Global Health Equity

The total health gains from eradicating cold housing in Australia : a simulation study

ABSTRACT

Background

Cold indoor temperature (<18 degrees Celsius) is associated with hypertension-related and respiratory disease, depression, and anxiety. We estimate total health, health expenditure and income impacts of permanently lifting the temperature in living areas of the home to 18 degrees Celsius in cold homes in South-eastern Australia (N=17 million).

Methods

A proportional multistate lifetable model was used to estimate health adjusted life years (HALYs), health expenditure and income earnings, over the remainder of the lifespan of the population alive in 2021 (3% discount rate). Multiple data were integrated including the prevalence of cold housing (5.87%; mean temperature 15 degrees Celsius), the effect of temperature to hypertension-related, respiratory disease, depression and anxiety.

Findings

Eradicating cold housing was predicted to lead to 89,600 (95% UI 47,700 to 177,000) lifetime HALYs gained over the population's remaining lifespan, nearly half of which occurred from 2021 to 2040. Respiratory disease (32.4%) and mental illness (60.6%) made large contributions to HALYs gained, but also had large uncertainty (95% UI 30.0% to 42.9% and 45.1% to 64.6%, respectively) due to uncertain estimates of their magnitude of causal association with cold housing. Health gains per capita were 6.1 times greater (95% UI 4.7 to 8.1) among the most compared to least deprived quintile.

From 2021 to 2040, health expenditure decreased by AUD$0.87 billion (0.35 to 1.98) and income earnings increased by AUD$4.35 billion (1.89 to 9.81).

Interpretation

Eliminating cold housing would lead to substantial health gains, reductions in health inequalities, savings in health expenditure, and productivity gains. Next steps require research to reduce uncertainty about the magnitude of causal associations of cold with mental and respiratory health.