

deprivation are necessary. In this study, we present the first step in the development of an index to investigate the effects of spatial concentration of deprivation on health status and mortality in Brazil. Our goal was to obtain a summary indicator of deprivation in the environment surrounding each household by census tract.

Methods Neighborhood conditions at the smallest level available (census tracts) were characterized using data from the latest edition of the Brazilian Census (2010). We selected variables that measure the deprivation of the area surrounding a household. These were lack of paving, street lighting, sidewalks, presence of open sewage and accumulated waste. Confirmatory factor analysis (CFA) using a Structural Equations Model approach was performed to reduce the number of variables and test the existence of the two underlying dimensions: sanitary conditions and infrastructure. Factors were extracted as index variables through regression scores and classified in population quintiles, as categories of deprivation intensity. QGIS and ArcGIS were used to plot these deprivation factors on a map for face validity and analysis of overlap with other similar indexes (i.e. Human Development Index and MPI-Multidimensional Poverty Index).

Results The 2 77 576 census tracts in Brazil, cover a population of approximately 97,613,505 in 56,528,865 households. CFA identified the two factors proposed, with good indexes of fit and model specification ($\chi^2_8=11606.06$; CFI=0.98; RMSEA=0.07; $p<0.05$). To test the index in use, we analyzed the distribution of deprivation throughout the regions and federative states of Brazil. The quintiles of census tract showed a clear geographic pattern, with most deprived areas (the fifth quintile) concentrated within the poorest regions of each state (as classified by the MPI).

Conclusion The selection of variables was based on an extensive theoretical framework, combining a variety of aggregate variables with coverage for more than 98% of the Brazilian population. This data-reduction demonstrates there are underlying deprivation factors which means there is considerable potential for creating a small area deprivation index using other indicators of material deprivation for the whole of Brazil at the census tract level. Use of the census will enable replication with future versions of the census. Therefore, it will be crucial for monitoring inequalities in health and mortality in Brazil.

RF19 ABSTRACT WITHDRAWN

RF20 **COMPARING STRATEGIES TO PREVENT STROKE AND ISCHEMIC HEART DISEASE IN THE TUNISIAN POPULATION: MARKOV MODELING APPROACH USING A COMPREHENSIVE SENSITIVITY ANALYSIS ALGORITHM**

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Background Premature heart disease and stroke are generating a large and growing burden of disease and death in low and

middle income countries. Though eminently preventable, debate continues about whether to prioritise primary, secondary or tertiary prevention.

The application of mathematical models in medicine and population health has proven useful, offering the potential to analyse and compare the effectiveness of different interventions to prevent future cardiovascular disease. We therefore developed a comprehensive algorithm of sensitivity analysis on Markov model applied to evaluate the impact of three interventions to reduce Ischemic Heart Diseases (IHD) and Stroke deaths: (i) improving medical treatments in acute phase, (ii) secondary prevention of stroke by increasing the prescribing of statins, (iii) primary prevention using health promotion to reduce dietary salt consumption.

Methods We developed and validated a Markov model for the Tunisian population aged 35–94 years old over a 20 year time horizon.

We compared the impact of specific treatment of stroke, life style and primary prevention on both IHD and stroke deaths. We reported the total number of CVD deaths (ischemic stroke and IHD deaths) that may be prevented or postponed for each specific scenario.

We then undertook extensive sensitivity analyses using a probabilistic multivariate approach and a simple linear regression metamodeling using R software.

Results The model forecasts a dramatic mortality rise, with approximately 1 11 000 cumulative IHD and Stroke deaths (95% uncertainty interval 107,000–115,000) predicted in 2025 in Tunisia.

Dietary salt reduction offered the potentially most powerful preventive intervention. This population level strategy might reduce IHD and stroke deaths by 27%, compared with 3% for secondary prevention following stroke and 1% for medical strategies for primary prevention.

The metamodeling highlighted that that the initial development of a minor stroke substantially increased the subsequent probability of a fatal stroke or IHD death.

Conclusion The primary prevention of cardiovascular disease via a reduction in dietary salt consumption appeared much more effective than secondary or tertiary prevention approaches applied after disease had manifest in individual patients.

Our simple but comprehensive algorithm offers a potentially attractive methodological approach that might now be extended and replicated in other contexts and populations.

RF21 **LIVING WITH MULTIMORBIDITY IN GHANA: A QUALITATIVE STUDY GUIDED BY THE CUMULATIVE COMPLEXITY MODEL**

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Background Defined as the co-occurrence of more than two chronic conditions, multimorbidity has been described as a significant health-care problem: a trend linked to a rise in non-communicable disease and an ageing population. Evidence on the experiences of living with multimorbidity in middle-income countries (MICs) is limited. In higher income countries