Managing environmental lead in Broken Hill: a public health success

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Aims
The city of Broken Hill, in western NSW, has been the site of silver, lead and zinc mining since 1884. In 1991 the majority of the town’s preschool children were discovered to have high blood lead levels; a major state government funded program to deal with this began in 1994. The aim of this paper is to describe changes in children’s blood lead levels within districts having different levels of environmental lead hazard.

Methods
The town was divided into five zones of increasing environmental lead hazard based on lead levels in soil and indoor dust. Data for all children aged 1-4 years attending the lead testing clinic between 1991 and 2005 were obtained from the lead management database and children’s address was used to code for the environmental lead risk zone in which they lived. Age-sex standardised mean blood lead level for each year was calculated for each lead risk zone.

Results
Between 1991 and 2005 the mean blood lead level of children declined in all lead hazard zones. Until 2002, children living in the highest lead hazard zone consistently had mean blood lead levels higher than children living in all other zones, and at least 50% higher than children living in the least hazardous zone. Since 2002 the mean blood lead level of children living in the area of highest lead hazard has reduced markedly, and is now similar to that of children living in other parts of town.

Conclusions
The reduction of children’s blood lead levels in Broken Hill is a major public health success. The combination of whole-of-community health promotion and targeted clean-up of high risk sites, including remediation of industrial areas, has resulted in mean blood lead levels falling by more than 60% and, since 2002, children living in what were previously the highest risk zones having mean blood lead levels similar to children living in less exposed areas of town. The marked reduction of children’s blood lead levels in the highest risk area may be due to the clean-up of high risk sites in that area. Applying a broad, whole-of-community health promotion strategy with targeted intervention to reduce structural risks to the most vulnerable is recommended to both increase the health of communities and reduce health inequities within them.