

# **Cost of Early Retirement Due to Ill Health**

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**REPORT TO THE APEC BUSINESS ADVISORY COUNCIL  
AND US CHAMBER OF COMMERCE**

Victoria Institute of Strategic Economic Studies  
Victoria University, Melbourne  
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Victoria Institute of Strategic Economic Studies  
Victoria University  
PO Box 14428  
Melbourne VIC 8001  
For further information contact:  
Bruce Rasmussen  
[Bruce.Rasmussen@vu.edu.au](mailto:Bruce.Rasmussen@vu.edu.au)

## EXECUTIVE SUMMARY

This report provides estimates of the cost, both economic and fiscal, of early retirement due to ill health for eight APEC economies, Australia, China, Japan, Malaysia, Peru, the Philippines, Singapore and the United States.

The report considers the combined impact of increasing chronic disease and ageing on the ability to work in the years prior to statutory retirement age. The estimated economic costs of this inability to work are estimated to be in the range 2-2.5% of GDP per annum.

The fiscal costs considered in this report arise from government support by way of disability pensions for those no longer able to work due to ill health. Currently these arrangements differ widely between the developed economies of US and Australia and developing economies, such as Malaysia, Peru, and the Philippines. While the costs currently being experienced by US and Australia, through their disability pension schemes are of the order of 1-1.5% of GDP, they are only in the range 0.01-0.02% of GDP for developing countries.

This difference arises because of the very different definitions of disability and their interpretation between the economies. In developing economies, the definition and its interpretation are narrow and consequently the coverage of pensions is restricted. However even projected on a 'status quo' basis, the costs of these arrangements are expected to rise by 4-5% per annum. Should these economies move to provide more generous arrangements, with pension rates and coverage moving toward (about 30% of) US/Australian levels, then the costs could accelerate the growth rates to the order of 15-20% per annum for Malaysia, Peru and the Philippines.

Chronic disease is generally associated with developed countries. The trends in the health risk factors associated with chronic disease are complex across the region. Some such as BMI are generally rising, while others such as smoking are generally falling. The Global Burden of Disease study provides a comparable and reasonably reliable measure of the impact of chronic and other disease on morbidity. This shows that while chronic disease is high in the developed economies of US and Australia, it is also high in the developing economies of Malaysia, Peru and the Philippines. This suggests that the level of disability identified by the definitions employed by these economies seriously under reports the impact of ill health on those of approaching retirement age.

The impact of ill health on the ability to work is a matter of increasing importance for many developing economies in the region because of the stalling, and in some cases falling, working age population. Increasingly maximising the productivity of this labour force is becoming a priority. An earlier VISES report in this series for ABAC showed that the economic cost of absenteeism and presenteeism was 4-6% of GDP. This report suggests that there is a further 2-2.5% of GDP arising from early retirement due to ill health.

In the US, some of this cost has traditionally fallen on business through the provision of health care plans for early retirees. The rising cost of these arrangements and the actions of US firms to constrain their increase suggest that they are not a good model for developing economies in the region. Nonetheless it can be expected that business in the region will be asked to bear an increasing share of the emerging cost burden.

This report suggests that new models of assistance need to be formulated, which will address the increasing problem of chronic disease, as well as providing support for those unable to work effectively due to ill health.



## Table of Contents

EXECUTIVE SUMMARY .....	iii
Table of Contents .....	v
List of Tables .....	vi
List of Figures .....	vi
Introduction .....	1
Context for the Study .....	3
Population trends .....	3
Implications for labour supply .....	4
Trends in risk factors .....	5
Burden of disease.....	11
Impact of Ill Health on the Ability to Work .....	12
Definitions of Disability and their Estimates.....	12
The Economic Loss Due to Early Retirement .....	14
Comparing Disability Prevalence with Disability Support.....	15
Modelling Disability Support.....	17
Cost to Business .....	18
Conclusions from the Analysis .....	20
Implications.....	21
References .....	22
Appendix A: Outline of Disability and Retirement Arrangements in Selected APEC Economies .....	24
Disability in developed countries.....	24
Disability in developing countries.....	25
Outline of arrangements in particular developing economies .....	26

## List of Tables

Table 1 Disability prevalence estimates from different sources: selected countries, various years.....	14
Table 2 Comparing disability prevalence with those on disability pensions .....	16
Table 3 Age structure of disability pensioners and their respective proportion of their population age cohorts, Australia and Malaysia .....	16
Table 4 Projected growth (CAGR) in cost of disability pensions, no change (1) and increased coverage (2) scenarios.....	17
Table 5 Projection of disability pension costs developing economies, Scenario 1 and 2 (2013 PPP million).....	18
Table 6 Health care cost trend analysis, top 20 US corporations, 2014 .....	19

## List of Figures

Figure 1 Employer contributions for employee pension funds, US private pension plans.....	2
Figure 2 Measures of the extent and timing of population ageing, four APEC economies, 1990-2010 and 2010-30 (projected), change in share of population in individual age groups (percentage points).....	3
Figure 3 Proportion of the labour force aged 50-64, eight APEC economies, 2000, 2010, 2015 and 2030 (projected) .....	5
Figure 4a Smoking rates, males, per cent of population, eight APEC economies, 1980 to 2012 .....	6
Figure 4b Smoking rates, females, per cent of population, eight APEC economies, 1980 to 2012.....	6
Figure 5 Mean systolic blood pressure rates, males, eight APEC economies, 1980 to 2008 (SBP in mm Hg) .....	7
Figure 6 Mean total cholesterol rates, males, eight APEC economies, 1980 to 2008 (mmol/L) .....	8
Figure 7a Mean BMI, males, kg/m <sup>2</sup> , eight APEC economies, 1980 to 2008 .....	9
Figure 7b Mean BMI, females, kg/m <sup>2</sup> , eight APEC economies, 1980 to 2008.....	9
Figure 8a Diabetes prevalence, males, per cent of population, eight APEC economies, 1980 to 2008 .....	10
Figure 8b Diabetes prevalence, females, per cent of population, eight APEC economies, 1980 to 2008.....	10
Figure 9 Burden of disease by cause (YLDs) of those aged 50-64, eight APEC economies, 2010.....	11
Figure 10 Global disability prevalence estimates from different sources .....	13
Figure 11 Economic cost of early retirement, selected economies, 2015 and 2030.....	15
Figure A1 Disability prevalence increases sharply with age which is critical in view of population ageing, self-assessed disability prevalence, as a percentage of the population, by age group, late-2000s .....	25

## Introduction

This report provides estimates of the fiscal and economic costs of early retirement due to ill health for eight selected APEC economies, Australia, China, Japan, Malaysia, Peru, the Philippines, Singapore and the United States.

This study is in the context of a series of reports which examine aspects of the impact of ill health on productivity. An earlier VISES report (Sheehan et al. 2014) focused on the impact of absenteeism and presenteeism on productivity in the work place. That report showed economic cost of absenteeism and presenteeism was in the region of 4-6% of GDP for the same economies considered in this report.

This report adds another piece to the health and productivity jigsaw by estimating the economic and fiscal costs of premature retirement from ill health. It does so by examining the prevalence of disability due to poor health which impairs the ability of people, as they age, to continue to work. The illnesses are largely the same chronic conditions which reduce productivity due to absenteeism and presenteeism. So the same risk factors, such as smoking and obesity, discussed in the earlier report are relevant to the problem addressed here.

Together with the earlier report, our several studies now address the impact on productivity of:

- (i) Premature death
- (ii) Morbidity which leads to lower productivity of those still able to work, and
- (iii) Morbidity which leads to early retirement.

The earlier VISES report (Sheehan et al. 2014) addressed (i) and (ii), while this report deals with (iii). These are mutually exclusive effects so the economic costs identified in this report of 2-2.5% of GDP can be added those estimated in the earlier report. The total potential impact of the two is in the range 6-8.5% of GDP.

The economic costs in (iii) are those arising from lost productive capacity due to the lower participation rates of the older age groups, as those impaired to varying degrees are limited in their ability to work.

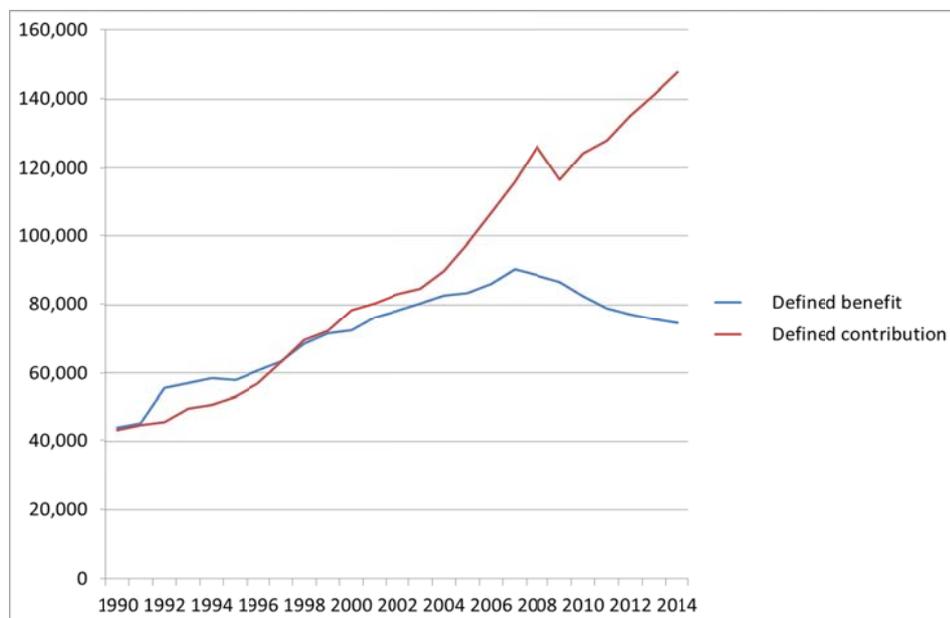
In most economies some of these people are entitled to government support in the form of disability pensions. The criteria used to qualify people for these pensions vary widely across the countries considered here, with developed economies more generous than developing economies. Accordingly, the fiscal cost of this support varies enormously between economies. As with the earlier study, this report does not provide estimates of the cost of treatment of ill health reflected in the decision to reduce or abandon work. The fiscal cost estimates and projections are confined to the increasing cost of disability support by government.

In addition to these costs, business in the United States bears a significant cost to provide health cover for its workforce. Many companies, particularly large ones, continue to meet the health costs of their retired employees, including those who have retired early due to ill health. This practice does not seem to have been adopted to any great extent by business in other countries that we examined. Moreover, the number of US corporations providing these benefits is reducing and the eligibility for the benefits are becoming more restricted as the costs of health care under these arrangements continues to rise at rates well above inflation. Google and Microsoft, for instance, do not have these liabilities, while communications companies, such as AT&T and Verizon, have particularly large obligations.

This study is concerned with the costs and obligations that arise from ill health for an ageing and prematurely retiring workforce. It does not seek to estimate the cost borne by companies and pension funds of the premature drawdown of retirement entitlements arising from ill health. The pension arrangements are highly complex. They vary substantially within and between countries. It would also be a massive study to disentangle the impact of ill health on corporate pension payments, and there is very limited (no) publically available data to allow estimates to be made of this health impact.

In addition, the impact is increasingly being borne by the individual, not business as the pension plans shift from defined benefit to defined contribution plans. For the US, aggregate balance sheet data published by the Bureau of Economic Analysis allows these trends and their relative magnitude to be scoped. Figure 1 shows the declining trend in the cost of employer contributions for private pension plans in the US, which reached a maximum of \$90.4 billion in 2007 and has since declined to \$74.7 billion in 2014.

**Figure 1 Employer contributions for employee pension funds, US private pension plans**



Source: US Bureau of Economic Analysis.

The uncertain future health status of retirees, along with their longevity, represents two of the most important risks faced by those living on retirement incomes. Both have a major impact on the adequacy of the lump sum amounts with which they begin their retirement years. While the retirement industry is increasingly focused on addressing the longevity problem as part of people's retirement plans, there is less attention given to the equally large problem of declining health status as retirees age. This presents an opportunity for the private sector to develop solutions that combine retirement income with the management of health risks.

Early retirement due to ill health arises mostly from chronic conditions, such as often untreatable musculoskeletal and circulatory system disorders, and their high incidence is of particular concern.

While these trends have been apparent in developed countries for some time, they are emerging problems for developing countries. Developed countries, such as Australia and the United States, have developed comprehensive retirement and disability support systems.

For the developing countries discussed in this report, China, Malaysia, Peru and the Philippines, provision for retirement and long-term ill health remains predominately a private or family cost and often a prescription for descent into serious poverty. The various government supported retirement and disability arrangements are often poorly targeted, narrow in their coverage and provide only low level support benefits (Park 2011).

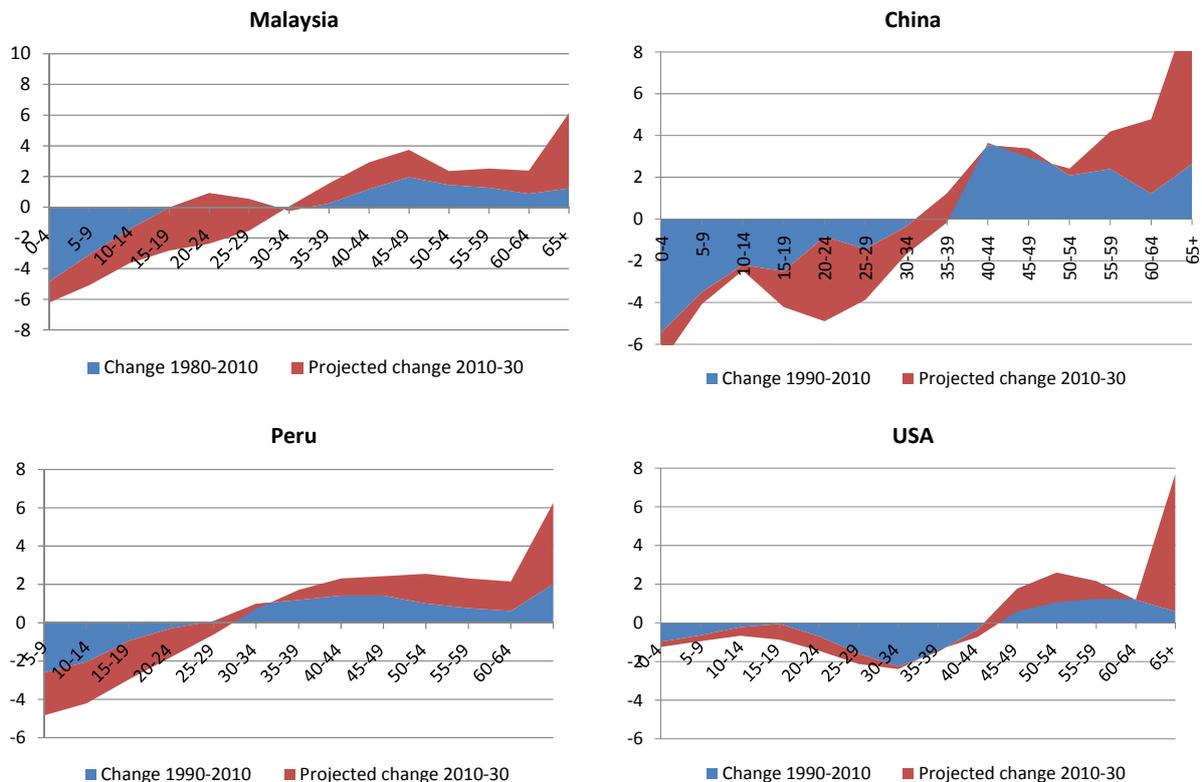
## Context for the Study

### Population trends

The combined effect of an ageing population and the high overall prevalence of a range of chronic diseases for most of the countries surveyed in this study are having an adverse impact on labour supply. For a number of these economies, their working age populations have peaked and are declining or about to do so. For affected economies, such as China, the previously rapid increase in labour supply has been one of its growth engines. For these economies, conserving labour by extending their working lives and improving their health status has become an important economic priority.

Sheehan et al. (2014) provided a detailed analysis of changing population patterns. Those for four representative economies are shown in Figure 2.

**Figure 2 Measures of the extent and timing of population ageing, four APEC economies, 1990-2010 and 2010-30 (projected), change in share of population in individual age groups (percentage points)**



Source: VISES analysis of data from United Nations (2014).

Common to each of the economies is the pronounced shift in population to the older age groups. The charts show this for two periods, firstly actual from 1990 to 2010 and secondly projected change from 2010 to 2030. While the effect is more pronounced for the US and China, all of the economies

will experience declining population numbers for those aged under 30 years of age and significant increases for those over 64 years of age.

China stands out as having the strongest ageing profile of the four economies, for both periods. Over the period 1990-2010, there was a sharp rise in the population shares for age groups from 40-60 years of age, at the expense of sharp falls in the pre-school and school years. Over the projection period, the big falls in population shares are in the 15-29 year age groups, while the rise in shares is mainly from 55 years and over. This means that, while there will still be significant labour force effects, the strongest growth will be in the population 65 years and over. This is also the case for the US.

Both Malaysia and Peru will experience significant increases in their older age working populations (45-64 years of age), which given higher prevalence of chronic diseases will have implications for the numbers retiring early due to ill health.

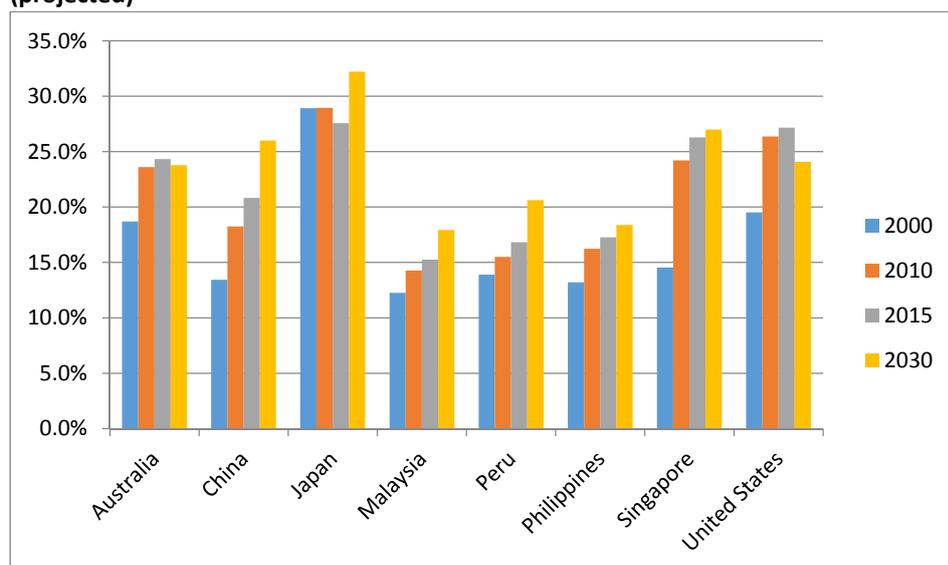
### Implications for labour supply

The Sheehan et al. study (2014) provided a detailed analysis of the implications of this ageing process for the labour force in each country. This showed the large shift in the proportion of the labour force aged over 45 years for most selected economies. The relative size of the older work force has a major influence on the costs of early retirement.

Figure 3 focuses on the preretirement workforce aged 50-64. It shows the changes in this age group as a proportion of the total labour force over the period 2000 to 2030 (projected). The pattern of change varies markedly between economies. Some such as China, and to a lesser extent Malaysia, Peru and Philippines have, and will continue to have, a greatly increasing proportion of the total labour force aged 50-64. For China, the share is projected to double from 2000 to exceed 25% of the labour force by 2030. For a number of economies, Australia, Singapore and the US, the largest increase occurred in the period 2000 and 2010, when it reached about 25% with little increase or a small decline for the US and Australia projected to 2030. For Japan, the proportion was already close to 30% in 2000 and is expected to increase to 32% by 2030.

In summary, four economies are already experiencing the problem of having 25-30% of their labour force in the increasingly high health risk 50-64 age group. China will reach that range by 2030. The other developing economies, Malaysia, Peru and Philippines, starting from a lower base, will experience a significant increase in their work forces aged 50-64 from around 12-14% to about 15-20% by 2030.

**Figure 3 Proportion of the labour force aged 50-64, eight APEC economies, 2000, 2010, 2015 and 2030 (projected)**



Source: ILO (2015).

### Trends in risk factors

Certain risk factors increase the probability that a person will develop non-communicable diseases, such as cardiovascular disease and cancer. The major risk factors include smoking tobacco, an inadequate diet, physical inactivity, high blood pressure (hypertension), high levels of cholesterol, being overweight and being diabetic. Trends in these risk factors can provide some insight into the prevalence of major disease.

Information on risk factors is patchy, particularly for developing countries, with the most common source being periodic national health surveys and one-off epidemiological studies. However, a number of researchers have attempted to provide as much information as possible on trends in the major risk factors. A number of articles in *The Lancet* in 2011 presented estimates for the years 1980, 1990, 2000 and 2008 of trends in systolic blood pressure (Danaei et al. 2011a), serum total cholesterol (Farzadfar et al. 2011), body mass index (Finucane et al. 2011), and fasting plasma glucose and diabetes (Danaei et al. 2011b). More recently Ng et al. (2014) have estimated smoking prevalence for the years 1980, 1996, 2006 and 2012. Given the data issues discussed above, these figures must be regarded as the best estimate possible by analysing the available data sets, rather than in any sense definitive figures, but we provide below a review of the findings of these and related studies.

The following analysis of risk factors presents the factors for both sexes except where the patterns are similar, in which case the risk factors for males are presented. Generally the risk factors for males are above those for women. One notable difference is for BMI and diabetes for Singapore where BMI for women has fallen in contrast to an increase for men and diabetes for women has fallen particularly sharply. This is considered in more detail below.

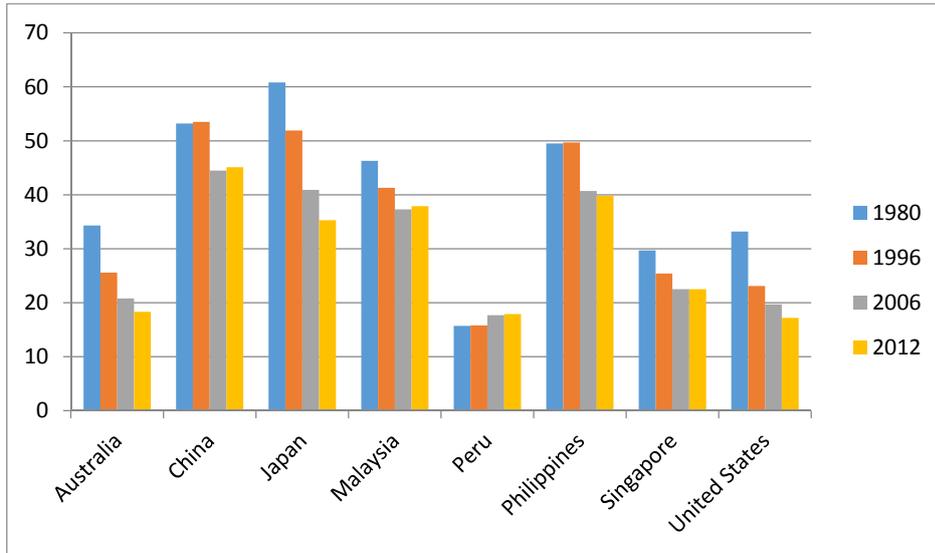
### Smoking

Smoking rates remain high, especially for men, in many developing countries, and especially in Asia. Figure 4a shows that, in terms of male smoking behaviour, the eight economies break into two distinct groups. In three – China, Japan, Malaysia and the Philippines – smoking rates for males remain close to or above 40% in both 2006 and 2012, after falling significantly between 1996 and

2006. By comparison, male smoking rates in Australia, the US and Singapore were lower than in these countries in 1986 and have fallen steadily since that time, down to 17-18% by 2012. In Peru, male smoking rates were low in the 1980s and, in spite of a modest rise since then, remain below 20% in 2012.

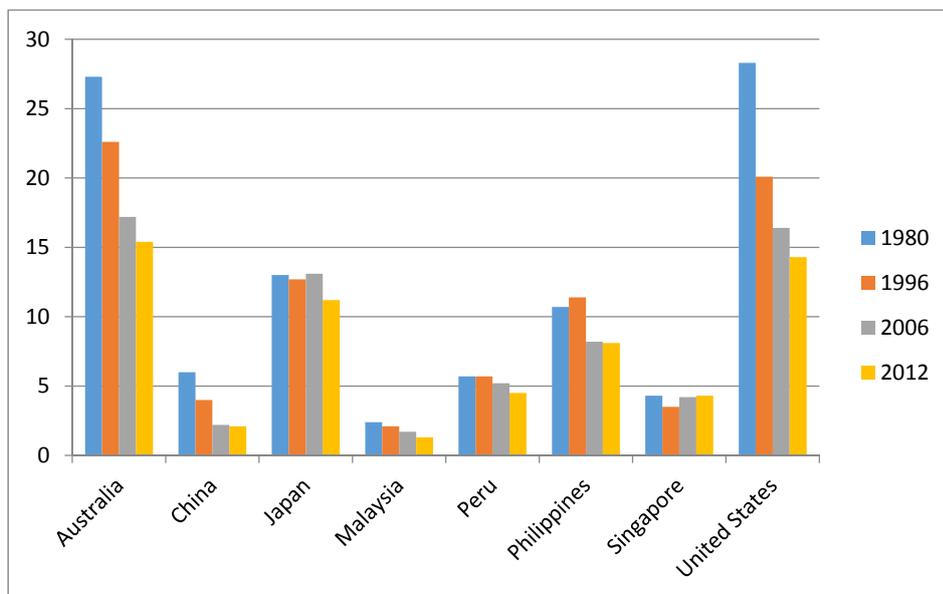
These persistently high smoking rates among men in the four Asian economies present a serious and ongoing health challenge to those economies. However, smoking rates among women in China, Malaysia and Singapore, are low; much lower than in Australia and the USA, where females smoking rates are reasonably close to those for males.

**Figure 4a Smoking rates, males, per cent of population, eight APEC economies, 1980 to 2012**



Source: Ng et al. (2014).

**Figure 4b Smoking rates, females, per cent of population, eight APEC economies, 1980 to 2012**

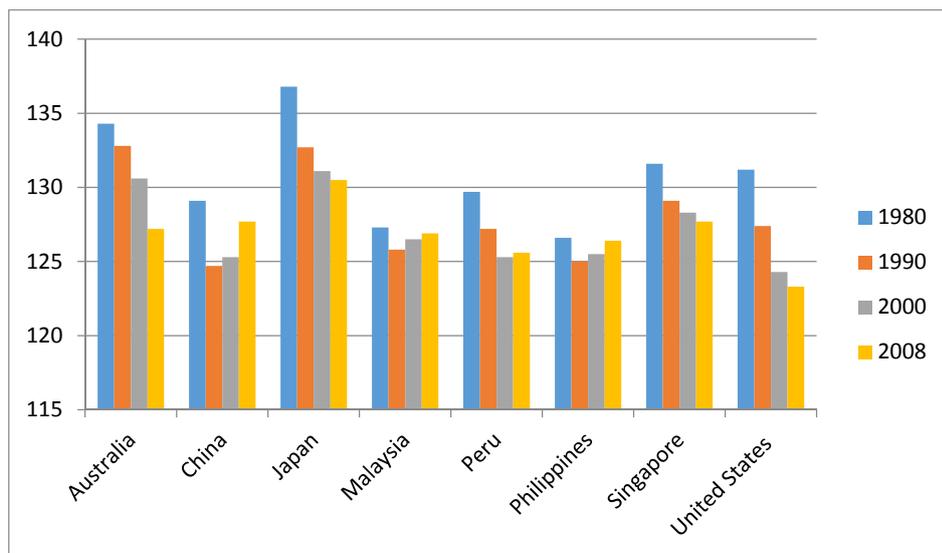


Source: Ng et al. (2014).

### Systolic blood pressure

High blood pressure or hypertension is an important risk factor for various forms of cardiovascular disease. High blood pressure can be treated by various forms of medication, and the levels reported in the studies are normally actual blood pressure after the effects of any treatment. Figure 5 shows that age-standardised mean systolic blood pressure (SBP in mm Hg) for males was higher in Australia and the USA than the other countries in 1980, but has fallen considerably and successively in each year since then. Much of this fall is likely to be from the effect of treatment rather than from improvement in the underlying cardiovascular condition.

**Figure 5 Mean systolic blood pressure rates, males, eight APEC economies, 1980 to 2008 (SBP in mm Hg)**



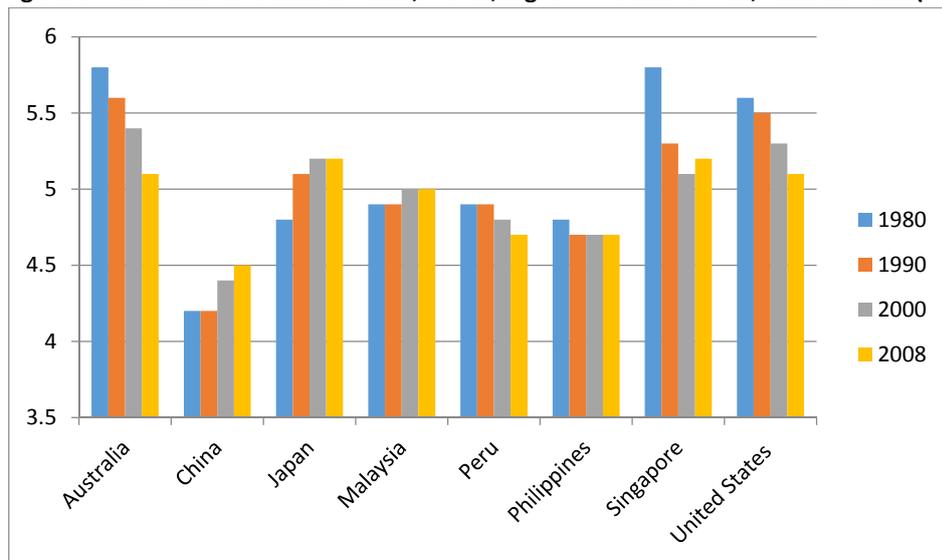
Source: Danaei et al. (2011a).

However, in the three Asian developing economies, blood pressure levels have increased since 1990, after falling between 1980 and 1990. This increase is especially notable for China, where official data suggests that the increase has continued after 2008, but is also substantial for both Malaysia and the Philippines. Peru is again a special case, with mean blood pressure levels falling significantly between 1980 and 2000, albeit rising slightly between 2000 and 2008.

### Cholesterol

As with high blood pressure, serum total cholesterol (TC) (reported in Figure 6 in mmol/L) is another risk factor for cardiovascular disease. TC rates for males were very high in the 1980s in Australia and the USA, but have fallen significantly since then, presumably in good part as a result of widespread treatment regimes. Trends in the other economies have been mixed. Peru and the Philippines had low TC in 1980 and levels have fallen somewhat since then. In China, Japan and Malaysia, TC has risen significantly although levels are still below those in Australia and the USA.

Figure 6 Mean total cholesterol rates, males, eight APEC economies, 1980 to 2008 (mmol/L)



Source: Farzadfar et al. (2011).

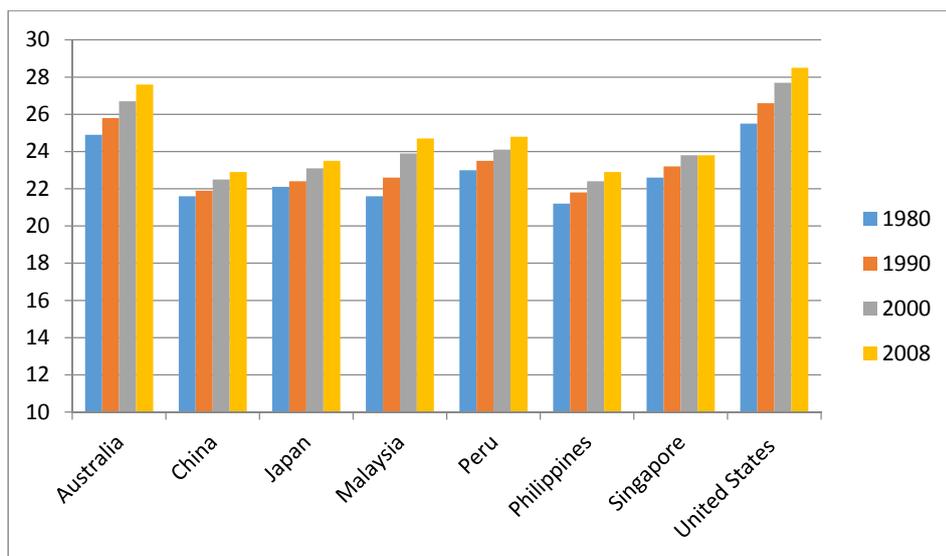
### Body mass index

Being overweight and obese is an important risk factor for many NCDs. The widely used measure is the body mass index (BMI), which is defined as a person's weight in kilograms divided by the square of height in metres. Overweight is defined as values greater than 25 kg/m<sup>2</sup> while obesity is defined as greater than 30 kg/m<sup>2</sup>.

BMI for males (Figure 7a) has increased in all eight economies, but more notably in Australia and the USA. Levels in 2008 indicate that the average person in those countries is overweight. Mean BMI levels in the developed economies are lower, but also rising. The increase in Malaysia and Peru has brought those countries close to the overweight level on average, with this rise in Malaysia being more rapid than in Peru. While the increases in China, Japan and the Philippines have been more modest, they have been steady across the full period and there are signs that the increase has continued beyond 2008.

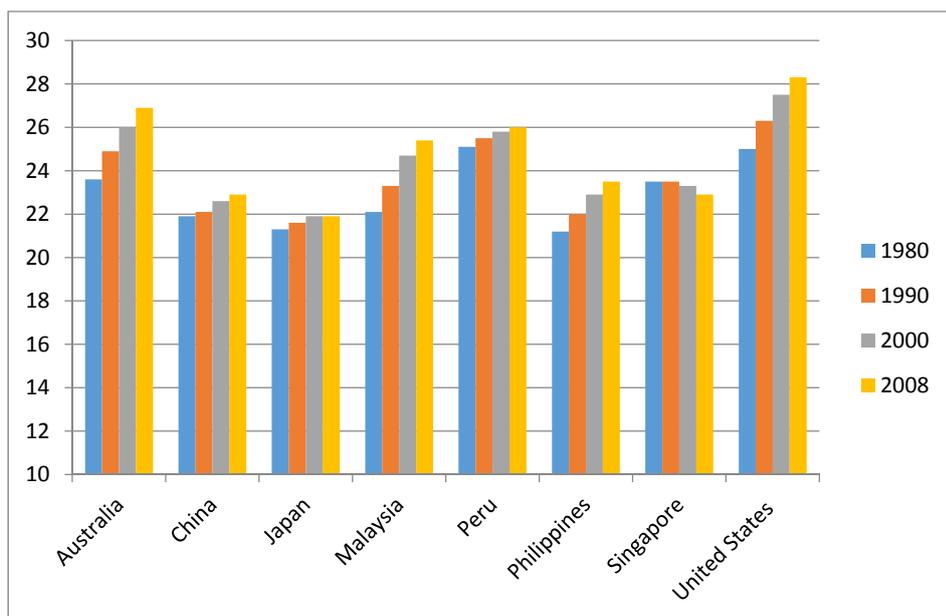
The trends for Singapore are somewhat different. There was no change in the BMI level for males between 2000 and 2008 and BMI levels for females (Figure 7b) has been declining since 1990.

Figure 7a Mean BMI, males, kg/m<sup>2</sup>, eight APEC economies, 1980 to 2008



Source: Finucane et al. (2011).

Figure 7b Mean BMI, females, kg/m<sup>2</sup>, eight APEC economies, 1980 to 2008



Source: Finucane et al. (2011)

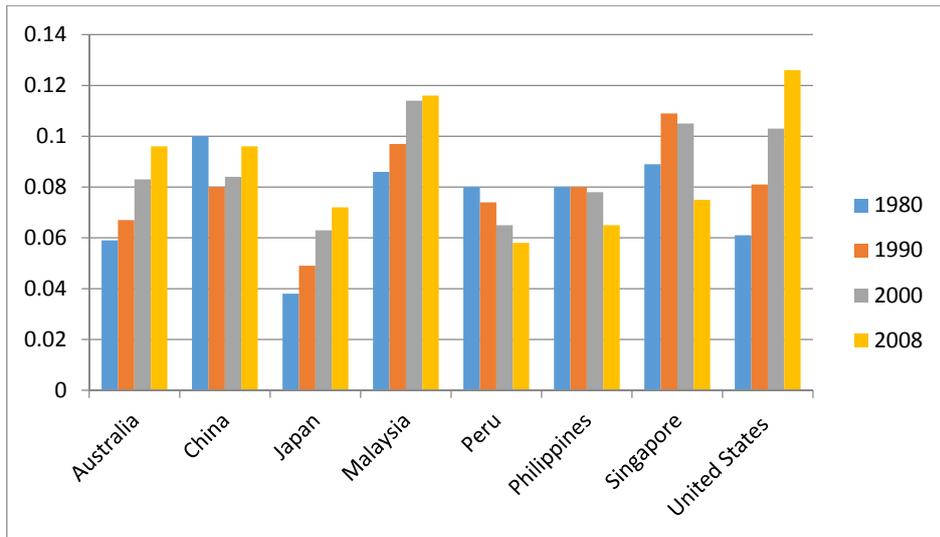
### Diabetes

The final risk factor to be discussed is diabetes which is both a disease in itself and an important risk factor for many other NCDs. Largely in contrast to these other risk factors, the prevalence of diabetes among males has increased strongly in Australia and the USA (Figure 8a). Malaysia also has high and rising prevalence, significantly higher than Australia, and by 2008 China had reached the same level as Australia. By contrast diabetes prevalence rates in Peru and the Philippines have been falling and are now much lower than in the other economies.

As with hypertension, the measure of diabetes prevalence normally includes diabetes which is treated and controlled, as well as that which is not diagnosed or, if diagnosed, is not controlled by

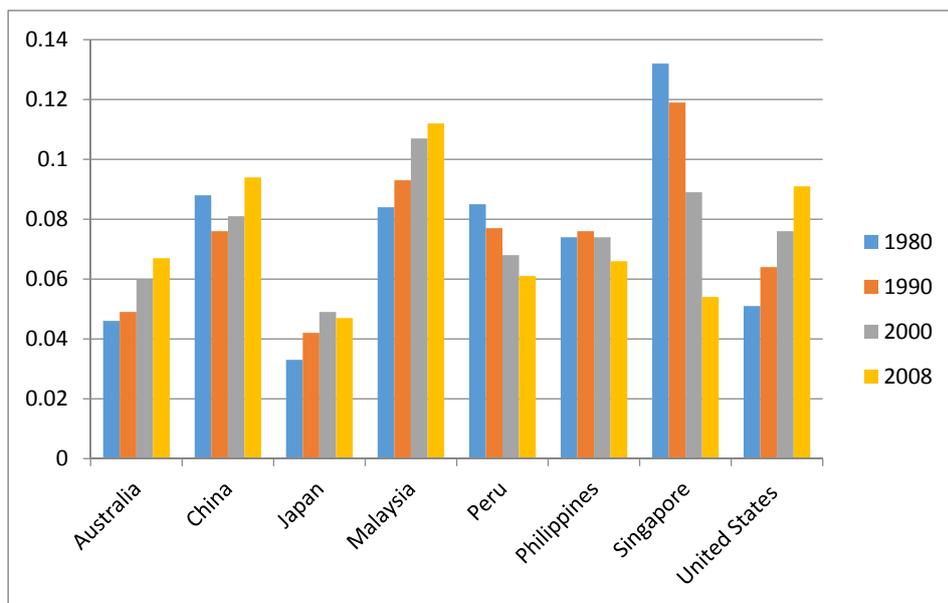
appropriate treatment. In Australia and the USA, a substantial proportion of the diagnosed level of diabetes is controlled, but it is known that, in economies such as China, only a modest proportion of actual diabetes is diagnosed and only part of that is controlled. While the movements against the trend in Singapore, Peru and the Philippines are striking, the continuing rise in diabetes in the other four economies remains of concern, especially in economies in which control rates are low. The trends for males and females is similar although the reduction in diabetes for females in Singapore is remarkable, with the rate more than halving in the period 1990 to 2008. In 1980 and 1990, the prevalence of diabetes amongst Singaporean women was the highest of the eight economies (Figure 8b). By 2008, it was the lowest except for Japan which has historically low rates for women.

**Figure 8a Diabetes prevalence, males, per cent of population, eight APEC economies, 1980 to 2008**



Source: Danaei et al. (2011b).

**Figure 8b Diabetes prevalence, females, per cent of population, eight APEC economies, 1980 to 2008**



Source: Danaei et al. (2011b)

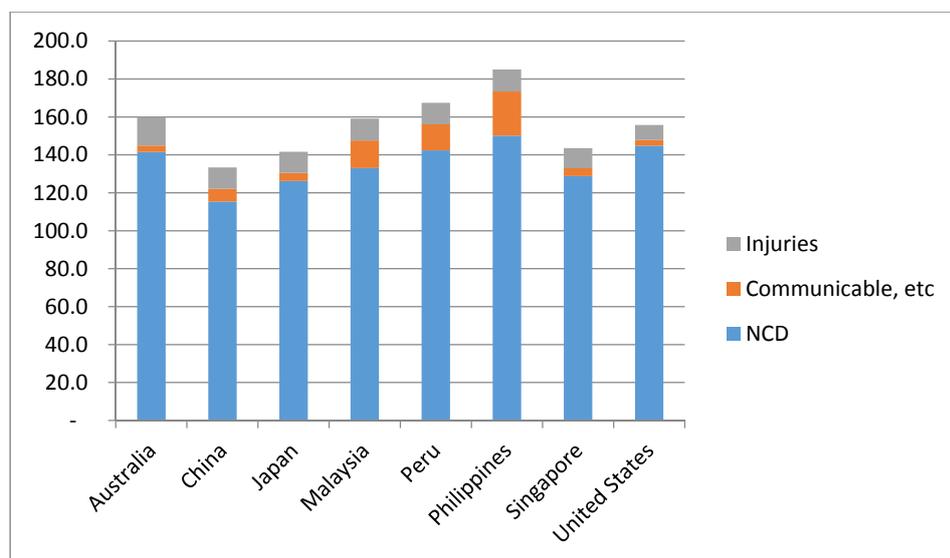
## Burden of disease

The risk factors discussed above have a direct bearing on the burden of disease, particularly for chronic conditions. NCDs are generally associated with developed countries. However, a recent paper by Bollyky et al. (2015) not only established that an increase in risk factors, such as obesity and smoking, had a statistically significant effect on adult mortality from NCDs, but also examined the relationship between economic development and NCDs. Their analysis demonstrated that low access to NCD prevention strategies in poorer countries resulted in such countries carrying a higher burden from NCDs than implied by their level of development.

The WHO global burden of disease study (Murray et al 2015) estimates both prevalence and severity of disease. It uses the number of years lived with disability as an indicator of the impact of morbidity arising from disease. Firstly, they estimate the prevalence of each sequela from a range of data sources, and then weight each of these by a disability factor, which is a relative estimate of the severity of each sequela. The prevalence is multiplied by the disability weight to arrive at the study's indicator of morbidity, the number of years lived with disability (YLDs) for each sequela. These are then all sequela to provide an overall measure of disability from disease measured in YLDs.<sup>1</sup> The results are grouped in three broad sequelae; communicable, maternal, perinatal and nutritional conditions, non-communicable diseases (NCDs) and injuries.

Figure 9 shows the burden of disease for the eight economies for those in their preretirement years aged 50-65. It shows that the burden of disease, as measured by YLDs, is highest for three developing economies, Malaysia, Peru and the Philippines. While this is in part due to high burden of communicable diseases, the burden from NCDs for Peru and the Philippines is comparable to, or greater than, the two developed western economies, Australia and United States, which are generally associated with high levels of chronic disease.

**Figure 9 Burden of disease by cause (YLDs) of those aged 50-64, eight APEC economies, 2010**



Source: IHME (2015).

Singapore, Japan and China have the lowest levels of disease burden, mainly arising from low levels of NCDs, substantially a testament to the low risk behaviours of females, which more than offsets

<sup>1</sup> See <http://issuu.com/ihme/docs/generatingevidenceguidingpolicy/9?e=2626063/7448030>

the high smoking and cholesterol levels of males. Both Singapore and Japan doubtless gain further benefit from their well-resourced health prevention and treatment systems.

### Impact of Ill Health on the Ability to Work

Ill health prevents some people from working and others are restricted in the amount of work they can undertake. In developed economies, such as the US and Australia, there are well developed systems for both recognising the impact of ill health on the ability to work and providing income support commensurate with the level of disability. Most developing economies also have systems and processes for identifying and supporting those in need arising from ill health, but they are more restrictive than those available in the developing economies. Those operated by the US and Australia, which cost respectively about 1% and 1.5% of GDP compared with some European countries which spend 4-5% of GDP on such schemes, are by no means particularly generous by developed country standards (OECD 2010, p. 10). The differences in the treatment of the disabled between developed and developing countries reflects different attitudes to disability and as a consequence very different definitions of disability

### Definitions of Disability and their Estimates

As outlined in the WHO report, *World Report on Disability*, disability is a 'complex dynamic, multidimensional and contested' concept (WHO and World Bank 2011, p. 3) which refers to difficulties in functioning due to impairments, activity limitations and participation restrictions. Thus in addition to health conditions, other personal and environmental factors have a bearing on disability (p. 5). Attempts to measure the prevalence of disability and to define it for pension purposes have reflected different aspects of these factors. In particular, developing countries have focused on a narrow choice of impairments, while developed countries tend to have a wider definition, which includes limitations and participation restrictions (p. 23). This means that country reported disability prevalence estimates from developing countries tend to have a downward bias compared with those from developed countries.

There are two global estimates of disability referred to by the *World Report on Disability*:

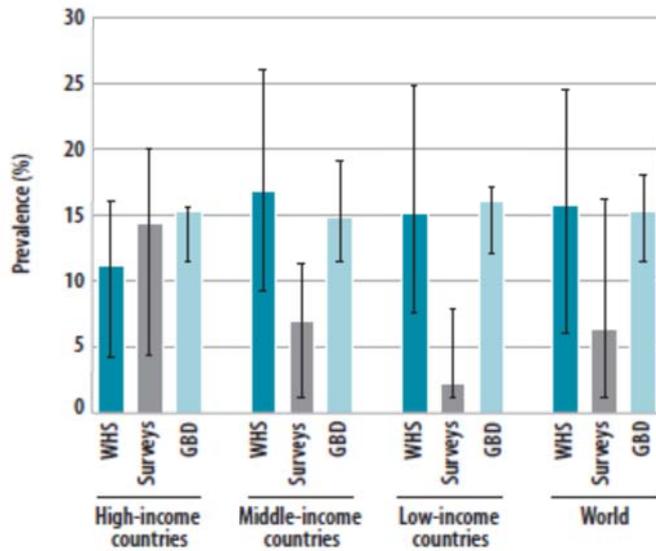
- WHO World Health Survey (WHS),<sup>2</sup> which includes questions about the difficulties in functioning; and
- WHO Global Burden of Disease (GBD) study, which focusses on health conditions and impairments as determinants of disability. The GBD study has given great attention to comparability of estimates across countries, although its estimates are subject to the usual limitations of poor data quality (Murray et al 2015).

Figure 10 below compares the global prevalence estimates from the WHS, the GBD and the averages of country surveys (in grey). The comparison shows that the GBD and WHS estimates are comparable for both middle and low income countries. However, the estimates derived from country surveys, which tend to use narrower definitions of disability, are much lower for developing countries than the WHS and the GBD based estimates.

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<sup>2</sup> <http://www.who.int/healthinfo/survey/en/>

Figure 10 Global disability prevalence estimates from different sources



Notes: This figure compares the population-weighted average prevalence of disability for high-income, middle-income, and low-income countries from multiple sources. The solid grey bars show the average prevalence based on available data, the range lines indicate the 10<sup>th</sup> and 90<sup>th</sup> percentiles for available country prevalence within each income group. The data used for this figure are not age standardized and cannot be directly compared with Table 2.1 and Table 2.3 of WHO World Report on Disability (2011).

WHS = World Health Survey.

Surveys = Technical Appendix A, WHO 2011.

GBD = Global Burden of Disease, 2004 update.

Source: WHO and World Bank (2011, p. 31, Fig. 2.1).

There are, however, conceptual differences between the WHO global burden of disease estimates of disability and those measured by the World Health Survey and own country surveys. These differences are discussed in Mont (2007) and Grosse et al. (2009). Despite their differences, the disability surveys all seek to measure the disability or degree of disability experienced by an individual. The result for the country is the prevalence of those individuals measured as having a disability.

As indicated above, the global burden of disease study estimates the severity of morbidity following an assessment of disability imposed by a particular disease sequela. Each sequela is given a disability weight reflecting the severity of the disease. The burden of a disease for a community is the prevalence of that disease multiplied by its disability weight.

Accordingly, while the global burden of disease is the most comprehensive measure of disease burden, it is not directly comparable with the disability surveys.

Table 1 shows the prevalence estimates provided by the WHS, other country sources (censuses and surveys), and the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) for countries which are the focus of this report. For Asian and Pacific countries, UN ESCAP has gathered disability data based on a comprehensive analysis of own-country disability definitions. It is for this reason that it is perhaps the best source of own-country survey results. However, it makes no attempt to adjust for the very different definitions and their interpretations across the region.

**Table 1 Disability prevalence estimates from different sources, selected countries, various years**

	WHS	Census	Other survey	UN ESCAP
Australia		4.4	20.0	18.5
China			6.4	6.3
Japan			5.0	5.8
Malaysia	4.5		0.4	1.3
Peru		10.9	8.7	
Philippines	28.8	1.2		1.2
Singapore				3.0
United States		19.3	14.9	

Source: WHO and World Bank (2011, p. 271) and UN ESCAP (2012).

The country surveys shown in Table 1 show large differences between countries. Using the UN ESCAP data, prevalence of disability estimates for Malaysia and the Philippines are only 1.2% and 1.3% respectively, while that for Australia is 18.5. This suggests that a narrow definition of disability is being adopted in these developing economies. Some differences are large within countries because of the different definitions used.

Unfortunately, the WHS results are only available for two countries and show surprisingly different results. The results from country censuses and other surveys provide a widely different picture. The inconsistencies suggest that different definitions of disability are as much the reason for the different results, as differences in prevalence.

The results of the 2010 Global Burden of Disease study shown earlier in Figure 9, which provides internally consistent and comparable disability indicators, demonstrates that Malaysia, Peru and the Philippines have the highest burden of disease, with the burden arising from NCDs at a comparable level to Australia and the US. This suggests that if a consistent definition of disability was applied across the region, the prevalence measures for the developing economies of Malaysia, Peru and the Philippines would be at least as large as for Australia and the US.

## The Economic Loss Due to Early Retirement

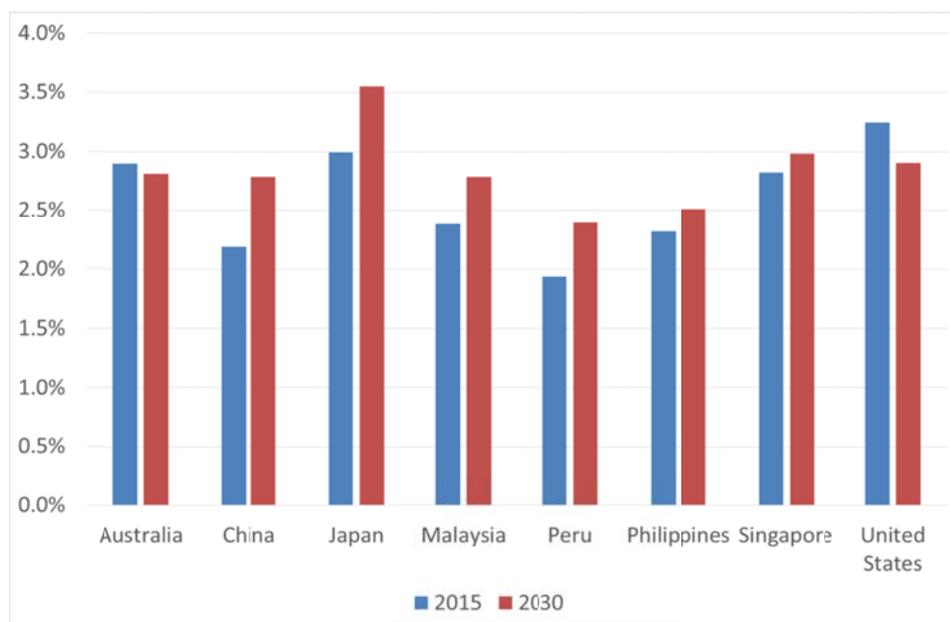
These results suggest that disability is underreported by the conventional survey methods in a number of developing countries. This means that these economies are suffering economic loss because people experiencing various levels of disability are retiring before the usual retirement age. The best data we have about the behaviour of early retirees is from two surveys conducted in Australia, the Survey of Disability, Ageing and Carers (SDAC) and the Retirement and Retirement Intentions survey. The SDAC provides details about those with disability by age, their sources of income and extent of disability. From this we gain a lot of information about the prevalence of disability by degree of impairment by age. The Retirement and Retirement Intentions survey provides data by age about the reasons for retirement, including due to ill health. To the extent that we have been able to cross reference this against US data, the key parameters seem to be similar. In addition, we have obtained unpublished data about Australian disability pension recipients. We have so far been unsuccessful in gaining equivalent data from the US.

There is very little data from the relevant developing economies with the necessary detail to model economic loss, so we used parameters drawn from the Australian data, which we adjusted where we could to the circumstances of the particular selected economy. For instance in arriving at the proportion of the population aged 50-64 who were disabled according to the international

WHO/World Bank definition, we used the Australian proportion (US proportion was very similar) adjusted for country specific disease burden sourced from the Global Burden of Disease study. A proportion based on Australian experience of these were estimated to have retired.

In essence, the economic loss is equal to those in early retirement multiplied by the average GDP per worker for each of the selected countries. This is projected using the UN population projections for each economy for those aged 50-64. The results are shown for 2015 and 2030 in Figure 11.

**Figure 11 Economic cost of early retirement, selected economies, 2015 and 2030**



Source: VISES estimates.

The projections are largely driven by demographic factors, particularly the stage in the ageing process of the various economies. For instance, despite relatively low levels of disease burden for Japan, the economic cost is high because of the age structure. Malaysia and the Philippines on the other hand, have a relatively low economic loss, despite high estimated burden of disease, because their population structure remains relatively young. For the US and Australia, the economic loss declines between 2015 and 2030 because the population aged 50-64 is projected to be lower in 2030 than in 2015.

### Comparing Disability Prevalence with Disability Support

A much higher proportion of the population suffer from a work-limiting impairment than receive disability support. This is as true for both developed and developing APEC economies by their own estimates. However, the scale is quite different. As shown in Table 2, while 3.5% of the Australian population receives a disability pension compared with 19.4% of the population that suffers from a level of disability, only 0.1-0.2% of the population in Malaysia and Philippines receive a disability pension. While this compares reasonably well with their own country estimates, the YLD estimates discussed earlier shows that these levels are extremely low compared with the disease burden.

**Table 2 Comparing disability prevalence with those on disability pensions**

	Own country prevalence estimates	% population on disability pension	Cost % GDP
Australia	18.5%	3.5%	1.47%
China	6.3%	0.5%	
Japan	5.8%	1.4%	0.41%
Malaysia	1.3%	0.2%	0.05%
Peru	10.9% <sup>(1)</sup>	0.1%	
Philippines	1.2%	0.1%	0.02%
Singapore	3.0%		
USA	19.3% <sup>(2)</sup>	2.8%	0.84%

Source: UNESCAP except for (1) Peru Census (2) US Census, other columns are VISES estimates.

While the age structure of the pensioner populations is not available for each of the case study countries, the comparison between Australia and Malaysia is illustrative of the differences between developed and developing economies (see Table 3). A high proportion of older age disability pensioners in both countries are aged 45-65, 63% in Australia and 73% in Malaysia. However, the coverage ratio for this aging population is very different. Whereas for instance, over 10% of those aged 55-65 in Australia were disability recipients, less than 1% of the Malaysian population were recipients of the disability pension.

**Table 3 Age structure of disability pensioners and their respective proportion of their population age cohorts, Australia and Malaysia**

	Australia		Malaysia	
	Disability pensioners	Population on pension	Disability pensioners	Population on pension
16-19	2.30%	0.3%	0.0%	0.00%
20-24	4.30%	2.2%	0.8%	0.01%
25-29	4.70%	2.2%	2.0%	0.03%
30-34	5.40%	2.7%	4.5%	0.08%
35-39	6.60%	3.4%	8.1%	0.19%
40-44	9.30%	4.7%	11.5%	0.29%
45-49	11.30%	5.9%	20.4%	0.55%
50-54	14.40%	7.6%	30.1%	0.93%
55-59	17.00%	10.0%	20.5%	0.78%
60-64	21.00%	13.6%	2.0%	0.10%
65 and over	3.80%	0.9%	0.1%	0.00%
Total	100.00%	3.5%	100.00%	0.16%

Source: UN ESCAP (2012).

In our view, the level of disability support provided by developing country governments will need to increase. This will in part be because of the increasing incidence of work-limiting chronic disease, which will substantially increase the proportion of the population unable to work before normal retirement age. In addition, there will be pressure to provide more comprehensive benefits to those unable to work due to ill health. In our view, this will result in developing economy governments raising their expenditure on disability support some way towards developed economy levels. The results of modelling of this scenario are presented in the next section.

## Modelling Disability Support

In this section, we focus on the four developing economies with particularly low levels of disability support but high levels of disease burden (China, Malaysia, the Philippines and Peru). We produce estimates of the cost of disability pensions for the period 2015 to 2035 under two scenarios. The first ‘No change’ scenario assumes that the level of coverage provided in 2015 remains constant during the period. The second scenario looks at the cost in going from the present coverage to a target coverage in 2030. For the four countries, we assume that the target rate in 2030 is 1.0% (compares with current Australian rate of 3.5% of population).

In calculating the coverage rates for each of the years between 2015 and 2030, we assume for all countries an annual rate of increase in the coverage rate to achieve the targets in 2030.

For each country, the average disability pension rate for the most recent year is calculated by dividing the total cost of the pension in the country’s own currency units by the number of recipients. This value of the pension is then allowed to increase by 2% per year to reflect a real increase in its value. Aside from this adjustment, there is no other allowance for inflation.

The number of recipients for the pension in a country is assumed to increase under the ‘No change’ scenario in line with the UN’s projections of growth in the population aged 45-65 in the country. The cost of the pension in a particular year is then just the number of recipients multiplied by the average value of the pension in that year.

Under the second scenario, the number of recipients increases because the coverage rate increases.

Table 4 shows the annual growth rates (CAGR) in disability pension costs for the two scenarios for the four developing economies. The ‘No change’ scenario shows the annual rate of growth in disability pension costs at current coverage ratios. The increase reflects increasing average pension cost, and changing age and population structure over the period. It assumes no increase in coverage rates as result of rising chronic disease. By itself, this scenario generates significant growth rates ranging from 4.9% per annum for the Philippines to 2.7% per annum for China, which currently has no formal disability pension. The growth rates for scenario 2 are much higher, ranging from 22.4% per annum for the Philippines to 7.7% per annum for China.

**Table 4 Projected growth (CAGR) in cost of disability pensions, no change (scenario 1) and increased coverage (scenario 2)**

	Scenario 1	Scenario 2
China	2.7%	7.7%
Malaysia	4.6%	15.2%
Peru	4.9%	21.7%
Philippines	4.4%	22.4%

Source: VISES estimates.

Table 5 provides the detailed projections of costs for the four developing economies based on actual cost largely for 2013 converted to purchasing power parity (PPP) as at 2013.

**Table 5 Projection of disability pension costs developing economies, scenarios 1 and 2 (2013 PPP million)**

Scenario	China		Malaysia		Peru		Philippines	
	1	2	1	2	1	2	1	2
2015	5,607	5,799	315	381	74	86	136	185
2016	5,840	6,243	331	440	78	105	142	227
2017	6,077	6,767	346	508	82	128	148	278
2018	6,295	7,281	362	586	86	156	155	341
2019	6,500	7,887	379	675	91	190	161	418
2020	6,697	8,478	395	779	95	232	168	512
2021	6,885	9,173	412	898	100	283	176	627
2022	7,065	9,851	428	1,034	105	344	183	768
2023	7,230	10,646	446	1,192	111	419	191	940
2024	7,410	11,422	465	1,372	116	510	200	1,151
2025	7,564	12,335	486	1,580	122	621	209	1,408
2026	7,698	13,225	509	1,817	128	755	218	1,722
2027	7,866	14,273	535	2,091	134	918	228	2,106
2028	8,009	15,296	563	2,404	140	1,116	238	2,575
2029	8,167	16,506	592	2,763	146	1,357	248	3,146
2030	8,372	17,692	621	3,174	153	1,649	260	3,844

Source: VISES estimates.

Scenario 2 captures the likelihood that governments will need to provide higher levels of coverage for disability pensions. This reflects an assumed capacity to do so, as these economies become richer. But more particularly, it is driven by the need to provide for increasing levels of ill health as an increasing proportion of the labour force moves into older age groups where chronic disease is more prevalent. As for developed economies, an increasing proportion of these older age groups will be unable to work or be severely inhibited from working and in need of support, whether funded entirely by government or in part funded by the private sector.

### Cost to Business

In the US, early retirement due to ill health is a direct cost to some business for some employees. Only 6% of US businesses offer retirees health cover. Most of these are the larger firms employing more than 1000 workers. Among private sector firms with 1000 or more workers, 37.5% offered health cover to early retirees in 2011. The cost of providing health care cover is of the order of \$10,000 per annum (Neuman and Huang 2014), a substantial loading on retirement income benefits.

Although the number of firms offering health cover and the benefits they offer are becoming more restricted, the total outstanding liabilities for S&P 500 firms for Other Postemployment Benefits (OPEB), principally health care benefits for retirees, but also may include life insurance, disability, legal and other services<sup>3</sup>, totalled \$253 billion in 2013 (S&P Ratings, 2015). This was down from \$369 billion in 2004, reflecting the narrower coverage and more restricted benefits. Health care benefits for retirees were provided by fewer than 60% of S&P 500 companies.

<sup>3</sup> <http://www.gasb.org/opeb>

A review of the top 20 US corporates by market capitalisation revealed that only 11 of these corporations reported health care obligations to their retirees (see Table 6). However, for most of those that did, the obligations were significant. The average interest and service cost was US\$440 million and the post-retirement benefit obligation was US\$8 billion. Two communications companies, Verizon Communications and AT&T reported the largest post-retirement benefit obligation of US\$27.1 billion and US\$30.1 billion respectively.

Each company with post-retirement benefit obligations generally reported a health cost trend rate which is the rate of change in the cost of healthcare. This ranged from 4.5% per annum to 7.5%, with an average of 6.5% per annum. These costs were therefore rising at a rate well above inflation and a strong motivation to restrict access to these schemes and work to reduce their cost.

**Table 6 Health care cost trend analysis, top 20 US corporations, 2014**

Company	Interest and service cost \$M	Post-retirement benefit obligation \$M	Health care cost trend	Impact of 1 % change in health care cost trend rate			
				Increase in service and interest		Increase in post-retirement benefit obligation	
				\$M	%	\$M	%
Apple	n.a.						
Google	n.a.						
Exxon Mobil	523	9436	4.5%	91	17.4%	1070	11.3%
Berkshire Hathaway	n.a.						
Microsoft	n.a.						
Wells Fargo			7.0%	2		45	
Johnson & Johnson	408	5081	6.0%	45	11.0%	560	11.0%
Wal-Mart	n.a.						
General Electric	588	8445	6.0%	56	9.5%	977	11.6%
Procter & Gamble	405	5505	6.8%	81	20.0%	824	15.0%
Pfizer	224	3168	7.0%	15	6.7%	228	7.2%
JPMorgan Chase	38	(842)	6.5%			9	
Verizon Communications	1365	27097	6.5%	193	13.7%	3760	13.9%
Chevron	198	3660	7.0%	13	6.6%	226	6.2%
Oracle	n.a.						
Coca-Cola Company	69		7.5%				
AT&T	1691	30709	4.5%	79	4.7%	796	2.6%
Merck & Co	193	2638	6.9%	32	16.6%	421	16.0%
Bank of America	66	1346	7.0%	2		41	
VISA	1	20	8.0%			1	
<b>Average top 20</b>	<b>443.8</b>	<b>8021.9</b>	<b>6.5%</b>	<b>55.4</b>	<b>11.8%</b>	<b>689.1</b>	<b>9.4%</b>

Source: Edgar 10-K reports.

The size of these costs are highly sensitive to changes in the health trend rate. Most companies reported sensitivity estimates of the impact of a 1% change in the health trend rate. Table 6 shows

the outcome of this analysis for a 1% increase in the health care trend rate. On average, a 1% increase is estimated to lift annual service and interest costs by 11.8% and benefit obligations by 9.4%.

From our survey of the selected economies, these obligations appear to be largely confined to the US. Retirees in other economies either have their own health insurance arrangements or rely on publically provided health services. Indeed, one implication to be drawn from the US experience is to question whether such arrangements are sustainable, given the rapid and radical changes being made to retiree health care plans. There may be lessons to be learned for the region from the US experience.

## Conclusions from the Analysis

The high level of burden of disease arising from NCDs indicates that for most of the developing economies included in this study, chronic disease is at least as great a health problem for these economies as for the developed economies, such as the US and Australia, where these conditions are longstanding and their acknowledged importance has led to the development of intervention programs.

While a number of risk factors are in decline in some economies, they are on the rise in others. For instance, the decline in smoking rates has stalled in a number of developing economies. Obesity rates are increasing for all economies. Diabetes is also on the increase, except for the Philippines and Peru, and females in Singapore. Cholesterol rates are falling for most economies. China is an exception. Rates have increased significantly from a low base. Singapore women have lowered their BMI levels and reduced their rate of diabetes by more than half since 1990.

While from this complex map of health risk trends across the region it is difficult to project overall future prevalence rates, what is clear is that with time most of the developing economies will have an increasing proportion of their workforce in the older age groups with consequent health impacts. Without greater attention to improved health behaviours, the work forces of these economies will become less healthy and more subject to absenteeism, presenteeism and early retirement.

This report has demonstrated that the disability arising from chronic and other health conditions is significantly underreported in a number of APEC developing economies. When allowance is made for this underreporting, it is clear that chronic disease is imposing significant economic and social costs. Modelling undertaken for this study has indicated that the economic costs are of the order 2-2.5% of GDP.

Currently this under reporting is reflected in the low rate and coverage of support for those disabled persons. The analysis highlights the potential for significant increases in fiscal costs for developing economies. Even at current rate and coverage levels, the cost of support for the disabled is estimated to increase at an annual rate of 4-5% per annum for Malaysia, Peru and the Philippines. Should the governments of the developing APEC economies move to provide more generous levels of support, then this rate of increase would rise substantially. A move to raise pension rates and coverage to about 30% of the pension levels and coverage of developed economies of Australia and the US would result in a cost of over 10 times the no change scenario by 2030 for Peru and the Philippines and 5 times for Malaysia.

The lessons from the US, where many large private sector employers have traditionally provided health care cover for their retiring employees, is that the rising cost of this cover has become unsustainable for business and steps have been taken to narrow the coverage and pass a greater

share of the risks to employees. A number of large corporations such as Google and Microsoft do not provide such cover for their retirees. This indicates that if business in the developing APEC region is to assume a greater share of the health risks for their retirees then the way in which this is undertaken will require careful consideration.

## Implications

- Early retirement due to ill health is a significant drag on productivity growth, which leads to lower economic growth, investment levels and increasing poverty.
- In contrast to developed APEC economies, these costs are largely borne by individuals and families.
- There is an increasing likelihood of rising costs for government, of disability support reflecting increased expectations.
- It is likely that there will be a call on business to provide improved support for those retiring early due to ill health.
- There is a potential opportunity for the private sector to provide products and services that address the associated problems of retirement incomes and health risks of older age.

It can be expected that resistance from both government and business in developing countries to emulate developed economy policies with respect to disability support and health cover for retirees will result in different solutions being developed by the developing economies. There is a need for the conjoint risks of older age retirement incomes, longevity and health status to be differently segmented and addressed by both the government and business in partnership. This suggests the need for a public private dialogue to address the strongly interdependent problems of chronic disease and aging labour forces.

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## Appendix A: Outline of Disability and Retirement Arrangements in Selected APEC Economies

### Disability in developed countries

In OECD countries, about 6% of the working age population is dependent on disability pensions, and public spending on disability benefits total 2% of GDP on average and as much as 4-5% for some countries such as Norway, Sweden and the Netherlands (OECD 2010, p. 10). Expenditure is particularly high for those aged 50-64, with those on benefits averaging 10-15% across OECD countries. Sickness benefit is frequently the precursor to receiving disability benefits, and once these are received the likelihood of returning to the workforce are close to nil (p. 67).

Mental health problems are the single biggest cause of disability benefit claim in most OECD countries (OECD 2010, p. 63). The OECD suggests that this reflects a more demanding, deregulated and less secure labour market, including shorter term contracts and increasing casualisation. In these circumstances, those suffering ill health are more easily marginalised and find re-entry to the labour force more difficult in the more competitive labour market environment.

Our more detailed work for Australia, suggests that while mental health is a large reason for being on a disability pension, this is not a condition that causes those post age 50 to retire early. The overwhelming reason for accessing disability benefits in this older age group are chronic diseases of which musculoskeletal disorders are by far the most important. Studies of Canada and the US have confirmed these disease patterns (WHO 2011, p. 33).

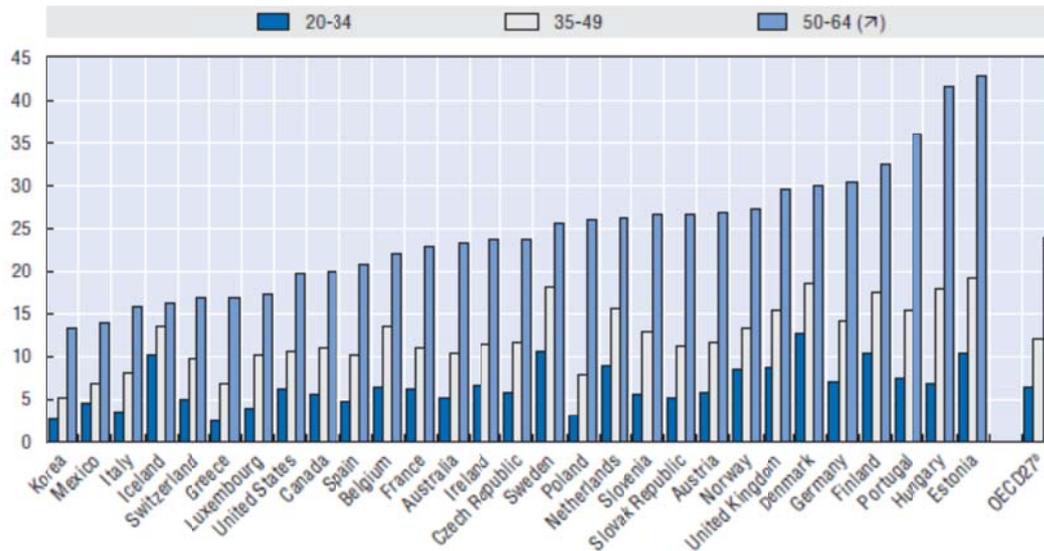
The OECD argues that population ageing is one good reason for increasing efforts to return those on disability pensions to work. OECD modelling (2010, p. 24) shows the impact of interventions to:

1. Increase labour force participation rates of those with disability to those without disability by 2050.
2. Defer retirement of older workers whereby the retirement age of the older cohort is assumed to fall to that of the younger cohort by 2050, i.e. the participation rate for those aged 60-64 is assumed to increase to that of the 50-59 age group by 2050.

For some OECD countries, the impact on the labour force of increasing participation rates for the disabled as proposed in 1 above, has a similar impact on labour supply as the delayed retirement option proposed in 2 above.

Disability prevalence is substantially higher for older age groups. Those aged 50-64 are about twice as likely to be disabled as those aged 35-49 (OECD 2010, p. 37).

**Figure A1 Disability prevalence increases sharply with age which is critical in view of population ageing, self-assessed disability prevalence, as a percentage of the population, by age group, late-2000s**



Notes: a) See definitions of self-assessed disability in OECD (2010, Figure 1.1).  
 b) OECD 27 refers to an unweighted average for 27 countries. Estonia and Slovenia are not included in the OECD average.  
 Source: OECD (2010, Figure 1.9, p. 37).

On average OECD countries spend 1.2% of GDP on disability benefits (2% if sickness benefits are included), almost 3 times the amount typically spent on unemployment benefits.

### Disability in developing countries

As indicated in Table 1, disability in developing countries appears to be at least as high, if not higher, than developed countries according to the only comparable data, with a consistent definition provided by the Global Burden of Disease study. As discussed, developing economies in the APEC region tend to have narrow definitions of disability based on level of impairment rather than levels of functioning. In the Philippines for instance, disability is defined in terms of blindness, deafness, severe mental problems and missing limbs. This compares with the ‘functioning’ approach adopted by developed countries as discussed above.

These data difficulties complicate comparing countries using quite different definitional frameworks. If however, we adopt the Global Burden of Disease estimates as being both authoritative and consistent, there is a large gap between those in receipt of disability pensions.

While there are significant differences between developing countries with respect to their support for those disabled in the preretirement period, they are all less generous than those of developed countries. China does not provide disability pensions. However, those who are unable to work due to a severe impairment and who have little other income are entitled to income support. In Malaysia, a defined contribution fund with high levels of employer and employees contribution rates offers Malaysian workers satisfactory support into retirement. It is, however, accessible by age 55 and by 50 in certain circumstances. This acts to encourage early retirement irrespective of health status. In the Philippines, a retirement scheme accessible post 60 provides very low benefit levels irrespective of health status. In Peru, a publically administered insurance scheme provides low level benefits for those who retire early due to ill health, dependent on years of contribution. A more detailed outline of these arrangements is provided below.

## Outline of arrangements in particular developing economies

### *Malaysia*

Malaysia has the Employees' Provident Fund (EPF), a defined-contribution, mandatory plan for employees and employers based on a prescribed rate of contributions accumulated as savings in a personal account, and covers about half the labour force. Employers with even one employee are required to contribute. In 2014, the contribution rate was 23% of wages (12 % from the employer and 11% from the employee) for employees earning less than RM 5,000 per month however, employers contribute 13% for employees who earn less than RM 5,000 per month. The EPF covers about half the labour force.

The Civil Service Pension Scheme is a defined-benefit pension scheme fully financed from the government budget. Civil servants account for about 11% of the labour force, but only 4% of the population. The Armed Forces Fund (LTAT) is a defined contribution scheme with employees contributing 10% of their monthly salary and 15% from the government as the employer.

The Social Security Organisation (SOCSO) operates the Employment Injury Insurance Scheme and the Pension Scheme for Invalids. The latter provides for people who become invalids or die due to any cause. The SOCSO also covers about half the labour force and had considerable overlap with the EPF.

Of the remainder of the labour force, about 15% to 18% are not covered by any pension scheme, and a further 20% are foreign workers who are excluded from the EPF and have limited access to public services (Park 2012).

In 2013, the EPF had 'Incapacitation' withdrawals of 280 million ringgit, which was only 1% of total withdrawals of 27.5 billion ringgit. By comparison, SOCSO paid 'Invalidity and Grant Benefits' of 453.6 million ringgit which was 20.6% of total payments. SOCSO also paid Permanent Disablement Benefits of 392 million ringgit and Temporary Disablement Benefits of 150 million ringgit.

The Incapacitation and Death Benefits are a goodwill gesture by the EPF, as no contributions are required. The Incapacitation Benefit is a once-off payment of 5,000 ringgit to help lessen the financial burden of incapacity to work (EPF 2015).

### *Philippines*

The Philippine pension system is primarily a defined-benefit scheme. The Social Security System (SSS) is mandatory for private sector workers, the Government Service Insurance System (GSIS) is mandatory for public sector workers, and the Armed Forces of the Philippines Retirement Separation Benefit System is required for the military, which is paid out of the national budget. The SSS covers about 75% of the labour force (aged 15-59) and GSIS 4%.

Employees contribute 3.63 % of their monthly salary to the SSS and employers a further 7.37%. GSIS members contribute 9% of their monthly compensation plus 12% employer's share. Four per cent of the 21% goes towards the life insurance coverage of the member, the rest is for the employee's retirement benefits.

Only totally and permanently disabled members of the SSS receive a lifetime monthly pension. About 3% of all SSS pensioners receive a disability pension. The SSS pays an old age pension to about 14% of the elderly (aged 60 plus) population and GSIS 3.6%. In 2013 The Philippines Department of Social Welfare and Development paid PHP500 per month to 255,763 indigent older persons (77 years plus). Other older persons and the disabled presumably rely on saving and family members for support.

## China

According to the China Disabled Persons' Federation (CDPF), as of end of 2010, there were 85.02 million disabled persons in China, within which 25.18 million are severe disabled and 59.84 million have low to medium levels of disabilities (CDPF 2015).

China does not have a disability pension. In 2014, a so-call 'disability two-subsidy system' was launched. In effect, the two subsidies were the disability living allowance and severe disability caring allowance. The former has been part of national minimum living allowance scheme providing financial support to urban and rural low income earners across all abilities. The caring allowance commencing in 2012, is given to people, who are classified as severely disabled.

Disabled people who qualify for the full minimum living allowance are those who do not have sources of income, cannot not work, and have no legal carers. According to a statistical report issued by the China Disabled Persons' Federation, in 2014, 2.62 million urban disabled person and 8.44 million persons in rural areas were included in the minimum living security scheme, and a total of 4.55 million disabled persons in urban and in rural areas were receiving government subsidies on a regular basis. There were 2.79 million severely disabled persons receiving a caring allowance (Statistical Report on China Disabled Persons' Development, 2014). The level of support for both the minimum living allowance and caring allowance depends on the minimum subsistence lines of different cities and rural areas.

## Peru<sup>4</sup>

Peru has a defined benefit public pension scheme (Sistema Nacional de Pensiones, SNP) and a defined contribution private pension scheme (Sistema Privado de Pensiones, SPP).<sup>5</sup>

The SNP has 82% of pensioners and the SPP has 18%. The SNP also has regulated minimum and maximum pensions (the SPP does not) and individuals must contribute at least 20 years to obtain a minimum pension. Only paid employees of the formal sector are required to enrol in the pension system, but the self-employed, employers and informal sector employees have a choice to join or not. As Peru has a very large informal sector, the result is that about 25% of the population over 65 years of age receive a pension.

In 2014, 21,475 people received an invalid pension in Peru. Total expenditure was 114 million new soles which was only 0.02% of GDP. Between 2007 and 2014, the number of invalid pensioners increased by an annual average of 5% as has total expenditure on invalid pensions.

With regards to retirement intentions, a household survey for 65-80 year old individuals was conducted by the National Institute of Statistics of Peru (INEI) in 2012, called ESBAM or Survey of Health and Wellbeing of the Elderly (Novella and Olivera 2014). The survey contains a large set of demographics and objective and subjective health indicators. Total sample was 3760. The survey was the baseline for *Pension 65*, a non-contributory pension scheme implemented at end of 2011 administrated by the Ministry of Development and Social Inclusion of Peru (MIDIS). The cash transfers of this program are targeted at individuals aged 65 or over who do not receive a contributory pension and live in extreme poverty.

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<sup>4</sup> This section sourced from Olivera (2014).

<sup>5</sup> The SNP is administered by the Oficina de Normalizacion Previsional (ONP) (Bureau of Pensions) and the SPP is supervised by the Superintendence of Banking and Insurance (SBS) and consists of four private pensions funds (AFPs).