

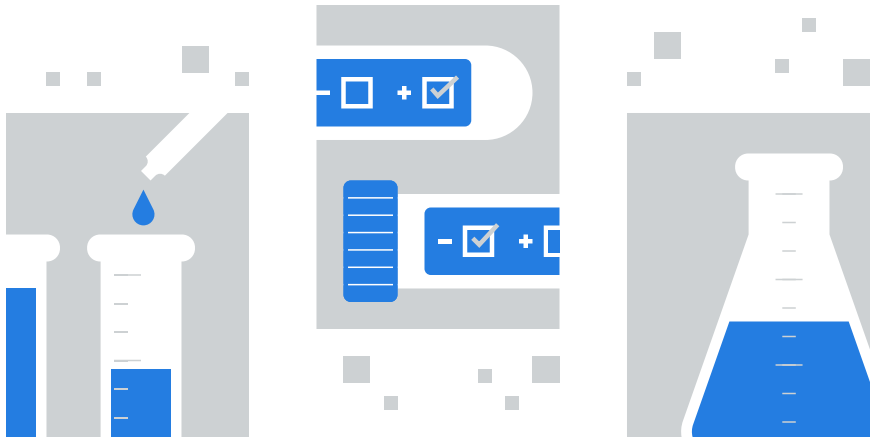
11. ASSESSING CHILDREN'S HEALTH IN PUBLIC AND ASSISTED HOUSING

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Lead exposure among children is associated with detrimental effects on development, such as damage to the brain and nervous system, slowed growth and development, learning and behavioral problems, and hearing and speech problems.^{1,2,3} Beginning in the late 1970s, blood lead levels in the United States declined greatly as a result of policies aimed at the removal of lead from gasoline, residential paint, and, to a lesser extent, solder used in cans.^{4,5,6} However, children are still at risk for exposure through ingestion of lead-based paint, which is particularly prevalent in older housing.⁷

Reducing the harmful effects of elevated blood lead levels in children is a key health objective for the U.S. Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC). The 2019 HHS budget affirms that “CDC will remain committed to the goal of eliminating elevated blood lead levels in children in the U.S. as a major public health problem by 2020.”⁸ Additionally, the HHS secretary is a co-chair on the President’s Task Force on Environmental Health Risks and Safety Risks to Children, a committee that was established in 1997 by executive order to serve as the focal point for federal collaboration to promote and protect children’s environmental health, including the prevention of lead poisoning.⁹

The U.S. Department of Housing and Urban Development (HUD) also prioritizes the reduction of elevated blood lead levels through the removal of lead-based paint hazards in at-risk housing units. In particular, HUD’s strategic plan includes an objective to “Protect families from lead-based paint and other health hazards by making an additional 23,500 at-risk housing units lead-safe by the end of [fiscal year] 2019.”¹⁰ HUD’s Office of Lead Hazard Control and Healthy Homes, which works to eliminate lead-based paint hazards, heads up this work.¹¹

The National Center for Health Statistics (NCHS) and HUD collaborated to link survey and administrative data, as a means to assess the relationship between key health indicators and housing characteristics. The collaboration led to the development of new evidence used by HUD leaders to inform healthy homes policies and programs focusing on reducing elevated blood lead levels among children living in the United States. Healthy homes policies and programs focus on addressing how housing conditions can mitigate or exacerbate health.

ISSUE BACKGROUND

Substantial progress has been made over the past 40 years to reduce the number of children with elevated blood lead levels. These reductions reflect the impact of coordinated policies and programs, implemented across national, state, and local agencies, aimed at eliminating lead in vehicle emissions, paint, and consumer products marketed to children as well as reducing lead concentrations in housing, air, water, and ground.^{12,13}

Lead exposure, however, continues to pose a health risk to children, especially among children residing in older housing stock, as these homes often contain deteriorating lead-based paint. Once the paint begins to deteriorate, chipping and flaking creates contaminated lead dust that becomes airborne and can be ingested. Residential lead dust exposure is highly correlated with elevated blood lead levels, which can lead to adverse health effects in children, including intellectual and behavioral deficits.^{14,15} Lead-based paint hazards are present in an estimated 23 million U.S. homes, including 1.1 million homes of low-income families with one or more children under age 6.¹⁶ In 2012, the CDC concurred with the Advisory Committee on Childhood Lead Poisoning Prevention that the primary prevention of lead exposure could best be accomplished by ensuring that all housing be lead-safe.¹⁷

Policymakers at HHS and HUD recognized the importance of the relationship between housing and health in the prevention of lead exposure among children, and that recognition is reflected in the strategic plans and budget proposals for both departments. Additionally, in December 2018, HUD, HHS, and the Environmental Protection Agency jointly released *The Federal Action Plan to Reduce Childhood Lead Exposures and Associated Health Impacts*, a comprehensive blueprint for reducing lead exposure and associated harms through collaboration among federal agencies with a range of stakeholders.¹⁸

To address the shared strategic interests of reducing lead exposure in those receiving federal housing assistance, and to evaluate the effectiveness of policies designed to reduce lead exposure, HUD approached NCHS with a request to link participants from NCHS population health surveys to HUD data resources on federal housing program participation.

NCHS was prepared to do this through its Data Linkage Program. The program is designed to link NCHS national health survey data with vital and administrative program data for eligible participants.^{19,20} The resulting linked files create new and unique data resources that enable evidence-based policy evaluation and a deeper understanding of the factors that influence disability, chronic disease, health care utilization, morbidity, and mortality. NCHS survey

data have been successfully linked to Medicare and Medicaid program data, Social Security disability and supplemental security insurance data, and cause and date-of-death information collected from the National Death Index. The linked data files are available to researchers through the NCHS Research Data Center.²¹ Both NCHS and HUD worked collaboratively to securely combine person-level information from the National Health Interview Survey and the National Health and Nutrition Examination Survey with information about federal housing assistance from HUD.²²

To undertake the desired linkage project, NCHS and HUD developed a memorandum of understanding to link NCHS survey data with HUD administrative records. The agreement included a commitment from both agencies to provide staff expertise to (1) assure high-quality linked data; (2) share recognition of the different mission of each organization and implications for the types of research questions, data analysis, and findings; (3) honor the different statutory requirements regarding data ownership, participant privacy, and data sharing present in each agency's data collections; and (4) define the conditions for subsequent use and access to the new linked data files.

NCHS and HUD strictly adhered to their applicable agency laws, policies, and procedures to protect the confidentiality of program and survey participants. NCHS is required to protect the handling and use of identifiable survey participant data according to the Privacy Act of 1974 and the Confidential Information Protection and Statistical Efficiency Act of 2002.²³ HUD was able to participate in the linkages because the HUD secretary has the authority to “undertake such programs of research, studies, testing, and demonstration relating to the mission and programs of the Department as he/she determines to be necessary and appropriate.”²⁴ Once the linkage occurs at the individual level, the resulting linked files are also covered under the same NCHS confidentiality requirements. To analyze these new linked data resources, researchers must use the NCHS Research Data Center, a secure mechanism that provides researchers access to restricted-use data for jointly (NCHS and HUD) approved research projects. NCHS and HUD continue to work cooperatively to ensure that the linked data are only used in a manner consistent with the consent provided by program and survey participants.

EVIDENCE AVAILABILITY

HUD provides housing assistance to approximately 10 million low-income persons annually.²⁵ HUD's largest housing assistance program categories include housing-choice vouchers, multifamily programs, and public housing. Multifamily programs provide affordable housing through contracts with private owners of apartment buildings. Local public housing agencies manage housing-choice vouchers and public housing; they also oversee data collection and manage housing assistance program implementation. Public housing authorities own public housing, while the housing-choice voucher program gives tenants a voucher that covers part of their rent in a private-market unit.²⁶

To administer its housing assistance programs, HUD collects information like household structure, household address, and detailed income information for all household members.

People living in HUD-assisted households are captured in HUD administrative data because they receive a rental subsidy or pay a below-market rent. Generally, a rental subsidy reduces gross housing costs for the tenant to about 30 percent of household income, although program rules may allow for substantial variations in that ratio.²⁷ While HUD administrative data contains information necessary to run its federally assisted housing programs effectively, they do not include information on participant health characteristics.

NCHS collects information on the health and well-being of the U.S. population through national surveys, some of which are fielded annually. The annual National Health Interview Survey is a nationally representative, cross-sectional household survey of 35,000 households in the United States.²⁸ The survey collects information on health status, access to and use of health services, health insurance coverage, behavioral health, and other health risk factors. The data helps researchers monitor trends in illness and disability and to track progress toward achieving national health objectives. The public health research community also uses the data to conduct epidemiologic and health policy analyses that characterize a wide variety of health conditions, to examine barriers to accessing and using appropriate health care, and to evaluate the effectiveness of federal health programs.²⁹

The National Health and Nutrition Examination Survey is a nationally representative survey of the U.S. population, comprising about 5,000 persons from 15 different counties each year.³⁰ The survey assesses the health and nutritional status of adults and children in the United States through in-person interviews and physical examinations. The National Health and Nutrition Examination Survey interview includes demographic, socioeconomic, dietary, and health-related questions. The examination component consists of medical, dental, and physiological measurements, as well as laboratory tests administered by highly trained medical personnel. HHS uses findings from this survey to determine the prevalence and risk factors of diseases and to set national standards for health measures, including height, weight, blood pressure, and other clinical measures, such as blood lead levels. National Health and Nutrition Examination Survey data are used in epidemiological studies and health-sciences research, which in turn help develop public health policies, direct and design health programs and services, and expand health knowledge for the nation.³¹

EVIDENCE USE

Researchers from both HHS and HUD successfully used the linked data to develop evidence through scientific research and analysis. The linkage allows for reliable national estimates of the prevalence of health conditions and health care utilization among adult and child participants receiving HUD assistance. HUD researchers published two reports that highlighted health characteristics of adults and children in HUD-assisted households. These two HUD reports represent a first step in securely sharing important health characteristics of participants receiving HUD assistance to provide insights about program operations.^{32,33}

Additionally, the data linkage garnered support and interest from HUD leadership. Researchers provided presentations that highlighted key findings to the HUD secretary, HUD's assistant

secretary for policy development and research, and HUD's assistant secretary for public and Indian housing. Additionally, the HUD 2018-2022 Strategic Plan cited findings from the linked data as evidence to support the removal of lead-based paint hazards. The report states: "Analysis by HUD and the Centers for Disease Control and Prevention (CDC) of HUD tenant data linked with health survey data shows that children ages 1–5 who lived in HUD-assisted housing in 2005–2012 had lower lead blood levels than expected given their demographic, socioeconomic, and family characteristics, suggesting that HUD implementation of its lead hazard control regulations is effective in reducing exposure among children."^{34,35}

Following the dissemination of this noted observational research finding based on linked National Health and Nutrition Examination Survey-HUD data, HUD proposed a new rule to further protect young children living in federally assisted housing by lowering the threshold for determining elevated blood lead levels in children living in assisted housing to match the standard used by the CDC. HUD's proposed "reference level" for lead in a young child's blood would be 75 percent lower (from 20 µg/dL to 5 µg/dL) and remain aligned with CDC recommendations in the future. This change to HUD's 17-year-old Lead Safe Housing Rule will allow for an earlier response when a child under 6 is exposed to lead-based paint hazards in their HUD-assisted homes.³⁶

The availability of the NCHS-HUD linked data has allowed HUD leadership to pose other specific research questions to NCHS on topics where it needs more information. For example, senior leadership highlighted the high prevalence of learning disabilities among HUD-assisted children as a data point that merits further research. The linked NCHS-HUD data are also available to the public health research community through secure-access mechanisms and have resulted in several publications, including health characteristics (smoking and physical activity), health care access, and health insurance coverage among the housing-assisted population.^{37,38,39}

The collaboration that led to linking data files has also fostered new cross-agency relationships between HUD and other agency partners, including:

- A collaboration between HUD and CDC partners to study childhood asthma among HUD-assisted children.
- A collaboration between HUD and the U.S. Department of Agriculture's Economic Research Service to examine rates of food insecurity among adults receiving rental assistance.
- A collaboration between HUD and the Administration for Community Living to examine disability and unmet health care needs among HUD-assisted older adults.

FOLLOWING THE DISSEMINATION OF THIS NOTED OBSERVATIONAL RESEARCH FINDING BASED ON LINKED NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY-HUD DATA, HUD PROPOSED A NEW RULE TO FURTHER PROTECT YOUNG CHILDREN LIVING IN FEDERALLY ASSISTED HOUSING BY LOWERING THE THRESHOLD FOR DETERMINING ELEVATED BLOOD LEAD LEVELS IN CHILDREN LIVING IN ASSISTED HOUSING TO MATCH THE STANDARD USED BY THE CDC.

LESSONS

- ***Cooperation and coordination go a long way.*** Bringing together data from population health surveys and administrative data from federal housing programs created new challenges and opportunities for both agencies. This project benefited from cross-agency leadership support and clearly defined data needs. Both agencies demonstrated a high level of cooperation and coordination throughout the process, including during the development of data-sharing agreements, data privacy, data exchange, and data analysis. Experts from both agencies were able to share expertise within their own data systems, which in turn helped to ensure accurate study findings, including an open assessment of each data system's limitations. Although each agency has its own statutory requirements regarding data confidentiality and privacy protections, cooperation and intent to achieve success resulted in a unique and high-quality integrated data resource.
- ***Privacy and confidentiality can be assured when sharing data.*** By using the NCHS Research Data Center as the secure-access mechanism for researchers' use of the linked data, both agencies can ensure that processes and procedures for accessing data continue to safeguard the privacy and confidentiality of program and survey participants. These safeguards include defining the process for evaluating and approving research proposals and statistical review of all researcher-generated analyses to assess disclosure risks.⁴⁰
- ***Combining data can produce valuable insights.*** This was the first-time population health indicators from survey participants were linked to administrative data on federal housing assistance. Based on empirical evidence generated from this new and unique data source, HUD was able to promote policy changes to further safeguard the health of children living in federally assisted housing. Given this recent success, both agencies are keen to continue collaboration and expect to have an updated linked file released in the spring of 2019. ■

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