

Mortality Protection Gap Study 2021



Table of Contents



I. Introduction	04
II. Overview of Hong Kong life insurance market	05
III. Why is the mortality protection gap worth attention?.....	07
IV. Defining the mortality protection gap	09
V. Mortality protection gap in Hong Kong	11
VI. Lifetime risk profiling	20
VII. Implications of the Study.....	24
VIII. Conclusion.....	26
Appendix 1: Methodology	27
Appendix 2: Data sources	33

Executive Summary

Size of overall protection gap
HKD 6.9 trillion

Average size of protection gap
HKD 1.9 million

* per economically active adult

Average size of protection gap
5.7 times of annual income

* weighted average per economically active adult

Life insurance in Hong Kong is well developed. Premiums from life insurance reached HKD 511 billion in 2019, making Hong Kong the 11th largest life insurance market (in terms of total premium size) in the world. Nevertheless, Hong Kong is not immune to the global mortality protection gap (“MPG”) phenomenon. The presence of a protection gap can threaten the ability of average families to maintain a decent living standard in the event of the unexpected vicissitudes of life, especially premature death.

About the Study

One of the statutory functions borne by the Insurance Authority ("IA") is to promote understanding by policyholders and potential policyholders of insurance products and the insurance industry. For this reason, a dedicated team has been set up to conduct policy research and public education.

Against this background, the IA carried out the Mortality Protection Gap Study ("Study") 2021, with a view to raising public awareness towards the protection gap, facilitating public discussion of personal risk profiles and evolving exposures and the way to bridge the gap, while placing a range of issues in a broader context for further investigation.

To assess the overall magnitude of Hong Kong's MPG, the Study examined the different components contributing to the gap.

Significant size of MPG

The overall size of the MPG in Hong Kong was around HKD 6.9 trillion in 2019, which translates to about HKD 1.9 million or 5.7 times weighted average annual income per economically active adult. Market statistics have identified MPGs for other jurisdictions in Asia ranging from USD 0.6 trillion (HKD 4.7 trillion) for Singapore to USD 40.6 trillion (HKD 316.7 trillion) for Mainland China.

Key role of insurance in closing the gap

In contrast to other financial instruments, where funds require a much longer time to accumulate and grow to a level that could provide sufficient protection, life insurance provides a quicker and more efficient way for policyholders to close their protection gaps. Life insurance is unique because it costs much less when it is bought at an early age. Hence, policyholders who act early, and who regularly review their insurance portfolios against their MPG and financial resources, can achieve better protection for themselves and their families.

I. Introduction

The origin of life insurance can be traced back to ancient Rome. Citizens in Rome formed 'burial clubs' in which the club would help finance the funeral and pay burial-related costs for members who pass away¹. In a sense, burial clubs could be viewed as a primary model of modern life insurance because the arrangement helped citizens manage their mortality risk. Mortality risk is of course the fundamental or most important issue addressed by life insurance.

Since then, the concept of life insurance has continued to develop gradually.

- In 1693, Edmond Halley published an article on life annuities. He constructed the first mortality table to provide a link between life insurance premiums and average life spans².
- In 1756, James Dodson reworked the mortality table, linking premium rate to age³.

Life insurance continues to evolve, and its scope has been expanded to cover areas such as savings and retirement. Nevertheless, the principle of insurance remains unchanged, that is, to offer protection to the insured and their families. So much so that in the global insurance industry, life premiums amounted to USD 2,797 billion in 2020⁴.

1. Historical Development of Insurance. In Encyclopedia Britannica. Retrieved from <https://www.britannica.com/>
2. Ciecka, J. E. (2008). Edmond Halley's life table and its uses. *Journal of Legal Economics*, 15(1), 65-VIII.
3. Institute and Faculty of Actuaries. James Dodson's 'First Lecture on Insurances', 1756. Retrieved from <https://www.actuaries.org.uk/learn-and-develop/research-and-knowledge/library-services/historical-collections/archive-equitable-life-assurance-society/highlights-equitable-life-archive/james-dodson-s-first-lecture-insurances-1756>
4. Swiss Re Institute. (2021). World insurance: the recovery gains pace.

II. Overview of Hong Kong life insurance market

The life insurance market in Hong Kong is well developed. According to statistics published by the Insurance Authority (“IA”), premiums for life insurance in-force policies reached HKD 511 billion (around USD 66 billion) in 2019⁵. It made Hong Kong the 11th largest life market in the world⁶. Hong Kong is also within the top tier in other key indicators. In 2020, Hong Kong’s insurance density (insurance premium per capita) and penetration (insurance premium as a percentage of gross domestic product (“GDP”)) ranked the highest in the world for life business⁷.

Policyholders have access to a wide spectrum of insurance products and choices to fit their needs, thanks to the presence of many multinational insurers in Hong Kong⁸. These products protect policyholders against numerous insurable risks such as mortality, morbidity and longevity⁹. Some products also serve financial planning purposes such as wealth accumulation and legacy planning.

The deep-rooted Asian culture strongly influences its peoples’ saving habits, which in turn is reflected in the selection of insurance products. Life insurance products with savings and investment elements are popular amongst Asians. Life insurance in-force business premiums in Hong Kong are derived mainly from protection type products with savings elements. The business mix in the Hong Kong insurance market somewhat matches the pattern in Asia¹⁰, which also shows a strong preference for savings and investment type insurance products.

5. Insurance Authority. (2020). Market Overview – Long Term Insurance. Premiums contributed by Mainland Chinese Visitors (“MCVs”) are included.

6. Swiss Re Institute. (2021). World insurance: the recovery gains pace.

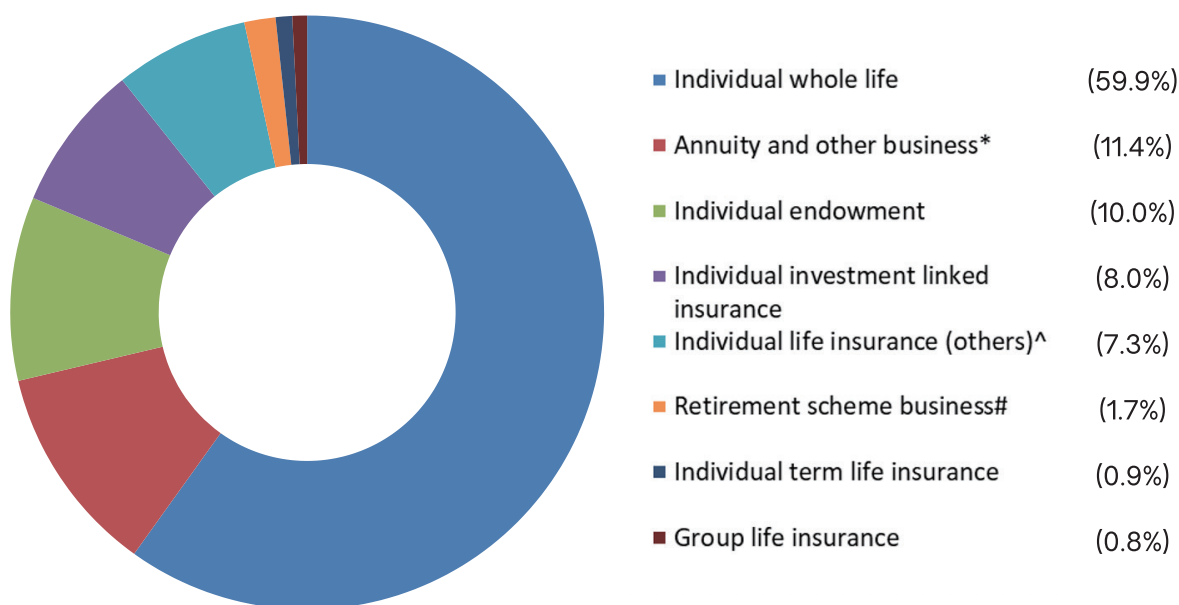
7. Ibid. The calculation of the insurance density and penetration quoted by Swiss Re includes insurance premiums contributed by the MCVs.

8. Axco Insurance Information Services Ltd. (2018). Hong Kong: Life & Benefits 2018 (Insurance Market Report).

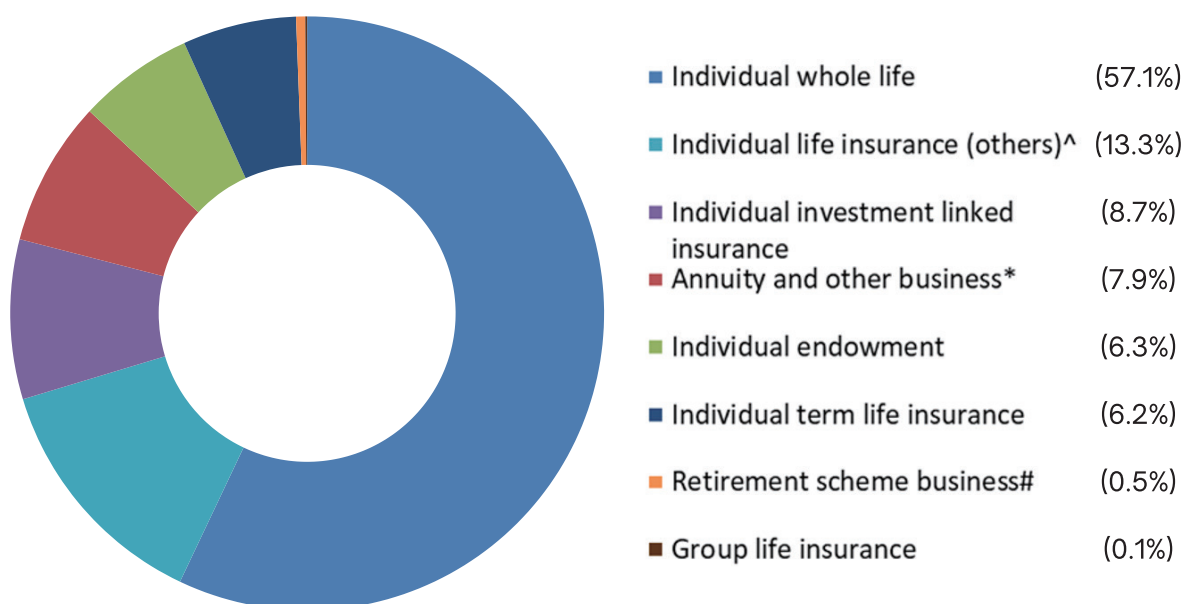
9. Morbidity risk refers to the risk incurred when someone is diagnosed with a critical illness, regardless of congenital causes; longevity risk relates to the risk incurred when someone’s retirement reserves are inadequate to sustain his/her living standard owing to a longer than expected lifespan.

10. McKinsey&Company (2018). Life insurance and annuities state of the industry 2018: The growth imperative. Note: The figures in the Study may not be fully compatible with this report due to the differences in product definition across the countries in the region.

Life insurance premium (in-force) in 2019



Life insurance number of policies (in-force) in 2019



* Annuity and other business consists of annuity, tontines business and other business.

^ Individual life insurance (others) consists of individual non-linked life business other than whole life, endowment and term. It may include universal life.

Retirement scheme business consists of Class G business, which provides for a guaranteed capital or return, and Class H business, which does not provide for such a guarantee.

Source: Insurance Authority

For key features of the different types of insurance products mentioned above, interested readers may visit our thematic sitelet, available at-<https://education.ia.org.hk/en/>

III. Why is the mortality protection gap worth attention?

The fundamental purpose of life insurance is to protect policyholders against mortality risk by helping to provide their dependents with sufficient amounts of money to continue living if the breadwinner passes away prematurely. It is important that the actual sum assured reflect the level of protection needed.

In recent decades, Hong Kong's life insurance market has enjoyed favourable growth, thus keeping Hong Kong in top position globally in terms of insurance density and penetration¹¹. The high values of both these indicators testify to the undeniable popularity of insurance products in Hong Kong.

An ageing population and growing health consciousness have deepened the public's understanding of protection needs against the backdrop of longer life expectancies and unexpected medical expenses. Deferred annuities and health insurance products have become more popular, clearly reflecting that the public is getting the message that they need to prepare early for longer life spans and higher

medical expenses. But while longevity and morbidity are well discussed, the public is not necessarily well aware of how insurance products hedge against their mortality risks.

Product knowledge is especially important as policy features grow ever more complex to meet the changing needs of a wide range of the population. As already mentioned, the Asian culture skews the local insurance market towards savings or investment elements¹². It has become mainstream for insurance products to serve a variety of financial purposes. But these heavy savings and investment elements can overshadow the actual insurance aspects, and at worst, can reduce the ability of the life insurance policy to hedge mortality risk.

But why pay attention to mortality risk? Is understanding the mortality protection gap ("MPG") that important? The MPG measures the impact on a breadwinner's family or, to be precise, their dependent(s) in the unfortunate event of the breadwinner's premature death. The larger the MPG, the more dependent(s) would

11. Insurance density is defined as the ratio of premium written in a given year to the total population whereas insurance penetration measures the ratio of premium written to the GDP in a given year.

12. McKinsey&Company (2017) Global Insurance Industry Insights - An in-depth perspective: It suggested that in the Asia-Pacific region life endowments were the leading products with a share of about 60%, while in the Europe, Middle East and Africa region and the Americas region, the percentages were about 35% and 20% respectively in 2015-2016.

III. Why is the mortality protection gap worth attention?

be unable to maintain the same living standard using the financial resources they have on hand, such as savings and investments, life insurance and pension. In a broader sense, the existence of a MPG not only means a financial shortfall for the unfortunate individual or household but could also impose a huge social cost on the whole economy.

Consumer behaviour is in fact influenced by their level of awareness of the MPG. This is demonstrated by a study¹³ on financial literacy levels in Hong Kong, whose recommendations spotlight the need for greater attention to mortality risks. Findings from this study include: i) inadequate management of household income and expenses, with only about half of households prepared with an emergency fund that can help support basic household living expenses for six months; ii) inadequate financial management amongst the younger generation, and iii) a key need to encourage and boost savings to build an adequate financial buffer for emergency use. In this regard, the IA will conduct research to further investigate insurance literacy levels in Hong Kong.

Ignorance about the MPG can have a devastating impact on dependents, given that family savings can be quickly depleted upon a breadwinner's premature death. An even greater financial burden would result when coupled with the anticipated increase in longevity and the rise of medical and education costs, impacting those unfortunate families, some of whom may eventually need to fall back on public assistance which may, in turn, affect the resources allocation of the public sector.

Examining the MPG in various dimensions is therefore a key objective of this study ("Study"), in light of the huge threat that the MPG poses to the future of individuals, families, and society.

13. Investors and Financial Education Council. (2019). Financial Literacy Monitor 2019.

IV. Defining the mortality protection gap

The MPG is a concept that addresses, on a quantitative basis, how dependents will be impacted after the death of the family's most important economically active adult¹⁴ (EAA). Generally, the MPG is defined as protection needs minus resources available. In this Study, discussion will basically focus on the ordinary working class and their dependents in general. Specifically, the methodology was developed based on families with monthly incomes and expenditure rankings at the average level of the society.

In reality, of course, society contains a wide spectrum of household mixes. Accounting for such a wide set of variables would create significant deviations in the value of the MPG. Therefore, to ensure a fair discussion, at least the following groups should be excluded from the scope of this Study:

1. EAAs without any dependents
2. Non-EAAs, or
3. Super high net worth people

On a separate note, to achieve a more accurate estimation, the life insurance premiums generated by MCVs¹⁵ are excluded in the rest of this report, and in the calculation of MPG in Hong Kong.

14. According to the Census and Statistics Department (C&SD), EAAs (aka labour force) is defined as employed persons (including employees, employers, self-employed persons and unpaid family workers) and unemployed persons. In other words, home makers, students, retirees and those persons who do not have to work for a living (independent means) are not EAAs.

15. MCVs accounted for 25.1% of new business in the Hong Kong life insurance market in 2019.

IV. Defining the mortality protection gap

In addition to defining the Study's target group, clearly describing the concept of "maintaining living standard" is also important to understanding the MPG and in fact, forms the skeleton around which the whole methodology is built. Included in the concept of "maintaining living standard" is the idea that dependents and/or remaining family members will not be worse off

in terms of the financial support they receive, even after the death of the breadwinner. In other words, dependents would continue to receive the same level of medical care and education support; and the family would be able to stay in the same dwelling place (whether it is self-owned or rented)^{16,17}.



Protection needs consist of the following:

- future medical cost of dependents;
- future education cost of dependent children;
- future household expenditure; and
- current level of household debt.

The components of the resources available are determined as follows:

- savings and investments;
- assets related to retirement schemes; and
- life insurance coverage.

16. Each person may have a different interpretation of the term "living standard", as no common definition exists to quantify living standard. However, in this Study, we consider that the living standard is maintained if, after the death of a breadwinner, the self-owned property needs not be sold.

17. According to the price index for selected popular developments in private domestic property published by the C&SD, domestic property prices in Hong Kong have skyrocketed by almost six times from 2003 to 2018. Some may argue that the prolonged uptrend independents and families - that is, they can sell the property to maintain their living standard. However, selling the property goes against the most important assumption behind the definition of protection needs - to maintain the living standard of the dependents and families.

V. Mortality protection gap in Hong Kong

This section briefly describes the methodology used to estimate the overall protection gap in Hong Kong and presents the key results. More detail is set out in Appendix 1.

Methodology

As mentioned, MPG is defined as the difference between protection needs and the resources available. The size of one's protection needs is primarily determined by income level. In this Study, the average income¹⁸ of EAAs is calculated based on the data from the General Household Survey from the C&SD.

1. Protection needs

Future household expenditures

Future household expenditures are estimated using the contribution of employment income of individual EAAs to their households. It is assumed that they make contributions to household expenditure until their retirement at age 65.

Theoretically, household expenditure refers to the actual expenditure incurred by households. In this Study, however, medical and education costs are extracted under certain conditions (details below) from the calculation of future household expenditure and treated as separate items, in order to allow more detailed discussion on these two expenditure components.

i) Future¹⁹ medical cost of dependents

This component takes into account the future medical costs of dependents such as students and other economically inactive persons including non-working spouses and retired elderly. For children, medical cost is factored in until they join the labour force. For the other dependents, medical cost is incurred until their death.

ii) Future education cost of dependent children

This component considers the accumulated education costs of dependent children before they enter tertiary education. The Study takes into account the period of time it takes for children to grow from toddlers to teenagers and considers relevant expenses other than tertiary tuition costs. This makes estimates of expense growth rates more accurate and comprehensive, thus ensuring significant factors are not missed in calculating the total education cost.

For children receiving their tertiary education, the relevant education cost is already reflected in total household expenditure.

18. The income level is calculated on a weighted average basis.

19. All future expenses are calculated based on the present value and allows for inflation.

Household debts at the current level

Household debts consist of outstanding residential mortgage loans, credit card advances and other personal loans.

2. Resources available

Savings and investments

i) Bank deposits

This component considers the deposits placed in banking institutions²⁰. Note that deposits placed by commercial corporates and offshore clients are excluded.

ii) Investments

This component takes into consideration investments in stocks and Exchange Traded Funds (“ETFs”) that are locally listed or traded on Hong Kong Exchanges and Clearing (“HKEX”) (e.g. Tracker Fund of Hong Kong) as well as other locally listed products such as Real Estate Investment Trusts (“REITs”), bonds and derivatives. In addition, the calculation also includes investments in mutual funds²¹.

Assets related to retirement schemes

This consists of five types of asset related to retirement schemes: Mandatory Provident Fund (“MPF”), Occupational Retirement Schemes Ordinance (“ORSO”) schemes, Civil Service pension schemes, Grant Schools Provident Fund (“GSPF”) and Subsidized Schools Provident Fund (“SSPF”).

Life insurance coverage

This component measures the total death benefits payable of life insurance policies issued to EAAs. It excludes the sum assured of non-residents by utilising results from the IA’s Industry Survey of Mortality Protection Gap²².

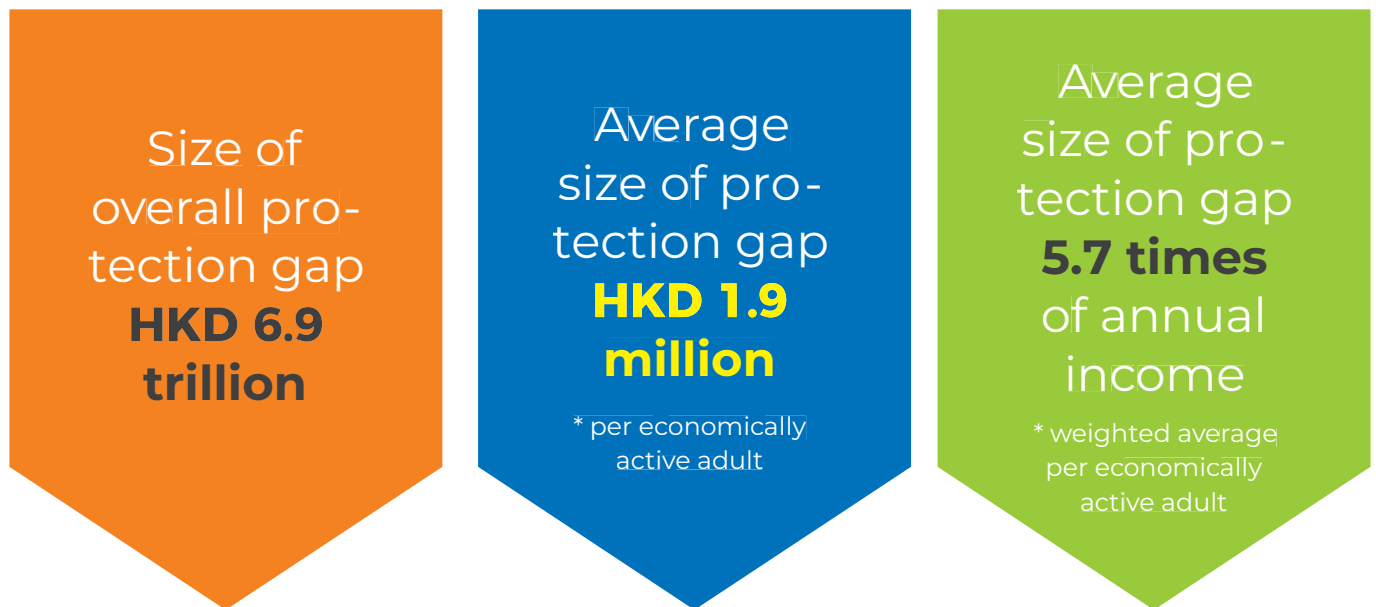
20. Banking institutions include licensed banks, restricted licence banks and deposit-taking companies.

21. In this report, only the assets under asset management and fund advisory business held by retail investors (excluding that belonging to MPF and other pensions) are considered.

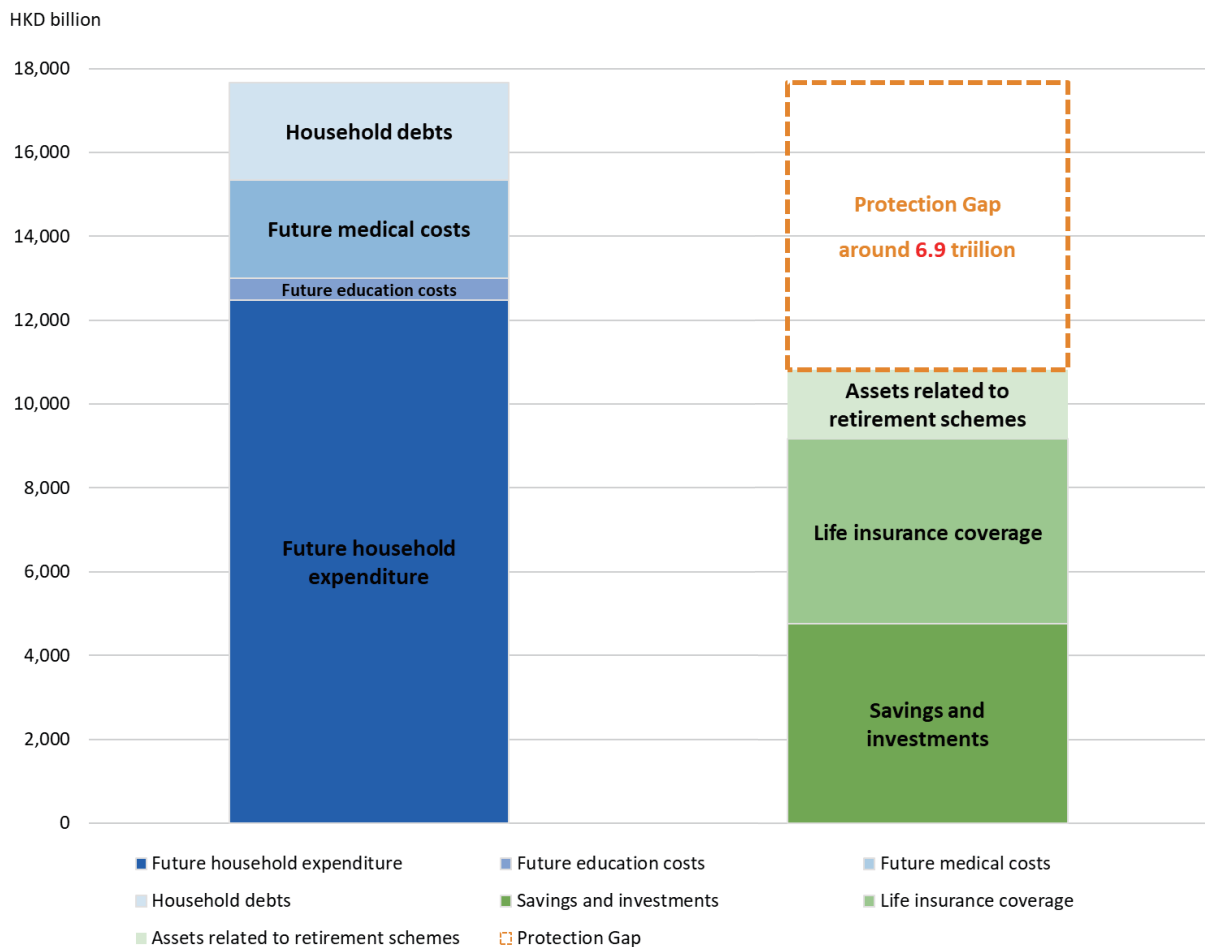
22. “Industry Survey of Mortality Protection Gap” conducted by IA in August 2018.

V.a. Key results

The overall size of the protection gap is estimated to have been around HKD 6.9 trillion in 2019.



Mortality Protection Gap in 2019



The total protection needs of all EAAs in Hong Kong were estimated at over HKD 17.6 trillion. Future household expenditure comprised the largest component of protection needs (70.6%), followed by 1) future medical expenditure for dependents (13.3%), 2) household debts (13.1%), and 3) future education costs (3.0%).

Total resources available upon the death of EAAs were around HKD 10.7 trillion which broke down into 1) savings and investments of all Hong Kong EAAs estimated to be around HKD 4.7 trillion, 2) insurance coverage (individual and group life policies issued to the group of EAAs) of around HKD 4.4 trillion and 3) assets related to retirement schemes of around HKD 1.6 trillion.

The average size of the MPG per EAA was thus HKD 1.9 million (or 5.7x the average annual income per EAA)²³.

The MPG for each individual can vary due to an array of factors such as demographics, financial income and dependents' particulars. Since these factors affect the size of an individual's MPG, a series of hypothetical cases is discussed in the next section to demonstrate the protection requirements of individuals under different circumstances.

23. According to the C&SD, at the end of 2019 there were 3.6 million EAAs and their weighted average annual income was about HKD 332,000.

What does a HKD 6.9 trillion MPG mean?

Looking at the protection gap from a global perspective, the aggregate MPG of the United States was close to USD 25 trillion (about HKD 195 trillion) in 2016²⁴. In the Asia-Pacific region, the size of the MPG amounted to USD 83 trillion (about HKD 647 trillion) in 2019, of which Mainland China accounted for USD 41 trillion (about HKD 320 trillion). The respective size of MPG for some developed and developing markets such as Japan and India were about USD 8.4 trillion (about HKD 66 trillion) and USD 16.5 trillion (about HKD 129 trillion)²⁵.

In Asia, the MPG per EAA with dependents across different countries ranged from USD 13,000 to USD 402,600 (about HKD 100,000 to HKD 3,140,000)²⁶.

The above figures demonstrate that the MPG is a global phenomenon and not just an issue for emerging markets.

24. Swiss Re Institute. (2018). Life underinsurance in the US: bridging the USD 25 trillion mortality protection gap; exchange rate calculation - USD 1 equivalent to HKD 7.8.

25. Swiss Re Institute. (2020). Closing Asia's mortality protection gap; exchange rate calculation - USD 1 equivalent to HKD 7.8. Due to the different methodologies applied, the figures may not be necessarily appropriate for direct comparison with the IA's findings. The sizes of the MPG in the selected ten jurisdictions/markets were (in descending order): Mainland China (USD 40.6 trillion); India (USD 16.5 trillion); Japan (USD 8.4 trillion); South Korea (USD 3.9 trillion); Australia (USD 2.8 trillion); Indonesia (USD 2 trillion); Thailand (USD 0.9 trillion); Malaysia (USD 0.7 trillion); and Singapore (USD 0.6 trillion).

26. Swiss Re Institute. (2015). Mortality Protection Gap: Asia Pacific 2015; exchange rate calculation - USD 1 equivalent to HKD 7.8.

V.b. Data Limitations

Data sources used in the Study and statistics used in the calculation of MPG are listed in Appendix 2.

Due to the nature of data sources and/or the assumptions made in this Study, readers should take note of the following key limitations of the Study:

- **Reference period of data sources used:**

As the statistics used come from various sources involving multiple organisations, some of the data used is not up-to-date. Taking into account inflation since the reference period of these data sources, these statistics (mainly the expenditure figures) have been inflated to make them comparable with other statistics as of 2019. While adjustments have been made, this may still affect the accuracy of the MPG calculation.

- **Assumptions on income growth and risk-free discount rate:**

For simplicity, the Study assumed constant income growth rate and risk-free discount rate over a certain period of time, as data is not available. This may affect the accuracy of the MPG estimation.

- **Data insufficiency on civil servant pensions:**

Due to the lack of data (e.g., exact figures for different civil servants' pay scales), the Study calculated civil servant pension assets by multiplying 1) the portion of EAAs in the pension pool and 2) the portion of their actual death benefit. This treatment may lead to an overestimation or underestimation of civil servant pension assets.

Possible causes for MPG overestimation

- **Exclusion of other household income sources:**

In the Study, it is assumed that household income is comprised entirely of employment earnings. Other household income, such as rental income, dividends and interest generated from investments, which are likely to continue after the EAA's death, are excluded to ensure against overestimation of the resources required to maintain living standards.

o **Future household expenditure for a specific household mix:**

The Study assumes that for a single EAA living with parents only, future household expenditure is funded up to the EAA's retirement age. However, elderly parents may pass away before the EAA's normal retirement age. In this case, the future household expenditure for remaining household members may be overestimated, resulting in an overestimation of the MPG.

o **Underestimation of savings and investments:**

The savings and investments considered in the Study include only deposits, stocks, bonds and mutual funds investment. Investment property (i.e., the owner is not occupying the property) and physical cash held by EAAs are not considered in the Study due to data limitation. Therefore, the total amount of savings and investments held by EAAs may be underestimated, resulting in an overestimation of the MPG.

Possible causes for MPG underestimation

o **Future health expenditure calculation:**

Dependents' future medical costs are a key component in calculating the MPG. Government statistics²⁷ show total health expenditure at HKD 170 billion, approximately 6% of local GDP, with more than half of health expenditure (50.3% in the financial year 2018/2019) met by government spending.

In this Study, future health expenditure is estimated based on the aggregate amount of "out-of-pocket" medical expense in Hong Kong. Current health expenditure is met by four types of financing: 1) public sector, 2) private insurance, 3) household out-of-pocket payment and 4) others (including employer-based insurance schemes, enterprise financing schemes and non-profit institutions serving households financing schemes). These accounted for 50.3%, 9.1%, 31.6% and 9.0%, respectively of total health expenditure according to official data for 2018-2019.

27. From the Hong Kong Domestic Health Accounts published by the Food and Health Bureau of the Hong Kong Government.

Estimating future health expenditure is difficult, due to limited available data for several key components of the calculation. In the Study, official data about household out-of-pocket medical expense was used as a proxy to estimate future average health expenditure. In reality, however, future health expenditure can vary significantly depending on different demographics, income levels, and financial preparedness of individuals to deal with unexpected medical expenses. In this sense, these limitations could lead to possible and significant underestimation in calculating future medical expenditure.

- Persistently high medical expenses and growth in the ageing population both contribute to medical inflation, driving medical cost ever upwards. While the Study estimates dependents' future medical expenditure at about 13% of the total resource required to maintain living standard (under an aggregate basis), data limitations mean that EAAs and dependents have both been assumed to have the same level of average out-of-pocket medical expense. In reality, out-of-pocket medical expense for dependents should be notably greater than

for EAAs, as a large number of EAAs are covered by group medical insurance provided by employers. As the calculation of total resource required to maintain living standard is based on the protection needs of dependents, future medical expenditure is possibly understated, resulting in underest of the MPG.

- **Effects of “negative MPG” not considered:**

If an EAA's available resources exceeds their protection needs, they should have a zero or literally a negative MPG. This occurs particularly when an individual has accumulated substantial financial resources while dependents' protection needs have decreased. Unfortunately, data limitations mean the Study could not exclude these negative contributions when calculating the aggregate size of the MPG. Without these negative contributions, the MPG of the ordinary working class EAA with dependents should be significantly greater, meaning that the aggregate MPG of all EAAs is possibly underestimated.

o **Children undertaking full-time tertiary education:**

In the Study, the education-related costs for dependents' tertiary education are not specifically singled out for detailed discussion. For those dependents undergoing tertiary education in Hong Kong, education-related costs were simply reflected in the total household expenditure. However, it is important to note that for those dependents who pursue tertiary study abroad, the total education cost could possibly be underestimated, resulting in an understated size of the MPG.

o **Funeral cost not under consideration:**

The funeral cost of EAAs is not considered in the Study due to data limitations. In fact, funeral costs are determined by the type of funeral selected and services required, which depend on the culture and religion of the deceased and the bereaved. Each household has its own circumstances so funeral cost cannot be reliably estimated.

o Having listed out most of the factors affecting the magnitude of the MPG, it would still be difficult to judge whether the estimated MPG is over- or underestimated. Exclusion of other household income sources could be a significant contributor to overestimation of the MPG, particularly for a family that is also supported by secondary income such as rental generated from investment properties. On the other hand, persistently high medical expenses and negative MPG should both contribute tangibly to the underestimation of MPG. Without persuasive data on which to make a reasonable judgement on the aforementioned factors, it is advisable to be alert to the possible deviation of the size of MPG as whole.

VI. Lifetime risk profiling

The MPG varies with each individual due to an array of factors, such as their demographics, income, and dependents. In addition, the MPG changes with an individual's different life stages, such as marriage, childbirth and property purchase. In other words, the concept of **Lifetime Risk Profiling is important** to the understanding of the MPG.

The following discussions focus on exploring the key factors which affect a person's risk profile along his/her life, including, but not limited to, academic backgrounds, choices of career and life planning in determining the size of one's protection needs²⁸.

The five hypothetical cases below consider the protection requirements of five individuals who were classmates in secondary school, namely **Alex, Bill, Carl, Dave and Eddy**. These individuals all share a similar background but pursue different career paths and later, different life plans.

To illustrate the high correlation between life planning and protection needs, certain assumptions were applied in the hypothetical cases. Alex, Bill, Carl, Dave and Eddy are all single

children in their respective families and are living with their parents in self-owned flats when they start their careers. When they turn 30, their parents retire. However, differences in career paths and life planning later result in significant variance in their protection needs.

In terms of education background and career path, Alex, Bill and Carl share similar characteristics: they are university graduates who start work in local companies as junior managers. Dave graduates from a top-notch university and works as a professional in an international corporation. Eddy starts to work as a labourer after leaving secondary school and never enters university.

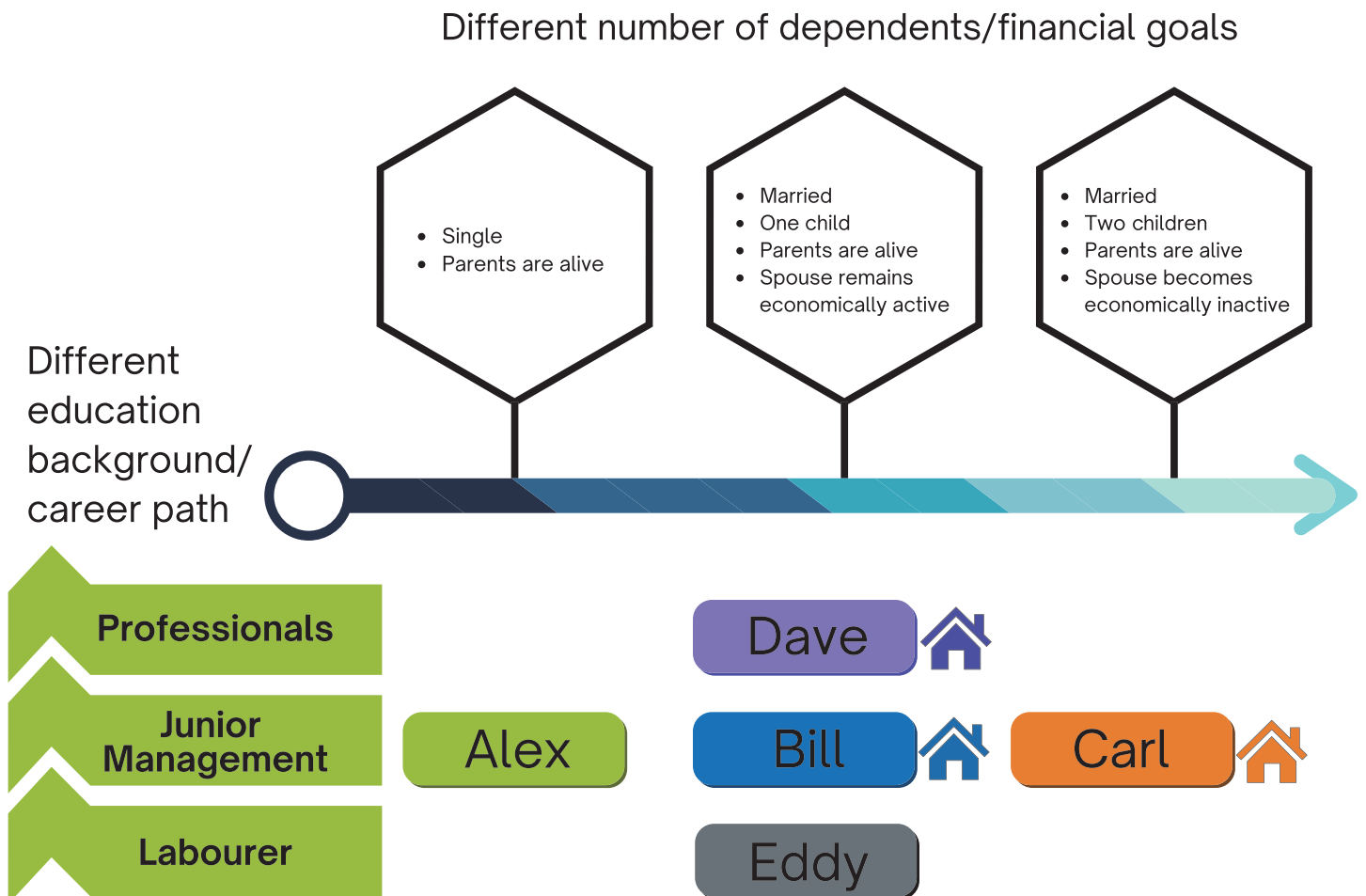
Meanwhile, these five individuals take different approaches to life planning. As Alex finds cooking fascinating, he spends almost all his leisure time on improving his cooking skills and exploring new recipes. He prefers to remain single.

28. Showing protection needs, instead of protection gap, could over time remove uncertainties over several key determinants such as savings, investments and pensions as performance is very volatile and thus it is difficult to predict the performances over a long time horizon.

Bill, Carl, Dave and Eddy choose a more common approach to life planning. Each meets his future spouse in the workplace and they all get married when they turn 28. When they are 32 years old, each has a child. Balancing their needs and their ability to purchase property, only Bill, Carl and Dave buy a new flat as the new family home.

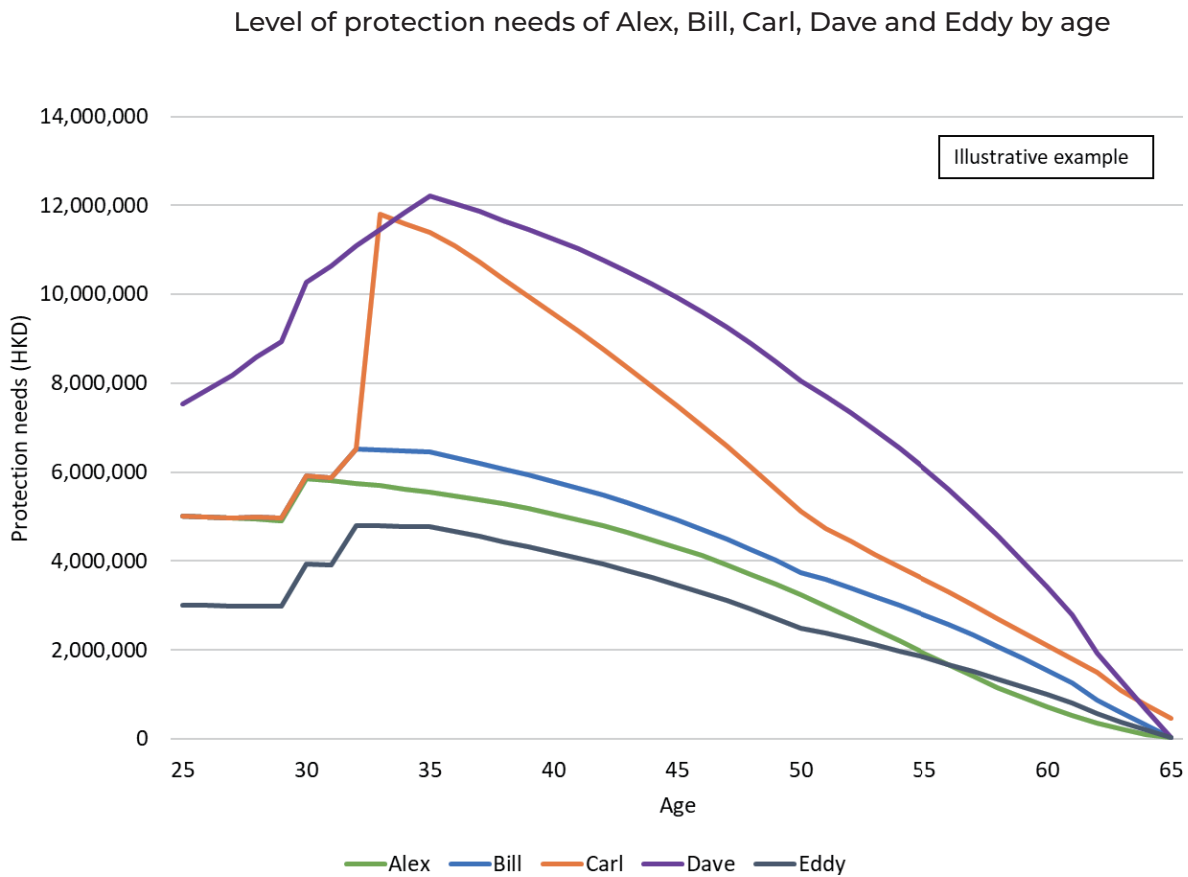
Carl is fond of children and, one year later, he has his second child. His wife decides to quit her job and becomes a homemaker thereafter.

The following graph summarises the differences in career path and life planning of these five individuals.



denotes the person has plans to purchase property

Alex, Bill, Carl, Dave and Eddy's levels of protection needs by age are shown in the following graph.



After they all left school, they become economically active, and protection needs for the benefit of their parents emerge. After their parents' retirement (i.e., when the five individuals reach age 30), the amount of protection needed increases significantly.

Alex prefers to remain single and has no plan to buy his own flat. As such, his protection needs are expected to narrow gradually as his parents grow older (and eventually pass away).

Bill's protection needs grow rapidly after the birth of his child, resulting in more dependents and the purchase of a property with a mortgage. For Carl, the birth of his second child and his wife's decision to become a full-time homemak-

er take his protection needs to a new height. Of course, Bill and Carl's protection needs also decrease gradually as their parents age and their child(ren) become self-reliant.

A difference in career path also creates a difference in the levels of protection needed. Dave's higher salary naturally leads to a higher household spending pattern and eventually to higher protection needs. Similarly, Eddy's protection needs are lowest in the early stages due to his having the lowest salary among the five. While their protection needs start at different levels, they change following a similar pattern to Bill's, with needs increasing after the retirement of parents and the birth of a child, and gradually declining afterwards.

Key findings from the cases of these five individuals

The key findings differentiating the protection needs of Alex, Bill, Carl, Dave and Eddy are highlighted as follows.

- **Level of protection needs**

When Alex, Bill and Carl are in their early thirties, their protection needs are fairly the same in terms of the absolute amount. Looking at Dave and Eddy, the amount of protection needed starts to differ as their career paths and monthly salaries begin to deviate significantly. Nevertheless, compared with that of Alex, the protection needs of the other four individuals surge after the birth of child(ren), the purchase of property, and/or whether the spouse quits the labour force. For our five cases, all lifetime events, such as marriage, parenthood and property ownership, brought drastic changes to their protection needs. This concept of lifetime risk profiling is in fact important to understand how protection needs change along one's life span.

- **Shape of the curve**

Despite the difference in absolute amount, the shape of the protection needs curve is similar over time. At the beginning, all their protection needs increase correspondingly with their salaries. The amount of protection needed decreases gradually over time (despite their different career paths, household mixes and life planning) because their dependents become self-reliant or pass away.

- **Insufficient life insurance coverage**

The aforementioned IA Industry Survey identified the average sum assured of life policies as ranging between HKD 200,000 and HKD 1,000,000, amongst all age groups. Considering the estimated protection needs of the five individuals just mentioned, these average sums assured are grossly insufficient for the majority of the working class. As the IA Industry Survey highlighted, people should ensure a sufficient amount of either life insurance coverage or accumulated wealth in order to close the MPG.

VII. Implications of the Study

Protection needs vary significantly across different household mixes

It is undeniable that the MPG exists in Hong Kong despite the mature development of our insurance market. As mentioned, life insurance products have evolved with features that help serve multiple functions. The public may have the sense to purchase insurance, but they often neglect the core principle of life insurance – to provide an appropriate and sufficient amount of protection against mortality risk²⁹. Thus, despite Hong Kong's high insurance penetration and density, the MPG was estimated to be an average HKD 1.9 million per EAA (around 5.7 times more than average annual income). The very existence of the MPG reflects the common problem of underinsurance (of mortality risk) amongst typical working individuals in Hong Kong. Policyholders should therefore make it a top priority to use appropriate life insurance products (in terms of both features and budget) to secure sufficient coverage to close the MPG.

The Study has revealed that the size of the MPG depends on an individual's demographic profile, household mix and financial condition. Further, different career paths and life plans change one's protection needs significantly across his/her life span. These changes expose policyholders to changing mortality risk, which unless addressed, can have a devastating impact on a family.

29. Life insurance is one of the possible ways to close the MPG. Besides that, increasing personal savings, investments or other financial resources can also help to achieve the same goal. However, unlike buying insurance, it takes much longer for other financial resources to accumulate to the level able to provide sufficient protection.

Life insurance is unique because it costs much less when it is bought at early age. The idea of Lifetime Risk Profiling helps smart policyholders regularly review and adjust their insurance portfolio.

As already stated, while the considerations involved in selecting life insurance products may become more complex, adequate protection against mortality risk should still be a priority. This is particularly so during one's working life when household spending can still be met mainly by one's earnings.

What constitutes a suitable insurance product to an individual would depend on his or her goals. An important tip, for example, is to strike an appropriate balance among "protection", "savings" and "investment", taking into account the affordability and the level of protection required. This balancing act is particularly important when the prospective policyholder is considering a life insurance policy which incorporates several financial features. What life insurance policies and features to choose are indeed very personal, but protection against mortality risk should always be the prime consideration.

The idea of "lifetime risk profiling" may also be a useful approach when making decisions on insurance purchase. One's whole life journey is undeniably dotted with different milestones, from starting a new family to investing in a

valuable new asset. Intuitively, these critical life decisions should reasonably affect our corresponding protection needs. For example, a new flat owner is advised to reassess his/her protection needs given their increased liability burden (mortgage). Therefore, everyone should review and adjust their insurance portfolios regularly to achieve comprehensive and sufficient risk protection.

This Study takes the first step towards refocusing the public on understanding and addressing the size and implications of the MPG. Various assessment tools are readily available in the market to help the public more fully understand their own insurance needs. The IA also provides a Protection Needs Assessment tool (<https://education.ia.org.hk/en/tool/calculator.html>) to support the general public as they review their own protection needs. This assessment tool helps the public assess their current protection levels and can even estimate lifetime-long protection needs, based on the user's assumptions and decisions. The Protection Needs Assessment tool is developed based on similar assumptions applied in this Study and helps to deliver a baseline examination of protection needs to its users.

VIII. Conclusion

This report achieves several goals, namely to 1) give an overview of the life insurance market in Hong Kong; 2) identify the existence and size of the MPG; 3) enhance awareness of the MPG; and 4) introduce to policyholders the concept that protection needs vary at various life stages and thus encourage a habit of regular portfolio review in accordance with their changing protection needs.

Governments around the world are struggling with a rocketing social burden due to ageing populations and increases in medical expense. Closing the MPG could help reduce the social costs that relate to premature death. Life insurance plays an important role in closing Hong Kong's HKD 6.9 trillion MPG. This figure works out at about HKD 1.9 million per working person, a gap that can be closed by using some of the simple structured and affordable insurance products available today.

A discussion of mortality risk should be viewed as the IA's first step in studying the Hong Kong insurance market. The IA will identify meaningful topics to further promote better understanding of insurance products and the insurance industry among existing and potential policyholders, as a pathway to achieving and maintaining a successful and educated insurance market.

Appendix 1: Methodology

This part describes the methodology of estimating the MPG in Hong Kong. In the Study, population groups are defined as follows:

- i) Economically Active Adults, EAAs (aka labour force), which comprise employed persons (including employees, employers, self-employed persons and unpaid family workers) and unemployed persons.
- ii) In contrast, Economically Inactive Adults include homemakers, students, retirees and those who do not have to work for a living.
- iii) Therefore, dependents are categorised into students and other economically inactive persons including spouse and retired elderly.

This Study focuses on EAAs whose dependents will lose financial support after the EAAs' death. Foreign domestic helpers, although economically active, are not included in the Study as their income will not be used in any form towards their employers' household expenses. More importantly, the dependents of foreign domestic helpers generally reside outside Hong Kong.

Assumptions about income growth, equity returns, and the discount rate used for determining the present value of cash are as follows:

- i) Annual income growth rate (Nominal) : 3.1%
- ii) Annual equity returns (Nominal) : 6.1%
- iii) Risk-free discount rate : 1.9%

These assumptions are based on the growing labour earnings trends in Hong Kong, and returns on the Hang Seng Index and the yield of the US 10-year Treasury bond.

1. Protection needs

There are four components included in the analysis of protection needs and they are:

- 1) Future medical cost of dependents;
- 2) Future education cost of dependent children;
- 3) Future household expenditure; and
- 4) Household debt at the current level.

The Study compiles the present values of the first three components. As for the fourth component, household debts are assumed to be repaid right after the death of the EAAs.

1.1. Calculation of present values

To obtain present values, future cash flows over a lengthy time horizon should be discounted to reflect the time value of money. In the Study, the discount rate benchmark is the yield of 10-year US Treasury bonds³⁰ which is commonly accepted as the proxy of long-term risk-free interest rate.

1.2. Present value of future household expenditure³¹ (excluding medical and education costs)³² for remaining household members

In the Study, household expenditure³³ is expected to be funded solely by the salary(ies) of the EAA(s) in that household. Any secondary income or other income sources are not considered due to data limitations.

- For a household that consists of two EAAs, both earners are responsible for household expenditure and the size of each person's contribution is directly proportional to his/her income. That means, the EAA who earns more is expected to shoulder more household expenditure.
 - When one of the earners in the household dies, only the part of the household expenditure originally paid by the deceased is included in the MPG calculation. The other part of the household expenditure will continue to be funded by the remaining earner(s) in the household and is excluded from the calculation.

30. The commonality and transaction volume made the US 10-year Treasury bond one of the most suitable picks for the discount rate.

31. The Household Expenditure Survey is conducted once every 5 years by the C&SD to collect up-to-date information on the expenditure patterns of households in Hong Kong. The latest results available were in 2014/15. It is the primary source of data.

32. In this Study, medical expenses and education costs are estimated separately because they depend on the characteristics of dependents (such as the age of parents), while other household expenses (such as food costs) are more correlated to the household size. In addition, medical inflation (as measured by out-of-pocket expense) could be over 6%, which is much greater than the general inflation of 2% to 3%.

33. According to the Household Expenditure Survey, household expenditure can mainly be attributed to housing (36%), food (27%) and miscellaneous services (such as education costs, medical services and package tours, 16%), goods (such as clothing and footwear and durable goods, 11%), transport (8%) and utilities (2%).

- For household spending, it should be noted that part of the income of an EAA will be used for savings, contributions to retirement scheme, paying personal tax and funding investment. It means that the household income would be at least equal to the household expenditure together with the aforementioned items.
- In the computation of household expenditure, for those families living in their own flats, the mortgage is deducted as it is assumed that any outstanding mortgage is repaid immediately after the death of the breadwinner. This refinement helps to avoid double-counting in the calculation of money required to maintain living standards.
- The Study also considers the marginal impact of household expenditure. When an EAA passes away, the household size would decrease by one. The future household expenditure incurred by the remaining household members is thus determined by deducting the marginal household expenditure (*MarHExp*), and can be expressed using the following formula:

$$MarHExp = \frac{\sum_{i=1}^6 NoH_i \times (AveHExp_i - AveHExp_{i-1})}{\sum_{i=1}^6 NoH_i}$$

where

- NoH_i* = Number of households with household size *i*
- AveHExp_i* = Average monthly household expenditure for the household size *i*

- The annual wage growth is needed to determine future income. In this report, the growth of the Nominal Payroll Index published by C&SD is used as a basis for forecasting income growth.

Inflation rates for medical and education expenses are usually different from those baskets of goods included in the Consumer Price Index (“CPI”) and thus, refinements for these two components were made in order to better reflect expenditure growth.

It is estimated that the present value of household expenditure (excluding medical and education costs) for remaining household members was HKD 12.5 trillion in 2019.

1.3. The present value of medical expenditure for dependents

In Hong Kong, medical expenditure is funded by four types of financing sources: the government scheme, household out-of-pocket payment, payment via insurance schemes and others (including employer-based insurance schemes, enterprise financing schemes and non-profit institutions serving households financing schemes). In this analysis, official data³⁴ about out-of-pocket medical payments is used as the proxy to estimate medical expenditures.

34. The Domestic Health Accounts are published annually by the Food and Health Bureau of the Hong Kong Government. It describes the health care expenditure flows in both the public and private sectors and is an essential data source for health care planning and management.

The number of years that a dependent receives financial support from the EAA is also needed to be determined. For different types of dependents, the treatment is different.

To reflect the difference in male and female life expectancy, the Study considers both age and gender of each dependent and calculates the survival probabilities at each age by applying the Hong Kong Life Table 2019 published by C&SD.

It is estimated that the present value of medical expenditure for dependents was HKD 2.3 trillion in 2019.

1.4. Present value of education-related expenditure

Information about 1) tuition fees, 2) annual student enrolment statistics³⁵, and 3) “Survey on Parents’ Spending on Children’s Learning and Schooling Related Expenses”³⁶ are used as a basis for estimating education-related expenditure.

It is estimated that the present value of education-related expenditure was HKD 0.5 trillion in 2019.

Again, tertiary education costs are already included in the calculation of household expenditure.

1.5. Value of household debt

In addition to the resources required for future expenses, the MPG model assumes the existing household would make debt repayment immediately after the death of an EAA. Household debts are made up of three major components in this report, namely outstanding 1) residential mortgage loans, 2) credit card advances, and 3) other personal loans.

The size of household debt by component is available from the Hong Kong Monetary Authority (“HKMA”) and the value was estimated at HKD 2.3 trillion in 2019.

35. These statistics are officially released by the Education Bureau.

36. The survey was conducted by Public Opinion Programme of The University of Hong Kong in 2010.

2. Resources available

Similarly, there are four components included in the calculation of available resources to cope with dependents' protection needs:

- 1) Savings and investments
 - i) Bank deposits,
 - ii) Investments,
- 2) Assets related to retirement schemes; and
- 3) Life insurance coverage

2.1. Savings and Investments

2.1.1 Bank deposits

The HKMA, as the banking regulator in Hong Kong, publishes statistics on the total deposits placed within banking institutions. However, the data available from HKMA reflects the aggregate deposits placed within licensed banks, which contain deposits from both individuals and commercial corporate clients around the world. To improve accuracy, the deposits placed by commercial corporates and offshore clients³⁷ are excluded from the analysis.

The amount of bank deposits in 2019 was thus estimated to be HKD 3.4 trillion.

2.1.2 Investments

This component takes into consideration investments in stocks and ETFs that are locally listed or traded on HKEX (e.g. Tracker Fund of Hong Kong) as well as other locally listed products such as REITs, bonds and derivatives. In addition, the calculation also includes mutual funds investment³⁸.

To estimate the market value of the locally listed equities held by all EAAs, the Study used the results of the Retail Investor Survey³⁹ conducted by the HKEX and the performance of the Hang Seng Index. For the mutual funds investment, only the assets under Asset Management and Fund Advisory business held by retail investors (excluded the part belongs to MPF and other pension) are considered.

In this study, annual investment returns are assumed at 6.1%.

The amount of investment in 2019 was estimated to be HKD 1.3 trillion.

37. The segment ratio for retail business of five leading licensed banks (in terms of asset size) is used as a proxy to estimate deposits made by individual depositors.

38. According to Asset and Wealth Management Activities Survey 2019 conducted by the Securities and Futures Commission ("SFC"), Asset and Wealth Management includes 1) Asset Management and Fund Advisory Business 2) Private Banking and Private Wealth Management and 3) Assets Held under Trusts.

39. Retail Investor Survey 2014 was conducted by the HKEX. The survey results showed the age distribution and career profiles of stock investors. The survey findings of investors' profile and the shareholding value were used as proxy to estimate the size of EAAs of part of the listed equities and securities investment.

2.2. Assets related to retirement schemes

Hong Kong's mandatory retirement protection system, the MPF scheme, was launched in 2000. Both employees and self-employed persons aged 18 and above but under 65 are required to join the MPF scheme unless they are "Persons Exempt" as prescribed in the Mandatory Provident Fund Schemes Ordinance. The majority of those EAAs exempted from the MPF scheme should be covered by other retirement schemes such as ORSO schemes, GSPF and SSPF⁴⁰, as well as the Civil Service pension schemes. In the Study, the asset sizes of those schemes are included in the calculation.

It is estimated that the value of assets related to retirement schemes was HKD 1.6 trillion in 2019.

2.3. Life insurance coverage

In addition to savings and investments and assets related to retirement schemes, EAAs' life insurance coverage, including both individual life and group life insurance, is another source of money available to dependents and remaining household members upon the death of the EAAs.

To arrive at an accurate figure for the MPG, the IA conducted a survey in August 2018 to collect selected figures (such as MCVs's policies information and that of economically inactive adults) from 10 major life insurers⁴¹. The total sums assured of individual life in-force business in respect of policies issued to EAAs is estimated with reference to these survey results.

It is estimated that life insurance coverage of EAAs was HKD 4.4 trillion in 2019.

40. The values of GSPF and SSPF are disclosed in their annual reports which are retrieved from the website of the Education Bureau.

41. All the selected 10 major insurers responded to this survey, representing market share of more than 80% in terms of life insurance premium in 2017.

Appendix 2: Data sources

The following table summarises, in alphabetical order, the data sources of statistics used in the Study. Statutory statistics published by the Hong Kong SAR Government and regulators are the primary data sources while data from other sources were used as estimation proxy when official data was unavailable.

Source of statistics	statistics used in the Study	Frequency / Reference period
Bloomberg	Hang Seng Index (Net Total Return Index)	Annually/2019
Census and Statistics Department	Consumer Price Index	Monthly/2019
	Hong Kong Life Table	Annually/2019
	Population statistics by age group and gender	Annually, year-end figures/2019
	Quarterly results of General Household Survey	2019
	Results of Household Expenditure Survey	October 2014 to September 2015 ⁴²
	Quarterly results of Labour Earnings Survey	2019
Education Bureau	Asset size of Grant Schools Provident Fund (annual basis)	as at 31 August 2019
	Asset size of Subsidized Schools Provident Fund (annual basis)	as at 31 August 2019
	School fees	School year 2019/20
	Annual Student Enrolment Statistics	2019
Food and Health Bureau	Hong Kong Domestic Health Accounts (annual basis)	as at fiscal year 2018/19
Hong Kong Exchanges and Clearing Limited	Retail Investor Survey	2014
Hong Kong Monetary Authority	Amount of loans and advances by type of use (Quarterly basis)	4Q2019
	Amount of liabilities to non-bank customers outside Hong Kong (Quarterly basis)	2019
	Total amount of deposits	Monthly
Insurance Authority	Long Term Business Statistics	Annually
	Provisional Statistics for Long Term Business	Quarterly
	Survey of Mortality Protection Gap	Financial year 2017 of each selected insurance company
Mandatory Provident Fund Schemes Authority	Asset size of Mandatory Provident Fund	Quarterly
	Asset size of Occupational Retirement Schemes Ordinance Schemes	Quarterly
Major licensed banks in terms of asset size	Segment ratio in liabilities	Financial year 2019 of each selected licensed bank
Public Opinion Programme of the University of Hong Kong	Survey on Parents' Spending on Children's Learning and Schooling Related Expenses	2010
Securities and Futures Commission	Asset and Wealth Management Activities Survey 2019	2019
US Federal Reserve Board	Yield of US 10-year Treasury bond	Monthly/ 2019 year-end

42. Most recent publication available by 2019.



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