

SOCIETAL AGING'S THREAT TO HEALTHCARE INSURANCE

IMPACT OF RISING PREVALENCE OF NON-COMMUNICABLE DISEASES



KEY TAKEAWAYS

- 1** Non-communicable diseases (NCDs) – which include diabetes, cancer, chronic respiratory disease, and cardiovascular disease – account for over 65 percent of disease burden in Asia-Pacific (APAC).
- 2** The incidence of NCDs increases with age, posing a challenge for rapidly aging populations across APAC. While the total population in the APAC region is expected to grow 20 percent by 2030, the prevalence of NCDs is projected to grow by over 40 percent.
- 3** NCDs pose a significant economic burden for societies. The annual direct cost of treating major NCDs can exceed the median annual personal income in some countries, and is expected to continue increasing due to high rates of medical inflation.
- 4** With a significant portion of healthcare costs paid out-of-pocket in many parts of Asia,¹ rising costs will make private insurance an increasingly important funding source for healthcare.
- 5** Medical insurance has traditionally focused on large, inpatient hospital bills. However, up to 50 percent of costs associated with NCDs can be outpatient or non-medical costs. Inadequate protection against healthcare expenses will leave individuals and their families vulnerable to potentially crippling expenses.
- 6** Societal aging, through an increase in the prevalence of NCDs, is forecasted to drive the doubling of insurance premiums across APAC between now and 2030. If recent medical inflation rates are applied, premiums could rise by up to four times.
- 7** Insurance represents a crucial source of protection and funding for healthcare costs. Therefore, the implementation of new care models and adoption of technology that reduces the cost and burden of disease will enable healthcare insurance to remain accessible and affordable, contributing to the sustainability of the overall healthcare ecosystem.

1. WHO 2014 Global Health Expenditure database

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INTRODUCTION

Rapid economic development in Asia-Pacific (APAC) has resulted in an epidemiological transition, with a decline in infectious diseases and an increase in non-communicable disease (NCDs). NCDs such as diabetes and cardiovascular disease account for 65 percent of all disease burden in APAC² and predominately occur in middle-aged and elderly individuals.

To complicate matters, APAC is the fastest aging region in the world, with an expected increase of 200 million elderly people (aged 65 and above) between now and 2030. This demographic shift is expected to lead to an increase in the prevalence of NCDs.

The demographic pressure of aging (that is, increasing old-age dependency ratio, reduction in family unit size) is straining formal and informal social protection systems. In our previous publication, we examined the impact of societal aging on elderly healthcare in APAC and estimated the cost to be \$20 trillion over the next 15 years, representing an immense financial burden and risk to governments, insurers, and individuals.³ As a significant portion of healthcare is paid out-of-pocket in many parts of Asia,⁴ private insurance is likely to be an increasingly important funding source for healthcare.

In this publication, we examine the impact of demographic aging on the prevalence of NCDs, and the role of insurance as a funding source. The publication also explores the potential impact on insurance premiums, and innovative approaches for insurers to ensure affordability and sustainability of the healthcare insurance model.

* For the purposes of this report we use a definition of Asia-Pacific that includes East Asia, South Asia, South-East Asia and Oceania, but excluding central Asia and the countries of the Eastern Pacific (North and South America).

2. WHO South-East Asia and Western Pacific Region statistics, 2015 <http://ghdx.healthdata.org/gbd-results-tool>

3. Asia Pacific Risk Center 2016. Advancing into the Golden Years: Cost of Healthcare for Asia Pacific's Elderly

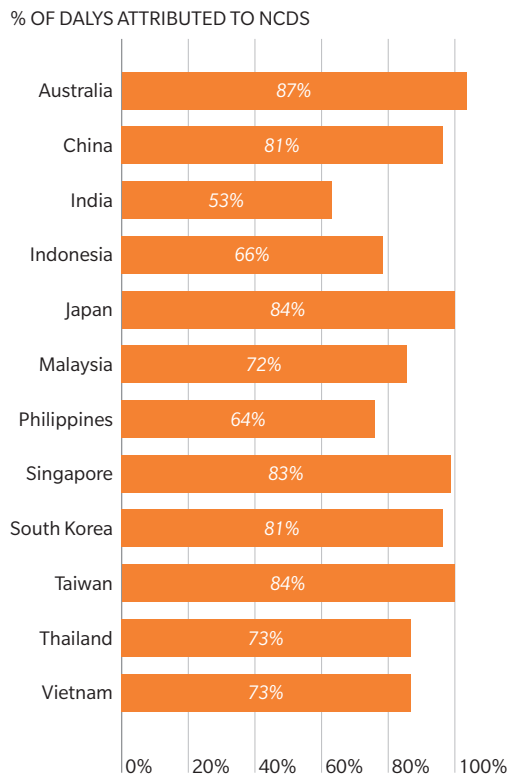
4. WHO 2014 Global Health Expenditure database

NON-COMMUNICABLE DISEASES IN ASIA-PACIFIC

Non-communicable diseases are responsible for 60-90 percent of deaths each year in the APAC region.⁵ Unlike infectious diseases, NCDs are not contagious; nonetheless, increasingly more people with NCDs contribute to the growing burden of disease facing the region. For example, in 2015, there were over 231 million diabetics in the APAC region, almost three times as many as in 2000.⁶

Importantly, the chronic nature of NCDs creates a persistent problem for societies. To measure the burden of disease, epidemiologists and economists use metrics like years of life lost (YLL) or disability-adjusted life years (DALY), which measures the number of years lost due to ill-health, disability or early death. While the prevalence of NCDs varies across APAC, they account for the majority (65 percent) of disease burden on average, with Australia topping the charts at 87 percent of its total DALYs.⁷

Exhibit 1: Burden of NCDs measured by DALYs across APAC (2015)



Source: The World Bank

NCDs are responsible for 60-90 percent of deaths in APAC

5. World Development Indicators, The World Bank

6. International Diabetes Federation. IDF Diabetes Atlas – 7th edition

7. Disability adjusted life years for Asia-Pacific region 2015. <http://ghdx.healthdata.org/gbd-results-tool>

NON-COMMUNICABLE DISEASES

The burden of cardiovascular disease, cancer, diabetes, and chronic respiratory disease is well-recognized, with the WHO focusing efforts on these four NCDs. In addition, we also include chronic end-stage kidney disease in this publication due to its high medical costs. While other studies of NCD also include mental illness, we do not include it here due to the variation in definition and broad spectrum of mental illnesses examined in studies (for example, from stress, to behavioral disorders reported by caregivers, to affective disorders), as well as the impact of culture on the diagnoses, particularly in societies across APAC.^{8,9}



Cardiovascular disease refers to a group of diseases related to the heart or blood vessels. Included in this grouping are strokes, coronary heart disease, myocardial infarction (commonly known as heart attacks), hypertensive heart diseases.



Cancer refers to the condition involving abnormal cell growth with the potential to spread to other parts of the body, disrupting the function of the affected organs.



Diabetes refers to a group of metabolic disorders that affect the ability to regulate the level of sugar in the blood. Importantly, diabetes is a strong risk factor for many other NCDs. In this paper, complications arising from diabetes (such as cardiovascular disease developing in a diabetic) are grouped under the complication and not diabetes.



End-stage kidney diseases are the last stages (4 and 5) in the progressive deterioration of kidney functions. While the initial stages may not seriously affect quality of life, the end stages of chronic kidney disease require costly treatment, including dialysis or kidney transplant.



Chronic obstructive pulmonary disease (COPD) is a progressive disease of the lung that is characterized by shortness of breath and heavy coughing. As the disease worsens, breathing takes greater effort and can prevent suffers from performing daily activities such as walking up stairs, showering, and dressing.

8. Steel Z et al. (2009). *The British Journal of Psychiatry*, 194(4): 326-333

9. Aggarwal N et al. (2015). *Ethnicity & health*, 20(1): 1-28

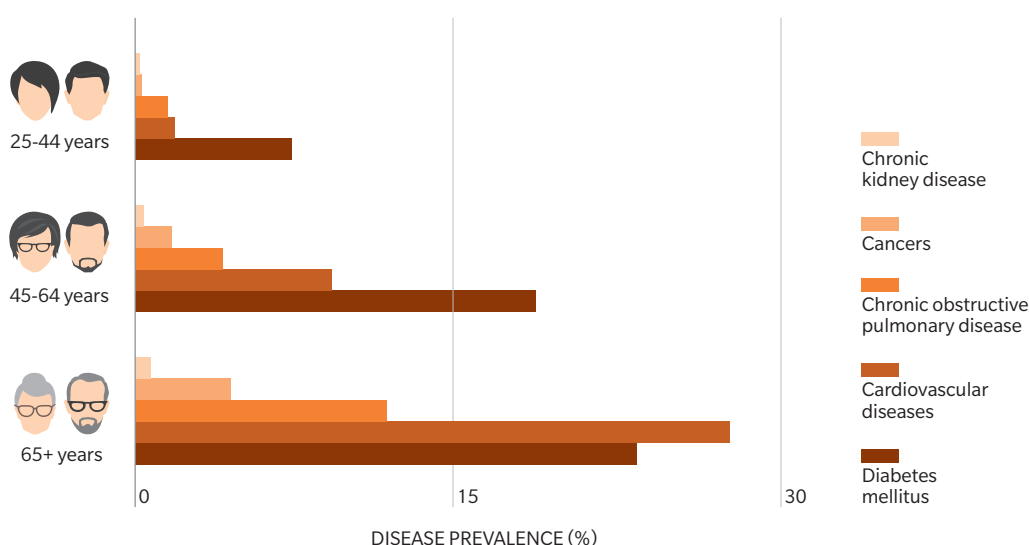
IMPACT OF AGING ON THE PREVALENCE OF NCDs

Asia-Pacific societies are aging at an unprecedented pace and scale. It took around a hundred years for the proportion of elderly in countries such as France and Sweden to double from 7 to 14 percent of the population. However, countries such as Japan, China, Thailand, Singapore, and South Korea will (or already have) experience(d) the same demographic changes within a quarter of that timeframe. As the fastest aging region in the world, APAC is experiencing a demographic shift that is expected to result in an increase of 200 million elderly people (aged 65 years and above) between now and 2030.

Data from 12 markets in APAC show significantly higher prevalence of the five NCDs in the older age groups (Exhibit 2). For example, analysis of South Korea's National Health Insurance database found that adults above 65 years were over 10 times more likely to have coronary heart disorder than those aged between 25 and 44 years.¹⁰ In Australia, the elderly represent 15 percent of the total population but consume 36 percent of all medication prescribed in general practitioner clinics.¹¹

Exhibit 2: Increasing prevalence of NCDs with age across 12 markets in APAC

NCD PREVALENCE BY AGE
2015, ACROSS 12 ASIAN MARKETS



Source: Global Health Data Exchange, APRC analysis

Besides aging, there are other risk factors for NCDs such as smoking, inactive lifestyles, and unhealthy diets. As many NCDs share common risk factors, many individuals with NCDs do not just suffer from one. In Australia, 40 percent of individuals aged 45 and above have two or more NCDs.¹² In addition, certain NCDs also directly increase the likelihood of developing a different NCD – for example, individuals with diabetes have up to twice the risk of developing cancer.¹³

10. Chang HS et al. (2012). The Socioeconomic Burden of Coronary Heart Disease in Korea. *Journal of Preventive Medicine and Public Health* 2012; 45(5): 291-300

11. Brit H et al. (2015). General practice activity in Australia 2014-15. The University of Sydney. Family Medicine Research Centre, Sydney School of Public Health

12. Australia Institute of Health and Welfare (2015)

13. Hartmann A et al. (2012) Diabetes, chronic kidney disease and cancer risk. *Nephrology Dialysis Transplantation* 27 (8): 3018-3020

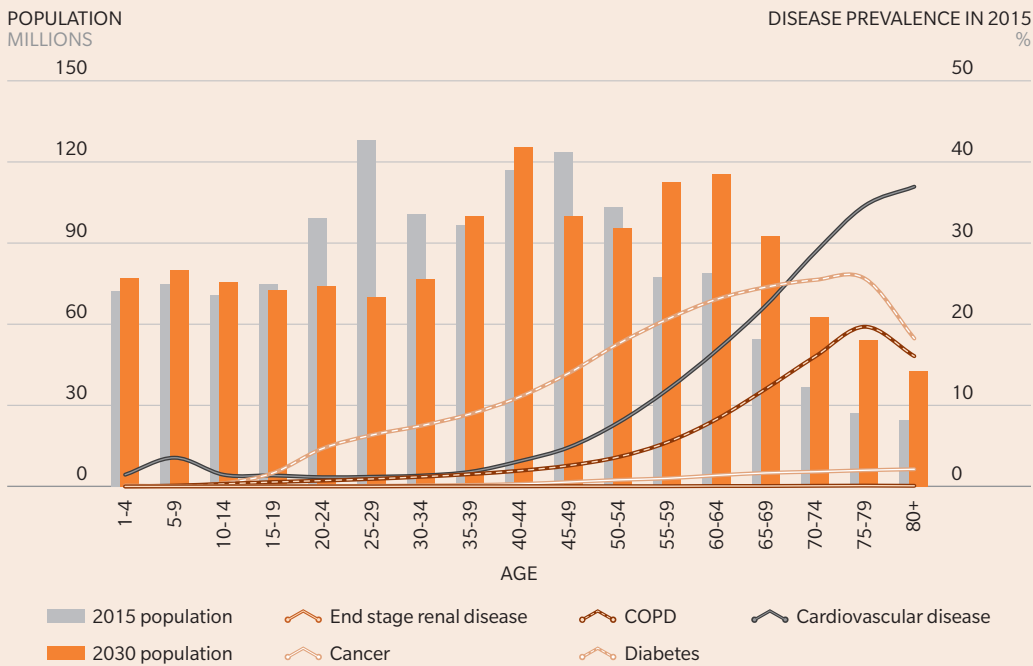
APAC is the fastest aging region in the world with an expected increase of 200 million in the elderly population by 2030

Incidence of NCDs increase with age. Therefore, societal aging will drive an increase in the prevalence of NCDs.

COUNTRY IN FOCUS

CHINA

Exhibit 3: Impact of an aging demographic due to higher prevalence of NCDs in older age groups



Source: APRC analysis of data from UN Population Division and Global Health Data Exchange

As illustrated in Exhibit 3, by 2030 China's population in the older age groups is expected to increase substantially. As the risk and prevalence of NCDs rise steeply with age, the aging demographic in China will result in a net increase in the incidence and prevalence of NCDs.

Our forecast shows that the number of NCD cases across APAC countries will increase by an average of 40 percent between now and 2030 (Exhibit 4). This analysis considers two elements: changing numbers of people in each age band (based on demographic forecasts), and changing disease prevalence rates for each age band (based on the historical rate of change between 2010 and 2015).

The APAC region consists of markets at different stages of economic development and extent of aging, two factors that are positively associated with the prevalence of NCDs. Nonetheless, across all markets, the age-specific prevalence rates for NCDs have been increasing over time (for example, the elderly are now more likely to have cancer or diabetes in many countries). Furthermore, as societies age, more people move into age bands with higher NCD prevalence rates.

This forecast is conservatively based on historical changes in prevalence rates continuing, but in reality they could grow even faster, depending on the growth rate of risk factors such as obesity, which is increasing rapidly in developing countries such as Vietnam or Indonesia.¹⁴ In particular, numerous studies have observed the *expansion of morbidity*, where increase in life expectancy is due to increased duration of survival of diseases, rather than a reduction in the incidence or delay in onset of diseases. As a consequence, there is a decrease in the proportion of life that is free of disability.

In other words, increased longevity is accompanied by an increase in number of people with chronic diseases and disability in the population. The significant increase in NCDs across APAC will put great pressure on societies – both in terms of the strain on the capacity of healthcare infrastructure, as well as the growing economic burden of paying for treatment.

The number of NCD cases across APAC is estimated to increase by an average of 40 percent by 2030

14. Economist Intelligence Unit 2016. The Current Landscape and State of Health in Relation to Obesity in South-East Asia

Exhibit 4: Impact societal aging on the prevalence of NCDs across APAC



Cancer rates expected to double in Australia, Japan, South Korea, and Singapore due to higher rates of screening and diagnosis in these developed markets.

The rates of diabetes in Malaysia and Singapore are among the highest in the world. This has been attributed in part to the high levels of obesity in these countries¹⁵, as well as ethnic/genetic susceptibility and the effects of rapid urbanization.¹⁶

Source: APRC analysis

15. Ng, Marie, et al. (2014) The Lancet 384(9945): 766-781

16. Nanditha, Arun, et al. (2016) Diabetes Care 39(3): 472-485

COST OF TREATING NCDs

The direct cost of treating NCDs can amount to tens of thousands of dollars' worth of medical bills a year for a patient, stacking up even further over their lifetime.

The cost of treatment varies across NCDs and is more than double in higher income APAC markets than their lower income counterparts (Exhibit 5). While the absolute costs of treating NCDs are less in lower income markets, they still comprise a significant share of personal income. For example, the treatment of cancer in low-income markets expends more than half of an individual's annual income, despite costing approximately one-third the amount it does in high-income markets.

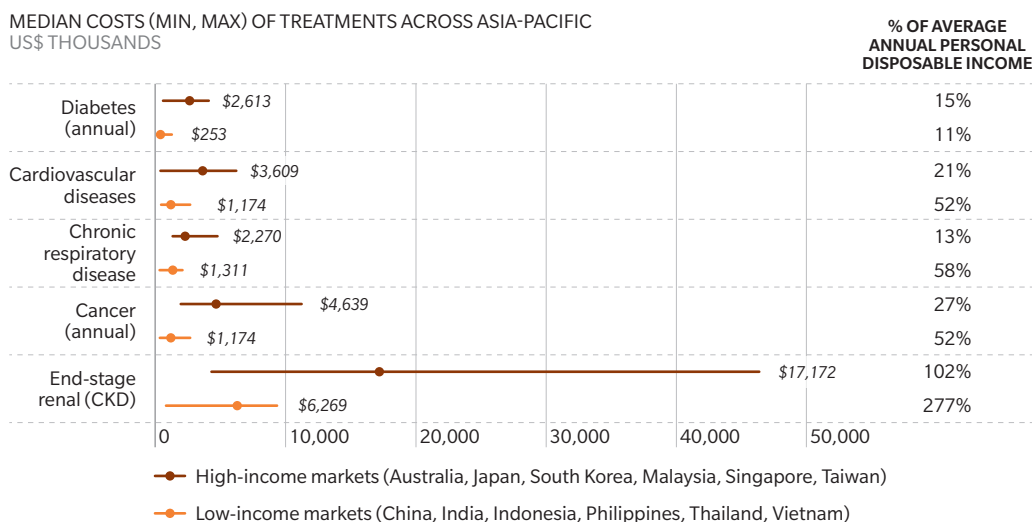
In addition, the economic burden of NCDs is compounded by substantial indirect costs, such as reduced productivity or loss of employment of patients and caregivers. For example, the economic impact of ill health (for example, due to absenteeism or early retirement) in APAC countries has been estimated at 5.2-7.4 percent of GDP.¹⁷

The cost of NCD treatments represents a significant share of personal income

Exhibit 5: Cost of treating NCDs across APAC

COST CHARTS OF NCD TREATMENTS

MEDIAN COSTS (MIN, MAX) OF TREATMENTS ACROSS ASIA-PACIFIC
US\$ THOUSANDS



Source: APRC analysis

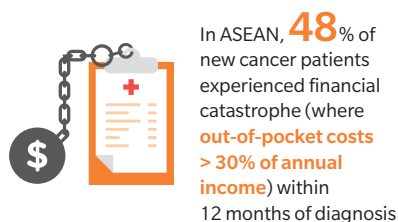
While aging populations are pushing the overall prevalence of NCDs upward, medical inflation is driving the cost of treatment higher. The 2016 Mercer Marsh Benefits Medical Trends survey reported that medical costs in Asia has been growing by an average of 10 percent per year, outstripping GDP growth, and even reached 10 times the overall inflation rate in markets such as Thailand, Taiwan, Singapore, and South Korea.¹⁸ This is partly due to the emergence of new (and more expensive) drugs and technologies, as well as the increased utilization of services due to increase in access and capacity (Exhibit 6). Consequently, the volume of drugs and services used for each treatment visit is also growing, either in the form of more medical services (such as scans) or types of medicine.

17. VISES 2016. Economic costs of absenteeism, presenteeism and early retirement due to ill health

18. Mercer Marsh Benefits. Medical Trends Around the World 2016

Exhibit 6: Rising cost of NCD treatments

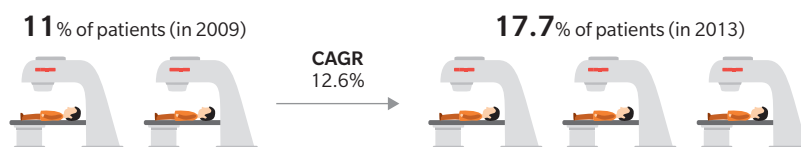
ECONOMIC IMPACT OF CANCER



MEDICAL TREND AND RISING UTILIZATION OF MEDICAL SERVICES

TAIWAN'S CT SCAN UTILIZATION

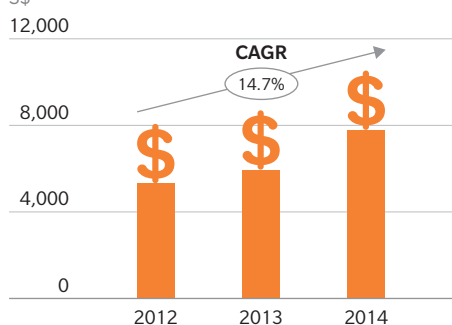
UTILIZATION RATE OF COMPUTED TOMOGRAPHY (CT) SCAN



INCREASING TREND IN MEDICAL COST

SINGAPORE HOSPITALIZATION COST

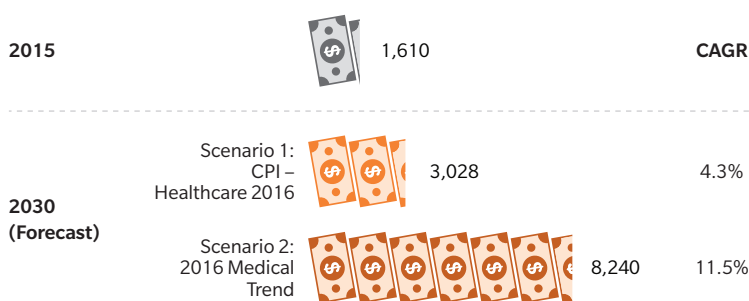
MEDIAN PRIVATE HOSPITAL INPATIENT BILL S\$



IMPACT OF INFLATION ON TREATMENT COST

CHINA'S CARDIOVASCULAR DISEASE TREATMENT COST

AVERAGE ANNUAL COST OF TREATMENT IN CHINA US\$



Source: APRC analysis, The ACTION Study Group (2015) BMC Medicine 13:190, Hu (2016) BMJ Open, HITF (2016) Managing the cost of health insurance in Singapore, China Public Health Statistical Yearbook 2015.

The direct treatment costs for NCDs in fact contain several distinct components (Exhibit 7).

DIRECT MEDICAL COSTS

This can be split further into inpatient and outpatient costs, based on the type of treatment.

- **Inpatient costs.** Inpatient treatment refers to cases where patients are admitted and stay in hospital to receive care. Inpatient costs (like surgery and ward fees) are traditionally the fright-inducing figures and account for approximately half of the direct cost of treating NCDs. A study of eight countries in Southeast Asia revealed that 48 percent of cancer patients experienced financial catastrophe (where out-of-pocket medical costs exceed 30 percent of a patient's annual household income).
- **Outpatient costs.** Outpatient treatment refers to care that does not require stay in the hospital (for example, consultation with a specialist, treatment at a general practitioner clinic). Due to the chronic nature of many NCDs, patients have to manage their disease over extended periods of time outside the hospital. Outpatient treatment accounts for 7-44 percent of direct treatment costs.

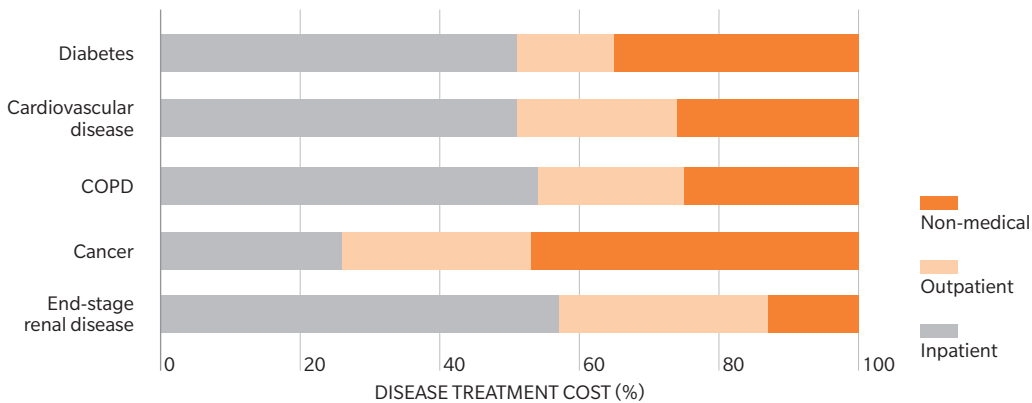
DIRECT NON-MEDICAL COSTS

- Additionally, there are direct costs associated with diseases that are non-medical in nature. One major non-medical cost is the need for long-term care (LTC), which includes stay in a nursing home or employing in-home care. Non-medical costs also include the cost of transportation to medical facilities, which can be significant (as a share of income) in rural societies with poor transportation infrastructure, or where a patient requires frequent treatment – for example, patients with kidney failure typically need to go for dialysis three times per week. Additional costs also include modification to housing (for example, ramps for wheel chairs, safety railings in bathrooms, etc.).

The costs discussed above are any costs directly attributable to treatment, including diagnosis, drugs, operations, or rehabilitation. In addition, indirect costs of NCDs, such as reduced productivity or loss of employment of patients and caregivers are substantial and are estimated to account for 11-65 percent of the total cost of illness.¹⁹ However, due to the subjectivity in assessing indirect costs, the present analyses focus on the direct medical and non-medical costs of disease.

Outpatient and non-medical services can account for over 50 percent of NCD treatment costs

Exhibit 7: Inpatient, outpatient, and non-medical direct costs of NCDs (across 12 APAC markets)



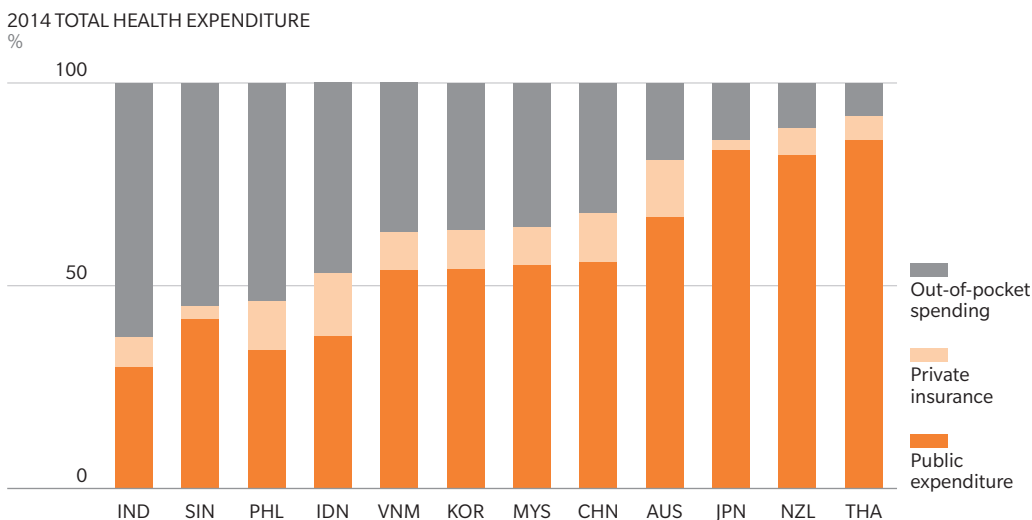
Source: APRC analysis of data from World Bank

HEALTHCARE FINANCING

Healthcare costs are generally split between governments (whose role includes constructing public medical facilities and providing subsidies or national insurance programs) and the private sector, which includes private healthcare insurance and out-of-pocket payments by individuals (Exhibit 8). The split in the share of costs often reflects the healthcare (and political) ideology of governments and societies. Governments in Thailand, Japan, and Australia provide extensive healthcare coverage, which reduces what individuals pay. Conversely, in countries like India, majority of the healthcare need is funded out-of-pocket.

Increasing healthcare costs will inevitably shift a greater portion of the financial burden to individuals.

Exhibit 8: Healthcare financing source



Source: APRC analysis

19. Bloom DE et al. (2011). The Global Economic Burden of Noncommunicable Diseases. Geneva: World Economic Forum

However, the increase in demand (for example, societal aging) and supply (for example, medical inflation) cost drivers for healthcare is threatening the sustainability of current funding arrangements, and forcing governments and insurers to re-assess coverage options to reduce their costs. This will inevitably shift treatment costs to individuals either directly (such as increased co-payments) or indirectly (such as through increased taxes or insurance premiums).

For example, the Australian government proposed in 2016 to reduce subsidies for diagnostic imaging and other pathology tests, which will save an estimated AU\$650 million (US\$486 million).²⁰ Similarly, a recent review of private healthcare insurance in Singapore was conducted in response to the increasing number of claims and cost per claim. To reduce the risk of overconsumption and improve awareness of costs by both providers and consumers, the review committee recommended increasing deductibles and co-payments.²¹ This, in effect, transfers a greater financial burden to individuals.

CASE STUDY

THE 4-2-1 FAMILY – INCREASING DEPENDENCY RATIO AND DIRECT HEALTHCARE COSTS

The old-age dependency ratio is an important measure when considering the economic consequences of an aging population. The ratio expresses the number of elderly people (those who are over the age of 65 years) as a percentage of the labor force (those between 15-64 years of age).

For example, the population over 65 years of age in China is projected to increase from 11 percent of total population in 2015 to 26 percent in 2050. In turn, the dependency ratio is expected to increase from 13 percent to 45 percent. This means that while an elderly person in 2015 is economically supported (for example, through government transfers) by roughly 8 working-age persons, this number is expected to go down to only about 2 persons in 2050.

Importantly, the rise in the old-age dependency ratio will increase direct healthcare costs.

Greater need for formal care. The increase in prevalence of NCDs in an aging population will drive demand for long-term care. However, shrinking family sizes will likely result in a shift from informal care by a family member to paid care in various healthcare and elderly care institutions.

Higher insurance premiums. The increase in the proportion of elderly people will skew the risk pool towards poorer health (and higher costs), which will result in the rise of insurance premiums.

China's previous one-child policy serves as a dramatic example of the economic burden on future generations in a rapidly aging population. This problem has been dubbed the "4-2-1 phenomenon", in which the one child will have to support two parents and four grandparents as she/he reaches working age (Exhibit 9).²²

Exhibit 9: The 4-2-1 family



20. Commonwealth of Australia. 2015-16 Mid Year Economic and Fiscal Outlook

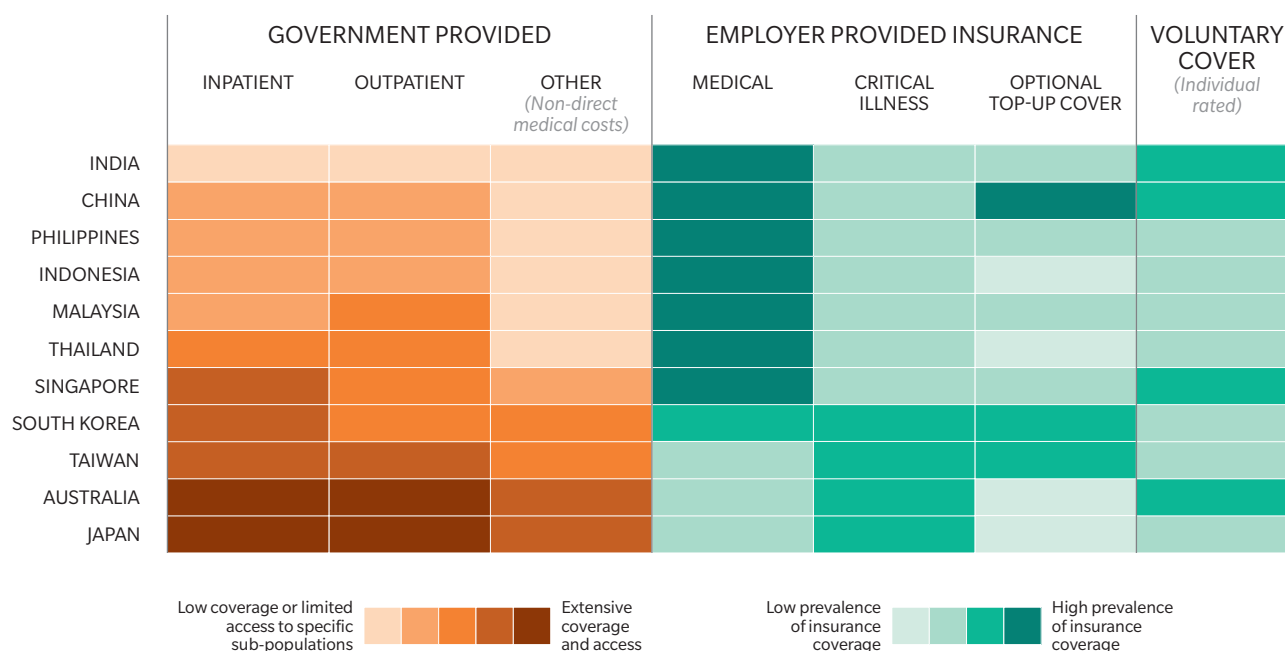
21. Health Insurance Task Force. (2016). Managing the cost of health insurance in Singapore

22. BBC 2012. Ageing China: Changes and challenges

INTERPLAY OF GOVERNMENT AND PRIVATE HEALTH INSURANCE

In societies where out-of-pocket payments make up a large share of costs, rising disease prevalence and treatment costs are a clear concern for individuals. However, even in societies where governments and private insurers (for example, through employer insurance) cover significant shares of cost, these payers may not provide comprehensive coverage for the costs associated with NCDs, especially outpatient and non-medical costs.

Exhibit 10: Government healthcare coverage and prevalence of private health insurance across APAC



Source: APRC analysis and Mercer Information Solution Survey

Exhibit 10 provides an overview of government-funded healthcare across markets in APAC, overlaid with the prevalence of private insurance. This analysis is not exhaustive and instead provides a high-level comparison that reflects the level of coverage and access for the general population (for instance, certain sub-populations such as children or veterans may have access to a broader range of treatments).

The examination of healthcare coverage across markets in APAC highlights several key trends:

- In countries where national/government-funded healthcare is limited (for example, China, India), private healthcare insurance products (employer-provided or voluntary purchased) are a critical source of protection against healthcare expenses and tend to be more prevalent.
- However, gaps in coverage often exist, particularly as NCDs are associated with long-term, outpatient costs that are often not covered by private healthcare insurance, which tends to focus on inpatient care.
- In addition, the chronic nature of NCDs translates to a need for LTC. However, the availability of LTC insurance is largely underdeveloped in the region, even in markets that have universal healthcare in place.
- Furthermore, as healthcare expenditure continues to rise, even in markets with universal healthcare, cost-shifting to individuals is likely to occur due to under-funding and/or inadequate capacity of public services.

LONG-TERM CARE INSURANCE IN APAC

APAC countries are aging rapidly, leading to a growing demand for LTC. In particular, the shrinking size of family units, increased female labor participation, migration resulting in the dispersion of families, and changes in social values (for example, the unwillingness of children to support elderly parents financially or physically) have resulted in the decline of intra-family support. As individual retirement savings are unlikely to be adequate to service the cost of formal LTC, this will place pressure on the adequacy and sustainability of funding from governments and private insurers.

Government budgets. Usually comes from a fixed national budget financed from general taxes. As the demand for elderly LTC services and the costs of provision increases, it is unlikely to be economically feasible for governments to meet the needs of an aging population, highlighting the need for more sustainable financing strategies.

Private insurers. One key challenge in providing LTC insurance is formulating the right pricing mechanism for premiums, which needs to account for the proportion of claimants, duration of care needed (largely correlated with life expectancy), and potential interest earned on invested premiums. As noted by the International Monetary Fund (IMF), life expectancy has been consistently underestimated, resulting in the underestimation of actuarial liabilities. For example, a critical mistake made by LTC insurers in the U.S. in the past was the overestimation of the mortality rate. Insurers had assumed that 5 percent of policies would lapse annually (that is, policyholders would die or drop without filing a claim). However, in reality, only 1 percent of policies lapsed. With the costs so severely underestimated, many insurers were unable to absorb the losses and forced into liquidation.

The availability of LTC insurance varies across APAC. Governments in advanced markets (whose populations are aging rapidly) have introduced various forms of LTC insurance, while the availability of LTC insurance remains negligible in many developing markets (for example, Indonesia, the Philippines, and Vietnam).²³

Government-subsidized LTC insurance programs typically include mandatory contributions from individuals.

In Singapore, the national LTC insurance program (Eldershield) is funded by government subsidies, as well as compulsory premiums paid from individuals' pension accounts. In the event that an individual is unable to perform at least three out of six Activities of Daily Living (ADLs), a monthly cash payout of up to \$400 is provided for up to 72 months. Financial means-tested subsidies of up to 80 percent for home and community care services are also available to citizens who meet both financial and clinical eligibility criteria. Similarly, in South Korea, an LTC insurance scheme was launched in 2008, funded through government subsidies and premium contributions by individuals. According to this scheme, the eligibility for LTC benefits is based on the individual's level of functional limitation, and is predominantly provided in the form of services (such as home and institutional care) instead of cash payments. However, one shortcoming is that the scheme only provides coverage for age-related care needs, and excludes coverage for disability-related care needs.

Public-private partnerships are another approach employed for the provision of LTC. In Japan, LTC insurance was introduced in 2000, which provides funding for LTC that includes in-home, community, and institutional care services. The program is jointly funded by general tax revenues and compulsory premiums paid by individuals aged 40 years and older. To manage costs, the type and cost of services covered under the program are determined by the government; there is also a co-payment of 10 percent by individuals, and a claim limit based on the individual's physical and mental health. Despite this, the cost of its LTC insurance program has grown at an average of 4.1 percent per annum (compared to Japan's average GDP growth of 0.5 percent), and is projected to account for up to 4 percent of Japan's GDP by 2025.

With rising life expectancies and healthcare costs across the region, there remains an opportunity for products that enable greater retirement savings to fund LTC. This includes hybridized LTC insurance products, such as policies linked with annuity or life insurance, to allow insurers to hedge against longevity risks, while reverse mortgage-linked LTC insurance provides the elderly with a means to pay for private LTC insurance.

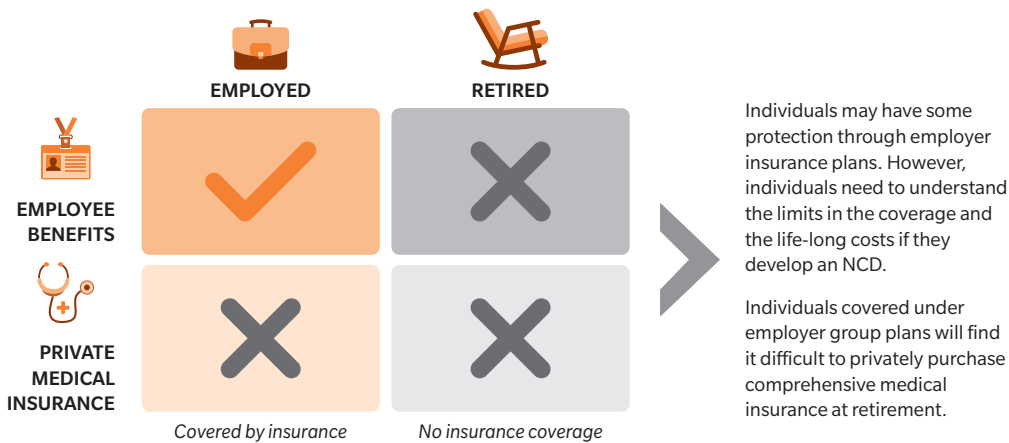
23. AXCO 2016. Insurance market report: Long-term care insurance

INSURANCE COVERAGE OVER LIFE CYCLE

Individuals who solely rely on employer-provided insurance may face challenges in securing comprehensive healthcare insurance coverage post-retirement (Exhibit 11).

Due to the increased risk of diseases with age and underwriting requirements, individuals who do not purchase private healthcare insurance prior to retirement (that is, while younger and prior to the development of chronic illnesses) will be subjected to higher insurance premium loading, coverage exclusions, or potentially be declined insurance coverage.

Exhibit 11: No voluntary private medical insurance during working life

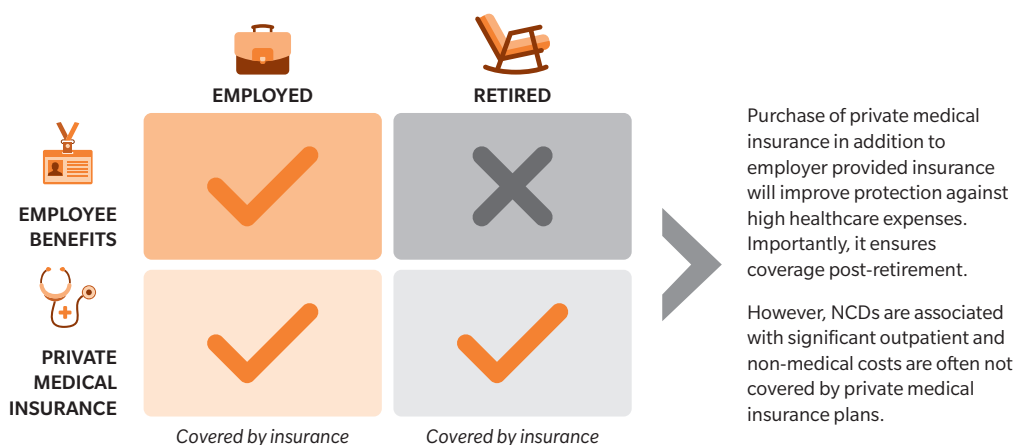


Source: APRC analysis

As highlighted in the World Economic Forum’s 2017 Global Risk Report, there is a need for social protection systems to take a whole-of-life approach. In particular, the need to *bolster individual resilience, and for flexibility to support individuals following substantially different life and career paths*. Individuals who purchase private medical insurance while young can ensure they have continued coverage in retirement (Exhibit 12). However, two key issues remain:

- While insurers may guarantee annual renewal of policies in retirement/old age, the premium rates at renewal are not, creating additional uncertainty over the affordability of coverage, particularly as premiums typically increase steeply with age.
- Individuals need to be aware of potential gaps in their insurance coverage. This can include co-payments, claim limits, exclusions, and non-medical costs of NCDs (Exhibit 7).

Exhibit 12: Insurance coverage in employment and retirement



Source: APRC analysis

The 2016 Mercer Financial Wellness Index reveals that LTC and healthcare expenses in retirement are the biggest financial worry for up to 33 percent of employees. Consequently, this highlights the need and opportunity for stakeholders to improve protection against healthcare costs:

GOVERNMENTS/REGULATORS

- Introduction of retirement and healthcare savings vehicles (for example, tax exempt savings account where funds are accessible only after retirement) to encourage greater financial security.
- Mandated insurance scheme that are community-rated (no underwriting of pre-existing conditions) to facilitate greater access and comprehensiveness of insurance coverage.

INSURERS

- Offer more comprehensive and greater access to medical insurance (for example, portability of insurance following retirement, and front loading of premiums during working years).
- Development of products that can deliver competitive returns during working life, with flexible and affordable payment options at retirement.

Importantly, inadequate funding of healthcare may cause individuals to delay seeking medical treatment, which can lead to the development of greater complications that ultimately prove costlier to treat and a greater burden to the healthcare system. Increased insurance coverage can help improve this, particularly if incentives or preventative services are offered (for example, free screening, and activity measurement).

IMPACT ON INSURANCE PREMIUMS

The rising prevalence of NCDs will drive the cost of insurance premiums steeply upwards, potentially restricting their affordability for the mass public, and ultimately the viability of the healthcare insurance model. In effect, societal aging results in the skewing of the risk pool towards poorer health (and higher costs).

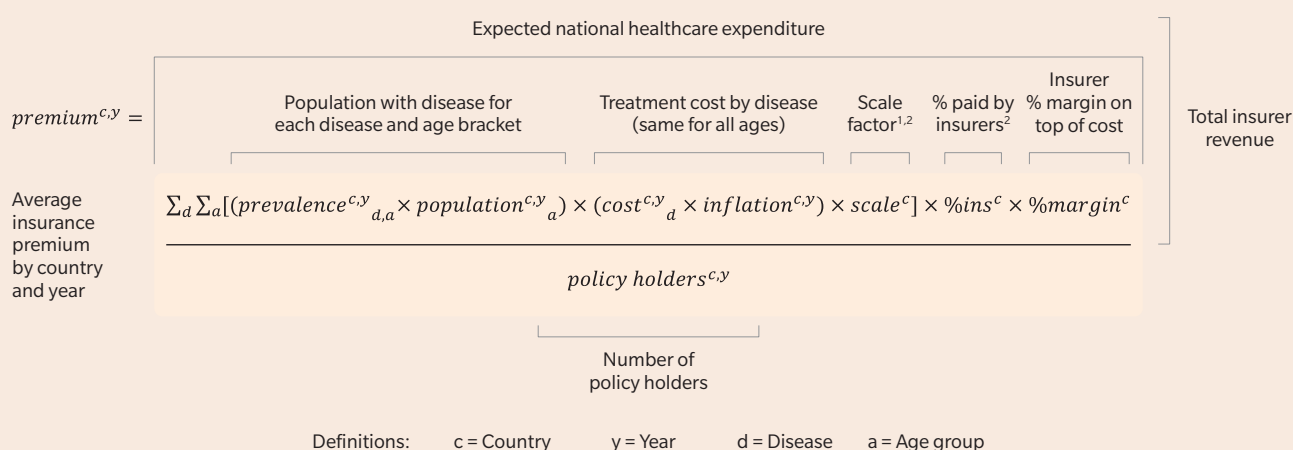
To estimate the change in private medical insurance premiums in 2030, we forecasted how private medical insurance claims across the region will change based on the increase in NCD prevalence due the aging populations (as described in earlier sections). This is combined with the growing cost of medical treatment, which is conservatively estimated using the projected consumer price index inflation²⁴ for each country.

PREMIUM CALCULATION METHODOLOGY

To forecast the rise in insurance premiums in 2030, the total cost of treating the five NCDs was estimated, and scaled up to total healthcare expenditure based on the historical proportions of healthcare spend on the five NCDs.

As described above in Exhibit 7, healthcare spending is split across three funding sources: individuals (out-of-pocket), private insurers, and governments. Accordingly, based on the proportion of healthcare expenditure paid by insurers, plus estimated margins for medical insurance, the total premiums charged by insurers was determined. Total premiums were then divided by the total number of people with private medical insurance coverage to estimate the average insurance premium per person annually in 2030.

Exhibit 13: Healthcare insurance premium forecasting methodology



1. Scales cost of 5 NCDs to total healthcare cost per country
 2. Assumed to be constant over time

Source: APRC analysis

24. Oxford Economics projections, June 2016

Societal aging, through an increase in the prevalence of NCDs, is forecasted to drive healthcare insurance premiums by up to 150 percent by 2030 (Exhibit 14).

The estimates are likely conservative as the analyses largely focuses on the impact of an ageing demographic and does not consider other cost drivers such as payments models that drive over-utilization, and adoption of new and expensive technologies. This is evidenced by the drastic premium growth experienced in many APAC countries in recent years. For example, private medical premiums in Australia have increased by almost 50 percent since 2010,²⁵ while private medical insurance in Singapore is set to increase by up to 36 percent in 2017.²⁶

The current analysis is also based on historical consumer price index growth rates. This is likely conservative as medical cost inflation, which is approximately 10 percent in Asia, has consistently outpaced the general inflation rate across the region.²⁷ If a less conservative estimate of medical inflation is used, premiums could reach four times the current levels by 2030. At this rate, private medical insurance premiums could represent up to 8 percent of personal disposable income across both developing and mature markets including Australia, Thailand, Taiwan, and Japan by 2030.

In addition, the present analysis does not account for other factors that influence the cost of healthcare:

- The increase in volume of medical services provided to each patient, particularly as access to healthcare increases in developing countries, or the introduction of new drugs and technology, which contribute to healthcare cost increases.
- Alternatively, the volume of care provided may be limited by the supply capacity of healthcare services. This could limit the growth in expenditure, or potentially result in higher price inflation.
- Healthcare expenditure reductions by governments, which will increasingly shift costs to insurers, place further upward pressure on insurance premiums.

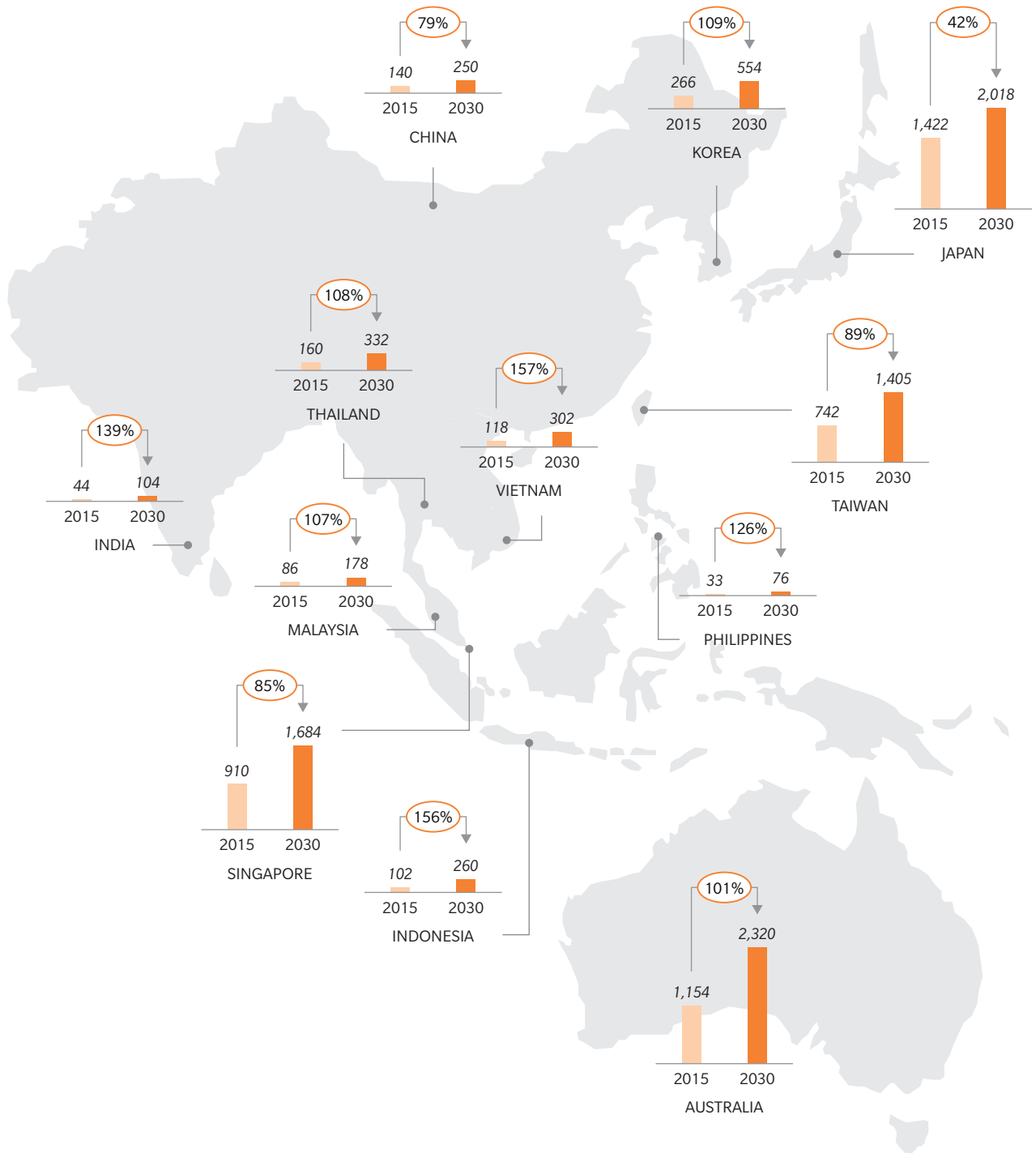
25. Australia Government Department of Health. 2016 Premium Round Individual private health insurer average premium increases

26. The Straits Times, Singapore (6th December 2016). AIA joins Aviva, Prudential in raising IP premiums

27. Mercer Marsh Benefits. Medical Trends Around the World 2016

Exhibit 14: Projected increase in healthcare insurance premiums due to societal aging

AVERAGE PRIVATE MEDICAL INSURANCE PREMIUMS
2015-2030, US\$



Source: APRC analysis

CONSEQUENCES OF RISING INSURANCE PREMIUMS

The rise in premiums could be moderated by cost-shifting among healthcare funding sources. The present forecast assumes that the current split of costs between public and private sources will remain. However, the increase in healthcare costs will likely result in the shift from private insurers to other parties:

- **Governments** may need to subsidize healthcare costs if total costs are perceived to be unsustainable at the individual level, as seen in Singapore with the introduction of the “Pioneer package” that provides additional healthcare subsidies for elderly citizens born before 1950. Governments could also mandate insurers to provide plans with guaranteed acceptance. This may be through community rating instead of individual risk rating (for example, Medishield Life in Singapore), or by limiting the premium loading for high-risk individuals, such as those with pre-existing medical conditions (for instance, proposed Voluntary Health Insurance Scheme in Hong Kong).
- **Individuals** will experience higher co-payments, stricter exclusions, and the imposition of coverage limits by insurers to manage their risk exposure. As a consequence, if insurance premiums are perceived to be costlier than directly paying for a disease if it occurs, then the uptake of insurance policies may decline with individuals assuming a greater burden of healthcare costs out-of-pocket. As a means to provide additional, non-insurance source funds for healthcare, individuals could be faced with government-mandated contributions into a health savings account through payroll deductions such as Medisave in Singapore.
- **Employers** will also face higher premiums for employee group insurance, which may force them to reduce insurance coverage (in effect shifting costs to employees). Besides the rising healthcare insurance costs, employers could be further burdened with loss of productivity associated with the increasing prevalence of NCDs. A study in the U.S. estimates that diabetes reduces a worker’s productivity by approximately a third²⁸ due to disability, early retirement, and absenteeism.²⁹

It should be noted that the forecast used in this study assumes the continuation of current profit margins used by (most medical) insurers. Rising disease prevalence will present challenges to the insurability of NCDs (Exhibit 13).

Consequently, unless new innovative approaches to the insurance model are developed, insurers may not be able to pass on the rising costs to consumers, and have to accept lower margins in order to offer affordable products and remain in the market.

28. Ng YC et al. (2001). Productivity losses associated with diabetes in the US. *Diabetes Care* 24:257-61

29. Vijan S et al. (2004). The impact of diabetes on workforce participation: results from a national household sample. *Health Serv Res* 39:1653-69

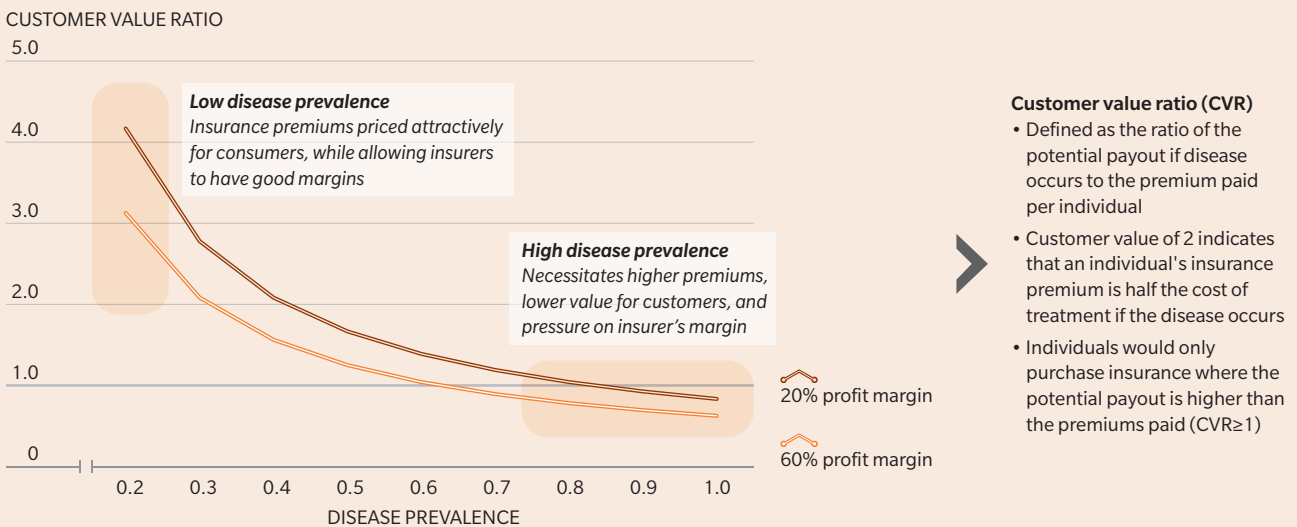
CASE STUDY

INSURABILITY CHALLENGES OF RISING NCD PREVALENCE

Our analysis has shown that societal aging will result in a significant increase in the prevalence of NCDs, which will contribute to the increase in insurance premiums. With a low likelihood of reversal in the aging trend, and with the increase in risk factors for NCDs (like unhealthy lifestyle as a consequence of urbanization), the prevalence of NCDs could reach critical levels that will challenge the viability of the current insurance model.

Determining the cost of insurance premiums is essentially a function of prevalence of disease, treatment cost, and profit margin for insurers. As the prevalence of diseases increase, the difference between premiums paid by customers and their insurance coverage limit will converge. The benefit of purchasing insurance can be assessed by the Customer Value Ratio, defined as the ratio of potential payout (or claim limit) if a disease occurs to the premium paid per individual. Exhibit 15 provides a simplified analysis, where insurance protection for a single disease, to illustrate the relationship between disease prevalence and Customer Value Ratio. In other words, as the Customer Value Ratio³⁰ approaches 1, the value of purchasing healthcare insurance as protection against costly medical treatment diminishes.

Exhibit 15: Assessing insurability of NCDs (prevalence, customer value, insurer profit margin)



Source: APRC analysis

30. Customer Value Ratio is defined as the ratio of potential payout (or claim limit) if a disease occurs to the premium paid per individual

INNOVATIONS FOR AFFORDABLE AND SUSTAINABLE INSURANCE

Strategies that improve the efficiency of the healthcare system and reduce disease burden will enable healthcare insurance to remain affordable, reflecting the interdependency in the sustainability of the healthcare system and the insurance model.

In accordance with the Oxford Health Alliance 3:4:50 model, three controllable behaviors (nutrition, exercise, and smoking) drive the risk for four chronic diseases (cancer, diabetes, respiratory disease, and cardiovascular disease) which are responsible for more than 50 percent deaths worldwide.³¹ In essence, this model highlights the importance of behavioral change in reducing risk factors and preventing NCDs. Key success factors for behavioral change include creating an environment that reinforces individuals' self-motivation, healthy food choices, a smoking ban, flexible working hours and opportunities to exercise.³²

Technological advancements in big data analytics, the Internet of Things (IoT), and wearable devices that allow real-time biometric monitoring (such as blood glucose levels, and medication intake) have the potential to influence the behavior of both individuals and healthcare providers. This includes engaging and enabling individuals' greater control of their health and lifestyle, and the integration of care providers to improve efficiency, while employers are able to contribute as facilitators of data-driven health and well-being management.

Termed Health Market 2.0,³³ healthcare is transforming from a supply-oriented industry to a **consumer-centric, data driven, integrated, and coordinated network of care providers** that focus on 'whole-person' health and deliver significant new value to consumers.³⁴ As discussed below, innovative products and arrangements have the potential to alter the behavior of stakeholders in the health ecosystem with the goal of improving health outcomes, and reducing overall costs.

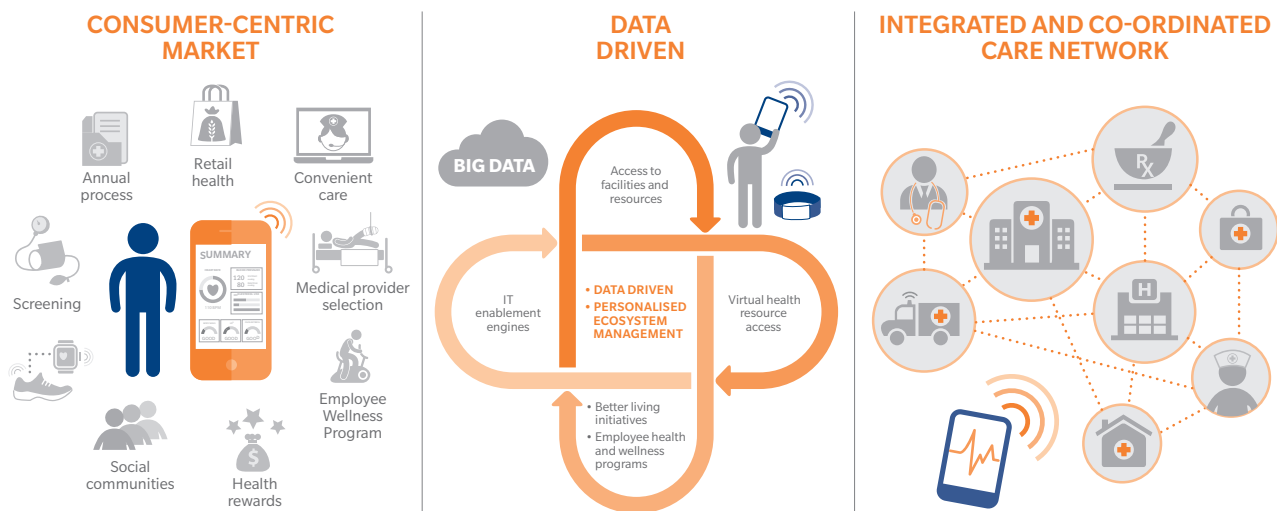
31. Taylor 2009. The Oxford Health Alliance (OxHA): prevention is the name of the game

32. Seidl 2014. Benefits & Compensation International. 43(10)

33. Oliver Wyman. The marketplace revolution. Shattering the foundation of the \$3 trillion sick-care marketplace

34. Oliver Wyman. The patient to consumer revolution

Exhibit 16: Features of transforming health ecosystems



Source: Oliver Wyman 2015, The patient to consumer revolution. APRC analysis

- Consumer-center market.** This goes beyond viewing healthcare as only when a patient is sick and in need of care. It involves providing a platform to engage and empower consumers to make informed decisions for themselves and their families in the health space. This requires an understanding of consumer preferences and changes in needs based on life circumstances and types of health decisions. Innovative employers are also in a prime position to facilitate this by providing a conducive environment. Human resource management (HRM) tools have the potential to go beyond traditional services (such as leave application or expense claims) by enabling employees to better manage their health. Taking it a step further, HEARTI Lab has developed an artificial intelligence underwriting engine to offer insurance protection based on lifestyle or travel schedule, as well as predictive algorithms to potentially enable earlier detection of conditions (such as example stress, burnout) that impact employee health and productivity. Data analytics of employee health and behavioural allows the development of strategies to reduce risk and cost of diseases through customization of health benefits, and development of employee wellness programs (such as lifestyle counselling, step/fitness challenges, health screenings).
- Data driven.** Big data analytics and the IoT enable companies to develop greater consumer insights and invent new engagement models. Passive biometric monitoring and real-time interactions are game-changers when integrated in to the clinical ecosystem particularly in the management of chronic disease. Predictive algorithms and machine learning analyze the raw data to produce personalized actionable information to enable pro-active engagement, prevention, and greater compliance. An example of this is the GlycoLeap program by Holmusk, a digital behaviour change program for populations at risk and in early stage of diabetes. The online platform integrates data from over 200 sources (such as weighing scale, glucose testing kit, public and proprietary databases) and provides data-driven health coaching for patients by health professionals. Through effective management of risk factors (such as body mass and glucose control), initial trials show that within 3 months of starting the program 24 percent of patients were medication-free, while medication use was reduced in another 35 percent. At an annual cost of US\$300 per patient (versus US\$2600 in high-income APAC markets), this program offers significant cost savings.

- **Integrated and coordinated care network.** Fragmented care pathways result in uncoordinated care leading to duplication (or negligence) of healthcare services, and unnecessary referrals to tertiary hospitals for conditions that could be managed more cost-effectively at primary care facilities. This is particularly pertinent in the management of complex conditions, which involve multiple healthcare professionals operating in different institutions (for example, family doctor, specialist, and physiotherapist). The decreasing cost of technology (such as electronic health records, telemedicine) will facilitate the delivery of coordinated care across a network of providers leading to better patient outcomes, efficiency, and the potential for financial savings.

For example, Mercer Marsh Benefits works with its network of providers to develop strategies to ensure delivery of cost-efficient care, improved cost management, and better patient outcomes. Comprehensive data-driven insights are developed through analysis of claims utilization, procedure and medication costs. This enables identification of waste or abuse (e.g., over-servicing, duplication of tests, poor adherence to treatment), and the formulation of strategies to incentivize and improve efficiency. This includes clinical audits, management of panel providers, and optimization of patient flow and support programs.

Accordingly, transformation in the health space through the adoption of innovative technologies, and the implementation of new models of care by providers, insurers, and individuals will contribute to the sustainability of the overall health ecosystem.

CASE STUDY

EMPLOYEE-CENTRIC, DATA-DRIVEN, AND INTEGRATED WORKPLACE HEALTH PROGRAMS

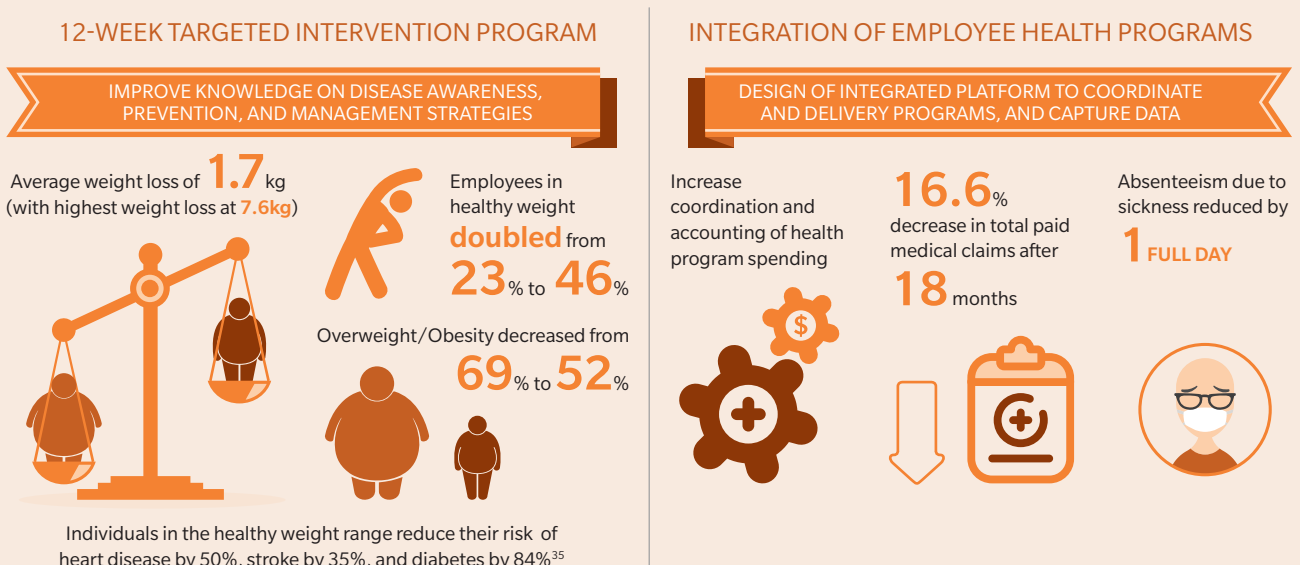
For many people, a large proportion of time is spent at work. Therefore, employers have the potential to significantly influence the health of employees. Mercer Marsh Benefits (MMB) designs evidence-based workplace wellness programs aimed at improving the health of employees, which in turn has been shown to improve employee engagement and productivity, and reduce costs.

MMB customizes these programs to suit the needs of each organization based on the industry, nature of work, demographics, and a health profile of employees. As shown in Exhibit 17, this includes:

Targeted intervention programs. MMB together with wellness partners deliver workplace wellness programs to improve employees' knowledge on key chronic diseases (including diabetes, obesity, cancer), disease prevention, and management strategies (such as nutrition, fitness programs). Through a 12-week targeted intervention program for weight management at one organization, the participants lost an average of 1.7 kg with the highest weight loss at 7.6 kg. In general, after the 12 months of wellness programs, the employees of healthy weight range increase from 23 to 46 percent while overweight and obese employees decrease from 69 to 52 percent.

Integration of employee health programs. MMB designs integrated healthcare "hubs" to coordinate and deliver health programs across multiple vendors. In addition, analytics platforms enable robust data capture (including expenditure on programs, employee health outcomes) to allow assessment of the value of programs and wellness strategies.

Exhibit 17: Real-world results of workplace initiatives improving employees' health



Source: APRC and Mercer analysis

35. World Obesity Federation. Relative risk by BMI

CONCLUDING REMARKS

Declining birth rates and increasing life expectancy have resulted in the aging of societies across APAC, which is placing pressure on social, economic and financial systems. As shown in our analyses, one direct consequence of societal aging is an increase in the prevalence of NCDs. This is compounded by high medical inflation rates across the region, which will challenge the ability for governments, insurers, and individuals to adequately and sustainably finance healthcare. While the focus of the analysis in this report is on the impact to healthcare insurance, the interdependency of the sustainability of insurance and the broader health ecosystem mean that addressing these challenges is a collective responsibility for all stakeholders.

Governments should consider national policies that support the prevention of NCDs (such as a sugar tax, and public health initiatives to encourage healthier lifestyles), and improve the efficiency of the health system (for example, value-based healthcare as opposed to fee-for-service). In addition, the interplay between governments and insurers is crucial to ensure the adequacy of healthcare financing. For example, all residents in Singapore are required to purchase Medishield Life, a national health insurance scheme that is partly subsidized by the government to ensure that premiums are affordable.

Insurers have an important role in improving access to insurance coverage, particularly for the elderly where income is more limited and healthcare needs are higher. Technology (such as telematics, wearable technologies, and big data analytics) has the potential to improve risk measurement to allow more accurate insurance pricing that reflects an individual's risk and distribution of healthcare costs. To capitalize on the potential of advancements in analytics, this will involve redesigning the underwriting processes, as well as developing customer centric interfaces to improve the experience for existing customers, which will also increase access to underserved segments that may have been turned down by insurers using traditional methods. Insurers also have a vested interest in developing innovations that prevent or delay the onset of NCDs, as well as strategies that minimize the cost and risk of downstream complications. Together with innovative approaches to structuring premium payments (like front loading of premiums during working years), this may enable insurers to broaden their risk pool and offer policies at lower premiums.

Individuals, as well as employers, have a responsibility and incentive to place greater emphasis on healthier lifestyles to reduce the risks of NCDs. In addition, greater awareness by individuals of their insurance coverage (from employer and private plans) is crucial to assess their level of protection/exposure to healthcare expenses.

Alongside the growing importance of private pension plans in contributing to the overall financial security for retirement,^{36, 37} private healthcare insurance plays an increasingly important role in healthcare financing as government budgets tighten, and as the need and cost of healthcare grows. However, the continued rise in NCD prevalence (driven in part by societal aging) will erode the affordability of healthcare insurance. Therefore, innovations and strategies to prevent NCDs and deliver healthcare more cost-effectively are required to contribute to the sustainability of the insurance model and the broader healthcare system.

36. Melbourne Mercer Global Pension Index 2016

37. Mercer 2017. Financial security: Mend the gap. Public pensions perspective

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Special thanks to Dr Charles Alessi (Senior Advisor to Public Health England) for his valuable input to the report.

The design work for this report was led by Shahroum Abdul Rahman and Doreen Tan, Oliver Wyman.

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