Effects of environmental degradation in the Aral Sea region of Uzbekistan on human health

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Introduction

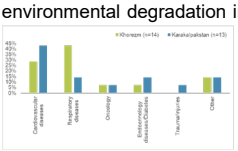
Over the past decades, the saline Aral Sea has declined to less than 10% of its original area due to changes in atmospheric circulation associated with global warming, hydrological changes and excessive irrigation for cotton cultivation. The sinking water table has freed-up sediments loaded with toxic salts and minerals originating from extensive pesticide use. Winds from the dry lake distribute these substances across distances reaching up to several hundred kilometers exposing humans to high levels of water, air and soil pollution and food contamination. How and to what degree this environmental disaster affects the human health in this region and beyond is still poorly understood.

Camel heard and beached boats in the Aral Sea, Muynak, May, 2021

Focus group in Nurafshon (left) and key informant interview in Muynok (right), 2021

Methods

Findings from a literature review, epidemiological data, and information gained in key informant interviews with health care providers and focus group discussions with community members were triangulated to assess the documented and perceived health impacts of the environmental degradation in the Aral Sea region.

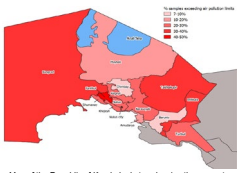


Most common discharge diagnosis where discharge diagnoses are recorded

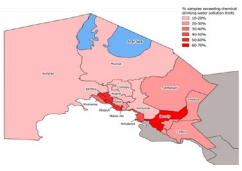
Medical waste disposal in republic of Karakalpakstan

Results and Discussion

Available evidence points at high exposure levels of the population to toxic salts and minerals but literature on health outcomes associated with these exposures is generally scarce and outdated. Key informants recognized increased rates of cerebrovascular, gastrointestinal, renal, respiratory diseases, neoplasms and genetic disorders and highlighted the impacts of climatic, environmental and socio-economic determinants. Community members perceived an increase in non-communicable diseases, specifically cardiovascular diseases and cancers in recent years, also noticeably more in the younger generation. For them, these trends were linked to widespread air and water pollution, high salt content of drinking water and lifestyle habits. The climate was described to have changed towards hotter summers and colder winters, with more frequent drought episodes and more intense dust storms exacerbating the deposition of toxic chemicals from the Aral Sea.



Map of the Republic of Karakalpakstan showing the percentage of samples exceeding the national maximum permissible air pollution levels by district in 2019



Map of the Republic of Karakalpakstan showing the percentage of samples exceeding the national maximum permissible chemical drinking water pollution levels by district in 2019

Conclusions

The combination of environmental degradation, economic hardship and social challenges result in an increased burden of disease in the Aral Sea region. The Government of Uzbekistan, in collaboration with the other countries in Central Asia , make substantial efforts to solve the Aral Sea conundrum and rehabilitate the affected region by restoring the delta and the wetland areas, improving living conditions and implementing a number of health-sector reform projects.

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