Resilience to Climate Change – A Tool to Assess Climate Impacts on Human Health of Aluminium Sector Workers and Communities

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Abstract

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The risks to human health arising from climate change take many forms, including heat-related illnesses, changes or increases in vector-borne diseases, drought-related impacts and extreme weather events that can damage infrastructure and cause serious injuries, deaths and long-term mental health effects. Climate-mediated risks are ubiquitous across the aluminium sector and related communities, and must be properly managed to ensure a reliable and productive workforce and ongoing sustainability of the sector. Adaptation options need to be identified, to avert or mitigate climate impacts on the health of aluminium sector workers and communities. An online engagement forum has been developed, comprising climate literacy resources and a fully functional assessment tool suitable for utilisation by the entire aluminium value chain. This tool helps aluminium industry assets and local communities to identify climate-related hazards of relevance to the specific locality, characterise risk pathways for human health, and identify adaptation measures that may be used to manage risks. The tool has been piloted at diverse global locations representing a range of climate vulnerabilities.

Keywords: Climate change health impacts, Climate change adaptation, Occupational health, Local communities.

1. Introduction

Climate change is characterised by rising global temperatures, shifting weather patterns, melting ice caps and glaciers, and rising sea levels. Climate change has significant impacts on ecosystems, weather extremes, natural resources, and human societies. These effects include more frequent and severe heatwaves, droughts, floods, storms, and disruptions to agricultural productivity. Additionally, climate change poses risks to human health, biodiversity, and economic stability. Addressing climate change requires concerted global efforts to reduce greenhouse gas emissions, transition to renewable energy sources, implement sustainable practices, and critically to adapt to the changing climate to minimise its detrimental consequences.

1.1 Addressing Human Health Vulnerabilities to Climate Change

Climate change poses significant risks to human health, encompassing direct impacts such as heat-related illnesses, respiratory disease and other air pollution mediated adverse health endpoints, increased magnitude and geographical range of vector-borne diseases, and increased frequency of extreme weather events that deliver damaging impacts on habitations and infrastructure, displacement of peoples, and knock-on adverse consequences to mental health.

Rising temperatures, changing rainfall patterns, water quality and food supply impacts, and increased frequency of extreme weather events can disrupt industrial operations, compromise worker health and safety, and negatively impact the health of nearby populations. These risks are

pervasive across various sectors, including the aluminium industry, and demand effective management strategies to ensure the well-being of workers, communities and the long-term sustainability of society.

To help address these climate-mediated risks, we have developed an innovative online engagement forum, comprising climate literacy resources and a comprehensive assessment tool. This platform facilitates collaboration and knowledge-sharing within the entire aluminium value chain, empowering industry assets and local communities to identify and address climate-related hazards specific to their localities. By characterising risk pathways for human health and identifying appropriate adaptation measures, our projects aim to enhance the resilience of the aluminium sector to climate change impacts on its workforce and surrounding communities.

Within this paper, we outline the key elements of our climate resilience projects, starting with a review of the existing literature on the impacts of climate change on human health and development of a catalogue of cause-effect pathways that connect climate change to diverse health outcomes. We discuss the development and functionality of our online engagement forum, which includes climate literacy materials and a tiered assessment tool designed to aid in risk identification and adaptation decision-making.

Additionally, we provide case studies of pilot projects implemented at diverse global locations representing various climate vulnerabilities within the aluminium sector. These case studies demonstrate the practical application of the assessment tool and showcase the outcomes, challenges, and potential adaptation measures identified through its utilisation.

By sharing our experiences and findings, we aim to contribute to the knowledge on climate resilience in the aluminium sector and provide valuable insights for other industries grappling with similar challenges. Ultimately, our efforts seek to promote the well-being of workers and communities, and foster sustainable practices that mitigate the health risks associated with climate change.

2.   Risks to Aluminium Operations

The aluminium industry plays a critical role in supporting economic development and supplying essential materials for various sectors, such as sustainable energy, construction, transportation, and packaging. Even in the absence of climate change, the industry is regularly faced with challenging climatic conditions, such that certain adaptations are required to ensure continuing resilience and sustainability. However, as the global climate continues to change, the industry faces a multitude of challenges that can have increasingly detrimental effects on the well-being of its workforce and the communities in which it operates.

The aluminium sector is already feeling the effects of climate change and these effects are expected to increase in both scope and magnitude in the future. One of the most consequential effects will be the impact of climate change on the health of aluminium sector workers and their communities. Climate change is already affecting human health and is likely to take an especially large health-related toll in decades to come. Notably, the human health impacts of climate change will be most severe in many of the same regions, and specific locations, where the aluminium industry is most active – developing countries and equatorial regions – as well as among many of the populations most relied upon for labour – people of lower socio-economic means and people living in small and remote communities.

The public health and safety impacts of climate change – severe weather events, air pollution, changing vector ecologies, proliferation of allergens, water and food security, civil unrest and increasing conflict, environmental degradation and extreme heat – are increasingly likely to

health. To address these challenges, it is crucial to promote and facilitate climate literacy, which involves understanding the causes and consequences of climate change. Climate literacy enables individuals to engage in the climate change dialogue with improved parity, make informed decisions, adapt to climate impacts, and advocate for effective climate action.

In the context of the aluminium industry, climate change poses risks to the health and well-being of workers and local communities. These risks include heat-related illnesses, respiratory disease, vector-borne diseases, air pollution, flooding, and water scarcity. To address these risks, an online engagement forum has been developed, which provides climate literacy resources and a tiered assessment tool. The forum facilitates collaboration and knowledge-sharing among industry stakeholders, enabling them to identify climate-related hazards and develop adaptation strategies specific to their assets and locations.

The tiered assessment tool allows for the identification and assessment of climate-related risks at different levels of complexity. It includes cause-and-effect pathways that link climate change to health outcomes, as well as specific vulnerabilities and adaptation options. The tool helps users evaluate risks and propose adaptation measures to protect workers and communities. It has been piloted in disparate global locations, considering various climate vulnerabilities.

In the future, the aim is to expand the tools and materials beyond human health effects to address all vulnerabilities in the aluminium sector. This includes considering non-human receptors such as infrastructure and supply chains. The tools will be updated with additional climate pathways and higher-tier assessment modules. Moreover, there is a focus on capacity building through training to enhance stakeholder understanding and decision-making in climate change vulnerability assessment and adaptation.

By developing climate literacy, utilising the assessment tool, and promoting collaboration, the aluminium industry can enhance its resilience to climate change, protect the well-being of its workforce, and contribute to sustainable practices.

7.   References

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