psychiatric illness were more likely to be female, younger and have non-shockable rhythms compared to patients without psychiatric illness. No study reported on the distribution of comparison groups by socioeconomic status, which is known to be linked to both psychiatric illness and poorer OHCA survival. The only study on OHCA survival reported lower odds of 30-day survival in patients with versus without psychiatric illness.

Conclusion This review highlights the paucity of studies reporting on psychiatric illness in relation to OHCA incidence and outcome. History of psychiatric illness may be a risk factor for OHCA incidence and poorer outcome, but further studies are needed in this clearly under-researched, yet very important, area.

P77 MODELLING THE SPREAD OF BEHAVIOURAL RISK FACTORS FOR CARDIOVASCULAR DISEASE IN A UK COMMUNITY USING AN AGENT-BASED MODEL

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Background Tobacco use, unhealthy diet, physical inactivity, and harmful use of alcohol are key behavioural risk factors for non-communicable diseases, including cardiovascular disease. Individuals' behaviours and attitudes are affected by their social environment, which can lead to the spreading of a behavioural risk factor through social connections. Understanding the spread of behavioural risk factors through social networks may allow us to identify targets amenable to intervention to reduce risk factor prevalence and ultimately death and suffering from non-communicable disease. Agent-based models are under-utilised as a tool to give insight into the epidemiology of non-communicable diseases.

Methods We propose an agent-based model of the spread of four behavioural risk factors through social networks (defined as friendships and household relationships), based on the linear threshold cascade model. We created a synthetic community of agents each assigned a unique ID, an age (in three age-groups: 18–34, 35–64 and 65+ years), sex, and a number of connections in the relevant communities (friendships and household contacts), as well as a level ([0–2], based on increasing risk of CVD) for each of the behaviours modelled. Parameters were evidence-informed estimates, based on epidemiological data published in the literature and expert opinion. Where possible nationally representative data from the UK or England were used to estimate parameters. We used the Python package NetworkX to create the network.

Results The method was applied to find the population risk of cardiovascular disease over 10 years for a population size of 10,000. Our model estimated rates of cardiovascular disease from 1.3 events per 1000 person years in 18–39 year old women to 83.1 events per 1000 person years in 65+ year old men which are consistently smaller than rates from observed data. We found that the model was most sensitive to the estimates of influence of spouse behaviour on agent behaviour. It was also sensitive to the average number of household contacts, particularly for the 18–34 age-group.

Conclusion Future work is needed to address our model's limitations which include that the model only considers two communities for each agent: its household and its friendships. Other communities such as workplaces and neighbourhoods could be integrated in the future. Future improvements will also be to add ethnicities and deprivation level to agents. Interactions between multiple behaviours are also relevant here. Our simplistic model assumes no interactions between concepts but integrating this in future versions will be necessary to model closer to reality.

P78 USE OF MATHEMATICAL MODELLING FOR POLICY MAKING: EXAMPLE OF CHRONIC KIDNEY DISEASE IN CHILE

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Background Chronic Kidney Disease (CKD) is a leading public health problem, with substantial burden for individuals, healthcare systems and society. Predictive tools to simulate the disease in the future could help inform decision makers of potential impacts of new treatments, for effective policy making. The aim of this study was to compare the impact of introducing pre-dialysis treatment in Chile with the standard treatment using a multistate model to estimate the future cases and costs of CKD.

Methods A dynamic stock and flow model was used to simulate CKD progression in the Chilean population aged ≥40 years, to the year 2030, from the Chilean public healthcare system perspective. The model included six states replicating progression of CKD, which was assumed in 1-year cycles and was categorised as slow or fast progression. We compared the current treatment for CKD Stages 3a to End-Stage Kidney Disease (ESKD) covered in Chile with a scenario that introduced pre-dialysis treatment for CKD Stages 4 and 5. Only direct treatment costs were considered. The model was calibrated based on international evidence; 95% credibility intervals were calculated with probabilistic sensitivity analysis. We conducted a financial analysis to calculate the annual cash flow and net present value with 3% and 6% discount rates.

Results By the year 2030, there is an expected increase in cases of CKD Stages 3a to ESKD, ceteris paribus, from 452,198 (95% CI 332,760–571,636) in 2020 to 558,271 (483,997–632,545) individuals. Direct costs of CKD stages 3a to ESKD would rise from £256.2M GBP (148.8–363.6) in 2020 to £516.6M (359.5–693.6) in 2030. The introduction of pre-dialysis treatment for CKD Stages 4 and 5 would reduce the proportion of fast progressors from the 30% assumed in the baseline scenario to 20%. This intervention is estimated to decrease the number of individuals worsening to stages 5 and ESKD, and reduce the total costs of CKD healthcare by £82.6M in 2030 to £434.0M (277.1–591.0). The financial analysis showed a net present value of -£139.8M and -£117.0M with 3% and 6% discounts, respectively.

Conclusion Predictive models are a useful tool for decision-making. The inclusion of pre-dialysis treatment for CKD Stages 4 and 5 would generate savings for the healthcare system due to the reduction in progression of CKD to ESKD. These results were presented to policy makers (Health, then Treasury) in Chile, to consider including pre-dialysis treatment for Stages 4 and 5 in the funded CKD healthcare in Chile.