

## Title

A Tale of Two Cities: Surveying behavioural changes in response to heat during pregnancy in Hanoi and Singapore

## Authors

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## Objectives

Pregnant women are vulnerable to health effects of heat exposure, with previous studies reporting associations between pregnancy during periods of extreme heat and higher risk of stillbirth, preterm birth and gestational diabetes. However, the degree to which behavioural changes in response to heat during pregnancy mediate the risk of adverse birth outcomes remains unclear. The impact of heat exposure on family relationships is also understudied. We addressed these gaps using qualitative surveys in working-age female populations in Singapore and Vietnam.

## Methods

Surveys derived from validated population-based questionnaires were administered to pregnant patients and other visitors of the National University Hospital, Singapore, women's clinics. In Vietnam, surveys were administered to female employees of various sectors in Hanoi. Responses were analysed with focus on identifying factors associated with air-conditioning use during pregnancy in Singapore and gauging heat-related health and family relationship outcomes in Vietnam.

## Results

377 responses were collected in Singapore and 378 responses were collected in Vietnam. The proportion of Singapore respondents who used air-conditioning more often on hotter days increased from 8.4% of those in their first trimester to 37.3% in their third trimester, with race ( $p = 0.036$ ) and parity ( $p = 0.031$ ) among factors associated with increased air-conditioning use. Working in an air-conditioned environment in Vietnam was associated with better quality of sleep ( $p = 0.015$ ). 62.8% of pregnant respondents in Vietnam reported experiencing difficulty with fertility or conception while working in hot environments, with those who experienced difficulty more likely to spent more time indoors, perform moderate-to-vigorous physical activity and drink more sweetened beverages during pregnancy.

## Conclusion

Our findings suggest that women in wealthy countries increasingly use air-conditioning during later stages of pregnancy, subject to sociodemographic factors. Wider adoption of air-conditioning across workplaces in Vietnam may also improve reproductive health and family relationships among female employees.