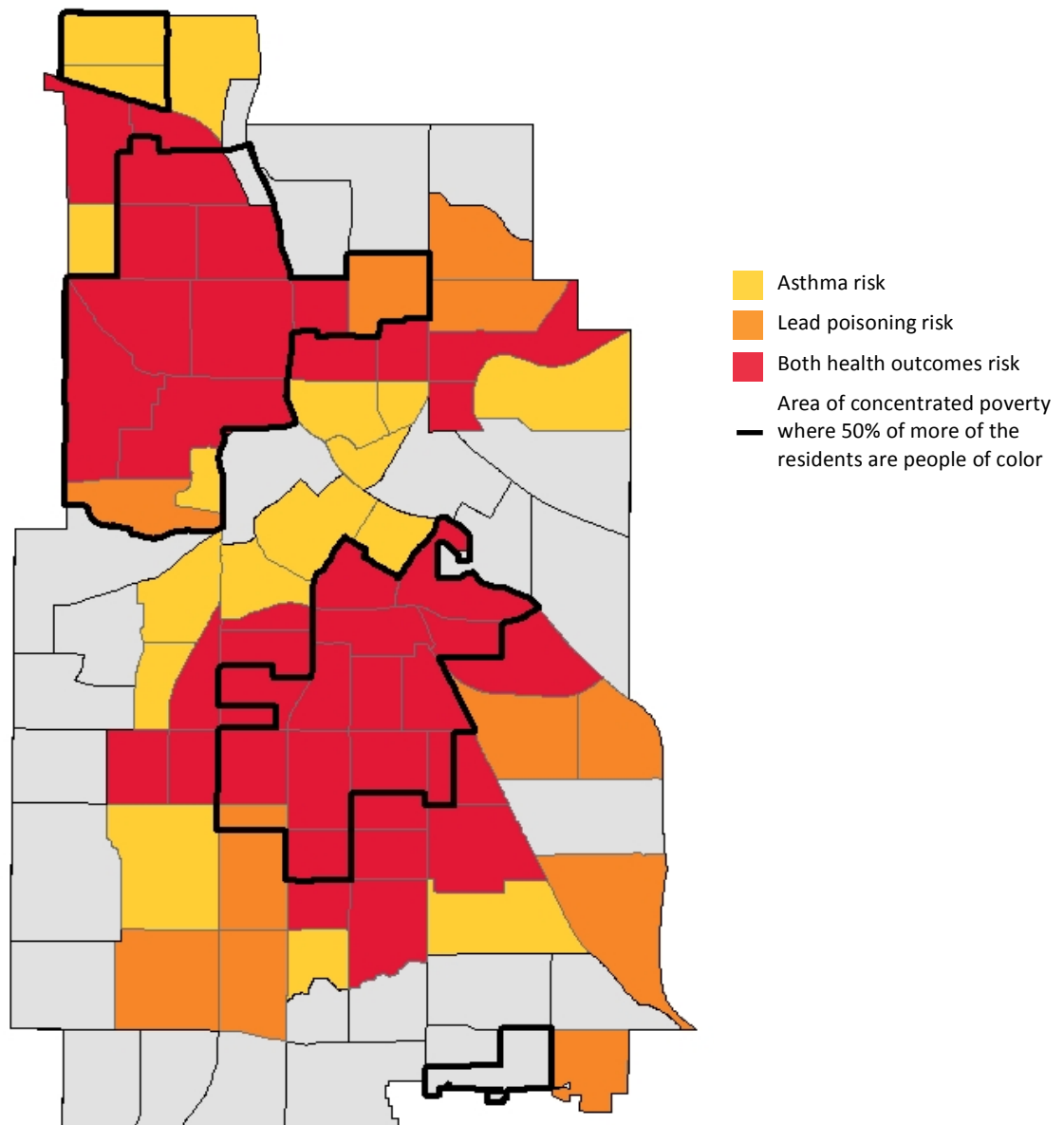


## Lead and asthma risk in Minneapolis, by neighborhood

Each neighborhood was given a score based on level of risk for asthma-related incidents, level of risk for lead poisoning, and presence of concern for both health outcomes. Areas within the city defined as areas of concentrated poverty where 50% of more of the residents are people of color are outlined below in bold black lines. All of the neighborhoods within those areas have at least one of the two health risks, but most of them are of concern for both. (Camden Industrial does not have enough residents to score for these risks). Some areas outside the areas of concentrated poverty are able to significantly reduce risk using their greater financial and social resources, reducing the long-term health outcomes associated with asthma hospitalization and lead poisoning. This is an illustration of the power that social determinants of health have to influence health outcomes.



## Defining risk

The six zip code areas with the highest age-adjusted asthma-related hospitalization rates in Minnesota are all in Minneapolis (the highest is 43 per 10,000 residents). A comparison with the Minneapolis-Saint Paul Metropolitan Area as a whole (9 per 10,000) and the State of Minnesota (7 per 10,000) reveals how disparate these rates are. Asthma is not a reportable disease, so there are no official statistics on the rate of asthma in Minneapolis. Survey estimates are unreliable. Asthma risk was defined using Minnesota Hospital Association data for age-adjusted rates of asthma-related hospitalizations across zip codes, accessed through the MN Public Health Data Access Portal, Minnesota Department of Health. While hospitalizations represent only the more severe end of the asthma spectrum, they can be helpful for examining differences among different locations. Because hospitalization rates vary considerably by age, this technique takes those variations into account by calculating the adjusted rate as though each area to be compared had similar proportions of residents in each age group. A five-year period is used for geographic comparisons to minimize minor year-to-year variations.

For the purposes of this report, all asthma risk was divided by quartiles, lowest to highest rates. The bottom 50<sup>th</sup> percentile (with the highest rates) was reported as an area of concern for asthma.

Lead poisoning risk was defined by using the Minneapolis Health Department's lead poisoning risk index, scoring each neighborhood on the presence of one or more out of five well-established risk factors for lead poisoning. The score was then compared with historic Elevated Blood Lead Levels (at the health standard of 5ug/dl or higher) for external validity. Because there are differences in screening rates and follow up, this technique allows us to examine exposures and consider how to prevent a child from becoming lead poisoned. Risk factors estimated using the U.S. Census 2010 data included: 1) poverty (proportion of individuals receiving SNAP); 2) children under six in the house (proportion of residents of each neighborhood under six years old); 3) rental properties (proportion of renter occupied housing); and 4) older houses (proportion of houses built before 1950). The fifth risk factor, high soil lead levels, was scored using previous soil testing done by both the Minneapolis Health Department and the University of Minnesota. Neither the State of Minnesota nor Hennepin County uses a risk index for comparison. Based on our understanding of lead exposures, we would expect risk to concentrate in an urban area like Minneapolis because more people are concentrated in older housing, including rental properties.

For the purposes of this report, all lead poisoning risk was scored, and the areas with four or five risk factors present were reported as an area of concern for lead exposure.

Areas classified as both an area of concern for asthma and an area of concern for lead were shaded red on the map. We used the Metropolitan Council's areas of concentrated poverty where 50% or more of the residents are people of color (i.e. not non-Hispanic white), 2007-2011.

## Conclusion

Based on multiple sources of data analyzed by the Minneapolis Health Department, specific neighborhoods are at increased risk for both asthma and lead poisoning-related negative health outcomes. Both of these outcomes appear to concentrate in and around areas of concentrated poverty where 50% or more of the residents are people of color, reinforcing the strong influence of social determinants on health outcomes. Risk can be mitigated by financial and social resources, which is why the exposures are present outside the areas of concentrated poverty, but the long term health outcomes vary.

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