the public sector. At the time of this writing, it is unclear what mechanism(s) will be used to cover these children. However, it is expected that many states will expand their Medicaid programs. Thus the focus on cost savings through managed care by both the private and the public sectors can be expected to have a radical impact on the delivery of children's health services in the near future.

**CHANGES IN PATTERNS OF CHILD HEALTH NEEDS**

As we think about training the pediatricians, it is critical that we consider the child health problems that these physicians will confront in their practice. Although this supplement specifically looks at the impact of managed care on pediatrics, discussions about the future of pediatric primary care must not focus solely on economic and political forces, but also must address how pediatric practice and training must evolve to meet the pressing health care needs of children. What is the current status of child health and how has it changed over the last several decades?

Pediatricians entering practice at this turn of the century will experience not only a different organization of health care services delivery, but also a very different child health reality than did physicians caring for children at the turn of the last century. In less than 100 years, infant mortality has decreased from 100 per 1000 to its present level of 7 per 1000 live births, and childhood mortality has declined from 10 to 20 per 1000 to <1 per 10 000.

Although there have been stunning declines in childhood mortality, there remain significant threats to children's health and safety both from biologic causes and from environmental agents. These include a vast array of chronic conditions and disabilities, as well as lifestyle concerns such as obesity, eating disorders, violence, drug and alcohol use, and learning and behavior problems. In addition, the very technologic breakthroughs that have prevented early death for many children have created a new cohort of young people with serious chronic illness.

The pattern of pediatric morbidity and mortality varies tremendously by age, with special patterns of health and illness in infancy, childhood, and adolescence (Table). In this section, we will examine these patterns of morbidity and mortality for each of these age groups. We then will discuss general sociodemographic trends in children and families in the United States today that also affect children's health care needs.

**Infancy**

The United States ranks ninth in infant mortality for whites and 25th for blacks. This racial disparity continues as both a serious scientific concern and a challenge for a better organized response to deal with the biologic and social factors responsible for prematurity, low birth weight, and infant deaths.

Several factors contribute to the infant mortality rate (defined as death occurring during the first year of life). These factors include perinatal complications, congenital anomalies, and SIDS. The major recent declines in infant mortality have been attributable to advances in obstetrics and intensive neonatal care. Much of the residual perinatal mortality is accounted for by social and environmental causes. Poverty, poor antenatal nutrition, drug and alcohol use, smoking, and stress place the fetus at risk in the prenatal period. These same factors continue as poor omens during postnatal adaptation, placing children at jeopardy, not only for infant mortality, but also for other nonfatal outcomes such as poor growth, delayed development, and chronic disability.

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**TABLE.** The Six Leading Causes of Death for Persons 0–24 Years of Age in the United States, 1995

<table>
<thead>
<tr>
<th>Ranking of Cause of Death</th>
<th>0–1 Year Rate, 7.7/1000</th>
<th>1–4 Years Rate, 4/10 000</th>
<th>5–14 Years Rate, 2/10 000</th>
<th>15–24 Years Rate, 10/10 000</th>
</tr>
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<tbody>
<tr>
<td>1 Congenital anomalies</td>
<td>Unintentional injury</td>
<td>Unintentional injury</td>
<td>Unintentional injury</td>
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</tr>
<tr>
<td>2 Short gestation and low birth weight</td>
<td>Congenital anomalies</td>
<td>Malignant neoplasms</td>
<td>Homicide</td>
<td></td>
</tr>
<tr>
<td>3 SIDS</td>
<td>Malignant neoplasms</td>
<td>Homicide</td>
<td>Suicide</td>
<td></td>
</tr>
<tr>
<td>4 Respiratory distress syndrome</td>
<td>Homicide</td>
<td>Congenital anomalies</td>
<td>Malignant neoplasms</td>
<td></td>
</tr>
<tr>
<td>5 Maternal complications of birth</td>
<td>Heart disease</td>
<td>Suicide</td>
<td>Heart disease</td>
<td></td>
</tr>
<tr>
<td>6 Complications of placenta, cord and membranes</td>
<td>HIV</td>
<td>Heart disease</td>
<td>HIV</td>
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</tbody>
</table>

The infant mortality rate also reflects our highly evolved capacity to care for children with extreme prematurity and complex congenital anomalies. Maintaining this excellent care depends on ensuring an adequate supply of highly trained pediatric subspecialists who provide the necessary secondary and tertiary care for these children. In countries not endowed with strong subspecialty capability, many of these infants would die in utero and show up in statistics as miscarriages or stillbirths.

The infant mortality statistics for deaths of children with congenital anomalies also speaks to the excellent technologic capability of our neonatal intensive care and actually reflects increases in the survival of children with complex conditions. For every child with prematurity and/or congenital anomalies who dies during the first year of life, there are many others who go on to live into childhood and adolescence. Some of these children suffer no sequelae. Others continue with significant disability.

For many pediatricians in practice, children with complex medical conditions such as these present new challenges. Tremendous advances in molecular genetics and biology also are anticipated in the next several decades. These advances will radically alter medical diagnosis, treatment, and management for a variety of conditions, and pediatricians will need to be facile and knowledgeable about the use of these tools in the care of children.

SIDS continues as a significant cause of postneonatal infant mortality (deaths occurring from 30 days to 1 year after birth). Although there remains no clear etiologic explanation for SIDS, new data suggest that sleeping position has a prominent influence on the determination of sudden death.

**Childhood**

The childhood years are marked by the lowest rate of mortality of any period in life. Most childhood illness is acute, and much is self-limited. This is a time of growth, change, and development. From the child health perspective, this is a time for disease prevention, with an emphasis on immunizations, screenings, safety, anticipatory guidance, and nutrition instruction. By far, the leading cause of death in this period is unintentional injury. Recognition of this pattern has led to legislative initiatives and enhanced efforts at public awareness campaigns, as well as reinforcement of safety messages by pediatricians as part of their well child care routine visits.

Childhood also is marked by the beginnings of mental health concerns such as behavior problems and school dysfunction. Pediatricians find themselves confronted with morbidity related to social interaction and educational needs for at least 15% to 20% of the children they care for.11

**Adolescence**

During adolescence, young people endure a number of important health challenges. As their bodies and emotions mature, they often are exposed to new experiences, confront new choices, and develop a new sense of themselves. Adolescents’ pattern of morbidity and mortality includes suicide, homicide, injuries, drug- and alcohol-related concerns, eating disorders, sexually transmitted diseases, pregnancy, and pregnancy-related health concerns.12

In addition, adolescents with chronic illness and disability often experience exacerbations of their conditions related to pubertal changes and/or the testing and noncompliance characteristic of the age group. For pediatricians in practice, a new set of skills often is required to address concerns about sexuality, vocational choices, independence, and transition to the adult health care system. As we have more success with surgical and pediatric subspecialty care, pediatricians will increasingly confront these realities.

**Sociodemographic Trends**

Health care needs of children also are driven by socioeconomic factors. Our society is becoming increasingly mobile, and families are stressed by the lack of social support related to mobility. Other stressors on families include discontinuities in families secondary to separation and divorce, the growing number of working mothers, and the percentage of children in the United States now living in single-parent households, usually headed by women. Additionally, although the United States as a whole has a high level of good childhood health compared with many other countries, there is a great deal of variation among regions of the country and among children of differing economic and cultural backgrounds. The number of children living in poverty has increased by 2.5 million in the past decade, particularly children of African-American and Hispanic background. These and other factors influencing child health must be addressed as we look at meeting the health care needs of children and their families in the future.13

**IMPLICATIONS FOR TRAINING PEDIATRIC PROVIDERS FOR THE FUTURE**

The major developments in child health delivery over the past 2 decades have only recently been factored into decision-making about resident education. These have included decreasing rates of hospitalization, more capacity to provide care on an ambulatory basis, more community-based services, more interdisciplinary care, and increased emphasis on outcomes. Likewise, developments in child health over the past 2 decades also must be considered as residency education is revised in response to these external changes. Alterations in child health patterns have led to a need for more training in community-based services and interdisciplinary care, as well as in cross-cultural and advocacy issues. It also will be a major challenge to the pediatric community to address work force issues for the 21st century. Each of these factors contributes to a need for reevaluation of pediatric practice and residency training.

**Less Hospitalization**

Rates of hospitalization have been decreasing nationally since the early 1980s. The rate of hospital discharges for children <15 years of age dropped...
More Ambulatory Care

Because of advances in technology, more and more care is provided on an ambulatory basis. In 1970, patients were routinely admitted to hospitals for radiologic procedures such as intravenous pyelography. Now much more extensive and invasive radiologic procedures are performed routinely on an outpatient basis. New short-acting anesthetics have radically expanded the number of cases that can be handled safely and effectively in outpatient settings. Many medical problems such as childhood cancer, end-stage renal disease, and hemophilia can be treated in short stays in day hospitals. Even the care of routine illness has been modified by new technologies. Because most patients now have telephones and can reach physicians more readily, a great deal of care actually takes place over the telephone. Clearly, as pediatric primary and specialty care move to the outpatient setting, residents must have increasing ambulatory experiences. Surveys of recent pediatric graduates also have highlighted the need for more training in adolescent medicine, behavioral and developmental pediatrics, dermatology, and orthopedics, as well as for exposure to the evaluation and outpatient management of subspecialty patients. In areas of the country where managed care programs are responsible for a large percentage of the population, trainees need opportunities to learn how care is divided between managed care ambulatory services, community hospitals, and academic health centers. Residents still will need exposure to intensive-care services, particularly in the stabilization of the acutely ill neonate or child in the community setting.

More Community-based Services

As described above, many of the children pediatricians will be caring for in the future will have chronic health problems or will be survivors of neonatal intensive care units, transplants, genetic therapies, or chemotherapy. These children will require ongoing monitoring of their health status and functional ability in the home and school settings. Technologic advances have moved the care of many of these children from the hospital setting to the home and community. Children who used to live in the hospital because of dependence on medical technology and/or nursing now often are cared for at home. To derive a full understanding of what a home care order means at discharge time, physicians in training would benefit greatly from exposure to community-based care. On the one hand, they would learn firsthand what can be done in the home and community. On the other, they would learn that nothing about home care can be taken for granted. Through home visits to families caring for children with complex illness, trainees learn the entire continuum of care and the importance of a comprehensive health care plan. Trainees also need exposure to the myriad community groups, public sector systems, and other agencies with which children with chronic illness interact.

Additional Interdisciplinary Care

Increasingly, pediatrics is becoming a team discipline. Both subspecialty and primary care teams have been demonstrated as effective in ensuring high-quality care for patients and families. Managed care depends on physicians assuming a specific team role as the gatekeeper who is well aware of the roles of other players, including nurses, subspecialists, and so on. Not only does the resident need to know the roles, but also how much in resources each team member will require to do his/her job. Generalists also will need to develop stronger competencies in the diagnosis and care of children with chronic illnesses and a solid grounding in the new genetics.

Increased Emphasis on Outcomes

Analysis of effectiveness has become an important component of care throughout medicine. Although medical providers always have closely observed the impact of interventions, new techniques for measurement on a timely basis have improved the ability to monitor the quality of care. This will become even more important as more and more of children’s care is provided under managed care. Although there are published studies investigating children’s health services in managed care plans, little is known about the effect of managed care on health care delivery to children. First, because of the variability in managed care plan organization and financing, much of the literature on managed care and children’s health appears contradictory in its findings. Second, much of the research available dates to evaluations of the Medicaid Competition Demonstrations conducted in the early 1980s. These studies tended to address Medicaid recipients who enrolled voluntarily in managed care plans, many of which were staff or group model health maintenance organizations and not independent practice associations or other looser organizational models prevalent in managed care today. Third, the explosive growth in managed care over the past decade has prompted the proliferation...
of multiple innovations in plan characteristics. Researchers have warned that past research on managed care may not be appropriate for drawing firm conclusions about the future impact of managed care on children.\textsuperscript{20–22} Fourth, concern has been raised that these dramatic changes are taking place in the organization and delivery of health care services without adequate methodology for ensuring quality of care for children.\textsuperscript{23} Residents will need adequate training in the science of outcome measurement to function in the managed care environment and to utilization outcome measurements to advocate for better care for children.

**More Advocacy for Children’s Health Needs**

It is clear from the discussion above that many of the problems children confront currently or will confront in the future are biopsychosocial in nature and will require ongoing management and collaboration with community and public sector organizations. In addition, at this time we can not truly state whether managed care will positively or negatively affect the delivery of health care services for children. Pediatric residents will need exposure to mentors involved in legislative efforts to ensure basic health and well-being for all children.

**More Exposure to Cross-cultural Issues**

Given the variety of ethnic backgrounds in the United States from which children come and the increasing percentages of children who are bilingual and are raised in different cultural environments, pediatrics must become more sensitive and cognizant of cross-cultural issues. Managed care may need to allow greater flexibility of care and practice style for pediatricians to better manage the health care needs of children from diverse cultural, social, and economic backgrounds.

**Work Force Issues**

Public and private sector adoption of managed care also is affecting the training of pediatricians. Currently, only a small number of MCOs assist in training medical students and residents, and the majority are staff and group model health maintenance organizations. These settings may be less appropriate, given the growth of looser style MCOs.\textsuperscript{24} Additionally, as Drs Bazell and Salsberg present so eloquently in their article in this supplement, cost-cutting measures that Congress is enacting to reform Medicaid and Medicare also include revisions of direct and indirect payments provided for residency training.\textsuperscript{25} Although these reforms may provide opportunities to redistribute monies and allow for greater outpatient experience during residency training, there is a very real concern that work force funding may be decreased substantially and negatively affect the ability to provide care to children, particularly if uninsured children, currently numbering >10 million, suddenly are ensured access to care.\textsuperscript{26} At the same time, many allied health professionals are being employed under managed care to provide effective and less costly basic care for children. It is of great importance to determine the roles for pediatricians and allied health professionals in the care of children, how many pediatric residents need to be trained to provide an adequate work force to meet the health care needs of children, and what that training must include to prepare the pediatrician for the 21st century.

**RESPONSES OF THE PEDIATRIC COMMUNITY**

As these child health and financing changes are occurring, leaders in the pediatric community have endured a lack of information about the potential effects of these changes both on the delivery of health services to children and on pediatric training. There has been a need for better information on these trends in care as well as for consensus statements on the direction of children’s health care and pediatric training.

Several recent efforts have been undertaken by the pediatric community to address pediatric training issues for the future. In response to efforts in the early 1990s to discuss graduate medical education reform, in 1933 the Pediatric Federation published its statement on graduate medical education to address pediatric work force requirements.\textsuperscript{27} The Ambulatory Pediatric Association’s Guidelines for Residency Training\textsuperscript{28} and the Residency Review Committee’s recent revision of pediatric program requirements\textsuperscript{29} also are redirecting training toward skills needed in the outpatient setting. The Bright Futures initiative and its associated curricular developments are bringing a much needed biopsychosocial perspective to the delivery of health care services for children.\textsuperscript{30} Also, given that almost 25% of children live in poverty, pediatric training must address health-related issues for these children. The Ambulatory Pediatric Association recently published curricular guidelines for caring for children living in poverty, and members are developing a comprehensive, multidisciplinary textbook as well.\textsuperscript{31} This supplement to *Pediatrics* also is important to the pediatric community by identifying specifically the impact of managed care on the organization of health care delivery, academic medical centers and children’s hospitals, and pediatric training.

The pediatric community, in collaboration with the Center for the Future of Children of the David and Lucille Packard Foundation and the Maternal and Child Health Bureau, has also undertaken a major initiative to revisit the 1978 Task Force on the Future of Pediatric Education. Funding has been provided by the American Academy of Pediatrics, the American Board of Pediatrics Foundation, the Association of Medical School Pediatric Department Chairmen, Inc, the Center for the Future of Children, and Project MCJ379381 of the Maternal and Child Health Bureau, Health Resources and Services Administration, for the years 1996 through 1999. The Task Force on the Future of Pediatric Education II (FOPE II) will evaluate the 1978 Task Force report for its relevancy to the education of children’s health care providers. FOPE II will provide direction for the improvement of pediatric education, with special emphasis on work force requirements, new instructional methodologies, and financing of pediatric education, as well
as recommend essential changes in the educational process to meet the current and future health needs of children. FOPE II also will address the impact of changes in the organization and financing of child health care delivery, including managed care and governmental reforms, on children’s health, resident training, academic medical centers, and the practice of pediatrics. Input from persons concerned about the future of health care delivery to children is welcome; members of the FOPE II Task Force can be reached by calling the American Academy of Pediatrics at 1–800–433–9016 or via e-mail at futpededII@aap.org.

Clearly, initiatives like these are crucial as pediatrics responds, hopefully proactively, to developing, financing, and organizing health care services for children. Consensus statements, review articles, and up-to-date health services research assume a vital role as organizations concerned about the care of children lobby with private and public sector representatives to ensure access to quality care for children and, by extension, quality training of their representatives to ensure access to quality care for children. Consensus statements, review articles, and up-to-date health services research assume a vital role as organizations concerned about the care of children lobby with private and public sector representatives to ensure access to quality care for children and, by extension, quality training of their health care providers. The pediatric community must continue these and other efforts for the betterment of our children’s health.

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COMMENTARY

Child Health Care in Changing Times by Palfrey et al

This excellent review of the major changes in financing and organizing health services for children and youth and changes in their patterns of health needs also serves to remind us of the importance of understanding the broader context of financing and organizing adult medical care. Whatever the organizational structure for providing health care, there is a need to recognize that the evolving health needs of children and adolescents require knowledge, skills, and resources that take into account an increasing number of children with uncommon, high-cost treatable diseases, chronic ill-

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ness and/or disability, disorders related to lifestyle, mental health conditions, and learning and behavioral problems. In addition, for many children access to appropriate acute care and preventive services is still a significant problem. Further, the health outcomes of most of these problems of children and youths are affected significantly by poverty and other social and environmental risks and by preventive care that frequently requires public health and educational measures beyond what can be provided during the physician–patient encounter. These issues are not new, but children have been placed at greater jeopardy by the current, primarily cost-driven, competitive marketplace and the excesses of individual entrepreneurs.

It is also particularly important to appreciate the substantial risk of compromising quality care during periods of system change and increased economic pressure. Ultimately, quality is the responsibility of the individual physician in the context of the doctor–patient relationship. It is dependent on knowledge, experience, and judgment in caring for individual patients, and on an appreciation of biologic variability and statistical probability. The explosion of information from science and technology has made evidence-based decision-making more difficult but no less essential than it has always been. This quality issue is central to both patient care and medical education, and quality health care is particularly vulnerable in times of economic uncertainty and institutional change. It is critical that academic pediatric leaders not neglect this perspective because of their necessary preoccupation with the details of adjusting to changing times.

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**Child Health Care in Changing Times**

Laurel K. Leslie, Rebecca Sarah and Judith S. Palfrey

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