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Preventive Health Care for Children With and Without Special Health Care Needs

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Abstract

OBJECTIVE—The objective of this study was to compare the receipt of preventive health services for children with and without special health care needs and to identify predictors of these health services for children with special health care needs using nationally representative data.

METHODS—Data from the 2002 and 2003 Medical Expenditure Panel Surveys were analyzed. A total of 18 279 children aged 3 to 17 years were included in our study. The Child Preventive Health Supplement was used to identify caregiver recall of specific health screening measures and anticipatory guidance during the previous 12 months. Odds ratios were calculated for predictive factors of preventive services for children with special health care needs.

RESULTS—The prevalence of special health care needs in children aged 3 to 17 years was 21.6%. Based on caregiver reports, 87.5% of children with special health care needs had ≥1 health screening measure checked in the past year compared with 73.1% of children without special health care needs. Receipt of ≥1 topic of anticipatory guidance was reported for 69.8% of children with special health care needs compared with 55.2% of children without special health care needs. Black and Hispanic caregivers of children with special health care needs were more likely than others to report receipt of all 6 categories of anticipatory guidance measured in this study.

CONCLUSIONS—We found that caregivers of children with special health care needs were more likely to report receipt of anticipatory guidance and health screening than were caregivers of children without special health care needs. Although a majority of these caregivers reported receiving some health screening and anticipatory guidance on an annual basis, there are clear gaps in the delivery of preventive health services. This study identifies areas for improvement in the delivery of preventive health services for children with special health care needs and children in general.

Keywords

children with special health care needs; Medical Expenditure Panel Survey; preventive care; anticipatory guidance; health screening; well-child care; pediatric health maintenance

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ALONG WITH IMMUNIZATIONS, anticipatory guidance and health monitoring are the cornerstones of well-child care for both healthy children and children with special health care needs (CSHCN). The American Academy of Pediatrics (AAP) provides recommendations for pediatric health supervision visits through their Guidelines for Health Supervision III.[1] In addition, the Maternal and Child Health Bureau (MCHB) launched a major initiative to improve the quality of health promotion and preventive services for infants, children, and adolescents through the sponsorship of Bright Futures.[2] These recommendations call for periodic monitoring, screening, and guidance for all children. Furthermore, preventive care is an essential part of the AAP's Medical Home policy statement.[3] Specifically, the AAP states that primary care services should include "growth and developmental assessments, appropriate screening, health care supervision, and patient and parent counseling about health, nutrition, and safety."[3] Many recent studies have focused on access to and use of preventive health care and anticipatory guidance for children in general, but there is a paucity of such data for CSHCN.[4–8] Instead, most previous research for CSHCN focused on access to selected components of the medical home, excluding preventive care.[9,10] At this point, there is little research regarding general health care maintenance and the quality of these services for CSHCN.

A recent study that was presented as an abstract at the Pediatric Academic Society Meeting 2006 found no difference between children with and without special health care needs in terms of preventive health topics discussed.[11] Unpublished data from the 2000 Iowa Child and Family Household Health Survey indicated that CSHCN received more anticipatory guidance than their healthy age-matched peers. Specifically, that survey found that 39% of families with CSHCN reported anticipatory guidance about seat belts, car seats, bicycle safety, or nutritional counseling compared with 26% of families with healthy children.[12] We found no other studies that addressed receipt of anticipatory guidance or health screening for CSHCN.

The MCHB defines CSHCN as children who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or an amount beyond that required by children generally.[13] Excluding children who are at risk for developing a special health care need, CSHCN make up 13% to 18% of the pediatric population, depending on the data source.[14–18] These children tend to use more health care services than other children and have higher health care expenditures.[14,17,19] Anecdotal evidence suggests that CSHCN receive less preventive health care than their healthy peers, because their special health care needs dominate clinical encounters. Care for these children is dynamic, and many health care providers find their energies consumed by time-intensive chronic condition– or disability-related issues.[20]

The purpose of this study was to determine how frequently children with and without special health care needs are receiving some of the preventive health screening and anticipatory guidance that are recommended by the AAP.[21] Our study is the first to evaluate preventive health care and identify predictors for the receipt of these services for CSHCN using nationally representative data: the 2002 and 2003 Medical Expenditure Panel Surveys (MEPS).

METHODS

MEPS provides national estimates of health care use, expenditures, and insurance coverage for the US civilian, noninstitutionalized population, including children. MEPS is composed of 4 components: the Household Component, the Medical Provider Component, the Insurance Component, and the Nursing Home Component.[22] In 2002 and 2003, a total of 18 445 children who were aged 3 to 17 years were surveyed by MEPS. Valid response data were available for 18 279 of those children and were included in our study. An adult caregiver, usually a parent, answered questions about health and health services use for all children.

The screening instrument that was used in MEPS to identify CSHCN, the CSHCN Screener, identified children who had a medical, behavioral, or other health condition that had lasted or was expected to last ≥1 year, and reported ≥1 of the following consequences of the condition: (1) using or needing more medical care, mental health services, or education services than other children of the same age; (2) using or needing prescription medication; (3) having limitations in their ability to do the things that most children of the same age do; (4) using or needing special therapies, such as physical, occupational, or speech therapy; or (5) using or needing emotional, developmental, or behavioral treatment or counseling.[23] Children were classified as having or not having special health care needs based on data from the CSHCN Screener. Children who were at risk for having a special health care need were not identified by this questionnaire. The prevalence of CSHCN then was calculated, and classification of children from the CSHCN Screener stratified the population for the rest of the measures.

We calculated the number of health care visits for children with and without special health care needs from questions that were included in the MEPS Child Preventive Health Supplement. On the basis of caregiver recall, additional questions identified whether sample children had their height, weight, and/or blood pressure checked during the past 12 months or ever had their vision evaluated. For anticipatory guidance, parents were asked whether their provider gave advice about dental care, passenger automobile safety, bicycle helmet use, exercise, healthful eating, and secondhand smoke exposure during the past 12 months.

We also created the categories of all, any, or none by calculating the percentages of caregivers who reported receipt of all, any, or none of the health screening parameters or anticipatory guidance topics. For example, if caregivers recalled the receipt of anticipatory guidance for 1 or more topics (but not all), then the data were classified in the any category. Likewise, data from care-givers who reported receipt of all of the measured anticipatory guidance topics were classified in the all category, whereas data from caregivers who reported receipt of 0 topics were classified in the none category. The same all, any, and none categories were calculated separately for health screening measures. We then identified predictive factors for the receipt of health screening and anticipatory guidance for CSHCN. Although the measures of health screening and anticipatory guidance that were identified in this study do not encompass all of the health screening parameters and anticipatory guidance topics that are recommended by the AAP, they provide a representative cross-section.

Estimates that are presented in the tables and text were statistically weighted to reflect national population totals. The weights, provided by the MEPS, are equal to the inverse of the sampling probability for each case, adjusted for nonresponse. We present results from bivariate and multivariate statistics. Our multivariate analyses used logistic regression methods to control for possible confounding. Standard errors and test statistics were derived using Stata software that takes into account the complex sample design of the survey.[24]

RESULTS

A total of 18 279 children who were between 3 and 17 years of age were included in our analysis (Table 1). Of these children, 3660 were CSHCN. The prevalence of special health care needs was 21.6% and was found to be higher in non-Hispanic white (23.7%) and black children (21.4%) than in Hispanic children (16.1%; $P < .001$ for all comparisons). Among children who were aged 3 to 17 years and had health insurance, 22.3% were CSHCN; in contrast, only 13.3% of children without health insurance were identified as CSHCN ($P < .001$). A higher percentage of boys (23.4%) were CSHCN than girls (19.7%; $P < .001$). There were significant regional differences in the prevalence of CSHCN ($P < .01$): the Midwest had the highest prevalence of CSHCN (23.4%), and the West had the lowest prevalence rate (18.5%). No significant difference was found when children were stratified by poverty status.

The vast majority (89.6%) of all survey respondents reported that their child had a usual source of care. However, CSHCN more frequently had a usual source of care (94.8%) compared with children without special health care needs (88.1%; $P < .001$). In the 12 months preceding the interview, children averaged 2.8 health care provider office visits. CSHCN made a significantly higher number of office visits than children without special health care needs (6.1 vs 1.9 per year; $P < .001$).

As shown in Table 2, caregivers of CSHCN were significantly more likely than other caregivers to report that their child had their height and weight checked in the 12 months before the survey administration (82.3% vs 66.6%; $P < .001$). Similarly, they were more likely to report blood pressure monitoring (69.5% vs 50.7%; $P < .001$). Of children who were between the ages of 3 and 6 years, 60.5% reportedly had their vision screened by a health care provider at least once in their lifetime; no statistical difference was noted between children with and without special health care needs.

On the basis of caregiver reports, 41.5% of children without special health care needs had all health screening parameters checked compared with 60.8% of CSHCN ($P < .001$). CSHCN also were more likely than other children to have had ≥1 parameter checked (87.5% vs 73.1%; $P < .001$). This means that 12.5% of caregivers of CSHCN did not recall having had any screening parameters checked in the 12 months preceding the study and neither did 26.9% of caregivers of children without special health care needs. Among the subset of children with ≥1 office visit in the previous 12 months, 90.7% of CSHCN received ≥1 type of health screening compared with 85.1% of children without special health care needs ($P < .001$), as reported by their caregivers.

In addition to questions about health screening parameters, MEPS respondents were asked about anticipatory guidance received in the 12 months before the survey (Table 3). Caregivers of CSHCN were more likely than the caregivers of children without special health care needs to report receiving anticipatory guidance about dental checkups (40.1% vs 33.8%; $P < .001$), healthful eating (47.6% vs 36%; $P < .001$), wearing a helmet (30.6% vs 25.6%; $P < .001$), secondhand smoke exposure (35.1% vs 27%; $P < .001$), and exercise (36.6 vs 25.3%; $P < .001$). In addition, caregivers of CSHCN were more likely than the caregivers of children without special health care needs to report that ≥1 topic of anticipatory guidance was discussed (69.8% vs 55.2%; $P < .001$). The statistical difference persisted when presentation to a health care provider in the year before the survey was accounted for. Of the CSHCN who made an office visit, 72.5% of caregivers reported being given advice about ≥1 of the anticipatory guidance topics compared with 63.5% of caregivers of children without special health care needs ($P < .001$). Only 8.6% of caregivers reported having all 6 anticipatory guidance topics discussed, and there was no significant difference between caregivers of CSHCN and caregivers of children without special health care needs. In addition, 41.7% of all caregivers did not recall having received any anticipatory guidance in the 12 months preceding the study. Caregivers of children without special health care needs were significantly more likely than the caregivers of CSHCN to report having 0 anticipatory guidance topics discussed in the past year by a health care provider (44.8% vs 30.2%; $P < .001$).

Predictive factors for receipt of health screening for CSHCN are shown in Table 4. Caregivers of CSHCN who had fair or poor health status were more likely to recall having had at least 1 health screening parameter checked in the previous 12 months than those with children with excellent health status (odds ratio [OR]: 1.81; 95% confidence interval [CI]: 1.03−3.16), but health status did not predict recall of receipt of all parameters. When compared with those who were living above 400% of the federal poverty level (FPL), caregivers of CSHCN who were living below 200% of the FPL were significantly less likely to recall having had any of the health screening measures checked (OR: 0.57; 95% CI: 0.42− 0.77). They also were less likely

to recall having had all parameters checked (OR: 0.76; 95% CI: 0.60 − 0.96). Caregivers of CSHCN in the middle family income category of 200% to 399% of the FPL were less likely to recall having had any health screening parameter checked (OR: 0.66; 95% CI: 0.48 − 0.92) but not significantly different in recall of having had all parameters checked. In addition, caregivers of uninsured CSHCN were significantly less likely than their insured peers to recall having had any or all parameters checked (OR: 0.50 [95% CI: 0.30 − 0.84] and 0.60 [95% CI: 0.38 − 0.96]), respectively. Compared with residence in the Northeast, living in the Midwest, South, and West decreased the likelihood of recalling having had any health screening (OR: 0.38 [95% CI: 0.23− 0.65], 0.38 [95% CI: 0.23− 0.63], and 0.32 [95% CI: 0.19 − 0.53]), respectively. Race was not a significant predictor of health screening.

Table 5 shows predictive factors for the receipt of anticipatory guidance. Caregivers of Hispanic and black CSHCN were more likely than caregivers of white children to report receipt of ≥1 topic of anticipatory guidance (OR: 1.37 [95% CI: 1.06 −1.76] and 1.48 [95% CI: 1.12 −1.96]), respectively. Caregivers of Hispanic and black CSHCN also were more likely to recall having had all items addressed than caregivers of white children (OR: 2.09 [95% CI: 1.40 −3.12] and 2.24 [95% CI: 1.42− 3.51]), respectively. Having a child with special health care needs in fair/poor or good health increased the likelihood of recalling that ≥1 anticipatory guidance topic was covered compared with those with CSHCN in excellent health (OR: 1.77 [95% CI: 1.19 −2.62] and 1.32 [95% CI: 1.05−1.66]), respectively. In contrast, health status was not a predictor for any subgroup of having all anticipatory guidance topics discussed. Caregivers of CSHCN who were living below 400% of the FPL were significantly less likely than those above to recall having had any anticipatory guidance topic discussed (OR: 0.64; 95% CI: 0.49 − 0.84). Caregivers of CSHCN with incomes between 200% and 399% of the FPL also were less likely to recall having had all 6 anticipatory guidance topics discussed (OR: 0.49; 95% CI: 0.32− 0.74) than CSHCN in families with incomes above 400% of the FPL, whereas caregivers of CSHCN who were living below 200% of FPL did not differ significantly from those above 400% of the FPL for recall of receipt of all 6 anticipatory guidance topics. Residence in the Northeast was a predictor of anticipatory guidance. Compared with the Northeast, caregivers of CSHCN who were living in the Midwest, South, and West were significantly less likely to recall having received any anticipatory guidance (OR: 0.60 [95% CI: 0.43− 0.84], 0.59 [95% CI: 0.44 − 0.78], and 0.48 [95% CI: 0.35− 0.66]), respectively. Age, gender, and insurance status were not significant predictors for receipt of anticipatory guidance.

DISCUSSION

Our study examined how frequently caregivers recall receipt of preventive health care screening and anticipatory guidance. We note that caregiver recall is a proxy measure for receipt of services in the discussion that follows. We found that, consistent with previously published results, nearly two thirds of all children received ≥1 anticipatory guidance topic at their office visit.[6,25,26] Nelson et al[25] found that families reported that anticipatory guidance topics were discussed for 62% of relevant recommended topics. Schuster et al[6] found that for 6 recommended anticipatory guidance topics, coverage ranged from 23% to 62%. The Agency for Healthcare Research and Quality (AHRQ) detailed in its 2004 National Healthcare Quality/ Disparities Reports that 36% of parents were counseled about healthful eating for their child.[26] For infants and young children, anticipatory guidance was provided on care safety 63% to 86% of the time (depending on the age of the child) and feeding was discussed in ~90% of visits.[5] Results from the Physicians' Practice Survey found that 80% of pediatricians reported discussing ≥1 anticipatory guidance topic during routine office visits.[8] With respect to health screening, the AHRQ found that 71% of children had their height and weight measured by a health care professional in 2001.[26] Our results are consistent with the data from the AHRQ. No other studies were available for additional comparison of health screening.

Our study also compared the rates of health care screening and anticipatory guidance between CSHCN and children without special health care needs. Somewhat surprising, we found that CSHCN were more likely than their peers to receive anticipatory guidance and were more likely to receive preventive health screening than children without special health care needs. This contradicts anecdotal evidence and the perception that CSHCN may not receive adequate anticipatory guidance and health screening compared with children without special health care needs. Notably, our results are consistent with the unpublished data from the 2000 Iowa Child and Family Household Health Survey.[12]

Our study adds to the existing literature in several substantive ways. First, we were able to describe, using a nationally representative sample, the frequency of anticipatory guidance and preventive health care screening in CSHCN for the areas surveyed in the Child Preventive Health Supplement of the MEPS. Second, we were able to show that CSHCN were more likely to receive both anticipatory guidance and preventive health screening when compared with their peers without special health care needs. We also identified some disparities within the population of CSHCN. CSHCN who were living below 200% of the FPL were significantly less likely than those from higher income families to have any health screening parameters checked. They also were less likely to have all screening parameters checked. This suggests that family income was positively associated with having health screening parameters checked by a provider regardless of health status. In addition, uninsured CSHCN were significantly less likely to have any or all health screening parameters checked compared with their insured peers. Insurance coverage for CSHCN not only enables medical care for the child's specific disease-related needs but also enables preventive services and health screening. One encouraging finding was that almost all CSHCN had an identified usual source of care. Given the increased need and complexity of their health care needs, having a usual source of care should improve the process of care for CSHCN.

In addition to the information about CSHCN, our results highlight that for children in general, there are deficits in the receipt of anticipatory guidance and health screening. Besides the strides that have been made by the pediatric community as a whole, we still have more work to do to ensure that children receive the recommended preventive services. Our results also showed that despite their increased need and perhaps more issues to address at any particular visit, CSHCN do receive anticipatory guidance and preventive screening measures. It seems that increased exposure to providers through increased number of office visits may contribute, in part, to more preventive services being provided to CSHCN. Our data support this conclusion. With increasing time pressure at every clinical encounter, it is important to ensure that all children receive the recommended number of visits and services, regardless of their health status.

Our study has several limitations. First, the data were derived from retrospective caregiver self-reports and therefore are susceptible to recall bias. Recall of receipt of services does not equate to actual receipt of those services. Averaging more visits per year, caregivers of CSHCN may be more likely to report anticipatory guidance, even if they could not recall the event explicitly in relation to a particular health care encounter. Second, given that CSHCN are a very heterogeneous group, encompassing various disease processes, it is possible that for CSHCN with greater functional limitation or different disease states and severity, our findings may not persist. We did not perform additional analysis on the basis of disease-specific data, which may have illuminated interesting and relevant findings. In addition, our data do not allow us to evaluate explicitly the quality of services given or the appropriateness of care at each encounter. There may be appropriate reasons for deferring an AAP-recommended screening or anticipatory guidance at any particular visit. Last, our study did not evaluate all of the various types of health screening and anticipatory guidance that are recommended by the AAP; therefore, the generalizability of our results is diminished.

CONCLUSION

Although a majority of children with and without special health care needs receive some of the recommended health screening and anticipatory guidance on an annual basis, there are clear gaps in the delivery of preventive health services for both groups. All 6 of the anticipatory guidance items identified in this study are rarely provided to families. This study identifies areas for improvement in the delivery of preventive health services for CSHCN and children in general. Given the importance that health professionals and the public place on preventive health services, pediatricians and other health care professionals who provide care to children should strive to provide the recommended health screening and anticipatory guidance for all of their pediatric patients.[27] Programs to improve the efficiency of the delivery of preventive health care should be sought. On the basis of our data, additional research is necessary to evaluate disparities in the receipt of preventive health services and determine the significance of these disparities. Lastly, research is necessary to evaluate how preventive health services can contribute to improvements in health and health care quality.

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Abbreviations

CSHCN, Children with Special Health Care Needs; AAP, American Academy of Pediatrics; MCHB, Maternal and Child Health Bureau; MEPS, Medical Expenditure Panel Survey; OR, odds ratio; CI, confidence interval; FPL, federal poverty level; AHRQ, Agency for Healthcare Research and Quality.

REFERENCES

1. Guidelines for Health Supervision III. 3rd ed.. American Academy of Pediatrics; Elk Grove Village, IL: 2002.
2. Green, M.; Palfrey, J.; Clark, E.; Anastasi, J., editors. Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents. 2nd ed., rev.. Maternal and Child Health Bureau; Arlington, VA: 2002.
3. Medical Home Initiatives for Children With Special Needs Project Advisory Committee. American Academy of Pediatrics. The medical home. Pediatrics 2002;110(pt 1):184–186. [PubMed: 12093969]
4. Nelson CS, Wissow LS, Cheng TL. Effectiveness of anticipatory guidance: recent developments. Curr Opin Pediatr 2003;15:630–635. [PubMed: 14631211]
5. Olson LM, Inkelas M, Halfon N, Schuster MA, O'Connor KG, Mistry R. Overview of the content of health supervision for young children: reports from parents and pediatricians. Pediatrics 2004;113 (suppl):1907–1916. [PubMed: 15173461]
6. Schuster MA, Duan N, Regalado M, Klein DJ. Anticipatory guidance: what information do parents receive? What information do they want? Arch Pediatr Adolesc Med 2000;154:1191–1198. [PubMed: 11115301]
7. Zuckerman B, Stevens GD, Inkelas M, Halfon N. Prevalence and correlates of high-quality basic pediatric preventive care. Pediatrics 2004;114:1522–1529. [PubMed: 15574610]
8. Galuska, DA.; Fulton, JE.; Powell, KE., et al. Pediatrician counseling about preventive health topics: results from the Physicians' Practices Survey, 1998−1999.. Pediatrics. 2002. Available at: www.pediatrics.org/cgi/content/full/109/5/e83
9. Cooley WC, McAllister JW. Building medical homes: Improvement strategies in primary care for children with special health care needs. Pediatrics 2004;113:1499–1506. [PubMed: 15121918]

10. Strickland B, McPherson M, Weissman G, van Dyck P, Huang ZJ, Newacheck P. Access to the medical home: results of the National Survey of Children With Special Health Care Needs. Pediatrics 2004;113(suppl):1485–1492. [PubMed: 15121916]
11. VanCleave J, Heisler M, Davis M. Do parents of children with special health care needs expect or receive different care at well child visits? E-PAS 2006;59:4122.6.
12. Public Policy Center, University of Iowa. Children with Special Health Care Needs in Iowa. Public Policy Center, University of Iowa; Iowa City, IA: 2002 [January 19, 2007]. Available at: http://ppc.uiowa.edu/health/iowachild2000/CSHCN/CSHCNrprt19.html.
13. McPherson M, Arango P, Fox H, et al. A new definition of children with special health care needs. Pediatrics 1998;102:137–140. [PubMed: 9714637]
14. Newacheck P, Kim S. A national profile of health care utilization and expenditures for children with special health care needs. Arch Pediatr Adolesc Med 2005;159:10–17. [PubMed: 15630052]
15. Bethell, C.; Read, D.; Blumberg, S.; Newacheck, P. Comparing and interpreting findings on the prevalence and characteristics of children and youth with special health care needs; Presented at: AcademyHealth Annual Research Meeting; Boston, MA. June 26−28, 2005;
16. Davidoff AJ. Insurance for children with special health care needs: patterns of coverage and burden on families to provide adequate insurance. Pediatrics 2004;114:394–403. [PubMed: 15286222]
17. Newacheck PW, Strickland B, Shonkoff JP, et al. An epidemiologic profile of children with special health care needs. Pediatrics 1998;102(pt 1):117–123. [PubMed: 9651423]
18. van Dyck PC, Kogan MD, McPherson MG, Weissman GR, Newacheck PW. Prevalence and characteristics of children with special health care needs. Arch Pediatr Adolesc Med 2004;158:884–890. [PubMed: 15351754]
19. Stein REK, Silver EJ. Comparing different definitions of chronic conditions in a national data set. Ambul Pediatr 2002;2:63–70. [PubMed: 11888440]
20. Ayyangar R. Health maintenance and management in childhood disability. Phys Med Rehabil Clin N Am 2002;13:793–821. [PubMed: 12465561]
21. Committee on Practice and Ambulatory Medicine of the American Academy of Pediatrics. Recommendations for preventive pediatric health care. Pediatrics 2000;105:645–646.
22. Agency for Healthcare Research and Quality. Overview of the Medical Expenditure Panel Survey. Agency for Healthcare Research and Quality; Rockville, MD: 2004.
23. Bethell CD, Read D, Stein REK, Blumberg SJ, Wells N, Newa-check PW. Identifying children with special health care needs: development and evaluation of a short screening instrument. Ambul Pediatr 2002;2:38–48. [PubMed: 11888437]
24. Stata Base Reference Manual. Stata Press; College Station, TX: 2005.
25. Nelson CS, Higman SM, Sia C, McFarlane E, Fuddy L, Duggan AK. Medical homes for at-risk children: parental reports of clinician-parent relationships, anticipatory guidance, and behavior changes. Pediatrics 2005;115:48–56. [PubMed: 15629981]
26. Selected Findings on Child and Adolescent Health Care From the 2004 National Healthcare Quality/Disparities Reports. Agency for Healthcare Research and Quality; Rockville, MD: 2005 [January 19, 2007]. AHRQ publication 05-P011. Available at: www.ahrq.gov/qual/nhqrchild/nhqrchild.htm.
27. Moyer VA, Butler M. Gaps in the evidence for well-child care: a challenge to our profession. Pediatrics 2004;114:1511–1521. [PubMed: 15574609]

TABLE 1

Prevalence and Characteristics of CSHCN

Population	*n*	Sample No. of CSHCN	Estimated Total Population, × 1000	Estimated Total Population of CSHCN, × 1000	Prevalence, %
Age 3−17 y	18 279	3660	61 023	13 175	21.6
Gender					
Male	9363	2056	31 225	7295	23.4
Female	8916	1604	29 798	5880	19.7
Race					
White non-Hispanic	7631	1879	36 638	8698	23.7
Black non-Hispanic	3370	724	9251	1983	21.4
Other non-Hispanic	1179	199	4131	727	17.6
Hispanic	6099	858	11 003	1767	16.1
Income level, % FPL					
<200	9785	1881	22 981	4863	21.2
200−399	5237	1030	20 772	4339	20.9
≥400	3257	749	17 270	3973	23.0
Insurance					
Insured	16 501	3474	56 538	12 579	22.6
Uninsured	1778	186	4485	596	13.3
Region					
Northeast	2720	658	10 874	2519	23.2
Midwest	3366	793	13 675	3206	23.4
South	6894	1367	21 639	4712	21.8
West	5299	842	14 835	2738	18.5

Source: MEPS, 2002 and 2003.

TABLE 2

Percentages of Health Screening in the Past Year According to Special Needs Status

Parameter	CSHCN	Children Without Special Health Care Needs	All Children
Height and weight checked[a]	82.3 (0.79)	66.6 (0.75)	70.0 (0.64)
Blood pressure checked[a]	69.4 (0.97)	50.7 (0.74)	54.8 (0.67)
Vision checked[b]	62.8 (2.66)	60.0 (1.26)	60.5 (1.16)
All parameters checked[a]	60.8 (1.00)	41.5 (0.75)	45.6 (0.69)
Any parameter[a]	87.5 (0.67)	73.1 (0.69)	76.2 (0.59)
None of the parameters[a]	12.5 (0.67)	26.9 (0.69)	23.8 (0.59)

Data are presented as % (SE).

Source: MEPS, 2002 and 2003.

[a] $\chi 2$ significant at .001 level.

[b] Asks whether ever performed, not necessarily in the past 12 months; only 3- to 6-year-olds.

TABLE 3

Percentages of Anticipatory Guidance in the Past Year by Special Needs Status

Parameter	CSHCN	Children Without Special Health Care Needs	All Children
Advice about dental checkups[a]	40.1 (1.21)	33.8 (0.76)	35.2 (0.71)
Advice about healthful eating[a]	47.6 (1.29)	36.0 (0.75)	38.5 (0.70)
Advice about passenger automobile safety (car seats, booster seats, and seat belts)	26.3 (1.13)	24.5 (0.64)	24.9 (0.65)
Advice about wearing a helmet[a]	30.6 (1.19)	25.6 (0.73)	26.7 (0.70)
Advice about secondhand smoke exposure[a]	35.1 (1.20)	27.0 (0.72)	28.8 (0.71)
Advice about exercise[a]	36.6 (1.08)	25.3 (0.74)	27.8 (0.69)
All 6 topics discussed[a]	9.2 (0.73)	8.4 (0.46)	8.6 (0.45)
Any topic[a]	69.8 (1.10)	55.2 (0.77)	58.4 (0.72)
None[a]	30.2 (1.10)	44.8 (0.77)	41.7 (0.72)

Data are presented as % (SE).

Source: MEPS, 2002 and 2003.

[a] χ^2 significant at .001 level.

TABLE 4

Predictors of Health Screening Among CSHCN

Parameter	Odds of Having All Health Screening Measures in the Past 12 mo	Odds of Having Some (at Least 1) Health Screening Measures in the Past 12 mo	Odds of Having No Health Screening Measures in the Past 12 mo
Age, y			
3−10	Reference	Reference	Reference
11−17	1.95 (1.63−2.33)	0.75 (0.57−1.00)	1.32 (0.99−1.77)
Gender			
Male	Reference	Reference	Reference
Female	1.10 (0.93−1.30)	1.32 (1.05−1.66)	0.76 (0.60−0.95)
Race			
White non-Hispanic	Reference	Reference	Reference
Black non-Hispanic	0.82 (0.66−1.03)	0.83 (0.61−1.14)	1.20 (0.88−1.64)
Other non-Hispanic	1.29 (0.82−2.04)	1.10 (0.56−2.16)	0.91 (0.46−1.80)
Hispanic	1.07 (0.86−1.34)	1.31 (0.97−1.76)	0.76 (0.57−1.03)
Income level, % FPL			
≥400	Reference	Reference	Reference
200−399	0.92 (0.74−1.15)	0.66 (0.48−0.92)	1.51 (1.09−2.08)
<200	0.76 (0.60−0.96)	0.57 (0.42−0.77)	1.76 (1.31−2.36)
Insurance			
Insured	Reference	Reference	Reference
Uninsured	0.60 (0.38−0.96)	0.50 (0.30−0.84)	1.98 (1.19−3.30)
Health status			
Excellent	Reference	Reference	Reference
Very good	0.88 (0.71−1.09)	1.00 (0.74−1.35)	1.00 (0.74−1.35)
Good	1.03 (0.82−1.31)	1.37 (0.99−1.89)	0.73 (0.53−1.01)
Fair/poor	1.26 (0.89−1.78)	1.81 (1.03−3.16)	0.55 (0.32−0.97)
Region			
Northeast	Reference	Reference	Reference
Midwest	0.69 (0.51−0.92)	0.38 (0.23−0.65)	2.61 (1.54−4.43)
South	0.68 (0.52−0.88)	0.38 (0.23−0.63)	2.64 (1.60−4.38)
West	0.65 (0.48−0.89)	0.32 (0.19−0.53)	3.13 (1.88−5.21)

Data are presented as adjusted OR (95% CI).

Source: MEPS, 2002 and 2003.

TABLE 5

Predictors of Anticipatory Guidance Among CSHCN

Parameter	Odds of Having All Areas of Anticipatory Guidance Covered in the Past 12 mo	Odds of Having Some (at Least 1) Areas of Anticipatory Guidance Covered in the Past 12 mo	Odds of Having No Anticipatory Guidance Covered in the Past 12 mo
Age, y			
3–10	Reference	Reference	Reference
11–17	0.87 (0.66–1.14)	0.89 (0.72–1.10)	1.12 (0.91–1.39)
Gender			
Male	Reference	Reference	Reference
Female	0.92 (0.71–1.20)	1.06 (0.87–1.29)	0.95 (0.78–1.15)
Race			
White non-Hispanic	Reference	Reference	Reference
Black non-Hispanic	2.09 (1.40–3.12)	1.37 (1.06–1.76)	0.73 (0.57–0.95)
Other non-Hispanic	0.38 (0.15–0.98)	1.17 (0.77–1.78)	0.86 (0.56–1.30)
Hispanic	2.24 (1.42–3.51)	1.48 (1.12–1.96)	0.67 (0.51–0.89)
Income level, % FPL			
≥400	Reference	Reference	Reference
200–399	0.49 (0.32–0.74)	0.64 (0.49–0.85)	1.56 (1.18–2.06)
<200	0.73 (0.50–1.08)	0.64 (0.49–0.84)	1.55 (1.19–2.03)
Insurance			
Insured	Reference	Reference	Reference
Uninsured	0.77 (0.33–1.80)	0.67 (0.44–1.03)	1.49 (0.97–2.29)
Health status			
Excellent	Reference	Reference	Reference
Very good	0.89 (0.62–1.27)	1.18 (0.94–1.49)	0.85 (0.67–1.06)
Good	0.85 (0.57–1.27)	1.32 (1.05–1.66)	0.76 (0.60–0.95)
Fair/poor	1.12 (0.70–1.79)	1.77 (1.19–2.62)	0.57 (0.38–0.84)
Region			
Northeast	Reference	Reference	Reference
Midwest	0.55 (0.35–0.87)	0.60 (0.43–0.84)	1.66 (1.19–2.32)
South	0.62 (0.40–0.97)	0.59 (0.44–0.78)	1.70 (1.28–2.26)
West	0.55 (0.34–0.89)	0.48 (0.35–0.66)	2.09 (1.52–2.87)

Data are presented as adjusted OR (95% CI).

Source: MEPS, 2002 and 2003.