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Peer Review

Review of: "Evolution of Occupational Health Risks Among Waste Incinerator Workers: A Four-Decade Review"

Monireh Khadem[1]

1. department of occupational health engineering, school of public health, Tehran University of Medical Sciences, Iran, Islamic Republic of

Title: Evolution of Occupational Health Risks Among Waste Incinerator Workers: A Four-Decade Review

This manuscript is a comprehensive literature review of occupational health risks among waste incinerator workers from 1980 to 2025 across municipal, medical, and hazardous waste incineration settings, with attention to exposure trends, health outcomes, and interventions; identification of emerging contaminants (brominated flame retardants, PFAS, microplastics); discussion of geographic disparities and regulatory contexts.

Its key findings include: Early high exposures to PCDD/Fs and heavy metals with substantial health effects; recent improvements due to emission controls but persistent risks in older facilities and less-regulated regions; emerging contaminants as new concerns; need for integrated protection, long-term surveillance, and research on emerging contaminants.

The major strengths of the manuscript are:

- Four-decade horizon yields valuable insights into how technology and regulation shape exposures and outcomes.
- Inclusion of municipal, medical, and hazardous waste incineration enhances generalizability and relevance.
- Attention to emerging contaminants (proactively addresses brominated flame retardants, PFAS, and microplastics).
- Global perspective: Highlights geographic disparities, informing capacity-building and technology transfer needs.

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- Offering practical implications for engineering controls, monitoring, surveillance, and regulatory frameworks.

There are some comments and recommendations about the manuscript:

A. Methods and reproducibility:

- Are the inclusion/exclusion criteria for studies explicitly defined (languages, study designs, worker populations, facility types, geographic regions)? Suggest including a PRISMA flow diagram.

B. Exposure assessment and outcomes

- Exposure metrics: How were historical exposure metrics harmonized (PCDD/Fs, metals, brominated flame retardants, PFAS, microplastics)? Do the authors acknowledge limitations due to older measurement techniques and incomplete historical records?

- How were potential confounders (smoking, concurrent exposures, socioeconomic factors) addressed across studies?

C. Interventions and regulation

- Which engineering controls, PPE, administrative controls, and monitoring strategies are shown to reduce exposures or improve health outcomes? Are effect sizes or trends reported?

- How do different regulatory regimes (e.g., EU, US OSHA/NIOSH) influence exposure levels and outcomes? Are cross-regional comparisons made with appropriate caveats?

- What are the concrete policy implications for different facility ages and regulatory contexts, and how should they be prioritized in resource-limited settings?

It is recommended:

- Include a glossary for technical terms (e.g., PCDD/Fs, PFAS, brominated flame retardants) to aid readers from related fields.
- In developed countries, there are many educational programs in society, such as waste segregation at home and proper transportation of waste from the place of waste generation, and high-tech and advanced waste incineration facilities and equipment. So, the question is: are the conditions similar to those in developing or underdeveloped countries? It seems that paying attention to the reports available in underdeveloped countries, even if they were published in a non-English language, could have provided the authors with a broader perspective.

Declarations

Potential competing interests: No potential competing interests to declare.