**Population Structure and COVID-19 Burden**

The effect of the enhanced shielding strategy was assessed in four population structures as part of a model sensitivity analysis. This included the baseline 20-20-60 model, 2-2-96 model, 8-8-84 model and a 14-14-72 model. With the numbers representing the percentage population structure attributable to the vulnerable, shielders and general groups respectively.

* Insert section on Sam’s Lorenz curves and how we identified attributable proportion to each sub-population

The relative risk of severe disease was calculated as a ratio of the risk of severe disease in the vulnerable population to the risk of severe disease in the remainder of the population (shielders and general population). Model output was used to calculate the cumulative incidence with regards to 365 days after the start of lockdown, in order to assess the impact of each considered population structure on the efficacy of the enhanced shielding strategy. The proportion of the severe disease burden attributable to each sub-population was calculated using the relative cumulative incidence in each sub-population, scaled by the proportion of severe disease risk attributable to each sub-population.

Table 1 - Comparison of the estimated distribution of COVID-19 burden for the 20-20-60, 2-2-96, 8-8-84 and 14-14-72 population structure model scenarios

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Sub-population | Proportion of Population | Proportion of severe disease risk attributable to the sub-population | Relative risk of severe disease | Cumulative incidence\* | Proportion of severe disease burden\* |
| 20-20-60 model | v | 0.20 | 0.80 | 16 | 0.186 | 0.554 |
| s + g | 0.80 | 0.20 | 1 | 0.600 | 0.446 |
| 2-2-96  model | v | 0.02 | 0.20 | 12.25 | 0.265 | 0.078 |
| s + g | 0.98 | 0.80 | 1 | 0.786 | 0.922 |
| 8-8-84  model | v | 0.08 | 0.504 | 11.69 | 0.242 | 0.249 |
| s + g | 0.92 | 0.496 | 1 | 0.740 | 0.751 |
| 14-14-72  model | v | 0.14 | 0.68 | 13.05 | 0.216 | 0.402 |
| s + g | 0.86 | 0.32 | 1 | 0.682 | 0.598 |

\*Over one year from start of lockdown (day 71 to day 436)