Defining Risks and Their Implications

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Time and again we are reminded that coronary heart disease is fast becoming the major cause of deaths from natural causes in Malaysia. Yet, we are also reminded that our data set of morbidity and mortality, in terms of its definitions and acquisition, requires further refinement and improvement to ensure its validity. Mohd Yusof and Margetts[1], in this issue of the *Journal,* underscore this point by highlighting the low rates (at best only about 50%) of medically certified and inspected deaths in Peninsular Malaysia. Interestingly, there has been some improvement in this respect among the Malays over the years 1970 to 1990 (29.1% from 15.2%) but not among the Chinese and the Indians who remain at just above the 50% mark. A number of factors may account for this, not least is the impact of urbanisation on these ethnic groups. Be that as it may, one is also well versed with the almost inherent inadequacies of the death certificate.

When addressing coronary artery disease, one is often confronted with risk factors for the disease. The concept of coronary risk factors was derived from the Framingham Heart Study, it denotes a level of association between certain conditions with the increased likelihood of the development of the disease. Coronary risk factors are identified through prospective cohort or case-control *observational* studies. They do not necessarily connote causality, for a valid association to be causal a number of conditions are required. This includes strength of association, time and dose dependence of exposure, consistency of relationship, biological plausibility and specificity of the association. Often this requires an *interventional* or *experimental* study such as the randomised clinical trials. For some obvious (for eg., age cannot be reversed) and sometimes ethical reasons (such as exposure to smoking to ascertain its impact on coronary heart disease), some risk factors cannot be completely proven as causal to coronary heart disease despite their overwhelming association and plausibility.

A number of coronary risk factors have been defined and classified as either minor or major, or modifiable or non-modifiable. This was obtained from observational studies as alluded to above. The role of these risk factors in the development of coronary heart disease was further consolidated by further observations. For instance, a linear relationship between serum cholesterol and coronary heart disease mortality has been established[2-4]. It has also been estimated that the remarkable 40% reduction in the age-adjusted mortality rate over the past 40 years in the United States was related to a reduction in the mean serum cholesterol and smoking[5]. Other studies[6-10] have attested to the value of risk factor reduction and that this intervention has been shown to be more cost-effective for the high risk as compared to the low risk target group[11-13]. These studies, both observational and experimental in design, have provided incontrovertible and convincing evidence that coronary artery disease prevalence and mortality can be controlled and significantly reduced through risk factor modification. Categorisation of the risk factors to facilitate formulation of an action plan to realistically target them has been proposed[14]. But an initial step is to define our population in terms of their risk factor profile.

The study by Khoo *et al*[15] in this issue of the *Journal* is one among the few that attempt at this definition. Khoo *et al* provide data complementing the currently available body of knowledge on the subject, in particular for a subset of the population affording private medical consultation for medical check-up. As recognised by the authors, their study population is by no means a representative of the Malaysian population. This is perhaps examplified, among others, by the rather lowish prevalence of low HDL-cholesterol. The high prevalence of hyperlipidaemia, as has been shown by others in other subsets of the Malaysian population[16], is alarming especially as it

suggests an increase in the mean serum cholesterol values over the years. Whilst not specifically reported from this study, other risk factors are also prevalent in the Malaysian population[17].

There is enough evidence to show that Malaysia is on a threshold of a major coronary artery disease epidemic. Further studies, not only observational but perhaps more importantly at this stage experimental, are required to enhance our chance of combating this menace. Authorities responsible for research grants and research promotion are well advised to facilitate this need for adequate, reliable and valid local data. Without this we may be off-target and not hitting the nail right on its head.

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