

Systematic Review of Health and Wellbeing Outcomes of Mining Communities in High Income Countries

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Introduction

- In Australia, rural communities are associated with higher mortality rates and health inequities compared to urban communities. In some settings, disparities may be further exacerbated by the mining industry, which can affect the social, physical and economic environment in which rural communities reside
- Examining health *and* wellbeing considers the physical, psychological and social outcomes and can provide a greater understanding of public health challenges facing a community
- There is a wealth of evidence of direct impacts of mining on health but not much is known about the broader determinants
- This systematic review aims to report the available scientific evidence of health and wellbeing outcomes in communities living in residential proximity to mining operations in high-income countries (HICs)

Method

PubMed, MEDLINE, ScienceDirect and PsycInfo were searched between June 2014 and May 2015. **Inclusion Criteria:** resident adults; HIC setting; community proximate to mining; individual or community wellbeing or health outcomes reported; published in any year and in English; and peer reviewed studies that used original or secondary data. A narrative synthesis framework was utilised to report the findings from the studies.

Results

- 16 studies were eligible for inclusion
- 5 studies did not report the type of mineral extracted; one was set in a community exposed to coal seam gas and others were exposed to coal
- 5 studies investigated overall physical health outcomes, 4 investigated a specific disease outcome and 7 investigated individual or community-level wellbeing
- The majority of studies were set in communities living near active mining and 4 were set in communities living near closed mines

Canada n = 2

- Life loss in females in the mining region was primarily attributable to cancer, and for males it was cardiovascular diseases
- During the mining boom, risky health behaviours were reported. During the mining bust, negative themes were identified around family breakdown, mental health issues and barriers to accessing health care services

Australia n=4

- Sense of place, identity and general wellbeing were affected by 'unwelcome change' in the home environment, leading to feelings of 'solastalgia'
- Health concerns for the indigenous population included diabetes, cancer and heart disease
- Changes to community structure impacted on mental health
- Concerns for succession planning for landholders, strain on health services and environmental concerns relating to future agricultural sustainability and water contamination
- Themes identified around isolation, culture and the social environment, which had negative influences on female psychological wellbeing

USA n = 7

- Health status worsened with increased proximity to mining: risk of cardiopulmonary, lung and kidney disease increased with proximity to heavy coal production
- Elevated prevalence rates of multiple health problems including poorer self-rated health and lower health-related quality of life compared to other rural non-mining areas
- Higher mortality rates from cardiovascular disease than non-mining areas
- Odds for reporting cancer twice as high than non-mining; and lung cancer rates higher in coal dense areas
- Indicators for chronic environmental contamination following mine closure were positively associated with higher HbA1c levels - a marker for diabetes

Italy n = 2

- At the beginning of mine closure, middle aged females (45-64 yrs) were more at risk of depression than females of other ages
- Two decades after mine closure, depression rates decreased apart from in young adult population (18-24 yrs), where rates increased

England n = 1

- Positive themes based around strong sense of place and community and bonding social capital
- Negative themes around a lack of perceived control and social and physical isolation that exacerbated poor access to primary health care

Discussion

- Poor self-related health and increased prevalence of some chronic diseases was associated with living in mining communities. The social, economic and environmental changes associated with mining incursion were linked to both positive and negative individual and community-level wellbeing outcomes
- Some outcomes are likely to be exacerbated by characteristics of rural communities, including barriers to accessing health care and isolation, but many studies attempted to account for this by including a non-mining rural comparator in the studies
- Some communities are built purposefully for mining activity. Health and wellbeing outcomes of residents could be confounded by occupational exposure but studies found that family members who move with the mine worker may experience social isolation and family breakdowns
- The effects of population change following mine boom and busts on social determinants of health include unemployment and housing affordability; or social disruption and weakened community connectedness which were reported to have knock on effects on health and wellbeing status
- Mental health outcomes were commonly discussed amongst residents in mine communities; stress, anxiety and depression outcomes were associated with mine closure
- Mining activity may influence health behaviours - visual environmental contamination from mine closure could influence levels of physical activity
- The influx of mining in predominantly agricultural communities may bring about changes in the visual environment and increased concern for the land. It is imperative that mining companies consider the environment in which they operate, both in terms of physical impacts but also the impacts on cultural and spiritual connectedness to the land
- Future studies examining the association between mining activity and health and wellbeing outcomes should report the type of mineral and stage of extraction, and include thorough consideration of the construct of the community

Conclusion

Consideration of the impacts of mining activity on wellbeing is important for a more comprehensive health profile of the community. Both the public and private sector, specifically government, health services and the mining industry, should ensure that allocation of resources for public health and wellbeing programs in mining communities are based on existing evidence and reflect the changes that communities experience from mining exploration through to mine closure.

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