

# Evaluating cardiovascular disease risk using the WHO/ISH risk prediction charts for South East Asian Regions D

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## *Supporting Information File 1*

We present two worked examples of using the POC simplified test for determining if a TC test will benefit CVD risk prediction using the WHO/ISH charts. Patient data is taken from our testing set of the APHRI dataset.

### Example 1

Consider a 70 year old male patient whose data is being collected at point of care. He is a non-smoker and weighs 49kg and is 162.5 cm tall. The patient has two consecutive blood pressure measurements taken which are recorded to be 137/87 mmHg and 138/84 mmHg. He also records a random blood glucose level of 79 mg/dl.

1. Prior to determining 10-year CVD risk, we can use equation (1) as described in the paper,

$$\text{logit}(c) = -5.6554 + 0.0416 * \text{Age} + 0.0132 * \text{SBP} \quad (1)$$

where  $c$  is the probability for a patient to require a cholesterol test.

2. The patient's mean SBP is calculated to be 137.5 mmHg.

$$\text{logit}(c_1) = -5.6554 + 0.0416 * (70) + 0.0132 * (137.5)$$

$$c_1 = \frac{1}{(1 + e^{-0.9284})}$$

$$c_1 = 0.2832$$

3. The threshold corresponding to the maximum F3 score, which has a high sensitivity, is 0.1215. Alternatively, the threshold corresponding to the F1 measure may also be considered (0.1762) if the user desires a balance between sensitivity and specificity. Both thresholds are below  $c_1$  indicating

that a TC test will be beneficial for risk estimation which implies that it is preferable to use the WHO/ISH HI charts.

The patient's complete medical data reveals a TC measurement to be 221 mg/dl. Hence the 10-year risk computed using the WHO/ISH LI charts would have been 20 to <30% risk while risk computed using the HI charts would be 30 to <40% risk. As a side note, if the patient had been assessed for risk only using the WHO/ISH LI charts, the NPCDCS guidelines would not have classified the patient as requiring treatment (10-year CVD risk would have been between 20 to <30% and SBP<140mmHg). On the other hand, the patient's risk according to the HI charts clearly mandates that he ought to be high risk and requiring treatment.

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## Example 2

Consider a 48-year old male patient, non-smoker with height 158cm and weight 61kg. He has a mean BP of 154/89 mmHg from two consecutive readings and a glucose level (random) of 110 mg/dl.

1. Using equation (1), we find

$$\begin{aligned} \text{logit}(c_2) &= -5.6554 + 0.0416 * (48) + 0.0132 * (154) \\ c_2 &= \frac{1}{(1 + e^{-1.6258})} \\ c_2 &= 0.1644 \end{aligned}$$

2. If we choose the threshold corresponding to the maximum F3 score (0.1215), a TC test and risk estimation by the WHO/ISH HI charts are recommend. However, the threshold for maximum F1 score (0.1762) which offers higher specificity would say the TC test won't be necessary and WHO/ISH LI charts would suffice.

The patient's complete medical data tells us his recorded TC was 208 mg/dl. Both the WHO/ISH LI charts and HI charts would estimate the 10-year risk to be less than 10% risk.

The variation of age, SBP, and  $c$  is shown through Fig. A.

## WHO/ISH risk prediction charts

The LI and HI WHO/ISH risk prediction charts for SEAR D are illustrated through Fig. B and Fig. C respectively.

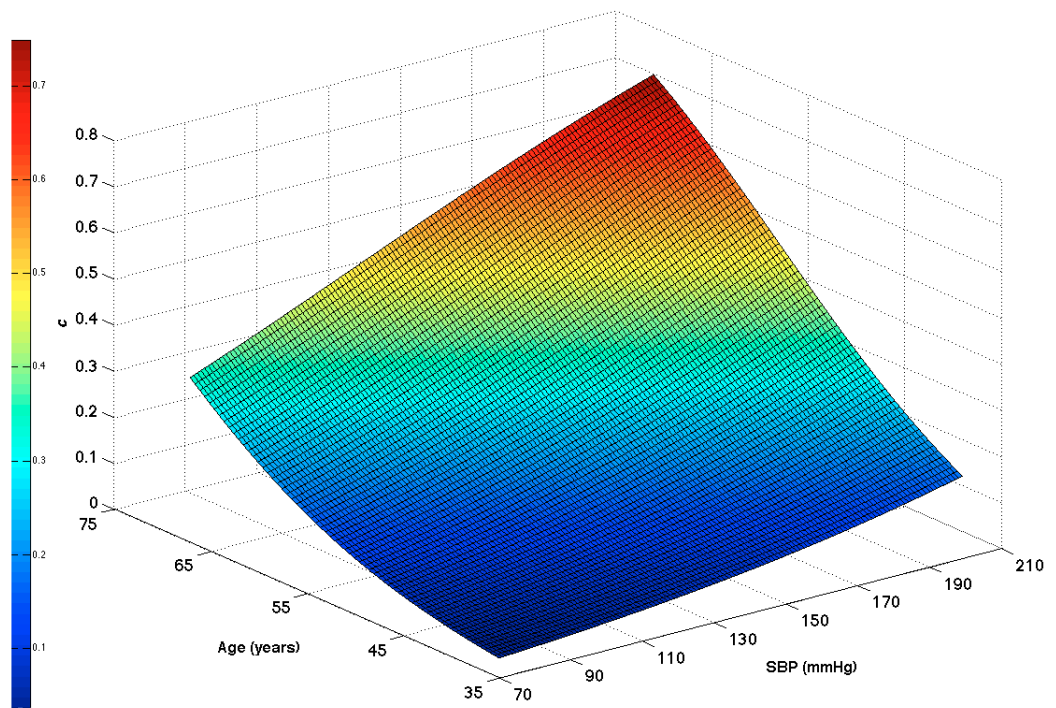
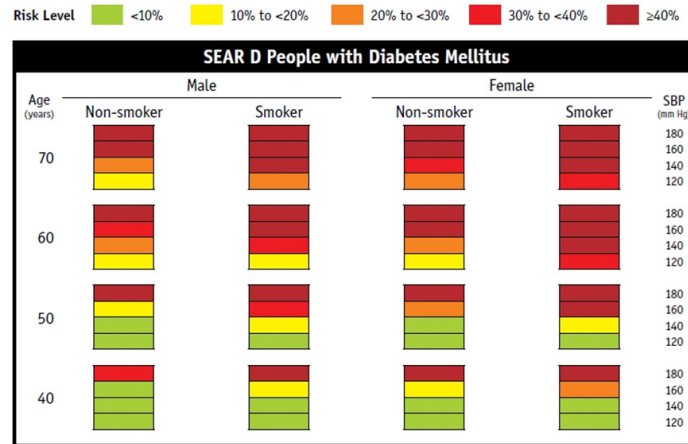
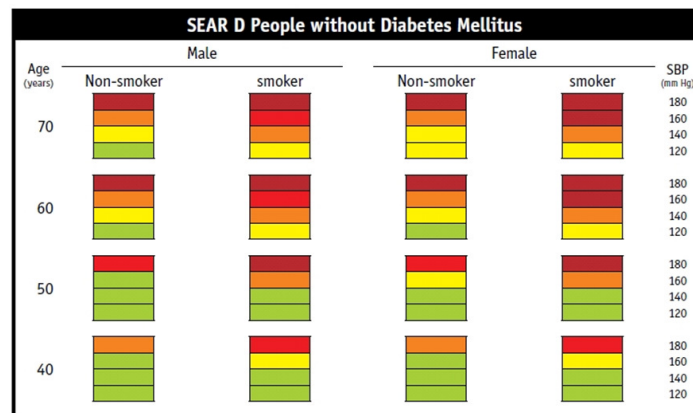


Figure A: The variation of  $c$  with age and systolic blood pressure.

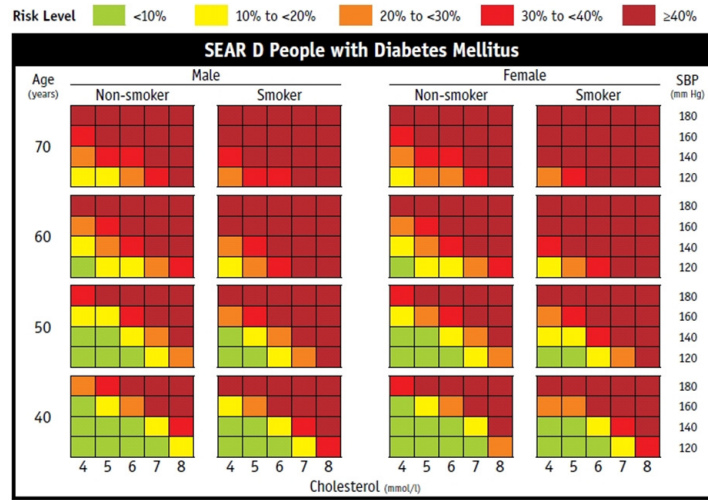


(a)

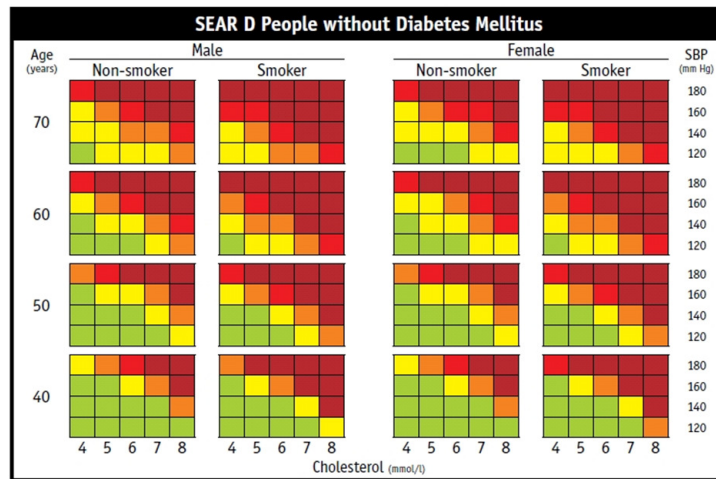


(b)

Figure B: Low information version of WHO/ISH CVD risk chart for SEAR D.



(a)



(b)

Figure C: High information version of WHO/ISH CVD risk chart for SEAR D.