The major conclusions for two controlled intervention trials conducted in Boston City and Boston Lying-In Hospitals have been presented at previous Aberdeen Colloquiums. At the first Aberdeen Colloquium, the study design, its rationale and pregnancy outcomes were described (O'Sullivan 1975). On the occasion of the second Colloquium, the subsequent development of diabetes mellitus and predictor variables were explored (O'Sullivan 1979). Finally, at the third Colloquium, the experience with both morbidity and mortality in our study subjects was described (O'Sullivan 1984).

In general, a significantly higher perinatal mortality was found among those women with gestational diabetes (GDM) than among randomly selected control patients whose only requirement was to exhibit a normal 3-h oral glucose tolerance test (OGTT). Insulin treatment was found to reduce the higher incidence of large-baby births to the rate of the negative controls but did not reduce the perinatal mortality rate (O'Sullivan and Mahan 1980). Consequently, a second study, using the current OGTT criteria, was initiated. These criteria for GDM were shown to select patients closer to the development of diabetes in later years than did the diagnostic standards employed in the earlier study. The second study showed, in a more convincing manner, a significantly higher perinatal loss rate among gestational diabetics than in controls. Although the rate was impressively lower among GDMs randomized into an insulin-treatment category than among the GDM controls, it did not achieve statistical significance by the time the study had prematurely closed.

When the data from these two studies were combined, then a significant beneficial effect on perinatal mortality for the insulin-treated group was found. This joining of two studies, however, required redefining the selection criteria for the first study and restrictions concerning the duration of insulin therapy for both investigations. Such retrospective analyses dictate that the conclusions be used for hypothesis setting only. I am unaware of any subsequent studies proving this apparently beneficial effect of insulin treatment on perinatal mortality rates in those with GDMs. Subsequent improvement in perinatal salvage across the whole spectrum of diabetes, and particularly so for the woman with GDM, renders the question, as originally posed, moot. It is now a matter of defining the
indications for the commencement of insulin in the individual case rather than deciding whether all those with GDM would benefit from its universal use.

Similarly, insulin management of the gestational diabetic in the Boston studies appeared to have no effect on the progression to diabetes in subsequent years. Here again some unanswered questions remain. For example, insulin management was found to reduce the incidence rates for diabetes when clinical criteria (large-baby birth; family history of diabetes) were used to describe subsets of gestational diabetics (O'Sullivan and Mahan 1980). As before, these results involved redefining retrospectively the baseline data and consequently are limited to hypothesis setting.

The morbidity and mortality findings on follow-up indicated a greater frequency of hypertension, hyperlipidaemia and abnormal resting and stress electrocardiograms among former gestational diabetics than among the negative control patients and a significantly lower mortality rate for the gestational diabetics who had received insulin treatment in their index pregnancies. The number of morbid endpoints were too few for multivariate analyses and the deaths too few for exploring mortality by cause. It is hoped that the study can be re-opened, if not for re-testing, then for a mortality follow-up.

Having briefly outlined the salient findings of the Boston Gestational Diabetes Studies, those achieving statistical significance and those needing confirmation, data that have relevance to the continuing need for identifying the gestational diabetic will be reviewed. Questions have also been raised concerning the absence of maternal age and weight analyses in the Boston studies and, indeed, concerning the whole concept of gestational diabetes (Jarrett 1981). One example of Jarrett's concern about the existing evidence for a relationship between glucose levels and perinatal mortality is the study of Hadden (1980). Hadden's perinatal mortality rate for the years 1966 to 1977 in the major Northern Ireland hospital was only marginally higher among women with an abnormal GTT than in the general prenatal population. Any generalization of these results, however, must consider the fact that the whole prenatal population did not receive glucose tolerance tests to separate out those with GDM. Our experience with screening suggests that a substantial number of those with GDM would have been missed by the screening procedures in use throughout that time period in Belfast. Inclusions of gestational diabetics in the general pregnant, rather than in the GDM study population, would have had little impact on the perinatal mortality rates of the former given its large denominator, but a potentially significant effect on increasing the rates from the latter due to the smaller numbers (denominator) of gestational diabetics.

Analyses from the second study of gestational diabetics at Boston City Hospital, confining the data to the untreated gestational diabetics and negative controls, are shown in Table 26.1. These data explore the significantly higher perinatal losses of the gestational diabetics in that study by subgrouping on maternal age and body weight. The data indicate that all of the losses among those with GDM are confined to women aged 25 years and over. Table 26.2 provides the mean venous whole blood glucose values obtained from the gestational OGTT results for the four GDM subsets in Table 26.1. No difference was found among the four groups with respect to blood glucose levels. In addition, the 1-h GTT values, averaging 174 mg/dl, were within 1 mg/dl of each other. It would appear from these analyses, then, that gestational hyperglycaemia in this study could be tolerated by the younger age group without adverse effects