

Federal housing programs appear to protect residents from lead exposure

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Americans already living in housing supported by federal housing assistance programs have significantly lower blood lead levels than counterparts who would later join these programs, according to new research led by environmental health scientists at Columbia University Mailman School of Public Health and Tufts Medical Center. The findings [appear](#) in the journal *Environmental Health Perspectives*.

"Living in federally-supported housing—especially public housing—limited opportunities for residents' exposure to lead," says first author MyDzung Chu, Ph.D., assistant professor in the Institute for Clinical Research and Health Policy Studies at Tufts Medical Center. "This likely relates to stricter compliance and enforcement of federal residential lead paint laws in HUD housing compared to non-assisted housing in the private market."

"Federal housing assistance is an important social-structural safety net for very [low-income households](#) to access both affordable and safe, healthy housing," adds senior author Ami Zota, Ph.D., associate professor of environmental [health](#) sciences at Columbia University Mailman School of Public Health. "Lead is a major health risk at any level of exposure."

The new study is the first to examine [blood lead levels](#) (BLLs) by federal housing assistance status in a nationally representative sample of HUD-eligible adolescents and adults. Researchers used the 1999–2018 National Health and Nutrition Examination Survey (NHANES) linked with housing records from the U.S. Department of Housing and Urban Development (HUD) to compare BLLs of NHANES participants on housing assistance (a total of 3,071) at the time of the survey and those who would receive assistance within two years after the survey (i.e., pseudo-waitlist recipients, a total of 1,235).

Participants living with HUD housing assistance had 11.4% lower BLLs than those in the pseudo-waitlist group. They also had 40% lower odds of having a BLL greater than or equal to 3.5 µg/dL—a level used to identify children with BLLs higher than those of most U.S. children, determine appropriate follow-up actions, and prevent further exposure. These numbers were adjusted to account for demographic and socioeconomic confounders.

Additional findings

Comparing three main HUD housing assistance programs, public housing was the most protective against lead exposure followed by multifamily income-restricted housing. No protective effect was seen for tenant-based housing choice vouchers (HCVs). HUD enforces more stringent lead control strategies in public housing units, which provide more long-term/permanent solutions to reduce lead exposure, such as requiring lead-based paint inspections and lead abatement for affected units.

In contrast, tenant-based rental assistance programs like HCVs only require that HCV-eligible units undergo a visual assessment and lead paint stabilization if lead is found, which are considered short-term/interim controls and thus less effective.

The link between HUD housing assistance and BLLs was weaker for non-Hispanic Black and Mexican American participants than for non-Hispanic Whites. This discrepancy could be due to Black and Mexican American individuals' exposure to other lead sources, such as lead-contaminated drinking water and proximity to [industrial pollution](#), though authors could not directly assess these sources in the NHANES or HUD data.

Moreover, Black households face barriers to high quality housing due to

legacies of racist housing policies and urban planning practices. Black families receiving vouchers tend to live in more disadvantaged, racially segregated, and overcrowded neighborhoods compared to White families receiving vouchers. The researchers say more attention is needed to ensure quality housing and racial equity across HUD's housing assistance programs.

Key background

BLLs in adults are linked with elevated blood pressure and risk of cardiovascular disease, renal insufficiency, and cognitive impairments. Elevated BLLs among children have been associated with neurocognitive and intellectual impairments, poor school performance, behavioral problems, and criminality later in life, even at low levels of exposure.

HUD provides affordable housing assistance to nearly 5 million families, including about 3 million children through three major programs administered by local public housing agencies: [public housing](#) (0.84 million households), tenant-based housing choice vouchers (HCVs) (2.3 million households), and multifamily income-restricted housing (1.4 million households).

More information: Federal Housing Assistance and Blood Lead Levels in a Nationally Representative US Sample Age 6 and Older: NHANES, 1999–2018, *Environmental Health Perspectives* (2024). [DOI: 10.1289/EHP12645](https://doi.org/10.1289/EHP12645)

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