

## Model for estimating the prevalence of patient-reported doctor-diagnosed CHD

A CHD Prevalence Model to estimate the prevalence of identified CHD within practice populations was developed as part of the programme to tackle health inequalities led by Chris Bentley, Director of Public Health for South Yorkshire<sup>1</sup>. This model has been modified by Doncaster's Public Health Intelligence Unit to incorporate more recently published data. The model uses a three-stage process to estimate the prevalence of identified CHD within practice populations.

**Stage 1** predicts the number of people with identified CHD within the practice, taking account only of the demographic distribution of the population.<sup>2</sup> The prevalence of doctor-diagnosed CHD in each age/sex stratum is based on national data from the Health Survey for England.<sup>3</sup>

| National Percentage Prevalence by Age and Sex <sup>3</sup> |       |       |       |       |       |       |      |
|--|-------|-------|-------|-------|-------|-------|------|
|  | 16-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75+  |
| Men  | 0.0   | 0.0   | 1.0   | 3.4   | 11.1  | 21.6  | 26.5 |
| Women  | 0.3   | 0.0   | 0.5   | 1.9   | 5.8   | 9.7   | 18.1 |

The prevalence of CHD in under 16s is assumed to be zero.

**Stage 2** takes account of inequalities between different local authorities in England. In the absence of sufficiently precise published data on the relationship between deprivation and CHD prevalence, the model makes the assumption that areas with higher CHD mortality rates have comparably higher prevalence of CHD. For example, Doncaster's 2002-04 standardised mortality ratio (SMR) for CHD in people of all ages was 116.0,<sup>4</sup> so the model increases the predicted prevalence in each of Doncaster's practices by 16%.

**Stage 3** takes account of inequalities between practices within the local authority area. Using data for all local authorities in England, a linear relationship between 2002-04 SMRs for CHD<sup>4</sup> and a deprivation score (UV67) derived from the 2001 Census Classification of Deprivation,<sup>5</sup> a linear relationship was calculated:

$$\text{CHD SMR} = (2.604 \times \text{UV67}) + 25.97$$

Using UV67 scores<sup>5</sup> calculated for each practice, the above formula gives a multiplying factor for each practice. For example, a practice with a UV67 score of 40% (very deprived) has a multiplying factor of 1.3. However, in stage 2 the prevalence was adjusted for CHD SMR, and much of this difference can be attributed to deprivation. The model uses the formula above to give a predicted CHD SMR for the local authority area. For example, Doncaster's UV67 score of 32.9% would predict an SMR of 111.8, compared with the actual SMR for 2002-04 of 116.0.

Hence the expected prevalence produced by stage 2 is divided by the predicted SMR before the practice's multiplying factor is applied, to avoid 'double-counting' the effect of deprivation on the practice's CHD prevalence.

### Notes

1. The original model was developed in Sheffield Health Authority by John Soady and Bruce Laurence. The current model is based on this model, but uses more recent data from the Health Survey for England and a different method of adjusting for deprivation.
2. Population data are obtained from the Patient Register held by the PCT.
3. Joint Health Surveys Unit (2004). *Health Survey for England 2003*.
4. National Clinical and Health Outcomes Database (2005). *Compendium of Clinical and Health Indicators*.
5. Calculation of the UV67 score using 2001 Census data is described in detail in the instructions for populating the model.