

Economic Costs of Absenteeism, Presenteeism and Early Retirement Due to Ill Health: A Focus on Brazil

**Report to the Brazil-U.S. Business Council, the US
Chamber of Commerce**

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Executive Summary

This report provides estimates of the economic cost due to productivity losses arising from absenteeism, presenteeism and early retirement due to ill health. For Brazil these losses equate to a total of 8.7% of GDP as shown in Table ES 1. This puts Brazil towards the upper end of the range for a group of 10 other countries that includes some of its Latin American peers as well as other middle income developing countries from other parts of the world.

Table ES1 Total Economic impact of absenteeism, presenteeism and early retirement

	2015			2030		
	Presenteeism & absenteeism	Early retirement	Total	Presenteeism & absenteeism	Early retirement	Total
Brazil	5.2	2.4%	7.6%	5.8	2.9%	8.7%
China	3.5	2.2%	5.7%	4.3	2.8%	7.1%
Colombia	4.9	2.4%	7.3%	5.4	2.7%	8.1%
India	4.8	2.9%	7.7%	5.0	3.3%	8.3%
Japan	4.1	3.0%	7.1%	4.6	3.6%	8.0%
Mexico	3.7	2.0%	5.7%	3.9	2.6%	6.5%
Peru	4.9	1.9%	6.8%	5.4	2.4%	7.8%
Poland	4.7	3.9%	8.6%	5.5	4.0%	9.5%
South Africa	4.9	3.0%	7.9%	5.2	2.8%	8.0%
Turkey	5.3	3.3%	8.6%	6.0	4.2%	10.2%
United States	5.2	3.2%	8.4%	5.5	2.9%	8.4%

Source: VISES estimates.

These estimates are driven by the intersection of an ageing workforce with the high burden of chronic disease, now prevalent in developing countries. Although the proportion of Brazil's population aged over 45 is lower than average for this group of countries, Brazil's population is ageing quite rapidly and is thus an emerging problem for its work force. The increase in the proportion of its work force aged 50-64 out to 2030 is one of the larger of this group of countries. Moreover Brazil has a high burden from non-communicable diseases (NCDs). Amongst this group of countries it has relatively high levels of disease burden across a wide range of diseases including cardio vascular disease, mental illness, muscular skeletal and neurological conditions.

Context of the Study

In spite of very different circumstances, most countries face three challenges in common:

- their populations are ageing, in different ways and to different degrees;
- there is an existing high prevalence of non-communicable diseases (NCDs), such as heart and respiratory disease, stroke, cancer and mental illness, particularly for older age groups; and
- many risk factors for the future incidence of NCDs are high, and in some cases continuing to rise.

Taken together these factors already impose heavy costs on business, governments and individuals, and threaten much greater costs in the future. The economic costs arise largely because due to ill health, people aren't able to work as much as they would like. They may either be sick and absent from work (absenteeism), present at work but not working at full capacity due to illness (presenteeism), or retired prematurely, say from aged 50 -64 due to ill health (early retirement due to ill health). The economic costs on productivity imposed by each of these groups has been modelled and included in this report. There are others who may not work at any time due to an incapacity and/or health condition which has been present for most of their lives. This group is not explicitly covered in this report.

Following an initial report for the APEC Business Advisory Council (ABAC) and the Life Sciences Innovation Forum (LSIF) in 2014, VISES has prepared four reports, Sheehan et al. (2014), (Sweeny et al. (2014) and Rasmussen et al. (2015a, 2015b) now covering eighteen countries on three aspects of these economic costs. These are:

- absenteeism;
- presenteeism; and
- early retirement due to ill health.

This summary report draws on these earlier reports with a focus on Brazil with ten other comparator countries chosen as most relevant from the eighteen.

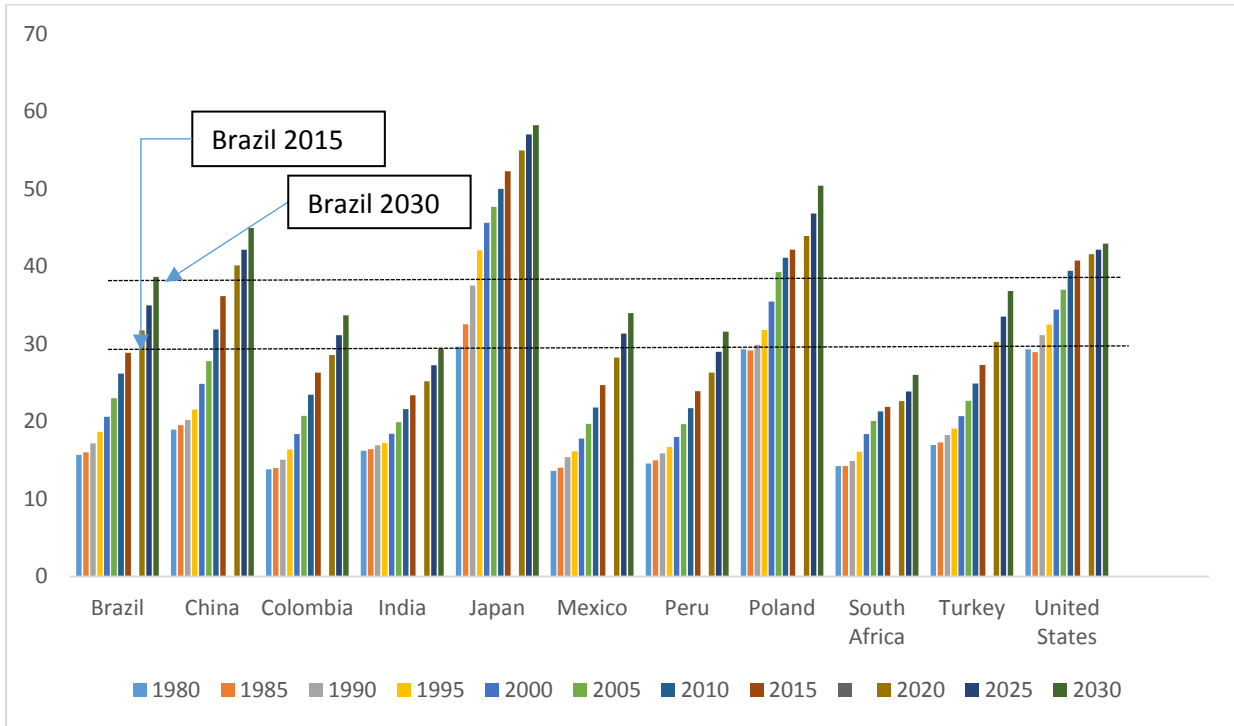
Population and Labour Force Ageing

Population ageing

While no single indicator can capture the diversity of ageing patterns, Figure 1 provides one summary indicator, the proportion of the population that is aged 45 years and over. The chart provides actual data for 1980-2010 and projections out to 2030 using the central case of the latest UN population projections (United Nations 2014).

In 1980, the proportion of Brazil's population aged over 45 was 16%, placing it at the lower end of this group of comparator countries, between Mexico at 14% and the US and Poland at 29% and Japan at 30%. In the period to 2015 the proportion for Brazil increased by 13%, to become the 'oldest' of the other Latin American countries in the group. In the period to 2030 the increase of 10% to 39% is the largest increase of any of the selected.

Figure 1 Share of population aged 45 years and over, 12 countries, 1980-2030 (projected)



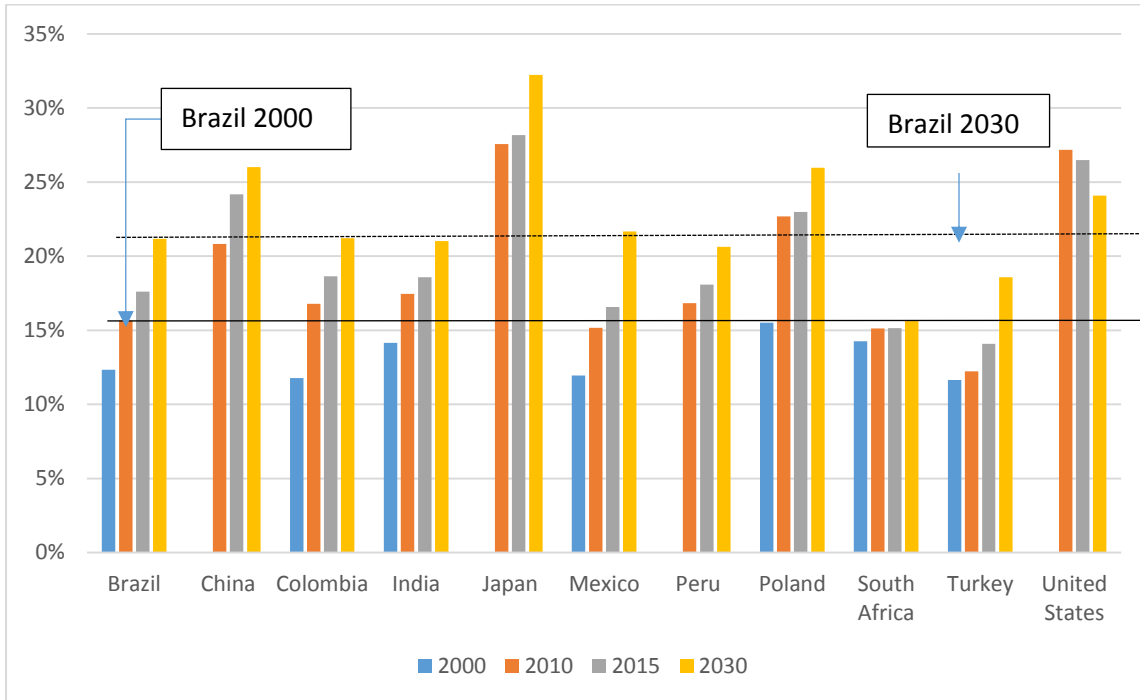
Source: United Nations (2014).

Implications for labour supply

The population shifts discussed above, which showed increases in those aged over 45, have significant implications for the incidence of NCDs since they have higher rates of prevalence in older age groups. These higher rates of NCDs contribute to the higher levels of absenteeism, presenteeism and early retirement.

Figure 2 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 for Brazil is very similar to the other Latin American countries in this group – Colombia, Mexico and Peru. The proportion aged 50-64 is relatively low in 2000 compared with many other countries in this group, particularly Japan, Poland and the US, and also South Africa and India. It remains lower than average over the period to 2015.

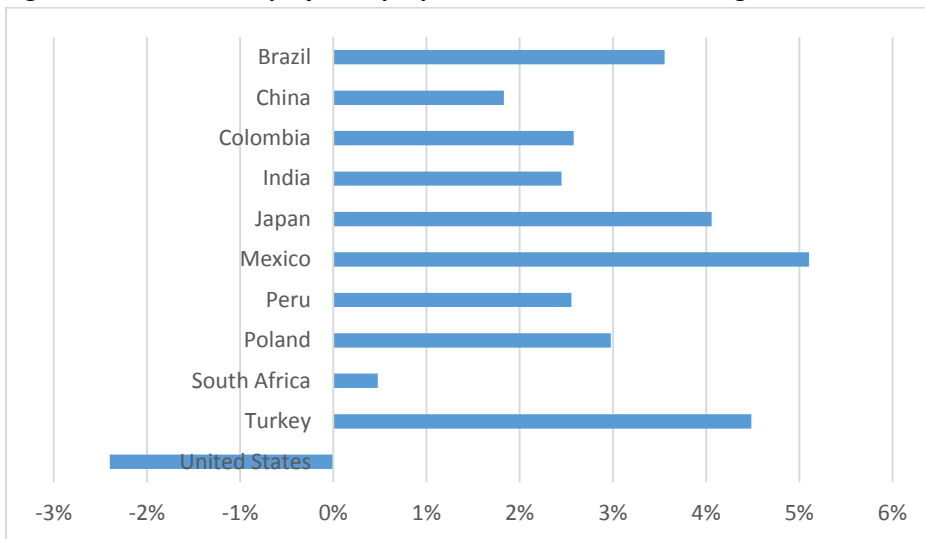
Figure 2 Proportion of the labour force aged 50-64, ten countries, 2000, 2010, 2015 and 2030 (projected)



Source: ILO (2014).

As shown in Figure 3, the increase in the proportion for Brazil between 2015 and 2030 at 3.6% is amongst the highest of the comparator countries, although Mexico is even higher at 5%. The increase for Colombia is 2.6%. As a result over 20% of the work force will be aged 50-64 by 2030 for each of these Latin American countries. The US is noteworthy for being the only country in this group to have a declining proportion in this age cohort.

Figure 3 Increase in the projected proportion of the labour force aged 50-64, ten countries, 2015-2030



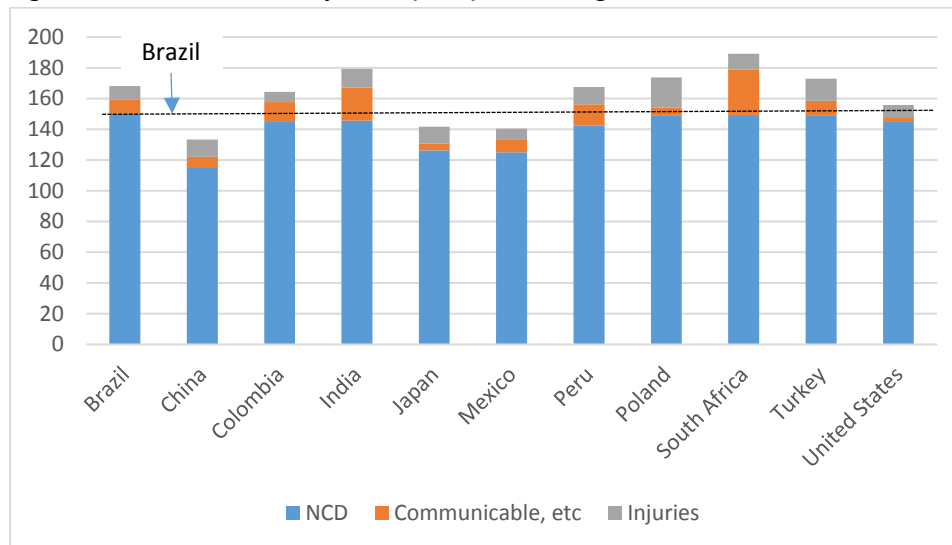
Source: ILO (2014).

Burden of disease

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 (YLD) as an indicator of the impact of morbidity arising from disease. The results are grouped in three broad sequelae: communicable, maternal, perinatal and nutritional conditions, non-communicable diseases (NCDs) and injuries.

Figure 4 shows the burden of disease for Brazil and the other ten countries for those in their preretirement years, aged 50-65. The figure shows that the burden of disease, as measured by YLDs, is highest for India, South Africa, Poland and Turkey by virtue of the high burden from injuries, and in the case of India and South Africa, from non-communicable diseases.

Figure 4 Burden of disease by cause (YLDs) of those aged 50-64, selected countries and United States, 2010



Source: IHME (2015).

However, Brazil has the highest burden (150 YLDs) from NCDs of the comparator countries. The other Latin American countries are lower. Colombia is the next highest with 145, followed by Peru, 142 and Mexico, 125. The high level for Brazil arises from relatively high YLDs for a range of diseases and conditions, including cardio vascular disease, mental illness, muscular skeletal and neurological conditions. The disease burden from Ischaemic heart disease (stroke) is the highest of the comparator countries. This may be a result of the relatively high systolic blood pressure levels recorded for Brazil as noted in Sweeny et al. (2014).

Estimating the Worker Attendance Costs of NCDs

Modelling methodology

The modelling methodology is based on estimating the reduction in productive capacity due to the impact of ill health on the workforce as a result of absenteeism, presenteeism and early retirement.

The modelling of the impact of NCDs is undertaken for 13 non-communicable diseases listed in Table 1 that were identified as most relevant to reductions in labour force participation and productivity using the disease descriptions from the 2010 Global Burden of Disease study (Murray et al. 2012). The disability weight indicates the severity of each disease.

Table 1 Disability weights and absenteeism and presenteeism assumptions, twelve countries

Disease	Disability weight	Per cent productivity loss due to absenteeism per employee per year	Per cent productivity loss due to presenteeism per employee per year
Ischemic heart disease	0.13013	2.8	6.8
Ischemic stroke	0.30300	2.8	6.8
Hemorrhagic and other non-ischemic stroke	0.30300	2.8	6.8
Diabetes mellitus	0.09463	0.8	11.4
Chronic obstructive pulmonary disease	0.19667	6.1	17.2
Asthma	0.05600	5.0	11.0
Migraine	0.43300	4.5	20.5
Tension-type headache	0.04000	4.5	20.5
Major depressive disorder	0.23000	10.7	15.3
Dysthymia	0.11000	10.7	15.3
Osteoarthritis	0.09100	2.5	11.2
Rheumatoid arthritis	0.33733	2.5	11.2
Neoplasm	0.32150	7.0	8.5

Sources: Murray et al. (2012), Salomon et al. (2012) and Goetzal et al. (2004).

To calculate the economic loss due to morbidity suffered by people in the labour force, one of the key aspects of the model is to quantify the impact of disease on labour force participation and on productivity at work. For this we use estimates by Goetzal et al. (2004) on productivity loss due to absenteeism and presenteeism by disease fitted to the disease categories used in the modelling (Table 1). An extensive review of the literature in the various countries on these issues has been conducted for this project, but no better source of such estimates has yet been identified.

Multiplying the GDP per person in the labour force estimates by the loss in productivity from a disease gives the estimated reduction in GDP per person attributable to a particular disease. Multiplying this by the prevalence in the labour force of that disease gives an estimate of the annual loss in GDP from that disease.

Interpreting the estimates

The overall estimates of the GDP losses arising from deaths (from 2010 onwards) and from absenteeism and presenteeism from the prevalence of NCDs in the actual and potential workforce are summarised in Table 2. Table 2 shows the total estimated losses in US\$ billions, at 2010 values, at five-year intervals over 2010-30, and also these costs as a share of GDP for each country.

In interpreting these estimates, it is important to note that they primarily reflect the pattern of ageing of the population of labour force age in the various countries, and the level of age standardised NCD

mortality and non-fatal prevalence rates in 2010. In countries such as Japan, where ageing is well advanced and 2010 mortality and prevalence rates are relatively high, the cost by 2010 is already relatively high and the future growth in cost more limited. This in part reflects the fact that many of the costs of the interaction of ageing and NCDs are felt beyond the years of labour force age.

The economic cost to Brazil of these factors is also high, rising from 5.2% to 5.8% over the period 2010-2030. Its workforce is ageing at one of the highest rates (Figure 2) and its disease burden from NCDs is also relatively high (Figure 4).

Mexico, which has one of the lowest estimated costs (only 3.9% by 2030 including NCD deaths) has the benefit of a particularly low NCD burden of disease. Its smoking rates and blood pressure levels are low, and although its average BMI and diabetes prevalence is relatively high, its somewhat high burden of disease arising from diabetes is more than offset by low burdens for mental disorders and respiratory diseases.

Table 2 Estimates of lost GDP from NCD deaths, absenteeism and presenteeism, 11 countries, to 2030

	2010	2015	2020	2025	2030
	(\$billion)				
Brazil	111.3	129.8	148.7	167.0	184.0
China	209.5	270.6	336.1	410.2	485.7
Colombia	14.2	18.7	24.0	30.5	38.1
India	81.5	109.6	145.2	191.2	249.2
Japan	225.4	237.7	256.6	275.4	290.7
Mexico	39.0	51.2	65.8	82.7	102.0
Peru	7.3	9.6	12.5	15.9	20.0
Poland	22.5	27.6	32.5	38.5	45.7
South Africa	18.2	23.1	28.9	35.9	44.7
Turkey	39.0	52.4	66.9	84.2	103.7
USA	779.9	872.2	963.0	1051.5	1142.6
	(share of GDP, %)				
Brazil	5.2	5.4	5.6	5.7	5.8
China	3.5	3.8	4.0	4.2	4.3
Colombia	4.9	5.1	5.2	5.3	5.4
India	4.8	4.8	4.8	4.9	5.0
Japan	4.1	4.2	4.4	4.5	4.6
Mexico	3.7	3.8	3.8	3.9	3.9
Peru	4.9	5.1	5.2	5.3	5.4
Poland	4.7	4.9	5.1	5.3	5.5
South Africa	4.9	4.9	5.0	5.1	5.2
Turkey	5.3	5.6	5.8	5.9	6.0
USA	5.2	5.4	5.5	5.5	5.5

Source: VISES estimates.

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 countries, 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 countries 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 countries.

Rasmussen et al. (2015a and 2015b) provide a discussion of the different definitions of disability adopted by different countries and their impact on the estimated size of the disabled populations. Overall the implications of these different definitions have been to underreport the size of disabled populations in many developing countries. The methodology adjusts for these differences using the results of the Global Burden of Disease study referred to earlier in this report.

The Economic Loss Due to Early Retirement

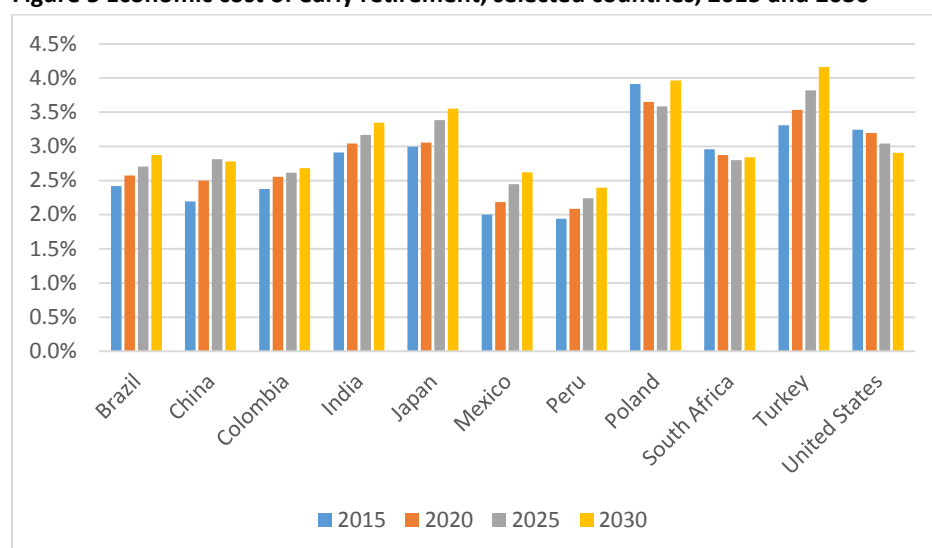
The best data we have about the behaviour of early retirees is from two surveys conducted in Australia, the Survey of Disability, Ageing and Carers (SDAC) and the Retirement and Retirement Intentions survey. The SDAC provides details about those with disability by age, their sources of income and extent 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.

Our modelling assumes that the decision to retire due to ill health is based on the impact of the relative morbidity of the 50-64 age group, measured in DALYs, in each of the selected countries.

There is very little data from the relevant countries 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 country. 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 (the 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 was 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 country for those aged 50-64. The results are shown for 2015 through to 2030 in Figure 5 and Table 3. Given the complexity of the trends in risk factors, the age adjusted disease burden rate is assumed to be constant over the projection period.

Figure 5 Economic cost of early retirement, selected countries, 2015 and 2030



Source: VISES estimates.

The projections are largely driven by the ageing process, in particular the proportion for each country in the 50-64 age group and by the size of the burden of NCDs. This places Brazil above the average of the comparator countries, and with a loss larger than the other Latin American countries. In addition, the economic loss for Brazil increases at an above average rate from 2.4% in 2015 to 2.9% in 2030. Poland, has the highest economic loss in 2015 of any of the countries of almost 4% of GDP. As has been noted, Poland has an above average disease burden and a high proportion of its work force in the 50-64 age group.

Table 3 Economic cost of early retirement, selected countries, 2015 and 2030

	2015	2020	2025	2030
Brazil	2.4%	2.6%	2.7%	2.9%
China	2.2%	2.5%	2.8%	2.8%
Colombia	2.4%	2.6%	2.6%	2.7%
India	2.9%	3.0%	3.2%	3.3%
Japan	3.0%	3.1%	3.4%	3.6%
Mexico	2.0%	2.2%	2.4%	2.6%
Peru	1.9%	2.1%	2.2%	2.4%
Poland	3.9%	3.7%	3.6%	4.0%
South Africa	3.0%	2.9%	2.8%	2.8%
Turkey	3.3%	3.5%	3.8%	4.2%
United States	3.2%	3.2%	3.0%	2.9%

Source: VISES estimates.

Conclusions from the Analysis

The high level of burden of disease arising from NCDs indicates that for most of the developing countries included in this study, chronic disease is at least as great a health problem for these countries as for the

developed countries, such as the US, where these conditions are longstanding and their acknowledged importance has led to the development of intervention programs.

It is clear that with time most of the developing and middle income countries will have an increasing proportion of their workforce entering the older age groups where the burden of NCDs is much higher. Without greater attention to improved health behaviours, the work forces of these countries will become less healthy and more subject to absenteeism, presenteeism and early retirement.

Overall modelling undertaken for this study (summarised in Table4)has indicated that the economic costs of absenteeism and presenteeism range from 4-6% of GDP by 2030 and 3-4% of GDP for early retirement due to ill health, taking productivity impact to 7-10 % of GDP. Brazil is at the upper end of this range. This is largely due to the relatively elevated disease burden for a range of NCDs which include, cardio vascular disease, mental illness, muscular skeletal and neurological conditions.

Table 4 Total Economic impact of absenteeism, presenteeism and early retirement

	2015			2030		
	Presenteeism & absenteeism	Early retirement	Total	Presenteeism & absenteeism	Early retirement	Total
Brazil	5.2	2.4%	7.6%	5.8	2.9%	8.7%
China	3.5	2.2%	5.7%	4.3	2.8%	7.1%
Colombia	4.9	2.4%	7.3%	5.4	2.7%	8.1%
India	4.8	2.9%	7.7%	5.0	3.3%	8.3%
Japan	4.1	3.0%	7.1%	4.6	3.6%	8.0%
Mexico	3.7	2.0%	5.7%	3.9	2.6%	6.5%
Peru	4.9	1.9%	6.8%	5.4	2.4%	7.8%
Poland	4.7	3.9%	8.6%	5.5	4.0%	9.5%
South Africa	4.9	3.0%	7.9%	5.2	2.8%	8.0%
Turkey	5.3	3.3%	8.6%	6.0	4.2%	10.2%
United States	5.2	3.2%	8.4%	5.5	2.9%	8.4%

Source: VISES estimates.

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