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P156 -Is there an association between heat exposure and decreased kidney function? A systematic review

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Introduction
During the last 30-years, deaths from a previously not described kidney disease have occurred among people without traditional risk-factors such as diabetes or hypertension. This tubule-interstitial kidney disease has been increasingly recognised among young people in deprived communities in Sri Lanka, Mesoamerica and India and its cause is still unknown. One hypothesis that has been frequently put forward is that exposure to extreme heat could cause lasting kidney damage. This systematic review aims to investigate the evidence of an association between heat exposure and decreased kidney function in people without pre-existing kidney disease.

Methods
Studies published after the year 2000 and limited to adults were included if they used kidney function as an outcome, and assessed people exposed to heat (external or internal heat measurements available) to a control group without the exposure, or with lower exposure. The database Medline was searched on July 13, 2018.

Results
The search identified 98 citations, of which 25 articles were screened. There were in total 11 eligible studies identified, all of which were performed in the general population.

There were eight studies which investigated short-term changes in estimated glomerular filtration rate (eGFR) between groups exposed to heat and groups not exposed to heat, with observed eGFR changes varying from 0 to a 20% decrease. There was no long-term follow-up.

The risk of experiencing acute kidney injury (AKI) was investigated in 4 studies, with inconclusive findings (Figure 1).

Finally, one large cohort study measured the odds of self-reported doctor diagnosed kidney disease for men with physical jobs exposed to heat strain, when compared with men not exposed to heat strain and found an Odds Ratio of 1.48 (95% CI 1.11 - 5.93).

The risk of bias within studies was medium to high, due to the measurements used for exposure/outcome, and the risk of confounding.

Conclusions
Among people exposed to heat strain there may be a risk of short-term decreased kidney function compared with people not exposed to heat strain. However, there were no studies that performed any objective measurements over a long-term follow up on their participants. Therefore, in the general population without pre-existing kidney damage there is no firm evidence of any long-term effects of heat on the kidneys.