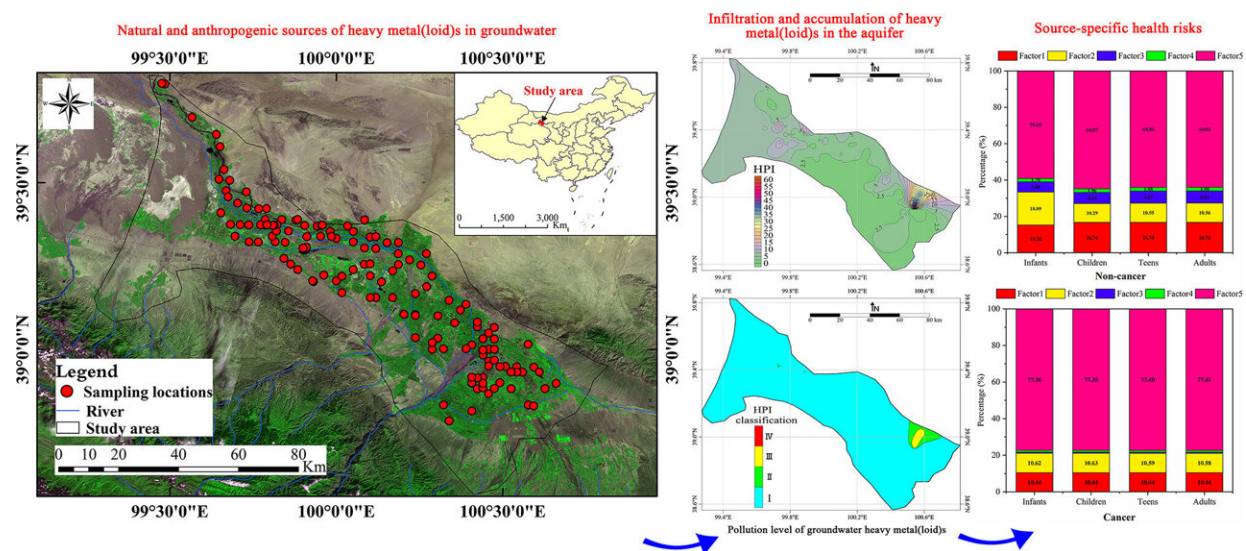# Impact of heavy metal pollution on health risks in oasis groundwater in northwest China

September 15 2022, by Li Yuan

Graphical abstract. Credit: *Science of The Total Environment* (2022). DOI: 10.1016/j.scitotenv.2022.156733

Groundwater heavy metal pollution in arid oasis regions has attracted widespread attention because of its toxicity, persistence, abundance and bioaccumulation capacity.

Previous research regarding groundwater in arid oasis regions have concentrated on water quantity, groundwater level simulation,

groundwater salinization and evolution. However, few comprehensive efforts have been made to identify the sources of pollutants, e.g., heavy metal(loid)s, in groundwater and associated health risks.

Recently, a research team from the Northwest Institute of Eco-Environment and Resources of the Chinese Academy of Sciences investigated the contamination characteristics, possible pollution sources, and source-specific health risks of groundwater heavy metal(loid)s in Zhangye Basin.

Related results were published in *Science of The Total Environment*.

The researchers used the heavy metal pollution index (HPI), the Nemerow index (NI) and the contamination degree (CD) to assess the pollution level of heavy metal(loid)s. Then, they apportioned the potential pollution sources of heavy metal(loid)s by comparing the absolute principal component scores-multiple linear regression (APCS-MLR) model and the positive matrix factorization (PMF) model, and quantified the source-specific health risks of heavy metal(loid)s by integrating the source apportionment with health risk assessment.

Results showed that Mn, Fe, and As exhibited noticeable accumulation in groundwater, while the contamination degree of the groundwater was relatively low according to the HPI index.

Additionally, the APCS-MLR model was more physically applicable for the current research than the PMF model.

The study indicates that the industrial-agricultural activity factor was the major source of non-cancer and cancer risks.

More information: Danrui Sheng et al, Contamination characteristics, source identification, and source-specific health risks of heavy

metal(loid)s in groundwater of an arid oasis region in Northwest China, *Science of The Total Environment* (2022). [DOI: 10.1016/j.scitotenv.2022.156733](https://doi.org/10.1016/j.scitotenv.2022.156733)

Provided by Chinese Academy of Sciences