# Primary Care Pediatrics and Public Health: Meeting the Needs of Today's Children

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The proportion of children suffering from chronic illnesses—such as asthma and obesity, which have significant environmental components—is increasing. Chronic disease states previously seen only in adulthood are emerging during childhood, and health inequalities by social class are increasing. Advocacy to ensure environmental health and to protect from the biological embedding of toxic stress has become a fundamental part of pediatrics. We have presented the rationale for addressing environmental and social determinants of children's health, the epidemiology of issues facing children's health, recent innovations in pediatric medical education that have incorporated public health principles, and policy opportunities that have arisen with the passage of the 2010 Patient Protection and Affordable Care Act. (*Am J Public Health.* 2012;102:e17–e23. doi:10.2105/AJPH.2012.301013)

In pediatrics, the acknowledgment of child development as a transactional process and ultimate determinant of adult capacity has important implications for the development of systems, practice models, and training. If we are to ensure children's health and, ultimately, overall population well-being, childhood service systems must become responsive and coordinated on many levels; practitioners must develop multiple skills outside the traditional medical model; and training strategies must become innovative. Promoting access to effective health and health-related services is essential for achieving Healthy People 2020 objectives (the US Department of Health and Human Services' set of health-promotion and disease-prevention goals to be achieved nationwide by 2020). There are many examples of shortfalls in adequacy of available services, effectiveness of care provided, organization of services, and focus on primary prevention. Up to 50% of developmental problems in children are not identified until school entry,[1] more than 8 million children remain without health care coverage in the United States, and a much larger number have no regular source of health care except in emergencies.[2] In addition to inadequate funding for appropriate services, the network of programs serving children is increasingly fragmented, difficult to navigate, and unresponsive.

A major challenge for children's and youths' services is to develop more effective and efficient service integration models. In the present system, pediatricians tend to avoid asking parents about matters for which they feel inadequately trained and for which they are not aware of patient resources, including child development, obesity, breastfeeding, family violence, environmental health, and mental health. The system will not respond without adequately prepared clinician–advocates who recognize and understand these issues and their relationship to ultimate outcomes.

## UNMET HEALTH NEEDS OF CHILDREN

A recent Brookings Institute analysis of the US child population from the 2010 US Census documented that from 2000 to 2010, the population of White children nationwide declined by 4.3 million, whereas the combined population of Latino and Asian children grew by 5.5 million.[3] In areas of the country gaining children, Latinos accounted for most of the growth (e.g., 95% of Texas' child population growth occurred among Latinos). Ten states and 35 large metropolitan areas now have minority White children populations.[3]

The accelerating population growth of minority children heralds an increasingly diverse labor force and child population. This transition presents challenges for America's social and political systems as well as the health of the country's future workforce. The field of public health has long recognized the relationship between socioeconomic status (and other social determinants) and health and delineates this relationship as reciprocal: poverty detracts from resources used to maintain health, and poor health detracts from the educational and employment paths to improving income. Although substantial gains in meeting some of the Healthy People 2020 objectives have been made in recent years, relatively little progress has been made in other important indices, especially in health disparities.

There are many examples of ongoing racial/ethnic disparities in health and health care. National Center for Children in Poverty analysis shows that health status and well-being is much worse in poor than in nonpoor children. Nationally, fewer poor children (71%) than nonpoor children (87%) are described by their parents as in excellent or very good health; Latino and Black children are more than 4 times as likely as are White children to be in only fair or poor health.[4]

Black children have a higher prevalence of asthma than do White children at all income levels, and even after controlling for numerous factors, Black children are 20% more likely than are White children to be diagnosed with asthma and to have had an attack in the prior year.[4] Although the issues of poverty, health insurance status, adverse environmental exposures, and obesity affect all children, minority children are disproportionately affected by these conditions.

### Poverty

Nearly 15 million US children—21% of all US children—live in families with incomes

below the federal poverty level: $22 050 a year for a family of 4 in 2010.[5] On average, families need an income of about twice the poverty level to cover basic expenses. Using this standard, 42% of children live in low-income families. The number of children living in poverty increased by 33% between 2000 and 2009. There are 3.8 million more children living in poverty today than 2000. Most of these children have parents who work, but low wages and unstable employment leave their families struggling to make ends meet.[5] Poverty can impede children's ability to learn and contributes to social, emotional, and behavioral problems. Poverty also strains physical and mental health. Risks are greatest for children who experience poverty when they are young or who experience deep and persistent poverty.[5]

Twelve percent of White children live in poor families. Rates of childhood poverty among White children do not vary dramatically; rates range from 9% in California and Texas to 16% in Ohio. Thirty-six percent of Black children live in poor families, with rates ranging from 30% in California and New York to 46% in Ohio and Michigan. Thirty-three percent of Latino children live in poor families, with rates ranging from 25% in Florida and Illinois to 41% in North Carolina and Georgia. Fifteen percent of Asian children, 34% of American Indian children, and 24% of children of other races live in poor families.[5]

### Health Insurance

Lack of access to health care insurance can lead to poorer health and can result in different life paths for children from their earliest years. Nine million children are uninsured in America, or 1 out of every 9 children overall.[4] The disparities are great: 1 in 5 Latino children, 1 in 5 American Indian children, 1 in 8 Black children, 1 in 9 Asian/Pacific Islander children, and 1 in 13 White children is uninsured.[4]

Many children in America, but especially low-income and minority children, grow up without basic dental care. For dental-related illness alone, children missed more than 51 million hours of school in 1 year. Two thirds of Black children, about 61% of Latino children, and three quarters of White children receive preventive dental care.[4]

### Adverse Environmental Exposures

Contaminants in children's environment have diverse adverse effects on growth, development, and childhood and adulthood health. For example, exposure to lead at any level is harmful to child development. Lead exposure during childhood is linked to learning disabilities, IQ decrements, behavioral problems, stunted growth, and hearing problems. Blood lead levels above 10 micrograms per deciliter are 4 times as common among Black children (3.5%) as among White children (0.9%). This disparity remains true at blood lead levels of 5 micrograms per deciliter: 17% of Black children and 4% of White children have levels above 5 micrograms per deciliter.[4]

### Obesity

Obesity is increasing among children, but it is most prevalent among Black and Latino children. One in 4 Black children aged 6 to 17 years is overweight compared with 1 in 7 White children. Among Black girls aged 12 to 19 years, more than 40% are overweight or at risk for overweight. Clinic-based reports and regional data suggest that Black and Latino children are also more likely than White children to be diagnosed with type 2 diabetes.[4]

## A NEW DEFINITION OF CHILDREN'S HEALTH

Current conceptions of children's health have evolved and expanded significantly from early notions of health as merely a state of being free of disease. The 2004 Institute of Medicine report *Children's Health, the Nation's Wealth* defined health as follows:

> Children's health is the extent to which individual children or groups of children are able or enabled to (a) develop and realize their potential, (b) satisfy their needs, and (c) develop the capacities that allow them to interact successfully with their biological, physical, and social environments.[6(p33)]

This change in definition parallels the expansion of concerns in the practices of individual children's health care professionals.

This broader definition of children's health acknowledges the influences of the biological, behavioral, social, and physical environments on health trajectories. Professional organizations focused on children's health and well-being, such as the American Academy of Pediatrics and the Maternal and Child Health Bureau, have embraced this definition of children's health and are operationalizing this in funding mechanisms, programs, and policies.

Children face numerous environmental and social challenges in the contexts of families, schools, and communities that significantly affect their well-being and health outcomes. To address this expanded approach to understanding children's health, primary care pediatrics is transforming itself to be able to influence the critical determinants of children's health and well-being, and primary care pediatricians have begun to successfully merge public health and population-based approaches with traditional clinical skills directed at individual children or families.

### Social Determinants of Health

The impact of adverse childhood events and determinants on the quality of adult health is clear. Social determinants are inextricably linked to health equity and, ultimately, social justice. In the United States, childhood obesity, dental caries, asthma, and early mental health issues are prevalent in today's child population and interact reciprocally with family dysfunction and school stress. Studies have examined the link between childhood obesity and cardiovascular disease in adulthood, lack of adequate calcium and vitamin D intake in childhood on adult osteoporosis, and childhood emotional stress on adult mental and physical health problems.[7–10]

Prompted by the pervasive impact of socioeconomic status on health and the fact that many aspects of this influence are amenable to policy intervention, primary care pediatricians are advocating for children who experience adverse health effects because of these social determinants. A purely medical approach to children's health falls short of changing the underlying determinants of health; thus, pediatrics and public health are being integrated to implement primary prevention.

### Environmental Health

The physical environment is a particularly important aspect of public health that affects the health and well-being of children. The physical environment affects individual development as well as population health. Whereas

environmental health hazards (e.g., polychlorinated biphenyls, mercury, mold, and fluorocarbons) are recognized and brought to pediatricians' attention, less consideration is given to the potential for adverse health effects from the "built environment" and poor-quality housing, inaccessible transportation, lack of outdoor spaces to play and exercise, and lack of coordinated community planning.

Because the design of the physical environment can cause or prevent illness or injury, a high-quality environment is essential for children's health and development. Because low-income children are more likely to be exposed to structural hazards in the home and to have lead poisoning and asthma, evaluating the quality of the physical environment is crucial when assessing population health. Primary care pediatricians, therefore, incorporate environmental health assessments into their routine care of patients with asthma, obesity, or significant or repeated injuries.

### Life Course Health Development

The life course health development (LCHD) framework shows that the continuous interaction between biology and experiences over the lifespan shapes human development.[8] This dynamic process has tremendous implications for the role early experiences have on and, consequently, the role primary care pediatricians play in a child's health and development. The LCHD framework includes the following precepts:

- The dynamic interactions of risk and protective factors occurring in socioeconomic, psychological, genetic, and cultural influences as well as the health care system affect health development.
- Although many sensitive periods of development amenable to intervention occur prenatally and during the early years, research on brain development during adolescence has highlighted the importance of this period to future psychological development and mental health.
- Optimizing lifelong health depends on a long-term strategy of enhancing protective and promoting factors and minimizing risks through preventive interventions affecting individuals and populations.

A basic premise of LCHD is that reducing the strain that specific risks induce facilitates optimal health development and increases protective factors and other conditions that promote the best possible functioning. Poverty is 1 of the most important stresses that children can experience. Longitudinal studies examining resilience in children have demonstrated that children who experience socioeconomic disadvantage are more likely to have major depression; high levels of inflammation, hypertension, obesity, total cholesterol, and glycosylated hemoglobin; and low maximum oxygen consumption.[7,9,10]

One recent study indicated that adverse childhood experiences accounted for approximately 30% of the metabolic risks of young adults.[11] Retrospective studies conducted in the United States regarding adverse childhood experiences have linked the number of adverse experiences to the prevalence of coronary artery disease, hypertension, alcoholism, and illicit drug use decades later.

## PRIMARY CARE–PUBLIC HEALTH PARTNERSHIPS

Pediatricians have always been a part of the public health system. As trusted sources of information for parents and frontline providers of preventive health care for children, pediatricians have addressed the needs of populations of children in daycare, school, and local community settings.

Traditional pediatric residency education, however, used to focus on equipping pediatricians to handle the biomedical problems of patients; it often provided inadequate training for pediatricians to feel fully comfortable handling more complex conditions with roots in societal problems. There are many examples of such complex conditions. Asthma, overweight and obesity, mental health problems, oral health problems, and violence are examples that require thinking past the clinical encounter. They are among the most important problems that affect children's health and are strongly influenced by factors in the family, the community, society, and the environment. Pediatricians are now being trained to take a population approach and urged to think beyond the walls of the clinic when addressing significant health issues.

### Asthma

Asthma is a leading chronic illness among children and youths in the United States. In 2007, 5.6 million school-aged children (aged 5–17 years) were reported to currently have asthma; and 2.9 million had an asthma episode or attack in the previous year.[12] In addition, asthma is a leading causes of school absenteeism. In 2003, an estimated 12.8 million school days were missed because of asthma among the more than 4 million children who reported at least 1 asthma attack in the preceding year.[13] Low-income children, minority children, and children living in inner cities experience more emergency department visits, hospitalizations, and deaths because of asthma than do children in the general population.[14]

Estimates from 2005 to 2007 indicate that Black and Puerto Rican children had higher prevalence rates of asthma than did White children.[15] The estimated cost of treating asthma in those younger than 18 years is $3.2 billion per year.[16] Asthma is the third-ranking cause of hospitalization among children younger than 15 years (http://www.cdc.gov/HealthyYouth/asthma).[17]

The current national and state profiles of pediatric asthma, although not encouraging, point out several areas where improved disease screening, diagnosis, and management provide a much higher quality of life for those who suffer from asthma. Health professionals agree that asthma is a complex disease, whose identification and control require understanding many environmental factors. The higher rates of asthma in Black children and Latino children, the 2 largest US ethnic minorities, may indicate differences in access to care, reporting bias, cultural background and beliefs, and genetic predisposition.[18] Pediatricians can advocate stricter regulation and enforcements of regulations on hazardous air pollutants.

### Obesity

Despite the mounting evidence of poor health outcomes associated with obesity, the rates of obesity among children and adolescents have more than doubled in less than 30 years.[19,20] In the 1999–2000 National Health and Nutrition Examination Survey, 16% of adolescents aged 12 to 19 years and 15% of children aged 6 to 11 years were obese. The rates of obesity were even higher for

minority children and adolescents. The survey found that 23% of Mexican American and 24% of Black adolescents were obese compared with 13% of White adolescents. Of those aged 6 to 11 years, 19% of Black children, 24% of Mexican American children, and 12% of White children were obese.

The physician workforce is poorly equipped to deal with the prevention, detection, and management of overweight children. Although an expert committee has made recommendations for obesity evaluation and treatment among children, less than half of pediatric health care providers surveyed nationally followed the expert committee's recommendations for treating obese children in all pediatric age groups.[21] The 1999–2000 National Health and Nutrition Examination Survey, however, reported that practitioners were interested in education in the treatment and management of obesity. Once pediatricians are trained, they can effectively influence the food intake and energy expenditure levels of children through sensitive and informed advice for parents.[22] Moreover, they can advocate planned communities where children can walk or bicycle to school and where fresh fruits and water are available in schools and stores nearby, replacing fast food and other unhealthy foods.

### Mental Health

The burden of suffering for children with mental disorders is high and often co-occurs with chronic physical health problems. Children's emotional and behavioral problems and associated impairments are likely to lower their quality of life and reduce their life chances.[23] No other set of conditions comes close in the magnitude of its deleterious effects on children and youths. Children with these disorders are at a much greater risk for dropping out of school and for not being fully functional members of society in adulthood. This burden of disease includes the prevalence of mental illness, morbidity, and cost. Prevalence estimates for the presence of a mental health problem range from 16% to 22%. Furthermore, childhood mental disorders persist into adulthood; 74% of those aged 21 years with mental disorders had prior problems.[23] The frequency of mental health problems is highest among the very poor, and the reduction of racial/ethnic mental health disparities is essential.

Pediatricians should have greater training in managing common mild to moderate mental health issues in children so they can manage them in the primary care setting. Pediatricians also should be aware of community resources for mental health care for children and families and should advocate the development of comprehensive models of care for mental health and substance use issues in children and youths.

### Oral Health

Dental caries has been described as the most prevalent childhood disease in the United States. Because caries is increasingly conceptualized as a preventable infectious disease, its prevalence serves as a good indicator of the success or failure of both preventive oral health initiatives and the dental health care system for children. Recent data from the 1999–2000 National Health and Nutrition Examination Survey have shown that 41% of US children aged 2 to 11 years have dental caries in their primary teeth (unchanged from a decade earlier), whereas 42% of children and adolescents aged 6 to 19 years have caries in their permanent teeth. Persistent disparities across all age groups were also noted by race/ethnicity, parents' education, and household income. Income is strongly inversely correlated with increasing dental caries, but there is evidence that racial/ethnic disparities persist even in higher income groups. As children's demographics shift in the United States and the numbers of Latino and poor children continue to grow, the prevalence of dental caries in the early childhood population may be set to rise. The long-term effects of poor oral health are significant, affecting overall health, well-being, and self-esteem as well as the ability to progress in school.

The inadequate number of pediatric dentists and general dentists willing to care for children is exacerbated by a low provider participation rate in the Medicaid program. The result is a dearth of providers available to care for the high number of children with immediate dental needs, especially in low-income communities. Even more challenging is the need to meet professional recommendations for an early first exam and periodicity recommendations for children at high risk for oral disease. High rates of being uninsured, even among children who are eligible for public programs, exacerbate the problem. Pediatricians can play a population-based preventive role in addressing early childhood caries by examining children's teeth for signs of dental caries in the pediatric office and by partnering with childcare sites and schools to increase participation in classroom-wide dental screenings.

### Violence

Current estimates indicate that as many as 10 million children per year witness or are victims of domestic violence, school and community violence, or catastrophic events.[24] Media violence continues to provoke debate, with the American Academy of Pediatrics reporting that by 18 years, the average American child will have viewed about 200 000 acts of violence on television alone. Childhood exposure to violence is a significant public health problem and has a devastating impact on children's development, affecting emotional growth, cognitive development, physical health, and school performance.

Childhood exposure to violence has been significantly linked with increased depression, anxiety, anger, and alcohol and drug abuse and with decreased academic achievement. Without intervention, children exposed to violence may suffer long-term repercussions of their exposure, including diminished health and well-being. Pediatricians have advocated limiting children's exposure to violence and have worked in policy and legislative arenas to increase professional and public awareness of the impact of violence exposure on the developing child.

## 21ST CENTURY PEDIATRICIAN TRAINING

General pediatric residency programs have evolved since the 1990s to include more community-oriented and population-based curricula. In 1996, the then Ambulatory Pediatric Association released educational guidelines for residency training that included many community- and population-based objectives. Examples of objectives from the educational guidelines, as revised in 2004, that demonstrate an intersection between clinical pediatrics and more population-oriented

public health topics and activities include the following:

- Identify and communicate with key legislators, staff members, and agency administrators as well as other advocates for children's health regarding specific children's health issues.
- Discuss barriers to health and health care for children in one's own community and some strategies to overcome these.
- Demonstrate a working knowledge of nonmedical systems that influence and direct care for children.
- Describe how to assess the perceptions of one's community about critical health priorities for children and how to use that information to target issues for child advocacy efforts.
- Speak effectively about children's health matters to families and community groups and participate in local children advocacy activities.

The Ambulatory Pediatric Association developed environmental health competencies for pediatricians and published them in 2003,[25] although training toward these competencies is available only in a few large academic medical centers.

Additionally, the Accreditation Council for Graduate Medical Education endorsed 6 general competencies in 1999 for all residents as a result of their outcome project. The 2 competencies most relevant to health care from a population and public health perspective are (1) practice-based learning and improvement, in which residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices; and (2) systems-based practice, in which residents must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. These 2 competencies in particular emphasize nonclinical aspects of medical education and overlap with many principles of population-based medicine and public health. They also lend themselves to improving the care of medically underserved populations. All residency programs must incorporate these educational objectives into their curricula as a requirement for Accreditation Council for Graduate Medical Education accreditation.

## PUBLIC HEALTH IN PEDIATRIC RESIDENCY TRAINING

Integrating population health perspectives into the education of physicians has been a concern of leaders in the medical and public health community for more than 25 years.[26–28] A variety of curricula and competencies have been developed and implemented in primary care training programs.[29,30]

### Community Pediatrics Training Initiative

In 1999, the Dyson Foundation launched an innovative training initiative responding to 2 issues: (1) the problems facing children and families both in and as a result of their community, and (2) the growing desire on the part of pediatric residents to address these problems. Although the Dyson Foundation funded 10 pediatric residency training programs to incorporate the principles of community pediatrics into their residency curricula, additional pediatric residency programs have implemented innovative programs as well, many without significant grant support or outside funding. All these programs are examples of novel approaches to residency training, incorporating new training curricula, developing innovative tools and resources for implementation and evaluation, and building strong partnerships with community-based organizations.[31]

In 2005, the Community Pediatrics Training Initiative at the American Academy of Pediatrics continued to increase the opportunities to support and expand the number of pediatric residency programs that incorporate community pediatrics principles into their curricula, which has helped more than 60 programs to date through grants for advocacy training, visiting professorships, and residency curriculum projects.

### Association of American Medical Colleges

In 2003, the Association of American Medical Colleges and the Centers for Disease Control and Prevention funded 7 medical schools through a cooperative agreement to pilot Regional Medicine–Public Health Education Centers, with the goal of improving public health education for their students by collaborating with local or state health departments.

In 2006, a second cycle of Regional Medicine–Public Health Education Centers establishment was funded to "fully integrate population health into the medical school curriculum"[32(p214)] by working with public health partners. At least 1 of the partners was required to be a local or state health department. The Regional Medicine–Public Health Education Centers developed a set of 12 population health competencies for medical students in 2009.[32]

### Pediatric Public Health Curriculum Project

After the experience of developing, implementing, and evaluating the Community Health and Advocacy Training program,[33] the Health Resources and Services Administration funded the Department of Pediatrics at the University of California, Los Angeles in 2008 to lead a national effort to develop a public health curriculum for pediatric residency programs.

Derived from the 12 public health competencies for medical education identified by the Association of American Medical Colleges, this 2-part project involved a national curriculum development effort by more than 50 pediatric public health experts and then an implementation pilot of the curriculum with 6 residency programs and collection of comparison data from 6 additional residency programs. The implementation pilot was completed in June 2011; results of the pilot and comparison data are forthcoming.

## OPPORTUNITIES FOR PRIMARY CARE PEDIATRICS AND PUBLIC HEALTH

One of the earliest provisions of the 2010 Patient Protection and Affordable Care Act[34] (ACA) to take effect is section 2713, which requires health plans to cover, at no out-of-pocket cost to families, preventive care services outlined in *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*.[35] Supported by the Health Resources

and Services Administration, Bright Futures is the definitive standard of pediatric well-child and preventive care and was developed by an evidence-informed, active collaboration that the American Academy of Pediatrics led.

The Bright Futures guidelines provide pediatricians and other health care professionals with recommendations on the services they should provide to children from birth to 21 years to keep them healthy and improve their chances of becoming healthy adults. The types of services that will be covered include regular well-child health visits, vision and hearing screening, developmental assessments, immunizations, and screening and counseling to address obesity and help children maintain a healthy weight.

This landmark investment in preventive services in the ACA will eventually allow all families, regardless of income, the opportunity to visit their children's health provider regularly at crucial milestones in their children's development. Coverage for clinically indicated well-child visits will allow pediatricians to identify and treat health problems in children before they start. This, in turn, should help reduce the prevalence of chronic conditions that place significant financial and physical strain on children and families. The ACA provides funding specifically for children, including $1.5 billion over 5 years for the Maternal, Infant, and Early Childhood Home Visiting Program. Home visiting programs provide patient-centered support and education to individuals to promote health literacy and, ultimately, improve health outcomes.

The ACA places a major focus on prevention and wellness. The law requires private insurance plans to cover preventive services and prohibits copayments and deductibles for preventive services, which can help eliminate cost barriers to preventive services. The ACA also invests in community health teams, enabling providers to offer more culturally appropriate care to patients in managing chronic diseases, a significant asset for working in minority communities. The ACA also includes prevention initiatives: section 4102 authorizes a 5-year national oral health campaign with an emphasis on disparities. Section 4002 authorizes a "prevention and public health fund" to "provide for expanded and sustained national investment in prevention and public health programs to improve health and help restrain the rate of growth in private and public sector health care costs."[34(p541)] For fiscal year 2010, up to $500 million in the fund went toward programs to expand the primary care workforce and toward prevention and wellness efforts (including public health infrastructure).

To support and strengthen the pediatric and primary care workforce, the ACA authorizes a $50 million combined annual loan repayment program for pursuit of full-time work in child and adolescent mental health, as well as medical and surgical subspecialties in pediatrics.[36] The ACA also increases funding for the National Health Service Corps program to provide scholarships and loan repayments for providers who practice in medically underserved areas. This includes primary, dental, and mental health care providers.

In addition, expansion of the preventive medicine residency program at the Health Resources and Services Administration allows physicians to pursue public health training at schools of public health and medicine, hospitals, and health departments.[37] The ACA includes several additional provisions focused on developing a diverse and appropriately trained workforce. Many of these provisions support physician practice in community settings with an orientation toward prevention and health promotion. This provides significant opportunity for primary care providers to strengthen the link between clinical practice and public health.

## CONCLUSIONS

We have detailed a number of important developing or emerging trends that could have significant positive effects on children's health: a clearer understanding and growing body of evidence of the broad factors that affect health, a shift in the content of pediatric training, a growing number of pediatricians who have been trained with a community or population focus, and a significant investment of public resources in prevention.

How to fit these pieces together to optimize children's health outcomes is the challenge for children's health providers, educators, and policymakers. As the epidemiology of children's health problems has shifted toward chronic illnesses, many of which were previously limited to adult populations and most of which are strongly affected by environmental and social factors, the role of the primary care children's health provider must also change to incorporate a population-based, public health approach. A population perspective on children's health is crucial for addressing the broad determinants of children's health, and it is apparent that now more than ever, primary care pediatrics and public health must collaborate to achieve optimal children's health outcomes in this country.

We have described how current training efforts in pediatric medical education and public health are producing pediatricians who are able to use population health principles in clinical practice as well as work in public health departments to develop programs to address important children's health issues at the population level.

As the ACA is implemented and increasing opportunities arise to address prevention efforts and strengthen our public health infrastructure and workforce, primary care pediatricians should take advantage of these opportunities and advocate children's health programs that address the environmental and social determinants of children's health. ■


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