Diabetes in Fiji:
an annotated checklist of Literature

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ABSTRACT

The compilers of this annotated bibliography on Diabetes abstracted published works, both within Fiji and abroad. The 62 articles mentioned are mainly from the Fiji Medical Journal. Others are from the Fiji School of Medicine Journal and the Fiji Food and Nutrition Newsletter. Of 62 articles abstrated, 27 were published abroad. Included in this are papers presented at seminars and conferences, and technical reports. Where available authors abstracts and summaries were used.

Bakani, I.R.
Acute myocardial infarction in Suva, Fiji.
N.Z. Med. J., 1975; 81 (536) : 288-92
A review of 100 cases of acute myocardial infarction admitted to the Colonial War Memorial Hospital in 1964 to 1965 is presented. The incidence of acute myocardial infarction in this series was 97 percent in Indians and 3 percent in Fijians. The predisposing factors such as diabetes mellitus, hypertension and hypercholesterolaemia are commoner in Indians than Fijians and their role in these patients are described. The mortality rate in the first week was 23.7 percent. A two bed coronary care unit was opened in this hospital last year as part of the overall care for these patients.

Bavadra, T.U.
Diabetes in Lakeba, Lau
Fiji Med. J., 1979; 7 (10) : 283-84
A diabetic case finding survey covering the 30+ age group in Lakeba island in Lau showed that 2.0% of people tested had diabetes mellitus as determined by positive urine and blood sugar tests.

Biumaiwai M, Bavadra T, Olakowski, T.
Population, Morbidity and Mortality in Fiji during last 100 years : Materials for WHO Intercountry Seminar on Strengthening of Epidemiological Surveillance System and Utilization of Existing Health Board in Pacific Island Countries, Kingdom of Tonga, 4-10 February 1984. Suva: Ministry of Health, 1984.
Brief mention of diabetes is made in this report. The mortality due to diabetes is on critical increase among both ethnic groups since 1971 among the age group 40-59 years. The mortality rates were higher in Indians than in Fijians.

Cassidy, J.T.
Diabetes in Fiji.
N.Z. Med. J. 1967; 66: 167-72.
The incidence of diabetes mellitus among 1000 adult Indians and 1000 adult Fijians has been investigated. Details are given for 410 diabetic hospital admissions.
The significant features of diabetes in Fiji are:

- The extremely high rate among the Indians
- The relatively low rate among the Fijians
- The lack of juvenile diabetes
- The extreme rarity of ketosis even under the stimulation of major sepsis.

Cassidy, J.T.
Differences in the incidence of certain diseases and their manifestations among the two races in Fiji.
Aust. N.Z. J. Med. 1973; 2: 217
The varying incidence of certain diseases among the two main races in Fiji, Fijians and Indians is discussed. Also the differing manifestations of these diseases among the two racial groups is dealt with. The main diseases dealt with are Diabetes and Ischaemic Heart Diseases — Diabetes because of the markedly different method of presentation in the two races and Ischaemic Heart Diseases because of the striking difference in the incidence of these diseases in Fijians and Indians. It is felt that in Fiji a long term study of Ischaemic Heart Disease in these two races which are roughly equal in number, one with extremely high incidence of Ischaemic Heart Disease and one with a very low one, would be very rewarding.

Christer V.
The Fiji Diabetic Association
Fiji Med. J., 1973; 1 (5) : 118-9.
Brief history of the formation of the Fiji Diabetic Association and its earlier activities.

FIJI — National Diabetes Centre
Patient educational pamphlets.
Available at the National Diabetes Centre and the Ministry of Health. The pamphlets includes:

1. Common questions in diabetes
2. How do I know I have diabetes
3. Learning to live with diabetes
4. Lead a normal life with diabetes
5. A diabetic diet is a healthy diet.
6. Foot care in diabetes

These pamphlets are available in English, Fijian and Hindustani.

Gyaneshwar R, Ram P.,
Diabetes in pregnancy.
Fiji Med. J. 1983; 11 (11/12) : 195-7.
Short review of diabetes in pregnancy and practical approach to the problem is discussed.

Hawley, T.G.
Diabetes Mellitus (editorial)
Fiji Sch. Med. J. 1971; 6 (2) : 23
Discusses the extent of the problem in Fiji and the importance of preventive measures.

Holmes, G, Komaivunuku S,
Diabetic Sepsis and gangrene in Lautoka
Fiji Sch. Med. J. 1979; 5 (8) : 16-18.
Report of 29 patients with diabetic sepsis treated at the Lautoka Hospital in 1969. The severity of the condition is emphasized.

King H, Zimmet P, Raper L.R., Balkau B.
Risk factors for diabetes in the three Pacific populations Am. J. Epidemiol 1984; 119 (3) : 369-409.

•The association between the prevalence of diabetes and three suspected risk factors — overweight, physical inactivity, and urbanization — has been studied in 5519 subjects from three Pacific populations : Melanesians and migrant Asian Indians in Fiji in 1980, and Micronesians in the Republic of Kiribati (formerly the Gilbert Islands) in 1981. Associations were found to be inconsistent between populations, and between the sexes within populations. In some cases, overweight was strongly associated with prevalence; in others, the principal variable

associated with diabetes appeared to be physical inactivity. More than one factor was associated with increased risk in Micronesians, and some evidence of interaction between factors also merged. Although longitudinal studies will be required for the complete elucidation of risk factors for diabetes, these findings suggest that risk factors may be heterogeneous in their effect upon different populations, and that an assessment of risk variables operating in a given target community may be of value in the initial phase of a diabetes prevention or control programme.

Lomani, S.
A Nationwide diabetic detection drive week 21st to 28th September, 1974.
Fiji Med. J. 1975; 2 (2) : 35-44.
In 1974 the Fiji Diabetic Association in conjunction with the Ministry of Health embarked on a nationwide diabetes detection drive. A total of 16,124 urine samples were tested, of which 1,410 (8.7%) were positive. Urine testing was on voluntary basis and virtually all those who volunteered were adults. In some areas the prevalence of glycosuria was 10.1% in Indians and even higher (12.3%) in Fijians. On the island of Ono-i-Lau in the Lau Group the prevalence of glycosuria was as high as 28%. Of 212 glycosuric who had their blood sugar level estimated 200 (94.3%) were considered to be diabetic.

Miller, M., Ram, P.
Diabetes sepsis
Fiji Med. J. 1979; 7 (6) : 152-4.
A study was undertaken to assess the possible reasons for the high incidence of sepsis in the local diabetic population. Diabetic sepsis was more common in Fijians than in other ethnic groups, and 80% of sepsis occurred in the lower limbs and of these half required amputation. The high incidence of sepsis is due to poor diabetic control, lack of adequate foot care and delayed, inadequate or inappropriate treatment of the early lesions. Undue susceptibility to infection in Fijian diabetics is another possible reason. The importance of foot care is emphasised.

Naidu V, Nasaroa J, Ram P.
Myocardial Infarction in Young Adults
Fiji Med. J. 1983; 11 (7/8) : 106-7.
Of 28 patients with myocardial infarction below the age of 40 years, all were Indian males. All except one presented with retrosternal chest pain lasting more than half an hour. Twelve patients had anterior infarction, 12 inferior and four had both anterior and inferior infarctions. None had a past history of ischaemic heart disease. Hypercholesterolaemia, cigarette smoking and family history were the most frequent risk factors. The presence of multiple risk factors was common; 39% had two risk factors and 47% had three or more risk factors. Eighteen percentage of patients had diabetes mellitus. The hospital mortality was low.

Nestel P. Ringrose H, Taylor R, Zimmet P, Sloman G.
High density lipoprotein apoprotein variability in a biracial population.
Ateriosclerosis 1983; 3 (2) : 132-7.
High density lipoprotein (HDL) cholesterol is a sensitive index for coronary disease in affluent societies. We have measured plasma apoprotein A-I levels (the major HDL protein) in randomly selected groups of urban and rural Fijian Melanesians and Indians. Despite higher prevalence rate of coronary disease and diabetes mellitus in Indians, Indian men and women had significantly higher A-I levels than Melanesian men and women. Multivariate analysis was carried out separately in all men and women of both races and also in younger men and women (less than 45 years old) to determine the predictive values of seven variables that might influence A-I levels. These variables accounted for about 16% of the A-I variation and of this more than one-half was due to ethnic origin. The remainder was largely due to three environmental factors: urbanization, alcohol consumption and physical activity. Men and women aged 20 to 44 years had significantly higher A-I levels in the town than in villages; alcohol drinkers had significantly higher A-I levels than non-drinkers, and in women physical inactivity resulted in significantly lower A-I levels. Age, smoking cigarettes, and body mass index did not contribute to the differences in A-I levels between the two races, despite less smoking and overweight among Indians. This study of a biracial population, that shares a similar environment but differs in cultural habits, had demonstrated the operation of genetic and environmental factors that explain a minor proportion of apoprotein A-I variability.

Patel I.C., Gopalkrishnan K.E., Ram P.
Acute Myocardial Infarction in Labasa
Fiji Med. J. 1983; 11 (7/8) : 110-12.
Cases of acute myocardial infarction admitted to the Labasa Hospital, the third major hospital in Fiji, over a 15 month period were reviewed. Of the 100 patients admitted, 93 were Indians and 7 were Fijians. The overall male:female ratio 10:1. The majority of the patients were in the 40-59 years age group and 18% were less than 40 years of age. Smoking, sedantary occupation, and hypercholesterolaemia were the most frequent risk factors. Nineteen percentage of the patients had diabetes mellitus. The hospital mortality was 19%.

Pathik B., Ram P.,
Acute Myocardical Infarction in Fiji.
In: Gwee, AL, ed. Fifth Asian Pacific Congress of Cardiology 8-13 October 1972. Singapore: Singapore Cardiac Society, 1972.
A three year retrospective study was carried on 227 patients with acute myocardial infarction at the CWM Hospital, Suva. The study revealed a high prevalence of myocardial infarction (6.3 per thousand) and at an early age, among Indians and very low prevalence among the Fijians (0.37 per thousand). Most patients presented with chest pain. There was a long delay of an average of 10 hours before hospitalisation. The major risk factors are hypercholesterolaemia, cigarette smoking, hypertension, diabetes and obesity. The overall mortality rate was 16%, a low figure probably accounted for by delayed admission to the hospital.

Pathik B, Ram P.
Acute myocardial infarction in Fiji : a review of 300 cases. Med. J. Aust. 1974; 2 : 922-24.
A study of 300 patients with acute myocardial infarction admitted to hospital between January, 1969, and October 1972, was done to determine racial incidence, clinical features, risk factors, complications and mortality. Of the 300 patients, 89% were Indians, 5.6% were Fijians, and 32% were in the 30 to 45 years age group. Of the risk factors, hypercholesterolaemia was present in 48% of cases and cigarette smoking in 56%; other risk factors were hypertension, diabetes and obesity. The mortality rate was 16%.

Ram B.P., Ram P.,
Hypertension and diabetes in Gau Island.
Fiji Med. J. 1983; 11 (3/4) : 35-8.
During the medical week programme (28 September - 2nd October 1981) the prevalence of hypertension and diabetes was assessed in Gau Island. In the residents aged 30 years and over the prevalence of hypertension 18% (males 12%, females 23%). The prevalence of diabetes mellitus was 3.7% and of glycosuria 15%. The problems of diabetes detection and management in isolated islands without facilities for blood glucose estimation, are discussed.

Ram P.
Cardiovascular diseases in Fiji — An overview.
Report to the Minister for Health and Social Welfare, 1983.
Brief summary of the disasterous trend regarding the Non-Communicable diseases in Fiji with particular reference to cardiovascular diseases and diabetes mellitus, the environmental determinants, pressing need for a National Non-Communicable Diseases Centres and a National Diabetes Centre, as well as reviving the Fiji Diabetic Association and the National Heart Foundation.

Ram, P.
Risks of Diabetes.
Fiji Food Nutr. Newsl. 1985; 6 (3) : 2, 7.
Major environmental factors in the aetiology of diabetes and preventive measures are discussed.

Ram, P.
Classification of diabetes mellitus and other categories of glucose intolerance.
Fiji Med. J. 1982; 10 (3/4) : 37-9.
New classification of diabetes mellitus and other categories of glucose intolerance is discussed.

Ram, P.
Diabetes care and treatment
Fiji Food Nutr. Newsl. 1985; 6 (2) : 4-5.
The important aspects of diabetes care and treatment are discussed.

Ram, P.
Diabetes explained.
Fiji Food Nutr. Newsl. 1985; 6 (1) : 4-5.
Major symptoms of diabetes mellitus are explained in relation to hyperglycaemia.

Ram, P.
Diabetes mellitus (editorial)
Fiji Med. J. 1982; 10 (1/2) : 2.
Discusses the magnitude of the problem in Fiji, the possible aetiological factors and the need for community based preventive measures.

Ram, P.
Diabetes mellitus in Fiji : current status
Fiji Med. J. 1979; 4 (3) : 68-71
Review of previous activities and the increasing problem of Diabetes in Fiji are discussed.

Ram, P.
Diabetes mellitus : How does this concern Fiji?
Fiji Med. J. 1983; 11 (11/12) : 186-89.
Diabetes mellitus is a major public health problem in Fiji at present. The prevalence and incidence are high (it is estimated that 1,000 adults may develop diabetes each year), yet more than 50 per cent of the diabetics in the community remain undetected. The major complications are frequent, 25% of all Myocardial Infarcts occur in diabetics. Diabetes is the 3rd most common cause of end stage of kidney disease. The proportionate mortality due to diabetes, is high, estimated to be at least 10%. The health expenditure on diabetes care is minimal and the treatment facilities are inadequate and this is further aggravated by the absence of a coordinating centre (diabetes centre).

Ram, P.
Diagnosis of diabetes mellitus and other categories of glucose intolerance.
Fiji Med. J. 1982; 10 (3/4) : 34-6.
Brief discussion on the National Diabetes Data Group and the World Health Organization criteria for the diagnosis of diabetes mellitus and other categories of glucose intolerance.

Ram, P.
Diet and diabetes mellitus
Fiji Med. J. 1982; 10 (3/4) : 42-4.
The importance of diet in the aetiology and the treatment of diabetes is reviewed.

Ram, P.
Diet, Diabetes and hypertension
In: Proceedings of Training Programme for Dietitians and Nutritionists conducted by the National Food and Nutrition Committee, Ministry of Health & Social Welfare with support from UNICEF: report by Indira Deo, Suva Food and Nutrition Committee, 1984: 49-53.
Discusses the high prevalence of diabetes mellitus and hypertension in Fiji and the role of diet in the etiology of these diseases.

Ram, P.
Metabolic diseases : Conference report.
Fiji Med. J. 1979; 7 (3) : 82-7.
Summary of metabolic disease conference held in Nauru in 1978.

Ram, P.
National Diabetes Centre
Science J. 1985; 1 (5) : 13-14.
The estabishment and functions of the National Diabetes Centre are discussed.

Ram, P.
National Diabetes Centre set for combat
Fiji Food and Nutr. Newsl. 1985; 6 (1) : 1
The establishment and functions of the National Diabetes Centre are discussed.

Ram, P.
National Diabetes Centre : National Training Centre, Education, Resource and Research Centre : Annual Report for the year 1984. Suva : Ministry of Health and Social Welfare, 1985.
The establishment, functions and activities of the National Diabetes Centre are discussed.

Ram, P.
Possible strategies to prevent or diminish the incidence of diabetes in developing countries.
Discussion paper — at the First WHO/IDF International Seminar on the Epidemiology and Public Health Aspects of Diabetes — Cambridge 1981.
Critical assessment of the recommendations of the WHO consultant for the control of the Non-Communicable Diseases including diabetes mellitus, following the 1980 National Diabetes and Cardiovascular Diseases in Fiji.

Ram, P.
Special problems of diabetes control in developing countries : experience from Fiji.
In: Tuomilehto J et. al. eds. Diabetes Mellitus : Primary Health Care prevention and control — I.D.F. Publication, 1982 p. 22-27.
Special problems of diabetes control include public unawareness of the magnitude of the problem, difficulties in diagnosis and case finding, limited resources, poor administration, poor patient compliance and lack of diabetes education and absence of coordinating centres.

Ram, P.
Who needs to know about diabetes?
Fiji Med. J. 1982; 10 (3/4) : 40-42.
The importance of diabetes education is discussed.

Ram P., Banuve S., Zimmet P., Taylor L.R., Sloman G., Hunt D.,
Diabetes in Fiji : the results of the 1980 National Survey.
Fiji Med. J. 1982; 10 (1/2) : 4-13.
Rural-urban and ethnic comparisons of diabetes prevalence were made in Fiji. The prevalence of diabetes was 1.1% in rural Fijians and 5.4% in urban counterparts. In Indians, the prevalence of diabetes was similar in rural and urban groups — 11.7% and 11.8% respectively. The prevalence in Lakeba Fijians was 5.7%.
If impaired glucose tolerance and diabetes prevalence are combined, the urban Fijian rate was 15.8% and urban Indian rate 22.2%. These are among the highest rates so far seen in Pacific or World populations. Evidence is presented here that links the change in lifestyle (i.e. modernization) and more particularly, a decrease in physical activity, as an important factor in these high rates of diabetes. In developing countries such as Fiji, the benefits of modernization of lifestyle have to be weighed against the escalating prevalence of chronic non-communicable diseases such as diabetes.

Ram P., Beg F.
Non-communicable Diseases (Editorial)
Fiji Med. J. 1982; 11 (7/8) : 87
Discusses the emerging problem of non-communicable diseases including diabetes, the environmental determinants and prevention.

Ram P., Collin V., Zimmet P., Taylor R., King H., Sloman G., Hunt D.
Cardiovascular disease risk factors in Fiji : the results of the 1980 survey.
Fiji Med. J. 1983; 11 (7/8) : 88-94
Certain conditions have been shown, beyond reasonable doubt, to increase the risk of cardiovascular disease in a number of populations. The results from the 1980 medical survey indicate that these risk factors are also present in both major ethnic groups in Fiji. Obesity, lack of physical activity, diabetes, hypertension, high plasma cholesterol concentration and smoking are all prevalent in Fiji. It seems that the urban population suffers more from most of the risk factors than does the rural. This could be due to the changes in lifestyle and diet which have occurred in the urban populations. The rural dwellers have a more traditional way of life, with local foods being their main source of energy. On the other hand, the urban areas have become more westernized and a large amount of the food is imported.
It is clear that active measures are indicated for the control of the risk factors for cardiovascular disease discussed in this paper before rates of disease discussed in this paper rise even higher.

Ram P., Mudaliar S.
Diabetes mellitus : Seminar report
Fiji Med. J. 1983; 11 (11/12) : 180-4.
Brief account of seminar on diabetes mellitus held at the Fiji School of Medicine on June 6 and 7th and at the Lautoka Hospital on June 8 and 9, 1983.

Ram P., Naidu V., Nasaroa J.
Myocardial Infarction in Fiji : 1979-1981.
Fiji Med. J. 1983; 11 : 101-4
The present study was undertaken to assess the current situation regarding myocardial infarction in particular to compare with that of a decade ago. Case notes of all 306 patients admitted to the C.W.M. Hospital over a 30 month period from July 1979 to December 1981 were reviewed. The age, sex distribution, clinical features, complications and mortality is similar to that of a decade ago. There has been some increase in Fijian patients with myocardial infarction. The time interval between the onset of symptoms and hospitalization was 5.5 hours, as compared to 10 hours in 1969-72 period. The major difference was in the frequency of risk factors. With the exception of hypercholesterolaemia, the present infarct patients have more risk factors compared to those of a decade ago. Twenty-five percentage of patients had diabetes mellitus.

Randall, G.R.
Diabetes mellitus in Labasa
Fiji Sch. Med. J. 1971; 6 (2) : 30-2.
Diabetes is a common cause of ill health in Labasa. Obesity is the principal problem. It seems hard to convince many of the patients of the importance of diets. Perhaps arranging for district nurses to check on patients from time to time will help.
There may be a good case for including Phenformin amongst the subsidized drugs supplied by the Medical Department.
Serious septic complications seem to be fewer in regular clinic attenders than in non-attenders, despite the rather unsatisfactory control of glycosuria in many of the former group.

Rathod C.B., Ram P.
Diabetes and eyes.
Fiji Med. J. 1981; 9 (12) : 188-92
The eye changes in diabetes mellitus are discussed.

Serjeantson S.W., Ryan D.P., Ram P., Zimmet P.
HLA and non-insulin dependent diabetes in Fiji Indians.
Med. J. Aust. 1981; 1 (9) : 462-4.
HLA frequency distribution in Fiji Indians with non-insulin dependent diabetes were compared with those in control subjects with confirmed two-hour plasma glucose levels less than 7.8 mmol/L. Antigen frequencies at HLA-A and HLA-DR loci were similar in patients and controls. At HLA-B, there was a significant increase in Bw61 (Bw40.2) in diabetics, with a relative risk for this antigen of 4.8. Since a similar finding has been reported previously in South African Indians with Insulin-dependent diabetes, it is possible that we have defined yet another genetically-distinct form of diabetes, especially prevalent in Indians. Alternatively, definition of new HLA alleles such as Bw61, a new subdivision of an established antigen, may reveal HLA associations with non-insulin-dependent diabetes in European Caucasians also.

Serjeantson S.W., Ryan D.P., Zimmet P., Taylor R., Cross R., Charpin M., Le Gonidec G.
HLA antigen in four Pacific populations with non-insulin dependent diabetes mellitus.
Ann. Hum. Biol. 1982; 9 (1) : 69-84.
HLA antigen distributions in persons with normal and abnormal glucose tolerance were compared in four Pacific Nations. The populations included Melanesians from the Fijian Islands, Loyalty Islands and mainland New Caledonia and Polynesians from the Wallis Islands. HLA-DR results are provided for the first time for Pacific groups. In Polynesians, HLA-B22 was increased in frequency in patients with non-insulin-dependent diabetes mellitus and also in persons with impaired glucose tolerance. However, the association was not statistically significant when corrected for the number of antigents tested. A similar increase in HLA-B22, although not significant, was seen in each of the three Melanesian populations with abnormal glucose tolerance. No other consistent increase in any HLA antigen occurred in persons with abnormal plasma glucose concentrations.

Sicree R., Ram P., Zimmet P., King H.
Follow-up study of diabetes-related mortality amongst the Melanesian and Indian population of Fiji.
In: Proceedings of the 3rd World Congress on Diabetes in the Tropics and Developing Countries, December 2-8, 1984, Bangkok, Thailand.
Diabetes Mellitus has been shown to be strongly associated with increased levels of microvascular and macrovascular disease in many populations including those in the Pacific. However, the association between non-insulin dependent diabetes (NIDDM) and mortality has not been studied in the Pacific to date.
The 1980 Cardiovascular and Metabolic Disease Survey in Fiji established the prevalence of several major cardiovascular risk factors, including NIIDM and Impaired Glucose Tolerance (IGT). In 1982 a follow-up study was commenced to determine whether NIDDM was associated with an increased risk of death and/or specific forms of morbidity amongst the survey responders in Suva, the capital of Fiji. Follow-up was initially retrospective, and has been by surveillance through medical records of hospitals, health centres, general practitioner surgeries and the Health Department. The study now covers a 4½ year period of follow-up. This report presents preliminary findings with respect to mortality in normal, IGT and diabetic subjects. A total of 1707 persons have been followed up, and 42 deaths have occurred amongst persons over the age of 45. There were 12 deaths from 339 persons (14%) in normal subjects, for the IGT group 6 deaths from 85 persons (7%), and for the NIDDM group 17 deaths from 132 persons (13%). Adjusting for age, the Mantel-Haenzel combined relative risk for diabetics compared with normals was 3.9 (highly significant). Logistic regression analysis including age, diabetes, body mass index and blood pressure still showed an independent effect for diabetes amongst this population on mortality. Further validation will be necessary before the possibility that these findings are due to an ascertainment bias can be excluded.

Sorokin, M.
Dietary Fibre and the saccharine diseases in Fiji.
Fiji Med. J. 1977; 5 (6); 109-114.
The possible role of dietary fibre in marked ethnic differences in disease patterns is discussed. The diabetes hospital admissions were six times as frequent in Indians than in Fijians.

Sorokin M.
Hospital morbidity in the Fiji Islands with special reference to the Saccharine disease.
S. Afr. Med. J. 1975; 49 (36) : 481-5.
The concept of the excessive consumption of carbohydrates as a cause of many diseases of civilisation has previously been proposed under the name of the 'saccharine disease'. A review of the hospital morbidity figures for these diseases in a divisional hospital in the Fiji Islands is presented. The hospital serves a population comprised of Indians and Fijians, suggesting comparison with the province of Natal, South Africa. Indians have a higher incidence of diabetes mellitus, myocardial infarction, duodenal ulcer, acute appendicitis, gallstones, renal stones, and exlampsia. Their diets differ mainly in the higher consumption of refined fibre-depleted carbohydrates, and it is suggested that the association is compatible with the concept of the "saccharine disease".

Sorokin M.
Myocardial infarction in Fiji.
Med. J. Aust. 1973; 2: 764-767.
Two hundred and twelve cases of myocardial infarction seen personally in a Fiji Divisional hospital are described. The majority of patients were male Indians and one-third were diabetic. The overall mortality rate was 24.1% although this is gradually decreasing. An attempt to lower the mortality rate by the use of a "preventive" regime without cardiac monitoring apparatus is described, the results showing no advantage over an empirical regime.

South Pacific Commission
Joint SPC/WHO meeting on metabolic disorders with particular reference to diabetes mellitus and gout, Nauru.
1978 report of meeting, Noumea: SPC, 1978.
This report reviews the current knowledge on the status of diabetes mellitus and other metabolic disorders in the Pacific region, and contains eleven recommendations to assist the Pacific Island governments and interested agencies in determining approaches to deal with the current and emerging health problems.

Sutton C.
Practical approach to problems of the parturient diabetic in developing countries.

Br. Med. J. 1977; 2 (6094) : 1069-72.
Improved management of diabetic pregnancies at Lautoka Hospital, Fiji, in 1976 resulted in a neonatal survival rate of 100%. Management

included attempts to control the maternal blood glucose concentration with insulin and delaying delivery until there was enough surfactant in the liquor to ensure a viable infant. The techniques are simple to use and require only minimal technological facilities.

Taylor R., Ram P., Zimmet P., Raper L.R., Ringrose H.
Physical activity and prevalence of diabetes in Melanesian and Indian men in Fiji.
Diabetologia 1984; 27 (6) : 578-82.
In Fiji Melanesian and Indian men, prevalence of diabetes is more than twice as high in those graded as sedentary or undertaking light activity as in those classed as performing moderate or heavy exercise. This difference was present in both ethnic groups, and maintained when age, obesity, and urban/rural-status were taken into account. It is concluded that, in the population under study, there is epidemiological evidence for the role of physical inactivity as an independent risk factor for Type 2 (non-insulin-dependent) diabetes.

Tuomilehto J.
Report on a field visit to Fiji 18 August to 14 September 1981: report Manila: WHO, WPRO, 1982. (WPR/CVD/FR/5).
A detailed report on the development of the National Diabetes and Cardiovascular Disease Control programme in Fiji.

Tuomilehto J., Ram P., Eseroma R., Taylor R., Zimmet P.
Cardiovascular disease and diabetes mellitus in Fiji : Analysis of mortality, morbidity and risk factors.
Bull. WHO 1984; 62 (1) : 133-43.
Mortality and hospital admissions due to cardiovascular diseases and diabetes mellitus have been increasing in Fiji steadily over the past 20 years. These diseases were present more frequently in the Indian than the Melanesian population of Fiji, but recently the steepest rise in prevalence rates occurred among the Melanesian population. The underlying conditions that contributed most to increasing mortality and morbidity were hypertension and diabetes mellitus. In 1978, the proportional mortality from diabetes mellitus was 6.0% (9.0% in persons aged ≥ 40 years). and that from cardiovascular diseases was 30.3% (39% in those aged ≥ 40 years). Ischaemic heart disease was the main cause of mortality and morbidity among the Indian population. This analysis of mortality and morbidity data is supported by the findings of a population survey, which showed that the prevalence rates of diabetes and hypertension in 1980 among urban Melanesians were similar to those among Indians. Urbanization and a modern life-style seem to play an important role in determining the disease pattern in Fiji, which is following the patterns in many industrial countries.

Tuomilehto J., Ram P., Rausuvanua E.
Mortality and morbidity in diabetes mellitus and cardiovascular disease in Fiji.
Fiji Med. J. 1982, 10 (3/4) : 45-57
This paper describes the magnitude and nature of diabetes mellitus and cardiovascular disease in Fiji based on the data from vital statistics and hospitals.

WHO
Outlines of non-communicable diseases programme with special attention to cardiovascular and diabetic control programme in Fiji — a report prepared for the Ministry of Health, Fiji in cooperation with World Health Organization, March 11, 1983 Suva : WHO, 1983.
This report discusses the extent of the problem in Fiji and the primary and secondary preventive and control measures.

WHO
Report of the joint WHO/SPC mission on prevention and control programme for non-communicable diseases in the South Pacific, 11-20th October, 1983. Manila : WHO, WPRO, 1984. [(WP) CVD/ICP/NCD/001]
Discusses the prevention and control of non-communicable diseases with particular reference to implementation and budgeting for such a programme.

Zimmet P.
Recent trends in the understanding of the aetiology and management of diabetes mellitus.
Fiji Med. J. 1979; 7 (9) : 263-7.
This paper is a brief review of the recent trend and current concepts of the aetiology and the management of diabetes mellitus.

Zimmet P., Taylor R., Ram P., King H., Sloman C., Raper L.R. Hunt D.
Prevalence of diabetes and impaired glucose tolerance in the biracial (Melanesian and Indian) population of Fiji : a rural-urban comparison.
Am. J. Epidemiol. 1983; 118 (3) : 673-88.
Rural-urban and ethnic comparisons of impaired glucose tolerance and diabetes mellitus were made in the biracial population of Fiji in 1980. No statistically significant differences existed in age-standardized impaired glucose tolerance prevalence between rural and urban groups or between Melanesians and Indians. The age-standardized prevalence of diabetes in the rural Melanesian male population was one-third that of the urban male population (1.1 vs. 3.5%). In females, there was a six-fold rural-urban difference (1.2 vs. 7.1%). By contrast, rural and urban Indians had similar rates (12.1 vs. 12.9% for males; 11.3 vs. 11.0% for females). Standardization of two-hour plasma glucose for age and obesity did not eliminate the rural-urban difference in plasma glucose concentration for Melanesian males and females. The results in Melanesians confirm previously reported rural-urban diabetes prevalence differences, and suggest that factors other than obesity, such as differences in physical activity, diet, stress, or other, as yet undetermined, factors contribute to this difference. The absence of a rural-urban difference in diabetes prevalence in Indians may suggest that genetic factors are more important for producing diabetes in this ethnic group, or that causative environmental factors such as diet operate similarly upon both the rural and the urban populations.

Zimmet P., Sloman G.
Prevention and control of cardiovascular and metabolic diseases. Assignment Report (Preliminary) Manila : WHO, 1980 [ICP/CUD/001.]
This report outlines the 1980 cardiovascular and metabolic Diseases survey in Fiji and the preliminary findings and recommendations for the control and prevention.

Zimmet P.
Prevention and control of cardiovascular diseases in Fiji. Assignment Report (Final Report) Manila, WHO, 1984 [(WP) NCD/ICP/CUD/001].
This is a very comprehensive report of the 1980 National Cardiovascular and Metabolic Diseases Survey in Fiji.

NOTE: Readers are requested to inform the compilers if they have contributed articles or are aware of publications on diabetes which are not included above. It is intended to compile a supplementary list if necessary.