

# Exposure to household air pollution from cooking fuel in Ugandan households and associated household factors: a retrospective analysis of demographic and health survey data



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## Abstract

**Background** Household air pollution is mostly caused by cooking fuel. We describe the trend in household air pollution (HAP) caused by several types of cooking fuel used in Ugandan households from 2001 to 2016 and explore the household factors associated with it.

**Methods** We did a retrospective analysis of data from four Ugandan demographic and health surveys (UDHS) that were conducted from 2000–01 to 2016, with the household as the unit of analysis. We included all households that were in the UDHS dataset. We included variables that described the households, the type of cooking fuel, and where the food was cooked. A household was considered to have exposure to HAP if they used cooking fuels such as coal; charcoal; wood; straw, shrubs, or grass; crops; or animal dung. Bivariate and multivariate logistic regression was used to determine the association between household characteristics and exposure to household air pollution (HAP) from the most recent UDHS of 2016. The DHS programme obtained relevant ethics approval within Uganda and informed consent was provided by the participants.

**Findings** In this study, 45 376 households were included and surveyed. In all the surveys, most households were in rural areas (from 74·3% to 85·1%) and had a male as a head of household (from 69·0% to 72·5%). Wood was the most used household cooking fuel (from 71·7% to 82·1%). Other cooking fuels used were charcoal (from 15·3% to 26·3%), kerosene (from 0·7% to 2·5%) and electricity (0·1% to 0·8%). Exposure to HAP remained high in all the surveys ranging from 96·7% to 99·8%. From the multivariate logistic regression analysis, households with a household head having attained either complete secondary education (adjusted odds ratio 0·13, 95% CI 0·03–0·58;  $p=0\cdot008$ ) or higher education (0·11, 0·03 – 0·48;  $p=0\cdot003$ ) were less likely to be exposed to HAP than households with a household head having no education.

**Interpretation** This study revealed that most households in Uganda have exposure to household air pollution caused by different types of cooking fuel used in the household. This underscores the need for innovations in cooking fuels such as clean energy stoves that are cost-effective and cause less exposure to household air pollution.

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## Declaration of interest

We declare no competing interests.

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