

families was uniformly low for all participants. The school district of Philadelphia report for 1996 (13) indicated that a range of 82.1-96.2% (South Philadelphia High School and Belmont Elementary, respectively) of pupils came from low-income families.

The potential offsite exposure to lead of each child could be an important confounding factor in assessing the relationship between test subjects and their exposure to lead in a preschool facility. For this reason, parents of the subject children completed a simple three-question yes-or-no survey to identify possible home sources of lead. The survey asked three questions. First, "Within the past 6 months, have you done any work in your home that involved scraping or sanding paint?" Second, "Does anyone in your family work in an occupation involving exposure to lead (for example, a battery factory)?" Third, "Is anyone in your family involved in a hobby that uses lead (for example, making your own fishing weights)?" Of the 97 replies received (rate of return = 58%), none indicated significant lead sources from renovation work, home hobbies, or parental occupation. Based on these replies, no potential participants were disqualified from the study.

We developed three surface-sampling protocols. The first included only inaccessible surfaces and represented a worst-case situation, although the probability of actual exposure was low. The second protocol included accessible surfaces and was designed to represent a high probability of exposure. The third protocol consisted of actual hand wipes of children and represented the final environmental stage before an ingestion exposure could occur. We collected hand wipes between 1030 and 1145 hr to ensure adequate contact time with accessible surfaces at the study sites while precluding any hand washing before the children's lunch. Inaccessible surfaces included the tops of lights ($n = 2$), tops of storage cabinets ($n = 3$), tops of bulletin boards ($n = 2$), tops of chalkboards ($n = 1$), and tops of file cabinets ($n = 3$). Accessible surfaces included desktops ($n = 2$), floors ($n = 2$), books ($n = 2$), toys ($n = 2$), windowsills ($n = 2$), and doorknobs ($n = 1$).

Analytical methods. All samples were collected 12-13 February 1997. We used National Institute for Occupational Safety and Health (NIOSH) method 9100 (14) to collect all surface-wipe samples. In brief, the method is as follows: Disposable wipes were folded into 5 cm $\times$ 5 cm squares and sealed into zippered plastics bags before sample collection. The wipes were consistently handled with new latex gloves that were changed between samples. After collection, the wipes were replaced in the bags and shipped for analysis by acid digestion and atomic absorption spectrometry according to NIOSH methods 7082 (15) or 7105 (16).

Solid surfaces. We placed a disposable 30 cm $\times$ 30 cm square template over the surface and collected wipes using four firm "S" strokes in each horizontal and vertical direction.

Children's palms. Children were asked to hold their hands palms-up in front of them. Using a clean wipe for each hand, we wiped the total area of each palm and placed the two wipes in a single bag for analysis. Hand areas were estimated by sketching the outlines of the children's hands. Sample times were restricted to between 1030 and 1145 hr to ensure adequate contact time with contaminated surfaces and precede any hand-washing for lunch.

PbB. We collected venous samples from children before admission to the Head Start program and after at least 6 months of attendance in one of the test buildings. All samples were analyzed using established Philadelphia Department of Public Health protocols (17). Reported results are changes in PbB: levels after minus levels before.

Soil and drinking water lead. We collected soil samples at all five of the schools in an effort to characterize the soil as a source of lead in school dust. Children had direct access to the soil at only two of the five sites. We used U.S. Environmental Protection Agency (EPA) method 3050B (18) for