Background

Mass gatherings attended by large crowds are an increasingly common feature of society. In parallel, an increased number of studies have been conducted to identify those variables that are associated with increased medical usage rates.

Methods

Search strategy

- Search strategies in 6 databases on 14 May 2019.

Data synthesis and critical appraisal

- Prediction model development studies: a narrative summary of the statistical significant (p<0.05) predictors from the multivariate models was conducted.
- Methodological limitations were assessed by making a judgment on the risk of bias items of the CHARMS checklist (Critical Appraisal and Data Extraction for Systematic Reviews of Prediction Modelling Studies). [1]
- GRADE was applied to assess the certainty in evidence.
- Meta-analyses have not been performed and data were summarised narratively. [2]

Results

- We identified 17 prediction modelling studies, performed in the USA (n=9), Australia (n=4), Japan (n=1), Singapore (n=1), South Africa (n=1) and The Netherlands (n=1), with a combined audience of >40 million people in >2000 mass gatherings.
- Statistically significant variables (p<0.05) to predict PPR and/or TTHR are shown in Figure 1.
- The initial certainty level was set at 'high' (association between predictors and outcomes irrespective of any causal connection). The evidence was downgraded due to methodological limitations (-1) and indirectness (-1) resulting in a final low certainty evidence. (Table 1)

Conclusions

- The GRADE approach and the CHARMS checklist allow researchers to rate the certainty of prediction modelling studies.
- Further formal guidance from the GRADE working group is recommended to use the GRADE approach on prediction modelling studies. This will improve evidence-based mass gathering medicine by more effective pre-event planning and resource provision.