Building Better Diabetes Care in Nauru

Report on the World Diabetes Foundation Project National Stakeholder Forum

March 12th – 13th 2008

GOVERNMENT
OF THE REPUBLIC OF NAURU

The University of Sydney

The National Stakeholder Forum
"Building Better Diabetes Care in Nauru"
March 12th – 13th 2008

The Forum was convened as part of the WDF Diabetes Project
"Building Capacity – Reducing Diabetes Complications: A Pacific Islands Model"

by:

The World Diabetes Foundation and the Nauru Ministry of Health

and organised and conducted by:

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The World Diabetes Foundation Project in Nauru
is conducted under a collaboration between
The Diabetes Unit – Australian Health Policy Institute at the University of Sydney
and the Ministry of Health, Nauru
with assistance from the
International Centre for Eye Care Education at the University of New South Wales and the
Australian and New Zealand Society of Nephrologists

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Foreword

Pacific Island Countries have undergone dramatic changes in lifestyle and diet, which unfortunately has resulted in a substantial increase in chronic non-communicable diseases (NCDs). Three out of four deaths in most Pacific Island Countries are due to NCDs and diabetes is a major factor in this. In the Western Pacific Region alone, it is estimated that 75 million people suffer from diabetes and this is expected to reach almost 100 million by 2025.

The 2004 Nauru WHO STEPS survey reported that the prevalence of NCD risk factors such as tobacco use, alcohol consumption, poor diet, physical inactivity, overweight / obesity and blood pressure were at very high levels in Nauru with 79.3% of 25-64 year olds being at a raised risk of developing NCDs. In addition to the high prevalence of risk factors, the 2004 STEPS survey found a 16.2% prevalence of diabetes among Nauruan adults aged 15-64 years. This prevalence increases dramatically with age with diabetes being present in 24.1% of those aged 35-44 years, 37.4% of 45-54 year olds and 45.0% of 55-64 years old. Associated with the high prevalence of diabetes, the people of Nauru are suffering a disproportionately high burden of preventable diabetes complications.

Impact of diabetes is not only human suffering. It significantly affects the productivity of people individually and collectively hence the social consequences are immense. Diabetes is increasingly affecting people in their productive years (ages 35-64). This decreases productivity, increases costs and threatens economic growth and development – particularly in countries like our own. In 2006, the United Nations (UN) passed a Resolution recognising the global threat of the diabetes epidemic. For the first time, governments have acknowledged that a non-infectious disease poses as serious a threat to world health as infectious diseases like HIV/AIDS, Tuberculosis and Malaria. In 2007, the UN resolved that 14 November will be observed annually as World Diabetes Day, and called for raised public awareness on the prevention and care of diabetes through education and usage of mass media.

Nauru has already embarked on a public campaign to raise awareness of diabetes through community engagement. Part of this campaign include community activities for example, Aerobics Sessions every Tuesday evening at Nauru General Hospital and the "WWW" walking program on every Wednesday evening is attended by many. But there is much more to be done and now is the ideal time for the development and implementation of national policies focusing on sustainable improvements in diabetes care and in preventing diabetes and/or its complications. A Diabetes Centre already exists at Nauru General Hospital and our aim is to enhance this centre to become a "one stop shop" where with a coordinated approach, optimal treatment, management and patient education can be provided.

The World Diabetes Foundation (WDF) project Stakeholder Forum represents an important milestone in the WDF diabetes project. The Forum brought together representatives of key stakeholder groups to review the current situation and to build a model of diabetes care through which Nauru can achieve the best possible health care and outcomes for people with diabetes within the constraints of our resource limitations. I encourage all who participated in the Stakeholder Forum to engage fully, and to encourage their colleagues, peers and the community at large to work together to improve diabetes care in Nauru and reduce the suffering caused by the largely preventable eye, foot and kidney complications all of which are linked and attributable to diabetes.

Hon. Mathew Batsiua MP
Minister for Health

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Background

"Building Capacity – Reducing Diabetes Complications: A Pacific Islands Model"

Why diabetes?

Chronic diseases are the cause of three in four deaths in all Pacific Island countries except Papua New Guinea where these diseases account for two in three deaths[1]. Type 2 diabetes is a major and growing component of the chronic disease burden in Nauru. Globally, it has reached epidemic proportions and is taking its biggest toll in developing countries where it is increasingly found in people in the productive years of life (35-64) and where some 70% of the global increase is predicted to occur[2,3]. It is estimated that almost 4 million people per year die of diabetes[4]. However, this in no way conveys the magnitude of the suffering of individuals who may live for many years with the debilitating consequences of diabetes – eg amputation, blindness, kidney disease, heart disease and stroke – before they die. Neither does it convey the financial impact on individuals and families who may experience financial hardship and even poverty as a result of diabetes. Nor does it convey the huge impact of diabetes on workforce participation and productivity, not to mention direct health care costs.

As it is everywhere, diabetes is threatening both the personal health of the people of Nauru and the economic health of the nation and its prospects for sustainable growth and development. The question is how can Nauru best prepare itself to meet and overcome the challenges posed by diabetes? Answering this question is the main thrust of the World Diabetes Foundation project currently underway in Nauru and the Stakeholder Forum which is the subject of this Report.

Currently, diabetes services are split between the Republic of Nauru (RON) Hospital and the Diabetes Centre at the Nauru General Hospital (NGH). There is a severe shortage of doctors at the Republic of Nauru Hospital with currently only 1 physician, 1 anaesthetist and 2 general practitioners employed. External assistance is provided by a visiting eye specialist every 3 months and annual visits from a renal specialist and a cardiac specialist. The availability of medications and laboratory reagents is not reliable. The Diabetes Centre at the Nauru General Hospital is staffed by a diabetes educator/manager, a diabetes wound care manager, a diabetes nurse, a dietician and a nutrition officer. It consists of an examination room and a waiting room. Services provided through the Diabetes Centre include basic non-medical management and education services. There is a physician who sees patients at the Diabetes Centre on a twice weekly basis. Extrapolating from the estimated population size and the diabetes prevalence estimated in the 2004 WHO Nauru NCD Risk Factors STEPS report there are approximately 2150 people with diabetes in Nauru. However, only 426 of these are currently registered with the Centre. This indicates that many people with diabetes are not utilising the specialised diabetes care that can be provided at the Diabetes Centre and that the Outpatient Department at RON Hospital is no doubt being over-burdened.

The project

The World Diabetes Foundation (WDF) has provided funding for The Diabetes Unit at the University of Sydney to work with the Nauru Ministry of Health and Australian collaborators (Australian and New Zealand Society of Nephrology and the International Centre for Eyecare Education) on a building capacity project which has been designed around the following:

Goal: To reduce the burden of diabetes complications in Nauru.

Aim: To design, develop and implement locally relevant and sustainable models to increase the

capacity of Nauru to manage, monitor and improve diabetes care and reduce eye, kidney and foot complications resulting from diabetes.

Focus: Secondary and tertiary prevention of diabetes complications through service and systems development and capacity building, with a particular emphasis on primary care and referral networks, documentation and communication systems. The focus is on the health system – specifically health professionals and systems of care; health services management, governance and research ie monitoring outcomes, quality improvement and evaluation. The project seeks to skill local staff in these areas as well as in clinical skills.

Primary Objective: To improve the quality, accessibility and effectiveness of diabetes care.

Secondary Objectives: To build up and/or improve:
- a suitably skilled workforce (including clinical, management and research skills)
- stronger systems and networks of referral and care (information systems, guidelines and protocols)
- the quality of care and access to health care services (upgrade staff skills and equip services)
- earlier detection and better management of diabetes and its associated complications

The diabetes project was designed primarily as a secondary / tertiary prevention intervention which follows a relatively simple 'recipe' of:

▪ *Measuring the problem*

Conducting a baseline situation analysis involving collating available data on diabetes risk factors, hospital admissions and amputations; assessing quality of care and complications rates; reviewing the status of diabetes related policy and health services; conducting a root cause analysis of amputations; and conducting a cost of illness survey.

▪ *Building the model*

The central approach is on empowerment for self determination and aims to address the identified problems through full engagement of health care providers, public health practitioners, health care planners, administrators and decision makers, relevant professional and non-government organisations and community and business leaders.

▪ *Making a difference*

Implementing the model to enable the improvement of the quality and accessibility of diabetes care. This investment will focus on provider training and competencies, clinical governance, information, and upgrading and delineating service roles.

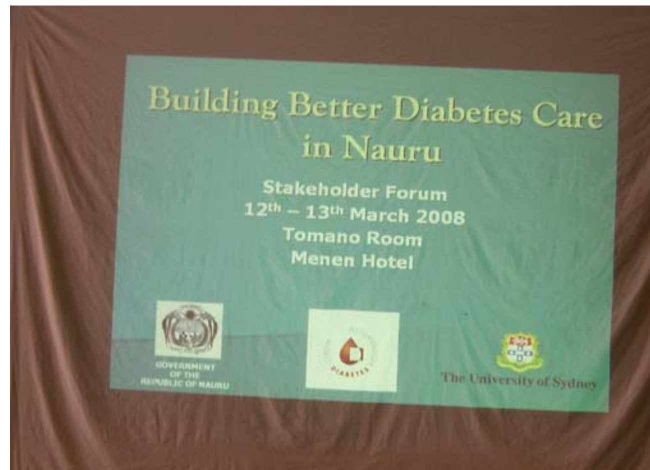
▪ *Measuring the difference*

This will require repeating the baseline assessments at the end of the project and comparing the results. Due to the relatively short timeframe of the project, tangible reductions in eye and kidney complications are not expected and progress towards these will be assessed by improvement in care processes and practices. However, it is feasible to expect a reduction in diabetes related amputation rates. Other parameters of interest will be the penetration of the project ie number of patients and staff reached, and the upgrading of diabetes services.

References
1. Tukuitonga, C. *Pacific Health Ministers Meeting*. World Health Organization, Secretariat of the Pacific Community, Vanuatu. 2007.
2. Amos A, McCarty D, Zimmet P. *The rising global burden of diabetes and its complications: estimates and projections to the year 2010.* Diabetes Medicine 14(Suppl 15): S1-S85, 1997.
3. King H, Aubert R, Herman W. *Global burden of diabetes: 1995-2025 prevalence, numerical estimates and projections.* Diabetes Care 21:1414-1431, 1998.
4. Roglic G, Unwin N, Bennett PH, Mathers C, Tuomilehto J, Nag S, Connolly V, King H. *The burden of mortality attributable to diabetes: realistic estimates for the year 2000.* Diabetes Care 28(9): 2130-2135, 2005.

Overview of the Forum

The Stakeholder Forum was a major deliverable of the Diabetes Project and was held as the project entered its second phase of "building the model". Entitled "*Building Better Diabetes Care in Nauru",* the Forum was based on whole-community engagement in developing systems to improve the quality and accessibility of diabetes care and support services. In line with the objectives of the WDF project, the Forum concentrated on developing and aligning the workforce and health services, information, funding and health policy with the needs of people with diabetes.



Aim of the Forum

The overall aim of the Forum was to bring together representatives of key stakeholder groups (see list of participants at Appendix 1) to review the current situation, identify opportunities, and propose a model of diabetes care through which Nauru can achieve the best possible health care and outcomes for people with diabetes within the constraints of its resource limitations.

Forum proceedings

The Forum was officially opened by the Hon. Mathew Batsuia, Minister for Health, Nauru.

The Hon. Mathew Batsuia Minister for Health, officially opening the Stakeholder Forum.

Following the opening ceremony, the Forum commenced with presentations introducing the WDF, and explaining the purpose and progress to date of the Nauru's diabetes project *"Building Capacity – Reducing Diabetes Complications: A Pacific Islands Model"*.

To thoroughly consider the issues and to set them in the broader political and socio - demographic context the Forum proceedings were designed to create an environment in which participants could freely express their views and share their expert knowledge of the Nauru health and social system and map this against needs and opportunities to identify a way forward. Consequently, the process was interactive and relatively informal and utilised a mix of presentations, small group work and plenary discussion. As shown on the agenda, the Forum was divided into three main areas which engaged participants in reviewing and analysing:

1. What is happening now?

- what is the status of diabetes
- what is the current situation with diabetes care and services

2. What should be happening?

- what are the internationally recommended standards of care?
- what do people with diabetes need?
- what kinds of health services produce the best outcomes?

3. How can we close the gap?

- what needs to be done to being diabetes care in Nauru closer to the recommended standards?

Presentations were given throughout the Stakeholder Forum in order to inform the participants of the current status of diabetes and diabetes care in Nauru and to present ideas to help developing the model of optimal diabetes care for Nauru.

The Forum was closed by the A/Professor Ruth Colagiuri, who thanked the participants for their active engagement in the Forum discussions and encouraged the participants to use the outcomes of the Forum to immediately take up the challenge of *"Building Better Diabetes Care in Nauru"*.

The remainder of this Report summarises and presents the main outcomes of the discussions and lists the main priorities and recommendations arising from the Stakeholder Forum.

Forum Agenda Day 1 – 12th March 2008

	Introduction	
9.00 am	Welcome	
9.10 am	Prayer	
9.15 am	Official Opening	Hon. Mathew Batsuia Minister for Health
9.30 am	Why diabetes? Why Nauru? Why this Forum?	A/Professor Ruth Colagiuri
10.00 am	*Morning Tea*	
Session 1 –What's happening now in Nauru?		
10.30	Public Health in Nauru	Dr Si Thu Win Tin Director of Public Health
	WDF Project Baseline Assessments	Dr Alexandra Buckley Mrs Eva Gadabu Mrs Ann Hubert Ms Dianna Demuro
Session 2 –What's should be happening?		
11.45 am	The international evidence for combating diabetes	A/Professor Ruth Colagiuri
12.00 pm	*Lunch*	
Session 3 – Developing a framework for closing the gap		
1.00 pm	SWOT Analysis - small group discussions to identify strengths, weaknesses, opportunities and threats for improving diabetes care in Nauru.	All Participants
2.00 pm	Plenary review and discussion of the results of the SWOT analysis - turning weaknesses into strengths and threats into opportunities	All Participants
3.00 pm	*Afternoon Tea*	
3.30 pm	Plenary discussion of what the Framework should look like	All Participants
4.00 pm	Close of Day 1	

Forum Agenda Day 2 – 13th March 2008

	Closing the Gap	
9.00am	Overview of Day 1	A/Professor Ruth Colagiuri
9.15am		All Participants led by:
	Strengthening the Health Workforce	
	- competencies & training	Mrs Eva Gadabu
	- clinical targets	Mrs Cindy Limen
	- national foot campaign	Mrs Rina Hartman
	Strengthening Health Services	
	- role delineation & referral pathways	Dr Alexandra Buckley
	- resources & equipment	Mrs Ann Hubert
	Strengthening Health Policy	
	- planning & co-ordination	Dr Si Thu Win Tin
	- information	Ms Dianna Demuro
10.15am	*Morning Tea*	
10.45am	Small group discussions on strengthening health workforce, health services and health policy	All Participants
12.30pm	*Lunch*	
1.30pm	Plenary discussions on strengthening health workforce, health services and health policy	All Participants
2.30 pm	Plenary discussion on identifying priorities and recommendations	All Participants
3.00pm	Closing Remarks	A/Professor Ruth Colagiuri
3.15pm	Close of Forum	

Forum Proceedings

What is happening now?

Public Health Programs in Nauru

In order to provide an empirical basis for making objective judgements about needs and solutions, on Day 1, Dr Si Thu Win Tin, the Director of Public Health in Nauru, gave a presentation summarising all the different public health projects currently underway in Nauru.

The Diabetes Situation in Nauru

The Forum participants were then presented with the findings of baseline assessments undertaken as part of the WDF project. These are listed below and the full details shown in Appendix 2:

i. **Situation analysis** – an electronic tool used to assess the current priorities, policies and programs relating to NCDs, the current status of diabetes and the available resources for managing diabetes and the associated complication.

ii. **Diabetes related hospital admission and amputation rates** – collated from the 2002 - 2007 medical ward and surgical ward admission books RON hospital.

iii. **Amputation root cause analysis** – a survey conducted on 21 people with diabetes who had had an amputation in the past 5 years to determine what preceding events led to the amputation and to identify key intervention points that may have prevented the amputation.

iv. **Complication screening** – an Australian clinical team and local diabetes clinic staff undertook a comprehensive complication screening on 108 people with diabetes. These people will be followed up throughout and at the end of the project as a means of evaluating the success of the project.

v. **Cost of Illness survey** – an adaptation of the Australian DiabCo$t survey was conducted on 133 people with diabetes (108 of these were people who underwent the complication screening). The survey was used to determine the cost to people with diabetes, cost of treatment and the general impact diabetes has on individuals, family, community and Nauru as a whole.

This session provided important quantitative and qualitative information, and the insights of local health professionals, to paint a comprehensive picture of what is currently happening in relation to diabetes and diabetes care in Nauru as a prelude to considering what should be happening and how to move closer to this.

What should be happening?

This segment of the Forum outlined the current internationally recognised recommendations for diabetes prevention and care, highlighting the excellent evidence for primary prevention and detailing which processes and practices of care lead to the best outcomes. The 'take home' message from this session strongly emphasised that:

- there is irrefutable evidence from several countries that diabetes can be prevented or significantly delayed through simple lifestyle interventions
- there is even stronger evidence that the complications of diabetes can be prevented or significantly delayed through early diagnosis and timely and appropriate treatment and care
- not only is the prevention of diabetes and its complications effective, it is known to be cost effective
- improving the prevention and care of diabetes is relatively inexpensive and is within the power of Nauru to achieve

How can we close the gap?

Determining how best to close the gap between what is actually happening now and what should be happening was achieved by participants engaging in small group discussions and working through a three-step process:

Step 1 – The SWOT Analysis

Step 2 – Developing the Framework

Step 3 – Identifying the Priority Strategies

Small group discussions were held throughout the Stakeholder Forum in order to engage the participants in developing the model of optimal diabetes care for Nauru.

Step 1 – The SWOT Analysis

As a first step, participants undertook a SWOT analysis to assist them to gain an overview of, and analyse Nauru's strengths and weaknesses in relation to any perceived deficiencies and opportunities for addressing them, and any threats that may be encountered along the way. The SWOT analysis was an important component of the process of engaging participants in exchanging and applying their collective expert knowledge of their own health system and community. The Forum participants divided into 4 small groups and each group was allocated one of the following headings: **S**trengths, **W**eakness, **O**pportunities or **T**hreats and asked to brainstorm and discuss issues of their allocated heading in relation to diabetes care in Nauru. Each group then presented the results of their discussions and brainstorming to the Forum and plenary discussions followed so as to finalise a list of points under each heading which were representative of all Forum participants. The results of SWOT discussions and brainstorming are set out below.

Strengths	**Weaknesses**
• Diabetes listed as a National Health Priority and has Government support • Existing Diabetes Centre staffed by health workers who have undergone intensive training and equipped with laboratory equipment required to provide optimal diabetes care • Availability of a dietician to help with the nutrition education for people with diabetes as well as those at risk of developing diabetes • Existing dialysis unit so people requiring dialysis treatment do not have to travel overseas • Visiting specialist teams provide support to the Nauru health system • District Primary Healthcare Workers have been trained and are ready to go out into the community • Opportunities for health workers to go on overseas attachments for training • In-country training workshops held occasionally • Regular health-promoting activities (eg Walk for Life, Aerobics) • Other diabetes awareness programs held in communities and schools • Sport activities regularly held • Kitchen gardens exist in numerous communities thereby promoting fresh fruit and vegetable consumption • Strong church and community network which provides support	• Lack of interest / awareness in health and well-being with some people in denial and refusing to change lifestyle • Some people are scared to know their health status so don't come in for check-ups • Feelings of helplessness once people diagnosed with diabetes • Lack of graphic messages promoting positive attitudes • Healthy foods (fresh local produce) not available. • Lack of knowledge on how to prepare healthy meals • Lack of incentive to participate in sport activities • Expensive cost of living and a cost imbalance between healthy and unhealthy foods • Government policies often not put into practice, particularly anti-smoking policies • Lack of Governance issues • Limited resources – human, technical, financial • IEC material not translated into Nauruan and not made culturally relevant • Slow development and lack of co-ordination for program implementation and lack of continuity of resources required to run programs • Transport problems, including fuel supply, making it difficult for patients to have regular check-ups • Equipment often stolen due to lack of security officers • Inadequate water supply at RON and NGH causing people to not wanting to come in for medical treatment

Opportunities	Threats
• WDF project • Expanding the Diabetes Centre to make it a "one-stop shop" with adequate human and technical resources • Government will • NCD Strategy • National sports activities, physical activity programs, weight loss competitions • World Diabetes Day events • Establishment of Kitchen Gardens – local food • Visiting specialists training up local healthcare workers • District Primary Healthcare Workers can provide basic diabetes knowledge, care and management out in their communities. • National Foot Campaign • Support from Churches and Community boards • Nauruan Culture and Traditions • Development of a national diabetes association to gain benefits of being members of international organisations. • Physical activity levels increased due to lack of transport.	• Political instability • Cheap unhealthy imported food • Healthy foods that are available are very expensive • Taxes are increasing, wages not • Bad social habits and attitudes towards health, particularly smoking, • Self-denial • Unemployment contributing to bad social behaviour and lack of motivation • Insufficient land to establish kitchen gardens • Short and unreliable supply of medical supplies • Poor communication between RON and NGH • Language, communication and cultural barriers between doctors and patients • Transport, including fuel supply • Privacy issues (stigma of being diagnosed with diabetes) due to the small island community

Summary of the SWOT Analysis

It was recognised that Nauru has many strengths and that there are a number of opportunities for refocussing the diabetes care system to achieve optimal diabetes care already exist in Nauru.

For clinical care, the existing Diabetes Centre at NGH was seen as obvious strength and provides an excellent platform and ample opportunity for building up the level of diabetes care nationally. It was agreed that in order to relieve the burden felt at RON Hospital, all people with diabetes should receive their primary and secondary care at the well-staffed Diabetes Centre and only be referred to RON Hospital for tertiary care. It was also thought essential to utilise the District Primary Healthcare Workers, training them to be able to raise diabetes awareness in their communities as well as provide basic diabetes care and management. An NCD Strategy has been developed and now is the time to capitalise on this. Many health promoting programs (Walk for Life, Aerobics, Weight Loss Competition) are already being run on a regular basis. An opportunity discussed was the formation of a National Diabetes Association in order to help lobby for what people with diabetes need and to raise and promote diabetes awareness, particularly on World Diabetes Day.

The discussions raised a number of crucial weaknesses and threats which need to be urgently addressed. These included the current cheap cost of imported processed foods compared to the lack of and expensive cost of more healthy food options and transport problems resulting in inadequate access to medical care. Fortunately, with the implementation of well thought out policies and programs, most of the identified weaknesses and threats can be turned into strengths and opportunities and thereby assist in the building of better diabetes care in Nauru.

Step 2 – Developing the Framework

The next step was to think about the components of a framework for closing the gap. A framework is a conceptual pathway which is designed to show how a vision and mission can inform the identification of strategies and priorities, and guide efforts to operationalise the goals in order to achieve the desired results if better access and improved health outcomes for all people in Nauru with, or at risk of diabetes. Through a plenary discussion, a skeletal framework of goals and area on which a cohesive strategy could be built was identified. The detail of the developed framework for Building Better Diabetes Care in Nauru is presented below:

Vision

- For Nauru to have the lowest prevalence of diabetes in the world and to be a role model for providing optimal diabetes care.

Mission

- To improve diabetes care in all communities / districts in Nauru

Goal

- To reduce diabetes-related complications

Objectives

- To provide all people with diabetes with the education and skills to manage their diabetes effectively
- To reduce the proportion of people with undiagnosed diabetes
- To have no more diabetes-related amputations by 2015.

Strategies

- Strengthening Health Workforce
- Strengthening Health Services
- Strengthening Health Policy

Step 3 – Identifying the Priority Strategies

On the morning of Day 2 of the Forum, examples of strategies of how health workforce, health services and health policy could be strengthened were presented to the participants. The Forum participants then engaged in a series of small group discussions to populate the framework with strategies for improving the systems and infrastructure that underpin diabetes care through strengthening the existing health system. A plenary discussion was then held and the strategies requiring priority action in order to successfully achieve the mission of reducing diabetes-complications in Nauru were identified. Much of the discussion about the strategies for improving diabetes care in Nauru was predicated on building up and strengthening the existing health system in terms of the health workforce, the health services and health policy. These are summarised on the following pages and the resulting Framework is pictured on Page 14.

Priority Strategies for Strengthening Health Workforce

It was suggested that the existing structure of the workforce needs to be strengthened and that this could be accomplished by developing standardised guidelines outlining clinical competencies for all levels of health workers, clearly delineating the various health worker roles, developing referral pathways so each health worker knows when and where to refer a patient if required, and adopting the clinical targets presented at the Forum for use in Nauru. To ensure that all health workers are aware of these developed competencies, roles, referral criteria and clinical targets it was agreed a training program should be conducted as a strategy for strengthening the health workforce and so that all health workers become aware for what care they should be able to provide and when and where patients should be referred to if required. It was also agreed that the District Primary Healthcare Workers should be trained thoroughly in basic diabetes prevention and care, particularly in the early detection and management of diabetes foot problems. It was discussed that the training of all health workers should not just be a one-off workshop, instead on-going refresher courses should be held on a regular basis.

Priority Strategies for Strengthening Health Services

The main strategy proposed for Strengthening Health Services was the expansion of the already existing Diabetes Centre so that it becomes a "one-stop shop" for all people with diabetes. This would result in the people with diabetes only having to go to one place for their regular check-ups, medications, patient education, as well as treatment of complications, particularly foot complications. The Diabetes Centre is already staffed with Specialised Diabetes Nurses including a Wound Care Manager and it would be ideal to utilise this and provide specialised care for diabetes-related foot problems. Using the Diabetes Centre as a "one-stop shop" would potentially reduce the burden at the RON Hospital outpatient and general foot clinic and would also most likely decrease the waiting time for patients which could lead to improved compliance and hence improved diabetes control. The Diabetes Centre has already been equipped with a DCA Analyser and an LDX Analyser which are machines used to assess metabolic status, including blood sugar control.

Transport is a major issue in Nauru so it was proposed that Outreach Clinical and Educational services into the communities should be commenced in order to keep track of people who are at risk of developing diabetes / already have diabetes and who are unable to make it in to the Diabetes Centre for review. A Diabetes Kit (pictured below) which contains basic testing equipment and referral criteria has already been provided to the Diabetes Centre and can be taken out into the communities. The District Primary Healthcare Workers have similar equipment in their backpack and so too could provide basic diabetes care services in the communities.

The Diabetes Kits

Given that reducing diabetes-related amputations is one of the main aims of the WDF project and that one of the framework objectives developed during the Forum was to have no more diabetes-related amputations by 2015, it was agreed that a National Foot Campaign should be launched. This would involve a substantial part of the training program to be focused on foot problems and optimal foot care, as well as raising public awareness about the importance of foot care in diabetes.

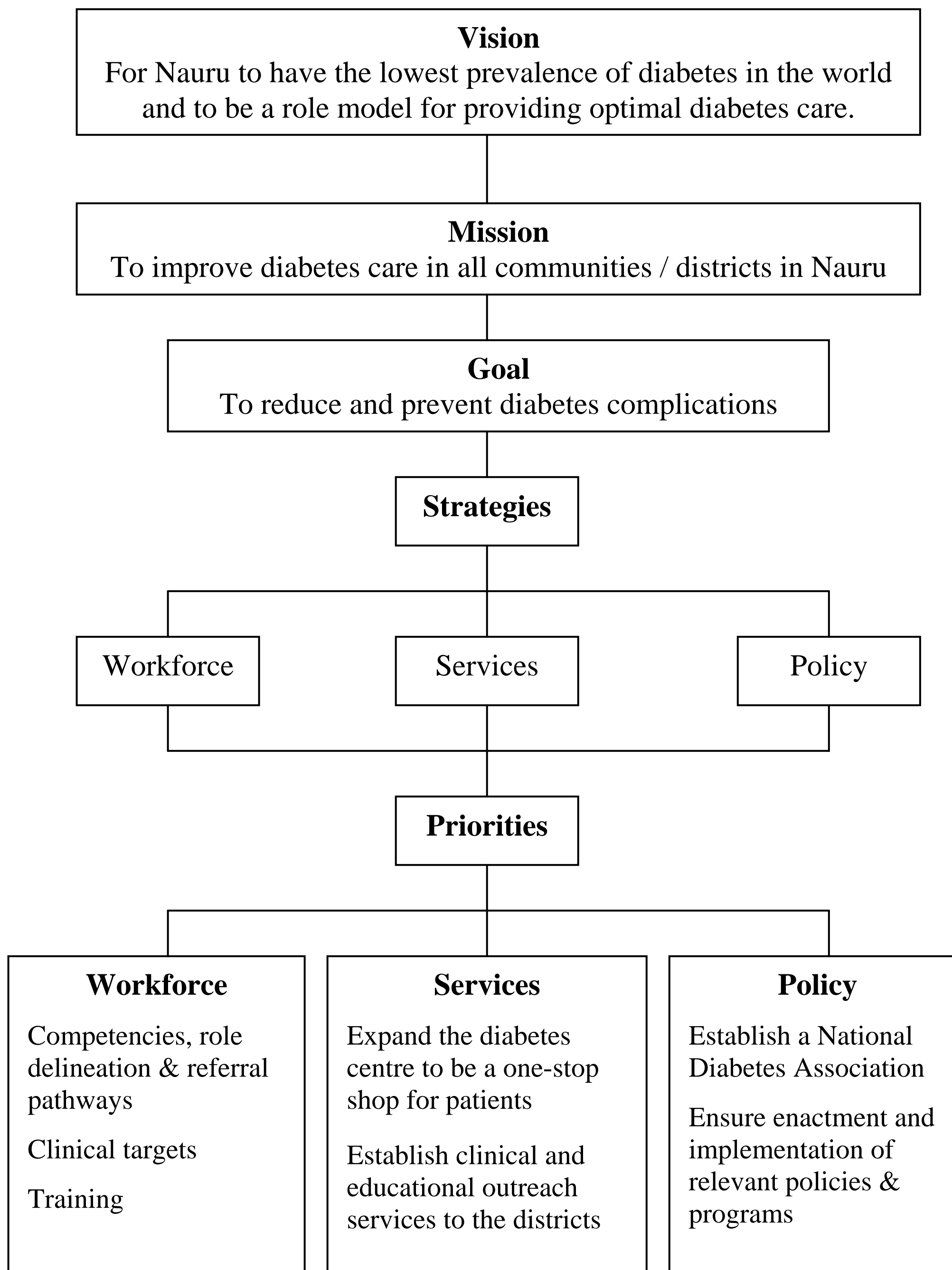
Priority Strategies for Strengthening Health Policy

Diabetes is already recognised as a formal National Priority area and an NCD strategy has already been developed. It was agreed that now is the time to see this fully implemented. There is a need to change the political environment so that developed policies are seen to be put into practice and enforced. Policies which aim to prevent and reduce prevalence of food related diseases by promoting local food (production, preparation and consumption) need to be strengthened and price control of healthy food is also required. Currently it is unhealthy food that is more affordable than healthy food.

It was also proposed that a National Diabetes Association be established. This association would be a consumer organisation that could lobby the Government for the needs of people with diabetes as well as for people at risk of developing diabetes. The association could reap further benefits by applying for membership of the International Diabetes Federation.

The Nauru Diabetes Team

Summary of the Framework



The Framework for Building Better Diabetes Care in Nauru

Prioritised Recommendations

From the proposed strategies outlined in the preceding pages, a list of agreed priorities for building a model of diabetes care that is appropriate, applicable and manageable in Nauru has been developed and, together with the summarised Framework depicted on the preceding page, is being recommended to the Secretary of Health in Nauru for formal endorsement by the Ministry of Health.

List of Priorities

1. **Strengthening Health Workforce by:**
   - i) developing guidelines (competencies, clinical targets and role delineation and referral criteria) to ensure consistency of the diabetes care provided
   - ii) conducting a diabetes training program for all healthcare workers (including doctors, nurses and the district primary healthcare workers)
2. **Strengthening Health Services by:**
   - i) expanding the Diabetes Centre so that it functions as a "one-stop shop" for all people with diabetes
   - ii) establishing clinical and educational outreach services to the districts
3. **Strengthening Health Policy by:**
   - i) having the developed polices and programs enacted and implemented
   - ii) establishing a National Diabetes Association which can lobby the Government

Appendix 1

List of Forum Participants

Forum Participants

Name	Position
Evi Agir	Pastor Assembly of God
Palik Agir	Pastor Protestant Church
Lois Aingimea	Assistant Director of Nursing
Merrilys Akaraba	Pharmacy OIC
Nahida Aktar	Dietician
Patrina Akua	Community Health/Eye Nurse
Vaiuli Amoe	Ewa Community
Roland Ange	Laboratory OIC
Shere-Lei Apad	Ijuw Community
Hon. Mathew Batsuia	Minister for Health
Junior Brectefield	Physiotherapist
Alexandra Buckley	Project Manager, The Diabetes Unit. University of Sydney
Kelvin Canon	Diabetes Role Model
Nemesia Capelle	Dialysis OIC
Ranwick Capelle	Nutrition Officer
Lorna Clodumar	Women's Fellowship
Vinci Clodumar	Rehabilitation Corp Chairman
Ruth Colagiuri	Director, The Diabetes Unit. University of Sydney
Corrina Cook	Aiwo Community
Ivy Cook	Catholic Legion
Rioli Deduna	Graphic Designer
Dr Deepti	Obstetrician
Dianna Demuro	WDF Project Support Officer
Tracey Denuga	Location Community
Manfred Depaune	Buada Community
Ramrakha Detenamo	Bureau of Statistics
Jane Dowabobo	Nibok Community
David Dowiyogo	Health Planner
Jean Duburiya	Foot Clinic OIC
Nicholas Duburiya	Transport Dept. Representative
George Fraser	Australian Consul General
Eva Gadabu	WDF Project Coordinator
Maxwell Gadaraoa	Media Dept
Dr Maria Gaiyabu	Secretary for Education
Chanda Garabwan	Health Educator
Dozono Gobure	District Primary Health Care Worker
Samuel Grundler	Finance Department (Development & Planning Dept)
Greta Harris	President Nauru Youth Council
Jason Harris	Media Dept
Labi Harris	Pastor Independent Church
Rina Hartman	Diabetes Centre Nurse
Peter Hatfield	AusAid
Ann Hubert	WDF Project Support Officer
Preston Itaia	Director of Youth Affairs
Raimin Itsimaera	Commerce, Industry and Resources Dept
Jeva Jose	District Health Liaison Officer
Uh Jin Kim	Pharmacist

Name	Position
Romana Koepke	Yaren Community
Cindy Limen	Diabetes Centre Nurse
Sr Mary Manuera	Catholic Church
Roneel Narayan	Capelle & Partner (Private Sector)
Dr Wunna Polay	GP (Diabetes Doctor)
Dr Ramany	Director for Medical Services
Fabiola Reweru	Baitsi Community
Natasha Rutana	Eigigu Holding Corp. (Sec. to Board)
Madeleine Salton	Strategic Health Planner
Ruth Scotty	Boe Community
Sunia Soakai	Secretary for Health
Brian Star	Foreign Affairs Dept
William Star	Acting Director for Administration (Health)
Milner Stephen	District Primary Health Care Workers
Nelson Tamakin	NAQUA (NGO)
Audrey Tannang	District Primary Health Care Worker
Carol Thoma	Location Community
Dr Kiki Thoma	GP
Morley Thoma	Eigigu Holding Supermarket Manager
Ruby Thoma	Health Promotion Coordinator
Symond Timothy	Ward Supervisor
Rimone Tom	Pastor Orro Church
Carmen Willis	Diabetes Role Model

Appendix 2

What's happening now

Appendix 2 – WDF Baseline Assessments

- Situation Analysis
- Mapping of the health services
- Diabetes related hospital admissions
- Diabetes related amputations
- Amputation root cause analysis
- Complication screening
- Cost of illness survey

Baseline Assessments of the WDF Project

As part of the WDF Project a number of baseline assessments have been completed by the local in-country Project Staff with assistance from the Australian Project Manager and the Australian Collaborators. These assessments included:

1. Situation Analysis
2. Diabetes related hospital admissions
3. Diabetes related amputations
4. Amputation Root Cause Analysis
5. Complication Screening
6. Cost of Illness Survey

Details of these assessments can be found in the following pages.

Situation Analysis

The "situation" prior to the commencement of the project in August 2007 was analysed using an electronic program which was completed by Ministry of Health Staff and assessed:

1. Priorities, policies and programs relating to diabetes, obesity, nutrition and physical activity.
2. Status of diabetes and associated complications as well as the cost of diabetes medications and care.
3. Available resources for managing diabetes and associated complications.

1. Priorities, policies and programs

Is diabetes **formally** listed as a national health priority?	Yes
Is there a national diabetes plan/program (NDP)?	No
Is there an NDP being developed?	No
Are clinical management guidelines routinely used?	No
Are any other guidelines for other aspects of diabetes care in use?	No
Are any other disease related guidelines available?	No
Is there a national **policy** on food and/or nutrition?	No
Is there a national **program** on food and/or nutrition?	No
Is there a national prevention **policy**?	No
Is there a national prevention **program**?	No
Is there a National Diabetes Association?	No
Is there a Diabetes Centre?	Yes

2. Current status of diabetes

Is the incidence and/or prevalence known for: • Type 1 diabetes • Type 2 diabetes • Gestational diabetes	Yes – approx 1% Yes – 16.2 % (15-64yrs) No
Are complication rates known for: • Blindness • End stage renal failure • Lower limb amputations • Heart disease • Stroke	No
Are diabetes prevalence and outcomes measured and monitored?	No
Is there a nationally agreed and standardised diabetes data set?	No
Is the cost of diabetes available for: • Cost of oral agents • Cost of insulin • Cost of supplies • Hospital costs • Cost of complications	No
How is diabetes medical treatment financed?	100% by Govt
How is diabetes hospital treatment financed?	100% by Govt
How is diabetes medications financed?	100% by Govt
How are diabetes laboratory tests financed?	100% by Govt

3. Available resources for managing diabetes

What type of health professionals are available to care for people with diabetes?	General Physicians Visiting Ophthalmologist Diabetes Nurses Dietician
What type of diabetes training programs are available in-country for the health professionals?	Regular in-formal workshops for nurses and dieticians
Is multidisciplinary care available to people with diabetes?	Yes GPs, Diabetes Nurses/Educators, Dietician, Renal Dialysis Nurses and Foot Care Nurses are available to provide care / treatment
What laboratory assessments are available? Fasting blood glucose Oral glucose tolerance test HbA_{1c} Total cholesterol Triglycerides HDL Microalbumin Creatinine Urea Proteinuria	 Yes – irregular strip supply No No (machine broken) No (machine broken) No (machine broken) No (machine broken) No (machine broken) No (machine broken) No (machine broken) No (machine broken) ** Samples are being sent to Australia for analysis
What equipment is available? DCA analyser and reagents Blood glucose meters ECG machine Blood pressure machines Injection Devices Monofilament Biothesiometer Doppler Slit lamp Retinal camera	 Machine is broken & no reagents Yes but supply of strips is very irregular Machine is broken Yes Yes Yes No No No Machine has no film

What medications are available?	
Insulin – short acting	Yes
Insulin – intermediate acting	Yes
Insulin – long acting	No
Insulin – pre-mixed	Yes
Oral diabetes agents	Yes
Anti-hypertensive agents	Yes
Lipid lowering agents	Yes
What facilities / systems available?	
Computer	Yes
Recall system	No
Diabetes database	No
Diabetes register	Yes
Documentation system	Yes
Referral criteria	Yes – informal
Clinical protocols	No

Diabetes Related Hospital Admissions

The medical ward admission books from 2002 to 2007 were used to determine the annual number of diabetes related admissions as well as the average length of hospital stay for these admissions.

Diabetes Related Hospital Admissions, Length of Stay and Patient Re-admission

Year	Number of Admissions	Average Length of Stay	Patient Re-admission
2002	N/A	N/A	N/A
2003	N/A	N/A	N/A
2004	54 admissions	18 days	5 patients
2005	22 admissions	8 days	2 patients
2006	105 admissions	8 days	11 patients
2007	163 admissions	14 days	19 patients

** N/A – the Admission Record Book for 2002 and 2003 could not be located at the time of data collection

Diabetes Related Amputations

The operating theatre record books from 2002 to 2007 were used to determine the annual number of diabetes related above knee, below knee, foot, half foot and toe amputations, as well as the annual number of major debridement of diabetic foot ulcers requiring general anaesthesia.

Number of Diabetes Related Amputations

	2002	**2003**	**2004**	**2005**	**2006**	**2007**
Above Knee	4	0	1	0	3	2
Below Knee	10	3	3	4	2	7
Foot	0	0	1	0	0	0
Half-Foot	0	2	3	8	2	0
Toe	12	25	12	11	8	17
Foot Ulcer Debridement (requiring GA)	8	5	2	3	2	3

Amputation Root Cause Analysis

The Amputation Root Cause Analysis survey aimed to determine what preceding events led up to the amputation and was used to identify key intervention points that may have prevented the amputation.

The surveys were administered by the in-country project staff to a sample of diabetic patients who had had an amputation in the last 5 years. In total 21 people with diabetes-related amputations were surveyed.

The patients were asked a series of structured questions relating to their:

1. Diabetes status
2. Diabetes medication being taken
3. Place and frequency of receiving treatment for their diabetes
4. Amputation
5. Perceptions of what caused the amputation
6. Foot care knowledge prior to and after the amputation

Demographics / Diabetes Status			
	Females (n = 6)	**Males (n = 15)**	**Total (n = 21)**
Average age (years)	50.3 ± 4.96	50.2 ± 1.46	**50.3 ± 1.72**
Average Duration of Diabetes (years)	19.2 ± 3.38	20.1 ± 2.58	**19.8 ± 2.04**
Average Duration of Diabetes (years) before having amputation	18.3 ± 3.54	17.2 ± 2.69	**17.5 ± 2.13**
Blood Sugar Level			
• below 7mmol/L	• 1	• 3	• **4**
• between 7 and 10mmol/L	• 0	• 0	• **0**
• between 10 and 15mmol/L	• 0	• 3	• **3**
• above 15mmol/L	• 3	• 5	• **8**
• varied	• 1	• 3	• **4**
• don't know	• 1	• 1	• **2**

Diabetes Medication			
	Females	**Males**	**Total**
Nil (diet only)	1	4	**5**
Tablets	5	9	**14**
Insulin only	0	2	**2**
Insulin & tablets	0	0	**0**

Diabetes Treatment			
	Females	**Males**	**Total**
Hospital Outpatients Clinic	5	9	**14**
Foot Dressing Clinic	1	3	**4**
Diabetes Centre	0	1	**1**
Australia	0	1	**1**
No where	1	1	**2**
Visits			
• daily (foot dressing clinic)	• 1	• 3	• **4**
• weekly	• 0	• 2	• **2**
• fortnightly	• 1	• 0	• **1**
• monthly	• 1	• 1	• **2**
• every 2-3 months	• 0	• 1	• **1**
• every 6 months	• 0	• 1	• **1**
• yearly	• 0	• 0	• **0**
• only when necessary (ie sick)	• 3	• 7	• **10**

Amputations			
	Females	**Males**	**Total**
What first led to this amputation?			
• infected wound	• 1	• 1	• **2**
• injury	• 1	• 7	• **8**
• blister	• 4	• 7	• **11**
What did the patient first do about this?			
• nothing	• 3	• 7	• **10**
• washed in salt (sea) water	• 1	• 4	• **5**
• incision of injury/blister site	• 0	• 1	• **1**
• sought medical treatment	• 2	• 3	• **5**
Time before getting professional help			
• nil (got help immediately)	• 2	• 1	• **3**
• the next day	• 1	• 2	• **3**
• after a few days	• 0	• 2	• **2**
• after 1 week	• 1	• 4	• **5**
• after 2-3 weeks	• 0	• 3	• **3**
• after a few months	• 0	• 3	• **3**
Place of professional help			
• outpatients clinic	• 5	• 10	• **15**
• foot dressing clinic	• 1	• 5	• **6**
Ease of getting professional help			
• easy	• 5	• 10	• **15**
• difficult	• 1	• 5	• **6**
Initial Treatment by professional			
• dressing	• 4	• 12	• **16**
• oral antibiotics	• 2	• 5	• **7**
• IV antibiotics	• 0	• 1	• **1**
• hospital admission	• 2	• 5	• **7**
• nothing	• 1	• 1	• **2**
• debridement	• 0	• 2	• **2**
Reason why amputation was performed			
• due to wound not healing in response to treatment	• 2	• 11	• **13**
• not complying to treatment	• 1	• 0	• **1**
• wound too infected by time of presentation	• 2	• 3	• **5**
• re-injury	• 0	• 1	• **1**
• don’t know	• 1	• 0	• **1**

Foot Care Knowledge			
	Females	**Males**	**Total**
Taught about foot care prior to amputation			
• **yes**	• 2	• 11	• **13**
• **no**	• 4	• 4	• **8**
If yes, what were you taught			
• **clean and dry feet**	• 1	• 6	• **7**
• **check feet regularly**	• 2	• 8	• **10**
• **wear good fitting shoes**	• 1	• 3	• **4**
• **massage with oil**	• 0	• 1	• **1**
• **cut nails**	• 1	• 3	• **4**
• **early presentation of injury**	• 0	• 0	• **0**
Taught about foot care after amputation			
• **yes**	• 0	• 4	• **4**
• **still nothing taught**	• 4	• 5	• **9**
• **nothing new taught**	• 2	• 6	• **8**
If yes, what have you been taught			
• **clean and dry feet**	• 0	• 0	• **0**
• **check feet regularly**	• 0	• 2	• **2**
• **wear good fitting shoes**	• 0	• 2	• **2**
• **massage with oil**	• 0	• 0	• **0**
• **cut nails**	• 0	• 0	• **0**
• **early presentation of injury**	• 0	• 0	• **0**
• **cannot remember**	• 0	• 0	• **0**
Perceptions of what caused the amputation			
• **not having regular check-ups**	• 0	• 0	• **0**
• **home/traditional treatment**	• 0	• 0	• **0**
• **delayed medical treatment**	• 2	• 9	• **11**
• **incorrect medical treatment**	• 1	• 3	• **4**
• **insufficient diabetes knowledge (better foot care)**	• 1	• 2	• **3**
• **unable to attend clinic for treatment due to transport problems**	• 1	• 2	• **3**
• **cannot think of anything**	• 1	• 1	• **2**

Complication Screening

An Australian clinical team visited Nauru in November 2007 and completed a thorough complication screening on a cohort of known diabetic patients. Prior to the complication screening visit, a cohort sample had been selected so that it was demographically representative of the diabetic population in Nauru. It was ensured that the cohort consisted of a cross section of patients living varied distances from the hospital by randomly selecting patients from each of the districts of Nauru.

The results of this screening visit are presented below as mean ± SEM.

Demographics:

	Females	Males	Total
n =	62	46	108
Age (years)	51 ± 2	52 ± 2	52 ± 1
Duration of diabetes (years)	13 ± 2	11 ± 1	12 ± 1

Anthropometry and Biochemistry:

	Females	Males	Total	Clinical Target
BMI (kg/m^2)	35.2 ± 3.72	31.8 ± 1.01	33.8 ± 2.20	< 25
Blood Pressure (mmHg)	124 / 72	132 / 78	128 / 74	< 130 / 85
HbA_{1c} (%)	10.1 ± 0.39	9.2 ± 0.47	9.7 ± 0.30	< 7
Urine Albumin:Creatinine	22.6 ± 4.30	23.8 ± 4.23	23.1 ± 3.02	Men < 2.5 Women < 3.5
Total Cholesterol (mM)	5.3 ± 0.13	4.7 ± 0.17	5.0 ± 0.11	< 5.0
HDL Cholesterol (mM)	0.9 ± 0.04	0.8 ± 0.04	0.9 ± 0.03	≥ 1.0
LDL Cholesterol (mM)	3.5 ± 0.12	3.1 ± 0.14	3.3 ± 0.10	< 2.5
Triglycerides (mM)	2.1 ± 0.16	1.8 ± 0.12	2.0 ± 0.11	< 2.0

Complications:

	Females	Males	Total
% of patients with poor glycaemic control (based on $HbA_{1c} > 7\%$)	77%	63%	71%
% of patients with microalbuminuria (based on albumin/creatinine ratio >3.5)	64%	73%	68%
% of patients with diabetic retinopathy	63%	70%	66%
% of patients with abnormal foot sensation (based on monofilament test)	23%	35%	28%
% of patients with foot ulcers	4.8%	10.9%	7.4%
% of patients with diabetes-related amputations	4.8%	17.4%	10.2%

Medications:

	Females	Males	Total
% of patients not taking correct medication	61%	48%	56%

Cost of Illness Survey

The Australian DiabCo$t survey was adapted to be locally relevant to Nauru.

The patients were asked a series of structured questions aiming to provide information relating to the:

1. Cost to people with diabetes
2. Cost of treatment
3. General impact of diabetes on individuals, family, community and the country

The survey was administered by the in-country project staff to the cohort of patients between August and November prior to undergoing the WDF complication screening in November 2007. A total of 133 surveys were completed. Results of the preliminary analysis are presented below.

Demographics:

Number of people surveyed	133 (62 males; 71 females)
Average age (years)	50 ± 1
Average age of diagnosis (years)	37 ± 1
Average duration of diabetes (years)	14 ± 1
Percentage of people in full-time employment	46%
Percentage of people in part-time employment	4%
Percentage of people self-employed	1%
Percentage of people not in paid employment	49%
Percentage of people receiving a pension	25%

Diabetes Treatment:

Percentage of people treated by diet only	44%
Percentage of people treated with oral hypoglycaemic tablets	49%
Percentage of people treated with insulin	7%

Hospital & Diabetes Centre Visits:

Percentage of people visiting the hospital outpatient clinic due to diabetes	52%
Average number of outpatient visits in 3 months / person	5
Percentage of people visiting the emergency department due to diabetes	7%
Average number of emergency department visits in 3 months / person	4
Percentage of people staying overnight in hospital	15%
Average length of overnight hospital stay in 3 months / person	12
Percentage of people visiting the diabetes centre	29%
Average number of diabetes centre visits in 3 months / person	2

Approximate Medication Costs (to the Government) (based on 3 month consumption of patients stating they were on prescription medications):

Oral hypoglycaemic tablets (65 people)	\$900 (~\$14 / person)
Hypertension medications (31 people)	\$600 (~\$20 / person)
Cholesterol medications (3 people)	\$600 (\$200 / person)
Antibiotics (12 people)	\$800 (~\$65 / person)
Pain relief / anti-inflammatory medications (3 people)	\$100 (~\$33 / person)
Total approximate cost of all prescription medications in 3 months	**\$3000**

Diabetes-related Costs to the Individual (based on 3 month expenses):

Percentage of people with non-prescription medication costs (Average cost)	55% ($15)
Percentage of people with special diabetic food costs (Average cost)	10% ($75)
Percentage of people with hospital visit related costs (Average cost)	30% ($55)
Percentage of people with diabetes centre visits related costs (Average cost)	23% ($15)
Total approximate diabetes-related costs to individuals in 3 months	**$160**

General Impact of Diabetes

Percentage of people taking days off work due to diabetes	24%
Average number of days off work due to diabetes in 3 months / person	24
Percentage of people who cannot work due to diabetes	17%
Percentage of people with diabetes-related complications Eye Kidney Foot Ulcers Amputations	 33% 13% 17% 14%
Percentage of people with mobility problems	34%
Percentage of people who have trouble looking after themselves	14%
Percentage of people who have difficulties performing usual daily activities	28%
Percentage of people who are in pain	44%
Percentage of people who are anxious / depressed	34%
Average perceived health value	66%
Percentage of people with a full-time diabetes carer	12%