DEVELOPING A SUITABLE TAKAFUL PRODUCT FOR PEOPLE WITH DIABETES AND AT RISK OF HAVING DIABETES IN MALAYSIA





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UNIVERSITI SAINS ISLAM MALAYSIA 2021

RESEARCH REPORT

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EXECUTIVE SUMMARY

Malaysia is known to be among the nations in Asia with the highest number of Type 2 Diabetes Mellitus (T2DM) patients. In 2019, 17.5% of Malaysians, or more than 3.9 million people aged 18 years and above were suffering from the disease. It has been predicted that nearly 60% non-diabetic adults are at risk of becoming diabetes patients in 10 years. Hence, the magnitude of diabetic cases is expected to escalate rapidly in the next decade. People living with diabetes are exposed to numerous macrovascular and microvascular complications such as retinopathy, nephropathy, neuropathy, major cardiovascular events, and stroke. These problems could lead to functional disabilities, emotional distress, low quality of life, reduced productivity and even premature death. Management of diabetes directly increases the financial demands to deal with medications as well as outpatient and inpatient treatment costs, and imposes a tremendous economic burden on the government. The indirect costs consist of financial demands related to diabetes complications, travel expenses, the cost for a healthy diabetic diet, and loss of income. A systematic review in 2019 estimated that the total annual cost of diabetes in Malaysia was approximately USD600 million, mainly being subsidised by the Ministry of Health. A smaller portion of the financing is delivered through the private health sector and conventional health insurance policies. Takaful is a dynamic product in Islamic finance, which combines the elements of social welfare in its business model. Nonetheless, to date, there are no takaful policies available in Malaysia for people living with diabetes and those at risk of developing diabetes. In addition, there is a need to understand health literacy and takaful demand among diabetes patients or individuals at risk of having diabetes. In light of this, a nationwide cross-sectional stratified random sampling study is proposed to explore the perceptions, preferences, and acceptance towards takaful plans dedicated to these groups of the community. This information is crucial to formulate a comprehensive and affordable takaful plan for them. It is hoped that these efforts will reduce the burden of people living with diabetes which is in line with the government's vision to improve the health and general wellbeing of Malaysians particularly those in the underserved groups.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The takaful market has been witnessing steady growth over the past few years. Globally, the takaful market has reached a value of USD23.5 billion in 2020. The market is projected to grow at a CAGR of nearly 13% in the forecast period of 2021–2026. Figure 1 illustrates the historical market and forecast for the global takaful market from 2015 to 2025. It can be observed that the market is estimated to reach a value of about USD49 billion by 2025 (Global Takaful Market, n.d.). The Gulf Cooperation Council (GCC), Southeast Asia, and Africa, among others, are the leading regions in the industry, with the GCC accounting for the largest market share.





Currently, Muslim's account for a fifth of the total global population, which is further projected to increase in the future, thus, propelling the industry globally. One of the major factors in improving market penetration is growing product awareness, as a majority of the Muslim population lacks protection due to a lack of information about the wide range of solutions provided by the takaful market (Global Takaful Market, n.d.) With the development of a comprehensive legal and regulatory framework for the takaful market that aims to facilitate its operations and governance, this sector continues to develop more quickly as compared to its counterpart. The element of digitalisation has empowered the industry's prospects. Further, the promotion of product customisation schemes in the takaful sector with the introduction of new products in accordance with the changing consumer demands is expected to aid the industry growth over the forecast period (Global Takaful Market, n.d.).

FWD Takaful Berhad has seized the opportunity by taking a proactive and aggressive effort in developing new products in the market to serve the public needs. As a family takaful operator in Malaysia, FWD Takaful is focused on creating fresh customer experiences and making the insurance journey simpler, faster and smoother, with innovative propositions and easy-to-understand products, supported by digital technology. Through this customer-led approach, FWD Takaful aims to be a leading pan-Asian insurer by changing the way people feel about insurance. Recently, FWD Takaful has launched FWD Income First, a Family Takaful plan combining savings and protection within one plan and offering an annual guaranteed cash payment benefit ('FWD Takaful launches new product', 2021).

FWD now takes further steps to develop a suitable takaful product for people with diabetes and at risk of having diabetes in Malaysia. It is indeed a noble effort that aims to reduce the burden of people living with diabetes, which is in line with the government's vision to improve the health and general wellbeing of Malaysians particularly those in the underserved groups.

1.2 Overview of Diabetes in Malaysia

Diabetes is a serious, long-term condition with a major impact on the lives and well-being of individuals, families, and societies worldwide. Globally it affected almost 500 million people in 2019. Over the past decades, the prevalence of diabetes has increased drastically. It is well known that diabetes is divided into several types; Type 1 diabetes (due to β -cell destruction, usually leading to absolute insulin deficiency), Type 2 diabetes (due to a progressive insulin secretory defect on the background of insulin resistance), gestational diabetes mellitus (GDM) (diabetes diagnosed in the second or third trimester of pregnancy that is not clearly overt diabetes) and specific types of diabetes due to other causes, e.g.

monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young [MODY]), diseases of the exocrine pancreas (such as cystic fibrosis), and drugor chemical-induced diabetes (such as in the treatment of HIV/AIDS or after organ transplantation).

A recent study reported that just under half a billion people are living with diabetes worldwide and the number is projected to increase by 25% in 2030 and 51% in 2045 (Saeedi et al., 2019). According to the National Health and Morbidity Survey (NHMS) 2015 in Malaysia, 17.5% of the Malaysian population, or an estimated 3.5 million adults, suffered from diabetes and the number increased to 17.5% in 2019 (IPH, 2019). The National Diabetes Registry reported that there were 875,278 diabetes patients actively seeking treatment in selected Ministry of Health (MOH) health clinics and hospitals. In addition, based on the International Diabetes Federation Diabetes Atlas 2015, Malaysia has become the leading country in terms of diabetes prevalence (16.6%) in the Western-Pacific region excluding the Pacific Island countries. In fact, Malaysia has surpassed the neighbouring countries such as Singapore (12.8%), Indonesia (6.2%), the Philippines (6.1%), and Thailand (8.0%) (IDF, 2017).

As for manpower, recent data reported that Malaysia's Ministry of Health employed 5,314 medical specialists, 24,253 medical officers, 7,987 pharmacy officers, 160 medical rehabilitation officers (physiotherapy), 169 imaging officers (X-ray technicians), 2,493 X-ray technicians (diagnostic), 249 X-ray technicians (therapy), 65,117 nurses, 13,986 assistant medical officers, 4,101 assistant pharmacy officers, and 1,383 physiotherapists (CodeBlue, 2019). All of these figures reflect the high cost incurred for optimum diabetes management.

Many studies have proven that the quality of life of people with diabetes is poor compared to the normal population (Schram et al., 2009; Polonsky, 2002). There are multiple reasons for this. For instance, they are overburdened with the daily hassles of disease management leading to feeling overwhelmed, frustrated, or 'burned out' by the unending, often burdensome self-care demands (Polonsky, 2002). Another factor is the complications of diabetes namely its effects on the eyes, brain, kidneys, heart, nervous system, and others. These have been investigated and reported in many studies suggesting that the presence of complications affects their quality of life (Donald et al., 2003). Not only do they affect the patients physically and mentally, but the complications arising from Page | 3 diabetes also affect them financially. In the UK, treatment of the disease and its complications takes up 4–5% of the total UK health care expenditure. The most important contributors to the costs of diabetes are those of treating complications such as eye and limb disease, heart disease, neuropathy, and nephropathy (Leese, 1992).

Complications of diabetes range from acute, life-threatening conditions such as severe hypoglycaemia or ketoacidosis to chronic, debilitating complications affecting multiple organ systems, such as retinopathy, nephropathy, neuropathy, and cardiovascular disease. The development of complications takes about 5 years from the onset of illness in type 2 diabetes. However, in type 2 diabetes complications can arise from the onset of the disease itself (Nickerson & Dutta, 2012). There is a potential future number of diabetes cases in people under the age of 20. At current rates, the number of people under the age of 20 with type 2 diabetes could increase by up to 49% by 2050. If the rates of incidence increase, the number of type 2 cases in youth could quadruple (Giuseppina et al., 2012).

This is due to the changes in lifestyle which has become modernised and westernised. Food is becoming unhealthy with diets high in saturated fat and sugar. In addition, the lack of physical activity and increased prevalence of tobacco smoking are common. These lifestyles account for over two-thirds of new NCD cases and increase the risk of exacerbations in those who already have these diseases (Beaglehole et al., 2011). The mushrooming of gadgets along with the improvement in technology has made life easier hence even moderate physical activity is no longer required during work hours. The huge number of television programs and movies which can be viewed anywhere also discourages people from moving about. This rapidly rising trend can also be attributed to ageing and obesogenic environments. A few studies have shown a relationship between using high technology gadgets with sedentary lifestyles among youth and children (Roberts et al., 2017).

Studies have reported that the treatment of diabetes is becoming very expensive as it requires intensive treatment and costly investigation. For example, Mustapha et al. (2017) reported that the cost of patient follow-up was estimated at RM459 per year. The cost of complications was RM42,362 per patient per year for nephropathy, RM4,817 for myocardial infarction, RM5,345 for stroke, RM3,880 for heart failure, RM5,519 for foot amputation, RM479 for retinopathy, and RM4,812 for cataract extraction (Mustapha et al., 2017). This is a global trend as due to improvements in technology and the use of more Page | 4

advanced instruments, the investigation of diabetes has become more sophisticated. The use of these devices permits early detection of complications thus allowing early intervention and treatment. Ironically, it adds a higher financial and mental burden on the patients.

With the rising costs of healthcare and specifically those related to diabetes, it may be time to explore other possibilities to reduce the financial burden. It has thus come to the attention of insurance and takaful companies to come up with specific products that can cater to the special group of people living with diabetes in the near future.

1.3 Medical and Health Insurance/Takaful industry in Malaysia

Medical and health insurance (MHI) in Malaysia started in the early 1970s with the major industry players being foreign-based insurers, for example American International Assurance, AETNA, and Prudential. By 1999, Malaysians were found to be spending a substantial amount of their income on health costs. Although the government provides and subsidises the public healthcare cost, the insurance/takaful industry is expected to play a complementary role in providing this service to meet the diverse needs of the increasing population and very sophisticated market (Abdul Rahman & Mohd Daud, 2010).

According to an assessment made by the Central Bank of Malaysia (BNM) in 1999, the regulatory body for the insurance and takaful industry reported that the MHI or medical and health takaful (MHT) businesses has become the emerging trend for the future and an important sector of the insurance and takaful industry as there is a potential for market growth (Abdul Rahman & Mohd Daud, 2010). Key drivers to the projected growth mentioned by BNM (Insurance Annual Report, 1999, 2002–2008) are as follows:

- i. Rising health care costs;
- ii. Ageing population requiring high medical costs;
- Malaysians aged 55 and above are expected to increase to 14% in 2020 from the current 9%;
- iv. Improvement in mortality for both males and females; currently, 70 and 75, respectively, to increase to 75 and 79, respectively, in the year 2020;
- v. Breakdown of extended family structure; caring family values expected and advocated by the government for the old-aged parents may change in the near

future;

- vi. Healthcare as an employment benefit is fast becoming an incentive offered by employers to ensure employee loyalty and retention; and
- vii. Personal income tax exemption of up to RM3,000 for MHI or MHT policy purchases.

Furthermore, based on statistics from the World Health Organization (2021), the per capita expenditure for healthcare in Malaysia increased by USD272 from USD155 in 2004 to USD427 in 2018, growing at an average annual rate of 7.99%. However, the percentage of expenditure on healthcare in the public health system has experienced a decrease of 3.8%, from 59% in 2009 to 55.2% in 2011. In contrast, the percentage of total expenditure on healthcare in the private sector health system is on the rise, up 3.8% from 41% in 2009 to 44.8% in 2011. This shows that society is increasingly dependent on the personal health system instead of the public health system. One of the factors which contribute to this situation is the public health system requires longer waiting periods for receiving treatment. Modern society nowadays is concerned with healthcare and realises that the possibility to regain health is higher if they can receive early treatment as soon as possible. Therefore, the probability of death can be reduced. This is in line with the statement by Senior Consultant Paediatrician & Paediatric Haematologist and Oncologist, Dr. Hishamshah Mohd Ibrahim who mentioned that the earlier cancer patients receive treatment, the higher the chances of recovery (Awang et al., 2015).

As an alternative, the public could choose the private health system to seek the best possible treatment although the cost of private healthcare is higher. Indeed, the high costs of medical treatment have become a burden on society, especially for the lower-income group. This situation became worse when the Ministry of Health allowed an increase in private healthcare medical charges by 14.4% in 2014 ('Medical schedule shows hikes', 2014). In order to reduce the burden to finance medical expenses, the public is advised to get medical and health insurance/takaful to pay for medical expenses.

In Malaysia specifically, there are several Takaful operators and insurance providers that offer MHT/MHI. Apart from hospitalisation and surgical insurance, critical illness insurance is also considered as one of the main concerns of modern living healthcare. Currently, there are 39 to 45 critical illnesses covered by the insurance companies and Takaful operators. Table 1.1 below illustrates the most popular medical Page | 6

health insurance schemes offered by Takaful operators and insurance companies in Malaysia. The medical and health Takaful schemes offer the cheapest package amounting to RM1,200 per year with a lifetime limit of RM650,000 based on the comparison between Takaful operators and insurance companies. However, the extremely expensive one-year premium payments charged by the insurance companies are not affordable for poor people despite the lifetime coverage provided (Salleh et al., 2018).

Takaful Operators/	Takaful (1	Operators [O)	Insurance Companies (IC)					
Insurance Companies	ТОА	тов	ICA	ICB	ICC	ICD	ICE	ICF
Annual premium (RM)	1,200	1,800	3,920	3,000	3,400	3,600	5,100	1,462
Rider/ Standalone	Rider	Standalone	Rider	Rider	Rider	Rider	Rider	Standalone
Death & TPD (RM)	0	0	19,000	130,000	12,000	10,000	10,000	0
Annual limit (RM)	No limit	10,000 (annually subject to benefits covered)	1.5 million	1.2 million	1.6 million	No limit	No limit	No limit; per disability limit of 650,000
Lifetime limit (RM)	650,000 (overall)	No limit	No limit	No limit	No limit	1.65 million	No limit	No limit

Table 1.1: Comparison Table of Medical Health Insurance/Takaful Coverage

Source: Salleh et al. (2018)

1.4 Micro-Takaful in Malaysia

Under the Government Transformation Programme (GTP), there are several National Key Results Areas (NKRAs) that have been identified to ensure the development of socioeconomic growth of Malaysians. Health care is one of the main priorities of this developing country based on the findings that the standard of living of most Malaysians are within the low to moderate level (Salleh et al., 2018). Specifically, the low to moderate level individuals consist of hard-core poor, poor and low-income earners (B40), and moderateincome earners (M40). According to the Economic Report 2015/2016, the B40 group is categorised as those households with a monthly income of RM3,855, while the M40 (40% medium income group) are those who earn between RM3,860 and RM8,319 monthly. The Eleventh Malaysia Plan (11MP) reported that 60% of the B40 and M40 are those who come from a level lower than the middle class. Therefore, access to health care has become one of the main agendas in which the government has taken action to increase the average health spending to 12–13% per year. The high budget allocated to the Ministry of Health for health services varies annually with allocations of RM19.3 billion in 2012, RM22.1 billion in 2014, and RM23.3 billion in 2015. Meanwhile, the Ministry of Health has established a program known as the Malaysian Healthcare Travel Council (HTC) to further promote Malaysia as a world-class healthcare service provider (Salleh et al., 2018).

However, the facilities provided at government hospitals are limited to only 134 hospitals and nine special medical institutions, which also minimises the services that should be made available to the public. Hence, this indicates the inadequate accessible healthcare services needed to cope with a population that is almost approaching 30 million. Health care can be expensive and in the absence of insurance cover, households with severe and immediate medical needs can be forced to spend a large amount of their household budget on health care (Burhan, Salleh & Burhan, 2015). One of the possible alternatives to overcome this problem is to buy health insurance (Drechsler & Jütting, 2005). Nevertheless, the existing health insurance is considered very expensive especially for the poor individuals in Malaysia.

The disadvantaged group of people who have limited access to health care is reported to suffer a negative impact on their dignity, human capital formation and their risk-management options (Jütting, 2003). In addition, WHO records highlight that very few countries cover large parts of their health care expenses through private health insurance Page | 8 schemes, hence the contribution of private risk-sharing programs towards universal health coverage is still very limited (Drechsler & Jütting, 2005). To solve the constraints, the scheme should be well planned for targeted subsidies (partial), flexibility in payment procedure (instalment), education, and strengthening risk awareness among the poor (Salleh, et al., 2018). Thus, the establishment of mechanisms that can increase the availability of insurance and takaful schemes for the poor is a matter of urgency.

In the takaful industry specifically, the microinsurance/micro-takaful scheme is not new. According to Bank Negara Malaysia (2016), a microinsurance/micro-takaful product can be defined as an insurance/takaful product that is designed to respond to the financial protection needs of low-income households. In this respect: (a) 'financial protection' means being able to access timely and adequate financial resources to (i) cope with major expenses; or (ii) provide temporary or partial relief from financial difficulties arising from unexpected adverse events; and (b) 'low-income households' refers to poor, vulnerable or lower middle-income households, particularly groups that have been previously excluded from access to insurance/takaful. Overall, a microinsurance/micro-takaful product should demonstrate the following principles presented in Table 1.2.

Simple	• Products are offered and serviced in a manner	
	that is easily understood by the target group.	
	• Product features are self-explanatory such that	
	minimal advice from intermediaries is needed.	
	• Benefits, terms and conditions are	
	straightforward with minimal exclusions and	
	restrictions.	
	• All disclosures, marketing materials and	
	languages used respond to the target group's	
	level of financial literacy.	
Protection Needs-Driven	• Proportion of premium/takaful contribution	
	allocated to financial protection is maximised.	

 Table 1.2: Principles of Microinsurance/Micro-Takaful

	• Protection provided is relevant and meaningful	
	in that it should not intentionally cover risks that	
	the target group does not need.	
Accessible	• Premium/takaful contribution is affordable for	
	the target group.	
	• Distribution channel is accessible and	
	approachable for the target group.	
	• Product features and processes suit the target	
	group's circumstances.	
	• All processes including premium/takaful	
	contribution payment, policy/takaful certificate	
	renewal, claims and enquiries are easily	
	accomplished by the policy owner/takaful	
	participant.	
Efficient	All processes are expedient and timely with	
	particular focus on minimising time to claims	
	pay-out.	
	• Back-office administration is simplified,	
	streamlined and automated as much as	
	possible.	

Source: Bank Negara Malaysia (2016)

The microinsurance and micro-takaful market in Malaysia shows promising trends as shown by the fact that Malaysia was leading for microinsurance coverage in 2013 (See Figure 1.2). Malaysia recorded a 184.7% compound annual growth rate in micro-insurance coverage between 2010 and 2012. This implies a continuous effort by the Malaysia government to assist low-income groups.



Sources: Munich Re Foundation, Report on the Landscape of Micro-insurance in Asia and Oceania 2013

Figure 1.2: Micro-insurance Coverage Compound Annual Growth Rate by Asian Country (2010–2012)

On 24 November 2017, in a collaboration between the central bank, the Life Insurance Association of Malaysia (LIAM), Malaysian Takaful Association (MTA) and General Insurance Association of Malaysia (PIAM), BNM officially launched the 'Perlindungan Tenang' protection scheme. Based on three basic criteria of being affordable, accessible and simple, the products available under *Perlindungan Tenang* were developed by insurers and takaful operators to enhance the financial inclusion of underserved segments in Malaysia, particularly the bottom 40% of households (B40). This initiative is aimed to reach out to eight million working-age Malaysians and over 700,000 micro enterprises that currently need insurance and takaful protection against key risks in life. Ultimately, it would help to fulfil the nation's aspiration of reducing the protection gap and insuring 75% of the population by 2020 with insurance and takaful protection (Eusoff, 2017). Currently, new incentives such as *Perlindungan Tenang* vouchers valued at RM50 each and the waiver of stamp duty for the purchase of *Perlindungan Tenang* products for another 5 years to 2025 have been announced by BNM and these efforts will benefit about 12.8 million members of B40 households in the country ('Perlindungan Tenang to benefit 12.8 mil B40', 2020). Table 1.3 presents Micro-takaful/Micro-insurance products provided by the takaful operators and insurance companies in Malaysia. This implies that there are Page | 11

serious and continuous efforts by many parties to help the underserved market to get their basic protection by providing affordable products/schemes.

Takaful Provider	Product offered	Features
AIA Public Takaful	AIA i-Starter Plan (Skim Perlindungan Tenang)	 Entry age: 16–55 years old Sum covered: RM10K–RM30K Contribution: min RM33/ year (RM2.87 per month) (depends on age/gender)
Allianz	Allianz Kasih hayat (<i>Skim</i> Perlindungan Tenang)	 Sum covered: RM10K & RM20K Contribution: min RM38/year (RM3.16 per month)
	BIMA Life (Skim Perlindungan Tenang)	 Sum covered: RM20K, RM40K, RM60K & RM100K Contribution: min RM5.30 to RM26.50/month
Great Eastern	Easy Care Plus (Skim Perlindungan Tenang)	 Sum covered: RM15K & RM40K (depends on age) Contribution: min RM10/month
Hong Leong Assurance	Life Protector (Skim Perlindungan Tenang)	 Sum covered: RM20K Contribution: RM60/year (RM5 per month)
MCIS Insurance Berhad	Merchantrade Insure – Life (Skim Perlindungan Tenang)	 Sum covered: RM4 to 20K Contribution: RM12–RM60/year (RM1 – RM5 per month)
Prudential BSN	PruBSN Lindungi (Skim Perlindungan Tenang)	 Entry age: 19–60 years old Sum covered: RM20K–RM30K Contribution: min RM50/year (depends on age /gender/health status/occupation)

Table 1.3: Micro-	Takaful/Micro-Insuran	e in Malaysia
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Sun Life Malaysia	GOLIFE (Skim Perlindungan Tenang)	 Sum covered: RM18K–RM76K Contribution: GOLIFE 5–RM60 per year (RM5 per month), GOLIFE 10–RM120 per year (RM10 per month) (depends on age /gender/health status/occupation)
Takaful Ikhlas	AGRO Mabrur-I (Skim Perlindungan Tenang)	 Entry age: 18–64 years old Sum covered: RM13K–RM40K (depend on plan) Contribution: min RM75/year (depends on plan)
Tokio Marine Life	Tokio Marine- starter Pack (Skim Perlindungan Tenang)	 Sum covered: RM10K–RM15K Contribution: min RM6 @ RM9 @ RM16/month (depends on plan)
Prudential BSN	Micro-takaful Jariyah Programme	• Free 12–month family takaful coverage for selected and eligible low-income households (B40).
Malaysia government	My Salam	• Free takaful assistance scheme by the government which provides takaful protection for eligible individuals

Source: Life Insurance Association of Malaysia

1.5 Focus of study

With the rising costs of healthcare, and specifically those related to diabetes, it may be the time to explore other possibilities to reduce the financial burden. It has thus become an undertaking of insurance and takaful companies to come up with specific products that can cater to the special group of people living with diabetes in the near future. Therefore, this study will explore, from the perspectives of both patients and insurance providers, their need, perception and view about medical coverage among people with diabetes. These valuable data are important to discover the type of reasonable, affordable, and unique insurance policy for people who are in need of such a scheme. Not only will they feel confident that their illness will be taken care of, but they will hopefully regain a better quality of life.

1.6 Research Objectives

The general objective is to develop a suitable takaful product for people with diabetes and at risk of having diabetes in Malaysia. The specific objectives for this research are:

- 1. To conduct market and competitor analysis of diabetes insurance coverage.
- 2. To describe the sociodemographic and clinical profiles of people with diabetes and at risk of having diabetes in Malaysia.
- 3. To categorise the risk faced by people with diabetes and at risk of having diabetes in Malaysia for potential coverage with takaful.
- 4. To investigate the perceptions, preferences and special needs of people with diabetes on suitable takaful products.
- 5. To identify the affordable pricing and coverage for people with diabetes.
- 6. To analyse the legal and Shariah framework/requirements needed to operate takaful products for people with diabetes.
- 7. To design suitable takaful products for the people with diabetes segment in Malaysia.

1.7 Research Methodology

This study has adopted a mixed-method approach. Research objectives 2, 3, 4 and 5 adopted the quantitative approach, while research objectives 1 and 6 of this study adopted the qualitative approach whereby content analysis of market reports, legal documents and market takaful products were conducted. The questionnaire development was based on previous literature and experts' opinions (through interviews). In order to achieve RO7, all results from RO1–RO6 were analysed and respective interview validations were performed accordingly after the analysis process.

1.7.1 Quantitative Approach

1.7.1.1 Study Design

A nationwide multicentred cross-sectional stratified random sampling study of two months' duration was conducted among people with diabetes and those at risk of having diabetes in Malaysia. A sample of 1,000 diabetic respondents and non-diabetic respondents in Malaysia was randomly selected. Information related to their sociodemographic and socioeconomic backgrounds, health and financial status along with other items related to the perceptions, preferences and special needs of people with diabetes on suitable takaful products were gathered.

1.7.1.2 Sample Size, Projected Number of Subjects and Study Site

The sampling process was initiated by identifying the prevalence of diabetic patients by region in Malaysia. Based on regions (north, south, west, east and East Malaysia), we calculated the percentage of diabetic patients to make sure the sample was representative of the whole population of Malaysia. From the percentage of diabetic patients in NHMS 2019 by region, we computed the percentage of respondents from the population of Malaysia and then divided it by urban/rural.

A total number of 1,000 respondents with diabetes (n = 500) and non-diabetics (n = 500) were randomly selected. The respondents were selected from diabetic patients visiting Klinik Kesihatan and those without diabetes were randomly chosen via Google survey throughout Malaysia. The sample of Klinik Kesihatan was from all states and federal territories in Malaysia. They were divided into five regions so as to get a representative sample of respondents reflecting the Malaysian population. The list of Klinik Kesihatan (KK) involved is presented in Table 1.4:

Region	State	Klinik Kesihatan (KK)
	Selangor	Klinik Kesihatan Ampang
West Coast		Klinik Kesihatan Cheras Baru
	Kuala Lumpur	Klinik Kesihatan Bandar Tun Razak
		Klinik Kesihatan Sungai Besi
South	Johor	Klinik Kesihatan Sg. Mati, Muar
South		Klinik Kesihatan Bandar Mas, Johor
East Coast	Dehana	Klinik Kesihatan Bandar Tun Abdul Razak
East Coast	Pahang	Klinik Kesihatan Rompin
	IZ - 1-1-	Klinik Kesihatan Pokok Sena
North	Kedan	Klinik Kesihatan Simpang Empat
	Penang	Klinik Kesihatan Kubang Semang
East Malaysia	Sarawak	Klinik Kesihatan Kota Sentosa, Kuching

Table 1.4: List of Klinik Kesihatan Malaysia Involved According to Region

1.7.1.3 Study Population

Two types of sample populations were studied:

- Healthy patients without known diagnosis of types 1 and 2 diabetes mellitus (T2DM) as the control group; AND
- ii. Patients with type 2 diabetes mellitus (T2DM).

1.7.1.4 Subject Inclusion Criteria

1. Healthy patients without known diagnosis of types 1 and 2 diabetes mellitus (T2DM)

Inclusion criteria were:

- i. Aged 18 and above;
- ii. No known diagnosis of type 2 diabetes mellitus (T2DM);
- iii. Malaysian nationality
- 2. Patients with type 2 diabetes mellitus (T2DM), diagnosed at least 1 year ago aged 18 and above.

Inclusion criteria were:

- i. Aged 18 and above;
- ii. Diagnosed at least 1 year ago aged 18 and above;
- iii. Currently on oral diabetic agents for the treatment of diabetes;
- iv. Malaysian nationality

1.7.1.5 Subject Exclusion Criteria

Did not understand Malay language and did not give consent to participate.

1.7.1.6 Study instruments

The diabetic respondents were given a set of questionnaires adapted for them (known as set diabetes). This self-administered questionnaire comprised the following three sections:

1. Sociodemographic data - Items on the socio-demographic characteristics including age, gender, ethnicity, education level, household income and others.

- 2. Diabetes profiling Diabetic respondents were categorised into low, medium and high risk of cardiovascular mortality and morbidity.
- 3. Perceptions, preferences and special needs of people with diabetes on suitable takaful products.

Similarly, the non-diabetic respondents were given a set of questionnaire adapted for them (known as set non-diabetes). This self-administered questionnaire comprised the following three sections:

- 1. Sociodemographic data Items on the socio-demographic characteristics including age, gender, ethnicity, education level, household income and others.
- 2. Risk of developing diabetes.
- 3. Perceptions, preferences and special needs of people with diabetes on suitable takaful products.

All of the questionnaires (set diabetes and non-diabetes) were developed in Malay and English. These questionnaires were generated based on literature reviews and opinions from expert views consisting of family medicine specialists, endocrinologists, economics scholars and people working in insurance companies. The questionnaires had undergone a validation process. For example, face validity was done to improve the clarity and comprehensibility of all of the questionnaires, among others. For the final versions of the questionnaires, a pilot study had been carried out to test the feasibility of the study and the time needed to answer the questionnaires.

1.7.1.7 Study flow

Respondent recruitment was made by a researcher who was not involved with the management of the respondents to avoid coercion. Once the respondents arrived at the study location and they satisfied the inclusion criteria, information about the study was explained to them. If they agreed, consent was taken from them and they were given the respective questionnaires. Both sets were self-administered questionnaires. If there was any doubt in answering the questions, a researcher was on hand to help them and clarify any issues.

Their data then were collected by the researcher. Anthropometric parameters, including weight, height, and waist circumference, were measured with the respondents dressed in

light clothing. The body weight of each respondent was measured with a standard scale to an accuracy of ± 0.1 kg and height was measured to an accuracy of ± 0.1 cm. The BMI was calculated as weight (kg) divided by height squared (m²). Other clinical parameters such as disease complications, HbA1c values, and a list of medicines were obtained from the case notes.

They were given a reimbursement of RM5 per completion of questionnaire as a token of appreciation. They were informed that they may opt out of the study anytime they wished. Table 1.5 shows the summary of the data collection process for this study.

Timing	Procedures	Duration
		spent
On the research data	Respondents' selection, screening,	10–15 min for
collection day	examination, informed consent will be	each patient
	conducted.	
	Self-administered questionnaires will be	
	distributed and anthropometric	
	measurements will be taken.	
	Researchers to obtain relevant clinical data	10–15 min for
	from the case notes	each patient

 Table 1.5: Data collection process

1.7.1.8 Respondent Recruitment and Duration of Participation

Respondents who met the inclusion criteria were approached and recruited from selected health clinics as mentioned above and their consents were taken by the researcher. After that, they were given the questionnaires. Their commitment stopped once they had completed the questionnaires given. The respondents were given RM5.00 per subject per questionnaire as a token of appreciation for their participation in the study.

1.7.1.9 Statistical Analysis

This study used two statistical tools to analyse the collected data; namely Statistical Package for the Social Sciences (SPSS) version 24.0; the SPSS was used to analyse the

descriptive analyses such as mean, standard deviation, frequencies and normality and crosstabulation analysis.

1.7.2 Qualitative Approach

Qualitative analysis was performed by conducting an in-depth interview (IDI) with relevant agencies and individuals (takaful providers, agencies, and Shariah experts). There were two stages and purposes for adopting in-depth interviews.

The *first phase* of interviews was conducted to gain inputs for instrument development i.e., survey questionnaire. Some inputs that were significant for the study are related to; (i) takaful pricing methods used by the takaful providers, (ii) takaful providers' capacity in offering the related products, and (iii) currently available facilities and support provided by the relevant NGOs and agencies.

In addition, the information from the in-depth interview (IDI) could answer the fifth research objective (RO5) related to pricing and coverage for people with diabetes. As the survey questionnaire asked for affordable pricing and required coverage from the perspective of the customers, the interview with underwriters and staff of the providers helped the researchers to gain information on pricing and coverage that can be offered from the providers' view. The interview protocol was developed prior to the interview session (see attachment).

Respondents who were selected for the first phase of interviews are listed below:

- 1. Underwriters;
- 2. Representatives from Diabetes Association Malaysia;
- 3. Physicians.

The *second phase* of the interviews was conducted after the model of the takaful product was completed (RQ7). The interview was part of the validation process of the model. The respondents of the second phase of the interview were three Shariah experts in the takaful industry.

1.7.2.1 Thematic Analysis

The data were analysed using content analysis (NVivo 10) and exploratory factor analysis Page | 19 (SPSS) to identify the factors influencing the need for a specific takaful product among diabetic patients.
CHAPTER TWO

MODEL AND CONCEPT OF TAKAFUL

2.1 Introduction

This chapter aims to report FWD Takaful preferences on suitable takaful products for the B40. Originally there were five sections in the interview with FWD Takaful regarding suitable takaful products and distribution channel for the B40 in Malaysia. However, after further analysis, the responses can be grouped into nine sub-topics.

2.2 The Existing Insurance/Takaful Product Related to Diabetes in Malaysia

Takaful is one of the dynamic products in Islamic finance, which combines the elements of social welfare in its business features and models (Billah et al., 2019). The takaful product development and the selected model should consider several factors including (i) concept of brotherhood, solidarity, mutual help and shared responsibility, ownership of funds which participants, (iii) elimination of uncertainty, and (iv) fund management. While these foundation criteria play important roles in takaful product development, the pricing factor is also one of the important criteria that must be considered. Under-pricing factors, elements of actual costs involved, mortality rates, and competition with other players are important items to be included (Masud, 2011). This is to ensure that the products are able to sustain and protect the participants as stated in the agreement.

In Malaysia, the takaful industry is positioned under Bank Negara Malaysia's authority and ruled under the Islamic Financial Services Act 2013. This act rules the licensing and operation of the providers and management of funds. Takaful providers are also subject to the Takaful Operational Framework 2019 (TOF), which was developed under the IFSA framework. TOF contains several requirements, closely monitoring the operational aspects of takaful products. Areas of emphasis under TOF are product structuring, underwriting, re-takaful, investment, surrender of takaful certificate, remuneration for providers, operating costs, surplus management, and others.

As far as the statistics of people with diabetes are concerned, it is perhaps surprising that very little is known about the stand-alone takaful and insurance products for diabetics in the market. With regard to the products or plans for diabetics per se, there is no standalone policy offered by any takaful operators in Malaysia. However, there are three insurance companies offering plans that are tailored for people with diabetes, which are MSIG Malaysia, Prudential Assurance Malaysia Berhad and Allianz Insurance Malaysia Berhad. When compared with stand-alone insurance products for diabetics in other Asian countries, there are a few insurance providers that offer the products so far in Singapore and Indonesia. The plans cover either pre-diabetics, type 1 diabetes, type 2 diabetes or combinations of the types. All the plans come with their own features and coverage related to diabetes. Most of the other countries also offer insurance products for diabetics, however the information provided is very much lacking to infer comparison between these products especially on the coverage and exclusions made for the policies. Table 2.1 shows examples of the insurance companies and the features of stand-alone insurance products for diabetics in Malaysia, Singapore, Oman and USA.

Since the cost of treating diabetes has become exorbitant, it is natural to observe that not many insurance companies will dare to provide insurance coverage for these unfortunate people. In Malaysia, very few companies are providing insurance coverage for people with diabetes. Challenges to the insurance company include the inclusion criteria to be created so as to ensure both parties are happy. Some do encourage lifestyle modifications in the patients so that the risk of them getting complications is low. This can be very beneficial not only to the insurance company, but the patients tremendously will get the benefit as the better control they acquire, the better life satisfaction they will obtain. Studies have shown that the control of diabetes can reduce the complications by almost 30% compared to those who are not.

Building and creating a new insurance policy for a diabetic patient requires a lot of work. Data needs to be gathered from patients and insurance companies. This is to ensure the motive and benefit of coverage can be enjoyed optimally without compromising the patient's overall health mentally and physically. The views from their families and friends around them is crucial in making the policy more user friendly, focused and beneficial to all. We need to ensure that the payment can be maintained and sustained so that the policy would be in force. There is no meaning if the payment is too high and causes economic burden to the patients. All in all, a certain level of monitoring of the flow is essential to circumvent any problem should they arise.

The creation of a new insurance or takaful product goes through the process of product development to ensure that the product is able to sustain. Product development is a step-by-step process that involves idea generation, product concept and feasibility, product planning and design, underwriting guidelines, product pricing, and reinsurance/re-takaful (Purushotam et al., 2017). This section emphasises the importance of product pricing as part of the product development process.

In essence, an insurance premium (takaful contribution) is the payment or cost to the policyholder in exchange for coverage. Payments in this case, can be made in different time frequencies such as monthly, quarterly or annually. In determining the price of a policy from the perspective of an insurance company, several factors will be considered before coming up with the final premium price (i.e. the price which a customer pays). Such factors include age, type of coverage, amount of coverage and some other personal information (Sriram et al., n.a).

Insurance Company	Type of Diabetes Covered	Features & Other coverage (Inclusion)	Exclusion	Entry Age	Details/Sources
Malaysia					
MSIG Malaysia	Pre-diabetes and Type 2 diabetes	 The policy has four plans covering the following benefits: Hospital Room and Board (per day), up to 150 days. Intensive Care Unit, up to 30 days. Surgical Fees. Anaesthetist Fees. Operating Theatre. Hospital Supplies & Services. In-Hospital Physician Visit, up to 150 days. Pre-Hospitalisation Specialist. Consultation/Diagnostic Tests-within 30 or 60 days (depending on selected plan) prior to admission. Post-Hospitalisation Treatment up to 60 or 90 days (depending on selected plan) following discharge from hospital. Ambulance Fees. Day Surgery. Home Nursing following Hospitalisation up to 26 weeks following discharge from hospital. Emergency Accidental Outpatient Treatment within 24 hours 	 Pre-existing illnesses, except for any conditions, illness or complication arising directly or indirectly from Type 2 Diabetes Mellitus or Pre-Diabetes which was declared and the Company has agreed not to exclude it. Specified Illnesses occurring during the first 120 days of continuous cover. Any medical or physical conditions arising within the first 30 days of the Insured Person's cover or date of reinstatement whichever is latest except for accidental injuries. Plastic/cosmetic surgery, circumcision or any surgery on the foreskin, eye examination and surgical correction for visual impairment due to near-sightedness, farsightedness, astigmatism or presbyopia or radial keratotomy or Lasik, glasses, multifocal lens or contact lens, the use or acquisition of orthosis, external prosthetic appliances or devices including but not limited to artificial limbs, external fixator, hearing aid, cochlear apparatus or implant, pacemaker, implantable cardiac defibrillator (ICD). Dental conditions including dental treatment or oral surgery except as necessitated by Accidental Injuries to sound natural teeth occurring wholly during the Period of Insurance. 	 18 60–80 (renewal only) 	https://www.msig. com.my/personal- insurance/product s/gluco-safeguard/

 following an accident and follow-up treatment up to 60 or 90 days (depending on selected plan). Emergency Accidental Dental Cover within 24 hours following an accident and follow up treatment up to 14 days. Second Surgical Opinion (Local only) within 30 or 60 days (depending on selected plan) prior to admission. Accidental Outpatient Alternative Medical Treatment and follow-up treatment up to 14 days from date of accident provided the first received treatment is at a registered hospital or clinic registered with the Ministry of Health within 24 hours following the accident. Medical report Fees up to RM100 (per claim). Daily Cash Allowance at Government Hospital, up to 150 days. Nutritional Allowance, RM500 per admission and up to RM2,000 per annum. Compassionate Care Allowance, RM50 daily up to RM1,500 per annum. Organ Transplant. Outpatient Kidney Dialysis, Cancer and Stroke Treatments. 	 Private of nursing care, non-hospital nursing care, rest cures, sanitaria care, hospice care and care or treatment that do not lead to a recovery, conservation of the Insured Person's condition or restoration to his/her previous state of health, injury or hospitalisation due to drug abuse, addictive disorders from substance misuse or while under the influence of alcohol, venereal disease and its sequelae, AIDS (Acquired Immune Deficiency Syndrome) or ARC (AIDS Related Complex) and HIV related diseases, and any communicable diseases requiring quarantine by law. Any treatment or surgical operation for congenital abnormalities or deformities including hereditary and developmental conditions. Pregnancy, childbirth (including surgical delivery), miscarriage, abortion and prenatal or postnatal care and surgical, mechanical or chemical contraceptive methods of birth control or treatment pertaining to infertility, erectile dysfunction and tests or treatment related to impotence or sterilisation. Hospitalisation or consultation primarily for investigation purposes, screening, diagnosis, X-rays, scans, general physical or medical examinations that are done routinely or are not incidental to treatment or diagnosis of a covered medical condition which is not Medically Necessary to be hospitalised, preventive treatments, preventive medicines, treatments, specifically for weight reduction or gain or bariatric surgery and treatment of an experimental, investigational or research nature. 	

Additional benefits: Digital diabetes management	 Suicide, attempted suicide or intentionally self-inflicted injury while sane or insane. War or any act of war, declared or undeclared, criminal or terrorist activities, active duty in any armed forces, direct participation in strikes, riots and civil commotion or insurrection. Investigation and treatment of sleep and snoring disorders, hyperhidrosis, hormone replacement therapy, stem cell therapy except hematopoietic blood disorders, alternative treatments such as chiropractic services, acupuncture, acupressure, reflexology, bone-setting, hyperbaric oxygen therapy, herbalist treatment, podiatry treatment, massage or aroma therapy or other alternative medicines (except as defined under Accidental Outpatient Alternative Medical Treatment Benefit). Psychotic, mental or nervous disorders (including any neuroses and their physiological or psychosomatic manifestations). Costs/expenses of services of a non-medical nature, such as but not limited to television, telephones, broadband services, electricity charges, admission/registration/record fee, admission kit/pack, laundry, film or digital storage medium, dietetic or nutritional consultation or treatment, patient education and other ineligible non-medical items. Sickness or Injury arising from racing of any kind (except foot racing), hazardous sports such as but not limited to water activities requiring breathing apparatus, winter sports, professional sports and Illegal Activities. For the avoidance of doubt, Illegal Activities mean any activation. 	

			committed by the Insured Person which is in violation of law or forbidden by law. Note: This list is non-exhaustive. Refer to the policy contract for the full list of exclusions under the policy.		
Prudential Assurance Malaysia Berhad	Type 2 diabetes	 Death & TPD Critical Illnesses. Among the conditions covered are kidney failure, blindness, stroke and cancer. Medical (High Deductible) 	Not Available	Not Available	https://www.prud ential.com.my/en/ products- health/medical/sp ecific- benefits/prumy- diabetes-care/
Allianz Insurance Malaysia Berhad	Type 2 diabetes	 The policy has four plans covering the following benefits: a) Hospitalisation & Surgical Benefit Hospital Room and Board (per day), up to 150 days. Intensive Care Unit, up to 150 days per confinement. Surgical Fees. Anaesthetist Fees. Operating Theatre. Hospital Supplies & Services. In-Hospital Physician Visit, (subject to a maximum of two (2) visits per day) Pre-Hospitalisation Diagnostic Tests (within ninety (90) days prior to Hospitalisation) - maximum of two (2) General 	 Pre-existing Conditions, except for any condition or illness, complication or ailment arising or connected to the condition of Type 2 Diabetes Mellitus or Impaired Fasting Glucose (IFG) or Impaired Glucose Tolerance (IGT) or Hypertension, if declared. Otherwise, they will be treated as Pre-existing Conditions or non-disclosure. Specified Illnesses occurring during the first one hundred and twenty (120) days of continuous cover, whether or not caused by Accident. Any medical or physical conditions arising during the Waiting Period except for Accidental Injuries. Surgery and/ or treatment related to plastic/ cosmetic purposes, circumcision, eye examination, glasses and refraction or surgical correction of near-sightedness (Radial Keratotomy or Lasik) and the use or acquisition of external prosthetic, external appliances or corrective devices such as 	 30 66–70 (renewal only) 	https://www.allian z.com.my/allianz- diabetic-essential

	 Practitioner and one (1) Specialist consultations) Post-Hospitalisation Treatment up to 60 or 90 days (depending on selected plan) following discharge from hospital. Ambulance Fees. Day Surgery. Home Nursing Care (subject to a maximum of one hundred and eighty (180) days per lifetime) Medical Report Fees Reimbursement b) Out-Patient Treatment Benefits Emergency Accidental Outpatient Treatment & thirty (30) days follow up treatment (Annual Limit). Out-Patient Cancer Treatment (includes consultation, examination tests and prescribed take-home drugs). Out-Patient Kidney Dialysis Treatment (includes consultation, examination tests and prescribed take-home drugs). Out-Patient Dengue or Enteric Fever Treatment (includes consultation, examination tests and prescribed take-home drugs) 	 artificial limbs, hearing aids, pacemakers and prescriptions thereof. Dental conditions including dental treatment or oral surgery except as necessitated by Accidental Injuries to sound natural teeth occurring wholly during the period of cover. Private nursing, rest cures or sanitaria care, illegal drugs, intoxication, sterilisation, venereal disease and its sequelae, AIDS (Acquired Immune Deficiency Syndrome) or ARC (AIDS Related Complex) and HIV related diseases, and any communicable diseases requiring quarantine by law. Any treatment or surgical operation for Congenital Conditions or deformities including hereditary conditions. Pregnancy, child birth (including surgical delivery), miscarriage, abortion and prenatal or postnatal care and surgical, mechanical or chemical contraceptive methods of birth control or treatment pertaining to infertility. Erectile dysfunction and tests or treatment related to impotence or sterilisation. Hospitalisation primarily for investigatory purposes, diagnosis, X-ray examination, general physical or medical examinations, not incidental to treatment or diagnosis of a covered Disability or any treatment which is not Medically Necessary and any preventive treatments, preventive medicines or examinations carried out by a Physician, and treatments specifically for weight reduction or gain. Suicide, attempted suicide or intentionally self-inflicted injury while sane or insane. 	
I			

 c) Special Benefits Second Medical Opinion Reimbursement for Alternative Treatment fees (post Hospitalisation Out- Patient benefit, within thirty (30) days following discharge from Hospital). d) Diabetes Management Benefit Medical Examination by a doctor Glycated Haemoglobin (HbA1c) Urine FEME Renal Function Test Lipid Profile Premium Discount 	 War or any act of war, declared or undeclared, criminal or terrorist activities, active duty in any armed forces, direct participation in strikes, riots and civil commotion or insurrection. Ionizing radiation or contamination by radioactivity from any nuclear fuel or nuclear waste from process of nuclear fission or from any nuclear weapons material. Expenses incurred for donation of any body organ by the Life Assured and costs of acquisition of the organ including all costs incurred by the donor during organ transplant and its complications. Investigation and treatment of sleep and snoring disorders, hormone replacement therapy and alternative therapy (other than the Alternative Treatment specified in Reimbursement for Alternative Treatment Fees provisions) such as treatment, medical service or supplies, including but not limited to acupressure, reflexology, bone setting, herbalist treatment, massage or aroma therapy or other alternative treatment. Care or treatment for which payment is not required or to the extent which is payable by any other insurance or indemnity covering the Life Assured and Disabilities arising out of duties of employment or profession that is covered under a Workman's Compensation Insurance Contract. Psychotic, psychiatric, mental or nervous disorders, (including any neuroses and their physiological or psychosomatic manifestations). Costs/expenses of services of a non-medical nature, such as television, telephones, telex services, radios or similar facilities, admission kit/pack and other ineligible nonmedical items. 	

			 Sickness or Injury arising from racing of any kind (except foot racing), hazardous sports such as but not limited to skydiving, water skiing, underwater activities requiring breathing apparatus, winter sports, professional sports and illegal activities. Private flying other than in any commercial scheduled airlines licensed to carry passengers over established routes. Expenses incurred for sex changes. The exclusions highlighted here are not exhaustive. Full details of exclusions are available in the policy document. 		
	Pre diabetes	Cuarantaad aguarage for five key	Not Available	Not Available	https://www.aia.c
Singapore Private Limited	and Type 2 diabetes	 Otharanteed coverage for five key diabetes-related conditions (Blindness, coronary artery by-pass surgery, heart attack, stroke and kidney failure. Add-on protection with Cancer Cover Additional benefits: Every time clients get active, eat well, and complete health checks, they will also earn AIA Vitality points. The more points they earn, the more they can boost their AIA Vitality status to enjoy partner benefits and unlock rewards that include up to 15% discount on their insurance premiums. 			om.sg/en/our- products/critical- illness- protection/aia- diabetes-care.html

Oman					
Oman Insurance Company	Type 2 Diabetes	 Critical Illness Cover 100% sum assured will be paid on diagnosis of the critical illnesses below: Blindness, Coronary artery by- pass surgery, Heart attack, Kidney failure, Stroke and Paralysis. Death Cover AED 10,000 will be paid in case of demise of the insured member. Repatriation Cover AED 5,000 will be paid in case of demise of the insured member. Cancer Cover (Optional) 100% sum assured will be paid on diagnosis. 	Not Available	Not Available	https://www.oman insurance.ae/indiv iduals/life- insurance/life- insurance- plans/diabetic- care
USA					
A. Diabetes	-Friendly Life Ins	urance Companies (no examination)			
Mutual of Omaha	Type 1 and Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: 50 Maximum face value \$250,000	Greenberg (2021)
Assusity Life Insurance Company	Controlled Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: 20 Maximum face value \$50,000	

American National Life Insurance	Controlled Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: 50 Maximum face value \$250,000	
5- Star Life Insurance Company	Type 1 and Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: N/A. Maximum face value \$100,000	
Sagicor Life Insurance Company	Controlled Type 2 diabetes (no insulin)	Not Available	Not Available	Minimum age of diagnosis: 50. Maximum face value \$500,000	
Nassau Life Insurance Company	Type 1 and Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: 30. Maximum face value \$400,000	
B. Diabetes	s-Friendly Life In	surance Companies (examination require	ed)		
Banner Life Insurance Company	Controlled Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: Case- by-case basis Maximum face value \$500,000	Greenberg (2021)
Prudential Insurance Company of America	Controlled Type 1 or Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: Case- by-case basis Maximum face value \$20,000,000	

Protective Life Insurance Company	Controlled Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: Case- by-case basis Maximum face value \$10,000,000
AIG American General Life Insurance Company	Controlled Type 2 diabetes	Not Available	Not Available	Minimum age of diagnosis: 30 Maximum face value: Varies based on age

2.3 Gap analysis

Based on the existing products in Section 2.2, and the relevant information that have been captured through the respondents, a gap analysis is conducted. Basically, existing products relating to pre diabetes or diabetes are still very few in the market; and do not yet exist for the takaful sector. Companies that offer such insurance products are tabulated in Table 2.1 (in Section 2.2), which shows a comparison of these products' features such as benefits and diabetes cover. Table 2.2 shows the gap analysis and the SWOT analysis is shown in Figure 2.1. From this information, combined with the results of the study, we identify the gaps that may be filled by upcoming products from FWD Takaful.

What is currently available?	What is needed in general (or demanded) by people with diabetes?	How to close the gap?
Only conventional insurance is being offered	Need to have a Shariah compliant product to give coverage for Muslims	Developing takaful for diabetes and pre-diabetes coverage
Current products more suitable for M40 and above	Product that is more affordable, especially to cover the B40 group	Developing such a product with basic benefits related to diabetes care and affordable for all groups of income (or possibly with a model that can entice the higher income people to donate to/sponsor those who are less fortunate or children purchasing for parents)

Table 2.2 :	Gap Analysis
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Current product focuses more on hospitalisation and coverage for critical illness	 Product that focuses more on providing basic needs in controlling diabetes as this segment of the population is quite large and untapped 	Developing such a product in collaboration with the Diabetes Malaysia (DM) organisation (formerly known as Persatuan Diabetes Malaysia) for the customer database and planned activities such as workshops, campaigns, webinars, etc. DM as at 2018, has 14 State Branches and 39 District Branches with about 13,351 active members comprising people with diabetes, medical and health professionals and others who are interested in diabetes.
Only a few products stressing on wellness program (e.g. app to monitor lifestyle and health status, educational newsletters/access to helpline, and providing a health coach for diet and fitness consultation.	Demand for such products do exist (from respondents' answers)	Links with DM and also influencers to talk about diabetes management and the existence of takaful product for diabetes to increase the awareness level.

2.4 SWOT Analysis

STRENGTHS

- New product and considered
 unique in current market
- Increasing number of prediabetes and diabetes patients
- Willingness to pay / existing demand of people with diabetes to have coverage

WEARINESSE

- May be less affordable
 Lack of awareness
- Lack of data availability

OPPORTUNITIES

 Cost for diabetes care increasing - people need coverage
 No takaful product offered in market (only conventional insurance)

THREATS

 Lack of publicly available datacauses a big challenge to premium setting
 Moral Hazard issues

Figure 2.1: SWOT Analysis

Based on the gap and SWOT analyses conducted, insurance products relating to diabetes are still very limited, which are currently being offered under the conventional insurance wing. It is therefore crucial for FWD to initiate the launching of such products due to the increasing number of pre-diabetes and diabetes patients in the country. Additionally, from the survey, it is found that those who are at risk or already have diabetes do tend to agree on having diabetes coverage (60.7%) which therefore creates the demand for such products. With the increasing awareness for Muslims to shift to takaful products, this will also provide an opportunity to the company to be one of the first to offer the Islamic version of coverage for diabetes. Nevertheless, non-Muslims should also be encouraged to participate in the product once it is launched.

Other than that, the current products are considered more suitable for those whose incomes are categorised under the M40 to T20 groups. Based on the information on various companies offering insurance for diabetes, the minimum premium charged is RM100 (double

check *identify which company). In order to target the lower income group, otherwise stated as B40, it is suggested that the coverage focuses on only the basic needs for diabetes such as insulin, medications and glucometer strip. (Identify from survey).

In essence, it could be seen that existing product more closely mimic coverage for critical illnesses such as those that require hospitalisation. Not many focuses on diabetes management itself, such as providing diet consultation and workshops or seminars to provide support groups for both people at risk or those who already have diabetes. Such an outcome could be achieved through various collaborations with the Diabetes Malaysia organisation since they already have a database of members totalling 13,351 members as at 2018.

At the same time, to make the product more attractive and IT-friendly in this new era of Industrial Revolution 4.0, it should include the use of mobile applications which can be easily installed on any mobile device. The function of the application is for participants to fill in their progress on diabetes management, including their daily reading of blood glucose level (check term), and weekly or monthly information such as weight, and diet plans. Over time, data that are available from existing participants could be used to model future needs to adjust the product coverage and contribution payment.

In relation to this, participants who show an improved reading in their health status could be given discounts on future payments based on a score given for each of the readings they need to enter. An example of this can be seen from the coverage provided by a company in India, which is HRDF-ERGO. (Show table for calculation of score). With the unique features of the product, it is hoped that participants would not only keep improving their health status from time to time but at the same time enjoy the benefits of the product.

Overall, the suggested product could be based on existing programs related to preventing diabetes such as one in the United States of America which will be discussed next.

2.4.1 Diabetes Prevention Program (Medicare)

An existing diabetes prevention program linked to insurance is the Medicare Diabetes Prevention Program in the United States, which was initiated in 2016, and expanded quite recently in 2018. This prevention program is aimed at arresting the development of diabetes among those who are overweight or obese or who are considered pre-diabetes. Among the activities included under the program are meetings with patients and lifestyle interventions through encouragement of physical activities and dietary changes.

The initiative has also seen remarkable outcomes, where such lifestyle interventions have been proven to slow down type 2 diabetes cases by half (Ackermann et al., 2019).

The MDPP basically involves three phases of program activities outlined below:

- a) In Phase 1 of the program, an instructor conducts core sessions in a group over a 6month period. The curriculum may include:
 - Tips on proper exercise and how to get enough exercise.
 - Lessons on nutrition
 - Tips on how to be consistent in behavioural changes.
 - Support, coaching and motivation from experienced coaches/experts.
 - Support group with those who also have similar goals.
- b) Phase 2 of the program will include 6 months of follow up sessions to maintain healthy habits that have been outlined in the first phase.
- c) Phase 3 of the program will include an additional 1 year of continuous maintenance of the sessions to ensure participants meet their goals.

In addition to the three phases of the program, additional coverage for participants may include medical or health check-ups as follows:

- a) Annual check-up (HbA1c, cholesterol check, blood pressure monitoring, BMI and doctor consultation;
- b) Half-yearly check-up (HbA1c, blood pressure monitoring, and BMI);
- c) Foot exams (every 6 months);
- d) Eye exams (glaucoma screening once a month)

The details of the MDPP are summarised in the following table:

Components	Medicare Part A	Medicare Part B	Medicare Part C	
Coverage	Hospital Insurance	Doctor's visits Outpatient services Preventive care: • Wellness visits • Smoking cessation • Cancer screenings • Vaccines Mental health screenings	More on Medicare advantage coverage • Dental care • Vision care • Hearing aids and screenings • Prescription drugs • Fitness plans	
Eligibility	 Not diagnosed with diabetes Not diagnosed with end stage renal disease (ESRD) Not enrolled in the MDPP before Further requirements to show signs of prediabetes: BMI of more than 25 (Asian > 23) HbA1c test results of 5.7% to 6.4% Fasting plasma glucose test of 110 to 125 mg/dL Oral glucose tolerance test with results of 140 to 199 mg/dI 			
Services	 A 2-year program divided into three phases (as described above) Phase 1 (Core Sessions) – 16 group sessions, once a week for about an hour led by an MDPP coach Tips on healthy eating, fitness, and weight loss Phase 2 (Core maintenance sessions) During 7th to 12th month (six sessions enrolment, provided participants have shown progress from phase 1) Phase 3 (Ongoing maintenance sessions) Split into 3 months to continue to meet weight loss goals 			

 Table 2.3: Breakdown of Medicare Diabetes Prevention Program Coverage and Details

With regard to the payment for the services, the MDPP implements a model that consists of suppliers who are registered to provide the program to participants. The suppliers will in turn make claim payments once participants progress from one phase to another. Since this type of diabetes prevention program is linked to the Medicare product, participants do not have to pay extra for this service. An example of the payment (from Medicare to the suppliers)

is shown in the following Table 2.4.

Performance Goal	Payment (With minimum weight loss)	Payment (Without minimum weight loss)
Core Sessions		
First core session attended	\$26	
Four total core sessions attended	\$52	
Nine total core sessions attended	ine total core sessions attended \$95	
Maximum Total Payment for Core Sessions	\$173	
Core Maintenance Sessions		
Two sessions attended in months 7–9	\$63	\$15
Two sessions attended in months 10–12	\$63	\$15
Maximum Total Payment for Core Maintenance Sessions	\$126	\$30
Ongoing Maintenance Sessions		
Two Sessions attended in one ongoing maintenance interval of 3 months (and each of the three subsequent intervals)	\$52-53	\$0
Maximum Total Payment for Ongoing Maintenance Sessions	\$210*	\$0
Weight Loss Performance Payments		
Five percent weight loss achieved (months 1–12)	\$169	\$0
Nine percent weight loss achieved (at any point during months 1–24)	\$26	\$0
Maximum Additional Weight Loss Performance Payments	\$195	\$0
Maximum Performance Payments	\$704	\$203

Table 2.4: Performance Payments under the MDPP Program
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*A total of \$52 will be received for each ongoing maintenance interval for which the requirements have been met in months 13–15 and 16–18. Another \$53 will be received for each ongoing maintenance interval for which the requirements have been met in months 19–21 and 22–24. With a maximum of four ongoing maintenance intervals, a total of \$210 may be received if requirements for all four intervals have been met.

2.5 The Existing Model of Takaful in Malaysia

As mentioned in the introduction section, investment-linked takaful (ILT) is a part of family takaful that combines investment and takaful (protection) cover. Part of the contribution paid will provide coverage that includes death and disability benefits, while the other part of the contribution will be invested in a variety of Shariah-compliant investment funds. Participants of an ILT plan have the flexibility to choose their own level of protection and investment according to their financial circumstances. They can also switch their current investment funds, such as equities, bonds or other financial instruments to invest in. Participants are also able to redeem part of their investment-linked units at any point. Based on an interview session with the industry player from FWD takaful, there are four existing ILT models practised by the company. Diagrams and brief descriptions of the four existing models are given below:

2.5.1 Model 1: Non-Investment-Linked Takaful (Non-ILT) without Participant Investment Fund (PIF)

Referring to Figure 2.2, a portion of the contribution paid by the participant in a non-ILT without PIF will first be deducted as the *wakalah* fee, which is charged to pay for services rendered, such as fund management fee services and surrender charges. The *wakalah* fee is credited into the Takaful Operator's Fund, which will be used to pay for management expenses or commissions. After excluding the *wakalah* fee, the balance of the contribution paid will be allocated into the Participant's Risk Fund in the form of participative contribution (*tabarru'*). If there is any surplus after the underwriting and investment activities, it will be divided between the participants and the takaful operator based on an agreed ratio.



Figure 2.2: Non ILT without Participant Investment Fund

Source: Interview session with FWD Takaful

2.5.2 Model 2: Non-Investment-Linked Takaful (ILT) with Participant Investment Fund (PIF)

Figure 2.3 depicts how contributions paid by the participant in a non-ILT with PIF will be allocated. Just like in Figure 2.2, part of the contribution paid by the participant will first be deducted to cover the *wakalah* fee for services such as fund management and other charges. The balance after the deduction of the *wakalah* fee will then be allocated into the Participant's Risk Fund for the purpose of tabarru', which will be shared among the participants, should any of them suffer any mishaps. If there is any surplus after the underwriting and investment activities, it will be divided between the participants and the takaful operator based on an agreed ratio. However, the participant's portion will be credited into the Participant's Investment Fund (PIF) for investment purposes.



Figure 2.3: Non ILT with Participant Investment Fund

Source: Interview session with FWD Takaful

2.5.3 Model 3: Investment-Linked Takaful (ILT) with Participant Investment Fund (PIF) and Unit Deducting Riders

Figure 2.4 describes the model for ILT with PIF and Unit Deducting Riders. The contribution paid by the participants are allocated the same way as the previous models. A portion of the contribution paid is deducted as the *wakalah* fee upfront and credited into the Takaful Operator's Fund. The balance of the contribution will be used to provide for takaful coverage in the Participant's Risk Fund. The basic coverage normally provides death and disability benefits. However, participants can extend the basic cover by adding additional coverage (riders), such as critical illness and personal accident. Another portion of the contribution will be used to purchase units in the Participant's Investment Fund and be invested in a variety of Shariah-approved investment funds of the participant's choice. Participants are given the flexibility to choose their own level of takaful protection and investments, based on their financial circumstances. If there is any surplus, the money will be shared between the participant and the takaful operator based on the pre-agreed ratio. The participant's share of the surplus will be used to purchase additional investment-linked units.





Source: Interview session with FWD Takaful

2.5.4 Model 4: Investment-Linked Takaful (ILT) with Participant Investment Fund (PIF) and Contribution Paying Riders

Figure 2.5 depicts the model for ILT with PIF and Contribution Paying Riders. The modus operandi is the same as in Figure 2.3. However, there is an additional benefit of contribution paying riders. These contributor riders will assist in paying for the participant, in the event of death, total and permanent disability (TPD) or critical illness of the participant or covered family member. These riders will not affect the amount of the sum assured.



Figure 2.5: ILT with PIF and Contribution Paying Riders

Source: Interview session with FWD Takaful

CHAPTER THREE

DESCRIPTIVE ANALYSIS

3.1 Introduction

This section reviews the background information of the respondents where we look at the demographic and socioeconomic profiles of the respondents. In addition, we also report the risk categorisation for the respondents as well as their perceptions, preferences and special needs with regard to the takaful product for diabetic patients. The discussion is divided into two parts (i) people at risk of having diabetes, and (ii) people with diabetes.

3.2 People at Risk of Having Diabetes

3.2.1 Demographic Profile

The demographic profile in terms of locality, age, gender, ethnicity, religion, education, occupational status and income of the respondents is discussed in this section. Table 3.1 (See Appendix 1) shows the frequency and percentage of each category of the respondents. Meanwhile, Figures 3.1–3.14 present the distributions in diagrams.

3.2.1.1 Locality

Among the respondents who were at risk of having diabetes, more than one-fourth were from Selangor (28.6%). The smallest number of respondents were from Pulau Pinang (1%) and W.P. Putrajaya (0.5%). In terms of residential area, most respondents were from urban areas (51%) and the minority of respondents were living in rural areas (22.3%).



Figure 3.1: Distribution of Respondents' Locality



Figure 3.2: Distribution of Respondents' Residential Area

3.2.1.2 Age, Gender, Ethnicity, and Religion

Figure 3.3 shows the age categories. Approximately 40.9% of the respondents were aged between 21-25 years old followed by 26–30 years old at 18.1%. The lowest percentages were respondents from the ages of 66–70, 71–75, and above 75 years old (0.5% each).

Meanwhile, Figure 3.4 shows that 63.3% of the respondents were female and the rest were male. Furthermore, among the respondents in Figure 3.5, those from Malay ethnicity were the majority (84.2%), followed by Sabah Native at 9.8% and other ethnicities 3.5%. As expected in Figure 3.6, 98.1% of the respondents were Muslim.



Figure 3.3: Distribution of Respondents' Age



Figure 3.4: Distribution of Respondents' Gender



Figure 3.5: Distribution of Respondents' Ethnicity



Figure 3.6: Distribution of Respondents' Religion

3.2.1.3 Marital Status and Dependants

As shown in Figure 3.7, more than half of the respondents were single (56.4%), 41.4% were married, 1.4% were divorced and 0.8% were widows or widowers. Meanwhile, in Figure 3.8, since the majority of the respondents were single, 58.8% did not have any dependants, 40.2% has 1–5 dependants and 0.9% had more than five dependants.



Figure 3.7: Distribution of Respondents' Marital Status



Figure 3.8: Distribution of Other Dependants (e.g., Parent, Grandparent)

3.2.1.5 Education

Among the respondents, the highest academic qualification was a degree or higher qualification (66.6%) followed by diploma holders (18.5%). The lowest percentage was from those without formal education (0.6%) as shown in Figure 3.9.



Figure 3.9: Distribution of Respondents' Education

3.2.1.6 Employment, Job Classification and Occupational Status

With respect to occupational status in Figure 3.10, 36.3% of the respondents were private sector employees, followed by government servants at 23.1%, and students (18.1%). The lowest percentage was from the 'others' occupation category which included athletes, farmers, and shop assistants. Based on the job classification in Figure 3.11, of those who were working, 83.4% were in Class 1 which had the lowest risk. For occupation status as shown in Figure 3.12, 61.7% were working as permanent staff, 23.3% were under contract and the remaining 15% were part-timers.



Figure 3.10: Distribution of Respondents' Occupation



Figure 3.11: Distribution of Respondents' Occupational Risk



Figure 3.12: Distribution of Respondents' Occupational Status

3.2.1.13 Income and Expense

Based on the monthly household income category as shown in Figure 3.13, the majority of the respondents were from the B40 group (RM0–RM4,849) (68.3%), followed by the M40 group (RM4,850–RM10,959) (21.4%) and the T20 group (above RM10,960) (10.3%). Only 10% of the respondents received any welfare, healthcare, or education financial assistance as shown in Figure 3.14.



Figure 3.13: Distribution of Respondents' Monthly Household Income



Figure 3.14: Distribution of Respondents who Received Welfare, Healthcare or Education Assistance

3.2.2 Risk Categorisation for People at Risk of Having Diabetes in Malaysia

Table 3.2 (See Appendix 1) displays the risk and diabetes profiles of respondents who were at risk of having diabetes. Figures 3.15–3.25 show the distribution of the risk and diabetes profiles of respondents.

3.2.2.1 Weight, Height and BMI

As shown in Figure 3.15, on average 58.1% of the respondents who were at risk of having diabetes weighed between 51-75 kg, 19.5% weighed between 36-50 kg, followed by 76-90 kg at 16.2%. With respect to the height of the respondents as shown in Figure 3.16, 54.8% were between 141-160 cm and 42.8% were between 161-180 cm. More importantly, according to the Body Measurement Index (BMI) of the respondents in Figure 3.17, 44.2% had desirable weight (18.5-24.9), 31.3% were overweight (25.0-30.0), 18.5% were obese (> 30.1) and 6% were underweight (< 18.5).



Figure 3.15: Distribution of Respondents' Weight



Figure 3.16: Distribution of Respondents' Height



Figure 3.17: Distribution of Respondents' Body Measurement Index
3.2.2.4 Waist Size

Among the respondents, 42.1% had waist sizes of between 31–34 inches, 25.2% had waist sizes of between 35–39 inches and 19.3% had waist sizes of less than 31 inches as shown in Figure 3.18.



Figure 3.18: Distribution of Respondents' Waist Size

3.2.2.5 Active Physically for 30 Minutes Daily

As shown in Figure 3.19, 50.1% of the respondents declared that they were physically active at least 30 minutes daily while the remaining said that they were not physically active.



Figure 3.19: Distribution of Respondents Who Were Active Physically for 30 Minutes Daily

3.2.2.6 Frequency of Fruit and Vegetable Consumption

The respondents were asked whether they frequently ate fruits and vegetables. Figure 3.20 shows that 61.4% claimed that they ate fruits and vegetables on a daily basis. The rest of the respondents did not eat fruits and vegetables daily. This data shows that the majority of the respondents practised a healthy food intake.



Figure 3.20: Distribution of Respondents' Fruit and Vegetable Consumption Frequency

3.2.2.7 Regular Intake of Hypertension Drugs

Among the respondents, 92.4% did not have a regular intake of hypertension drugs which also means that they did not have hypertension as shown in Figure 3.21.



Figure 3.21: Distribution of Respondents' Hypertension Drug Intake (to Control High Blood Sugar)

3.2.2.8 High Blood Sugar Reading

Surprisingly, as shown in Figure 3.22, 88.3% of the respondents reported having high sugar reading and 55.2% of the respondents said that they have close family members who have diabetes as shown in Figure 3.23.



Figure 3.22: Distribution of Respondents' High Blood Sugar Reading



Figure 3.23: Distribution of Respondents' Parents, Siblings and Relatives who Have Been Diagnosed with Diabetes

3.2.2.10 Smoking Status

Among the respondents, only 6.9% were smokers while the rest of the respondents did not smoke (93.1%) as shown in Figure 3.24.



Figure 3.24: Distribution of Respondents' Smoking Status

3.2.2.11 Risk Level to Get Diabetes

The respondents were also asked about their perception of the risk level to get diabetes. Figure 3.25 shows that 43.8% said that they had low risk, 40.9% claimed that they had moderate risk while another 15.2% said that they had high risk.



Figure 3.25: Distribution of Respondents' Risk Level to Get Diabetes

3.2.3 Perception, Preferences and Special Needs of People at Risk of Having Diabetes on Suitable Takaful Product

This section discusses the tendency and need for takaful product among the respondents who are at risk of having diabetes. Table 3.3 (Appendix 1) shows the intention and need for takaful coverage among the people at risk of having diabetes. Figures 3.26–3.38 present the distribution of each question in diagrams.

3.2.3.1 Type of Current Protection Plan

The respondents were asked about what type of insurance or takaful plan they currently have and were allowed to tick more than one answer. Based on the responses, the most popular insurance/takaful plans the respondents had were health insurance/takaful plan (40.3%), followed by life insurance/takaful (32.9%) and accident insurance/takaful plan (29.5%), as shown in Figure 3.26.



Figure 3.26: Distribution of Type of Protection Plan Joined by Respondents

3.2.3.2 Perception, Preferences and Needs Towards Having a Takaful Plan for Diabetes

From the responses shown in Figure 3.27, 60.7% of respondents were interested in purchasing a takaful protection plan for diabetes. Approximately 28.1% were not sure while 11.2% of the respondents decided not to buy any insurance or takaful plan for diabetes.



Figure 3.27: Distribution of Respondents' Interest in Getting Takaful Protection Plan for Diabetes

3.2.3.3 Willingness to Pay in a Month to Get Protection Plan for Diabetes Treatment



Figure 3.28: Distribution of Respondents' Willingness to Pay in a Month to Get Protection Plan for Diabetes Treatment

Based on the respondents' perception of the need to have a takaful plan for diabetes, most of the respondents as shown in Figure 3.28 were willing to pay a premium of between RM0 – RM50 (40.1%). For the premium payment, the respondents preferred to make monthly payments (47.8%) through online banking (74.4%). Meanwhile, for the payment of claims from the takaful provider, most respondents preferred to be paid through online banking (65.6%).



3.2.3.4 Type of Benefits Preferred if Getting Diabetes Treatment Within a Year



In terms of the benefits that respondents expected to receive from the diabetes takaful plan, Figure 3.29 shows that 81.2% chose drugs, 63% preferred counselling and advisor service and 55.8% favoured the glucose meter.



3.2.3.5 Compensation to be Received by The Beneficiary in Case of Death



For the total compensation to be received by the beneficiary in case of death, Figure 3.30 shows that 44.1% preferred more than RM50,001, 15.1% expected to receive compensations between RM10,001–RM20,000 and 10.8% chose less than RM10,000.

3.2.3.6 Decision to Get Takaful/Insurance Plan, I Will...

In making the decision to buy an insurance/takaful plan, the respondents preferred to make the decision on their own (52.7%) rather than discussing the decision with their spouse (27%) or parents/siblings (18.4%) as shown in Figure 3.31.



Figure 3.31: Distribution of Decision to Get Takaful/Insurance Plan, I Will...by Respondents

3.2.3.7 Health Status

With respect to health status as shown in Figure 3.32, 63% self-reported that they had a good health status while 23.7% claimed to have a very good health status.



Figure 3.32: Distribution of Respondents' Health Status

3.3 People with Diabetes

3.3.1 Demographic Profile

3.3.1.1 Age, Gender, Ethnicity and Religion

The mean (SD) age of the respondents was 55.4 (12.35) years. About 6.5% of the diabetes patients were in the young age group (18–35 years old). This was followed by 35.8% for middle-age (36–55 years old) and 58% older adults (56 years old and above). Approximately 62% of the patients were in the 40–65-year-old group. About one-fifth (19.4%) of the diabetes patients came from the 56–60-year-old group range.

About 3 out of 5 (61.25%) respondents were female. Malay ethnicity predominated (77.6%), followed by Chinese (11.4%) and Indian (5.4%). As expected, 79% of the respondents were Muslim. Another 9.6% and 6.6% were Buddhists and Christians, respectively.



Figure 3.33: Distribution of Respondents' Age



Figure 3.34: Distribution of Respondents' Gender



Figure 3.35: Distribution of Respondents' Ethnicity



Figure 3.36: Distribution of Respondents' Religion

3.3.1.2 Marital Status, Number of Children and Dependants

About 8 out of 10 respondents were married (79.8%), and another 11.8% were widows/widowers. About 70% of the respondents had between 1 to 5 children. In view of the fact that most of the respondents were elderly, it was not surprising to see 74.8% of them did not have other dependants such as parents or grandparents.



Figure 3.38: Distribution of Respondents' Marital Status



Figure 3.39: Distribution of Number of Children of Respondents



Figure 3.40: Distribution of Respondents' Other Dependants

3.3.1.3 Education

About 4 out of 5 respondents (78.8%) had received formal education with more than half (55.65%) finishing secondary school. Another 15.4% studied up to tertiary level. Only 5.8% claimed that they had never received any formal education in their life.



Figure 3.41: Distribution of Highest Academic Qualification

3.3.1.4 Employment and Occupational Safety

With regard to the occupational aspect, almost a third (28.4%) were retired/pensioners whereas we observed an almost equal distribution of private sector employees, housewives and government officers (11.8–15.4%). In the study about 11.8% were unemployed. Students accounted for less than 10% of the study population. In terms of job description, Class 1 and Class 2 predominated (49.2% and 40.6%, respectively) and Class 4 comprised the fewest (1.2%). Among those who were still working, the majority had a permanent job (85.5%).



Figure 3.42: Distribution of Occupation



Figure 3.43: Distribution of Respondents' Job/Daily Activities



Figure 3.44: Distribution of Respondents' Occupational Status

3.3.1.5 Income and Expense

In the study, the majority of respondents had less than RM4,849 (88.6%) in monthly household income. As for monthly gross income, similarly the majority took home less than RM4,849. The majority (85%) of the studied population did not receive welfare, healthcare or education assistance. It is expected that the total monthly expenses too were less than RM4,849 (98%) for almost all of them, which would be in keeping with their monthly household income and monthly gross income.

With regard to the normal way of paying for diabetes treatment, more than half (62%) reported that they used their own money and a minority claimed that they got help from other sources such as zakat payment, PERKESO and so on (1.4%).



Figure 3.45: Distribution of Respondents' Monthly Household Income



Figure 3.46: Distribution of Respondents' Monthly Gross Income



Figure 3.47: Distribution of Respondents Who Received Welfare, Healthcare or Education Assistance



Figure 3.48: Distribution of Respondents' Total Monthly Expenses

3.3.2 Risk Categorisation for People with Diabetes in Malaysia

3.3.2.1 Disease Duration

The mean (SD) duration of having diabetes was 9.3 (7.08) years, with duration ranging between 1 to 36 years. A quarter of the respondents had lived with diabetes for at least 1 to 3 years (25.6%). Almost half of them (45.8%) have had diabetes for more than 10 years.

The mean duration of having diabetes among patients who were interested in getting a takaful diabetes plan was 8.9 (6.86) years. Interestingly, as the duration of the illness escalates, the patient's willingness to take a takaful plan decreases. Thus, a diabetes takaful product can be beneficial if it is introduced earlier in the disease process.



Figure 3.49: Distribution of Duration of Suffering from Diabetes

3.3.2.2 Diabetes Treatment

Following the longer duration of having diabetes, 4 out of 5 (43%) patients were prescribed insulin to manage their glycaemic level. Most of them (92.6%) were on either one or a few types of oral hypoglycaemic agents. It is interesting to note that about 7.2% of the respondents took traditional and complementary medicine for their diabetes.



Figure 3.50: Distribution of types of diabetes treatment received by respondents



Figure 3.51: Distribution of diabetes complications in respondents

3.3.2.3 Diabetic Control

With regard to diabetes control, it is not surprising that more than half of the patients had poor glycaemic control (67.4%), whereas only 32.6 % had good glycaemic control. This is reflected in the poor overall HbA1c level reading of 8.5%. Nonetheless, it is good to note that 58.8% did home blood glucose monitoring reflecting good care in their diabetes control. About 59.5% of the patients who monitored their sugar level at home requested to receive a glucose meter as a benefit upon enrolling in any diabetes insurance coverage. As expected, about four-fifths of patients who did not practise home blood sugar monitoring demanded a glucose meter too.



Figure 3.52: Distribution of diseases suffered by the respondents (other than diabetes)



Figure 3.53: Distribution of respondents who monitored their sugar reading at home

3.3.2.4 Diabetes-Related Complications and Comorbidities

More than half of our respondents (53.85) did not have any diabetes complications. The commonest diabetes-related complications detected in the current study was peripheral neuropathy, where a quarter of them (26.6%) experienced numbress of the hands and feet.

Another 12.2% reported having significant proteinuria, which indicates the presence of renal impairment. Approximately 5.6% were diagnosed with chronic kidney disease. With regard to smoking status, it is good to know that almost all of them were under the category of never smoked (80%) and already quit smoking (11.6%). Only a minority was still smoking actively (8.4%).

In general, patients who developed serious and debilitating complications had suffered from diabetes for a duration of between 11 to 13 years. Mean (SD) duration of patients with lower limb amputation and heart disease was 13.4 (7.93) years and 11.5 (7.11) years for the latter.

3.3.2.5 Diabetes Co-Morbidities and Smoking Status

About 8 in every 10 patients in this study were diagnosed with hypertension. The mean (SD) systolic blood pressure was 139.1 (20.36) mmHg, and diastolic blood pressure was Approximately 69.6% of the respondents had hypercholesterolemia. All the lipid parameters were acceptable except for the LDL-cholesterol level, which was 7.6% higher than the targeted level of < 2.6 mmol/L. About two-fifths of the respondents were obese or had a body mass index of equal to or more than 27.5 kg/m². Ideally, these individuals should aim for a 10% reduction of current body weight within 6 months.

Regarding smoking status, it is good to know that almost all of them were under the category of never smoked (80%) and already quit smoking (11.6%). Only one-tenth (8.4%) of respondents were still smoking actively.



Figure 3.54: Distribution of respondents' smoking status

3.3.2.6 Health-Seeking Behaviour

As expected, 96.4% of the respondents had sought treatment at a public health clinic followed by 8.4% who had a follow-up at a government hospital. The top three reasons given for their choosing these centres for their follow-up were they were cheaper, easy and near to home. In addition, the number of follow-up visits in a year was reasonable as noted in the relevant table. About 61.6% of diabetes patients went for follow-up appointments 4 to 6 times a year. In the ideal standard diabetes management, a diabetes patient should be reviewed once every 3 to 4 months to address any issues related to diabetes control or its co-morbidities. Some patients might be seen more frequently depending on their general health status, such as having poor diabetes control or worsening diabetes complications. Assure was 79.2 (11.58). These figures are within the upper limits of the recommended blood pressure measurements based on the national diabetes guidelines.





Figure 3.55: Distribution of reason for seeking treatment

Figure 3.56: Distribution of frequency of visit to a clinic/hospital

CHAPTER FOUR

CROSSTABULATION ANALYSIS

4.1 Introduction

The crosstabulation analysis in this chapter is divided into two sections; (i) people at risk of having diabetes and (ii) people with diabetes. For both sections, the variables of interest were crosstabulation by the sociodemographic and socioeconomic status of the respondents i.e. income, occupation, ethnicity, religion, marital status, residential area, education level, and occupational risk.

4.2 People at Risk of Having Diabetes

Among the people at risk of having diabetes, the researchers are interested to know the distribution of the respondents who are (i) interested in getting a takaful protection plan for diabetics, (ii) health status, and (iii) willingness to pay, by their socioeconomic background.

4.2.1 Interest in Getting a Takaful Protection Plan for Diabetics vs Socioeconomic Background

This section reports the crosstabulation of respondents who are interested in getting a takaful plan for diabetes based on the sociodemographic and socioeconomic backgrounds such as income, occupation, ethnicity, religion, marital status and others.





Figure 4.1: Crosstabulation of interest in getting takaful protection for diabetics with household income

The household income category is divided into three income groups i.e. RM0–RM4,849 (B40), RM4,850–RM10,959 (M40), and above RM10,960 (T20) (See Appendix 3). Among those who are interested in getting a takaful protection plan for diabetics, the highest percentage comes from the B40 group (38.7%), followed by the M40 (15.2%) and the T20 (6.7%). Figure 4.1 shows that 56.7% of the B40 group and 71.2% of the M40 group are interested in purchasing a takaful plan for diabetes. Since diabetes is more prevalent among the B40, thus, it is suggested that FWD Takaful market their takaful product to this group.

4.2.1.2 Crosstabulation with Occupation

According to types of occupation, among those who are interested to get takaful protection plan for diabetes, the highest percentages were the private sector employees (23.1%) and government employees (14.7%). Among the private sector employees, 63.8% were interested in getting takaful protection plan for diabetes. Figure 4.2 shows the crosstabulation of respondents who are interested in getting a takaful plan for diabetes with occupation.



Figure 4.2: Crosstabulation of interest in getting takaful protection for diabetics with occupation

4.2.1.3 Crosstabulation with Ethnic Group

Most of the respondents in our sample were Malay. Thus, we found that 51.6% of all respondents were interested in purchasing a takaful protection plan for diabetes. Furthermore, among the Malays, 61.3% were interested. Figure 4.3 shows the crosstabulation of respondents who were interested in getting a takaful plan for diabetes with ethnicity.



Figure 4.3: Crosstabulation of interest in getting protection with ethnicity

4.2.1.4 Crosstabulation with Religion

Based on the religion of the respondents, among those who were interested in getting takaful protection plan for diabetes, 59.8% were Muslim and among the Muslims 60.9% were interested in buying the takaful plan for diabetes. Figure 4.4 presents the crosstabulation of respondents who were interested in getting a takaful plan for diabetes with religion.



Figure 4.4: Crosstabulation of interest in getting protection with religion

4.2.1.5 Crosstabulation with Marital Status

Among those who were interested in getting a takaful protection plan for diabetes, 34.8% were single, and 24.9% were married. Among the singles, 61.6% were interested in subscribing to a takaful plan for diabetes. Figure 4.5 presents the crosstabulation of respondents who were interested in getting a takaful plan for diabetes with marital status.



Figure 4.5: Crosstabulation of interest in getting protection with marital status

4.2.1.6 Crosstabulation with Residential Area

The crosstabulation of respondents who were interested in getting a takaful plan for diabetes with residential area showed that 32.6% of the respondents who lived in urban areas were interested, followed by 15.6% from the sub-urban and 12.6% from the rural areas. Among the urban area residents, 63.8% were interested in buying a takaful plan for diabetes. Figure 4.6 displays the crosstabulation of respondents who were interested in getting a takaful plan for diabetes with residential area.



Figure 4.6: Crosstabulation of interest in getting protection with residential area
4.2.1.7 Crosstabulation with Education Level

Based on the education level of respondents, 43.5% of the degree and higher qualification holders were interested in buying a takaful plan for diabetes. Among them 65.3% were interested in buying a takaful plan for diabetes. Figure 4.7 shows the crosstabulation of respondents who were interested in getting a takaful plan for diabetes with education level.



Figure 4.7: Crosstabulation of interest in getting protection with education level

4.2.1.8 Crosstabulation with Occupational Risk

Based on the respondents' occupational risk, 50.8% of the respondents in Class 1 who worked in a less risky building were interested in buying a takaful plan for diabetes. Only 4.5% were interested in buying a takaful plan for diabetes from Class 2, 3.8% from Class 3 and 1.5% from Class 4. Among the respondents in Class 1, 60.9% were interested. Figure 4.8 shows the crosstabulation of respondents who were interested in getting a takaful plan for diabetes with occupational risk.



Figure 4.8: Crosstabulation of interest in getting protection with occupational risk

This section reports the crosstabulation of respondents' willingness to pay based on socioeconomic background. Since most of the respondents preferred to pay a takaful premium of less than RM50 monthly, the discussion will look at the distribution based on this group of takaful premium.

4.2.2.1 Crosstabulation with Household Income

Based on income, among the respondents who preferred to pay a takaful premium of less than RM50 monthly, 31.5% were from the B40 group, 5.6% from the M40 group and 3% from the T20 group. As expected, among the B40 group, 46.2% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.9 shows the crosstabulation of respondents' willingness to pay with income.



Figure 4.9: Crosstabulation of willingness to pay with household income

4.2.2.2 Crosstabulation with Occupation

With respect to occupation, among the respondents who preferred to pay a takaful premium of less than RM50 monthly, 14.1% were private sector employees and 9.2% were government servants. Among the private sector employees, 38.8% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.10 shows the crosstabulation of respondents' willingness to pay with occupation.



Figure 4.10: Crosstabulation of willingness to pay with occupation

4.2.2.3 Crosstabulation with Ethnicity

From the perspective of ethnicity, among the respondents who preferred to pay a takaful premium of less than RM50 monthly, 33.4% were Malay. Among the Malays, 39.6% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.11 shows the crosstabulation of respondents' willingness to pay with ethnicity.



Figure 4.11: Crosstabulation of willingness to pay with ethnicity

4.2.2.4 Crosstabulation with Religion

When viewed from the perspective of religious belief, among those who preferred to pay a takaful premium of less than RM50 monthly, 39.1% were Muslim. Among the Muslims, 39.8% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.12 shows the crosstabulation of respondents' willingness to pay with religion.



Figure 4.12: Crosstabulation of willingness to pay with religion

4.2.2.5 Crosstabulation with Marital Status

With respect to marital status, among the respondents who preferred to pay a takaful premium of less than RM50 monthly, 21.6% were single, and 16.7% were married. Among the singles, 38.4% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.13 shows the crosstabulation of respondents' willingness to pay with marital status.



Figure 4.13: Crosstabulation of willingness to pay with marital status

4.2.2.6 Crosstabulation with Residential Area

Based on residential area, among the respondents who preferred to pay a takaful premium of less than RM50 monthly, 20.1% were living in urban areas, 10.1% were living in sub-urban areas and 9.9% were living in rural areas. Among the respondents who lived in urban areas, 39.4% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.14 shows the crosstabulation of respondents' willingness to pay with residential area.



Figure 4.14: Crosstabulation of willingness to pay with residential area

4.2.2.7 Crosstabulation with Education Level

With regard to education level, among the respondents who preferred to pay a takaful premium of less than RM50 monthly, 22.3% were those who obtained a degree or higher qualifications. Among them, 33.5% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.15 shows the crosstabulation of respondents' willingness to pay with education level.



Figure 4.15: Crosstabulation of willingness to pay with education level

4.2.2.8 Crosstabulation with Occupational Risk

Based on occupational risk, among the respondents who preferred to pay a takaful premium of less than RM50 monthly, 33.8% were from Class 1, 3.4% were from Class 3, 2.3% were from Class 2 and 0.6% were from Class 4. Among the respondents who were working in Class 1, 40.6% were willing to pay less than RM50 monthly for the takaful premium. Figure 4.16 shows the crosstabulation of respondents' willingness to pay with occupational risk.



Figure 4.16: Crosstabulation of willingness to pay with occupational risk

4.3 **People with Diabetes**

This section examines the perceptions of people with diabetes against independent demographic variables such as income, occupation, ethnicity, religion, marital status, residential area, and education level using the cross-tabulation analysis.

4.3.1 Suffering from Diabetes Mellitus vs Socioeconomic Background

This study used a sample of people with diabetes which included type 1 and 2 diabetes mellitus (T2DM). Five hundred respondents from this group responded to the survey.

4.3.1.1 Crosstabulation with Household Income

This study defines income into three categories of household income; RM0–RM4,849 (B40), RM4,850–RM10,959 (M40), and above RM10,960 (T2). Data shows that the highest percentages for periods of suffering based on income are for durations of more than 10 years, specifically for RM0–RM4,849 (B40) and RM4,850–RM10,959 (M40), with total percentages of 40% and 5% under each category of respective income.

As the comparison is made within the B40 household income, data shows that 45.1% suffered from diabetes mellitus for more than 10 years and 22.6% had been suffering for a duration of at 1–3 years, which indicate the future trends in diabetes patients and the need for coverage to reduce the government's budget on health.



Figure 4.17: Crosstabulation of suffering from DM with household income

4.3.1.2 Crosstabulation with Occupation

The study analyses the periods of diabetes suffering against the occupation types (private sector employee, housewives, pensioners/retirees, not working, government servants, entrepreneurs/ self-employed, students and others). Data shows that from 45.8% of the respondents suffering from diabetes for more than 10 years, 13.4% consisted of pensioners/retirees, followed by housewives (7.4%) and government servants (6.6%). From the category of those suffering for 1-3 years, the highest percentage came from the private sector employee respondents.



Figure 4.18: Crosstabulation of suffering from DM with occupation

4.3.1.3 Crosstabulation with Ethnicity

In a comparison between 'period of suffering from diabetes' with ethnic group, data shows that Malay and Chinese had higher percentages in terms of period of diabetes suffering compared with the other ethnicities at 33.2% and 5.8%, respectively, within the range of more than 10 years of suffering.



Figure 4.19: Crosstabulation of suffering from DM with ethnicity

4.3.1.4 Crosstabulation with Religion

The previous data on crosstabulation analysis of diabetes suffering according to ethnic group is relatively consistent with religion. Approximately 34.8% of all the respondents who suffered from diabetes consisted of Muslims. This was followed by the Buddhists.



Figure 4.20: Crosstabulation of suffering from DM with religion

4.3.1.5 Crosstabulation with Marital Status



Figure 4.21: Crosstabulation period of suffering from diabetes mellitus with marital status Crosstabulation analysis of the years of suffering and marital status categories show that the highest percentages of those who were suffering for more than 10 years came from those who were married (35.8%), followed by divorcees/divorces (6.2%). From the category of 1–3 years of suffering, 21.4% of the respondents also came from married respondents followed by widows/widowers (2.0%).









4.3.1.7 Crosstabulation with Education Level

Figure 4.23: Crosstabulation of period of suffering from diabetes mellitus with education level

Education is assumed to be an important factor towards diabetes awareness. The data evidently shows that high percentages of those who were suffering within 1–3 years and more than 10 years came from the secondary and primary school education backgrounds. Approximately 21.8% of all the respondents suffering from diabetes for more than 10 years came from the secondary school education background.

4.3.1.8 Crosstabulation with Occupational Risk

Types of occupation risks also provide some indication on period of diabetes suffering. The data shows that those who were from Class 1 (involved with indoor work that is less risky) and Class 2 (involved with outdoor work or are riskier than Class 1) without a proper preventive lifestyle had a high tendency to get diabetes. Approximately 21.8% of the respondents who suffered from diabetes came from Class 1.



Figure 4.24: Crosstabulation of period of suffering from diabetes mellitus with occupational

risk

4.3.2 Having a Protection Plan

The data shows that 83% of the 500 respondents with diabetes did not have any protection plan. This section presents findings from the crosstabulation analysis of those who have a protection plan with demographic factors (income, occupation, ethnicity, religion, marital status, residential area, and education level). The analysis is vital to understand the significance of having a plan based on these factors.



4.3.2.1 Crosstabulation with Income



In a comparison of level of income with protection plan owned, the data shows that a majority of those who placed under the B40 category of household income did not have a protection plan (86.2% within the group). This percentage contributed 76.5% of the total percentage for non-ownership of any contribution within all the household income categories. A majority from the income categories of (RM4,850–RM10,959) and (RM10,960 and above) had a protection plan.





Figure 4. 26: Crosstabulation of having a protection plan with occupation

An analysis of category of occupation and having a protection plan demonstrates that from the total percentage of those who did not have coverage, the majority came from the retirees (26%), followed by housewives (11.6%) and private sector employees (11.4%).

4.3.2.3 Crosstabulation with Ethnicity



Figure 4.27: Crosstabulation of having a protection plan with ethnicity

This study also looked at the crosstabulation analysis of ethnicity and having protection categories. The data shows that 83% of all respondents did not have a protection plan. The majority of those who did not have a plan consisted of Malays (64.8% from the total number of respondents), followed by Chinese (8.6% from all respondents).

4.3.2.4 Crosstabulation with Religion





Consistent with the previous section on ethnicity, the findings in this section shows that a majority of Muslims did not have any coverage, and the numbers contributed to 66.4% of the total number of respondents. This number is very significant compared to other ethnicities.



4.3.2.5 Crosstabulation with Marital Status

Figure 4.29: Crosstabulation of having a protection plan with marital status

This section analyses the group of marital status and having a protection plan. The data shows that the married group did not have a protection plan (66.4% of all respondents). This was followed by widowers (10.8% of all respondents).

4.3.2.6 Crosstabulation with Residential Area



Figure 4.30: Crosstabulation of having a protection plan with residential area

This section shows that the most of respondents in the rural group did not have a protection plan (87%). This percentage contributed to 42.8% of the total respondent numbers. This number was followed by the urban group at 30.8% of the total number of respondents.





Figure 4.31: Crosstabulation of having a protection plan with education level

The survey on education background is important to look at how it can influence people to get coverage from takaful. The data shows that a majority of respondents under the category of secondary school (81.7%) did not have a protection plan. This percentage contributed to 45.4% of all respondents.



4.3.2.8 Crosstabulation with Occupational Risk

Figure 4.32: Crosstabulation of having a protection plan with occupational risk

This section compares the occupational risk group and having protection. Based on the analysis, a majority of Class 1 (involved with indoor work that is less risky) and Class 2 (involved with outdoor work or are riskier than Class 1) did not have any coverage, which amounted to 82.5% and 81.3%, respectively, for each group. Those who did not have any protection plan from Class 1 made up 40.6% of all respondents.

4.3.3 Interest in Getting Protection

This section presents an analysis of the comparison between the preference of 'interest in getting protection' among people with diabetes with the demographic factors of income, occupation, ethnicity, religion, marital status, residential area and education.





Figure 4.33: Crosstabulation of interest in getting protection with income

Figure 4.41 examines the preferences of respondents (from three different groups of income) on their interest to get a protection plan. The data shows significant results from the B40 group (RM0.00–RM4,849). A majority of this group were interested to get the protection (53.5%). This group made up 47.5% of the total number of respondents.

4.3.3.2 Crosstabulation with Occupation

This part reports the analysis of the preferences towards getting a protection plan based on eight types of respondent occupations.



Figure 4.34: Crosstabulation of interest in getting protection with occupation

The findings show that pensioners/retirees showed a high interest in getting protection compared with the other groups. Based on the data, this group that stated 'yes' represented 19% of the whole sample. The next group expressing interest in getting a protection plan were the private sector employees. This result indicates that as the pensioners/retirees made up a large percentage of those suffering from years of diabetes, they tended to show their preference for getting protection.

4.3.3.3 Crosstabulation with Ethnicity

Figure 4.43 presents the analysis of preferences on interest in getting a protection plan based on respondent ethnicity. By looking at the percentages of the groups' interest along with the total number of respondents, the data shows us that a majority of those interested consisted of Malays (45% of all respondents), followed by other ethnic groups. There were relatively a large number of respondents who gave the answer of 'not sure' from this group, which indicate that there is some room for marketing activities needed to create awareness of the need for a takaful plan.



Figure 4.35: Crosstabulation of interest in getting protection with ethnicity

4.3.3.4 Crosstabulation with Religion



Figure 4.36: Crosstabulation of interest in getting protection with religion

Consistent with the previous findings on preference for interest in getting protection based on ethnicity, the results show that a majority of Muslims were interested in getting protection, and their numbers represented 45.8% of the whole sample. This number is relevant in the context of Malaysia as well as this study, where the religious belief of Malays is always connected to Islam.

4.3.3.5 Crosstabulation with Marital Status

Preference towards interest in getting a protection plan is tabulated based on marital status, as shown in Figure 4.37.





This study found that a majority of those who were married were interested in getting a protection plan (43.2% of the total respondent number). However, a relatively large number of this group stated that they were not sure (21.6% from the whole respondent number), which indicates that some marketing should be done to encourage people to have protection.

4.3.3.6 Crosstabulation with Residential Area

Data on preference towards interest in getting protection is also cross-tabulated with residential area.



Figure 4.38: Crosstabulation of interest in getting protection with residential area

Interestingly, those who were from rural areas showed a high interest in getting protection compared with other groups (32.2% of all respondents), followed by the urban and sub-urban respondents. However, clearer data on urban preference is needed to identify whether the low percentage among the urban respondents compared with the rural group on interest in getting protection is influenced by their existing ownership of protection coverage.

4.3.3.7 Crosstabulation with Education Level

Education level is assumed to be an important factor in customer decision making. Figure 4.39 looks at the preference of respondents in getting protection based on education level.



Figure 4.39: Crosstabulation of interest in getting protection with education level

As indicated by Table 4.47, the majority of respondents in every group (except for the no formal education group) were interested in getting protection. From these groups, the secondary schooling group had a high percentage of interest in getting protection compared with the other groups (32% of the total number of respondents).

4.3.3.8 Crosstabulation with Occupational Risk

This section cross-tabulates occupational risk with respondents' interest in getting protection.



Figure 4.40: Crosstabulation of interest in getting protection with occupational risk

A comparison is made on the class of occupational risk vs interest in getting protection. The data shows that respondents in Class 1 (involved with indoor work that is less risky) stated that they were interested in getting a protection plan. Those who were interested from this group represented 32.6 of all respondents.

4.3.4 Willingness to Pay

This section is crucial to examine how much people are willing to pay (WTP) for a protection plan for the whole family (including themselves) based on the demographic categories. This information can provide some background for the marketing strategy of the takaful providers.

4.3.4.1 Crosstabulation with Income

Figure 4.41 examines the WTP for a takaful plan with different income groups (categories of B40, M40 and T20).



Figure 4.41: Crosstabulation of willingness to pay with household income

The data shows that a majority of respondents from the B40 group preferred to pay the minimum payment (RM50 and below) for coverage. This represented 78.2% of the total sample. The M40 interestingly had relatively parallel results, where the majority of this group preferred the lowest contribution.

4.3.4.2 Crosstabulation with Occupation





Figure 4.42: Crosstabulation of willingness to pay with occupation

The data shows that a majority of respondents from each group selected the lowest contribution (less than RM50). From these numbers, 25.8% of the total number of respondents willing to pay this amount consisted of pensioners.
4.3.4.3 Crosstabulation with Ethnicity



This part provides the cross-tabulation analysis of WTP for a protection plan according to ethnic category.

Figure 4.43: Crosstabulation of willingness to pay with ethnicity

The findings show that most respondents from each group of ethnicity chose the lowest contribution (less than RM50.00). From these numbers, Malays comprised a large percentage in the WTP (65%) compared with others, perhaps due to the sampling approach.

4.3.4.4 Crosstabulation with Religion

The results of the crosstabulation analysis of religion with WTP is shown in Figure 4.44. In parallel with other findings, a majority were willing to pay the minimum amount (less than RM50).



Figure 4.44: Crosstabulation of willingness to pay with religion

The data as shown in the table demonstrates that Muslims were willing to pay the minimum amount, representing 66% of the total number of respondents. The same indication is shown in other religions such as Buddhism and Christianity.

4.3.4.5 Crosstabulation with Marital Status

The next analysis examines marital status and WTP. As shown in Figure 4.45, a majority of the respondents from the different categories were willing to pay the lower amount (RM40 and below).



Figure 4.45: Crosstabulation of willingness to pay with marital status

On the whole, those who were married and willing to pay the minimum amount for protection represented 67.2% of all respondents. This indicates that suitable products with acceptable pricing should be developed to serve all groups.

4.3.4.6 Crosstabulation with Residential Area



The level of WTP for a protection plan is suitable to be examined from the category of residential area.

Figure 4.46: Crosstabulation of willingness to pay with residential area

Again, this analysis shows that a majority of the respondents preferred the lowest contribution amount to the operators for protection. Of the groups who were willing to pay the minimum amount, the largest numbers came from rural areas (42% of all respondents) and urban area (33.2% of all respondents).

4.3.4.7 Crosstabulation with Education Level

This section identifies whether there are differences in WTP in comparison with education level. The result is shown in Figure 4.47.



Figure 4.47: Crosstabulation of willingness to pay with education level

The data does not show any variance on the amount that the respondents were willing to pay, as the majority chose the minimum contribution (less than RM50). From these results, respondents from the secondary school education background and willing to pay the minimum amount represented 48% of the total number of respondents.

4.3.4.8 Crosstabulation with Occupational Risk

This section examines the differences between the groups of occupational risks on their WTP for protection. Similar to other findings, most respondents from different groups of occupational risks were willing to pay the lower contribution. The data significantly shows that people from Class 1 (involved with indoor work that is less risky) who preferred to pay the minimum amount represented a large percentage (42.8%) compared with the other groups.



Figure 4.48: Crosstabulation of willingness to pay with occupational risk

4.4 Summary of Findings

Understanding the needs of people and producing the products that suit those needs are important, not only for marketing and performance purposes, but beyond that to ensure that customers are able to benefit from our products. The data shows that people who have been suffering from diabetes for longer periods are interested in getting coverage, with the majority of respondents willing to pay the minimum premium for coverage (equal to or less than RM50). This aspect should be considered by the takaful providers.

CHAPTER FIVE

SUGGESTION AND PROPOSAL

5.1 Proposed Shariah Model and Re-Takaful Including Validation

The major challenge in managing the Participant Risk Fund (PRF) is finding a balance between the contribution, claims and margin for takaful operators. Since the focus of this research is to develop products for the mass market and B40 segment, with the findings and data showing that this group has a higher proportion of diabetes patients, the probability of claim will be higher than other normal products. From another perspective, the expectation of participants that this product must be affordable and cost less than RM50 per month could harm the PRF and cause it to go into a deficit and become unsustainable. At the same time, this could affect FWD's margin as an operator of this product.

Therefore, one of the mitigations plans for takaful operators in managing risk is to engage and share the risk with a re-takaful operator. This to ensure the sustainability of the product and protect operators in the event of a catastrophe. However, it is difficult to find re if those risks are not covered by re or the risk is too high. Thus, another mitigation plan is to provide a sustainable buffer to the PRF in the form of an injection to the establishment of PRF.

From the shariah point of view, an injection from shareholders to establish the new PRF should be in the form of *hibah*. However, the takaful operational framework (TOF) only mentions the seed money to inject into the Participant Investment Fund (PIF) of an Investment-Linked fund but is silent on the PRF. In depth, if seed money is injected into the PRF, the status of PRF ownership will be questionable. TOF clearly mentions that the ownership of the PRF is with the participants, and therefore they are entitled to any distributable surplus. If this seed money is distributed to participants in the form of surplus, it could affect the PRF's sustainability in the future.

One of the mitigation plans is to ensure that the consent given prior to participating in the scheme is not for distributing the surplus, but to keep it until the end. In addition, they should give consent that upon discontinuation of the product or PRF, this money could be transferred to another PRF. The next issue, before the participant participates in the scheme, who will 'own' the PRF since it is already established with seed money? This could be another issue

since the TOF clearly mentions that the PRF is owned by participants.

We will limit the discussion of this issue for this research but we propose that FWD engages another research team to tackle this issue. We believe that this issue is germane not only from the shariah perspective, but involves and requires a major amendment to the TOF.

5.1.1 Pricing

In pricing the product, we base our decision by drawing upon factors such as underwriting. Factors that are looked into for underwriting health insurance usually include age, gender, weight, and certain health conditions. Depending on the insurance or takaful company, the underwriting process may be fully implemented or simplified and may require further health assessment to ensure that the participant does not have any high underlying risk factors. Each company may have their own set of policies regarding the underwriting process, which may lead to exclusion of coverage for certain conditions. This in turn will help the company to determine individual rates in the pricing process.

Nonetheless, the company must also take into account other factors in the best practices of the organisation such as those mentioned in Soualhi and Djafri (2019). This includes assumptions on mortality/morbidity, gender, lifestyle, family history, occupation, investment returns, future expenses, shareholder profit, loadings, etc. Although medical or health insurance is not practically under the umbrella of life insurance/family takaful, the practice of ratemaking for such products can be learned from probabilities and theories from the life insurance experience (Lotter, 2000). Assumptions such as the multiple state models using Markov chain properties can also be extended in pricing a product relating to diabetes. This can be possible with available data such as countries that implement the National Health Insurance (NHI) programs. In Malaysia, however, such insurance at the national level is not yet in practice; therefore, data limitations would hinder the process of understanding the states involving a person with diabetes. Nevertheless, the medical costs relating to diabetes are provided in the appendices for reference together with related product costs under the Diabetes Malaysia organisation (See Appendix 10).

Concerning the contribution payment to be charged to the customer, based on the survey results, a majority of the respondents are willing to pay up to RM50 for coverage, while there are about 34% (from those at risk of having diabetes) willing to pay up to RM100. For people

with diabetes, 83.8% are willing to pay up to RM50; while only around 10.3% are willing to pay up to RM100.

Furthermore, it has been shown by the results that those who have developed the disease for more than 10 years showed a decline in demand for coverage for diabetes. With the above discussion, our suggestion is to have a product that may cover the basic needs of a person at risk of having diabetes with more involvement of a diabetes management or wellness program that will not include hospitalisation or complications such as those covered in existing products. The aim is to have a prevention program rather than to pay the costs for serious conditions. The price for the product is also suggested to be within the range of affordability based on the respondents' preference; that is between RM10 and RM50 considering the product is to cater to the B40 group.

5.1.2 Coverage

Basing our decision on the fact that people who have already developed diabetes for several years will not be very much interested in any coverage, the takaful product aims to cover people at risk of having diabetes and possibly those in the early phase of diabetes. As already mentioned above, the product will be a diabetes management program or wellness program, which aims at preventing those at risk to develop more serious conditions of type-2 diabetes.

The programs are suggested to be linked with the Diabetes Malaysia organisation as they have already implemented various programs with active members. The company may also follow the MDPP model by having suppliers to provide the said programs to participants and later make claims for payment if necessary.

The suggested coverage shall be similar to the MDPP discussed in Section 2.3.1 with the following phases:

- a) In Phase 1 of the program, an instructor conducts core sessions in a group over a 6 month period. The curriculum may include:
 - Tips on proper exercise and how to get enough exercise.
 - Lessons on nutrition
 - Tips on how to be consistent in behavioural changes.
 - Support, coaching and motivation from experienced coaches/experts.
 - Support group from those who also have similar goals.

- b) Phase 2 of the program will include 6 months of follow up sessions to maintain healthy habits that have been outlined in the first phase.
- c) Phase 3 of the program will include an additional 1 year of continuous maintenance of the sessions to ensure that participants meet their goals.

In addition to the three phases of the program, additional coverage (could also be added as riders depending on the price of product) for participants may include medical or health check-ups as follows:

- a) Annual check-up (HbA1c, cholesterol check, blood pressure monitoring, BMI and doctor consultation;
- b) Half-yearly check-up (HbA1c, blood pressure monitoring, and BMI);
- c) Foot exams (every 6 months);
- d) Eye exams (glaucoma screening once a month).

5.1.3 Benefits

The benefits follow from the coverage outlined in Section 5.1.2. The programs are suggested to be linked with the Diabetes Malaysia organisation as they have already implemented various programs with their active members. The company may also follow the MDPP model by having suppliers to provide the said programs to participants and later make claims for payment if necessary.

The benefits to include are:

- a) Entitlement to follow the phases of programs under implementation to reach the goals (to prevent or reduce effect of diabetes) as provided in Section 5.1.2.;
- b) Entitlement to medical/health check-ups which may consist of the following:
 - a. Annual check-up (HbA1c, cholesterol check, blood pressure monitoring, BMI and doctor consultation;
 - b. Half-yearly check-up (HbA1c, blood pressure monitoring, and BMI)
- c) Additional benefits which may include wellness support such as:
 - a. Providing mobile app access to track participants' health through medical records, etc.
 - Monthly newsletters and face to face appointments or webinars (due to limitations during the COVID-19 period), and access to helpline for any queries

on matters related to diabetes management.

5.1.4 Eligibility

For coverage eligibility, we suggest focusing on those who are overweight and obese (similar to the program outlined above in the MDPP) as this is the group who are at risk of having diabetes, including those who already have a family history of diabetes.

To be eligible for the product, the following criteria are proposed:

- i. Age 18 years to 55 years (entry)
- ii. Overweight or obese (BMI > 23)
- iii. HbA1c equal to or less than 8 (preferably between 5.5 and 6.5)
- iv. Family history of type 2 diabetes
- v. Income of less than RM5000 per month
- vi. Age 65 years (maximum coverage)
- vii. Not diagnosed with type 2 or type 1 diabetes at entry

5.2 Legal and Operational Issue

Products offered by providers should consider Shariah and legal requirements as well as the supported guidelines. The takaful products are bound by the Islamic Financial Services Act (2013), and other guidelines including (but not limited to):

- a) Takaful Operational Framework (TOF, 2019)
- b) Guidelines on Operating Costs of Family Takaful Business
- c) Guidelines on Medical and Health Takaful Business
- d) Guidelines on Bancatakaful.

Based on the guidelines related to operational costs and fees, there are no pricing issues in product offering for micro-takaful. The main concern, however, is the capability of the participants to pay for the proposed product's contribution. In addition, there is an issue of sustainability of the PRF if the product is priced at too low a price due to the possibility of high claim.

As the proposed product (in the previous section) includes the product features (a-g), this study also highlights several issues for implementation that should be considered prior to the product

development process. TOF (2019) highlights several aspects that should be considered by takaful providers including the a) application of Shariah contracts; (b) establishment and maintenance of takaful funds and shareholders fund, including, where applicable, establishment of additional takaful funds or consolidation of additional PRF(s); (c) product structuring; (d) management of underwriting; (e) management of re-takaful; (f) management of investments; (g) management of claims; (h) remuneration for management of takaful funds; (i) management of operating costs; (j) management of surplus in PRF; and (k) management of deficiency and loss rectification.

Based on findings from the secondary data and respondents' survey, this study proposes that the takaful providers should inject the seed money into the PRF to increase and sustain the funds. The issue is possibly settled from the Shariah position in two ways:

- a) Seed money can be in the form of *hibah* (or other charitable funds) contributed by the provider to the PRF;
- b) The providers should gain consent from participants in the usage and ownership of the combined funds (mix of existing funds in PRF and seed money) prior to entering the contract.

However, there are some issues from the legal perspectives related to the contribution of the seed money by the providers into the PRF and the ownership status of the funds. These two issues will determine the possibility of the funds to be maintained without withdrawal (for the surplus distribution) as well as the practice of cross-subsidisation from the surplus PRF to another deficit PRF.

a) The Ownership of PRF

Based on IFSA 2013, it is understood that the takaful fund is under the participants' ownership. IFSA maintains the roles of the providers in managing the funds on behalf of providers (S. 92. (1) A takaful fund established under section 90 shall be maintained and managed by a licensed takaful operator on behalf of and in the best interests of the takaful participants ...).

TOF in relation to S. 92 IFSA also indicates the status of PRF ownership. As indicated in G 9.2: As takaful funds are owned by takaful participants, Section 92 of the IFSA also imposes an obligation on a licensed takaful operator to ensure that the funds are established and managed in a manner that preserves the interest of the takaful participants at all times

b) Seed Money in PRF

IFSA is silent on the injection of seed money into takaful funds. TOF mentions the possibility of implementing seed money and permits the operator to inject seed money pursuant to paragraph 10.3(b) and the policy document on Investment-Linked Business, a licensed takaful operator may provide an injection of seed money from the shareholders fund to assist in the establishment of the PIF of an investment-linked fund. However, there is no indication on this practice on PRF in order to safeguard the sustainability of the PRF in order to cover shareholders' funds to the PIF of an investment-linked fund. This is shown in G 10.12 for high and continuous claims from the participants.

This issue needs in depth discussion among legal practitioners and researchers. The guideline does not specifically mention the injection of seed money into the PRF, thus leaving some loopholes as well as some potential or possibility of its adoption in practice.

c) Cross Subsidisation between the PRF Funds

Another aspect that should be considered prior to adoption of the proposal is the possibility of cross subsidisation of the funds. The possibility of transferring some amount from one PRF (with surplus) to another PRF (with deficit) can help to sustain the health of all PRF. However, TOF prohibits such practices. This reduces the alternative to ensure that all PRF are in a healthy financial position. TOF in S. 9.10 b) any surplus of such funds is utilized only for the respective PRF(s) or additional PRF(s). Any cross-subsidisation of surplus between these funds is not allowed.

5.3 Summary of Product Proposal

Based on our findings, inclusive of cross analysis with NHMS data as well as perceptions of respondents, we would like to propose the product on Diabetes as follows:

- a) Type and Model
 - i. Medical

This product is specifically made for medical related purpose i.e. people with diabetes and people at risk of having diabetes.

ii. Individual

This product targets individuals, not groups. It can be subscribed to by an individual as the beneficiary, or separately between payor and person covered (permissible Takaful interest).

iii. Without Dripping

This product is proposed to be non-ILT without Participants Investment Fund (PIF) i.e., non-cash.

iv. Basic

We would like to propose this product as a basic product, but also as a possible rider for other products such as FWD Kasih, with some modification to the death benefit.

b) Benefit

- i. Death
- ii. Pancreatic Failure or Oral Hypo-Glycaemic Agent (OHA) Failure
- iii. Acute Complication of Diabetes (Hypo-Glycaemia or Hyper-Glycaemia)
- iv. Amputation
- v. Blindness due to Diabetes Retinopathy

We propose this product to be limited to sum covered. The amount disbursed for each of the benefits will be limited to total sum covered. For items ii to v, we propose to put a threshold from sum covered. The benefit for item ii may be disbursed in form of cash or items (injection needle).

- c) Parameters/Eligibility
 - i. Age 18 years to 55 years (entry)
 - ii. Income of less than RM5000 per month
 - iii. Age 65 years (maximum coverage)
 - iv. Sum covered from RM10,000 to RM40,000 (4 phases)
 - v. Special Conditions
 - vi. Type 2 Diabetes
 - vii. Hba1c equal to or less than 8
- viii. BMI equal to or less than 31
- ix. Not on Insulin and never been awarded because of Diabetes.
- d) Contribution

- i. Regular (monthly)
- ii. Level
- iii. Race
- iv. Smoker/Non-Smoker

Items i and ii are based on the perception in our findings. Item iii is evidenced by NHMS data, which reflects that certain race have significant risk compared with other races. Item iv is based on the risk associated with significant medical complication.

e) Underwriting

We propose this product to be a simplified underwriting, other than full underwriting which is limited and complicated to access. A simple health declaration is required to participate in this product.

f) Channel (Distribution)

- i. Online
- ii. Affiliate
- iii. Cash Deposit Machine (CDM)

We propose that FWD take advantage of the strength of technology to promote this product through online channels. However, to cater to the rural segment, or the elderly who are not online-friendly, we propose the Cash Deposit Machine (CDM) payment method as well.

g) Re-Takaful

We believe that this product's risk is similar or even higher than FWD Kasih, which is difficult to seek re-Takaful. We would like to propose seed money to the risk fund, whether from shareholders, or any contribution outside the entity. However, it has potential shariah, legal and operational issues.

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APPENDICES

Appendix 1: Descriptive Analysis for People at Risk of Having Diabetes

Item	Category	Frequency (n)	Percentage (%)
	Selangor	246	28.6
	W. P. Kuala Lumpur	34	4.0
	W. P. Putrajaya	4	0.5
	Negeri Sembilan	51	5.9
	Melaka	25	2.9
	Johor	122	14.2
	Perak	41	4.8
State	Kedah	18	2.1
	Pulau Pinang	9	1.0
	Perlis	22	2.6
	Pahang	28	3.3
	Terengganu	53	6.2
	Kelantan	65	7.6
	Sabah	122	14.2
	Sarawak	20	2.3
	Below 20–year-old	17	2.0
	21 - 25-year-old	352	40.9
	26 - 30-year-old	156	18.1
	31 - 35-year-old	57	6.6
	36 - 40-year-old	61	7.1
	41 - 45-year-old	37	4.3
Age	46-50-year-old	73	8.5
6	51 - 55-year-old	50	5.8
	56 – 60-year-old	36	4.2
	61 - 65-year-old	9	1.0
	66 – 70-year-old	4	0.5
	71 - 75-year-old	4	0.5
	75 and above	4	0.5
	Male	316	36.7
Gender	Female	544	63.3
	Malay	724	84.2
	Chinese	8	0.9
	India	4	0.5
Ethnic	Sabah Native	84	9.8
	Sarawak Native	10	1.2
	Others	30	3.5
	Muslim	844	98.1
	Buddhist	4	0.5
Religion	Christian	10	1.2
	Others	2	0.2
	Single	485	56.4
Marital Status	Married	356	41.4

Table 3.1: Demographic profile of people at risk of having diabetes

	Divorce	12	1.4
	Widow/Widower	7	0.8
	No	515	59.9
Number of	1-5 persons	297	34.5
Children	6-10 persons	46	5.3
	11 - 15 persons	2	0.2
	No	506	58.8
Other Dependants	1-5 persons	346	40.2
(e.g. parent, grandparent)	6-10 persons	8	0.9
grandparonty	Urban	439	51.0
	Sub-Urban	229	26.6
	Rural	192	22.3
	No Formal Education	5	0.6
Highest	Primary School	12	1.4
Academic	Secondary School	111	12.9
Qualification	Diploma/Certificate	159	18.5
	Degree & above	573	66.6
	Private sector employee	312	36.3
	Government servant	199	23.1
	Housewife	46	5.3
	Entrepreneur/Self-employed	100	11.6
	Pensioner/Retired	10	1.2
Occupation	Student	156	18.1
	Not working	31	3.6
	Others	51	5.0
	(Athlete: farmer: shop	6	0.7
	(Aunete, farmer, shop	0	0.7
	Class 1: You are involved		
	with indoor work that is less	717	83 /
	risky	/1/	05.4
	Class 2. You are involved		
Which	with outdoor work or are	57	6.6
Describes Your	riskier than Class 1	01	0.0
Job	Class 3: You are involved		
000	with risky sub-machine	66	7.7
	Class 4: You are involved		
	with dangerous work and	20	23
	heavy machinery	20	2.5
	Permanent	531	61 7
Occupational	Part-Time	129	15.0
Status	Contract	200	23.3
Monthly	$\frac{1}{1} = \frac{1}{1} = \frac{1}$	587	<u> </u>
Household	RM4 850 - RM10 050	18/	21 /
Income	RM10.960 = RW10,737	80 80	21. 4 10.3
Monthly Cross		687	70.2
Income	$R_{10100} = R_{1014,049}$	002 1 47	17.3 17 1
meonie	KIVI4,0JU – KIVI10,9J9	14/	1/.1

	RM10,960 and above	31	3.6
Receive Welfare, Healthcare or Education Assistance	Yes (Source: family; Baitulmal; JPA; PTPTN; Jabatan Agama; SOCSO; PERKESO; BSH & etc) (Amount: RM50 – RM150,000)	86	10.0
	No	774	90.0
Total monthly	RM0.00 - RM4,849	807	93.8
expenses	RM4,850 – RM10,959	53	6.2

Item	Category	Frequency (n)	Percent (%)
	1 – 35 Kg	3	0.3
	36 - 50 Kg	168	19.5
Weight	51 – 75 Kg	500	58.1
	76 - 90 Kg	139	16.2
	More than 91 Kg	50	5.8
	100 - 120 cm	5	0.6
	121 - 140 cm	4	0.5
Height	141 - 160 cm	471	54.8
	161 - 180 cm	368	42.8
	More than 181 cm	12	1.4
Dody	Underweight (< 18.5)	52	6.0
Maguramant	Desirable weight (18.5 –	380	44.2
Index (BMI)	24.9)	380	44.2
IIIdex (DIVII)	Overweight (25.0 – 30.0)	269	31.3
	Obese (> 30.1)	159	18.5
	Less than 31 inches	166	19.3
	31 - 34 inches	362	42.1
Waist Size	35 – 39 inches	217	25.2
	40-45 inches	92	10.7
	More than 46 inches	23	2.7
Active	Yes	431	50.1
physically 30	105	101	50.1
minutes daily	No	429	49.9
Frequency of			
fruit and	Daily	528	61.4
vegetable			
consumption	Not daily	332	38.6
•••••••			
Regular intake	Yes	65	7.6
of hypertension			
medication	No	795	92.4
Have high	Yes	101	11.7
blood sugar			
reading	No	759	88.3
Father, mother,			
siblings,	Yes	475	55.2
children,			
grandfather,			
grandmother or	No	385	44.8
close relatives	110	505	0
have diabetes			
Smoking status	Non-smoker	801	93.1
Smoking status	Smoking	59	6.9
Perception	Low	377	43.8

Table 3.17: Risk and diabetes profile

(Risk level to	Moderate	352	40.9
get diabetes)	High	131	15.2

Item	Category	Frequer	icy (n)	Percent (%)	
	Death	283	860	32.9	100%
	Accident	254	860	29.5	100%
True of quotosticg alon	Family	142	860	16.5	100%
i ype of protection plan	Health	347	860	40.3	100%
Jonied	Others (Savings; Education)	186	860	21.6	100%
	No	313	860	36.4	100%
	Yes	522	2	6	0.7
Interest in getting takaful protection plan for diabetes	No	96	i	11.2	
	Not Sure	242	2	2	8.1
	Sustainable food counselling	470	860	54.7	100%
	Guidance structure exercise	139	860	16.2	100%
	Regular sugar checks	168	860	19.5	100%
diagnosed with diabetes	Blood pressure device	130	860	15.5	100%
	Others (Follow up on cost treatment; Exercise equipment)	316	860	36.7	100%
	None	27	860	3.1	100%
	Very Good	204	4	2	3.7
	Good	54	2	6	3.0
Health status	Not Sure	94		10.9	
	Poor	19		2.2	
	Very Poor	1		0.1	
	RM0.00 –	34:	5	4	0.1
	KM50.00				
	RM30.01 - DM100.00	29:	5	3	4.3
Willingness to pay in a	KW100.00				
month to get protection	PM150.00 =	110	5	1	3.5
plan for diabetes treatment	RM150.00				
-	RM200.01 - RM200.00	51		5	5.9
	More than RM200.00	40)	Ζ	1.7
	Not Sure	13		1	.5

Table 3.3: Intention and need for takaful coverage

	Monthly	411		4	7.8	
Preferred frequency of	Quarterly	145		16.9		
contribution	Bi-annually	36		4.2		
	Annually	80		9	0.3	
	Unsure	188		2	1.9	
	Post Office	70	860	8.1	100%	
	Bank	330	860	38.4	100%	
Method preferred for	Online	640	860	74.4	100%	
PAYMENT	Agent	151	860	17.6	100%	
	Cooperative	13	860	1.5	100%	
	Others (Child	21	860	24	100%	
	helps to manage)	21	000	2.4	100 /0	
	Post Office	66	860	7.7	100%	
	Bank	341	860	39.7	100%	
Method preferred for	Online	564	860	65.6	100%	
CLAIM	Agent	273	860	31.7	100%	
	Cooperative	25	860	2.9	100%	
	Others (Company;	106	860	123	100%	
	Did not want)	100	000	12.5	10070	
	Drugs	698	860	81.2	100%	
	Counselling and	542	860	63.0	100%	
Type of benefits sought if	service advisor		0.00		1000/0	
getting diabetes treatment	Shoes	82	860	9.5	100%	
within a year	Glucose meter	480	860	55.8	100%	
	Support group	139	860	16.2	100%	
	BP Set	340	860	39.5	100%	
	Less than	93		1	0.8	
	RM10,000					
	RM10,001 –	130		15.1		
	RM20,000					
Compensation to be	RM20,001 - PM20,000	91		10.6		
received by the beneficiary	DM20.001					
in case of death	RM40.000 =	75		8	8.7	
	RM/0.001					
	RM50,001 =	92		1	0.7	
	More than					
	RM50.001	379		4	4.1	
	Make own	1.50		_		
	decision	453		5	2.7	
Decision to get	Discuss with	150		1	0.4	
takaful/insurance plan, I	parents/siblings	158		1	8.4	
will	Discuss with	222		2	7.0	
	spouse	232		Z	7.0	
	Discuss with	17			2.0	
	colleagues	1/		2	2.0	
Recommendation related to						
takaful plan for diabetes						

Item	Category	Frequence	Frequency (n)		Percentage (%)	
Have protection plan	Yes	85		17.0		
	No	415		83	3.0	
	Death/Life	109	500	21.8	100%	
	Accident	53	500	10.6	100%	
Types of protection plan	Family	20	500	4.0	100%	
	Health	58	500	11.6	100%	
	Did Not Have	287	500	57.4	100%	
Interest in getting a	Yes	273		54	1.6	
takaful protection plan for diabetics	No	89		17	7.8	
	Not Sure	138		27	7.6	
	Sustainable food counselling	307	500	61.4	100%	
Type of treatment benefits	Guidance structure exercise	205	500	41.0	100%	
	Regular sugar checks	348	500	69.6	100%	
	Others	31	500	6.2	100%	
	Very Good	54		1(10.8	
	Good	391	391		78.2	
Current health status	Not Sure	29		5	.8	
(Perception)	Poor	25		5	.0	
	Very Poor	1		0.2		
	RM0.00 -	/10	410		2 8	
	RM50.00	417		05.0		
	RM50.01 –	54		10.8		
Willing to contribute	RM100.00	54		10.8		
from monthly income	RM100.01 –	13		26		
surplus to take a diabetes	RM150.00	10		2.0		
treatment plan	RM150.01 –	9		1	.8	
	RM200.00					
	More than	5		1	.0	
	Monthly	356		71	2	
	Fvery 3 months	58		11	6	
Frequency of payment	Every 5 months	20		5	8	
contributions	Vearly	2) 50		10	.0	
	Not Sure	50 7	30 7		4	
	Post Office	209	500	41.8	100%	
Most suitable ways to	Bank	388	500	77.6	100%	
make a PAYMENT	Online	211	500	42.2	100%	
	Agent	47	500	9.4	100%	

 Table 3.6:
 Tendency and need for takaful coverage

Others 21 500 4.2 10 Post Office 203 500 40.6 10 Bank 406 500 81.2 10 Most appropriate ways to make a CLAIM Online 197 500 39.4 10 Connernative 2 500 11.8 10	00% 00% 00% 00% 00% 00%	
Post Office 203 500 40.6 10 Bank 406 500 81.2 10 Most appropriate ways to make a CLAIM Online 197 500 39.4 10 Connerative 2 500 11.8 10	.00% .00% .00% .00% .00% .00%	
Bank 406 500 81.2 10 Most appropriate ways to make a CLAIM Online 197 500 39.4 10 Connerative 2 500 11.8 10	.00% .00% .00% .00% .00%	
Most appropriate ways to make a CLAIMOnline19750039.410Connerative5950011.810Connerative2500610	.00% .00% .00% .00%	
make a CLAIM Agent 59 500 11.8 10	.00% .00% .00%	
$C_{\text{concentive}} = 2 500 \epsilon 10$.00% .00%	
	.00%	
Others 18 500 3.6 10		
Less than RM100,000 171 34.2		
RM100,001 – RM200,000 157 31.4		
Total amount of compensation to beRM200,001 - RM300.000367.2		
beneficiary in case of RM300,001 – 27 5.4		
death RM400,001 – RM500,000 12 2.4		
More than RM500,001 97 19.4	19.4	
Drugs 407 500 81.4 10	.00%	
Counselling and 244 500 48.8 10 Type of benefits sought if Service advisor	.00%	
getting diabetes treatment Shoes 99 500 19.8 10	.00%	
within a year Glucose meter 336 500 67.2 10	.00%	
Supportive group 137 500 27.4 10	.00%	
BP Set 267 500 53.4 10	.00%	
Less than 251 50.2		
RM100,000 251 50.2	50.2	
RM100,001 – RM200,000 130 26.0	26.0	
Compensation sought if $\frac{\text{RM200,001} - 24}{\text{RM300,000}}$ 24 4.8	4.8	
getting diabetes treatment within a year RM300,001 – 13 2.6	2.6	
RM400,001 – RM500,000 6 1.2	1.2	
More than RM500,001 76 15.2	15.2	
Make own 197 500 39.4 10 decision	100%	
Discuss with If want to decide to take a parents/siblings 102 500 20.4 10	100%	
takaful/insurance/banking Discuss with plan, I will 260 500 52.0 10	100%	
Discuss with colleagues 4 500 .8 10	100%	
Others 39 500 7.8 10	100%	

Views and suggestions regarding the protection plan for diabetics

Appendix 2: Descriptive Analysis of People with Diabetes

Item	Category	Frequency (n)	Percentage (%)
	Selangor	61	12.2
	W. P. Kuala Lumpur	105	21.0
	Melaka	1	.2
	Johor	82	16.4
	Perak	2	.4
State	Kedah	88	17.6
	Pulau Pinang	39	7.8
	Pahang	80	16.0
	Terengganu	1	0.2
	Kelantan	1	0.2
	Sarawak	40	8.0
	Below 20-year-old	1	0.2
	21 - 25-year-old	4	0.8
	26 – 30-year-old	6	1.2
	31 – 35-year-old	20	4.0
	36 – 40-year-old	43	8.6
	41 – 45-year-old	35	7.0
Age	46 – 50-year-old	55	11.0
	51 – 55-year-old	46	9.2
	56 – 60-year-old	97	19.4
	61 – 65-year-old	77	15.4
	66 – 70-year-old	64	12.8
	71 – 75-year-old	34	6.8
	75 and above	18	3.6
Gender	Male	194	38.8
	Female	306	61.2
	Malay	388	77.6
	Chinese	57	11.4
	Indian	27	5.4
Ethnicity	Orang Asli	3	0.6
	Sabah Native	1	0.2
	Sarawak Native	22	4.4
	Others	2	0.4
	Muslim	395	79.0
	Buddhist	48	9.6
Religion	Hindu	19	3.8
item Bron	Christian	33	6.6
	Traditional	2	0.4
	Others	3	0.6
Marital status	Single	27	5.4

Table 3.4: Demographic profile of people with diabetes

	Married	399	79.8
	Divorce	15	3.0
	Widow/Widower	59	11.8
	No	106	21.2
Number of children	1–5 persons	350	70.0
	6–10 persons	44	8.8
Other dependents	No	374	74.8
(e.g.: parents,	1–5 persons	124	24.8
grandparents)	6–10 persons	2	0.4
Desidential	Urban	201	40.2
Residential	Rural	246	49.2
area	Sub-Urban	53	10.6
	No Formal Education	29	5.8
	Primary School	116	23.2
Highest	Secondary School	278	55.6
academic	Diploma/Certificate	48	9.6
qualification	Degree & Above	25	5.0
	Others	4	.8
	Private Sector Employee	74	14.8
	Housewife	77	15.4
	Pensioner/Retired	142	28.4
	Not Working	59	11.8
Occupation	Government Servant	59	11.0
occupation	Entrepreneur/Self-	57	11.0
	Employed	13	2.6
	Student	44	88
	Others	32	6.0 6.4
	Class 1: You are involved	52	0.7
	with the work in the building that is less risky	246	49.2
Which Describes Your Job/daily	with the work outside of the office or are riskier than Class 1	203	40.6
activities	Class 3: You are involved with risky sub-machine	45	9.0
	class 4: You are involved with dangerous work and heavy machinery	6	1.2
	Permanent	216	43.2
Occupational	Part-Time	15	3.0
status	Contract	24	4.8
	Not Applicable	245	49.0
Monthly	RM0.00-RM4,849	443	88.6
			Page 157

household	RM4,850–RM10,959	53	10.6
income	RM10,960 and above	4	.8
Monthly more	RM0.00-RM4,849	461	92.2
income	RM4,850–RM10,959	38	7.6
liicoine	RM10,960 and above	1	.2
Receive	Yes Source: BDN: Zakat:	75	15.0
Healthcare or	Baitulmal; etc.	15	15.0
Education Assistance	No	425	85.0
Total monthly	RM0.00-RM4,849	490	98.0
expenses	RM4,850–RM10,959	10	2.0

Table 3.5: Risk and diabetes profiles

Item	Category Frequency (n)		ncy (n)	Percentage (%)	
Duration of	1–3 years	128		25.6	
Duration of	4–6 years	88		17.6	
diabatas	7–9 years	55		11.	0
diabetes	More than 10 years	229	9	45.	8
	Government Health Clinic	482	500	96.4	100%
TT11 4	Private Hospital	8	500	1.6	100%
Usual place to	Government Hospital	42	500	8.4	100%
treatment for	There is no regular follow-	1	500	0.2	100%
diabetes	up treatment	5	500	1.0	1000/
	Private Clinic	5	500	1.0	
	Others	3	500	0.6	
	Ural medication	403	500	92.6	
The second se	Homeopathy drug	-	500	-	
Type of	Insulin injection	215	500	43.0	100%
diabetes treatment	Did not take any drug	2	500	4	100%
	Traditional medication	11	500	2.2	100%
	Supplement besides than	25	500	5.0	100%
	No complication	269	500	53.8	100%
	Potinonathy/ava lasar	207	500	55.0	100 /0
	treatment	57	500	11.4	100%
	Erectile Dysfunction	9	500	1.8	100%
	Numbness of hand and feet	133	500	26.6	100%
	Protein in the urine	61	500	12.2	100%
Diabetes	Wound/leg ulcer	10	500	2.0	100%
complication	Surgery to remove parts of				
	the body such as the thumb,	8	500	1.6	100%
	toes, etc. (amputation)				
	Skin problem (Example:	10	500	28	1000/
	often get fungal infections)	17	300	5.0	10070
	Kidney problems	28	500	5.6	100%
	Others	20	500	4.0	100%

	Blood pressure	388	500	77.6	100%	
	Cholesterol	348	500	69.6	100%	
	Heart attack	28	500	5.6	100%	
In addition to	Stroke	11	500	2.2	100%	
diabetes, also	Kidney failure	9	500	1.8	100%	
suffers from	Obesity	81	500	16.2	100%	
	Blockage of leg blood	1	500	0.2	1000/	
	vessels	1	500	0.2	100%	
	Others	55	500	11.0	100%	
Monitoring	Yes	294	1	58.	.8	
sugar reading at home	No	200	5	41.	.2	
	Own money	310)	62.0		
Normal way	Get help from other sources					
paying for	such as zakat, PERKESO	7		1.4		
diabetes	and so on					
treatment	Government charities	115	5	23.0		
	Not related	68		13.6		
Reason for	Cheaper	388	500	77.6	100%	
seeking	Easy	374	500	74.8	100%	
treatment at	Near to home	383	500	76.6	100%	
government	More confident	215	500	43.0	100%	
and private	Not related	8	500	1.6	100%	
clinics/hospital s	Others	5	500	1.0	100%	
Total	1–3 times	160)	32.	.0	
frequency of	4–6 times	308	3	61.	.6	
clinic/hospital	7–9 times	10		2.0	0	
for diabetes						
treatment in a	More than 10 times	22		4.4	4	
year						
Smoking status	Non-Smoker	458	3	91.6		
Smoking status	Smoker	42		8.4		

Appendix 3: Crosstabulation Analysis of People at Risk of Having Diabetes with Interest in Getting a Takaful Protection Plan for Diabetics

			Tetel		
Housenoid	Income	Yes	No	Not Sure	Total
	n	333	65	189	587
RM0.00 –	%	56.7	11.1	32.2	100.0
RM4,849	% of Total	38.7	7.6	22.0	68.3
RM4,850 – RM10,959	n	131	20	33	184
	%	71.2	10.9	17.9	100.0
	% of Total	15.2	2.3	3.8	21.4
	n	58	11	20	89
RM10,960	%	65.2	12.4	22.5	100.0
and above	% of Total	6.7	1.3	2.3	10.3
Total	n	522	96	242	860
	% of Total	60.7	11.2	28.1	100.0

Table 4. 1: Crosstabulation of respondents who are interested in getting a takaful protection plan for diabetics with income

Table 4. 2: Crosstabulation of respondents who are interested in getting a takaful protection plan for diabetics with occupation

Occupation		Yes	No	Not Sure	Total
	n	199	27	86	312
Drivete sector employee	%	63.8	8.7	27.6	100.0
r rivate sector employee	% of Total	23.1	3.1	10.0	36.3
	n	126	22	51	199
Covernment convent	%	63.3	11.1	25.6	100.0
Government servant	% of Total	14.7	2.6	5.9	23.1
	n	26	6	14	46
Hongowife	%	56.5	13.0	30.4	100.0
Housewife	% of Total	3.0	0.7	1.6	5.3
	n	60	9	31	100
Self-employed/	%	60.0	9.0	31.0	100.0
Entrepreneur	% of Total	7.0	1.0	3.6	11.6
	n	5	3	2	10
Pensioner/Retiree	%	50.0	30.0	20.0	100.0
	% of	0.6	0.3	0.2	1.2

	Total				
	n	88	21	47	156
Student	%	56.4	13.5	30.1	100.0
Student	% of Total	10.2	2.4	5.5	18.1
Not working	n	16	6	9	31
	%	51.6	19.4	29.0	100.0
	% of Total	1.9	0.7	1.0	3.6
	n	2	2	2	6
Others (Gardener,	%	33.3	33.3	33.3	100.0
shop assistant, athlete)	% of Total	0.2	0.2	0.2	0.7
Total	n	522	96	242	860
	% of Total	60.7	11.2	28.1	100.0

 Table 4. 3: Crosstabulation of interest in getting protection with ethnicity

Ethnic			Total		
		Yes	No	Not Sure	Total
	n	444	87	193	724
Malay	%	61.3	12.0	26.7	100.0
	% of Total	51.6	10.1	22.4	84.2
	n	3	2	3	8
Chinese	%	37.5	25.0	37.5	100.0
	% of Total	0.3	0.2	0.3	0.9
	n	4	-	-	4
Indian	%	100.0	-	-	100.0
	% of Total	0.5	-	-	0.5
Sahah	n	45	6	33	84
Saban	%	53.6	7.1	39.3	100.0
Inative	% of Total	5.2	0.7	3.8	9.8
Como la	n	6	1	3	10
Sarawak	%	60.0	10.0	30.0	100.0
Inative	% of Total	0.7	0.1	0.3	1.2
	n	20	-	10	30
Others	%	66.7	_	33.3	100.0
	% of Total	2.3	-	1.2	3.5
Total	n	522	96	242	860
Total	% of Total	60.7	11.2	28.1	100.0

Religion			T - 4 - 1		
		Yes No Not Sure		Total	
	n	514	92	238	844
Muslim	%	60.9	10.9	28.2	100.0
	% of Total	59.8	10.7	27.7	98.1
	n	2	2	-	4
Buddhist	%	50.0	50.0	-	100.0
	% of Total	0.2	0.2	-	0.5
	n	4	2	4	10
Christian	%	40.0	20.0	40.0	100.0
	% of Total	0.5	0.2	0.5	1.2
	n	2	-	-	2
Others	%	100.0	-	-	100.0
	% of Total	0.2	-	-	0.2
Total	n	522	96	242	860
Total	% of Total	60.7	11.2	28.1	100.0

Table 4. 4: Crosstabulation of interest in getting protection with religion

Table 4. 5: Crosstabulation of interest in getting protection with marital status

Marital Status			Tatal		
		Yes	No	Not Sure	Total
	n	299	45	141	485
Single	%	61.6	9.3	29.1	100.0
	% of Total	34.8	5.2	16.4	56.4
Married	n	214	46	96	356
	%	60.1	12.9	27.0	100.0
	% of Total	24.9	5.3	11.2	41.4
	n	6	3	3	12
Divorced	%	50.0	25.0	25.0	100.0
	% of Total	0.7	0.3	0.3	1.4
	n	3	2	2	7
Widowed/Widower	%	42.9	28.6	28.6	100.0
	% of Total	0.3	0.2	0.2	0.8
Total	n	522	96	242	860
Iotal	% of Total	60.7	11.2	28.1	100.0

Residential_Area			Tetel		
		Yes	Not	Not Sure	Totai
	n	280	57	102	439
Urban	%	63.8	13.0	23.2	100.0
	% of Total	32.6	6.6	11.9	51.0
Sub-Urban	n	134	20	75	229
	%	58.5	8.7	32.8	100.0
	% of Total	15.6	2.3	8.7	26.6
	n	108	19	65	192
Rural	%	56.3	9.9	33.9	100.0
	% of Total	12.6	2.2	7.6	22.3
Total	n	522	96	242	860
Total	% of Total	60.7%	11.2%	28.1	100.0

Table 4. 6: Crosstabulation of interest in getting protection with residential area

Table 4. 7: Crosstabulation of interest in getting protection with education level

E la setter			T-4-1		
Educatio	n	Yes	No	Not Sure	Total
No formal	n	2	3	-	5
No formal	%	40.0	60.0	-	100.0
education	% of Total	0.2	0.3	-	0.6
	n	5	2	5	12
Primary school	%	41.7	16.7	41.7	100.0
	% of Total	0.6	0.2	0.6	1.4
Secondary school	n	56	15	40	111
	%	50.5	13.5	36.0	100.0
	% of Total	6.5	1.7	4.7	12.9
	n	85	19	55	159
Diploma/Certificate	%	53.5	11.9	34.6	100.0
_	% of Total	9.9	2.2	6.4	18.5
	n	374	57	142	573
Degree and above	%	65.3	9.9	24.8	100.0
	% of Total	43.5	6.6	16.5	66.6
Tatal	n	522	96	242	860
Iotal	% of Total	60.7	11.2	28.1	100.0

Occurrational Disk			Tatal		
Occupational	KISK	Yes	No	Not Sure	Totai
Class 1: You are	n	437	76	204	717
involved with the	%	60.9	10.6	28.5	100.0
work in the building that is less risky	% of Total	50.8	8.8	23.7	83.4
Class 2: You are	n	39	5	13	57
involved with the	%	68.4	8.8	22.8	100.0
work outside of the office or are riskier than Class 1	% of Total	4.5	0.6	1.5	6.6
Close 2. Ven one	n	33	14	19	66
class 5: 1 ou are	%	50.0	21.2	28.8	100.0
involved with risky sub-machine	% of Total	3.8	1.6	2.2	7.7
Class 4: You are	n	13	1	6	20
involved with	%	65.0	5.0	30.0	100.0
dangerous work and heavy machinery	% of Total	1.5	0.1	0.7	2.3
	Count	522	96	242	860
Total	% of Total	60.7	11.2	28.1	100.0

Table 4. 8: Crosstabulation of interest in getting protection with occupational risk
Appendix 4: Crosstabulation Analysis of People at Risk of Having Diabetes with Willingness to Pay (WTP)

				W	TP			
Household	Income	RM0.00 _ RM50.00	RM50.01 _ RM100.00	RM100.01 _ RM150.00	RM150.01 _ RM200.00	More than RM200.00	Not Sure	Total
	n	271	192	64	28	22	10	587
RM0.00 –	%	46.2	32.7	10.9	4.8	3.7	1.7	100.0
KM4,849	% of Total	31.5	22.3	7.4	3.3	2.6	1.2	68.3
DM4 050	n	48	75	37	15	8	1	184
KM4,850 –	%	26.1	40.8	20.1	8.2	4.3	0.5	100.0
RM10,959	% of Total	5.6	8.7	4.3	1.7	0.9	0.1	21.4
	n	26	28	15	8	10	2	89
RM10,960	%	29.2	31.5	16.9	9.0	11.2	2.2	100.0
and above	% of Total	3.0	3.3	1.7	0.9	1.2	0.2	10.3
	n	345	295	116	51	40	13	860
Total	% of Total	40.1	34.3	13.5	5.9	4.7	1.5	100.0

Table 4. 17: Crosstabulation of willingness to pay with income

 Table 4. 18: Crosstabulation of willingness to pay with occupation

				WT	P			
Occupational		RM0.00 - RM50.00	RM50.01 - RM100.00	RM100.01 - RM150.00	RM150.01 - RM200.00	More than RM200.00	Not Sure	Total
	n	121	110	41	20	16	4	312
Private sector employee	%	38.8	35.3	13.1	6.4	5.1	1.3	100.0
	% of Total	14.1	12.8	4.8	2.3	1.9	0.5	36.3
	n	79	63	30	13	12	2	199
Covernment convent	%	39.7	31.7	15.1	6.5	6.0	1.0	100.0
Government servant	% of Total	9.2	7.3	3.5	1.5	1.4	0.2	23.1
	n	23	10	8	3	2	-	46
Housowiyos	%	50.0	21.7	17.4	6.5	4.3	-	100.0
Housewives	% of Total	2.7	1.2	0.9	0.3	0.2	-	5.3
	n	40	38	11	5	4	2	100
Self-	%	40.0	38.0	11.0	5.0	4.0	2.0	100.0
employed/Entrepreneur	% of Total	4.7	4.4	1.3	0.6	0.5	0.2	11.6
	n	7	2	-	1	-	-	10
Pansionar/Ratira	%	70.0	20.0	-	10.0	-	-	100.0
Pensioner/Retire	% of Total	0.8	0.2	-	0.1	-	-	1.2
	n	60	59	20	8	4	5	156
Student	%	38.5	37.8	12.8	5.1	2.6	3.2	100.0
	% of	7.0	6.9	2.3	0.9	0.5	0.6	18.1

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	Total							
	n	11	12	5	1	2	-	31
Not working	%	35.5	38.7	16.1	3.2	6.5	-	100.0
	% of Total	1.3	1.4	0.6	0.1	0.2	-	3.6
	n	4	1	1	-	-	-	6
Others (Gardener; shop	%	66.7	16.7	16.7	-	-	-	100.0
assistant; athlete)	% of Total	0.5	0.1	0.1	-	-	-	0
	n	345	295	116	51	40	13	860
Total	% of Total	40.1	34.3	13.5	5.9	4.7	1.5	100.0

 Table 4. 19: Crosstabulation of willingness to pay with ethnicity

				W	ТР			
Eth	nic	RM0.00	RM50.01	RM100.01	RM150.01	More		Total
Etin	nc	-	-	-	-	than	Not Sure	Total
		RM50.00	RM100.00	RM150.00	RM200.00	RM200.00		
	n	287	242	104	45	33	13	724
Moley	%	39.6	33.4	14.4	6.2	4.6	1.8	100.0
wiałay	% of Total	33.4	28.1	12.1	5.2	3.8	1.5	84.2
	n	2	5	-	1	-	-	8
Chinaga	%	25.0	62.5	-	12.5	-	-	100.0
Chinese	% of Total	0.2	0.6	-	0.1	-	-	0.9
	n	2	-	-	-	2	-	4
Indian	%	50.0	-	-	-	50.0	-	100.0
Indian	% of Total	0.2	-	-	-	0.2	-	0.5
	n	35	30	10	4	5	-	84
Sabah	%	41.7	35.7	11.9	4.8	6.0	-	100.0
Native	% of Total	4.1	3.5	1.2	0.5	0.6	-	9.8
	n	5	4	-	1	-	-	10
Sarawak	%	50.0	40.0	-	10.0	-	-	100.0
Native	% of Total	0.6	0.5	-	0.1	-	-	1.2
	n	14	14	2	-	-	-	30
Others	%	46.7	46.7	6.7	-	-	-	100.0
Others	% of Total	1.6	1.6	0.2	-	-	-	3.5
	n	345	295	116	51	40	13	860
Total	% of Total	40.1	34.3	13.5	5.9	4.7	1.5	100.0

Table 4. 20: Crosstabulation of willingness to pay with religion

				W	ГР			
Religion		RM0.00	RM50.01	RM100.01	RM150.01	More		Total
		-	-	-	-	than	Not Sure	Total
		RM50.00	RM100.00	RM150.00	RM200.00	RM200.00		
	n	336	292	116	50	37	13	844
Muelim	%	39.8	34.6	13.7	5.9	4.4	1.5	100.0
wiusiiiii	% of	20.1	24.0	12.5	5 9	12	15	08.1
	Total	39.1	54.0	15.5	5.8	4.5	1.5	90.1
	n	-	3	-	1	-	-	4
Buddhist	%	-	75.0	-	25.0	-	-	100.0
	% of	-	0.3	_	0.1	_	-	0.5

	Total																									
	n	9	-	-	-	1	-	10																		
Christian	%	90.0	-	-	-	10.0	-	100.0																		
	% of	1.0				0.1		1.2																		
	Total	1.0	-	-	-	0.1	-	1.4																		
	n	-	-	-	-	2	-	2																		
Othors	%	-	-	-	-	100.0	-	100.0																		
Others	% of					0.2		0.2																		
	Total	-	-	-	-	0.2	-	0.2																		
	n	345	295	116	51	40	13	860																		
Total	% of	40.1	24.2	12.5	5.0	47	1.5	100.0																		
	Total	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1	54.5	13.5	5.9	4./	1.5

 Table 4. 21: Crosstabulation of willingness to pay with marital status

				WI	P			
Marital Status	5	RM0.00	RM50.01 -	RM100.01 -	RM150.01 -	More than	Not	Total
		RM50.00	RM100.00	RM150.00	RM200.00	RM200.00	Sure	
	n	186	174	67	25	24	9	485
Single	%	38.4	35.9	13.8	5.2	4.9	1.9	100.0
Single	% of Total	21.6	20.2	7.8	2.9	2.8	1.0	56.4
	n	144	121	47	25	16	3	356
Monnied	%	40.4	34.0	13.2	7.0	4.5	0.8	100.0
Marrieu	% of Total	16.7	14.1	5.5	2.9	1.9	0.3	41.4
	n	8	-	2	1	-	1	12
Divorced	%	66.7	-	16.7	8.3	-	8.3	100.0
Divorceu	% of Total	0.9	-	0.2	0.1	-	0.1	1.4
	n	7	-	-	-	-	-	7
Widowed/Widower	%	100.0	-	-	-	-	-	100.0
widowed/widowei	% of Total	0.8	-	-	-	-	-	0.8
Total	n	345	295	116	51	40	13	860
10(21	% of Total	40.1	34.3	13.5	5.9	4.7	1.5	100.0

 Table 4. 22: Crosstabulation of willingness to pay with residential area

				W	ГР			
Residential Area		RM0.00 _ RM50.00	RM50.01 _ RM100.00	RM100.01 _ RM150.00	RM150.01 _ RM200.00	More than RM200.00	Not Sure	Total
	n	173	137	68	27	25	9	439
Urban	%	39.4	31.2	15.5	6.2	5.7	2.1	100.0
	% of Total	20.1	15.9	7.9	3.1	2.9	1.0	51.0
	n	87	97	24	11	6	4	229
Sub-	%	38.0	42.4	10.5	4.8	2.6	1.7	100.0
Urban	% of Total	10.1	11.3	2.8	1.3	0.7	0.5	26.6
Rural	n	85	61	24	13	9	-	192
	%	44.3	31.8	12.5	6.8	4.7	-	100.0

	% of Total	9.9	7.1	2.8	1.5	1.0	-	22.3
	n	345	295	116	51	40	13	860
Total	% of Total	40.1	34.3	13.5	5.9	4.7	1.5	100.0

 Table 4. 23: Crosstabulation of willingness to pay with education level

				WI	Γ P			
Education		RM0.00 - RM50.00	RM50.01 - RM100.00	RM100.01 - RM150.00	RM150.01 - RM200.00	More than RM200.00	Not Sure	Total
	n	4	-	-	1	-	-	5
No formal	%	80.0	-	-	20.0	-	-	100.0
education	% of Total	0.5	-	-	0.1	-	-	0.6
	n	11	1	-	-	-	-	12
Primary school	%	91.7	8.3	-	-	-	-	100.0
Primary school	% of Total	1.3	0.1	-	-	-	-	1.4
	n	61	32	10	3	3	2	111
Secondary school	%	55.0	28.8	9.0	2.7	2.7	1.8	100.0
Secondary school	% of Total	7.1	3.7	1.2	0.3	0.3	0.2	12.9
	n	77	56	12	9	3	2	159
Dirlama /Cartificata	%	48.4	35.2	7.5	5.7	1.9	1.3	100.0
Dipioma/Ceruiicate	% of Total	9.0	6.5	1.4	1.0	0.3	0.2	18.5
	n	192	206	94	38	34	9	573
Dograa and abova	%	33.5	36.0	16.4	6.6	5.9	1.6	100.0
Degree and above	% of Total	22.3	24.0	10.9	4.4	4.0	1.0	66.6
	n	345	295	116	51	40	13	860
Total	% of Total	40.1	34.3	13.5	5.9	4.7	1.5	100.0

 Table 4. 24: Crosstabulation of willingness to pay with occupational risk

				W	ТР			
Occupation	al Risk	RM0.00	RM50.01	RM100.01	RM150.01	More than	Not Sure	Total
		RM50.00	RM100.00	RM150.00	RM200.00	RM200.00	ittersuite	
Class 1:	n	291	245	97	39	36	9	717
You are	%	40.6	34.2	13.5	5.4	5.0	1.3	100.0
involved								
with the								
work in	% of	22.0	29.5	11.2	4.5	1.2	1.0	02.4
the	Total	33.8	28.5	11.3	4.5	4.2	1.0	83.4
that is less								
risky								
Class 2:	n	20	21	6	6	4	-	57
You are	%	35.1	36.8	10.5	10.5	7.0	-	100.0
involved								
with the								
work	% of							
outside of	Total	2.3	2.4	0.7	0.7	0.5	-	6.6
the office								
or are								
riskier								

than Class								
1								
Class 3:	n	29	19	10	5	-	3	66
You are	%	43.9	28.8	15.2	7.6	-	4.5	100.0
involved								
with risky	% of	2.4	2.2	1.2	0.6		0.2	77
sub-	Total	5.4	2.2	1.2	0.0	-	0.5	1.1
machine								
Class 4:	n	5	10	3	1	-	1	20
You are	%	25.0	50.0	15.0	5.0	-	5.0	100.0
involved	1							
with								
dangerous	% of	0.6	1.2	0.3	0.1		0.1	23
work and	Total	0.0	1.2	0.5	0.1	-	0.1	2.5
heavy								
machinery								
	n	345	295	116	51	40	13	860
Total	% of Total	40.1	34.3	13.5	5.9	4.7	1.5	100.0

Appendix 5: Crosstabulation Analysis of People with Diabetes on Period of Having Diabetes

Household Income			Suffering	g Diabetes		
		1–3 years	4–6 years	7–9 years	More than 10 years	Total
DM0.00	n	113	79	51	200	443
KW0.00 -	%	25.5	17.8	11.5	45.1	100.0
KIV14,049	% of Total	22.6	15.8	10.2	40.0	88.6
DN4 950	n	15	9	4	25	53
RM4,850 – RM10,959	%	28.3	17.0	7.5	47.2	100.0
	% of Total	3.0	1.8	0.8	5.0	10.6
DM10.000	n	-	-	-	4	4
KM10,900	%	-	-	-	100.0	100.0
and above	% of Total	-	-	-	0.8	0.8
Tetal	n	128	88	55	229	500
1 otal	% of Total	25.6	17.6	11.0	45.8	100.0

Table 4. 25: Crosstabulation of period of suffering from diabetes mellitus with level of household income

Fable 4. 26 : Crosstabulation of	period of suffering fr	rom diabetes mellitus	with occupation
	type		

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Occupation Type			Suffering	g Diabetes		
		1–3 years	4–6 years	7–9 years	More than 10 years	Total
	n	32	12	10	20	74
Private sector	%	43.2	16.2	13.5	27.0	100.0
employee	% of Total	6.4	2.4	2.0	4.0	14.8
	n	21	10	9	37	77
Housowife	%	27.3	13.0	11.7	48.1	100.0
Housewife	% of Total	4.2	2.0	1.8	7.4	15.4
	n	31	26	18	67	142
Pansionar/Ratiroo	%	21.8	18.3	12.7	47.2	100.0
Pensioner/Retiree	% of Total	6.2	5.2	3.6	13.4	28.4
Not Working	n	15	10	8	26	59
	%	25.4	16.9	13.6	44.1	100.0
	% of Total	3.0	2.0	1.6	5.2	11.8
	n	11	12	3	33	59
Covernment Servent	%	18.6	20.3	5.1	55.9	100.0
Government Servant	% of Total	2.2	2.4	0.6	6.6	11.8
	n	4	3	-	6	13
Entrepreneur/Self-	%	30.8	23.1	-	46.2	100.0
Employed	% of Total	0.8	0.6	-	1.2	2.6
	n	9	7	4	24	44
Student	%	20.5	15.9	9.1	54.5	100.0
Student	% of Total	1.8	1.4	0.8	4.8	8.8
	n	5	8	3	16	32
Others	%	15.6	25.0	9.4	50.0	100.0
	% of Total	1.0	1.6	0.6	3.2	6.4
Total	n	128	88	55	229	500
I Utal	% of	25.6	17.6	11.0	45.8	100.0

Total				
	Total			

			Suffering	Diabetes		
Eth	nnic	1–3 years	4–6 years	7–9 years	More than 10 years	Total
	n	109	70	43	166	388
Malay	%	28.1	18.0	11.1	42.8	100.0
	% of Total	21.8	14.0	8.6	33.2	77.6
	n	12	8	8	29	57
Chinese	%	21.1	14.0	14.0	50.9	100.0
	% of Total	2.4	1.6	1.6	5.8	11.4
	n	2	3	2	20	27
Indian	%	7.4	11.1	7.4	74.1	100.0
	% of Total	0.4	0.6	0.4	4.0	5.4
	n	1	2	-	-	3
Orang Asli	%	33.3	66.7	-	-	100.0
	% of Total	0.2	0.4	-	-	0.6
Cabab	n	-	-	-	1	1
Saban	%	-	-	-	100.0	100.0
Inauve	% of Total	-	-	-	0.2	0.2
Gamarrala	n	4	5	1	12	22
Sarawak	%	18.2	22.7	4.5	54.5	100.0
Inauve	% of Total	0.8	1.0	.20	2.4	4.4
	n	-	-	1	1	2
Others	%	-	-	50.0	50.0	100.0
	% of Total	-	-	0.2	0.2	0.4
Tetal	n	128	88	55	229	500
Total	% of Total	25.6	17.6	11.0	45.8	100.0

Table 4. 28 : C	rosstabulation	of period	of suffering	from diabetes	mellitus v	vith religion

			Suffering	g Diabetes		
Relig	ion	1–3 years	4–6 years	7–9 years	More than 10 years	Total
	n	109	70	42	174	395
Muslim	%	27.6	17.7	10.6	44.1	100.0
	% of Total	21.8	14.0	8.4	34.8	79.0
	n	11	7	9	21	48
Buddhist	%	22.9	14.6	18.8	43.8	100.0
	% of Total	2.2	1.4	1.8	4.2	9.6
	n	1	3	2	13	19
Hindu	%	5.3	15.8	10.5	68.4	100.0
	% of Total	0.2	0.6	0.4	2.6	3.8
	n	6	6	1	20	33
Christian	%	18.2	18.2	3.0	60.6	100.0
	% of Total	1.2	1.2	0.2	4.0	6.6
	n	1	1	-	-	2
Traditional	%	50.0	50.0	-	-	100.0
	% of Total	0.2	0.2	-	-	0.4
	n	-	1	1	1	3
Others	%	-	33.3	33.3	33.3	100.0
	% of Total	-	0.2	0.2	0.2	0.6
Total	n	128	88	55	229	500
10181	% of Total	25.6	17.6	11.0	45.8	100.0

			Suffering	g Diabetes		
Marital Status		1–3 years	4–6 years	7–9 years	More than 10 years	Total
	n	7	3	5	12	27
Single	%	25.9	11.1	18.5	44.4	100.0
Single	% of Total	1.4	0.6	1.0	2.4	5.4
	n	107	74	39	179	399
Married	%	26.8	18.5	9.8	44.9	100.0
	% of Total	21.4	14.8	7.8	35.8	79.8
	n	4	2	2	7	15
Diverse	%	26.7	13.3	13.3	46.7	100.0
Divorce	% of Total	0.8	0.4	0.4	1.4	3.0
	n	10	9	9	31	59
Widow/Widowor	%	16.9	15.3	15.3	52.5	100.0
widow/widower	% of Total	2.0	1.8	1.8	6.2	11.8
	n	128	88	55	229	500
Total	% of Total	25.6	17.6	11.0	45.8	100.0

Table 4. 29: Crosstabulation of period of suffering from diabetes mellitus with marital status

 Table 4. 30: Crosstabulation of period of suffering from diabetes mellitus with residential area

			Suffering	g Diabetes		
Residential Area		1–3 years	4–6 years	7–9 years	More than 10 years	Total
	n	46	35	18	102	201
Urban	%	22.9	17.4	9.0	50.7	100.0
	% of Total	9.2	7.0	3.6	20.4	40.2
	n	74	40	30	102	246
Rural	%	30.1	16.3	12.2	41.5	100.0
	% of Total	14.8	8.0	6.0	20.4	49.2
	n	8	13	7	25	53
Sub-Urban	%	15.1	24.5	13.2	47.2	100.0
	% of Total	1.6	2.6	1.4	5.0	10.6
Tatal	n	128	88	55	229	500
Total	% of Total	25.6	17.6	11.0	45.8	100.0

Table 4. 3	L: Crosstabulation	of period of	f suffering fron	n diabetes	mellitus	with	education
			level				

Education level			Suffering	g Diabetes		
		1–3 years	4–6 years	7–9 years	More than 10 years	Total
	n	2	8	3	16	29
No Formal Education	%	6.9	27.6	10.3	55.2	100.0
No Formal Education	% of Total	0.4	1.6	0.6	3.2	5.8
	n	24	22	14	56	116
Drimory School	%	20.7	19.0	12.1	48.3	100.0
Primary School	% of Total	4.8	4.4	2.8	11.2	23.2
	n	73	52	33	120	278
Secondam School	%	26.3	18.7	11.9	43.2	100.0
Secondary School	% of Total	14.6	10.4	6.6	24.0	55.6

	n	23	3	2	20	48
Dinloma/Contificato	%	47.9	6.3	4.2	41.7	100.0
Dipionia/Cel uncate	% of Total	4.6	0.6	0.4	4.0	9.6
	n	6	1	3	15	25
Degree & Above	%	24.0	4.0	12.0	60.0	100.0
	% of Total	1.2	0.2	0.6	3.0	5.0
	n	-	2	-	2	4
Othora	%	-	50.0	-	50.0	100.0
Others	% of Total	-	0.4	-	0.4	0.8
	n	128	88	55	229	500
Total	% of Total	25.6	17.6	11.0	45.8	100.0

Table 4. 32: Crosstabulation of period	d of suffering fro	om diabetes mellitus	with occupational
	risk		

		Suffering Diabetes				
Occupation	onal Risk	1–3 years	4–6 years	7–9 years	More than 10 years	Total
Class 1: You	n	64	39	34	109	246
are involved	%	26.0	15.9	13.8	44.3	100.0
with the						
work in the	% of Total	12.8	78	68	21.8	40.2
building that	70 01 10tai	12.0	7.0	0.8	21.0	47.4
is less risky						
Class 2: You	n	49	39	13	102	203
are involved	%	24.1	19.2	6.4	50.2	100.0
with the						
work outside						
of the office	% of Total	9.8	7.8	2.6	20.4	40.6
or are riskier						
than Class 1						
Class 3: You	n	13	8	8	16	45
are involved	%	28.9	17.8	17.8	35.6	100.0
with risky	% of Total	2.6	16	16	3.2	9.0
sub-machine	70 01 10tai	2.0	1.0	1.0	5.2	2.0
Class 4: You	n	2	2	-	2	6
are involved	%	33.3	33.3	-	33.3	100.0
with						
dangerous						
work and	% of Total	0.4	0.4	-	0.4	1.2
heavy						
machinery						
Total	n	128	88	55	229	500
10121	% of Total	25.6	17.6	11.0	45.8	100.0

Appendix 6: Crosstabulation Analysis of People with Diabetes on Having Protection Plan

Household Income		Having P	Tatal	
		Yes	No	Totai
D 140.00	n	61	382	443
KIVI0.00 - DM4 840	%	13.8	86.2	100.0
KIV14,049	% of Total	12.2	76.4	88.6
RM4,850 – RM10,959	n	23	30	53
	%	43.4	56.6	100.0
	% of Total	4.6	6.0	10.6
RM10,960 and above	n	1	3	4
	%	25.0	75.0	100.0
	% of Total	0.2	0.6	0.8
Total	n	85	415	500
Total	% of Total	17.0	83.0	100.0

Table 4. 33: Crosstabulation of having a protection plan with income

 Table 4. 34: Crosstabulation of having a protection plan with occupation

Ocean office of Terms		Having P	T - 4 - 1	
Occupational Type		Yes	No	Total
	n	17	57	74
Private sector employee	%	23.0	77.0	100.0
	% of Total	3.4	11.4	14.8
	n	19	58	77
Housewife	%	24.7	75.3	100.0
	% of Total	3.8	11.6	15.4
	n	12	130	142
Pensioner/Retiree	%	8.5	91.5	100.0
	% of Total	2.4	26.0	28.4
	n	14	45	59
Not Working	%	23.7	76.3	100.0
	% of Total	2.8	9.0	11.8
	n	12	47	59
Government Servant	%	20.3	79.7	100.0
	% of Total	2.4	9.4	11.8
	n	3	10	13
Entrepreneur/Self-Employed	%	23.1	76.9	100.0
	% of Total	0.6	2.0	2.6
	n	4	40	44
Student	%	9.1	90.9	100.0
	% of Total	0.8	8.0	8.8
	n	4	28	32
Others	%	12.5	87.5	100.0
	% of Total	0.8	5.6	6.4
Tetal	n	85	415	500
Total	% of Total	17.0	83.0	100.0

Table 4. 35: Crosstabulation of having a protection plan with ethnicity

Ethnic		Having P	Tatal	
		Yes	No	Totai
	n	64	324	388
Malay	%	16.5	83.5	100.0
	% of Total	12.8	64.8	77.6
	n	14	43	57
Chinese	%	24.6	75.4	100.0
	% of Total	2.8	8.6	11.4
Indian	n	5	22	27

	%	18.5	81.5	100.0
	% of Total	1.0	4.4	5.4
	n	-	3	3
Orang Asli	%	-	100.0	100.0
	% of Total	-	0.6	0.6
	n	1	-	1
Sabah Native	%	100.0	-	100.0
	% of Total	0.2	-	0.2
Sarawak Native	n	1	21	22
	%	4.5	95.5	100.0
	% of Total	0.2	4.2	4.4
	n	-	2	2
Others	%	-	100.0	100.0
	% of Total	-	0.4	0.4
Tatal	n	85	415	500
Total	% of Total	17.0	83.0	100.0

 Table 4. 36: Crosstabulation of having a protection plan with religion

Religion		Having F	Tetal	
		Yes	No	Totai
	n	63	332	395
Muslim	%	15.9	84.1	100.0
	% of Total	12.6	66.4	79.0
	n	14	34	48
Buddhist	%	29.2	70.8	100.0
	% of Total	2.8	6.8	9.6
Hindu	n	5	14	19
	%	26.3	73.7	100.0
	% of Total	1.0	2.8	3.8
	n	3	30	33
Christian	%	9.1	90.9	100.0
	% of Total	0.6	6.0	6.6
	n	-	2	2
Traditional	%	-	100.0	100.0
	% of Total	-	0.4	0.4
Others	n	-	3	3
	%	-	100.0	100.0
	% of Total	-	0.6	0.6
	n	85	415	500
Total	% of Total	17.0	83.0	100.0

Table 4. 37: Crosstabulation of having a protection plan with marital status

Marital Status		Having P	Total	
		Yes	No	Total
	n	7	20	27
Single	%	25.9	74.1	100.0
	% of Total	1.4	4.0	5.4
	n	67	332	399
Married	%	16.8	83.2	100.0
	% of Total	13.4	66.4	79.8
	n	6	9	15
Divorce	%	40.0	60.0	100.0
	% of Total	1.2	1.8	3.0

1	n	5	54	59
Widow/Widower	%	8.5	91.5	100.0
	% of Total	1.0	10.8	11.8
Total	n	85	415	500
	% of Total	17.0	83.0	100.0

Table 4. 38: Crosstabulation of having a protection plan with residential an	ea
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Residential Area		Having P	T . 4 . 1	
		Yes	No	Total
	n	47	154	201
Urban	%	23.4	76.6	100.0
	% of Total	9.4	30.8	40.2
Rural	n	32	214	246
	%	13.0	87.0	100.0
	% of Total	6.4	42.8	49.2
	n	6	47	53
Sub-Urban	%	11.3	88.7	100.0
	% of Total	1.2	9.4	10.6
Total	n	85	415	500
	% of Total	17.0	83.0	100.0

 Table 4. 39: Crosstabulation of having a protection plan with education level

Education loval		Having P	rotection	Total
Education level	Education level			Totai
	n	1	28	29
No Formal Education	%	3.4	96.6	100.0
	% of Total	0.2	5.6	5.8
	n	6	110	116
Primary School	%	5.2	94.8	100.0
	% of Total	1.2	22.0	23.2
Secondary School	n	51	227	278
	%	18.3	81.7	100.0
	% of Total	10.2	45.4	55.6
	n	14	34	48
Diploma/Certificate	%	29.2	70.8	100.0
	% of Total	2.8	6.8	9.6%
	n	12	13	25
Degree & Above	%	48.0	52.0	100.0
	% of Total	2.4	2.6	5.0
	n	1	3	4
Others	%	25.0	75.0	100.0
	% of Total	0.2	0.6	0.8
Total	n	85	415	500
10141	% of Total	17.0	83.0	100.0

Occupational Bick	Occupational Bisk				
Occupational Kisk	Yes	No	Total		
Close 1. Versens investigated with the most in the	n	43	203	246	
Class 1: You are involved with the work in the	%	17.5	82.5	100.0	
building that is less risky	% of Total	8.6	40.6	49.2	
	n	38	165	203	
Class 2: You are involved with the work	%	18.7	81.3	100.0	
outside of the office of are fiskler than Class 1	% of Total	7.6	33.0	40.6	
Class 2: Ver and involved with vislar sub	n	3	42	45	
Class 5: You are involved with risky sub-	%	6.7	93.3	100.0	
пасшие	% of Total	0.6	8.4	9.0	
Class 4. Ver and involved with demonstra	n	1	5	6	
Class 4: You are involved with dangerous	%	16.7	83.3	100.0	
work and neavy machinery	% of Total	0.2	1.0	1.2	
Total	n	85	415	500	
10181	% of Total	17.0	83.0	100.0	

Table 4. 40: Crosstabulation of having a protection plan with occupational risk

Appendix 7: Crosstabulation Analysis of People with Diabetes on Interest in Getting Protection

Household Income			Interested			
		Yes	No	Not Sure	Total	
DM0.00	n	237	80	126	443	
EN10.00 – DM4 840	%	53.5	18.1	28.4	100.0	
NIV14,049	% of Total	47.4	16.0	25.2	88.6	
DM4 950	n	33	9	11	53	
DM10.050	%	62.3	17.0	20.8	100.0	
KW110,959	% of Total	6.6	1.8	2.2	10.6	
DM10.0(0 and	n	3	-	1	4	
KW110,960 and	%	75.0	-	25.0	100.0	
above	% of Total	0.6	-	0.2	0.8	
	n	273	89	138	500	
Total	% of Total	54.6	17.8	27.6	100.0	

Table 4. 41: Crosstabulation of interest in getting protection with household income

Table 4. 42: Crosstabulation of interest in getting protection with occupation

			Interested		Tetel
Occupational Ty	ре	Yes	No	Not Sure	Total
	n	45	5	24	74
Private sector employee	%	60.8	6.8	32.4	100.0
	% of Total	9.0	1.0	4.8	14.8
	n	39	22	16	77
Housewife	%	50.6	28.6	20.8	100.0
	% of Total	7.8	4.4	3.2	15.4
	n	95	16	31	142
Pensioner/Retiree	%	66.9	11.3	21.8	100.0
	% of Total	19.0	3.2	6.2	28.4
Not Working	n	32	12	15	59
	%	54.2	20.3	25.4	100.0
	% of Total	6.4	2.4	3.0	11.8
	n	27	14	18	59
Government Servant	%	45.8	23.7	30.5	100.0
	% of Total	5.4	2.8	3.6	11.8
E-4	n	9	2	2	13
Entrepreneur/Sen-	%	69.2	15.4	15.4	100.0
Employed	% of Total	1.8	0.4	0.4	2.6
	n	10	9	25	44
Student	%	22.7	20.5	56.8	100.0
	% of Total	2.0	1.8	5.0	8.8
	n	16	9	7	32
Others	%	50.0	28.1	21.9	100.0
	% of Total	3.2	1.8	1.4	6.4
Total	n	273	89	138	500
Total	% of Total	54.6	17.8	27.6	100.0

E4bata			Tetal		
Etr	inic	Yes	No	Not Sure	Total
	n	225	53	110	388
Malay	%	58.0	13.7	28.4	100.0
	% of Total	45.0	10.6	22.0	77.6
	n	24	21	12	57
Chinese	%	42.1	36.8	21.1	100.0
	% of Total	4.8	4.2	2.4	11.4
	n	15	5	7	27
Indian	%	55.6	18.5	25.9	100.0
	% of Total	3.0	1.0	1.4	5.4
	n	3	-	-	3
Orang Asli	%	100.0	-	-	100.0
	% of Total	0.6	-	-	0.6
	n	1	-	-	1
Sabah Native	%	100.0	-	-	100.0
	% of Total	0.2	-	-	0.2
Constrait	n	4	10	8	22
Notivo	%	18.2	45.5	36.4	100.0
Nauve	% of Total	0.8	2.0	1.6	4.4
	n	1	-	1	2
Others	%	50.0	-	50.0	100.0
	% of Total	0.2	-	0.2	0.4
Total	n	273	89	138	500
Total	% of Total	54.6	17.8	27.6	100.0

 Table 4. 43: Crosstabulation of interest in getting protection with ethnicity

Table 4. 44: Crosstabulation of interest in getting protection with religion

Deligion			Total		
Keng	ion	Yes	No	Not Sure	Totai
	n	229	54	112	395
Muslim	%	58.0	13.7	28.4	100.0
	% of Total	45.8	10.8	22.4	79.0
	n	21	15	12	48
Buddhist	%	43.8	31.3	25.0	100.0
	% of Total	4.2	3.0	2.4	9.6
	n	10	4	5	19
Hindu	%	52.6	21.1	26.3	100.0
	% of Total	2.0	0.8	1.0	3.8
	n	9	15	9	33
Christian	%	27.3	45.5	27.3	100.0
	% of Total	1.8	3.0	1.8	6.6
	n	2	-	-	2
Traditional	%	100.0	-	-	100.0
	% of Total	0.4	-	-	0.4
	n	2	1	-	3
Others	%	66.7	33.3	-	100.0
	% of Total	0.4	0.2	-	0.6
Total	n	273	89	138	500
Total	% of Total	54.6	17.8	27.6	100.0

Marital Status			Interested		Total
		Yes	No	Not Sure	Total
	n	9	5	13	27
Single	%	33.3	18.5	48.1	100.0
	% of Total	1.8	1.0	2.6	5.4
	n	216	75	108	399
Married	%	54.1	18.8	27.1	100.0
	% of Total	43.2	15.0	21.6	79.8
	n	7	4	4	15
Divorced	%	46.7	26.7	26.7	100.0
	% of Total	1.4	0.8	0.8	3.0
	n	41	5	13	59
Widow/Widower	%	69.5	8.5	22.0	100.0
	% of Total	8.2	1.0	2.6	11.8
Totol	n	273	89	138	500
Total	% of Total	54.6	17.8	27.6	100.0

 Table 4. 45: Crosstabulation of interest in getting protection with marital status

Table 4. 46: Crosstabulation of interest in getting protection with residential area

Residential Area			Interested				
		Yes	No	Not Sure	Total		
	n	91	42	68	201		
Urban	%	45.3	20.9	33.8	100.0		
	% of Total	18.2	8.4	13.6	40.2		
	n	161	35	50	246		
Rural	%	65.4	14.2	20.3	100.0		
	% of Total	32.2	7.0	10.0	49.2		
	n	21	12	20	53		
Sub-Urban	%	39.6	22.6	37.7	100.0		
	% of Total	4.2	2.4	4.0	10.6		
Total	n	273	89	138	500		
	% of Total	54.6	17.8	27.6	100.0		

Table 4. 47: Crosstabulation of interest in getting protection with education level

Educe (free las			Interested		Tetel
Education lev	/el	Yes	No	Not Sure	Total
	n	9	9	11	29
No Formal Education	%	31.0	31.0	37.9	100.0
	% of Total	1.8	1.8	2.2	5.8
	n	57	33	26	116
Primary School	%	49.1	28.4	22.4	100.0
	% of Total	11.4	6.6	5.2	23.2
	n	160	38	80	278
Secondary School	%	57.6	13.7	28.8	100.0
	% of Total	32.0	7.6	16.0	55.6
	n	26	7	15	48
Diploma/Certificate	%	54.2	14.6	31.3	100.0
	% of Total	5.2	1.4	3.0	9.6
	n	19	1	5	25
Degree & Above	%	76.0	4.0	20.0	100.0
	% of Total	3.8	0.2	1.0	5.0
	n	2	1	1	4
Others	%	50.0	25.0	25.0	100.0
	% of Total	0.4	0.2	0.2	0.8
Total	n	273	89	138	500
Total	% of Total	54.6	17.8	27.6	100.0

Oserrati	an al Diala		Interested		Tetal
Occupation	onal Kisk	Yes	No	Not Sure	Total
Class 1: You	n	163	35	48	246
are involved	%	66.3	14.2	19.5	100.0
with the work					
in the building	% of Total	32.6	7.0	9.6	49.2
that is less risky					
Class 2: You	n	88	43	72	203
are involved	%	43.3	21.2	35.5	100.0
with the work					
outside of the					
office or are	% of Total	17.6	8.6	14.4	40.6
riskier than					
Class 1					
Class 3: You	n	20	9	16	45
are involved	%	44.4	20.0	35.6	100.0
with risky sub-	% of Total	4.0	1.8	3.7	9.0
machine	70 01 10tal	4.0	1.0	5.2	9.0
Class 4: You	n	2	2	2	6
are involved	%	33.3	33.3	33.3	100.0
with dangerous					
work and heavy	% of Total	0.4	0.4	0.4	1.2
machinery					
Total	n	273	89	138	500
10141	% of Total	54.6	17.8	27.6	100.0

Table 4. 48: Crosstabulation of interest in getting protection with occupational risk

Appendix 8: Crosstabulation Analysis of People with Diabetes on Willingness to Pay (WTP)

Household	Income	RM0.00	RM50.01	RM100.01	RM150.01	More	Total
		-	-	-	-	than	
		RM50.00	RM100.00	RM150.00	RM200.00	RM200.01	
	n	391	38	6	4	4	443
RM0.00 -	%	88.3	8.6	1.4	0.9	0.9	100.0
RM4,849	% of	78.0	7.6	1.2	0.8	0.8	99 C
	Total	78.2	7.0	1.2	0.8	0.8	00.0
DM4 950	n	27	15	6	4	1	53
KIV14,050	%	50.9	28.3	11.3	7.5	1.9	100.0
- RM10 959	% of	5 4	3.0	1.2	0.8	0.2	10.6
1000000	Total	5.4	5.0	1.2	0.8	0.2	10.0
	n	1	1	1	1	-	4
RM10,960	%	25.0	25.0	25.0	25.0	-	100.0
and above	% of	0.2	0.2	0.2	0.2		0.8
	Total	0.2	0.2	0.2	0.2	-	0.0
	n	419	54	13	9	5	500
Total	% of	83.8	10.8	26	18	1.0	100.0
	Total	0.5.0	10.0	2.0	1.0	1.0	100.0

Table 4. 57: Crosstabulation of willingness to pay with household income

 Table 4. 58: Crosstabulation of willingness to pay with occupation

				WTP			
Occupational Tr	vne	RM0.00	RM50.01	RM100.01	RM150.01	More	Total
Occupational 1	pc	-	-	-	-	than	Iotai
		RM50.00	RM100.00	RM150.00	RM200.00	RM200.01	
	n	55	13	6	-	-	74
Private sector	%	74.3	17.6	8.1	-	-	100.0
employee	% of Total	11.0	2.6	1.2	-	-	14.8
	n	61	9	4	3	-	77
II	%	79.2	11.7	5.2	3.9	-	100.0
Housewhe	% of Total	12.2	1.8	0.8	0.6	-	15.4
	n	129	9	-	2	2	142
Domaton on/Dating o	%	90.8	6.3	-	1.4	1.4	100.0
Pensioner/Retiree	% of Total	25.8	1.8	-	0.4	0.4	28.4
	n	47	9	1	-	2	59
Not Working	%	79.7	15.3	1.7	-	3.4	100.0
Not Working	% of Total	9.4	1.8	0.2	-	0.4	11.8
	n	48	8	1	2	-	59
Government	%	81.4	13.6	1.7	3.4	-	100.0
Servant	% of Total	9.6	1.6	0.2	0.4	-	11.8
	n	11	-	1	1	-	13
Entrepreneur/Self-	%	84.6	-	7.7	7.7	-	100.0
Employed	% of Total	2.2	-	0.2	0.2	-	2.6
	n	40	4	-	-	_	44
Student	%	90.9	9.1	-	-	-	100.0
Student	% of Total	8.0	0.8	-	-	-	8.8
Others	n	28	2	-	1	1	32

	%	87.5	6.3	-	3.1	3.1	100.0
	% of Total	5.6	0.4	-	0.2	0.2	6.4
	n	419	54	13	9	5	500
Total	% of Total	83.8	10.8	2.6	1.8	1.0	100.0

 Table 4. 59: Crosstabulation of willingness to pay with ethnicity

				WTP			
Ethnic		RM0.00 - RM50.00	RM50.01 - RM100.00	RM100.01 - RM150.00	RM150.01 - RM200.00	More than RM200.01	Total
	n	325	46	8	7	2	388
Malay	%	83.8	11.9	2.1	1.8	0.5	100.0
Ivialay	% of Total	65.0	9.2	1.6	1.4	0.4	77.6
	n	45	3	5	2	2	57
Chinaga	%	78.9	5.3	8.8	3.5	3.5	100.0
Chinese	% of Total	9.0	0.6	1.0	0.4	0.4	11.4
	n	21	5	-	-	1	27
Indian	%	77.8	18.5	-	-	3.7	100.0
mulan	% of Total	4.2	1.0	-	-	0.2	5.4
	n	3	-	-	-	-	3
Orang	%	100.0	-	-	-	-	100.0
Asli	% of Total	0.6	-	-	-	-	0.6
	n	1	-	-	-	-	1
Sabah	%	100.0	-	-	-	-	100.0
Native	% of Total	0.2	-	-	-	-	0.2
	n	22	-	-	-	-	22
Sarawak	%	100.0	-	-	-	-	100.0
Native	% of Total	4.4	-	-	-	-	4.4
	n	2	-	-	-	-	2
Others	%	100.0	-	-	-	-	100.0
Others	% of Total	0.4	-	-	-	-	0.4
Total	n	419	54	13	9	5	500
Total	% of Total	83.8	10.8	2.6	1.8	1.0	100.0

				WTP			
Religi	on	RM0.00 - RM50.00	RM50.01 - RM100.00	RM100.01 - RM150.00	RM150.01 - RM200.00	More than RM200.01	Total
	n	330	47	8	7	3	395
Maralian	%	83.5	11.9%	2.0%	1.8%	.8%	100.0%
Muslim	% of Total	66.0	9.4%	1.6%	1.4%	.6%	79.0%
	n	38	3	5	0	2	48
Duddhiat	%	79.2	6.3%	10.4%	0.0%	4.2%	100.0%
Buuuiiist	% of Total	7.6	.6%	1.0%	0.0%	.4%	9.6%
	n	16	3	0	0	0	19
Hindu	%	84.2	15.8%	0.0%	0.0%	0.0%	100.0%
Hillau	% of Total	3.2	.6%	0.0%	0.0%	0.0%	3.8%
	n	30	1	0	2	0	33
Christian	%	90.9	3.0%	0.0%	6.1%	0.0%	100.0%
Cirristian	% of Total	6.0	.2%	0.0%	.4%	0.0%	6.6%
	n	2	0	0	0	0	2
Traditional	%	100.0	0.0%	0.0%	0.0%	0.0%	100.0%
Taunonai	% of Total	0.4	0.0%	0.0%	0.0%	0.0%	.4%
	n	3	0	0	0	0	3
Others	%	100.0	0.0%	0.0%	0.0%	0.0%	100.0%
Others	% of Total	0.6	-	0.0%	0.0%	0.0%	.6%
	n	419	54	13	9	5	500
Total	% of Total	83.8	10.8	2.6%	1.8%	1.0%	100.0%

Table 4. 60: Crosstabulation of willingness to pay with religion

 Table 4. 61: Crosstabulation of willingness to pay with marital status

Marital Statu	S	RM0.00 – RM50.00	RM50.01 – RM100.00	RM100.01 - RM150.00	RM150.01 - RM200.00	More than RM200.01	Total
	n	19	4	4	-	-	27
Circal a	%	70.4	14.8	14.8	-	-	100.0
Single	% of Total	3.8	0.8	0.8	-	-	5.4
	n	336	43	9	7	4	399
Manutad	%	84.2	10.8	2.3	1.8	1.0	100.0
Married	% of Total	67.2	8.6	1.8	1.4	0.8	79.8
	n	11	4	-	-	-	15
Divorced	%	73.3	26.7	-	-	-	100.0
Divorced	% of Total	2.2	0.8	-	-	-	3.0
	n	53	3	-	2	1	59
Widow/Widowon	%	89.8	5.1	-	3.4	1.7	100.0
Widow/Widower	% of Total	10.6	0.6	-	0.4	0.2	11.8
	n	419	54	13	9	5	500
Total	% of Total	83.8	10.8	2.6	1.8	1.0	100.0

Docidont	ial Amon	RM0.00	RM50.01	RM100.01	RM150.01	More	Total
Kesidentiai Area		-	-	-	-	than	Total
		RM50.00	RM100.00	RM150.00	RM200.00	RM200.01	
	n	166	22	4	4	5	201
T. h	%	82.6	10.9	2.0	2.0	2.5	100.0
Urban	% of	22.2	4.4	0.8	0.8	1.0	40.2
	Total	55.2	4.4	0.8	0.8	1.0	40.2
	n	210	28	5	3	-	246
Dunal	%	85.4	11.4	2.0	1.2	-	100.0
Kurai	% of	42.0	5.6	1.0	0.6	-	40.2
	Total		5.0	1.0			49.2
	n	43	4	4	2	-	53
Sub-	%	81.1	7.5	7.5	3.8	-	100.0
Urban	% of	96	0.8	0.8	0.4		10.6
	Total	8.0	0.8	0.8	0.4	-	10.0
	n	419	54	13	9	5	500
Total	% of	02.0	10.9	26	1.0	1.0	100.0
	Total	03.8	10.8	2.0	1.8	1.0	100.0

Table 4. 62: Crosstabulation of willingness to pay with residential area

 Table 4. 63: Crosstabulation of willingness to pay with education level

	WTP						
Education level	ı	RM0.00 -	RM50.01 -	RM100.01	RM150.01	More than	Total
		RM50.00	RM100.00	– RM150.00	_ RM200.00	RM200.01	
	n	28	-	-	-	1	29
No Formal	%	96.6	-	-	-	3.4	100.0
Education	% of Total	5.6	-	-	-	0.2	5.8
	n	109	4	1	1	1	116
Drimory School	%	94.0	3.4	0.9	0.9	0.9	100.0
Filmary School	% of Total	21.8	0.8	0.2	0.2	0.2	23.2
	n	240	31	2	3	2	278
Secondary School	%	86.3	11.2	0.7	1.1	0.7	100.0
Secondary School	% of Total	48.0	6.2	0.4	0.6	0.4	55.6
	n	29	11	6	1	1	48
Dinlomo/Contificato	%	60.4	22.9	12.5	2.1	2.1	100.0
Dipionia/Cer uncate	% of Total	5.8	2.2	1.2	0.2	0.2	9.6
	n	10	7	4	4	-	25
Degree & Above	%	40.0	28.0	16.0	16.0	-	100.0
Degree & Above	% of Total	2.0	1.4	0.8	0.8	-	5.0
	n	3	1	-	-	-	4
Others	%	75.0	25.0	-	-	-	100.0
Others	% of Total	0.6	0.2	-	-	-	0.8
	n	419	54	13	9	5	500
Total	% of Total	83.8	10.8	2.6	1.8	1.0	100.0

				WTP			
Occupational Risk		RM0.00 – RM50.00	RM50.01 – RM100.00	RM100.01 - RM150.00	RM150.01 - RM200.00	More than RM200.01	Total
Class 1: You	n	214	16	7	7	2	246
are involved	%	87.0	6.5	2.8	2.8	0.8	100.0
with the work in the building that is less risky	% of Total	42.8	3.2	1.4	1.4	0.4	49.2
Class 2: You	n	166	29	3	2	3	203
are involved	%	81.8	14.3	1.5	1.0	1.5	100.0
with the work outside of the office or are riskier than Class 1	% of Total	33.2	5.8	0.6	0.4	.6	40.6
Class 3: You	n	35	7	3	-	-	45
are involved	%	77.8	15.6	6.7	-	-	100.0
with risky sub-machine	% of Total	7.0	1.4	0.6	-	-	9.0
Class 4: You	n	4	2	-	-	-	6
are involved	%	66.7	33.3	-	-	-	100.0
with dangerous work and heavy machinery	% of Total	0.8	0.4	-	-	-	1.2
	n	419	54	13	9	5	500
Total	% of Total	83.8	10.8	2.6	1.8	1.0	100.0

Table 4. 64: Crosstabulation of willingness to pay with occupational risk

Appendix 9: Medical Cost of Diabetes in Malaysia

CONDITION AND SETTING	COST PER PATIENT IN STUDY YEAR (RM)	COST PER PATIENT, ADJUSTED TO 2011(RM)	ESTIMATED PRICE IN 2021 (RM)	UNIT	SOURCE
T2DM outpatient care					
MOH health clinics (with FMS)	1128	1281	1807.6694	per year	Rohana et al., 2007
MOH health clinics (without FMS)	802	911	1285.5478	per year	Rohana et al., 2007
MOH hospital with specialist	773	909	1282.7256	per year	Sharifa Ezat et al., 2009
MOH hospital without specialist	761	896	1264.3808	per year	Sharifa Ezat et al., 2009
MOH health clinics	386	454	640.6572	per year	Sharifa Ezat et al., 2009
Cardiovascular disease					
Myocardial infarction, tertiary teaching hospital	2235	2487	3509.5033	per admission	Goldhaber-Fiebert et al., 2010
Non-fatal coronary event, public hospitals	3915 - 6976	4133 - 7365	10393.0405	per admission	Clarke et al., 2010
Fatal coronary event, public hospitals	479–854	506 - 902	1272.8476	per admission	Clarke et al., 2010
Cerebrovascular disease					
Tertiary teaching hospital	11396	12685	17900.3013	per admission	Goldhaber-Fiebert et al., 2010
Non-fatal cerebrovascular event,	4495 - 8010	4746 - 8457	11934.0046	per admission	Clarke et al., 2010
Fatal cerebrovascular event, public hospitals	2511 - 4474	2651 - 4723	6664.8106	per admission	Clarke et al., 2010
Hoort failure (HF)					
Non-fatal HF, public hospitals	4630 - 8251	4888 - 8711	12292.4339	per admission	Clarke et al., 2010
Fatal HF, public hospitals	654 - 1166	690 - 1231	1737.1124	per admission	Clarke et al., 2010

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Peripheral vascular disease (PVD) Tertiary teaching hospital Non-fatal PVD, public hospitals Fatal PVD, public hospitals Diabetic foot amputation, tertiary teaching hospital	4246 943–1680 6120–10906 12935	4726 996 – 1774 6461 – 11514 14937	6669.0441 2503.3610 16247.8572 21078.1868	per admission per admission per admission per admission	Goldhaber-Fiebert et al., 2010 Clarke et al., 2010 Clarke et al., 2010 Ibrahim et al., 2010
Microvascular disease Retinopathy, tertiary teaching hospital Cataract surgery, MOH hospitals Dialysis, MOH centres	1788 3750 33481	1990 4812 42362	2808.1671 6790.4020 59778.6805	per admission treatment per year	Goldhaber-Fiebert et al., 2010 Loo et al., 2004 Hooi et al., 2005

Appendix 10: Diabetes Malaysia Product Costs

CONDITION	BASE CASE ESTIMATE RM (MILLION)	LOW ESTIMATE RM (MILLION)	HIGH ESTIMATE RM (MILLION)	COST TO GOVERNMENT RM (MILLION)
T2DM outpatient care	554.7	548.6	1547.4	451.1
Myocardial infarction	307.4	32.3	470	222
Stroke	92.7	46	220.1	67
PVD requiring amputation	41.7	7.5	108.9	30.1
Retinopathy	16.9	17	70.5	12.2
Nephropathy	918	717.2	948.6	543.8
Cataract	65.4	65.4	65.4	47.2
Heart Failure	40.2	7.2	90.3	29
Total cost	2037.1	1441.1	3521	1402.5