

## Estimated Lead Exposures for a Population of Urban Community Gardeners

---

The [Healthy Soils, Healthy Communities](#) study of lead exposure for a population of community gardeners and their household members has been published in the journal *Environmental Geochemistry and Health*. The study estimated exposure based on 564 soil samples, 159 vegetable samples, and 58 egg samples from approximately 60 community gardens in New York City (NYC). Urban soils can have elevated levels of lead because of human activities including some industries, past use of leaded gasoline and paint, building demolition and resuspension of dust and soil from nearby areas. Previously, we found that lead was at levels above health-based guidance values in some [NYC community garden soils](#) and [vegetables](#), and, rarely, in [eggs](#). The *Healthy Soils* team shared results, interpretation, and advice on [healthy gardening practices](#) with the gardeners who provided all of these samples.

Until this study was completed, we had not known which sources of exposure were the greatest and whether commonly recommended healthy gardening practices were targeting these exposures appropriately. For this study, we estimated exposures to lead by combining testing results for soils, vegetables, and eggs with information we collected from gardeners about time spent in the garden and the amount of vegetables eaten from the garden.

**Overall, our study found that total exposure to lead for the typical urban community gardener and household member was below health-based recommendations for exposure.** However, some gardeners (about 10%) and even a higher percentage of visiting children (40%) were estimated to exceed those recommendations. The most important source of exposure to lead for children was accidentally ingesting soil, both through direct soil contact where children play (often in areas other than in raised beds) and indirectly through soil tracked into the home. The most important source of exposure for adult gardeners was eating garden vegetables. Previously, we found that root zone soil lead levels were not a good predictor of vegetable lead levels. Only vegetable type could predict vegetable lead levels, with fruiting vegetables (like tomatoes) having much lower lead levels than other types of vegetables (like root and leafy vegetables). We had previously found a strong association between soil and chicken egg lead levels, suggesting that reducing chickens' contact with high-lead soil would be an effective means of reducing lead in eggs. The current study suggests that intakes of lead through egg consumption are relatively low for most people, so the reduced lead intake for gardeners and household members from efforts to reduce lead levels in eggs may be small.

Estimated lead intakes for most gardeners and household members in this study were below health-based recommendations, but many urban gardeners and their household members can still benefit from steps to reduce exposure. The study's results support advice to cover soils (with landscape fabric, grass cover, or mulch) accessible to young children. This is particularly important in non-bed areas where children often play and gardeners pick up soil on their shoes and track it into their homes, especially since these areas tend to have higher soil lead levels. This will help reduce children's direct soil contact and contact with soil tracked into the home. The study also suggests that urban gardeners should choose crops carefully (fruiting crops have by far the lowest levels of lead) and wash or peel garden produce well to remove soil and dust.

In summary, while healthy gardening practices to reduce lead concentrations in raised beds or other growing areas (such as importing clean soil and amendments) are important and should be encouraged, these practices should be supplemented by other strategies to reduce exposures. Many healthy gardening strategies are outlined in the *Healthy Soils* tip sheet "[What Gardeners Can Do: 10 Best Practices for Healthy Gardening](#)". Other resources on our [Healthy Soils](#) and [Healthy Gardening](#) web sites can help gardeners reduce exposure and enjoy the many health benefits of urban gardening.

The full article describing the study is available to journal subscribers on the [journal's website](#).