

2011

annual report

Kiribati





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Preface

Mauri, the Ministry of Health and Medical Services is happy to present the first Annual Report produced for over ten years now. The Health Information Unit, who is responsible for the production of this report, stores much data in the system that has never been analysed. In this year, 2012, expertise from the University of Queensland, Brisbane, has assisted the Ministry of Health and Medical Services in Kiribati to produce this report. The Ministry would like to thank the head of the University of Queensland for allowing staff from the Ministry to come over and work in their office and finish the report with the assistance from their expertise.

The main purpose of this report is to assess the status of our population's health. It is also going to serve the need from health donors on any kind of information they might need. In addition, the Ministry of Health and Medical Services required this report to assess its performance towards the health status of the population, and to better or improve its future plans and budget. There is no doubt that this report will help improve plans for the future. This report also plays a crucial role in documenting all information from past years that never been documented.

The Ministry of Health and Medical Services wishes to give its sincere gratitude to the team at the Health Information Systems Knowledge Hub, University of Queensland, for their assistance in producing this report, alongside our Senior Health Information Officer, Mr Teanibuaka Tabunga:

Professor Alan Lopez

Nicola Hodge

Fallon Horstmann

Michael Buttsworth

Jillian Ridley.

Also words of thanks to the team from the Australian Bureau of Statistics, and the Working Committee of the Pacific Health Information Network for your great support. Last, but not the least to the staff of the Health Information Units in Nowerewere for their assistance from home.

Without your individual support, this report would have never been done. But your great commitment is indicated in the completion of this report, and it is one way of many to help improve Health Information Systems

in Pacific Island Countries, and the Ministry of Health and Medical Services is thankful for this.

Finally, to Mr Tabunga's mentor, Nicola Hodge, for her great support and advice: many thanks for the fantastic lessons; they have given our health information staff a new understanding of statistics.

Dr Kautu Tenaua
Minister of Health & Medical Services

Mr Elliot Ali
Permanent Secretary

Key points – Kiribati’s health 2011

This section presents selected key findings from the report.

Table 1 Main indicators, 2011

Indicator	Males	Females	Both sexes
Total population	51,002	52,464	103,466
Percent of population living in South Tarawa	23.3	25	48.3
Percent of population less than 15 years of age	37	35	36
Percent of population aged 15-24	21	20	21
Percent of population aged 25-59	37	39	38
Percent of population older than 60 years of age	5	6	5
Crude birth rate (per 1,000 people)	-	-	28.7
Crude death rate (per 1,000 people)	5.4	3.9	4.6
Infant mortality rate (per 1,000 births)	-	-	34
Under-five mortality rate (per 1,000 births)	-	-	47.3
Life expectancy at birth (years)	70	80.1	75.1
Fertility rate	-	2.7	-

Source: National Statistics Preliminary Census 2010; Health Information Unit, MHMS 2011

General

Life expectancy and death

- The crude death rate in 2011 was 4.6 deaths per 1,000 people
- Life expectancy in Kiribati is currently 80 years for females and 70 for males
- The total fertility rate in Kiribati was 2.7 per female in 2010. The rate is lower than those of neighbouring Pacific Island Countries and Territories
- The leading causes of death in 2011 were digestive (8.7%) and cardiovascular (8.5%) diseases

Diseases

- 28.1% of the adult population is estimated to have diabetes
- In 2011, 12.3% of the new cases seen at clinics were for acute respiratory infections

Health risks

- 61.3% of the adult population are 'current smokers', and of these, 59% smoke daily
- 25.5% of the adult population consumed alcohol in the past 12 months (in the year leading up to 2006)
- 50.1% of the population have low-levels of physical activity each week
- 99.3% of the population consume less than five servings of fruit and vegetables per day
- 17.3% of the population have high blood pressure
- 27.7% of the population have high blood cholesterol

Babies and children

- There were 2,971 births in 2011, which is approximately eight babies born per day
- The infant mortality rate is 34 deaths per 1,000 live births
- The under-five mortality rate is 47 deaths per 1,000 live births
- These rates have not increased or decreased significantly over the past 20 years
- Kiribati is currently not on track for achieving Millennium Development Goal 4 (Reduce child mortality)

Health services

- Approximately 29,000 people visit an outpatient clinic each month
- Over 700 pregnant women are seen by antenatal clinics each month
- Just under 10,000 home visits were conducted by public health nurses in 2011, the majority for treating sick patients, followed by care for infants under-one
- In 2011, under 700 patients were referred to Tuarua Central Hospital from the outer islands, the majority by plane
- There is an increasing number of patients registered at hypertension and diabetes clinics each year

- In 2011, 30,000 patients were registered with a hypertension clinic, and 24,000 with a diabetes clinic
- There are four Main Hospitals: Betio Hospital, Tarawa Central Hospital (TCH), Southern Kiribati Hospital (SKH), and Kiritimati Hospital
- There are 34 Health Centres (eight in South Tarawa, four in Betio, and 22 from Outer Islands)

1. Introduction

How...

- good is the health of people living in Kiribati?
- does it vary between the different islands?

What...

- things influence health?
 - is being done to improve health, and how well is that working?
-

These are the big questions behind the *Annual Report 2011*, the first report of its kind produced by the Ministry of Health and Medical Services in over ten years. As a report to the nation, the *Annual Report 2011* brings together the latest available national statistics compiled by the Ministry of Health from many data sources. Its target readers are interested members of the public, clinicians, researchers, students, policy makers and government.

We can see from this report that there are some answers to these questions. The health of I-Kiribati is generally good, is improving (in some areas), and compares well with other countries in the Pacific.

But the 'simple' big-picture answers have a complex background. They depend on many statistics that are derived from a large amount of data compiled by many people throughout Kiribati and its extended health system. Contributors include people working in hospitals and other health facilities, in research agencies, in government health departments, and in special health registries.

Ultimately, it is all people from Kiribati who contribute to this report because there would be no data without them. Through them we also learn about the exceptions to the generally good news. These exceptions include the high infant mortality and under-five mortality rates, which have not reduced for over 20 years. Young males are also dying at much higher rates than young females, mostly from accidents and other external causes of injuries. Non-communicable diseases are a growing concern in the Pacific, and many people are already suffering from conditions such as diabetes.

This first chapter begins by discussing what health is, why health information is important and presenting a brief picture of Kiribati today.

1.1 Understanding health

What is health?

Ideas continue to change about what it means to be healthy or unhealthy. One view focuses mostly on the individual and emphasises the presence or absence of disease or sickness. Another view of health includes a wide range of social and economic risk and protective factors, along with various aspects of wellbeing. This report is based on an idea of health as described by the Australian Institute of Health and Welfare (AIHW); that it is:

An important part of wellbeing, of how people feel and function; that it contributes to social and economic wellbeing; that it is not simply the absence of illness or injury, and there are degrees of good and bad health; and that health should be seen in a broad social context. Overall, it can be said that healthy people feel and function well in body and mind and are in a condition to do so for as long as possible.¹

A framework

This report is based on a conceptual framework of health, as shown in Figure 1. It shows that levels of health and wellbeing ('how good is Kiribati's health?') depend on two forces: **determinants** ('what things influence health?') and **interventions** and their resources ('what is being done to improve health?').

There are many determinants of health and they interact in complex ways. They include behaviours such as smoking, diet and physical activity, and much broader factors such as our social and environmental background. Interventions can range from personal services to treat us when we are sick, to prevention campaigns aimed at determinants.

¹ Australian Institute of Health and Welfare (AIHW). 2010. *Australia's health 2010. Australia's health series no. 12. Cat no. AUS 122.* Canberra: AIHW

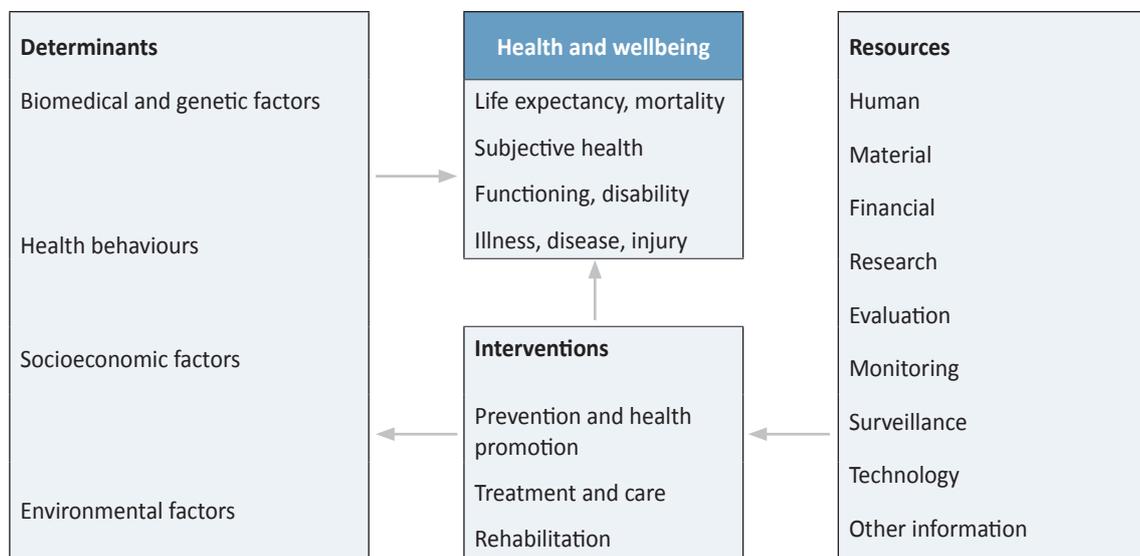


Figure 1 Conceptual framework of health²

² Australian Institute of Health and Welfare (AIHW). 2010. *Australia's health 2010. Australia's health series no. 12. Cat no. AUS 122. Canberra: AIHW*

1.2 Health information

What is a health information system, and why is it important?

Health information systems (HIS), defined by the World Health Organization as integrated efforts to 'collect, process, report and use health information and knowledge to influence policy making, programme action and research', are essential to the effective functioning of health systems worldwide.³ Routine HIS, such as those operated through health information departments or national statistics offices, provide information on risk factors associated with disease, mortality and morbidity, health service coverage, and health system resources.⁴

Governments rely on the information provided to them from HIS for the production of high-quality, user-friendly statistical information on the health status of the community; the use and need of health services;

formulating, monitoring and evaluating health policies; and measuring progress made in the provision of health services.⁵ HIS can also identify health problems; help to form effective health policies; respond to public health emergencies; select, implement and evaluate interventions; and allocate resources.⁶

Collecting, analysing and sharing health information is a difficult process that requires a clear understanding of its underlying components and how these components interact. The Health Metrics Network provides a conceptual representation of the six components and standards of a HIS:

1. HIS resources – such as appropriately trained staff, finance, logistics support and context-specific technologies. These resources (or inputs) must be situated within the broader legislative, regulatory and planning framework of a country

³ AbouZahr C and A Commar. 2008. *Neglected Health Systems Research: Health Information Systems. Alliance for Health Policy and Systems Research: World Health Organization*

⁴ Lewin S, Oxman A, Lavis J, Fretheim A, Marti S and Munabi-Babigumira S. 2010. Chapter 11: Finding and using evidence about local conditions. In A Oxman, J Lavis, S Lewin and A Fretheim (eds.), pp 164-183, *SUPPORT Tools for Evidence-Informed Policymaking. Report Number 4, 2010. Norwegian Knowledge Centre for the Health Services: Oslo*

⁵ World Health Organization Regional Office for the Western Pacific Region (WPRO). 2003. Chapter 5: Data quality of statistical reports. In *Improving Data Quality: A guide for developing countries*, pp 54-67. World Health Organization: Geneva

⁶ Pappaioanou M, Malison M, Wilkins K, Otto B, Goodman R, Churchill R, White M and Thacker S. 2003. Strengthening capacity in developing countries for evidence based public health: The data for decision making project. *Social Science and Medicine* 57(10): 1925-1937

2. Indicators – the basis of a HIS strategic plan must include a core set of indicators and related targets that can provide a picture of the determinants of health, health system condition, and the status of population health
3. Data sources – such as civil and vital registration (births, deaths and cause-of-death), censuses and surveys, medical records, service records and financial and resource tracking
4. Data management – includes data collection, storage, quality, flow, processing, compilation and analysis
5. Information products – the transformation of data into information and therefore into a tool for evidence-based decision-making that will lead to improved health
6. Dissemination and use – increasing the value of health information by making it accessible to decision-makers and providing incentives for the use of health information.⁷

⁷ Health Metrics Network (HMN). 2008. *Framework and Standards for Country Health Information Systems, 2nd Edition*. World Health Organization: Geneva

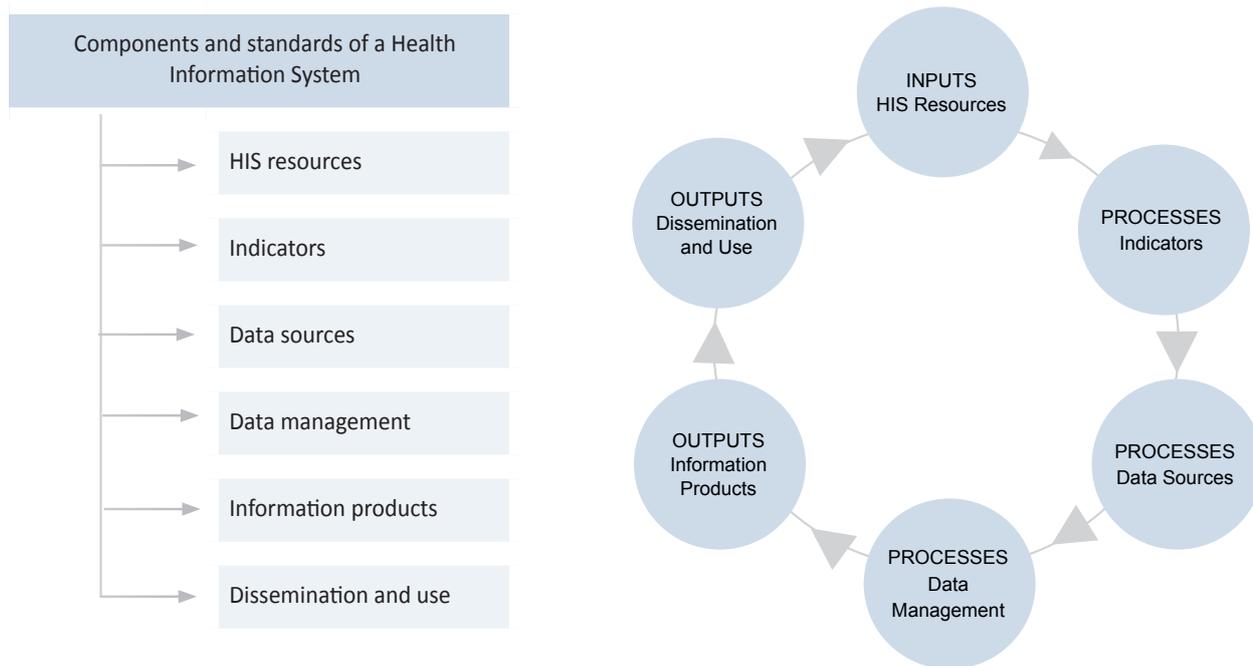


Figure 2 Components and standards of a health information system⁷

1.3 Kiribati health system

The government of Kiribati is the main provider of health services in the country. As of 2011, government health facilities included four main hospitals (Betio Hospital, Tungaru Central Hospital, Kiribati Southern Hospital and Kiritimati Hospital), 34 health centres operated by Medical Assistants from South Tarawa, Betio and outer islands, and 66 Clinics manned by Public Health Nurses.

There are six other health care providers that also report to the Health Information Unit, including the Integrated Management of Children's Illness (IMCI) clinic, Gynaecology clinic, Diabetic clinic, Kiribati Family Health Association (KFHA), Reproductive Health Development and Adolescent Health Development.

Kiribati is comprised of 33 atoll islands divided among three island groups; the Gilbert Islands, the Phoenix Islands and the Line Islands. Of the 33 islands of Kiribati, 24 are inhabited. There are no private health care providers. All health care services are provided free to all Kiribati residents by the Government and there is very minimal out-of-pocket spending for health.

In 2009, the Government spent approximately 16.5% of its total recurrent budget on health, taking the second largest share next to education. In addition to the recurrent budget, significant amounts of resources from external sources contribute to financing health services and activities through the government's Development Fund and through other channels such as non-governmental organizations (NGOs).

2. The health of I-Kiribati – an overview

How....

- healthy are the people of Kiribati?
- does Kiribati compare with other countries?
- is this changing over time?

This chapter describes Kiribati's health using general measures of health status, for example, life expectancy, birth and death rates, and chronic disease prevalence. The population is considered as a whole, with some key differences highlighted for people living on remote and outer islands.

2.1 Kiribati's changing population

To understand a population's health, it is useful to start with its demographic features: the size of a population, the ratio of males to females, its age structure, and how these characteristics are changing. These features are an important aspect of health monitoring, as they reflect past health events and also provide insight into the current and future health of the population.

Other helpful insights come from statistics about fertility, mortality and life expectancy. Birth and death rates are major drivers of a population's age structure, whereas life expectancy summarises the outlook on life based on current mortality patterns. Migration also contributes to changes in the size, structure and health of the population.

Population growth

The bar graph below shows the crude death rates and the crude births rates. It highlights a very important message that more babies are born than people died every year. Again the number of deaths still remains unchanged for the last 20 years whereas the births of babies started to increase from the year 2010 and 2011. The birth rates in 2011 are worrisome because comparing with baseline births during the past 20 years the births remains around 20 births per 1000. In 2006 the number of births increases to 25 births per 1000, then decrease 2007, 2008 and 2009. Again the decreasing could have to do with missing of data. Hence, 2010 and 2011 the births again increase.

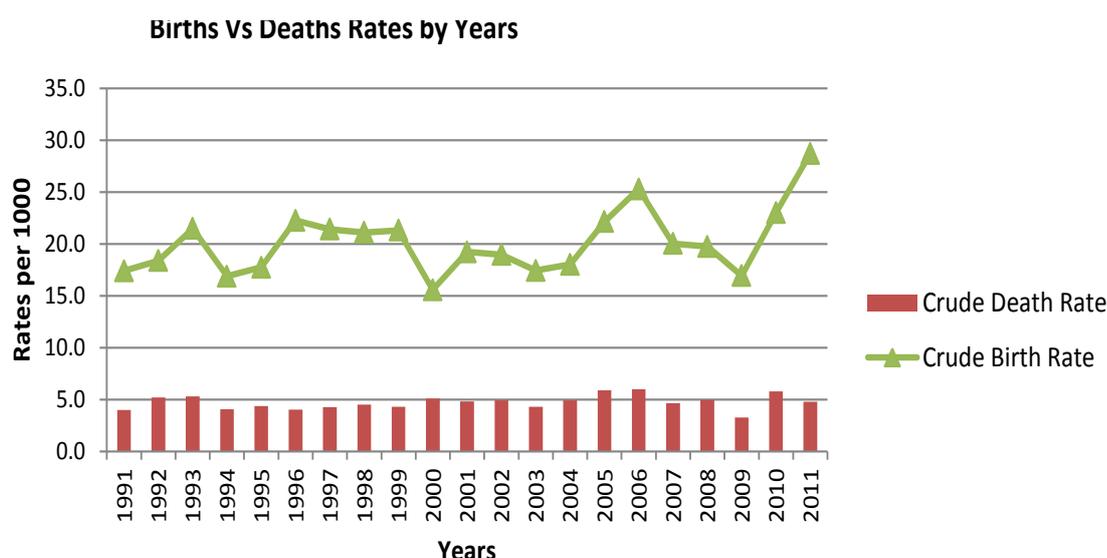


Figure 3 Birth and death rates by year. Source: MHMS, Health Information Unit 2011

Age and sex structure

The estimated resident population of Kiribati in 2010 was 103,466, having grown by 11.8% since the last census in 2005. Since 1990, the population has increased by 43 percent. Overall, natural increase (that is, the number of births exceeding the number of deaths) has stayed the same over the past 20 years. The average rate of natural increase is 1.6 percent.

Figure 4 (below) indicates that the population of Kiribati is young and still growing. It also indicates that there are more females in the older age groups than males (from about age 25 upwards), due to the higher mortality rates among young males.

The 2010 census (tables provided in annexes at the end of the report) shows that 48.3% of the total population resides in South Tarawa, with the remaining population living on the different outer islands. The Ministry of Health and Medical Services will have to plan to make

sure that the health services are efficient and adequate to the public, especially those living on remote outer islands.

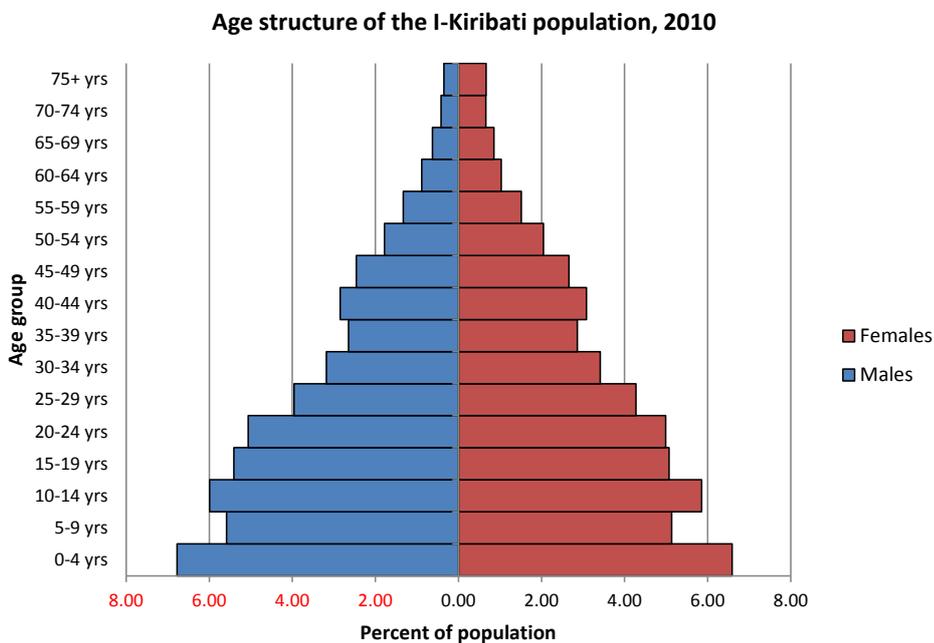


Figure 4 Population pyramid. Source: National Statistics Preliminary Census, 2010

Fertility

Two different measures are commonly used to describe trends and patterns in fertility: the number of children born to each female, and the age of mothers giving birth.

Total fertility rate

The total fertility rate (TFR) is a summary measure used to describe the number of children a female could expect to give birth to during her lifetime, if she experience the current age-specific fertility rates throughout her childbearing life.

The TFR in Kiribati was 2.7 per female in 2010. The rate is lower than those of neighbouring Pacific Island Countries and Territories.

Mortality

Data on death and its causes are important measures of a population's health. Examining trends and patterns in mortality can help explain changes and differences in health status, evaluate health strategies, and guide planning and policy making. Cause-specific mortality provides further insight into the events contributing to deaths, and changes in the pattern of these causes reflects changes in behaviours, exposures, and social and environmental circumstances as well as the effects of medical and technological advances.

Table 2 (below) shows that Kiribati continues to have high infant mortality, especially among males. Mortality declines in childhood and adolescence (five to 19 years of age), before increasing steadily and peaking in the 70 years and over age group.

Of concern is the high number of young boys (aged five to 19) and men (20 to 29) dying, compared to girls and women of the same age.

Table 2 Deaths by age and sex, 2011. Source: MHMS, Health Information Unit, 2011

2011 Age	Males		Females		Sex ratio	
	Number	Rate	Number	Rate	Crude	Rate ratio
Less than 5	75	1070.2	57	836.1	132	128.0
5 – 19 years	10	56.9	4	24.1	250	236.4
20-29 years	24	257.1	10	104.3	240	246.5
30-39 years	15	248.9	13	200.2	115	124.3
40-49 years	37	673.7	23	386.7	161	174.2
50-59 years	42	1307.6	32	869.3	131	150.4
60-69 years	34	2183.7	20	1025.1	170	213.0
70 and over	42	5269.8	43	3136.4	98	168.0
Total	279	547.0	202	385.0	138	142.1

Note: of the 494 deaths in 2011, only 481 deaths had data on age and/or gender recorded

Trends

There were 494 deaths recorded by the Health Information Unit in Kiribati in 2011. Figure 5 shows the national total number of deaths from the year 1991 to 2011. It includes all ages and both sexes. The downfall in 2009 on the number of deaths is the outcome of the missing data during this year. This is when the reporting tool was renewed.

However, looking at the graphs it tells us that the number of deaths for the past 20 years until the 2011 is stable. An average of 4.7 per 1000 people die in Kiribati per year.

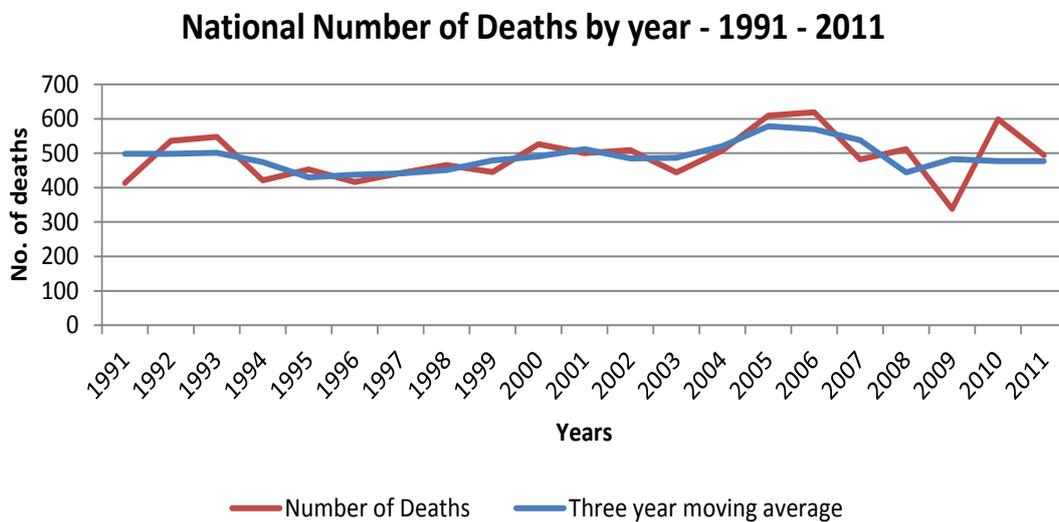


Figure 5 Number of deaths (absolute and three-year moving average) by year. Source: MHMS, Health Information Unit, 2011

Table 3 Crude death rate by year. Source: MHMS, Health Information Unit, 2011

Year	Total number of deaths	Crude Death Rate / 1000
1991	413	4.0
1992	536	5.2
1993	547	5.3
1994	421	4.1
1995	453	4.4
1996	416	4.0
1997	442	4.3
1998	465	4.5
1999	445	4.3
2000	526	5.1
2001	500	4.8
2002	509	4.9
2003	444	4.3
2004	508	4.9
2005	609	5.9
2006	619	6.0
2007	482	4.7
2008	512	4.9
2009	338	3.3
2010	599	5.8
2011	494	4.8

The table above indicates the number of deaths from 1991 to 2011. The total population used is from the preliminary census in 2010 from the national statistical office. The crude death rate (number of deaths per 1000 people) peaks in 2005 and 2006. The low number of deaths recorded in 2009 (338) is likely due to the change in reporting forms that year, which resulted in missing data.

2.2 Causes of death

This section provides an overview of the leading causes of death in Kiribati. Cause-of-death statistics are usually based on the **underlying cause**, which is the disease or injury that initiated the train of events leading directly to an individual’s death – in other words, the condition believed to be the primary cause-of-death. Any other

condition or event that is not the underlying cause, but is still considered to contribute to the death, is known as an associated cause.

Leading causes of death

For the population as a whole, the top 10 causes presented here have been listed as specific causes rather than at the broader International Classification of Diseases (ICD) chapter level. Information on cancer deaths, for example, have been provided by individual cancer type rather than for cancer overall.

The top 10 causes of death were responsible for 64% of all deaths in 2011. The leading cause-of-death was ‘other digestive diseases’. ‘Other cardiovascular diseases’ is second, followed by cerebrovascular diseases and lower respiratory infections.

Table 4 Leading underlying specific causes of death, all ages, 2011. Source: MHMS, Health Information Unit, 2011

Rank	All ages, both sexes		
	Cause of death	Number of deaths	% of all deaths
1	Ill-defined diseases	80	16.6
2	Other digestive diseases	42	8.7
3	Other cardiovascular diseases	41	8.5
4	Cerebrovascular diseases	33	6.9
5	Lower respiratory infections	30	6.2
6	Diabetes mellitus	26	5.4
7	Diarrhoeal diseases	17	3.5
7	Other infectious diseases	17	3.5
9	Endocrine diseases	16	3.3
10	Protein-energy malnutrition	14	2.9
	Total leading causes	316	64.0
	All deaths	494	100.00

Major causes of death by life stage

The statistics for various age groups are provided here at the broad ICD chapter level, rather than at the specific disease level, to give a better picture of the broad distribution of causes of death. Overall, the relative contribution of different underlying causes-of-death varies with age. For infants, the main cause-of-death for both males and females relates to conditions originating in the perinatal period. Infectious and parasitic diseases; endocrine, nutritional and metabolic diseases; and diseases of the respiratory system are the main causes of death for children aged 1-14 years. For young adults, the main cause-of-death differs for males (external causes) and females (neoplasm's). As people age, diseases of the circulatory and digestive system cause more deaths. Ill-defined conditions account for a higher proportion of assigned causes-of-death as people age; representing 45.5% of all deaths for females aged over 85 years; and 32.7% of all deaths for males aged 65-84.

Table 5 Leading underlying broad cause-of-death by age group, 2011. Source: MHMS, Health Information Unit

Age group	#	Males		#	Females	
		Cause-of-death	% of deaths		Cause-of-death	% of deaths
Infants (<1 year)	1	Conditions originating in the perinatal period	62.3	1	Conditions originating in the perinatal period	65.1
	2	Endocrine, nutritional and metabolic diseases	11.3	2	Endocrine, nutritional and metabolic diseases	11.6
	2	Ill-defined conditions	11.3	3	Diseases of the respiratory system	9.3
	4	Infectious and parasitic diseases	7.5	4	Infectious and parasitic diseases	7.0
1-14	1	Endocrine, nutritional and metabolic diseases	25.8	1	Infectious and parasitic diseases	23.5
	2	Infectious and parasitic diseases	22.6	1	Endocrine, nutritional and metabolic diseases	23.5
	3	Diseases of the respiratory system	12.9	1	Diseases of the respiratory system	23.5
	4	External causes of morbidity and mortality	9.7	4	Diseases of the circulatory system	11.8
15-24	1	External causes of morbidity and mortality	43.8	1	Neoplasm's (cancer)	33.3
	2	Diseases of the digestive system	31.3	2	Infectious and parasitic diseases	16.7
	3	Infectious and parasitic diseases	6.3	2	Endocrine, nutritional and metabolic diseases	16.7
		Diseases of the circulatory system		2	Diseases of the circulatory system	16.7
	3	Diseases of the respiratory system	6.3			
	3	Ill-defined conditions	6.3			
	25-44	1	Diseases of the circulatory system	21.3	1	Diseases of the digestive system
1		Diseases of the digestive system	21.3	2	Diseases of the circulatory system	16.7
1		Ill-defined conditions	21.3	3	Ill-defined conditions	13.3
4		Infectious and parasitic diseases	10.6	4	Diseases of the genitourinary system	10.0
45-64	1	Diseases of the circulatory system	40.0	1	Diseases of the circulatory system	20.0
	2	Ill-defined conditions	17.7	2	Endocrine, nutritional and metabolic diseases	18.0
	3	Endocrine, nutritional and metabolic diseases	12.7	2	Diseases of the digestive system	18.0
	4	Diseases of the digestive system	8.9	4	Neoplasm's (cancer)	12.0
65-84	1	Ill-defined conditions	32.7	1	Diseases of the circulatory system	26.0
	2	Diseases of the circulatory system	21.2	2	Ill-defined conditions	23.9
	3	Endocrine, nutritional and metabolic diseases	11.5	3	Diseases of the respiratory system	15.2
	3	Diseases of the respiratory system	11.5	4	Infectious and parasitic diseases	8.7
85 and over	1	Diseases of the skin and subcutaneous tissue	100.0	1	Ill-defined conditions	45.5
	-			2	Diseases of the circulatory system	18.2
	-			2	Diseases of the respiratory system	18.2
	-			4	Infectious and parasitic diseases	9.1

Note: Broad causes of death refer to ICD-10 Chapter-level headings

Percent of deaths are calculated within each age and sex group

3. Determinants: keys to prevention

Many things can affect how healthy we are. They range from society-wide influences right down to highly individual factors such as blood pressure and genetic makeup – they also include the health care we receive. This chapter focuses on these various influences, which are known as health determinants because they help determine how likely we are to stay healthy or become ill or injured.

3.1 What are health determinants?

A person’s health and wellbeing has many aspects. They result from the relationship between social, environmental, socioeconomic, biological and lifestyle factors, nearly all of which can be affected (to some extent) by health care and other interventions.

It is important to note that some determinants are positive in their effects on health and others are

negative. A high daily intake of fruit and vegetables, for example, or being vaccinated against disease are known as **protective factors**.

Things that increase our risk of ill health are known as **risk factors**. Examples include behaviours such as smoking or being physically inactive.

Measuring and monitoring determinants helps to explain trends in health. This information can then be used to help understand why some groups have poorer health than others, and to develop and evaluate policies and interventions to prevent disease and promote health.

Table 6 Relationship between selected chronic diseases (conditions) and risk factors (determinants)⁸

Risk factor	Condition				
	COPD ^(a)	CHD ^(b)	Depression	Type 2 diabetes	Stroke
Behavioural					
Tobacco smoking	✓	✓			✓
Physical inactivity		✓	✓	✓	✓
Alcohol misuse		✓	✓		✓
Poor nutrition		✓		✓	✓
aBiomedical					
Obesity		✓	✓	✓	✓
High blood pressure		✓			✓
High blood cholesterol		✓			✓

(a). COPD Chronic obstructive pulmonary disease

(b). CHD Coronary heart disease (also known as ischaemic heart disease)

8 Australian Institute of Health and Welfare (AIHW). 2010. *Australia’s health 2010. Australia’s health series no. 12. Cat no. AUS 122. Canberra: AIHW*

3.2 Health behaviours

Many things can influence a person's health-related behaviours. A person's knowledge, attitudes and beliefs may make a particular behaviour more or less likely. Further, behaviours may be affected by the presence of disease or disability.

Changing health behaviours is a primary goal of **health promotion**, which often operates at a population level. Other population health interventions such as legislation, regulation or price control may make it harder for people to continue with unhealthy behaviours.

Ultimately, individuals make their own choices about health-related behaviours based on this mix of determinants, interventions and other influences, and consequently have more power to change their own behaviours than many of the other determinants discussed in this chapter.

The following sections describe the levels, patterns and trends of the health-related behaviours that have been shown to have a major influence on health.

Tobacco smoking

Tobacco smoking is a major risk factor for coronary heart disease, stroke, peripheral vascular disease, cancer and a variety of other diseases and conditions. The usual measure of population smoking rates is 'daily' smoking (those who smoke any tobacco product every day), as this reflects the pattern of smoking most harmful to health.

Estimates from the latest STEPS Report (see Box 1) show that in 2006, 61.3% of the population were 'current smokers'⁹ and among current smokers, 59.0% smoked daily. Males were more likely to be daily smokers (74.0%) than females (45.4%). The mean age people started smoking was 19.1 years; men started smoking at a marginally younger age than women (18.2 and 20.5 years, respectively).

Box 1: WHO STEPwise Approach to Surveillance of Risk Factors for NCDs (STEPS Report)

The STEPS Report is a WHO surveillance tool for chronic disease risk factors and chronic disease-specific morbidity and mortality to be used at the national level. To date, 106 countries and territories throughout the world have used the WHO national STEPS tool.

The STEPS approach gathers information on key risk factors in a representative sample of the population using interviews and questionnaires, obtaining simple physical measurements, and collecting blood samples for biochemical assessment. The data gathered enables Governments to put emphasis in the right place when planning and implementing activities to reduce NCD risk factors. National STEPS results can also be used to evaluate the impact of NCD interventions, monitor national trends and judge a country's overall performance by comparing results with other countries.

Data used in the Kiribati STEPS Report are based on a national representative population-wide sample of I-Kiribati. The survey was carried out in South Tarawa and four outer islands (Butaritari, Makin, Onotoa and Beru) from May 2004 to September 2006. A total of 1,755 individuals (response rate 88%) participated in the survey.

⁹ Current smokers are defined as those who had smoked any tobacco product (such as cigarettes, cigars or rolled tobacco) in the past 12 months

Prevalence of 'current smokers', Kiribati and selected countries

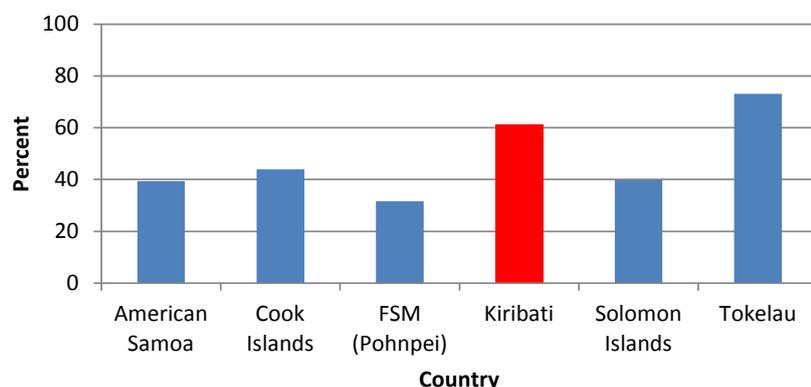


Figure 6 Prevalence of 'current smokers' in Kiribati and selected Pacific Island Countries and Territories, 2009.
Source: STEPS Report, WPRO

Alcohol consumption

Excessive alcohol consumption is a major risk factor for a variety of health problems such as stroke, coronary heart disease, high blood pressure, some cancers, and pancreatitis.¹⁰ It also contributes to motor vehicle accidents, drowning, homicides and falls. Measuring the health risks posed by different levels and patterns of drinking is complex and informed by a large body of research.

The STEPS Report shows that 25.5% of the I-Kiribati adult population had consumed alcohol in the past 12 months (defined as 'current drinkers'). The survey shows that heavy drinking is more common among I-Kiribati men than women. Overall, greater proportions of males in all age groups drank six or more standard drinks per drinking day, with the highest proportion found in the 25-34 years age group (Table 7).

¹⁰ Australian Institute of Health and Welfare (AIHW). 2010. *Australia's health 2010. Australia's health series no. 12. Cat no. AUS 122.* Canberra: AIHW

Table 7 Number of standard drinks per day among current drinkers by age group, 2004-2006¹¹

Age group (years)	Males					Females				
	Total (N)	% one drink	% two-three drinks	% four-five drinks	% six or more drinks	Total (N)	% one drink	% two-three drinks	% four-five drinks	% six or more drinks
25-34	94	--	1.1	11.7	87.2	17	--	5.9	29.4	64.7
35-44	80	2.5	2.5	15.0	80.0	10	20.0	20.0	20.0	40.0
45-54	65	--	6.2	12.3	81.5	15	6.7	33.3	26.7	33.3
55-64	25	--	8.0	20.0	72.0	4	25.0	25.0	--	50.0
25-64	264	0.7	2.8	13.3	83.1	46	7.5	16.9	24.9	50.7

¹¹ World Health Organization Western Pacific Region (WPRO). 2009. *Kiribati NCD Risk Factors: STEPS Report. Fiji: Excellence Fiji Ltd*

Prevalence of 'current drinkers', Kiribati and selected countries

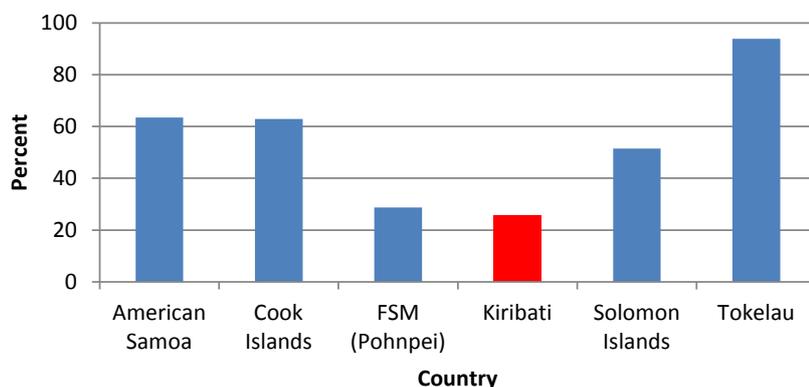


Figure 7 Prevalence of 'current drinkers in Kiribati and selected Pacific Island Countries and Territories, 2009.

Source: STEPS Report, WPRO

Physical inactivity

Physical inactivity is linked to poor health, including many chronic conditions and injuries, excess body weight and low bone-mineral density. Conversely, regular physical activity is associated with maintaining good health, and is important in helping to prevent the onset of some chronic diseases. It helps with better maintenance and control of certain conditions such as arthritis and Type 2 diabetes; and for those who have experienced heart attacks, physical activity can improve recovery and reduce the likelihood of further cardiovascular events.¹² Participating in regular physical activity, in conjunction with a healthy diet, helps to maintain a healthy body weight and reduce body fat, helping to prevent or eliminate obesity.

National guidelines from Australia for physical activity, for both adults and children, provide recommendations about how much physical activity should be undertaken to gain a health benefit (see Box 2). The latest data about physical activity also come from the 2004-2006 STEPS Report, which included questions about how often (frequency) and how long (duration) people were engaged in three domains of physical activity: during recreation or leisure time, work, and transport

in a typical week. In the work and leisure domains, respondents were asked how many days per week and how many hours/minutes per day they participate in moderate- and vigorous-intensity activities. In the transport domain, respondents were asked how often and how long they either walk and/or cycle to and from places.

Box 2: National Physical Activity Guidelines for Australians¹²

The National Physical Activity Guidelines for Australians are guidelines for adults and recommend at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week. The recommendations for children and adolescents advise at least 60 minutes of moderate to vigorous activity every day and no more than two hours of screen-time activity each day.

Examples of moderate-intensity activity are brisk walking, swimming, doubles tennis and medium-paced cycling. More vigorous physical activity includes jogging and active sports like football and rugby.

¹² Australian Institute of Health and Welfare (AIHW). 2010. *Australia's health 2010. Australia's health series no. 12. Cat no. AUS 122.* Canberra: AIHW

Levels of physical activity

The survey found that 50.1% of I-Kiribati reported low-level total physical activity, that is, engaged in physical activities of less than 600 MET (metabolic equivalent) minutes per week.¹³ A greater proportion of women (57.3%) undertook low-level of physical activity compared to men (41.8%). Conversely, a higher proportion of men

reported high-level of total physical activity compared to women (30.1% and 16.6% respectively) (Table 8). Overall, most physical activity in Kiribati was undertaken as part of work, and to a lesser extent, as part of transport. Leisure-time physical activity contributed to very little of the total time spent in physical activity.

13 600 MET minutes per week equals 30 minutes of moderate-intensity physical activity for five days per week, or 20 minutes of vigorous activity for three days per week

Table 8 Categories of total physical activity by age group¹⁴

Age group (years)	Males			Females				
	Total (N)	% Low	% Moderate	% High	Total (N)	% Low	% Moderate	% High
25-34	147	39.5	28.6	32.0	216	54.2	25.5	20.4
35-44	165	36.4	33.3	30.3	231	59.3	27.3	13.4
45-54	149	49.7	20.1	30.2	179	61.5	25.1	13.4
55-64	81	50.6	25.9	23.5	120	55.0	26.7	18.3
25-64	542	41.8	28.1	30.1	746	57.3	26.1	16.6

Prevalence of 'low level physical activity', Kiribati and selected countries

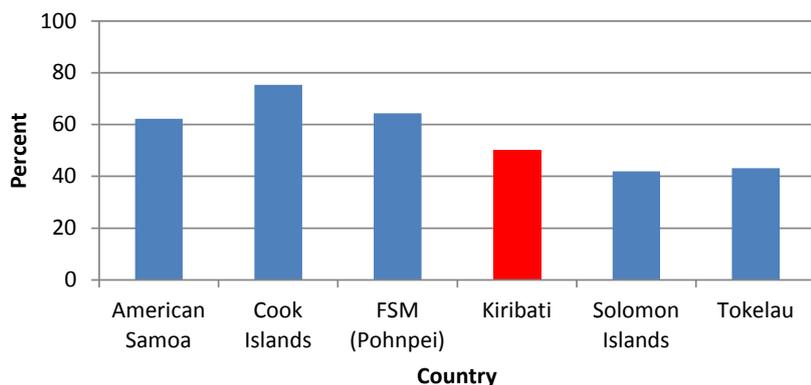


Figure 8 Prevalence of 'low level physical activity' in Kiribati and selected Pacific Island Countries and Territories, 2009. Source: STEPS Report, WPRO

14 World Health Organization Western Pacific Region (WPRO). 2009. *Kiribati NCD Risk Factors: STEPS Report. Fiji: Excellence Fiji Ltd*



Dietary behaviours

The food we eat plays a major role in our health and wellbeing. The dietary guidelines for Australians provide guidance on healthy food choices and lifestyle patterns that promote good nutrition and health. The guidelines have a clear emphasis on enjoying a wide variety of nutritious foods from the five food groups: 1) vegetables and legumes; 2) fruit; 3) cereals; 4) dairy; and 5) meat or meat alternatives. They also recommend that care should be taken to limit saturated fat and restrict total fat intake, to choose foods low in salt and to limit sugar intake.

fruit and vegetables in a typical week, and how many servings of each that they consumed on one of those days. The survey showed that average consumption of fruit and vegetables among I-Kiribati was well below the recommended levels. The mean number of days per week fruit and vegetables were consumed on were 1.5 and 1.9 days respectively. When fruit and vegetables were consumed, the self-reported mean number of combined fruit and vegetable servings was 0.8 serves. The overall prevalence of those consuming less than five combined servings of fruit and vegetables per day was 99.3%.

Fruit and vegetable consumption

In the STEPS Survey, eating behaviours were assessed by asking respondents how many days they consumed

Box: How much is a serve?	
By convention, a serve of fruit is 150g and a serve of vegetables is 75g. The table below sets out some examples of everyday fruit and vegetables in terms of a 'serve'.	
Fruit	Vegetables
1 medium apple, orange or banana	1 medium potato, ½ medium sweet potato
2 items of small fruit, such as apricots or plums	1 cup of salad vegetables
1 cup of canned fruit	½ cup tomatoes, capsicum or cucumber
½ cup of fruit juice	½ cup spinach, cabbage or broccoli

Table 9 Mean number of combined servings of fruit and vegetables consumed per day of the week¹⁵

Age group (years)	Males		Females		Total	
	Total (N)	Mean number of servings	Total (N)	Mean number of servings	Total (N)	Mean number of servings
25-34	158	0.9	218	0.7	376	0.8
35-44	177	0.7	233	0.8	410	0.8
45-54	159	0.7	180	0.7	339	0.7
55-64	85	0.7	119	0.7	204	0.7
25-64	578	0.8	750	0.8	1,329	0.8

15 World Health Organization Western Pacific Region (WPRO). 2009. *Kiribati NCD Risk Factors: STEPS Report*. Fiji: Excellence Fiji Ltd

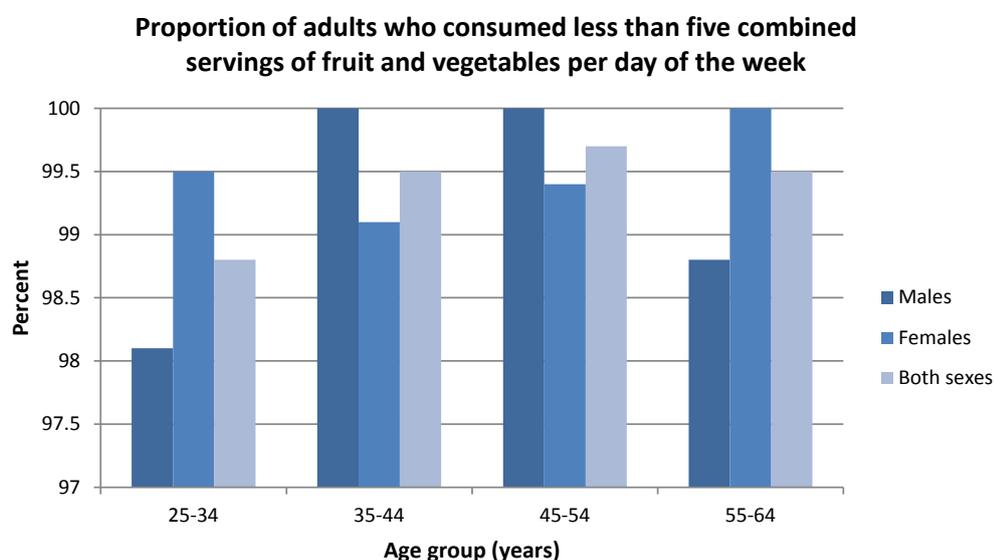


Figure 9 Proportion of people who consumed less than five combined servings of fruit and vegetables per day of the week. Source: STEPS Report, WPRO

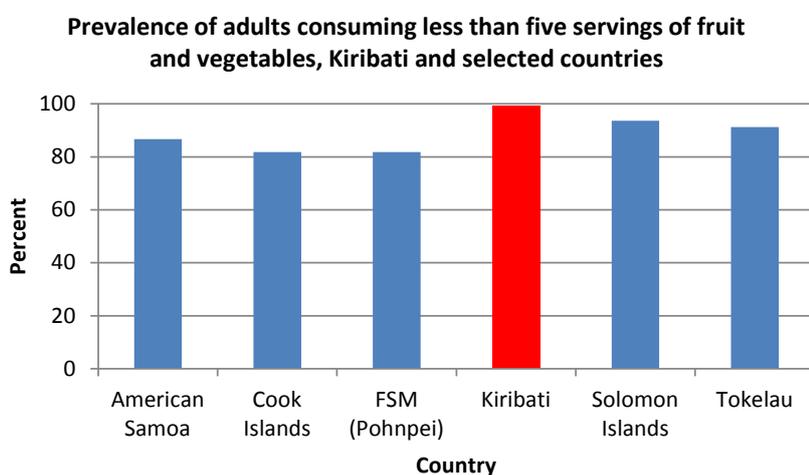


Figure 10 Prevalence of adults consuming less than five servings of fruit and vegetables in Kiribati and selected Pacific Island Countries and Territories, 2009. Source: STEPS Reports, WPRO

3.3 Biomedical factors

Unlike behaviours and other determinants discussed earlier in this chapter, biomedical factors represent actual bodily states. Biomedical factors such as high blood pressure and high blood cholesterol can be regarded as relatively 'downstream' in the process of causing ill health. They carry relatively direct and specific risks for health, and they are often influenced by behavioural factors, which are in turn influenced by other 'upstream' determinants.

Health behaviours tend to interact with each other and influence a variety of biomedical factors. Both physical activity and diet, for example, can affect body weight, blood pressure and blood cholesterol. They can each do this independently, or, with greater effect, they can act together. Further, behavioural and biomedical risk factors tend to increase each other's effects when they occur together in an individual.

Note that several of the biomedical risk factors discussed here are often highly interrelated in causing disease. Excess body weight, high blood pressure and high blood cholesterol, for example, can all contribute to the risk of heart disease and amplify each other's effects if they occur together. In addition, obesity can in itself contribute to high blood pressure and high blood cholesterol.

Body weight

There are health problems associated with being either underweight or having excess weight (overweight and obesity) (see Box 3 for definitions). Being significantly underweight may lead to malnutrition and a range of health problems such as osteoporosis and the inability to fight infections. As Table 10 shows, measurements in the 2004-2006 STEPS Survey suggest that 81.5% of the population is overweight, and from this group, 50.6% is considered obese. Females were more likely to be overweight or obese than males.

Although underweight can be a serious risk to health, the material presented here focuses on excess body weight, as the scale of this problem is markedly greater than that of underweight.

Excess weight, especially obesity, is a risk factor for cardiovascular disease, Type 2 diabetes, some musculoskeletal conditions and some cancers. As the level of excess weight increases, so does the risk

of developing these conditions. In addition, being overweight can hamper the ability to control or manage chronic disorders.

Rates of overweight and obesity are high in Kiribati and overseas. The WHO has estimated that by 2015 there will be 2.3 billion adults who are overweight, and more than 700 million who will be obese.¹⁶ Once considered a problem only in developed countries, obesity is now an increasing concern in developing countries, where problems associated with it often exist along with the effects of under-nutrition.

Box 3: Classifying body weight

Body mass index (BMI) and waist circumference are the two main measures used for monitoring body weight. The BMI assesses people's weight in relation to their height, and is more commonly used in surveys than the waist circumference. The BMI is calculated by dividing a person's weight in kilograms by the square of their height in metres (kg/m²).

The standard classification of BMI recommended by the World Health Organization for adults is based on the association between BMI and illness and mortality and is as follows:

- Underweight: BMI < 18.5
- Healthy weight: BMI ≥ 18.5 and BMI < 25
- Overweight but not obese: BMI ≥ 25 and BMI < 30
- Obese: BMI ≥ 30.³

This classification may not be suitable for all ethnic groups and it is unsuitable for children, so should be used with caution.

For adults, a waist circumference of 94cm or more in males and 80cm or more in females indicates increased risk. A waist circumference of 102cm or more in males and 88cm or more in females indicates substantially increased risk. This classification is not applicable to people aged under 18 years and the cut-off points may not be suitable for all ethnic groups.

¹⁶ World Health Organization (WHO). 2006. Obesity and overweight. Fact sheet no. 311. Geneva: WHO

Excess weight arises through an energy imbalance over a sustained period. Although many factors may influence a person's weight, weight gain is essentially due to the energy intake from the diet being greater than the energy expended. Energy expenditure occurs in three ways: basal metabolism (that is, the energy used to maintain vital body processes), thermic processes (that is, the energy taken to digest and absorb food), and physical activity. Physical activity is the most variable component of energy expenditure, and the only component a person has any direct control over. In a normally active person, physical activity contributes about 20% to daily energy expenditure.¹⁷

In the 2004-2006 STEPS Survey, the majority of adults (81.5%) has a body mass index (BMI) (based on measured data) that indicated they were overweight or obese. A larger proportion of females than males were overweight or obese (84.5% compared with 78.2%).

17 Australian Institute of Health and Welfare (AIHW). 2010. *Australia's health 2010. Australia's health series no. 12. Cat no. AUS 122.* Canberra: AIHW

Table 10 Body mass index based on measured data, by age and sex, persons aged 25-64 (percent)¹⁸

Sex and BMI	Age group (years)				
	25-34	35-44	45-54	55-64	Total 25-64
Males					
Underweight	--	0.5	0.6	--	0.3
Normal	24.7	19.0	20.1	20.7	21.6
Overweight	37.6	33.7	35.4	42.5	36.5
Obese	37.7	46.7	43.9	36.8	41.7
Total males	100.0	99.9	100.0	100.0	100.1
Females					
Underweight	0.5	0.4	--	2.4	0.6
Normal	14.0	13.8	12.6	23.2	14.8
Overweight	24.2	27.2	27.0	24.8	25.7
Obese	61.4	58.6	60.4	49.6	58.9
Total females	100.1	100.0	100.0	100.0	100.0

18 World Health Organization Western Pacific Region (WPRO). 2009. *Kiribati NCD Risk Factors: STEPS Report.* Fiji: Excellence Fiji Ltd

A person's waist circumference can be used to measure what is known as abdominal obesity. Waist circumference is regarded as an important independent risk factor for Type 2 diabetes and the risk increases with increasing waist circumference. In 2004-2006, all age groups for both genders (except for 25-34 year-old males), were at an **increased risk of ill health** due to high waist circumference measurements. While mean waist circumference increased with age among males, the pattern was more stable with females, peaking in the 45-54 year-old age group.

Table 11 Mean waist circumference (cm) and risk level by gender and age group¹⁹

Age group (years)	Males		Females	
	Mean (cm)	Risk level	Mean (cm)	Risk level
25-34	91.4	--	96.8	Substantially increased
35-44	95.8	Increased	96.9	Substantially increased
45-54	95.5	Increased	99.3	Substantially increased
55-64	96.9	Increased	96.4	Substantially increased
25-64	94.2	Increased	97.3	Substantially increased

19 World Health Organization Western Pacific Region (WPRO). 2009. *Kiribati NCD Risk Factors: STEPS Report*. Fiji: Excellence Fiji Ltd

Prevalence of 'overweight' and 'obese', Kiribati and selected countries

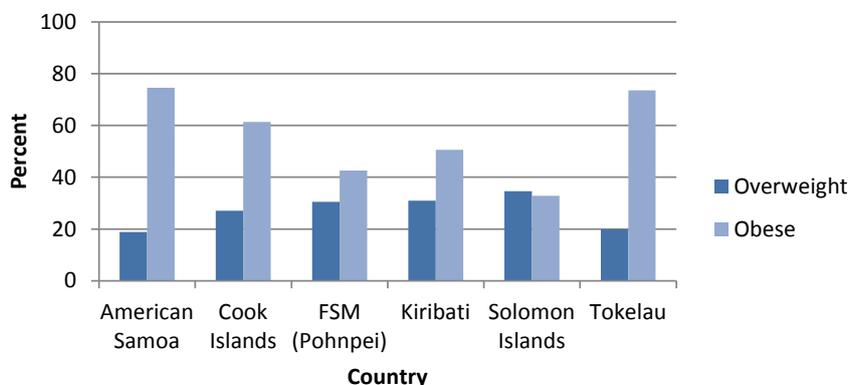


Figure 11 Prevalence of 'overweight' and 'obese' in Kiribati and selected Pacific Island Countries and Territories, 2009. Source: STEPS Report, WPRO

Blood pressure

High blood pressure (often referred to as hypertension; see Box 4) is a major risk factor for coronary heart disease, stroke, heart failure and chronic kidney disease. Studies have shown that the lower the blood pressure, the lower the risk of cardiovascular disease, chronic kidney disease and death.²⁰ When high blood pressure is controlled, the risk is reduced, but not necessarily to the levels of unaffected people.²¹

Worldwide, high blood pressure has been found to be responsible for more deaths and disease than any other biomedical risk factor.²² Major causes of high blood pressure include diet (particularly a high salt intake), obesity, excessive alcohol consumption and insufficient physical activity. Attention to health determinants such as body weight, physical activity and nutrition plays an important role in maintaining healthy blood pressure.

Despite the definition of high blood pressure, blood pressure is a continuum with no threshold level of risk as it rises. Starting from quite low levels, as blood pressure increases so does the risk of stroke, heart attack and heart failure. This means that, for people's usual, day-to-day blood pressure, the lower the better. This is true with rare exceptions.

As part of the STEPS Survey, all survey participants had their blood pressure measured. Participants were also asked if they had their blood pressure measured in the last 12 months, within the last one to five years or longer, whether they had ever been told in the last 12 months by a health worker that they had high blood pressure, and if they were currently receiving any medical treatment for high blood pressure.

The survey found an estimated 17.3% of I-Kiribati had high blood pressure. While raised blood pressure increased with age, this condition was more common among men than women.

Box 4: High blood pressure

Blood pressure represents the forces on the wall of the arteries, and is written as systolic/diastolic (for example 120/80 mmHg, stated as '120 over 80'). Systolic blood pressure reflects the maximum pressure in the arteries when the heart muscle contracts to pump blood; diastolic blood pressure reflects the minimum pressure in the arteries when the heart muscle relaxes before the next contraction.

There is a continuous relationship between blood pressure levels and cardiovascular disease risk. This makes the definition of high blood pressure somewhat arbitrary. The World Health Organization and STEPS Survey define 'high blood pressure' as:

- Systolic blood pressure of 140 mmHg or more, or
- Diastolic blood pressure of 90 mmHg or more, or
- Receiving medication for blood pressure.

20 National Health Foundation of Australia (NHFA). 2009. Position statement: build environment and walking. Melbourne: NHFA

21 World Health Organization – International Society of Hypertension (WHO-ISH). 1999. 1999 World Health Organization – International Society of Hypertension statement on management of hypertension. *Journal of Hypertension* 21: 1983-92

22 Lopez et al. 2006. Global and regional burden of diseases and risk factors, 2001: systematic analysis of population health data. *Lancet* 367: 1747-57

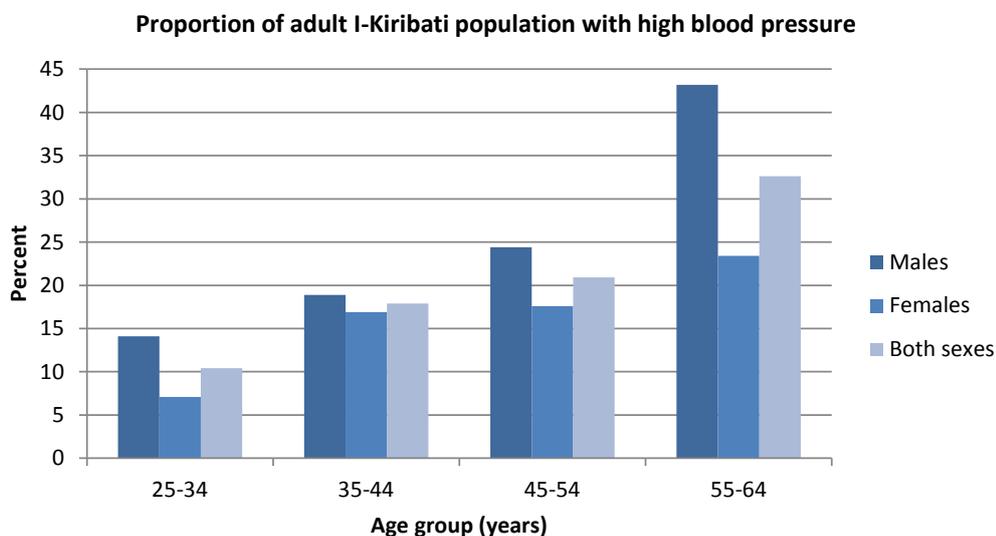


Figure 12 Proportion of adults with high blood pressure (SBP \geq 140 and/or DBP \geq 90 mmHg or currently on medication for high blood pressure) by gender and age group. Source: STEPS Report, WPRO, 2009

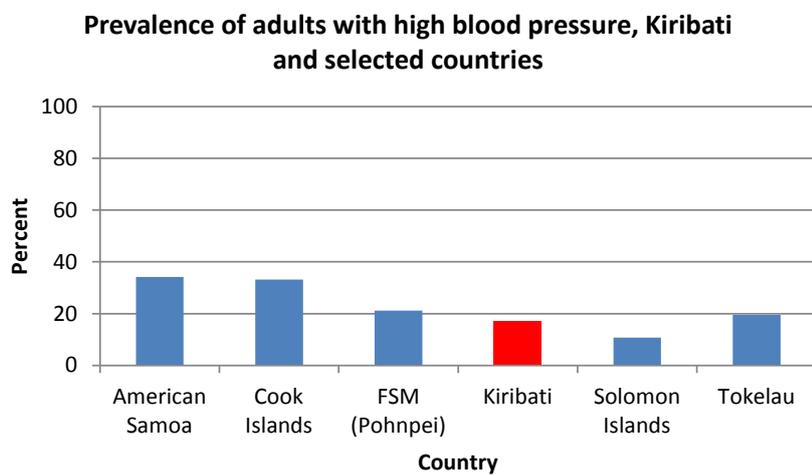


Figure 13 Prevalence of adults with high blood pressure in Kiribati and selected other Pacific Island Countries and Territories, 2009. Source: STEPS Report, WPRO, 2009

Blood cholesterol

High blood cholesterol (see Box 5) is a major risk factor for coronary heart disease and ischaemic stroke. It is a basic cause of plaque, the process by which the blood vessels that supply the heart and certain other parts of the body become clogged.

For most people, saturated fat in the diet is the main factor that raises blood cholesterol levels. Genetic factors can also affect blood cholesterol, severely in some individuals. Physical activity and diet play an important role in maintaining a healthy blood cholesterol level.

Box 5: High blood cholesterol

Cholesterol is a fatty substance produced by the liver and carried by the blood to the rest of the body. Its natural function is to provide material for cell walls and for steroid hormones. If levels in the blood are too high, this can lead to artery-clogging plaques that can bring on heart attacks, angina or stroke. The risk of heart disease increases steadily from a low base with increasing blood cholesterol levels.

For the STEPS Report, levels of 'high' blood cholesterol are based on a total cholesterol level of 5.0 mmol/L or more.

The STEPS Survey estimated that 27.7% of the population of I-Kiribati had elevated blood cholesterol levels. There was a higher proportion of females (30.6%) with elevated cholesterol as compared to males (23.8%). The prevalence of high blood cholesterol increased with age to a peak for females aged 45-54 years. Among males, the prevalence increased dramatically in the 35-44 age group, before declining again in the older age groups (Figure 14).

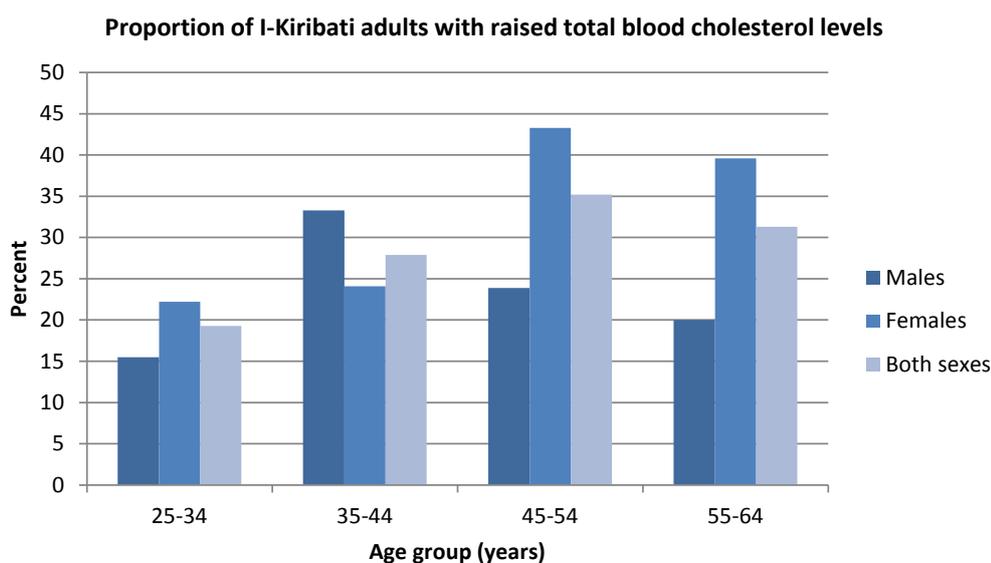


Figure 14 Proportion of I-Kiribati adults with raised total blood cholesterol (≥ 5.0 mmol/L) by gender and age group²⁴

²⁴ World Health Organization Western Pacific Region (WPRO). 2009. *Kiribati NCD Risk Factors: STEPS Report*. Fiji: Excellence Fiji Ltd

Blood glucose

Every cell in the body depends on glucose for energy. Insulin is a hormone that helps regulate the movement of glucose from the bloodstream and into the cells. Changes in the production and action of insulin can affect glucose regulation.²³

Impaired glucose regulation is the metabolic state between normal glucose regulation and failed regulation. Failed glucose regulation is known as diabetes. There are two categories of impaired glucose regulation: impaired fasting glucose (IFG) and impaired glucose tolerance (IGT). IFG and IGT are risk factors for the future development of diabetes and cardiovascular disease.

The 2004-2006 STEPS Survey measured levels of fasting blood glucose among adults. It found that the overall prevalence of diabetes (defined as raised fasting blood glucose levels) among I-Kiribati aged 25-64 was 28.1%.

The prevalence of diabetes increases with age across both genders (Figure 15). For males, a substantial and significant increase in diabetes occurs between the age of 35-44 years and 45-54 years, from 27.7% to 49.6% respectively. For females, diabetes prevalence almost doubles between 25-34 and 35-44 years. The prevalence rate peaks for both genders in the oldest age group.

²³ Australian Institute of Health and Welfare (AIHW). 2010. *Australia's health 2010. Australia's health series no. 12. Cat no. AUS 122.* Canberra: AIHW

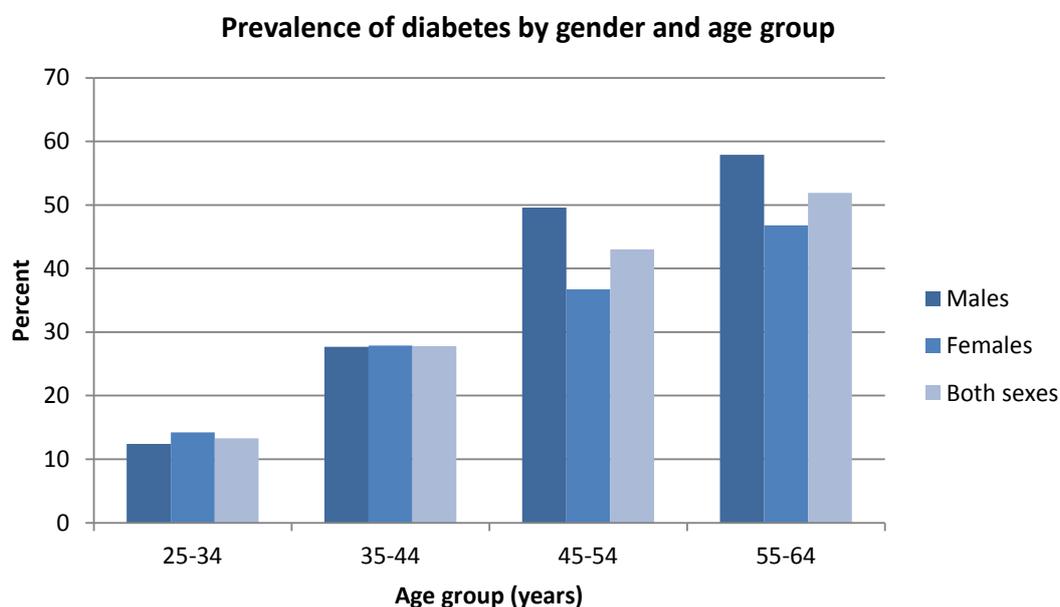


Figure 15 Prevalence of diabetes by gender and age group (raised blood glucose or currently on medication for diabetes and/or diagnosed with diabetes). Source: STEPS Report, WPRO, 2009

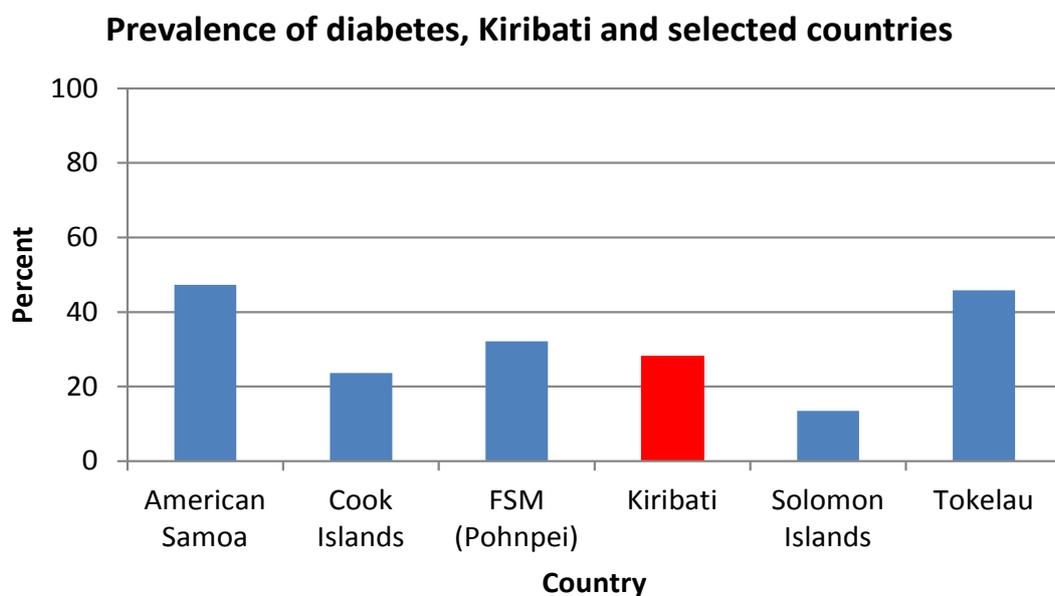


Figure 16 Prevalence of diabetes in Kiribati and selected other Pacific Island Countries and Territories, 2009. Source: STEPS Reports, WPRO, 2009

