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Report to the Ranking Minority Member, Committee on Government Reform and Oversight, House of Representatives

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MEDICAID

Elevated Blood Lead Levels in Children

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Health, Education, and
Human Services Division

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The Honorable Henry A. Waxman
Ranking Minority Member
Committee on Government Reform and Oversight
House of Representatives

Dear Mr. Waxman:

High levels of lead in the blood—usually present as a result of being around surfaces painted with lead-based paint—have been an ongoing concern because high concentrations of lead in the body can affect learning abilities and can produce severe health problems. The Department of Health and Human Services (HHS) has recently released health survey data indicating that, while an estimated 890,000 U.S. children aged 1 through 5 have high levels of lead in their blood, the incidence of such high levels of lead is declining markedly. The Health Care Financing Administration (HCFA), the agency responsible for administering the Medicaid program at the federal level, is now reviewing the mandatory requirement for screening for lead toxicity in Medicaid children. As a joint federal and state program, Medicaid provides medical care to about one-third of all children aged 1 through 5 in the United States.[1]

At your request, we are reviewing federal support for lead-poisoning prevention programs, including the extent to which at-risk children have been screened for lead toxicity. In light of our ongoing work, you asked us to provide you with our initial analysis of HHS's survey data, focusing specifically on Medicaid children. This letter provides information on (1) the degree to which blood lead levels associated with harmful health effects exist among young children covered by Medicaid and (2) the extent to which children covered by Medicaid have had blood lead screening tests.[2] At present, a blood test is the only screening method available to identify children with high blood lead levels.

[1]Medicaid is a means-tested program for low-income persons including families with children, pregnant women, and persons who are aged, blind, or disabled. In return for federal financial participation, states agree to provide or arrange for the provision of a number of screening services to members of this population under age 21, including blood lead level assessments appropriate for age and risk factors.

[2]We are defining "screening" as a laboratory test for lead in blood.

Our analysis is based on data from HHS's most recently released phase of the National Health and Nutrition Examination Survey (NHANES).[3] This survey contains nationally representative information on the health and nutritional status of the U.S. population through direct physical examinations and interviews. The physical examinations include a test for blood lead, and the interviews include questions on various health, demographic, and nutritional characteristics, including Medicaid coverage and whether the participant has been screened for lead toxicity. The most recent segment of NHANES was based on a national sample of 15,427 persons 2 months and older (and was conducted between 1991 and 1994). Of the persons surveyed, 2,387 were children aged 1 through 5 years, of whom 984 were covered by Medicaid. The information we present on Medicaid beneficiaries is only for children aged 1 through 5 because young children are most vulnerable to the effects of lead toxicity. Appendix I explains in further detail our methodology for analyzing the NHANES data. We conducted this work from September 1997 to January 1998 in accordance with generally accepted government auditing standards.

Results in Brief

Our analysis of the NHANES data shows that lead toxicity is a significant problem for children receiving care under Medicaid. These children were more than three times as likely to have high levels of lead in their blood as were children not receiving care under Medicaid. We estimate that more than half a million Medicaid children—about 1 in every 12 children aged 1 through 5 in the program—have harmful levels of lead in their blood. Despite HCFA's mandatory screening requirements for children in these age groups, most Medicaid children had never been checked for high lead levels. For nearly two-thirds of the Medicaid children identified through NHANES screenings as having high lead levels, this was the first screening for lead they had ever received. Projected to the entire Medicaid population of children aged 1 through 5, this represents about 352,000 children who probably have high levels of lead in their blood but have not been tested for it.[4]

Background

Childhood lead poisoning has long been considered to be the most serious environmental health threat to children in the United States, estimated to

[3]The NHANES has been conducted many times since 1960. This analysis is from the Third NHANES, Phase 2 (1991-94). U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, Third National Health and Nutrition Examination Survey, 1988-1994, NHANES III Laboratory and Youth Data Files (CD-ROM), Hyattsville, Md., 1996.

[4]Our estimates represent the means. Appendix II shows the upper and lower limits of these estimates.

cost society billions of dollars. At extremely high levels, lead can cause devastating health consequences, including seizures, coma, and death. At lower levels, lead can affect a child's intelligence and ability to learn. Young children are more susceptible to lead poisoning because their developing nervous systems are more vulnerable to injury and they absorb more lead than adults. One- and 2-year-old children are at greatest risk because of normal hand-to-mouth activity and increasing mobility during the second year of life, resulting in more access to lead hazards.

In 1991, HHS established the goal of eliminating childhood lead poisoning in the United States by 2011. In conjunction with this goal, the agency's Centers for Disease Control and Prevention (CDC) issued guidelines calling for virtually all children aged 1 through 5 to be screened for lead toxicity. In November 1997, citing a declining trend of average blood lead levels and generally low rates of screening, CDC revised its guidelines.[5] CDC's new guidelines recommend that state health officials develop statewide plans for childhood lead screening and better target children who are at specific risk.

In response to CDC's changing guidelines, HCFA is reconsidering its Medicaid policy. Federal Medicaid policy for screening children for lead toxicity was established by the Omnibus Budget Reconciliation Act of 1989, which required that Medicaid's early and periodic screening, diagnostic, and treatment services include blood lead level laboratory tests appropriate for age and risk factors.[6] In 1992, HCFA required that in line with CDC recommendations, Medicaid children be screened for lead toxicity at a minimum at ages 1 and 2 for low-risk children and more frequently if they were determined to be at higher risk. CDC's new guidelines indicate that anticipated changes in HCFA's policy may give the states the responsibility of deciding whether all Medicaid children should be screened.

The Prevalence of Elevated Blood Lead Levels Is Much Higher for Medicaid Children

On the basis of NHANES data, CDC estimates that 890,000 children aged 1 through 5 in the United States have blood lead levels associated with harmful effects on children's ability to learn. CDC has set this "harmful effects" level of lead toxicity at 10 or more micrograms of lead per deciliter (µg/dL) of blood. At this level, CDC considers blood lead levels to

[5]On average, blood lead levels in the total population declined by 22 percent between the most recent segments of the NHANES. The first segment was conducted between 1988 and 1991, and the second was conducted between 1991 and 1994.

[6]Making such services available in compliance with the law does not guarantee their provision.

be "elevated" and recommends that various actions be taken. These actions differ depending on the severity of the lead toxicity and include providing family education on lead, follow-up testing, and clinical management such as administering drugs to remove lead from the system.

Applying CDC's definition of a harmful lead level to Medicaid beneficiaries aged 1 through 5 in the NHANES, our analysis shows that about 1 Medicaid child in every 12 had an elevated blood lead level. This rate was more than three times that of the non-Medicaid population. Specifically, about 9 percent of Medicaid children aged 1 through 5 had blood lead levels at 10 µg/dL or greater, compared to about 3 percent of the non-Medicaid population.

NHANES data indicate that Medicaid children constitute the majority of children with elevated blood lead levels. Although Medicaid children represented about one-third of the U.S. population of children aged 1 through 5, they represented about 60 percent of the 890,000 children with elevated blood lead levels.

In addition, at least 83 percent of children with higher levels of lead toxicity (20 µg/dL or more) in the NHANES were covered by Medicaid. At this level, CDC recommends children receive more intensive clinical management, including evaluations for complications of lead poisoning, family lead education and referrals, and follow-up testing. CDC further recommends that treatment at this level include environmental investigations to identify and control sources of lead exposure.

Few Medicaid Children Are Screened for Blood Lead Levels

Blood lead screening is an important element in eliminating childhood lead poisoning, because in most cases there are no obvious symptoms of elevated blood lead levels or lead poisoning. Despite HCFA's screening requirements, 81 percent of Medicaid children in the NHANES had not been previously screened, based on the NHANES respondent interviews.

This screening rate was not sufficient to identify most Medicaid children with excessive blood lead levels. While Medicaid children with lead toxicity had been screened at a higher rate than other Medicaid children, a significant portion of children with elevated blood lead levels had not been previously screened. The survey indicates that about 65 percent of the Medicaid children aged 1 through 5 with elevated blood levels had not been screened for blood lead prior to receiving a screening as part of the

survey. From these results, we estimate that 352,000 of the 535,000 Medicaid children with elevated blood lead levels have not been screened.

The NHANES data do not provide enough information to show how HCFA should update its lead screening policy. However, they do indicate that the problem of lead toxicity is concentrated in the Medicaid population and that the implementation of HCFA's mandatory screening policy has been inadequate to identify the majority of children with elevated lead levels. The NHANES data do not allow us to determine why screenings are not occurring or to examine follow-up treatment and case management services for children found with elevated blood lead levels. As we agreed with your staff, we are continuing our analysis of these and other issues related to federal support for lead-poisoning prevention programs in preparation for our final report to you later this year.

Agency Comments

We provided a draft of this report to the Secretary of HHS for review and comment; however, we did not receive comments in time for publication. CDC and HCFA officials provided technical comments that we incorporated as appropriate.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days from the date of this letter. At that time we will send copies of this report to the Secretary of HHS and other interested parties. We will also make copies available to others on request.

The information contained in this report was developed by Frank Pasquier, Assistant Director, Tim Clouse, and Katherine Iritani. Please contact me at (202) 512-6543 or Frank Pasquier at (206) 287-4861 if you or your staff have any questions.

Sincerely yours,

Bernice Steinhardt
Director, Health Services Quality
and Public Health Issues

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Abbreviations

CDC	Centers for Disease Control and Prevention
HCFA	Health Care Financing Administration
HHS	Department of Health and Human Services
NHANES	National Health and Nutrition Examination Survey
SUDAAN	Software for Survey Data Analysis

Methodology and Use of NHANES Data

The NHANES III is designed to provide national estimates of health and nutritional status of the civilian noninstitutionalized population of the United States aged 2 months and older. It is the latest in the NHANES series (conducted many times since 1960) and was conducted in two phases: Phase 1 ran from 1988 to 1991 and Phase 2 ran from 1991 to 1994. Details of the survey design and questionnaires are published in the NHANES III Plan and Operation Reference manual.[7]

The NHANES oversampled selected subpopulations to increase the reliability of estimates. These subpopulations were children aged 2 months through 5 years, blacks, Mexican Americans, and persons aged 60 or older. While NHANES was not designed to specifically sample the Medicaid population, the NHANES III, Phase 2, Medicaid child population estimates are comparable to those published by HCFA. Specifically, the NHANES III, Phase 2, estimate for Medicaid children aged 1 through 5 years between 1991 and 1994 was 6,274,000. The HCFA estimate for fiscal year 1993 (the midpoint for NHANES III, Phase 2) was 6,632,000.

The variables and population estimates that we selected were consistent with those CDC used in its publication of the estimates for the prevalence of elevated blood lead levels among the population at large.[8] Of the 15,427 persons who were examined in NHANES III, Phase 2, there were 2,387 children aged 1 through 5 years whose survey results contained data on their blood lead levels and Medicaid status. NHANES III, Phase 2, questions regarding blood lead testing were answered by the respondents for the 2,351 of the children in our sample. We excluded children whose survey results were missing responses to questions whenever we used those questions in our analysis.

We excluded from our analysis some children who may be eligible for Medicaid in order to present conservative estimates of the prevalence of elevated blood lead levels among Medicaid children. The children excluded were living in a family in which at least one other person was receiving Medicaid benefits, but the NHANES survey data did not show that the specific child selected for NHANES was receiving Medicaid benefits.

We reviewed the NHANES design, data reliability checks, and reporting guidelines before using these data. We also compared the

[7]Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94, National Center for Health Statistics, Vital Health Stat. 1, Vol. 32 (1994).

[8]Centers for Disease Control and Prevention, "Update: Blood Lead Levels—United States, 1991-1994," MMWR, Vol. 46 (1997), pp. 141-46. Erratum: MMWR, Vol. 46, No. 7 (1997), p. 607.

NHANES-computed estimates with Bureau of the Census population estimates and Health Care Financing Administration (HCFA) reports on the Medicaid population. From these reviews and comparisons, we conclude that NHANES data are sufficiently reliable to be used in meeting our objectives.

Upper and Lower Limits for Estimates

The tables in this appendix show the estimates made from the National Health and Nutrition Examination Survey (NHANES) data, together with the confidence intervals of these estimates. There is a 5-percent chance that the actual number is outside these limits.[9] While the comparatively small sample size of some subpopulation categories results in a relatively wide range between the high and low estimates, the numbers of children at the low ends of these estimates remains substantial.

Table II.1: Estimated Number of Children Aged 1-5

	Estimate		
Number	**Mean**	**Lower limit**	**Upper limit**
Children	20,179,000[a]	16,900,000	23,458,000
Medicaid children	6,274,000	5,459,000	7,088,000

[a]NHANES benchmarked the means to those used by the Bureau of Census 1993 undercount adjusted Current Population Survey.

Table II.2: Estimated Number of Children Aged 1-5 With Elevated Blood Lead Levels

	Estimate		
Number with elevated blood lead levels	**Mean**	**Lower limit**	**Upper limit**
All children	890,000	526,000	1,254,000
Medicaid children	535,000	290,000	780,000
Non-Medicaid children	355,000	157,000	553,000

Note: According to the definition of the Centers for Disease Control and Prevention (CDC), elevated blood lead levels are at 10 µg/dL of blood or greater.

Table II.3: Estimated Number of Children Aged 1-5 Screened for Elevated Blood Lead Levels

	Estimate		
Number screened for elevated blood lead levels	**Mean**	**Lower limit**	**Upper limit**
All children	2,321,000	1,510,000	3,131,000
Medicaid children	1,127,000	648,000	1,696,000
Non-Medicaid children	1,194,000	692,000	1,787,000

Note: These estimates are based on information reported by the NHANES respondents in the interview portion of the survey.

[9]Means, proportions, and standard errors were obtained by using Software for Survey Data Analysis (SUDAAN), as suggested in the NHANES III Analytic and Reporting Guidelines.

Table II.4: Estimated Number of Children Aged 1-5 With Undetected Elevated Blood Lead Levels

Number with elevated blood lead levels and not previously screened	Estimate		
	Mean	Lower limit	Upper limit
All children	565,000	344,000	786,000
Medicaid children	352,000	270,000	434,000
Non-Medicaid children	213,000	131,000	295,000

Note: Children with elevated blood lead levels who had a history of a prior blood lead test were excluded from these estimates. The NHANES data did not identify whether these children were in the process of being treated for an existing blood lead level condition or whether NHANES was actually identifying a more recent undetected exposure. To the extent that the latter situation exists, the estimates of undetected cases could be increased. For this reason, our estimate of children with undetected elevated blood lead levels is conservative.

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