

Appendix 1.

The ASSIGN score and the Framingham cardiovascular score

(a) The ASSIGN score

Note the following abbreviations apply below. tc=total cholesterol, hdlc= HDL-cholesterol, sbp= systolic blood pressure, family = family history, cpd= cigarettes per day, SIMDSC10= Scottish Index of Multiple Deprivation score divided by 10.

Men

The betas (log hazard ratios) for each risk factor are: $b_{age}=0.05698$, $b_{tc}=0.22286$, $b_{hdlc}=-0.53684$, $b_{sbp}=0.01183$, $b_{diabetes}=0.81558$, $b_{family}=0.27500$, $b_{cpd}=0.02005$, $b_{SIMDSC10}=0.06296$.

For each person, define: $L=b_{age}*age+b_{tc}*tc+b_{hdlc}*hdlc+b_{sbp}*sbp+b_{diabetes}*diabetes+b_{family}*family+b_{cpd}*cpd+b_{SIMDSC10}*SIMDSC10$. An asterisk denotes multiplication.

Evaluate L at the mean values:

$Lbar=b_{age}*48.8706+b_{tc}*6.22520+b_{hdlc}*1.35042+b_{sbp}*133.810+b_{diabetes}*0.0152905+b_{family}*0.263762+b_{cpd}*7.95841+b_{SIMDSC10}*2.74038$.

Let $A=L-Lbar$ and $B=\exp(A)$. Then the ASSIGN score is $P=100*(1-(0.8831^B))$, where 0.8831 is the 10y survival rate, free from CVD, for men in SHHEC.

Women

Similarly, $b_{age}=0.07203$, $b_{tc}=0.12720$, $b_{hdlc}=-0.55836$, $b_{sbp}=0.01064$, $b_{diabetes}=0.97727$, $b_{family}=0.49159$, $b_{cpd}=0.02724$, $b_{SIMDSC10}=0.09386$. Define L, A and B as for men.

$Lbar=b_{age}*48.7959+b_{tc}*6.40706+b_{hdlc}*1.62837+b_{sbp}*130.115+b_{diabetes}*0.0127275+b_{family}*0.326328+b_{cpd}*6.44058+b_{SIMDSC10}*2.82470$. Then, $P=100*(1-(0.9365^B))$, where 0.9365 is the 10 year survival rate for women.

(b) The Framingham cardiovascular score for both sexes (from Anderson et al 1991)⁴

Define variables: LVH=left ventricular hypertrophy, liprat=totchol/hdl; female=1 only if the person is female (else zero); diabetes=1 only if the person has diabetes (else zero);

logage=log(age); logsbp=log(SBP);lograt=log(liprat);

agefem=logage*female; and diabfem=diabetes*female.

Then define,

$\mu=18.8144-1.2146*female-1.8443*logage+0.3668*agefem-1.4032*logsbp-0.3899*smoker-0.5390*lograt-0.3036*diabetes-0.1697*diabfem-0.3362*LVH$.

Let $\sigma=\exp(0.6536-0.2402*\mu)$.

Let $u=(\log(10)-\mu)/\sigma$.

Let $new=-\exp(u)$.

Then the Framingham score is $pcvd=100*(1-\exp(new))$.

Note: these values are quoted solely for comparison with ASSIGN. For information on Framingham scoring, readers should consult the original sources quoted.

Appendix 2.

Family history questions:

1. Have either of your parents developed heart disease *or stroke* before the age of 60?
2. Have any of your brothers and sisters developed heart disease *or stroke* before the age of 60?
3. *Have any of your father's or mother's brothers and sisters, or any of their children* developed heart disease or stroke before the age of 60? If yes, how many of them?*
**that is, uncles, aunts or first cousins of the participant.*

Normal print is the original question in the Scottish Heart Health Study questionnaire (which also asked about number of sibs). *Italic print shows modifications for the new ASSIGN score.*

Accept a positive family history for “yes” as an answer to either question 1 or question 2 or both. Question 3 is superfluous for this purpose if the answer to one of the other questions is “yes.” If “no” for both, accept a positive family history from question 3 only if two or more of these more distant relatives are affected.