

Topic: household air pollution from solid fuel use

Title: Cooking and season as risk factors for acute lower respiratory infections in African children: a cross-sectional multi-country analysis

Conclusion: Different types of solid fuels and kerosene as well as cooking location have differential and season-dependent effects on acute lower respiratory infections among children.

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Abstract: BACKGROUND: Acute lower respiratory infections (ALRI) are a leading cause of death among African children under five. A significant proportion of these are attributable to household air pollution from solid fuel use. METHODS: We assessed the relationship between cooking practices and ALRI in pooled datasets of Demographic and Health Surveys conducted between 2000 and 2011 in countries of sub-Saharan Africa. The impacts of main cooking fuel, cooking location and stove ventilation were examined in 18 (n = 56,437), 9 (n = 23,139) and 6 countries (n = 14,561) respectively. We used a causal diagram and multivariable logistic mixed models to assess the influence of covariates at individual, regional and national levels. RESULTS: Main cooking fuel had a statistically significant impact on ALRI risk ( $p < 0.0001$ ), with season acting as an effect modifier ( $p = 0.034$ ). During the rainy season, relative to clean fuels, the odds of suffering from ALRI were raised for kerosene (OR 1.64; CI: 0.99, 2.71), coal and charcoal (OR 1.54; CI: 1.21, 1.97), wood (OR 1.20; CI: 0.95, 1.51) and lower-grade biomass fuels (OR 1.49; CI: 0.93, 2.35). In contrast, during the dry season the corresponding odds were reduced for kerosene (OR 1.23; CI: 0.77, 1.95), coal and charcoal (OR 1.35; CI: 1.06, 1.72) and lower-grade biomass fuels (OR 1.07; CI: 0.69, 1.66) but increased for wood (OR 1.32; CI: 1.04, 1.66). Cooking location also emerged as a season-dependent statistically significant ( $p = 0.0070$ ) determinant of ALRI, in particular cooking indoors without a separate kitchen during the rainy season (OR 1.80; CI: 1.30, 2.50). Due to infrequent use in Africa we could, however, not demonstrate an effect of stove ventilation. CONCLUSIONS: We found differential and season-dependent risks for different types of solid fuels and kerosene as well as cooking location on child ALRI. Future household air pollution studies should consider potential effect modification of cooking fuel by season.

Keywords: household air pollution, child