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**Developing Diabetes Education Materials for Young Adults:
Using Focus Groups to Determine the Effectiveness of
Public Service Announcements (PSA) for Diabetes
Education in Solomon Islands**

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE
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ABSTRACT

PURPOSE: This study aims to identify and develop appropriate diabetes education materials and interventions for young adults in Solomon Islands. It also help in determining the effectiveness of diabetes messages and the appropriate mode(s) of delivering Public Service Announcements (PSA) in health education as well as assessing students' knowledge about chronic diseases, in particular, diabetes. **METHODS:** Forty students from 5 educational Institutions- one boarding and four day schools- in Honiara, the Solomon Islands' capital, were recruited to participate in focus group discussion sessions. Focus group sessions were held in pidgin (*pijin*) and audiotaped. The sessions were conducted by the Principal Investigator (PI) (who was also the moderator) and a dietitian as co-moderator. The co-moderator and participants confirmed the priority issues at the end of each session. The content of the transcripts was analyzed using the computer Excel spreadsheet, and chi-square and Fisher Exact Test for statistical differences in responses between schools and genders. **RESULT:** Participants showed that there is a marked improvement in their knowledge about diabetes and indicated inclination to change and live a healthful lifestyle. Participants acknowledged the effectiveness of radio PSA as an effective medium for diabetes education. Participants recommended that other than radio PSA, diabetes PSA should be extended and included with other health topics and integrated into school curriculum. Participants also recommended other media be used for diabetes education, including the use of audiovisual, especially videotapes and television, the print medium, and health workers.

CONCLUSION: A program based on the above recommendations would be effective in educating young adults about diabetes in Solomon Islands.

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CHAPTER 1 INTRODUCTION

Global health challenges have changed significantly since the beginning of the last century. From the mid-1900s, as medical science advanced and health services improved, more of the world's population had access to medical drugs and were relatively healthier. Advances in medical science, for example, made it possible either to eradicate or control communicable diseases such as polio, leprosy (Hansen's Disease), small pox and tuberculosis that had previously plagued many parts of the world. These positive developments were strengthened by improvements in medical administration and education that enabled more people to have access to health services and become aware of the causes and symptoms of diseases and how to prevent them.

By the late 1900s, however, the medical achievements of the last three to four decades were overshadowed by the emergence of a new health challenge: the rapid rise in prevalence of non-communicable diseases (NCDs) such as cardiovascular disease, cancer, chronic obstructive pulmonary disease, and diabetes mellitus. According to the World Health Report 2000, these NCDs contributed to almost 60% of global mortality (31.7 million deaths) and 43% of the global burden of disease in 1999 (WHO, 2005 b). These are diseases that are associated with changes in lifestyle and people's socio-economic situations.

In many developed societies, for instance, people were generally not doing as much physical exercise as they would have had in the previous era. In countries like the United States (US), Australia, and those of Western Europe, advances in transportation technology, for example, made it possible for many people to travel without having to

walk long distances. Furthermore, advances in manufacturing technology and the changing nature of work meant that many people did not have to engage in manual labor. This reduction in physical exercise has had detrimental impact on the health of individuals and society at larger.

This was exacerbated by changes in these societies' eating habits. More people now consume more processed foods. This is partly because such food became much cheaper and more accessible, but also because many people succumbed to the powerful images that multinational food manufacturers use in marketing their products.

In the underdeveloped countries, rapid urbanization and poor socio-economic conditions meant that many people could not afford healthful food, proper shelter, and sanitation. Consequently, many of them fell victim to NCDs. Their situation is often worsened by their inaccessibility to adequate and quality health services.

NCDs, therefore, affect both the rich and the poor, although with different degrees of impact. Because of this, a global and multidimensional effort is needed to address the increasing prevalence of NCDs. This involves understanding, not only the medical science of the disease, and the drugs required to treat them, but also the socioeconomic factors that underlie their causes. This means that those involved in addressing the problem must not only be medical scientists, but also sociologists and psychologists. Such a multi-dimensional approach is required to enable us to understand both the nature of social changes and why people behave in certain ways despite awareness of their actions. It also raises questions about the best way of informing people about the dangers of NCDs, and how such information might change human behavior.

This points to the central concern of this thesis: an examination of the effectiveness of different media in creating awareness about NCDs. This thesis, however, focuses more specifically on the examination of diabetes education in Solomon Islands. This is a Pacific Island country where diabetes mellitus is still in the lag stage of development, but rapidly becoming a challenge. This thesis discusses the nature of the problem and then examines the use of a different medium used to create public awareness about the disease and change social behavior in order to mitigate the problem. More specifically, the thesis examines the effectiveness of radio Public Service Announcements (PSA) as a medium for educating young adults about diabetes. This medium may have the potential to disseminate information about diabetes in particular and other NCD more generally.

There are four general questions that drive and guide the research agenda of this thesis: (i) Are the developed diabetes PSA clear and easily understood by young adults? (ii) Are the developed diabetes PSA relevant to young adults? (iii) Can radio be an effective mode for the delivery of diabetes PSA? , and (v) What appropriate mode (s) of delivery of PSA can be effective for young adults?

Study Objectives

The aim of the study is to provide an understanding of and to measure the effectiveness of radio PSA as a tool for diabetes education amongst young Solomon Islander adults. More specifically, the objectives of the study are:

- (i) To validate the clarity of developed diabetes PSA

- (ii) To test the relevance of the PSA contents
- (iii) To determine the effectiveness of radio PSAs in educating young adults about diabetes.
- (iv) To determine the effectiveness of and appropriate mode(s) of delivery of PSA in health education among young adults in SI.
- (v) To identify and develop appropriate diabetes education material and intervention for young adults in SI.

Thesis Outline

There are six chapters to the thesis. Chapter Two provides a broad global perspective of the nature of the diabetes problems and outlines the work and discussions that are taking place, both in academia and in government. In particular, this Chapter examines the diabetes education programs that have been attempted, the medium used, and some of the achievements and challenges of these programs. It also focuses on Solomon Islands. It provides an overview of the diabetes problem in the country, the various programs introduced as attempts to address it, and some of the achievements and challenges that these programs face.

Chapter Three describes the methodology and statistical analysis used in the study.

Chapter Four discusses the results of this particular case study in Solomon Islands. It outlines the findings of the study on PSA and school children in Solomon Islands.

Chapter Five provides an analysis of the findings of this study. This involves critical discussions of the Solomon Islands situation and making comparative references to the international context. This is to ensure that the finding of the Solomon Islands study is located within the global context. This could ensure that the Solomon Islands study contributes to the global efforts to address the diabetes problem.

Chapter Six provides some concluding remarks. I hope, these remarks will be useful in the development of policies and methods for public education about diabetes.

CHAPTER 2 REVIEW OF LITERATURE

Part I

Diabetes: A global Health Challenge

Diabetes is a global health challenge (WHO, 2001 a & b). Because of its widespread prevalence and rapid growth, there is a need to know as much as possible about the disease and put in place ways of addressing it.

Diabetes: What is it?

Diabetes mellitus is a metabolic disease characterized by elevated levels of glucose in the bloodstream. There are two types of diabetes mellitus classified according to the nature of onset and treatment (Shils, *et al.*, 1999; ADA, 2001). The first is Insulin Dependent Diabetes Mellitus (IDDM) or Type I diabetes. This occurs most commonly in children and young adults. It results from insufficient insulin produced by the beta cell of the pancreas, or from the total absence of insulin, causing accumulation of glucose in the blood. Due to the lack of insulin, a person with Type I diabetes must depend on daily injections of insulin.

A second type of diabetes is Non Insulin Dependent Diabetes Mellitus (NIDDM) or Type II diabetes. It occurs due to the inability of target tissues to use glucose efficiently because tissue sensitivity to insulin is lowered. In the past, Type II diabetes usually developed in adults, 40 years and older. Nowadays, however, it is becoming more common in overweight children, adolescents and young adults. Type II diabetes can sometimes be controlled by proper nutrition and lifestyle changes; but, in

some cases, oral glucose medication or insulin injection becomes necessary, especially as the condition progresses.

It is the Type II that is the more prevalent form of diabetes in Pacific Island Countries where changes in dietary habits, and reduced physical activity have subsequently led to increases in overweight and obesity in the population. This is particularly the case in urban centers where lifestyle changes have been more dramatic (WHO, 2001 a & b; Coyne, 1984; SPC/World Bank, 2003). This problem is, however, not unique to PIC. Type II diabetes affects some 151 million adults (4.6% of the 20 – 79 age group) worldwide (Lieberman, 2003). According to the International Diabetes Federation (IDF), the cases of Type II diabetes are projected to reach 300 million by 2025 (IDF, 2001). Further, the IDF states that more than 22 million children under five are now obese or overweight and, therefore, have the risk of developing Type II diabetes (IDF, 2005).

While there is still a need for research into risk factors for onset of Type I diabetes in the PICs, research has established both non-modifiable and modifiable factors for development of Type II diabetes. The major non-modifiable risk factor is genetic makeup. This includes variables related to a family history of diabetes, history of gestational diabetes, and age (40 years and older).

For Type II diabetes, as stated above, the factors that increase the risks of developing it are those that can be modified or prevented. These are linked to lifestyle, such as diets high in saturated fat, low in fiber, and with high glycemic load, and low physical inactivity. This leads to the prevalence of obesity, which is defined as a body mass index (BMI) of 30kg/m² or higher. Obesity has been increasing dramatically

worldwide. According to American Obesity Association (AOA) website, obesity is increasing at an alarming rate in both developing and developed countries and is becoming the world's biggest health problem (AOA, 2004). Recent reports suggest that obesity may soon overtake cigarette smoking as a serious health risk (UKHCHC, 2004). Prior website states that in the US, approximately 127 million adults are overweight; 60 million are obese and 9 million suffer from life-threatening obesity. Furthermore, 30.3 percent of children (ages 6-11) are overweight and 15.3 percent are obese. For adolescents (ages 12-19), 30.4 percent are overweight and 15.5 percent are obese. In the United Kingdom (UK), nearly two-thirds of men and over half of all women are now overweight – and 1 in 5 are obese (at least 30-40 pounds overweight). The level of obesity has tripled in the past 20 years, and is still rising. At this rate, by 2010 at least 1 in 4 adults will be obese in the UK (UK HCHC, 2004).

Obesity rates in developing countries are also rising (WHO, 2001 a & b; Burslem, 2004). Associated with this is the increasing prevalence of diabetes in these countries. This is also associated with rising poverty and the economic inability of people to afford nutritious diets, exercise, and a healthy life style in general. It is possible to prevent or delay the onset of Type II diabetes if these modifiable risk factors are reduced.

Pacific Island Countries and the Diabetes Challenge

Diabetes is one of the NCDs that has posed the greatest challenge for Pacific Island Countries (PICs). It is either widely prevalent, or is rapidly growing in most of

the island countries. As will be discussed in detail below, this is due largely to islanders' changing lifestyle and eating habits.

Here, the term "Pacific Islands Countries (PICs)" is used inclusively to refer to both the independent island countries like Fiji, Tonga, Samoa, Papua New Guinea, Solomon Islands, Vanuatu, Kiribati, Nauru, Tuvalu, Marshall Islands, Palau, Cook Islands, Federated States of Micronesia (FSM), and non-independent and self-governing territories like New Caledonia, Tokelau, Wallis and Futuna, Guam, North Mariana Islands, American Samoa, and Pitcairn Islands. These island countries represent a wide diversity of cultures and population size and are going through a wide range of political, economic, and social changes. These include a rapidly changing life style where traditional values, customs, and foods are replaced by "Western" lifestyle. Most of the island countries have also experienced rapid urbanization.

While the changes to island societies' lifestyles have had many positive impacts, there are also some negative impacts. In the past two decades, PICs have experienced two parallel, but contradictory developments in the health sector. First, there were general improvements in the health of many Pacific Islanders, as manifested in demographic and epidemiologic changes. These were largely a result of improved living conditions and greater accessibility to better health facilities, drugs, and trained health workers. Consequently, many Island countries have been able to control, and in some cases eradicate, communicable/infectious diseases such as tuberculosis (TB), polio, and leprosy. Further, in most countries there has been a decrease in infant mortality and an increase in life expectancy (SPC/World Bank, 2003).

In spite of these improvements, the changing lifestyle – in particular eating habits – of Islanders has engendered new health challenges. The most significant of these challenges was the rapid increase of NCDs (WHO, 2001 a & b). The United Nation’s World Health Organization (WHO) (WHO, 1999 a & b; WHO, 2001 b; SPC/World Bank, 2003), for example, notes that NCDs accounted for 53.3 % of all deaths for low and middle-income countries of the PICs compared to 35% due to deaths from communicable diseases (Table 1).

Table 1: Causes of death. Low/middle and high income countries, Western Pacific Region, 1998

Number of deaths and percentage

Cause of death	Low/middle Income	Percentage (%)	High Income	Percentage (%)
NCDs	729	53.3	1285	86.7
Malignant neoplasms	184	13.5	379	25.6
Other neoplasms	2	0.1	7	0.5
Diabetes	15	1.1	29	2.0
Nutritional/endocrine	2	0.1	9	0.6
Neuropsychiatric	17	1.2	41	2.8
Sense organs	0	0.0	0	0.0
Cardio Vascular	355	26.0	650	43.9
Respiratory	36	2.6	71	4.8
Digestive	71	5.2	59	4.0
Genito Urinary	25	1.8	25	1.7
Skin	1	0.1	2	0.1
Musculoskeletal	2	0.1	6	0.4
Congenital	19	1.4	6	0.4
Oral	0	0.0	0	0.0
CDs and other	479	35.0	108	7.3
Infectious and parasitic	273	20.0	29	2.0
Respiratory infections	111	8.1	55	3.7
Maternal	14	1.0	0	0.0
Perinatal	66	4.8	20	1.3
Nutritional deficiencies	15	1.1	4	0.3
Injuries	159	11.6	88	5.9
TOTAL DEATHS	1367	100.0	1482	100.0

Source: World Health Organization 1999 b [89]; SPC/World Bank 2003[57]

Furthermore, the Disability-Adjusted Life Years (DALYs), which is a measure of illness (morbidity), death (mortality) and disability due to NCDs, showed that the total burden of NCDs account for 42.5% of all DALYs lost in 1998 compared to 40.4% for communicable diseases in the same year for the Western Pacific region. These statistics indicate that NCDs are a significant burden for the PICs.

The severity of these problems is, however, not the same in all the PICs. Some PICs like Fiji, Samoa, and Tonga are well into the advanced stage of an “NCD epidemic” which has resulted in a higher economic cost. For example, according to a report compiled by the World Bank and Secretariat of the Pacific Communities (SPC) on economic cost and burden of NCDs in these countries, 11 - 27% of their total health spending was on NCDs. This compares to countries like Vanuatu, Kiribati, and Solomon Islands where the so-called “NCD epidemic” has not yet reached the advanced stage, although it is growing rapidly (SPC/World Bank, 2003; Coyne, 2000; Saadah, et al., 1995).

NCDs are “new” diseases that, as stated above, are related to changing lifestyle. Many Pacific Islanders, especially (but not exclusively) those who live in urban centers, have either abandoned, or marginalized their traditional values, customs, and lifestyles in favor of a “Western” lifestyle. This trend is not unique to PICs. Rather, it is a global phenomenon that is closely associated with modernization approach to development, which sees (and encourages) social change as a lineal progression from traditional to “modernity” (Popkin et al., 2002; Popkin, 2002; SPC/World Bank, 2003; WHO, 2005 a). Hence, many people perceive the consumption of Western goods (including food) as giving one social status in society, compared to local goods. Such perceptions have

been exacerbated by the onslaught of commercials in the mass media and by the representation of Western goods as being not only more valuable, but also carrying greater social status.

The changes in Pacific Islands societies are also due to the increasing importance of a cash economy, which, since the late 19th Century, has attracted many able-bodied Islanders to work in plantations, and later in factories, offices, fishing boats, and any other place where they could trade their labor for an income. While the income enabled them to purchase Western manufactured goods (and food), it took them away from their food gardens where they used to produce much of their food. This means, therefore, that the consumption habits of many Islanders have changed; they no longer eat the root crops (taro, banana, cassava, yam, sweet potatoes), vegetables, and fish that they used to have. Instead, they have replaced them with processed foods such as rice, canned food, and other high-calorie food. In Tonga, for example, it was documented that imported foods such as corned beef, mutton flaps, chicken, and refined carbohydrate have recently increased and replaced traditional diet (Evans, *et al.*, 2002). Further, the shift away from the village to the urban centers and from the food gardens to offices and factories has also reduced the level of many Islanders' physical activities.

These changes in diet and in reduction of physical activities have contributed to increasing weight and higher body mass index (BMI) amongst Pacific Islanders, which lead to a higher risk of Type II diabetes. This is evident in Fiji where, between 1965 and 1993, there was a 433% increase in diabetes amongst the indigenous urban population (Lako, 2001). A recent study on diabetes prevalence in Tonga showed an approximate doubling of diabetes since 1973 (Colagiuri, *et al.*, 2002). In Papua New Guinea, it

seems probable that there has been a rise in prevalence with time for urbanized Melanesians (Cockram, 2000). The data are limited for other PICs, but they are faced with similar challenges.

Despite the widespread awareness of the enormity of the problem, analysis and deep understanding of the challenge is constrained by poor data collection mechanisms, and hence, to the unavailability of reliable data. This is the case for nearly all PIC, but especially so for countries such as Solomon Islands where state institutions have been severely affected by internal civil unrest. Most PICs depend on the Secretariat of Pacific Community (SPC) for data collection and analysis, and the monitoring of health situations. However, as stated in United Nation Development Program (UNDP) Common Country Assessment (CCA) Report, “The Secretariat of the Pacific Community is the regional agency with the mandate for the collection of statistical data and support to PICs but it lacks the resources to address all important PIC needs” (UNDP, 2002 a). Thus, available data should be interpreted with caution.

Despite the limitations of data collection and analysis, there is enough evidence to indicate that NCD are increasing rapidly, and could have negative political, economic, and social impact on PIC. Consequently, there is a need to put in place and implement prevention and intervention programs that could help alleviate the problem. Nutrition education is, for example, integral to the successful prevention and management of NCD, especially diabetes. In acknowledging this, PIC have either collectively, or individually, developed a number of such education programs as means to educate the public about diabetes (SPC, 1992; SPC/World Bank, 2003). In Tonga, for example, King Taufa’ahau Tupou started a weight loss and health improvement

program called “His Majesty Healthy Lifestyle.” This program provides nutrition education for the public by promoting the benefits of weight loss, a healthful diet, and increased physical activity. In Samoa, a local Non-Governmental Organization (NGO) produces a weekly television program that promotes the use of vegetables in order to form a healthful diet. This television program has subsequently led to the development of a cookbook aimed at educating the public about simple, nutritious recipes (SPC/World Bank, 2003).

The rapid growth in NCD cases in PIC is not only a health issue. It is also a growing social and economic concern as the costs of treatment and the disability of a potentially productive population increases. This points to the need for the development and implementation of policies that would address the problems (SPC/World Bank, 2003; WHO, 1998). In 1998, for example, the direct costs of NCDs (including diabetes) for Fiji, Samoa, and Tonga were about 11%, 27%, and 17%, respectively, of the total health expenditure of each country (SPC/World Bank, 2003). The social and economic burden of NCD for PIC becomes more evident as more data on the diseases are collected and analyzed. It is important to note, however, because of governments’ limited capacity to collect and analyze data on the health sector, there might be an underestimation of direct costs of NCD.

The 37 countries/territories and areas comprising the WHO Western Pacific Region (WPR) are: American Samoa, Australia, Brunei Darussalam, Cambodia, China, Cook Islands, Fiji, French Polynesia, Guam, Hong Kong (China), Japan, Kiribati, Lao People's Democratic Republic, Macao (China), Malaysia, Marshall Islands, Federated States of Micronesia, Mongolia, Nauru, New Caledonia, New Zealand, Niue, Northern

Mariana Islands, Palau, Papua New Guinea, Philippines, Pitcairn Islands, Republic of Korea, Samoa, Singapore, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Viet Nam, and Wallis and Futuna (WHO, 1999 b) .

Diabetes accounts for increasing morbidity and mortality especially from complications such as cardiovascular diseases, renal failure, foot ulceration, lower limb amputations, retinopathy and neuropathy amongst WPR, including PIC (WHO, 1999 a & b; Anderson, 1999). Cardiovascular diseases account for 26% of deaths in lower income countries in the WPR whereas deaths from the later ones (renal failure, foot ulceration, lower limb amputations, retinopathy and neuropathy) differ within countries. Note that low and middle-income countries in the WPR do include most of PICs.

Type II diabetes pose a rapidly growing health challenge to Pacific Islanders. It currently ranks in the top five causes of death in 11 of 21 PIC (PIN, 2002; SPC/World Bank, 2003; WHO, 1999 a & b; SPC, 1992). In most PIC, data sources lump together both types of diabetes making it difficult to provide a precise representation of the prevalence of Type II diabetes mellitus. According to the WHO, however, Type II diabetes mellitus accounts for over 90% of all diabetes cases in PIC (WHO, 2001b).

Diabetes complications result from delayed diagnosis, lack of treatment or inappropriate treatment, or acute illness (Shils, *et al.*, 1999; Coyne, 2000). These complications include acute ones, such as hypoglycemia (abnormally low glucose level in blood), hyperglycemia (excess glucose in blood), ketoacidosis (excess production of keto acids), and hyperosmolar coma (Anderson, 1999; ADA, 2001). Chronic complications include heart diseases, stroke, foot ulceration, gangrene and lower limb amputation, visual impairment and blindness, and renal failure. In the PICs,

approximately 40% of people with diabetes have diabetic nephropathy and 7% have amputations (WHO, 1998; WHO, 1999 b; SPC/World Bank, 2003). However, over half of individuals who have type II diabetes remain undiagnosed in most PICs.

Studies in the Pacific demonstrate a diversity of prevalence rates between island countries (WHO, 2001 a; SPC/World Bank, 2003). Table 2 gives the details of diabetes mellitus prevalence in selected PICs. In Solomon Islands (rural male), for instance, the prevalence rate was 0%, compared to Nauru where it was over 40%. The PICs also exhibit some of the highest recorded prevalence of diabetes globally. In Nauru, for example, the prevalence rate was about 42% compared to 3.6% in Australia, and 4.2% for the United States 4.2% (SPC/World Bank, 2003; Coyne, 2000; WHO, 1999 a).

Table 3: Diabetes prevalence in PICs (%)

Country	Ethnic group	Male Urban	Rural	National or Unspecific	Female Urban	Rural	National or Unspecific
Cook Islands	Polynesian	7			10.1		
Fiji	Melanesian	5.2	2.1		11.9	1.7	
	Indian	23.6	23		20.3	16	
Kiribati	Micronesian	15.8	4		13.4	4.6	
Micronesia, FS	Micronesian	12			15		
Nauru	Micronesian			40.6			42
New Caledonia	European	2.8	4.9		5.6	5	
	Melanesian	5.2	3.5		7.5	5.8	
Niue	Polynesian			7.9			10.4
Papua New Guinea	Wanigela	27.5	17.2		33	10	
	Kalo		0.6			2.4	
Samoa	Polynesian	9.5	5.3		13.4	5.6	
Solomon Islands	Melanesian	0	0		1.4	1.5	
Tokelau	Polynesian			3.4			6.5
Tonga	Polynesian	5.5	4.7		9.7	10.1	
Tuvalu	Polynesian	1.3			6.3		
Vanuatu	Melanesian	2.1	1		12.1	0.9	
Wallis and Futuna	Polynesian			3.2			4.7

Source: World Health Organization, 1999 b [89] Secretariat of the Pacific Community/World Bank, 2003 [57]

Over the past decade the reported cases of diabetes in Fiji, French Polynesia, New Caledonia, Papua New Guinea, the Cook Islands, and Samoa increased at an alarming rate of 200% (SPC/World Bank, 2003). This increase was associated with a

high rate of urban migration, which subsequently changed lifestyles. In particular, urban populations are more likely to have poorer diets and less likely to be engaged in physical activities because of the nature of their work. It was previously estimated that by 2010 there will be over 200,000 persons with diabetes in the PICs (SPC, 1978; Coyne, 1984; WHO, 2001 a & b). Furthermore, it was recently been projected that the largest rise in the number of people with diabetes will be recorded amongst the economically productive age groups of 20-64 years (PIN, 2002; de Onis, 2000).

These alarming statistics are a cause for concern because, as stated above, diabetes could have a tremendous impact on Pacific Island societies. The cost of treating diabetes could be enormous, and unaffordable for most PICs whose economies are small and not performing well. Further, a disease-prone young, potentially productive population would mean a reduction in productivity, and thus exacerbate the countries' poor economic performances. In societies where family values and interdependence are paramount, and where the very young and very old are dependent on able-bodied family members, a sickly population would have negative impact on the societies' safety mechanisms, such as accessibility to food, shelter, health care, and even financial income.

Part II

Diabetes in Solomon Islands: An emerging challenge

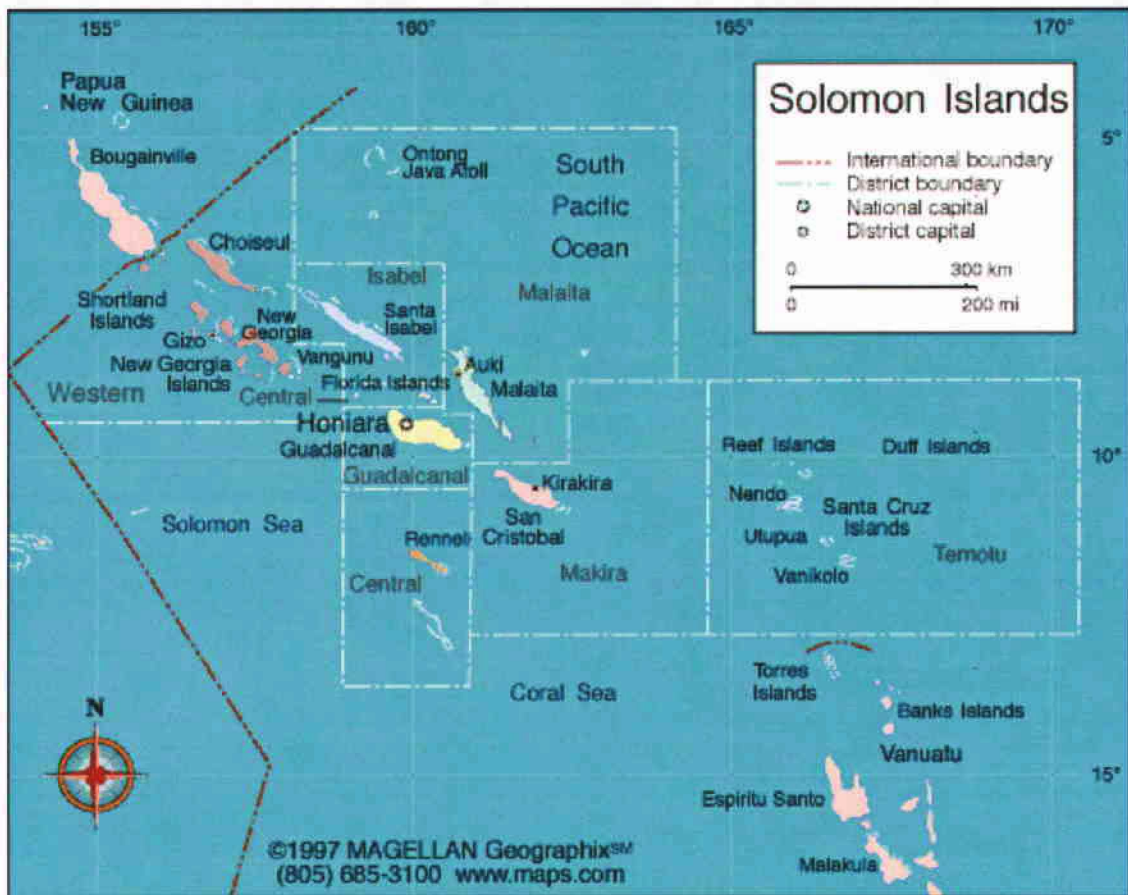
Like other Pacific Island Countries diabetes is an emerging health challenge in Solomon Islands. This is in spite of the fact that Solomon Islands' is one of the PICs that is currently in the "lag stage" of a "diabetes epidemic." This means that the

prevalence of diabetes is lower compared to other PICs. However, like other countries in the region, Solomon Island societies are also experiencing social, economic, political, and cultural changes that will affect health related-behaviors and lifestyle. The rapid increase in the disease's prevalence is a cause for concern.

Overview of Solomon Islands

Before discussing the nature of the diabetes challenge, it is useful to provide some brief geographical, demographic, and socio-economic background on the country. Solomon Islands is an archipelago of 922 islands about 1,860 kilometers north east of Australia and located between 5 and 12 degrees south latitude and 155 and 170 degrees east longitude. The group consists of six large islands (Choiseul, Isabel, Malaita, New Georgia, Guadalcanal and Makira), twenty medium-sized ones, and hundreds of smaller islets and reefs. These lands stretch in a double chain for over 1,800 kilometers from the Shortland Islands in the northwest to Tikopia and Anuta in the southeast, and nearly 900 kilometers from Ontong Java atoll in the north to Rennell Island in the south (see Map, Figure 1). Of these islands, only 347 are presently inhabited. The total land area is 28,369 square kilometers, which makes Solomon Islands the second largest insular nation of the south Pacific, after Papua New Guinea (PNG) (Stanley, 1999; BBC News, 2003). According to the 1999 household and population census, the country has a population of about 450,000, with more than 50% below the age of 15, and an average annual growth rate of 2.8% (SIG, 2002). This is a decline from the previous average annual growth rate of 3.5%.

Figure 1: Solomon Islands Map



Source: <http://www.infolapse.com/atlas/country/solomonislands.html>

It is estimated that if the current growth rate continues, the population will reach 800,000 in 2025, with a rapid increase in the younger (15 – 25 years old) population. This means that young people are important, and must be regarded as an important resource and target for health education programs, especially those relating to diabetes and other NCDs.

Solomon Islands, like other PICs, has experienced two parallel developments in the health sector in the past three decades. First, since gaining constitutional independence from Great Britain in 1978, the country has seen some overall

improvements in the health sector. More clinics were built, more health workers were trained, and people were generally more health conscious. For instance, there are currently eight hospitals in the country, compared to five in 1995- the major one is the National Referral Hospital, which, is situated in the capital Honiara. Between 1999 and 2003, there were about 59.5% of all health workers and professionals were trained and qualified (SI MHMS, 2003 a). Overall health status has improved since the mid-1970s. The best indicator of this improvement is the decrease in the infant mortality rate from 70 deaths per 1,000 live births in the 1970s to a low of 44 deaths per 1,000 live births in 1992. Mortality rates from communicable diseases have, for instance, decreased and have been progressively controlled in the past three decades (Saadah, *et al.*, 1995). This positive development was made possible by the fact that the period from independence to the mid-1970s witnessed significant economic growth, and an improvement in the government's ability to provide social services, such as healthcare.

While these improvements were taking place, however, a second development has taken place. There has been an increasing number of NCDs such as cancer (especially cervical, and breast cancer followed by lung cancer), diabetes, and hypertension (SI MHMS, 2003 a; Saadah, *et al.*, 1995) in the past two decades due to changing lifestyles, especially dietary habits. This is particularly, but not exclusively, the case in the rapidly growing urban populations.

The country's declining economic performance, which severely affected the government's capacity to provide social services, like health, and facilitate development, worsened the situation. From the late 1980s, the country's economic performance started to decline, owing largely to poor management by successive

governments. This greatly affected the ability of the government to maintain and improve the provision of health services. Consequently, out of the 174 countries ranked on the United Nation Human Development Index (HDI), Solomon Islands' was ranked 121, which was low by global standards (UNDP, 1999). This HDI ranking compares unfavorably to other PIC like Palau that ranked 46 – the highest for PIC – and favorably to the lowest, Papua New Guinea, at 164.

Solomon Islands' situation was further affected in recent years by a violent civil unrest, which started on the island of Guadalcanal in late 1998 (Kabutaulaka, 2002; UNDP, 2002 a) and left the country's economy in disarray, caused social dislocations, and dramatically reduced the government's capacity to provide social services such as health. The country's economy deteriorated further, undermining the government's ability to provide and maintain adequate social services. Gross Domestic Product (GDP) fell by 14% in 2000 and 10% in 2001. Between 1996 and 2001 exports had declined 60% and GDP per capita had halved in real terms since independence in 1978 (ASPI, 2003). By mid 2003, the country's debt was registered at AUS\$352 million, more than three times the country's annual budget. In a statement the Governor of the Central Bank, Rick Hou, reported that since 1999 the Government had defaulted on all interest as well as on some principal payments, and had failed to bring spending under control (ABC News, 2003). This situation was described vividly by the Central Bank of Solomon Islands (CBSI):

Since 2000, the Solomon Islands economy had severely contracted causing a fall in incomes, increased unemployment and widespread poverty, and the poor delivery of social services, particularly *in the education and health sectors*. In fact, without the goodwill of the donor community, services in these two important sectors would have discontinued early in the year (CBSI, 2003).

In June 2003, in reaction to continuing violence and because of concerns about broader global security issues, Australia led a Regional Assistance Mission to Solomon Islands (RAMSI) (Kabutaulaka, 2002). Since the deployment of RAMSI the country's economy has slightly improved, although it is still a long way from restoring the provision of adequate and quality social services, such as healthcare.

The development problems that the country faced in the past years have exacerbated the emergence and rapid growth of the prevalence of NCDs like diabetes and other health problems. Most of the cases of diabetes in the Solomon Islands are Type II diabetes, which, like other PICs, is associated with urbanization, poor diet, and physical inactivity (SPC/World Bank, 2003; WHO, 1999 a & b). Even though Type II diabetes has been somewhat common with older people and in urban populations, "it is now becoming common in young adults and rural populations." This was a statement made by Ministry of Health and Medical Services (PFNet, 2001 b).

In the past Solomon Islanders have, traditionally, practiced subsistence farming and produced nutritious foods that were readily available. People were also physically active because they were engaged in manual labor. This has, however, changed in the past three decades because of the similar kinds of socio-cultural and economic changes that are occurring in the Pacific Islands, as described above. There is a shift towards cash crops such as copra, palm oil, large-scale fishing and forestry that have taken labor away from the production of food crops (UNDP, 1999; World Bank, 2000). Although people still do subsistence farming, there is a growing preference of manufactured foods. This is because processed foods like noodles, canned tuna, and rice are easier to

obtain – you can simply buy them from shops – and because there is social status attached to the consumption of such foods. The preference for manufactured foods has resulted in an increase in the country's imports. In 1999, for instance, the average food import was 14% of total import expenditure (\$SBD83.0 million) compared to 10.2% reported in 1986 (World Bank, 2000). The imports of consumer goods, including food, remained almost unchanged during 2000 but soared by 36.6% (\$SBD108.4 million) in 2001 and increased by 3.2% (\$SBD112.3 million) by 2003 (CBSI, 1999, 2000, 2001, 2000, 2003). These were mainly highly refined or processed foods such as sugar, white rice, white flour, and canned goods. This is a change from the traditional diet of root crops such as sweet potato, yams, taro, and cassava; coconut; fresh fish; and green vegetables, to a diet with lower vegetable content and higher intake of white rice and bread, flour, tinned fish, sugar, salt, and alcohol (Coyne, 1984; Coyne, 2000; SPC, 1978). Consumption of these less nutrient-dense, high kilocalorie foods, combined with lack of physical activity, has led to surplus of available energy that is converted into body fat. This can then lead to obesity, which is a risk factor for developing Type II diabetes. In Solomon Islands, these changes are more evident in urban populations, but also occur in rural areas.

As stated above, the overall prevalence of diabetes appears to be low in the Solomon Islands compared to other PICs. According to initial diabetes surveys in 1966 and 1972, no diabetes was found in rural populations compared to ones that were more acculturated to western contact (Eason, *et al.*, 1987). Similar data had been found in 1985, but risk factors for diabetes were starting to emerge. A 1989 National Nutrition Survey found that 33% of women were classified as overweight and 11% as obese in

the Solomon Islands (SIG, 1989). This illustrates that the severity of the risk factors for Solomon Islands was similar to those of other PIC where diabetes was more established.

In 1999, over 600 diabetes patients, mainly in the capital, Honiara, were registered at the Solomon Islands National Diabetes Center (SINDC). Of these, approximately 30% had already developed complications such as foot ulceration, retinopathy, heart diseases, and renal failure (DPC/NCD Unit, 2001 b). In 2000, there were 2000 cases with accumulation of new cases, including records from rural areas (PFNet, 2001a). In the same year, 31 complications such as amputations of upper or lower limb, renal failure, and retinopathy were admitted to the National Referral Hospital (NRH). This number increased to 58 in 2001, with more in males being affected than women (DPC/NCD Unit, 2001 a). Most recent data from the SINDC for 2002 and 2003 showed a 10-fold increase in diabetes since 1998 (SIBC News, 2004). The incidence of confirmed cases by gender was 70 and 63 new cases for male and female, respectively, in 2002, and 180 and 90 respectively in 2003. SINDC also reported on the increasing new cases from provinces, particularly Malaita, Western, and Guadalcanal, from 2000 to 2003. These provinces have urban centers that are likely to influence population lifestyle, including eating habits. These data show that diabetes has increased proportionally in both genders (PFNet 2001 a & b). The SINDC also reports that most diabetic patients are between ages 31 and 65, with the youngest recorded so far between ages 21 and 30.

Diabetes is a chronic disease and can have profound impact on health status, such as well-being and life-expectancy; on social status, such as lifestyle and relationships; and economic status, such as work productivity and income.

Economically, the high cost for the treatment for diabetes and its complications is becoming a critical concern for the Solomon Islands health care system and the patients' families. In the Solomon Islands, most cases seen have already developed complications and the cost of treatment is high. Furthermore, the treatment for severe complications cannot be done in the country due to the lack of facilities, equipment and trained personnel. Thus, patients must travel overseas, usually Australia. In most cases this is difficult due to financial constraints on the part of the patients' family, as well as on the economy of the country. In 2001, for example, the health care system was unable to provide insulin to patients who required it in order to manage their diabetes. Some, who could afford the cost, bought insulin from private pharmacies. The ones who could not afford it, however, went without treatment. Furthermore, diabetes complications can cause less productivity, which will lead to slow economic growth and development of the country (DPC/NCD Unit, 2001 a & b). In addition, death associated with diabetes complications has continued to increase because the country cannot meet high cost of diagnosing and treating diabetes, caring for the disabled, and sending patients overseas for medical treatment.

Diabetes also impacts peoples' health and social status. People with diabetes are likely to be admitted to a hospital and, once admitted, are likely to have a prolonged length of stay. In the presence of complications, associated costs will increase. Diabetes also can create disabilities that may cause pain and suffering. Furthermore, loss of employment, added cost of caring for the sick, and decreased household income due to illness and death may follow. These socioeconomic and health impacts are likely to

increase significantly over the next 10 years unless preventive measures are taken into consideration now (WHO, 1999 a & b; SPC/World Bank, 2003).

Part III

Diabetes Prevention and Education in Solomon Islands

Nutrition education is integral to both primary and secondary prevention of diabetes (DPC/NCD Unit, 2001 a; Pan, *et al.*, 1997; DCCT, 1993; SPC/World Bank, 2003; WHO, 1999 a). Primary prevention involves prevention or delaying the onset of diabetes in susceptible individuals. In communities this can be achieved by increasing public awareness of more healthful lifestyles and reducing risk factor for type II diabetes, such as obesity, unhealthy nutrition, and lack of physical activity. To accomplish this, the public or communities should be educated on the negative impacts of diabetes in order to prevent members of the healthy population from developing risk factors. This could involve an increase in public awareness of the risk factors and the significance of risk factors, an emphasis on healthful diet, and physical activity.

The effectiveness of such primary prevention was illustrated in the DaQing study conducted in China, which showed a 46% reduction in progression from Impaired Glucose Tolerance (IGT) to diabetes over a six-year period (DCCT, 1993). This was the result of a continuous program on dietary modification and increased physical activity. Secondary intervention, on the other hand, involves the management of diabetes. This includes preventing, or delaying the development and progression of diabetes complications through diabetes education programs. A number of studies on secondary

intervention, such as patient education and improved clinical management, showed a reduction in the number of complications, such as blindness, kidney failure, and amputations in people with IGT (DCCT, 1993; Pan, *et al.*, 1997; Larson, *et al.*, 1995). Amongst people without retinopathy a 65% decrease was found with intensive therapy compared to 50% in people with retinopathy (Pan, *et al.*, 1997). Several other studies showed a successive reduction by 30%-65% in amputation and foot ulcers due to intensive screening and education programs (Larson, *et al.*, 1995). These studies suggest the importance of both primary prevention and secondary intervention. In view of primary and secondary prevention programs in the Pacific region, data are limited for most PICs. However, a report on successful secondary prevention was reported in Tonga. This Pacific Island country engaged a diabetes program in 1992 and established a Diabetes Center with the financial help from Australia. This led to the opening of the National Center for the Prevention and Control of Diabetes and Cardiovascular Disease and Healthy Lifestyle Promotion in 1993. After the establishment of this center, the number of diabetes amputations has dropped by more than 50% in the last decade (UNSW, 2004). Solomon Islands, with the help of outside funding, also established a Diabetes Center, but reports of similar success are not available.

PICs, including Solomon Islands, could systematically and promptly apply both primary prevention and secondary intervention to address the emerging diabetes problem. This is especially important for Solomon Islands, a country that is still at the lag stage of the diabetes epidemic and wishes to prevent it from becoming the serious problem that it is in countries like Nauru (SPC/World Bank, 2003). If this is not done,

then the projected large increases in the incidence of diabetes will, in the next few years, lead to major economic, social, and health problems.

Educational models: availability and challenges

In response to the “diabetes epidemic,” increased priority has been given to diabetes and related NCD in many PICs. WHO Regional Office for the Western Pacific Region (WPR), in partnership with International Diabetes Federation (IDF) and SPC, has developed and fostered regional and national action plans in the prevention and control of diabetes for the WPR, including PIC (WHO, 1998) and has encouraged appropriate bodies to implement plans in specific countries.

In Solomon Islands, the Ministry of Health and Medical Services is implementing the WHO recommendations as part of the National Plan of Action. The majority of the programs are carried out by the DPC/NCD Unit and the Solomon Islands National Diabetes Center. The programs target in-patients, and supports diabetes workshops for health professionals (DPC/NCD Unit, 2001 a & b).

The National Diabetes Center was established in 1996 to train staff and patients on diabetes management and prevention. Patients also utilized the center to receive treatment, counseling, and resources to manage diabetes and prevent complications. Center staff travel to other provinces to run workshops, mainly to increase health workers knowledge of diabetes guidelines so that they will be able to diagnose, manage, and raise diabetes awareness successfully in communities.

While these are positive developments, there remains the need for policy development and more training for provincial coordinators, development of

teaching/education aids and material, and increased resources not limited to hospitals but accessible to public, such as schools and training centers. According to the DPC/NCD Unit annual report of 2001, the activities to address NCDs, including diabetes, in the Solomon Islands are running slowly but effectively (DPC/NCD Unit, 2001 a & b).

Education is clearly essential to the successful prevention and management of diabetes. Primary prevention is an important aspect to combat the increasing burden caused by diabetes. For most NCD, including diabetes, primary prevention comes with a relatively low cost compared to secondary intervention (SPC/World Bank, 2003). Given the high cost associated with secondary interventions such as treatment and management services, primary prevention should be considered because it is cost-efficient and can decrease the total cost of the disease (SPC/World Bank, 2003; WHO, 1998). This can be achieved through nutrition education. This is helpful, especially for Solomon Islands, where even with lower diabetes prevalence compared to other PIC, it has been demonstrated that there are economic difficulties in management and treatment of diabetes. Thus, investing in a primary diabetes prevention and control program will be economically and socially beneficial to both society and individuals.

Modes of delivering nutrition education

There are a number of nutrition education approaches that could be used to raise diabetes awareness and prevent the disease before it becomes an epidemic. These nutrition education approaches include the use of print and electronic media – visual, audio, and more recently, the Internet (Schwartz & Fielding, 1986).

Print media use printed words that are presented in a variety of forms: booklets, pamphlets, fact sheets, posters, billboards, magazines, and newspapers. Audio media, however, use the spoken word and are transmitted through radio, audiocassettes, CD, and telephones. The visual media use technologies such as slides, films, videotapes, and television. Internet is the most recent technology and, where it is available, has become the fastest growing mode of communicating information to the public.

The advantage of the print media is its effectiveness in educating a person about diabetes because the person can study its content independently when, where, and as often as it is convenient. Furthermore, it is inexpensive to produce. A study on seniors showed that the use of posters and pamphlets were found to be effective in providing nutrition concepts (Weiss & Davis, 1985). The main disadvantage, however, is the possible delay in feedback from peer review on content and appropriateness. Also, providing information not equal to learning or using it. In societies of low literacy such as Solomon Islands, this could be a problem not only because of the high cost associated with the production of print media but also because a majority of people would not be able to read them.

The use of audio media is the most economical and at the same time effective in reaching a larger part of a public population (Hendy, 2000). The major disadvantages are the requirement of a functioning radio station and the unavailability of radio reception to certain populations. In the Solomon Islands, the government spends about 11.6% of the total government expenditure on health services (SIG/UNDP, 2002). According to a source from the Ministry of Health, annual budget for health education is about \$SBD60, 000 to \$SBD75, 000 and about a quarter of this is used for developing

health education information including radio health talks. The diabetes-related education or awareness program is funded by financial donors such as World Health Organization.

Visual media are relatively costly, require experts to develop, and use special equipment. Furthermore, use of certain visual media such as access to TV may require cost to the user. The advantage of visual media is a delivery format where one can see the presenter, making communication more effective (Hurworth, 2004). This is true for certain countries. However, in Solomon Islands, access to the visual medium in general is limited.

Internet provides a wide range of information, which one can access conveniently. However, the major disadvantage, especially for the Solomon Islands, is the cost related to developing certain computer programs, which may require special expertise.

Selection of media usage varies between and within different countries depending on the availability of the medium, its suitability, and access to the target group. In most developed countries, the prominent mass media are television, video, Internet, and newspaper. These media has been used to communicate health and nutrition information to the public successfully. Internet is an unprecedented form of educational delivery because it is interactive and responsive to individual needs and provides multimedia information on-demand (unlike remote television or local classroom education). With the ability to access and use the Internet, any community member has the opportunity to conveniently tap resources available through the world wide web as a form of 'just-in-time' education where employees seek information as

needed. Timely access to information will improve individual and community competitiveness in a technological world (Tennessen, et al., 1997). The Internet has also been adapted by hospitals in London to provide information on diabetes for patients and their relatives, as well as for students and health-care professionals (Lehmann, 2005). In a study on assessing TV based on the number of viewers of specific health programs showed increase from 0.7%, when the study started, to 7.6% of the TV audience at the end of the 1 year study (Cianciara, et al., 2004). A study done on young children using video intervention to enhance physical activity showed that the intervention group had greater gains in knowledge and self-efficacy than did the comparison group ($p < 0.001$), and they seemed to enjoy the video (Levin, et al., 2002).

In countries such as Solomon Islands, however, the mass media are relatively underdeveloped. First, the print media consists of one daily and one weekly newspaper. Accessibility to the newspapers is limited because they are circulated mostly in Honiara. Second, they are all English-language newspapers, which limits peoples' understanding of contents. Third, (and important for both newspapers and other printed material) is the fact that Solomon Islands' has a relatively low literacy rate. This means that only a small percentage of the population could read and understand the printed information. This is the same for health education through other printed forms: booklets, pamphlets, fact sheets and posters. Studies to measure their effectiveness are not documented for Solomon Islands.

The electronic media are also limited. There is only one radio station, the government-owned Solomon Islands Broadcasting Corporation (SIBC) that broadcasts nationwide. There are, however, 6 FM radio stations that broadcast within the Honiara

boundaries. These radio stations mainly play music and commercials and target mainly younger populations. Radio is quite prominent in today's society because it provides a venue where information can be disseminated at a relatively cheap price to a larger population (Guthrie & McKenric, 1982; Romero-Gwynn & Marshall, 1990; Hendy, 2000). According to the literature, radio has been used widely in developing countries as a medium to offer health, nutrition, and agricultural education (Romero-Gwynn & Marshall, 1990). A study done in Kentucky on what influences teens' decision, showed that radio was cited as the third most influential source of information after television and prints (Rennekamp, 1990). In another study, nutrition classes were broadcast on local Hispanic radio and the result showed the difference between pre- and post-test knowledge was statistically significant ($p = 0.05$) (Romero-Gwynn & Marshall, 1990). Such studies are unavailable for Solomon Islands.

The use of visual media, such as television, is further limited, although it might have a potential in the future. At present Solomon Islands does not have a local TV station. Australian Television (Channel Ten) and the British Broadcasting Corporation (BBC) are transmitted through Solomon Telekom for public consumption. These, however, have no local programs that would target issues such as diabetes. Even these are accessible only to the urban (Honiara) population. Majorities of Solomon Islanders, therefore, do not have access to TV.

What could prove effective in diabetes education is the production of video documentaries that could then be shown in communities. Many villages have access to VHS that could be used to screen such documentaries. The problem, though, is that

video production is relatively expensive and needs expertise. That expertise could easily be trained.

Internet is a new medium that could be utilized to create diabetes awareness. It is a medium that has rapidly become accessible to urban and some rural areas, although the percentage of the population who has access to it is relatively low. In 1997, for example, there was only one Internet café in Honiara. By 2004, however, there were four Internet cafes. Provincial towns like Gizo, Lata, and Auki also have Internet cafes. In recent years the People First Network, a UNDP-sponsored project, has connected seventeen rural areas through its Rural e-mail Network that uses two-way radios. These provide new opportunities for facilitating diabetes awareness. Currently, there is still only one Internet service provider (Solomon Islands Telekom Company). Despite these developments, the Internet continues to be very costly. This is partly because the service monopolized by one service provider, the Solomon Telekom, a subsidiary of Cable and Wireless, a British-owned company.

Importance of Diabetes Prevention in Solomon Islands

Solomon Islands has a relatively high infant mortality, low life expectancy, and a younger population. This is different from other PIC like Fiji, with lower infant mortality, longer life expectancy, and an older population (SPC/World Bank, 2003). With Solomon Islands' huge and rapidly growing young population, it is prudent to target this young age group in efforts to educate people about diabetes. It is, therefore, important that diabetes education uses the medium of communication with which young population is familiar, has access to, and enjoys. One such medium is radio. In general,

there is a global tendency for younger people to listen to radio more per day compared to other age groups (Guthrie, *et al.*, 1982; Chandar & Sharma, 2003). There is a same general observation for young adults in Solomon Islands, though data are limited. With the prevalence of diabetes and risk factors higher in urban population, diabetes education and awareness programs through use of radio may be effective in educating the public about the prevention of diabetes. In addition, achievement of a successful outcome should involve systematic, timely and continuity of awareness of the program (WHO, 1999 a & b, 2001 a; SPC/World Bank, 2003).

There are varieties of nutrition education programs adapted for schools and similar communities in other countries, which have proved effective. For instance, the school meals program was initiated by the Food and Nutrition Services (FNS) of USDA to provide nutritious meals for students and, at the same time, the opportunity to practice skills learned in classrooms and promote learning readiness and healthful eating behaviors (USDA, 2004). A study done in Canada to find the effectiveness of school programs in decreasing obesity showed students from schools participating in a coordinated program that incorporated recommendations for school-based healthful eating programs exhibited significantly lower rates of overweight and obesity, had healthier diets, and reported more physical activities than students from schools without nutrition programs (Veugelers & Fitzgerald, 2005). Other nutrition programs which schools and communities utilize include 5 A day to encourage children and adults to eat more vegetables and fruits (Unites States Department for Health and Human Services (USDHHS/NIH/NCI, 2005; Dole Food Company, 2005). In Hawaii, it was established through the “Healthy Hawaii Initiatives.” According to a school-based effectiveness

trial to measure increased vegetable and fruit consumption among youth, an average measure of 0.4 servings of vegetables and fruit was seen and this was shown to be a significant result for further school-based intervention (Stables, *et al.*, 2002).

Public service announcements (PSA) are another effective way to convey health messages to the public (HSDOH, 2004). In Hawaii, the State Department of Health often imparts health-related information to the public through PSA for movies, television or radio. For example, the Department of Health developed a PSA, which is aired on television and radio stations to encourage teenagers to stop smoking in order to prevent lung cancer, which was found to be effective in reaching this age group (HSDOH, 2004). Radio script and PSA have also been used and found to be an effective venue in Pacific Island country like Kiribati for family planning (Tarau, 1982). Because of the effectiveness of this venue in conveying health-related information to the public, the use of public service announcements in Solomon Islands is the focus of the research reported in this paper.

Public Service Announcements (PSAs)

PSAs are “short, simple sound bytes that can offer nutrition information through media to reach a larger audience in some countries, free of cost” (Dooley & Soll, 1999). They are designed to catch a listener’s attention and leave them with ending call-to-action statement to let the listener use the given information for personal benefit. The effectiveness of PSAs in the PICs, including Solomon Islands, is not well documented. However, with this recent trend in use of radio as another means of communicating with

larger audience, it is an ideal medium to incorporate simple diabetes messages and communicate them to the public at low cost.

Based on the concept that nutrition education messages can be communicated by an approach similar to that used by advertisers, short radio messages on diabetes should also have impact on the hearers. Thus the incorporation of PSAs into FM stations is an promising technique to convey diabetes awareness to the targeted population in the Solomon Islands. They borrow ideas from commercial marketing, where short messages of commercial products are inserted into scheduled programs to reach a larger audience (Parlato, 2003).

PSAs could be an effective technique for the Solomon Islands due to availability of both AM and FM radio stations. These include the AM station, Solomon Islands Broadcasting Cooperation (SIBC) and, FM stations, Wantok FM, Z FM, Paoa FM, and Good News. The use of PSAs may be beneficial not only to younger populations but also to people of any age who have access to radio programming.

Focus Group Methodology

A focus group is:

“...a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment. It is conducted with approximately 7 to 10 people by a skilled interviewer. The discussion is comfortable and often enjoyable for participants as they share their ideas and perceptions. Group members influence each other by responding to ideas and comments in the discussion (Kruger, 1994).”

The use of focus groups is a qualitative method that enables the researcher to see reality from the respondents' point of view (Krueger, 1994; Vaughn, *et al.*, 1996; Krueger &

Casey, 2000). The methodology provides insight into perceptions, feelings, interests, and attitudes of a defined target audience (Wdowik, et al., 1997). Focus group data are obtained from small group discussions under the guidance of a moderator and are based on specific topics that are of interest to the investigation (Anderson, et al., 1996). A focus group interview is subjective research rather than objective, as in structured questionnaires, because it allows participants to answer open-ended questions and provide in-depth information (Krueger, 1994). Effective data collection and analysis depend on how well the focus group is designed and implemented.

The use of focus groups appears in several reviewed literatures. Although advertising and social marketing groups initially used it, nowadays it has been adopted into the nutrition profession for health education and promotion. Focus groups have been used to study issues such as attitudes of college students with diabetes (Wdowik, et al., 1997), psychosocial issues of urban black individuals with diabetes (Anderson, et al., 1996) health-related practice and beliefs of Native Americans (Roubideaux, et al., 2000) and urban Caribbean Latinos with diabetes (Anderson, et al., 1998). Focus groups have also been used to develop community-based nutrition education programs for Pacific Islanders (Wang, et al., 1999).

The purpose of this research was to determine the effectiveness of radio PSAs as a tool for diabetes education among young adults. The goals also were to validate the clarity of diabetes PSA contents, to test the relevance of diabetes PSA contents, to determine the effectiveness of and appropriate mode(s) of delivery of PSAs in health education, and to identify and develop appropriate diabetes education materials and intervention for young adults in Solomon Islands.

CHAPTER 3 METHODS

Study Design

PSA Material

Material for the PSAs (Appendix A) was developed from a current series of diabetes information pamphlets obtained from the Non Communicable Diseases (NCD)/Disease Prevention and Control (DPC) Unit of the Solomon Islands Ministry of Health and Medical Services. These pamphlets are found in Appendix B. The “What is diabetes?” pamphlet provided diabetes information such as definition of the sickness, risk factors, why diabetes is a problem, and signs of diabetes. The “Diabetes: Too much sugar in the blood” pamphlet provided similar information and includes suggestions on how to prevent diabetes through making healthful dietary choices and exercise. Diabetes information from these pamphlets was selected based on the focus of the study and also modified to fit into a 30-seconds radio segment. However, the information content of both is closely related. The PSAs, as well as the diabetes pamphlets, were in English. Thus, the PSAs were translated into Solomon Islands *pijin* for the study and back translated by a native Solomon Islands speaker to check for correctness. The final outcome was four PSAs namely; 1) “Diabetes” which provides definition and risk factors of diabetes and simple advice; 2) “Signs of diabetes,” which provides information on the signs of diabetes and advice about seeing a doctor if someone is having these signs; 3) “Beating diabetes odds” which begins with the risk for diabetes being high in Solomon Islands, and then provides simple guidelines on a healthful diet and advice on possible behavioral change; 4) Lastly, “Diabetes and exercise,” which emphasizes the importance of exercise, at least sixty minutes a day for health benefit

and help with balancing food intake. This PSA also provided advice on some practical forms of exercise to which young adults have access. The PSAs were taped in both English and Solomon Islands *pijin* and used in focus group sessions for feedback and analysis (Appendix C).

This study was reviewed by and received exempted approval from the Committee on Human Studies of the University of Hawaii at Manoa.

Subjects

In this study, forty (40) students were recruited as subjects for the study. To meet the study interest, students were recruited from 4 day-schools and 1 boarding school. In this study, day-school refers to a school that takes day students only and boarding school refers to a school where students are lodged and fed, as well as taught. Each focus group had eight (8) participants, forming the total of five (5) focus groups. The subjects were students in Forms 5, 6 and 7, enrolled in six high schools and the University of the South Pacific (USP) Center in Honiara, the Capital of Solomon Islands. The age range of the subjects was between 18 to 21 years and subjects were of both genders.

Focus group participants were randomly selected from a list of six high schools and USP center that was obtained from the Head of Schools and USP Center. Individual participants were then approached by the PI and asked to participate in the study. Hence, each participant was recruited based on his or her willingness to participate.

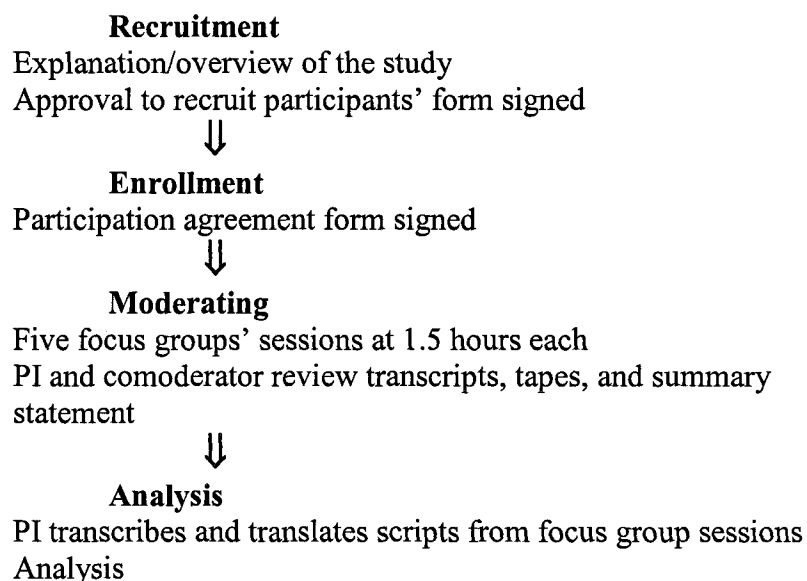
Data Collection

Students attended one of five groups, each of which was equal in size and gender distribution. Each group of students participated in one group session only. A stipend of \$SBD10 was given to each participant to compensate for his/her time.

The operation for the study could be found in Figure 2. The study duration was five weeks. In the first three weeks, the PI went to the schools and provided a brief explanation about the purpose and protocol of the study. Consent was obtained from heads of schools, followed by participants' recruitment and getting signed consent forms completed by each participating student after the PI orally provided information about participating (Appendix D).

During the last two weeks, the moderator (also PI) conducted five focus group sessions for about 2 hours each. A co-moderator, who is a practicing dietitian at the country's National Referral Hospital, tape-recorded and took relevant notes of each session. These were translated from *pijin* to English and used for analysis.

Figure 2: Study design



Data Analysis

Content analysis was based on four themes (Table 3), which was derived from five key questions, which are displayed in Table 6. These themes included (1) Clarity of PSA contents; (2) relevance of the PSA contents; (3) effectiveness of radio PSAs; (4) recommendations for diabetes education and intervention.

Table 3: Main Themes of the study

Four main themes
1. Clarity of PSA content
2. Relevance of PSA content
3. Effectiveness of radio PSA
4. Recommendations

After the focus group sessions, the moderator transcribed and translated audiotape discussions for content analysis using an excel spreadsheet (Taylor-Powell & Renner 2003; Stockdale, 2002). The process initially involves the development of the coding plan (Appendix E), which involves numbering of the data, sorting and coding the information, which formed the themes (Krueger & Casey, 2000). These themes were then entered into a computer excel spreadsheet. Prior to that, the moderator read and looked at how all individuals responded to each questions and identified consistencies and differences (and highlighted) the occurrence of these words, phrases or sentences to color code responses from different people or groups (Krueger, 1994). All the data from each question were then put together and analyzed as a whole. The frequency tables for each of the focus groups were then compared to develop themes in

the computer excel spreadsheet. This information was then categorized by themes or patterns and then organized into coherent categories that summarizes and bring meaning to the text (Taylor-Powell & Renner, 2002).

Chi-Square and Fisher Exact Test (Greenwood & Nikulin, 1996; Black, 1999) were used to find the statistical significance on responses between boarding and day schools as well as between genders. For all tests, $p \leq 0.05$.

CHAPTER 4 RESULTS

This chapter outlines the results of the research carried out amongst young adults at five educational institutions – one boarding and four day schools – in Honiara, the Solomon Islands capital.

As shown in Table 4, there were a total of 40 young adults who participated in the study. Eight participants were from a boarding school (Betikama Adventist College) and thirty-two from day schools (Florence Young, Honiara High School, St. Nicholas, and the University of the South Pacific Center). Each focus group was made up of eight participants, consisting of four males and four females whose ages ranged from 18 to 21 years and who were of Melanesian or Polynesian ethnic background.

Table 4: Participants’ characteristics by schools

Schools	Age group (years)	Ethnicity (% of total)	Number of subjects	
			Male	Female
Boarding school (1)	18-21	Melanesian (88%)	3	4
		Polynesian (12%)	1	
Day School (4)	18-21	Melanesian (94%)	15	15
		Polynesian (6%)	1	1
Total			20	20

Key questions related to five domains of diabetes knowledge were asked of all participants groups (see Table 5). These domains also formed the four main themes addressed by the study (Table 3).

Participants were asked to listen to all the pre-recorded PSA messages and then asked to answer the questions outlined in Table 5. Based on the participants’ answers to

these questions, the moderator was able to ascertain whether or not the participants found the PSA messages clear and informative. This helped in assessing the effectiveness of radio PSA as a medium of diabetes education.

Table 5: Five key questions

Current diabetes knowledge	Questions answered
I. Clarity of PSA content	Q1. After listening to the PSA, what do you think is/are the major messages? (Repeated for each PSA)
II. Relevance of PSA content	Q2. A number of messages have been identified. Think about yourself and the content of the message/s. If you have personal experience (yourself, family, and friends) with diabetes, can you share it with us? If you don't, how is this PSA message important to you?
III. Effectiveness of radio PSA	Q3. We are planning to use radio PSA to educate you about diabetes. Think about yourself and your daily radio listening behavior. How effective will the local radio stations be in getting the PSA to you?
IV. Best way for diabetes education	Q4. Diabetes is becoming a serious health problem in our country, and affects mostly adults who are overweight. It is important to have sufficient knowledge about diabetes in order to prevent its development. How would you best like to be educated about diabetes?
V. Other Suggestions	Q5. Other than radio PSA, what else do you think is the best way to educate you about diabetes?

The moderator was also able to ascertain the similarities and differences in the answers between schools, between boarding and day schools, and between genders. This provided insights, not only about the level of knowledge that young Solomon Islander adults have about diabetes, but also more importantly (for this study) to evaluate the effectiveness of radio PSA. This can be vital in helping us understand the

role of radio PSA, and in designing them for the purposes of diabetes education in Solomon Islands, in particular, and for the Pacific Islands, more generally.

Question 1: Clarity of PSA contents

PSA1: What is diabetes? (See Appendix A, page 76 & 80). The first PSA was designed to assess the clarity of PSA content by informing participants about diabetes and how it improves their knowledge of the disease. The moderator asked the participants a question: “After listening to the PSA, what do you think is/are the major messages?” In response, all the participants described diabetes as a sickness where the body is unable to control the level of “sugar” in the blood causing an abnormally high level. Examples of the answers given by participants include:

- *“Diabetes is a sickness when there is high level of sugar in the blood.”*
- *“Diabetes occurs when there is uncontrolled sugar level in the blood, too high than normal.”*
- *“Diabetes is a sickness when there is high level of sugar in the blood”*

Further, the participants listed the risk factors of diabetes such as being overweight, eating and drinking too much of the wrong kinds of food, doing less physical activity, or being under stress. More specifically, some of them expressed ideas such as:

- *“It can be caused by being overweight, eating too much foods and not doing exercise.”*
- *“Diabetes can be caused by eating the wrong kinds of foods, for example imported foods...and not doing enough exercise”*
- *“Diabetes is a disease that can be caused by being overweight, always having stress.”*

- *“It can be caused being overweight, eating too much food and not doing exercise.”*

Participants also mentioned being over forty years old or from a family where diabetes is common. Examples of quotes are:

- *“Hereditiy, meaning one can get it if he has diabetes in the family.”*
- *“One can also inherit it from family.”*
- *“The PSA also said that if you are over 40 years old you are at risk for having diabetes.”*

Some participants suggested simple advice such as exercising to stay slim, eating healthful foods, or, if over 40 years old, seeing a doctor for a “sugar” test. Examples of quotes are:

- *“One must stay slim to avoid diabetes.”*
- *“To avoid getting diabetes one should be involved in sports and also must go and check with the doctor if he is over 40 years old.”*
- *“To prevent it, one must exercise and eat healthy foods.”*
- *“To avoid diabetes, one must exercise and if over 40 years, see a doctor for a sugar test.”*

PSA 2: Signs of diabetes (See Appendix A, page 77 & 81): PSA 2 provided information about the signs and symptoms of diabetes. After the participants listened to the PSA, the moderator then asked them: “After listening to the PSA, what do you think is/are the major messages?” All the participants conveyed an understanding of the signs or symptoms of diabetes such as feeling thirsty, drinking lots of water and passing lots of urine all the time, having sores and cuts that take long time to heal, getting boils often, experiencing poor vision and blurry eyesight, feeling weak and tired, losing a lot

of weight, having numbness, tingling and weakness of limbs, and feeling hungry all the time. Two examples of the exact answers given are:

- *“The signs of diabetes are feeling thirsty all the time, frequent urination, blurred eyes or eyes cannot see well, poor focus and getting blind, I think. Also, sores take too long to heal; the body feels weak all the time.”*
- *“I think speaker six said it all. I agree with what was said and that is the signs of diabetes includes feeling hungry and thirsty all the time, likes to urinate all the time, has boils and sores that cannot heal quickly.”*

In addition, some participants suggested that anyone with these symptoms should see a doctor. For example, they said things like:

- *“It is important to check with doctor if you have symptoms. Yes, check with doctor if these signs occur . . .”*
- *“ If one has some of these signs, they have to go to the doctors and check their blood sugar level.”*
- *“If someone has those kinds of signs, one has to seek medical advice from a doctor. For me, I will visit the hospital in order to help me control diabetes.”*

PSA 3: Beating the diabetes odds (See Appendix A, page 78 & 82): PSA 3 focused on how to prevent diabetes. After listening to the PSA, the participants were asked: “After listening to the PSA, what do you think is/are the major messages?” All the participants conveyed concepts that highlighted the need for a healthful diet: eating plenty of fruits and vegetables everyday; eating less fatty, fried foods; and, keeping fresh fruits and vegetables at home; work, and school; and boiling, steaming or baking instead of frying foods. Examples of participants’ exact statements are:

- *“We must eat more fruits and vegetables, do not eat oily foods or food prepared in oil like frying but use simple cooking methods like boiling and baking.”*
- *“Also, always carry a fruit around with you for lunch and recess to avoid buying and eating oily and fatty foods.”*

- *“I would agree with all that was said and that is, there is no cure for diabetes and what people can do is to eat healthy like eating fruits and vegetables. We must not eat fatty and oily foods, have lots of fruits and vegetables for lunch break, and when shopping look for low fat foods and when cooking, do steaming boiling and baking instead of frying food in oil.”*

PSA 4: Exercise and Diabetes (See Appendix A, page 79 & 83). After listening to the PSA the participants were again asked the question: “After listening to the PSA, what do you think is/are the major messages?” Participants stated that there is a need to do about 60 minutes of exercise a day to stay slim; to develop a habit of walking to the workplace; to jog, or walk home; to be involved in sports, such as swimming; and, to do gardening and yard work at home. Examples of exact quotes are:

- *“Daily exercise is important but must be at least 60 minutes per day.”*
- *“To lower the risk of diabetes one has to exercise. Some exercise like swimming, gardening, walking, and aerobics.”*
- *“Stay slim to avoid diabetes.”*
- *“People who are working must walk to their workplace and back home, don’t try to use car for short distances.”*
- *“If one cannot walk or jog, working around the house and doing gardening is also good and can keep one healthy, we have no excuse.”*

Table 6 provides detailed numerical statistics on the issues addressed by the PSAs and discussed above. The research found, for instance, that 50 % of males and 50% of females at Betikama (the boarding school) responded correctly to PSA 1. This compares with 82% males and 76% females participants from day schools who responded correctly to PSA 1. A percentage above 50 is decisive for the clarity of

diabetes PSA. Thus, this means that the diabetes PSA are clear and understandable. In general, there is a high level of understanding of all the PSA; most participants responded correctly to all the PSA.

Table 6: Q1. Clarity of diabetes PSA: Number and percentage of subjects responding correctly to PSA by gender and schools

PSA	Schools				Differences by gender within and between schools	Differences between schools
	Boarding (n=8) n (%)		Day (n=32) n (%)			
	M	F	M	F		
What is diabetes?	2 (50)	2 (50)	13 (82)	9 (76)	NS ¹	NS ¹
Signs of diabetes	4 (100)	4 (100)	14 (88)	16 (100)	NS ¹	NS ¹
Beating the diabetes odd	4 (100)	3 (75)	14 (88)	15 (94)	NS ¹	NS ¹
Exercise and diabetes	4 (100)	4 (100)	15 (94)	14 (88)	NS ¹	NS ¹

¹Not significant, $p \geq 0.05$

For example, 100% of male and 100% of female participants at boarding schools, and, 88% of male and 100% of female at day schools responded correctly to PSA 2, while 100% of male and 75% of female participants at boarding schools, and, 88% of male and 94% of female at day schools responded correctly to PSA 3. One hundred percent of male and 100% of female participants at boarding schools, and, 94% of male and 88% of female at day schools responded correctly to PSA 4. Further, there are no significant differences between genders (male and females) and between boarding and day schools.

Question 2: Relevance of PSA contents

Table 7 shows the relevance of the PSA contents to the participants. After listening to the PSA the participants were asked: “Think about yourself and the content of the message/s. If you have personal experience (yourself, family, and friends) with

diabetes, can you share it with us? If you don't, how is this PSA message important to you?"

Table 7: Q2. Relevance of PSA content

School	Gender				Difference by gender within and between schools	Differences between schools
	Male		Female			
	Yes n (%)	No n (%)	Yes n (%)	No n (%)		
Boarding School (1)	4 (100)	0 (0)	3 (75)	1 (25)	NS ¹	p=0.03
Day Schools* (4)	4 (25)	9 (56)	4 (25)	9 (56)		

¹ Not significant, $p \geq 0.05$

* 26/32 participants responded

Participants indicated that PSA content was relevant to them because it was informative about diabetes. Of the total sample in boarding school, 100% of males and 75% of females had personal experience with diabetes through family members and friends. Some responses from boarding school participants are as follows:

- *“Both my parents’ sides have diabetes. I know I am at risk so it is important to stay healthy and slim, just like me now. I am still young and slim and having this opportunity to learn about diabetes gives me the chance to avoid the sickness.”*
- *“I find these PSAs interesting and helpful because I have a relative with diabetes, my uncle, and he is too scared to do any form of exercise. He said that would hurt him, but after hearing these PSA, I think he should do some form of exercise. For me, I can now avoid diabetes by following what I learn today from these PSA.”*
- *“Diabetes is common in my family. My dad died from diabetes last year. Since then I have been trying my best to learn more about the disease through personal research from books and Internet. With the information I learned, I tried to convince my family members to start eating healthy but no successful but I will keep trying. As I have a risk myself, I must prevent diabetes by eating healthy and doing my exercise.”*
- *“I have two aunties with diabetes and their diets are not healthy because they like cooking food in oil too much. I am thankful to have this opportunity so that I could keep myself from getting diabetes because I know now that I am at risk.”*

In day schools, out of the 23 participants who responded to the question, only 25% males and 25% females had, and shared, personal experiences with diabetes. Example of comments are quoted:

- *“My parents have diabetes. Now with this information I can take care of myself because, like speaker 3, I am at risk too.”*
- *“My mother has diabetes since last year but she has a very bad eating habit and doesn’t want us to talk to her about it. She likes fried foods a lot. Now I will go and tell her that she needs to eat healthy and exercise to help control it.”*
- *“I have a family member with diabetes, my grandpa. I am so thankful for getting the information now and I have more knowledge about diabetes now which I could use to help my family, those with no diabetes and with diabetes like my grandpa.”*
- *“The messages I heard are very important to me because I have a grandfather who has diabetes and just last year has a amputation on his leg. He did not want to listen to what the doctors said. I can learn from that and from what I heard today and must stay healthy because I think I am at risk like the PSA said. Diabetes runs through family as well. All I have to say is, now I know how I can prevent diabetes. Thanks for this opportunity.”*
- *“I have diabetes in both side of my parents, my grandfather on my mother’s side and my grandmother on my father’s side. What I noticed is that they eat differently and take injections and medicine everyday. I will definitely use this information I learned today to prevent diabetes because I am at risk already.”*

All the participants who responded positively to the question about relevance of PSA content described either a relevance of the PSA content to their personal life, through having personal experience with relatives and friends who have diabetes, or appreciation of the opportunity to hear the information. They expressed determination to use the information in the PSA to start living a more healthful lifestyle by making better dietary choices and engaging in physical activity in order to prevent diabetes.

Participants who answered “no” implied only that they did not have personal experience (i.e., did not know anyone) with diabetes. However, even these participants who previously had no personal experiences with diabetes found the PSA informative and helpful. Further, after listening to the PSA they expressed a desire to begin a more healthful lifestyle habit. Some of the comments they made were:

- *“I don’t have personal experience with diabetes. I don’t know anybody with diabetes. But I know a neighbor with those signs of diabetes. But today, I know more about diabetes and that’s good because now I will look after myself and also go and tell my neighbor to go to the doctor and get a sugar test.”*
- *“No personal experience with diabetes. But its good to know one can avoid this disease through exercise and eating a lot of fruits and vegetables. We have not excuse here because we have lots of fruits and vegetable in our country. We can always eat fruits and vegetables to live longer.”*
- *“I have not heard about diabetes. But now, I know and will exercise and eat healthy to avoid diabetes.”*
- *“I don’t know any friends or family with this diabetes. Actually, I just know of this disease today so I have the opportunity to help my family and myself.”*

There was a statistically significant difference between boarding and day schools so far as the personal relevance of PSA content is concerned. More participants in the boarding school (Betikama) had direct personal experiences with diabetes because they reported having relatives and friends with diabetes compared to a less number of participants from day schools with that experience (see Table 7). There is, however, not enough information to ascertain why there is that difference between boarding and day-schools with personal experiences with diabetes.

Question 3: Effectiveness of radio PSA

Table 8 outlines the responses to the question about the effectiveness of radio PSA: “Think about yourself and your daily radio listening behavior. How effective will the local radio stations be in getting the PSA to you?” As shown in Table 8, 26% of males and 50% of females in boarding school said that radio PSA would be effective in educating them about diabetes. This compares to 88% males and 76% females in day school who said that it would be effective. This may be because students at the boarding school were not allowed to own their own radios and were not likely to have access to one while at school. Day scholars, however, had access to and listened to radios at their homes before and after school or while commuting to and from school in public buses. This, therefore, may have had more to do with access to radio rather than personal radio listening behavior.

Table 8: Q3. Effectiveness of radio PSA

Effectiveness of radio PSA	<i>n</i> Yes	% of responses by gender	Difference by gender within and between schools	Difference between schools
Boarding school (1)				
M	1	26	NS ¹	NS ¹
F	2	50		
Day schools (4)				
M	14	88	NS ¹	NS ¹
F	12	76		

¹Not significant, $p \geq 0.05$

In addition, 50% of all subjects indicated that radio PSA would be more effective to them if all radio stations play diabetes PSA in both *pijin* and English at the same time throughout the day. Thirty percent indicated that all radio stations should

play the PSA between 6 and 9 at night. 20% did not specify. With regard to the type of announcer, 30% suggested a male, 20% indicated female as an effective announcer. Another 20% of subjects suggested having both genders in a dialogue and comedy presentation of radio diabetes PSA whereas 30% did not specify. Example of quotes:

Male

- *“Radio is effective for PSA. But the PSA must be presented in a way that is funny (humorous), and creative use of language is important, for instance use both pijin and English.”*
- *“I think the use of comedy/ humorous PSA is important because I will want to listen to it. I will laugh but at the same time the message will be always remembered. The announcer must be a funny type of guy.”*
- *“Make sure to have a dialogue between female and male and must be catchy. Run PSA on all radio stations at the same time.”*
- *Yes, put PSA in all radio stations; play at the same time, throughout the day.*
- *“I prefer all stations not only SIBC (Solomon Islands Broadcasting Corporation). But the most important thing for me is that, these PSA should be run by favorite or popular and funny announcers like speaker one mentioned. The most effective way will be to use funny type of program such as the Nati program (local comedian) on Wantok (One Talk) FM radio station.”*

Female

- *“Put PSA on all radio stations and play them at the same time. However, I think most students like me listen to Z Radio FM and Wantok Radio FM stations so I think it will be more effective to use these radio stations and tell them to play the PSA. Also use their announcers because I think they are most people’s favorite and popular announcers. Also, I think using call-in shows on these radio stations will be effective for students like me.”*
- *“Radio stations are effective. Play the PSA on all and at the same time, throughout the day.”*
- *“If it is on radio, I prefer listening to PSA that are announced by funny (humorous) announcer and its has to catch my attention. Maybe use music at the background or something.*

- *“I listen to radio especially music. So I think playing this on all FM stations at the same time will be effective.”*
- *“Radio is ok and effective for me. Play them throughout the day. Especially during meals time so that people could hear it at restaurant and home or school and make right choice when they buy food.”*

Comparison on responses between school status and gender within schools showed no significant differences (Table 8).

Question 4 and 5: Recommendations for diabetes education and/or other mode (s) for PSAs delivery

Responses to questions, “How would you best like to be educated about diabetes? and “other than radio PSA, what else do you think is the best way to educate you about diabetes?” conveyed recommendations displayed in Table 9. Subjects mentioned incorporating health education, including diabetes education, in the school curriculum, combining diabetes education in schools with the use of video, health workers and print media such as pamphlets, posters, and billboards. Examples of quotes are:

Male

- *“Have health talks in class by health workers and have it as one period a day and mandatory like other class periods. Must have topics on diabetes and other health topics as a class and part of the school curriculum. Video is also effective.”*
- *“The best way to educate me about diabetes is to do a video showing complications and effects of diabetes. For example, show the amputation picture. This is most effective for young people because we will be scared and would like to prevent diabetes.”*
- *“Use of TV and video are more useful and effective because you will be able to present the message and at the same time show real pictures as posters and*

prints and this will help me to make an effort to live healthy and prevent diabetes. Also, showing video is effective for schools.”

- *“The best way I could be educated about diabetes would be educational talks on health in schools by health workers from the ministry of health.”*

Female

- *“The most effective for me is to include this information as a class and included in school curriculum so that I could learn about it everyday at school and practice it at home.”*
- *“ For me, the best way to educate me about diabetes would be to show pictures or video about diabetes and its complications so that I can understand and see for myself. Use video in schools.”*
- *“I agree with the prior suggestions and also I think it is important for specialists on this kinds of topics to teach them in schools.”*
- *“I prefer video showing and having school clinics nurses or health workers from ministry of health to do health talks in school. I also like drama.”*

Comparison of responses between genders showed that there was no gender difference within schools when responding to all recommendations. The finding was similar for difference between school status. However, a statistically significant difference in responses between schools was noted for life education center and video (Table 9).

Table 9: Recommendations

Recommendations	n subjects who support health ed. medium by gender and school				% of responses by gender				Difference by gender within and between schools	Difference between schools
	Boarding		Day		Boarding		Day			
	M	F	M	F	M	F	M	F		
Drama	1	0	1	3	25	25	6	19	NS ¹	NS ¹
Health workers	3	2	3	6	75	50	19	38	NS ¹	NS ¹
Life education center	1	1	0	0	25	25	0	0	NS ¹	p= 0.03
Prints	3	2	5	3	75	50	33	19	NS ¹	NS ¹
School curriculum	4	3	12	9	100	75	75	56	NS ¹	NS ¹
Television	0	1	1	3	0	25	6	19	NS ¹	NS ¹
Video	3	4	6	3	75	100	38	19	NS ¹	p=0.004
Other (PE in school curriculum, school canteen, T-shirts, community health talks subscribe to newspaper companies)	0	1	2	1	0	25	13	6	NS ¹	NS ¹

¹ Not significant, p≥ 0.05

CHAPTER 5

DISCUSSION, CONCLUSION, AND IMPLICATION

Discussion

The results of this research highlight a number of issues that are pertinent to enhancing our understanding of the role and effectiveness of radio PSA as a medium for diabetes education among young adults in Solomon Islands.

After listening to the PSA, there was reported inclination to change life style and live a more healthful life. This research did demonstrate that radio PSA were popular and also that they could be an effective medium for diabetes education with young Solomon Islands adults. The popularity of radio PSA was demonstrated by the fact that a large percentage of the participants, especially in day schools, listen to radios (see Table 8, page 54); and they acknowledge its effectiveness. In fact, a majority of the participants indicated that they have a habit of listening to the radio everyday. Thus, if a diabetes PSA is aired, on all radio stations, at the same time, it could be effective in educating them about diabetes. As stated above, the effectiveness of the PSA was most vividly demonstrated by the improvement of participants' short –term knowledge about diabetes and their expressed desire to change their life styles to prevent, or lower the risk of, diabetes. Many of the participants indicated their determination to start making good dietary choices and engaging in physical activities in order to prevent diabetes.

If this is reflective of the general population of young adults in Solomon Islands, then it means that the PSA used in this study (see Appendix A, page 76) could effectively be used for diabetes education in the country. This, therefore, suggests the clarity of using radio PSA. The fact that there were no differences in the responses

between genders within schools, and between boarding and day schools further suggests the appropriateness of the venue for both genders and different kinds of schools in Solomon Islands.

The results of this study also show that the radio PSA used in this study are relevant to the daily personal life of the participants. For many of them, the information could be related to their own lives, and also to their personal experiences with relatives and friends (or people they know well) who have diabetes (see Table 7, page 51).

Quite interestingly, the study showed that there is a significant difference between boarding and day schools insofar as personal experiences with diabetes were concerned. As shown in Table 7 (page 51), more participants from the boarding school (Betikama) than day schools indicated having had personal experiences with diabetes because they have relatives and friends with diabetes. However, the study design does not provide sufficient information to tell us more about what this means. This does not imply, for example, that students from this school have higher risk of diabetes, or that they come from more high-risk families. Rather, it may merely show that they have a better sense of the sickness of diabetes and that nutrition education must be a priority concern. Also, due to the small study sample, caution must be used in extending this finding to the general population of young adults in Solomon Islands. This could be the subject for further studies.

In preparing PSA for Pacific Islands Countries, such as Solomon Islands, it is also important to consider the language used. This study shows that there is preference for both English and *Pijin* as the languages of communication. Also quite interesting and useful is the fact that participants volunteered suggestions on how PSA should be

presented. The suggestion that satire (comedy) be used has great relevance for the Solomon Islands' context, a society where satire plays an important role in conveying serious messages. As one of the participants said, "I think the use of comedy/humorous PSA is important because I will want to listen to it. I will laugh, but at the same time the message will be always remembered. The announcer must be a funny type of guy" (see page 55). This is not surprising given the role that satire plays in Solomon Islands society and the fact that it is already widely used in radio commercials and announcements.

Further, the study supports the "popular wisdom" that young adults in Solomon Islands listen more to radio stations that play music, than to those stations that do not. These music stations are predominantly FM radio stations that broadcast only in the vicinity of Honiara, the country's major urban center. It would, therefore, be interesting and useful to find out about the kinds of PSA that would work for the rural population where a majority of the country's young adults live. This study is, therefore, limited by its focus on Honiara.

This study is further enriched by the creative and innovative recommendations from the participants, especially related to the various media (or venues) that could be used for PSA delivery in diabetes education. There is a general opinion that diabetes PSA should be included with other health topics and integrated into the national school curriculum. For example, 70% of the participants expressed the need to include diabetes education in the school curriculum (see Table 9, page 58). At present, based on the participants' recommendations, it could be assumed that diabetes education does not feature prominently in the school curriculum. This is a concern because of the rapid

increase in the occurrence of diabetes and the relative absence of public knowledge about the disease. Its potentially negative effect on society means that the Solomon Islands Government, particularly the Ministry of Education, should work with the Ministry of Health in integrating it into the school curriculum. According to a source from the Ministry of Education, health classes were written into the school curriculum in the late 1980's for primary level, which are grade one to four, only. However, this curriculum was not implemented.

The participants of this study also suggested other venues for diabetes education. These include the use of audio-visual media, especially videotapes and television, the print media, and health workers. Table 9 (page 58) shows that 75% male and 100% female in boarding school, and 38% male and 19% female in day school recommended the use of video as media for diabetes education. The use of video is important and could prove to be effective given the fact that VCRs and videos are now accessible to many people throughout the country, even in rural villages. The visual representation of the progression of the disease and any sound bytes that accompany it could particularly be effective for a country like Solomon Islands where there is a relatively high adult illiteracy rate of 38% compared to a Pacific Island country like Tonga whose adult illiteracy rate is less than 1% (UNESCO, 2000; UNDP, 2002 a). As one of the participants stated, "The best way to educate me about diabetes is to do a video showing on complications and effects of diabetes, for example, show the amputation picture. This is most effective for me and other young people because we will be scared and would like to prevent diabetes" (see page 57). The challenge, however, is that at present there is no local television production. As stated earlier, only foreign television

programs, such as those via Australia Broadcasting Corporation (ABC), are broadcast in the country. Even these are limited to the Honiara areas, unless of course, one has a satellite dish outside of Honiara. Further, video production is expensive. It would be difficult to find the funds to produce short video documentaries that could be used for public education about diabetes.

The use of print is also useful, although its effectiveness will be limited by the low literacy of the population, as well as by the costs of production and distribution. The use of the print mass media would be limited by the fact that the one daily newspaper and one weekly newspaper are both Honiara-based and are quite expensive to use. For example, based on personal experience, cost for an advertisement ranges from \$112- \$312 for three newspaper issues. However, pamphlets and simple newsletters could be produced either in *Pijin*, or local languages and distributed through clinics and health centers, and explained by health workers. Health workers could travel to various parts of the country and provide effective face-to-face public education about diabetes. At present, however, there is a shortage of trained health workers. For instance, at the beginning of 2002 there was provision for a total of establishment of 76 doctors (a ratio of one doctor to 5382 people) (UNDP, 2002 b). This means that the government should look at training more health workers and providing them with clinics and health centers from which they could operate.

Conclusion and Implication

Diabetes is a rapidly growing health problem in Solomon Islands. Public education is important as an approach to addressing it. This study provides some useful insight into approaches to public education, especially in the use of PSA.

From the results of this study, it is evident that radio PSA could be vital for diabetes education amongst young adults in Solomon Islands. Based on experience, existing diabetes-related materials are not well distributed in Solomon Islands in general, and amongst young adults, in particular. This is a grave concern, given the increasing occurrence of diabetes in the country's population.

This study also shows that radio PSA could be an effective medium for public education and this venue should be more widely used than it currently is. In producing radio PSA it is also important to consider the language and style used. Both English and *Pijin* are effective for the urban-based young adults. However, for the broader population one might need to use *Pijin* or other local languages more. Further, the use of satire in producing radio PSA was also identified by the Solomon Islands young adult participants as vital in ensuring effectiveness in influencing people's lifestyle to enhance the prevention of diabetes.

As discussed above, the participants in this study have identified other media that could be used for diabetes education. The inclusion of diabetes PSA as part of health education in school curricula could contribute greatly to informing young adults about the disease. It is, therefore, vital that the Ministries of Education and Health work together to produce material about diabetes that could be integrated into health

education at schools. Such material could be written, as well as in audio-visual format. This highlights the relevance of video and television. As the young population becomes more technologically educated and uses the electronic media much more, it is important that the Solomon Islands government considers putting money into producing videos as part of diabetes education. These could enhance the training of more and better qualified health workers who are not only informed about the scientific basis of diabetes causes and prevention, but also have the knowledge on how to educate others.

This study is the first of its kind to be done in Solomon Islands. Although the study sample is small, findings provide valuable insights into the need of diabetes education for young adults. It is, however, not exhaustive and there remains a need for further studies to strengthen any efforts to address the growing diabetes problem.

Based on this study, a number of recommendations could be made, some more speculative or far-reaching than others.

- (i) More PSA material on diabetes, healthful diets and lifestyles, in both printed and audio-visual formats, should be produced and distributed. This means that financial allocations will be needed to assist in the production of such PSA material.
- (ii) The Solomon Islands Government should consider including diabetes education in formal school curricula as health education.
- (iii) More health workers should be trained to facilitate diabetes education.
- (iv) More studies should be carried out to find ways of enhancing diabetes education for young adults in Solomon Islands.

- (v) The country's economy should be improved to enable people to live healthful lifestyles. This is because diabetes is also a problem associated with the inability to live healthful economically stable lives.

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APPENDIX A: PUBLIC SERVICES ANNOUNCEMENTS (PSA)

PSA (ENGLISH)

PSA 1

DIABETES

What is diabetes? Diabetes is a sickness where the body is no longer able to control how much sugar is in the blood. You have a higher risk of getting diabetes if:

- You are overweight
- You eat and drink too much of the wrong kind of foods and do too little exercise
- You are under stress
- You are from a family where diabetes is common
- You are over 40 years old

Simple advice will help. Stay slim and if overweight, try to lose weight. Exercise to stay healthy. Eat healthy foods. Avoid stress. If you are over 40 years, pay a visit to your doctor for a sugar test.

For Nutrition Unit & DPC/NCD Unit- Ministry of Health and Medical Services

SIGNS OF DIABETES

What are the signs of diabetes? Feeling thirsty, drinking lots of water and passing lots of urine all the time.

Sores and cuts that take a long time to heal. Getting boils often.

Poor vision and blurry eyesight.

Feeling weak and tired or losing surprisingly a lot of weight.

Numbness, tingling and weakness of the limbs.

Feeling hungry all the time. If you think you have some of these signs of diabetes, you should see your doctor for the sake of your health!

For Nutrition Unit & DPC/NCD Unit- Ministry of Health and Medical Services

BEATING THE DIABETES ODDS

Did you know that diabetes is becoming a serious health problem in Solomon Islands? About half of the people diagnosed with diabetes have already developed its complications. According to studies, a healthful diet may prevent diabetes. How can you beat the odds? By following some simple guidelines while choosing the foods you eat:

-Eat plenty of fruits and vegetables everyday. Eating fruits and vegetables help protects against the development of diabetes.

-Eat less fatty, fried foods. Diets high in fat seem to be associated with diabetes.

Simple changes will help. Keep fresh fruits and vegetables handy at work and at home. Boil, steam or bake instead of frying foods in oil at home. Look for and order low-fat foods when you have your lunch break.

For Nutrition Unit & DPC/NCD Unit- Ministry of Health and Medical Services

PHYSICAL ACTIVITY AND DIABETES

Did you know that people are getting fatter? This trend maybe because we spend less time doing physical activity to balance out our food intake. Studies have shown that exercise for at least 60 minutes a day lowers an individual risk of becoming fat, a risk factor for diabetes.

Simple advice will help. Stay slim by developing a habit to walk to your workplace, jog or walk home after work, involve in sports, aerobics, swimming, or at home, do gardening and yard work.

For Nutrition Unit & DPC/NCD Unit- Ministry of Health and Medical Services

PSA (PIJIN)

PSA 1

DAEBITIS

Wanem nao daebitis? Daebitis hem siki wea bodi hem no save kontrollim nao level blong suga insaet lo blad. Long Solomon, plande pipol kolem suga. Iu garem hae chanis fo garem daebitis supos iu:

- fat tumas or ovaweit
- kaikaim en drinkim staka rong kaikai en drink en doim lelebet exercise nomoa
- save wari olowe
- kam from famili wea daebitis hem plande
- ovam 40 ia ol

Samfala gudfala isi toktok fo helpim yu. Stap slim en supos yu fat tumas, iu mas trae fo lusim weit. Eksesaes olowe fo stap helti. Kaikaim helti kaikai. No woriwordi tumas. Supos yu ovam 40 ia ol, go lukim doctor fo testim blad blong iu fo level blong suga.

Fo Nutricion Unit & DPC/NCD Unit- Ministri blong Helt en Medikal Sevis

PSA 2

SAENS BLONG DAEBITIS

Wanem nao samfala saens blo daibitis? Iu save iu garem daebitis sapos iu:

- laik fo drink olowe,
- drinkim staka wata tumas en laik fo mimi olowe
- garem soa wea no save hilap kuik taem
- garem boila olowe
- no save lukluk gud
- fil wiki and taed
- lusim plande weit tumas
- leg en han save fil num or wiki
- fil hagere olowe

Sapos iu tingim iu garem samfalla saen olsem, iu mas go lukim dokta fo iu mas stretem helt blong iu.

Fo Nutricion Unit &DPC/NCD Unit- Ministri blong Helt en Medikal Sevis

HAO IU SAVE STOPEM DIABETES

Iu save tu olsem daebitis hem stat fo kamap olsem wanfalla siries helt problem fo Solomon Islands? Taem pipol faed aot se oketa garem daebitis, haf long olgeta sik big finis nao wetem plande problems. Stadi faed oat olsem helti kaikai save stopem daebitis. Hao nao iu save stopem diabetes? Supos iu falom samfalla isi ruls taem iu chusim kaikai iu kaikaim:

- kaikaim plande frut en kabis (or vegetables) everidei. Kaikaim frut en kabis (or vegetables) save help fo protektim iu from developim diabetes.
- kaikaim lelebet nomoa lo olgeta fatty en fried kaikai. Kaikai wea hae long fat hem save lid go long daebitis.

Samfala smol change save help. Kipim fresh fruts and vegetables wetem iu long waka ples en long haus. Boilim, steamim or bakim kaikai instead long fraenim long oel. Taem iu garem lunch break from waka, iu mas chusim en odam kaikai wea hem no garem plaude fat.

Fo Nutricion Unit &DPC/NCD Unit- Ministri blong Helt en Medikal Sevis

PSA 4

EKSESAES EN DAEBITIS

Iu save tu olsem plande pipol stat fo putim on staka weit and becom fat winim bifo? Disfalla change hem hapen bekos iumi no spedim staka taem nao fo eksessaes fo balensim wanem iumi kaikaim. Stadi some olsem eksesaes fo et lest 60 minites long wan dei save daonim chance fo iu fat. Sapos iu fat tumas bae hem save lid go long daebitis.

Isi advis save help. Mekem habit fo wakabaot go long ples wea iu waka, ran or wakabaot go back lo house after waka, tek part long sports, aerobics, swimming, or doim samfalla gardening and yard waka long haus.

For Nutricion Unit & DPC/NCD Unit- Ministri blong Helt en Medikal Sevis

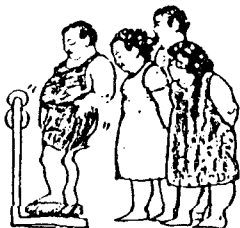
APPENDIX B: DIABETES PAMPHLETS USED FOR PSA

Feeling hungry all the time



**HOW TO PREVENT
DIABETES?**

Stay slim If overweight, try to lose weight



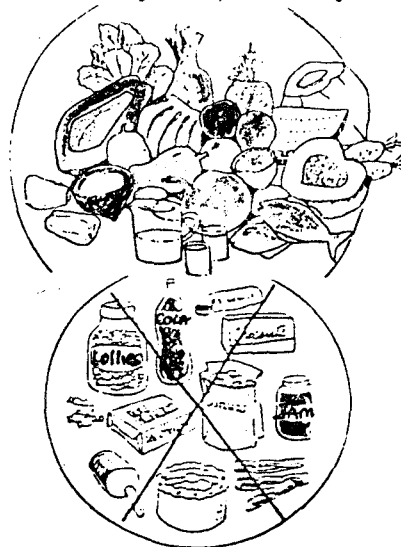
Exercise to stay fit.



If you have diabetes *do not drink alcohol,*



Eat healthy foods, Eat wisely



What is Diabetes

**MORE INFORMATION
CONTACT NCD/DPCU-MHMS
HONIARA. S.I**

* **WHAT IS DIABETES?**

Diabetes is a sickness where the body is no longer able to control how much sugar is in the blood.

If you have diabetes you will have to live and eat right so that the amount of sugar in your blood stays normal, otherwise you will become very sick.

WHO WILL GET DIABETES?

You have ↑ risk

You have a high risk of getting diabetes if:

- ◆ You are overweight
- ◆ You eat and drink too much of the wrong kind of foods and do too little exercise.
- ◆ You are under stress
- ◆ You are from a family where diabetes is common
- ◆ You are over 40 years old.

WHY IS DIABETES A PROBLEM?

Too much sugar in your blood can slowly damage many parts of your body and cause:

- ◆ Poor eyesight and **BLINDNESS**
- ◆ **INFECTED** sores on feet and legs.
- ◆ High blood pressure and **STROKE**
- ◆ **KIDNEY PROBLEMS.**

THERE IS NO CURE FOR DIABETES BUT IT CAN BE CONTROLLED BY EATING HEALTHY FOODS AND EXERCISE.
You may also need to take tablets to help control diabetes

WHAT ARE THE SIGNS OF DIABETES?

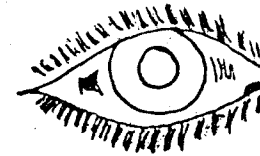
Feeling thirsty, drinking lots of water and passing lots of urine all the time.



Sores and cuts that take a long time to heal. Getting boils often



Poor vision and blurry eyesight



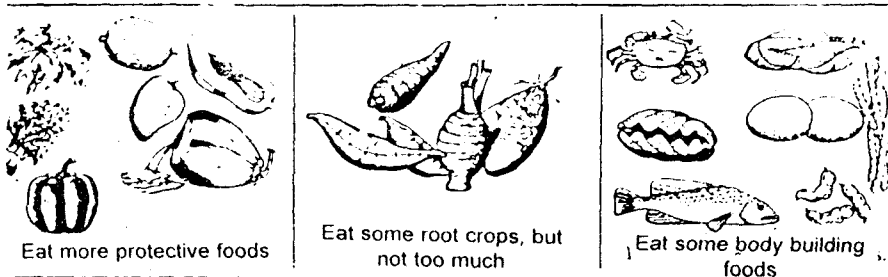
Feeling weak and tired or losing weight.

Numbness, tingling and weakness of the limbs



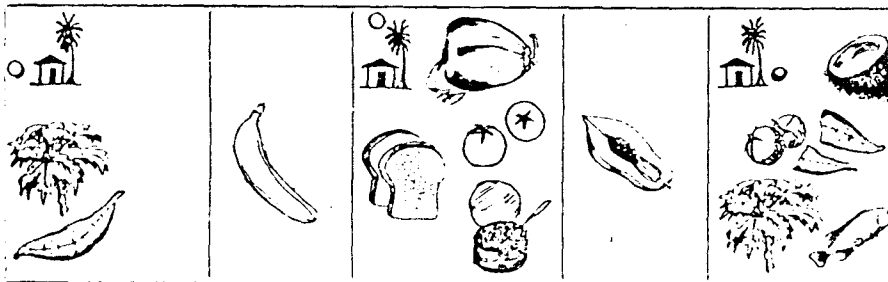
HOW TO LIVE WITH DIABETES

EAT A VARIETY OF HEALTHY FOODS

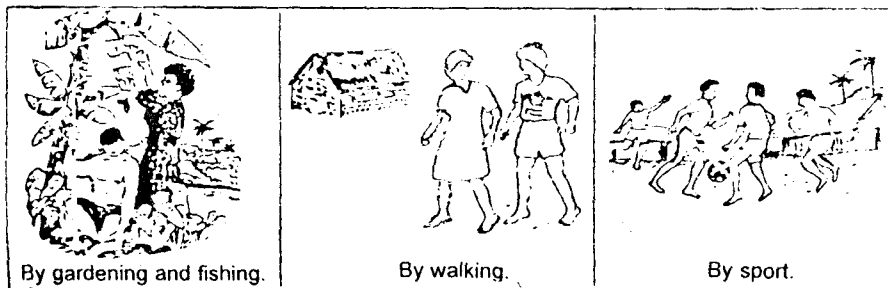


- * EAT LESS RICE, NOODLES, BREAD AND BISCUIT
- * AVOID SUGAR AND SUGARY FOOD.
- * EAT LESS FAT, OIL, COCONUT CREAM AND GREASY FOODS.
- * AVOID ALCOHOL.

EAT THREE MEALS A DAY



KEEP YOUR BODY FIT



DIABETES

TOO MUCH SUGAR IN THE BLOOD

WHAT IS DIABETES

Diabetes is a sickness where the body is no longer able to control how much sugar is in the blood.

If you have diabetes you will have to live and eat right so that the amount of sugar in your blood stays normal, otherwise you will become very sick.

WHO WILL GET DIABETES

You have a high risk of getting diabetes if:

- * you are overweight.
- * you eat and drink too much of the wrong kind of food and do too little exercise.
- * you are under stress
- * you are from a family where diabetes is common.
- * you are over 40 years old.

WHY IS DIABETES A PROBLEM

Too much sugar in your blood can slowly damage many parts of your body. The main causes are:

- * poor eyesight and BLINDNESS.
- * sore on feet and legs and ROTTEN FOOT.
- * HEART DISEASE
- * high blood pressure and STROKE
- * KIDNEY PROBLEMS.

THERE IS NO CURE FOR DIABETES BUT IT CAN BE CONTROLLED BY EATING HEALTHY FOODS AND EXERCISE. You may also need to take tablets to help control diabetes.

AT ARE THE SIGNS OF DIABETES

g thirsty, drinking lots of
and Mimi all the time



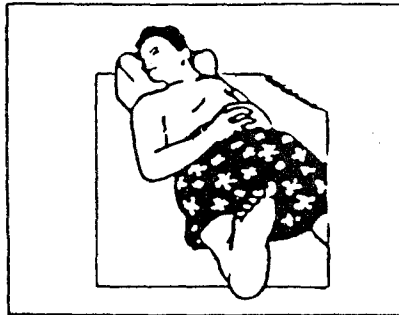
Feeling weak and tired, or
losing weight



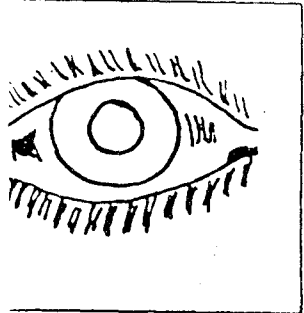
and cuts that take a long
real.
boils often



Numbness, tingling and,



ision and blurry eyesight



Feeling hungry all the time



HOW TO PREVENT DIABETES

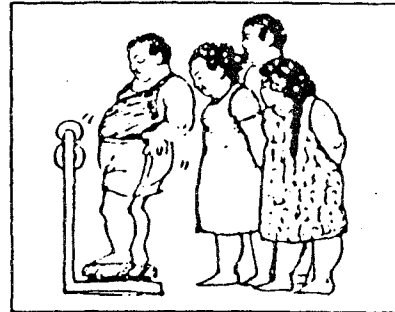
Stay slim



Exercise to stay fit



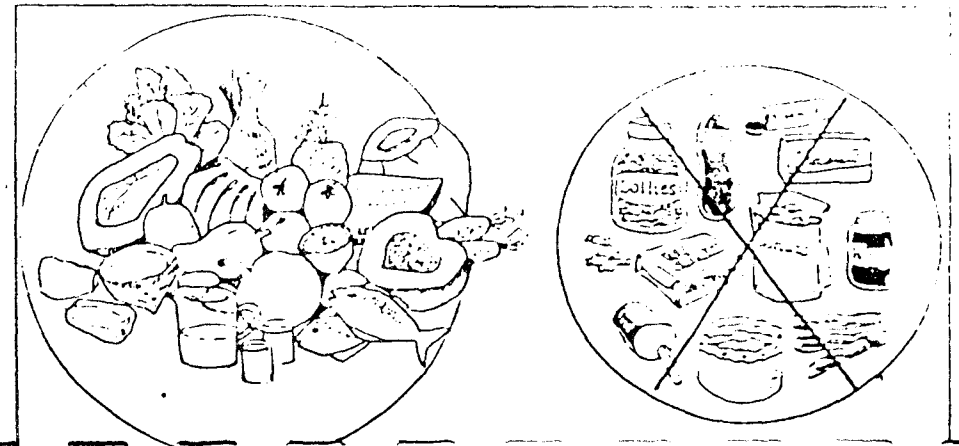
If overweight, try to lose
weight.



If you drink alcohol, drink
less.



Eat healthy foods, Eat wisely



HAVE ANY SIGNS OF DIABETES GO THE CLINIC IMMEDIATELY

APPENDIX C: TAPED PSA (CD)

APPENDIX C: TAPED PSA (CD)

RECEIVED

AS

FOLLOWS

Diabetes Public Service
Announcements (PSAs)
(English)

maxell

CD-R

80 min 700 MB

COMPACT
disc
RECORDABLE



Diabetes Public service
Announcements (PSAs)
(Solomon Islands
Pijin)



APPENDIX D: APPROVAL TO RECRUIT PARTICIPANTS FORM

**Approval to recruit participants for the study
Diabetes education for young adults: Using focus groups to determine the
effectiveness of Public Service Announcements (PSA) in Solomon Islands.**

Principal Investigator: Jillian T. Wate
Graduate Student
Department of Human Nutrition, Food and
Animal Sciences
University of Hawaii at Manoa
Honolulu, Hawaii
Email: wate@hawaii.edu

Faculty Advisor: Dian A. Dooley, Ph.D.
Associate Professor
Department of Human Nutrition, Food and
Animal Sciences
University of Hawaii at Manoa
Honolulu, Hawaii
Email: dian@hawaii.edu

The purpose of this study is to identify and develop appropriate diabetes education materials and intervention for young adults and to determine the effectiveness and appropriate mode(s) of delivering PSA in health education.

Students will be recruited from this institution from July to August 2004. Students will be participating in focus group interviews. Results from focus group interviews will be useful for developing nutrition education programs for chronic diseases among young adults in Solomon Islands.

All information provided by participants will be held confidential. Participants are free to withdraw from the study at any time, for any reason, without prejudice.

I certify that I have read and understand the foregoing, and I have been given satisfactory answers to my inquiries concerning the project procedures and other matters. I have given approval to recruit students from this institution to participate in the study.

Signature of USP Director/Head of School: _____ Date: _____

School: _____

APPENDIX E: PARTICIPATION AGREEMENT FORM

**Agreement to participate in the study
Diabetes education for young adults: Using focus groups to determine the
effectiveness of Public Service Announcements (PSA) in Solomon Islands**

Jillian T. Wate
Department of Human Nutrition,
Food & Animal Sciences
1955 East-West Road AGSCI 314S
Honolulu, HI 96822
Phone: (808) 945-9293
Email: wate@hawaii.edu

Project description

The purpose of this study is to identify and develop appropriate diabetes education material and intervention for young adults and to determine the effectiveness and appropriate mode(s) of delivering PSA in health education.

I will take part in focus group sessions. Result from focus group discussions will be useful for developing nutrition education programs for chronic diseases among young adults in Solomon Islands. I will have the opportunity to increase my knowledge about chronic diseases and learn how to eat more healthfully, as a result of this study.

All information provided by me will be held confidential. I am free to withdraw from the study at any time, for any reason, without prejudice.

I certify that I have read and understand the foregoing, and that I have been given satisfactory answers to my inquiries concerning the project procedures and other matters, and that I have been advised that I am free to withdraw my consent without prejudice.

I understand that I alone may be responsible for the costs of transportation to and from site.

Signature of student: _____ Date: _____

If you cannot obtain satisfactory answers to your questions or comment or complains about this study, contact:
Committee on Human Studies, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822.
Phone: (808) 956-5007 or Dr. Dian Dooley (808) 956-7021

APPENDIX F: CODING PLAN

10/14/2004

CODING PLAN

CODE		DESCRIPTION
1	Gender	
1.1	Female	Looks like female
1.2	Male	Looks like male
2	School Status	
2.1	Day school	School taking day students only
2.2	Boarding school	Students are lodged and fed as well as taught
3	PSA 1: Messages identified	Referring to “what is diabetes” PSA. Definition and risk factors: Identified message must include definition, risk, simple advice (2/3)
3.1	Definition	Diabetes is a sickness where the body is unable to control the level of glucose in the blood
3.2	Risk	Overweight, drink and eat too much wrong kinds of foods, do little exercise, under stress, diabetes common in the family, over 40 years
3.3	Simple advise	Stay slim, try to lose weight if overweight, exercise, eat healthy foods, and avoid stress, if over 40 years old, visit a doctor.
4	PSA 2: Message identified	Referring to “signs of diabetes” PSA: Identified message must include signs and seeing doctor (1/2)
4.1	Signs of diabetes	Feeling thirsty, drinking lots of water and passing lots of urine all the time, sores and cuts that take long time to heal, getting boils often, poor vision and blurry eyesight, feeling weak and tired or losing surprisingly a lot of weight, numbness, tingling and weakness of limbs, feeling hungry all the time.
4.2	Action of seeing a doctor	See a doctor if you have some of these signs
5	PSA 3: Message identified	Referring to “beating diabetes odds” PSA: Identified message must include increase risk in SI, guidelines, behavioral change (2/3)
5.1	Risk increase in SI	Diabetes becoming a serious health problem in SI
5.2	Guidelines	Healthful diet; eat plenty of fruits and vegetables everyday, eat less fatty, fried foods
5.3	Behavioral change	Keep fresh fruits and vegetables at home, work, and school; boil, steam or bake instead of frying foods; look for and order low fat foods for lunch
6	PSA 4: Message	Referring to “exercise and diabetes” PSA:

	identified	Identified message must include balance between food intake and exercise (increase risk of diabetes), exercise 60 mins a day, forms of exercise (2/3)
6.1	Balance in food intake and exercise	People becoming fatter, no balance of food intake and physical activity
6.2	Exercise everyday	Exercise 60 mins a day according to studies lower being fat, a risk of diabetes
6.3	Some forms of exercise	Stay slim; develop habit to walk to your workplace, jog, or walk home; involve in sports, aerobics, swimming, do gardening and yard work at home
7	Language	Discussion on how well the PSA can be understood in both prints and audio-related media
7.1	English	Standard language used in formal education
7.2	Pijin	Creole language spoken in Solomon Islands
7.3	Both	Using of both languages
8	Announcer	Discussion about how well the PSA can be presented in audio-related media (radio, TV, video, CD)
8.1	Female	PSA presented by female
8.2	Female Comedian	PSA presented by female comedian
8.3	Male	PSA presented by male
8.4	Male Comedian	PSA presented by male comedian
8.5	Both (dialogue)	PSA presented by both gender as a dialogue
8.6	No comedy (dramatic)	PSA presented by either one or both gender in a dramatic way
9	Relevance of PSA	Referring to the level of personal experience with diabetes
9.1	Personal experience (yourself, family, friends)	Self-reported as having some sort of personal experience
9.2	No personal experience	Self-reported no personal experience with diabetes
9.3	Personal wellness	Self-reported on PSA content for personal wellness
10	Is radio effective?	Referring to the present AM and FM radio stations (SIBC, Wantok FM, Z FM, Paoa FM, Good News FM)
10.1	Yes	Self-reported as effective
10.2	No	Self-reported as not effective
11	Recommendations: Best way to educate about diabetes	Other modes of delivering PSA or diabetes education that participants like to have access to such as CD, Drama, health workers (specialists, nurses, health educator), education center, prints (newspaper, poster, pamphlets, billboards,

		pictures), radio, school program/curriculum (health topics, PE, school canteen), TV, and Video.
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