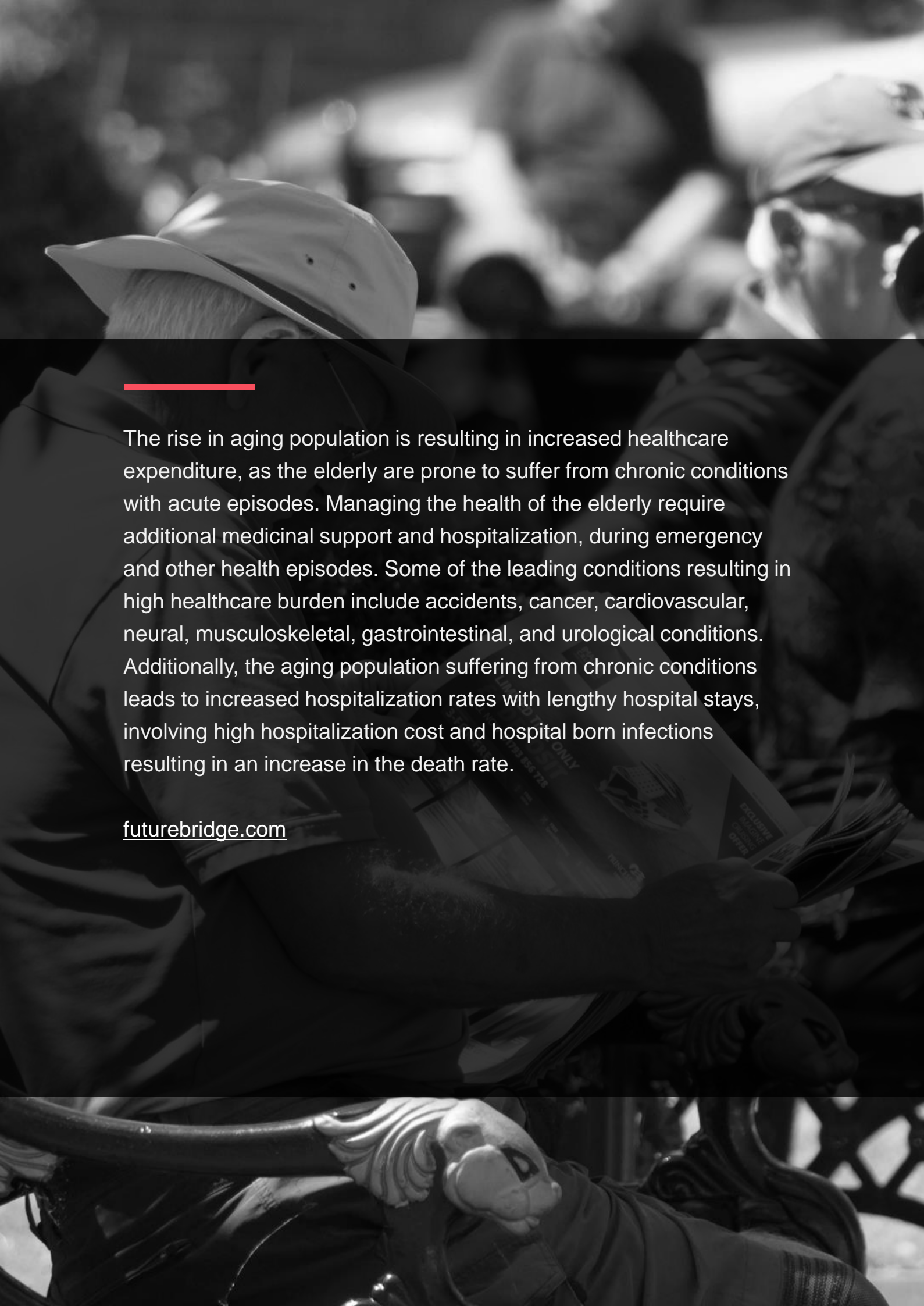




WHITE PAPER

May 2019

Aging Population – Impact on Healthcare & its Management



The rise in aging population is resulting in increased healthcare expenditure, as the elderly are prone to suffer from chronic conditions with acute episodes. Managing the health of the elderly require additional medicinal support and hospitalization, during emergency and other health episodes. Some of the leading conditions resulting in high healthcare burden include accidents, cancer, cardiovascular, neural, musculoskeletal, gastrointestinal, and urological conditions. Additionally, the aging population suffering from chronic conditions leads to increased hospitalization rates with lengthy hospital stays, involving high hospitalization cost and hospital born infections resulting in an increase in the death rate.

futurebridge.com

Introduction

Increasing life spans are beneficial to the economy, as the elderly population can make use of more opportunities, such as higher education, starting a new business, or pursuing a new passion. However, the extent of these opportunities and contributions depends heavily on an individual's overall health. If these added years are characterized by a decline in physical and mental capacity, then it would be detrimental to society. The rise in aging population results in increased healthcare expenditure, as the elderly are prone to suffer from chronic conditions with acute episodes.

Managing the health of the elderly population is more challenging, as they are immunocompromised, have low tolerability to drugs, are malnourished due to the weak gastrointestinal system, and have reduced physical activity due to degenerative problems and neurological conditions. All these factors require additional medicinal support and hospitalization, during emergency and other health episodes. Some of the leading conditions resulting in high healthcare burden include accidents, cancer, cardiovascular, neural, musculoskeletal, gastrointestinal, and urological conditions. Additionally, the aging population suffering from chronic conditions leads to increased hospitalization rates with lengthy hospital stays, involving high hospitalization cost and hospital born infections resulting in an increase in the death rate.

More individuals expected to live by 2050 than the current estimation

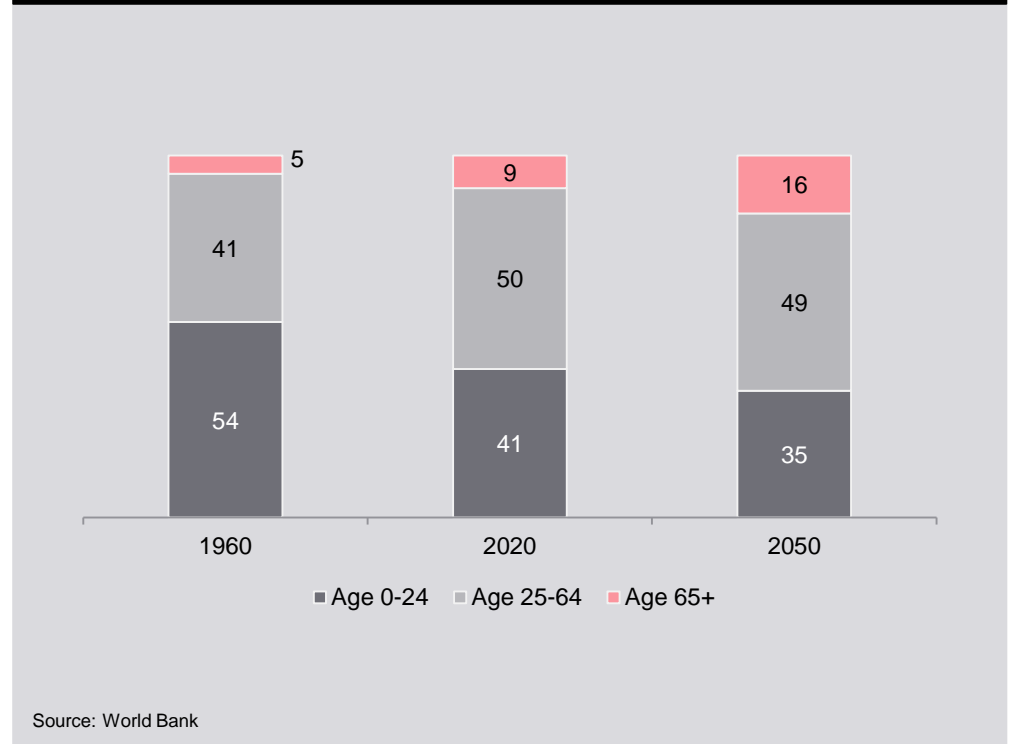
The world population will reach around 10 billion by 2050; a 2.5 billion or 30% increase from an estimated 7.6 billion individuals in 2018, according to projections made by Population Reference Bureau (PRB) included in the 2018 World Population Data Sheet.

Owing to a difference in the demographic mix, there will be a change of pattern in aging in emerging geographies: by 2050, projections indicate that 16% of the world's population will be aged 65 and older, up from 9% in 2018. The percentage of individuals in this age bracket in developed countries is projected to reach 27%, up from 18% in 2018, and in emerging countries, it is projected to reach 14%.

The economic and social trajectory of countries worldwide may have implications by the shift in age structure over time. In addition, resource allocations and policy

agendas may be affected to a significant extent. Several countries are experiencing a steady increase in the number of older adults, both in absolute terms and as a percentage of the total population. This trend poses challenges for countries in balancing the pension, health, and other benefits that older adults typically receive. In addition, some countries may choose to incentivize older adults to remain in the workforce longer.

EXHIBIT 1: Percentage of Population by Age, 1960-2050



Predictions about the age structure data shows that by 2050, 82 countries are projected to have at least 20% of their population aged 65 and above. The population aged 65 and above in Northern Africa is projected to nearly quadruple by 2050. The percentage of the population aged 65 and above in the U.S. is predicted to increase from 15% in 2018 to 22% by 2050. The percentage of the U.S. population under the age of 15 is projected to decline from 19% in 2018 to 17% by 2050. In Japan, more than 36% of the population is projected to be aged 65 and above by 2050, an increase from 28% in 2018.

Factors affecting changing age structures

Increasing life expectancies: Prior to the 1900s, the average life expectancy was best estimated at 30 years of age across all major regions worldwide. During the early 1900s, life expectancy started to increase in newly industrialized countries, while in other countries, it remained stagnant.

At present, owing to public health initiatives and successful infection control interventions, the average life expectancy globally is 72 years of age. Antibiotics and vaccinations have helped reduce the number of deaths caused by communicable diseases. Medical and technological breakthroughs, including sophisticated screening technologies, help identify illness and allow doctors and nurses to administer treatment earlier than ever before. Improvements in surgical techniques and surgical procedures have also increased life expectancy.

Dramatic changes in fertility rates: There has been a downward shift in fertility rates worldwide. In the mid-1960s, the average woman had more than five children. At present, the average woman has fewer than two/three children. Developed countries, in particular, have some of the lowest fertility rates across the globe. Europe has the lowest fertility rate at 1.6.

In contrast, Middle and Western Africa have some of the highest fertility rates, with more than five children per woman on average. Some developing regions are also witnessing rapidly declining fertility rates. Asia, Latin America, and the Caribbean have an average fertility rate of roughly 2.2 children per woman. At present, approximately half of the world's population lives in countries with fertility rates below the replacement rate (the number of children each woman needs to have to maintain current population levels). This has created a new phenomenon known as sub-replacement fertility, a total fertility rate that leads to each new generation being less populous than the previous one.

Increasing access to healthcare system: Individuals these days have greater access to healthcare, new improved medication, new technologies, etc. as compared to earlier. This helps them to not only manage health conditions at the old age but also to lead life in a way that results in lesser age-related conditions, thereby increasing the life expectancy.

Increased affordability of healthcare: The development of new medications and accessibility of diagnostic technologies have resulted in the affordability and increased adoption of healthcare services. Both public and private insurance providers are increasing their healthcare coverage.

Increased awareness among the population: There is an increased awareness regarding new technologies and medications across individuals worldwide. The increased awareness levels among the general public can be attributed to private product advertisements by companies or developmental initiatives undertaken by government authorities.

Evolving perceptions of health and aging

There is no typical older person: Policies must be framed in ways that enable as

many people as possible to achieve the positive trajectories of aging. While some people might face difficulty to perform even basic tasks by the age of 60, some can perform them at the age of 80. Enabling the abilities and meeting the needs of such a diverse population can result in policies that appear disjointed and may even be administered through different and competing arms of government bodies.

Diversity in older age is not random: The diversity seen in older age arises from the physical and social environments. Being financially strong, some may not require government support, while others might need them. Policy responses need to be crafted in ways that overcome, rather than reinforce these inequities.

Older age does not imply dependence: A widespread stereotype regarding older people is that they are dependent or are a burden. This can lead to an assumption during policy development that spending on older people is simply a drain on economies. Aged-based assumptions of dependence ignore several contributions that older people make to the economy.

Increased QoL for older people: If 70-year-olds at present have the same health as 60-year-olds in the past, one conclusion that might be drawn is that currently 70-year-olds are better placed to fend for themselves, and so there is less need for policy action to help them do this. Although there is strong evidence that older people are living longer, particularly in high-income countries, the quality of these extra years is unclear.

Hurdles to elderly healthcare

High-value care at a reasonable cost – Technology, such as wearable and remote monitoring, can support caregivers and help older adults keep their independence. Unfortunately, the lack of reimbursement is slowing the widespread adoption of these tools.

Overlooked patient desires: Elders are often ignored when decisions are being made regarding their care. For example, family members and doctors may push them to move into a nursing home or assisted living facility. Reality is, many wish to remain in their homes, using services such as ridesharing and meal delivery that would allow them to stay independent. It is important to consider the wants and desires of older people and match orient care plans to help them live happier, healthier, and longer lives.

Eldercare seen as a huge burden: Research shows that elders have lower healthcare costs and spend fewer nights in a nursing home if they have children. But it is worth noting that not all elders have a family member who can care for them. These individuals often rely on inpatient care, which ultimately drives up the cost of care.

Required change in medical education: Even though the current healthcare policy is moving towards value-based care that rewards healthcare organizations for providing quality care over quantity of care, medical schools are slow to this transition. It is no longer enough to solely train doctors to treat inpatient needs; rather, medical schools must prepare clinicians to treat patients both inside and outside the clinical setting, supporting them with necessary tools and resources.

Finding a solution for lack of interoperability: Doctors treating the same patient can struggle to communicate and collaborate, which can lead to overtreatment or multiple drug interactions that cause adverse effects. In several cases, care teams - comprised of medical professionals, family members, caregivers, and patients - fail to communicate effectively, as tools and resources may not be in place to facilitate seamless communication.

The perception regarding treatment for the aged must change to resolve these problems. Players in the ecosystem proactively need to work together to solve interoperability challenges, commit to value-based care, and accommodate as well as support caregivers and patients alike. Partnerships between hospitals and community organizations that provide more support for caregivers should be facilitated. Additionally, reimbursing patients for tools outside of the healthcare ecosystem will be critical.

Increased healthcare expenditure due to rise in the aging population

The cost of healthcare is mostly covered by private insurance or Medicare; however, not all costs are covered and an unexpected bill can have devastating effects on finances. Since healthcare costs are not evenly distributed, one can be among the tragically unlucky with much higher costs.

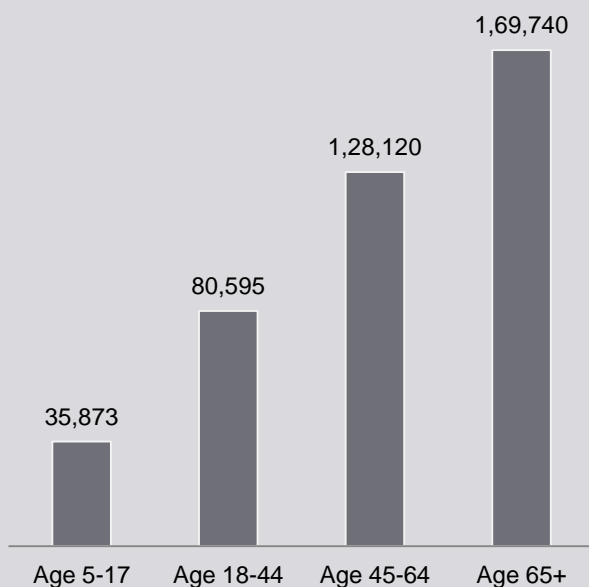
Although the estimate of \$414K lifetime spends on healthcare per person is conservative, it does not take into account minor ailments for the older population. For an average person suffering from a major ailment, elevated healthcare expenses can cause financial distress.

Exhibit 2 depicts the cumulative healthcare spend and *Exhibit 3* depicts how much the lifetime healthcare spending will be, if healthcare costs rise with inflation.

If healthcare costs increase by 1% faster than inflation, the total bill for healthcare will be \$710K, and if healthcare costs rise at 3% more than inflation, the lifetime healthcare costs will exceed two million dollars and so on.

EXHIBIT 2: Cumulative Healthcare Spend, 2016

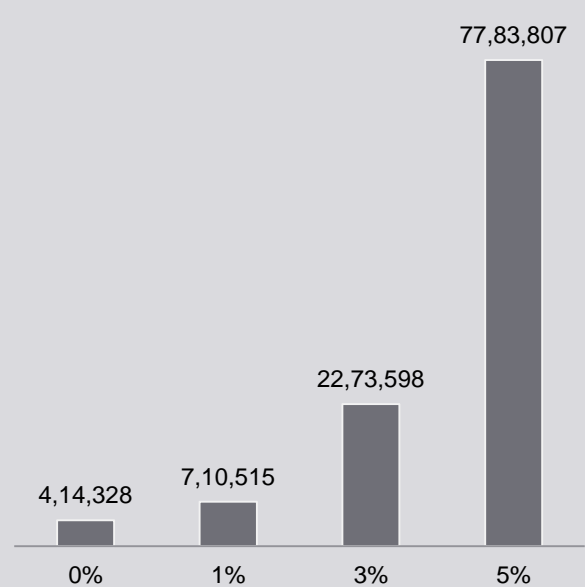
(Values in USD)



Source: US Department of Health and Human Services MEPS Data

EXHIBIT 3: Lifetime Spend with respect to Inflation, 2016

(Values in USD)



Source: US Department of Health and Human Services MEPS Data

Challenges of an aging population

As the worldwide population ages, healthcare systems of various countries will face significant challenges that need to be addressed to meet the demands of an aging population.

Declining number of geriatricians in developed countries: Increase in the number of elderly population worldwide has led to the rise in the need for geriatric care. However, geriatrics is not the most glamorous specialty in the healthcare field. In addition to medical school and a standard residency program, to practice geriatrics, a student must also become board certified, complete a geriatric fellowship, and then obtain certification in geriatric medicine over a period of an additional 8-11 years. Post completion, a practicing geriatrician is often not financially rewarded. Though the number of professionals opting for geriatric specialization is increasing in countries such as India, this may not be sufficient against the rising aging population.

Lower reimbursement: As a majority of elderly patients are enrolled in Medicare, reimbursement is generally lower for these patients than for privately insured. Geriatrics is the only specialty wherein the doctor often does not get paid for having completed a fellowship. Lack of financial incentives, along with a general distaste for the specialty, makes the necessary increase of geriatricians seem unlikely.

Psychological factors of patients: Older people are not psychologically aligned for products focused on old age. Direct product placement for older people may affect the adoption of products.

Certain chronic health conditions resulting in high healthcare burden

According to the National Council on Aging, approximately 80% of older adults have at least one chronic disease, and 68% have at least two. From making it difficult to perform daily tasks such as walking up steps or bathing, to causing significant physical, emotional, and financial strain, these diseases can take an extensive toll on the health of the elderly population.

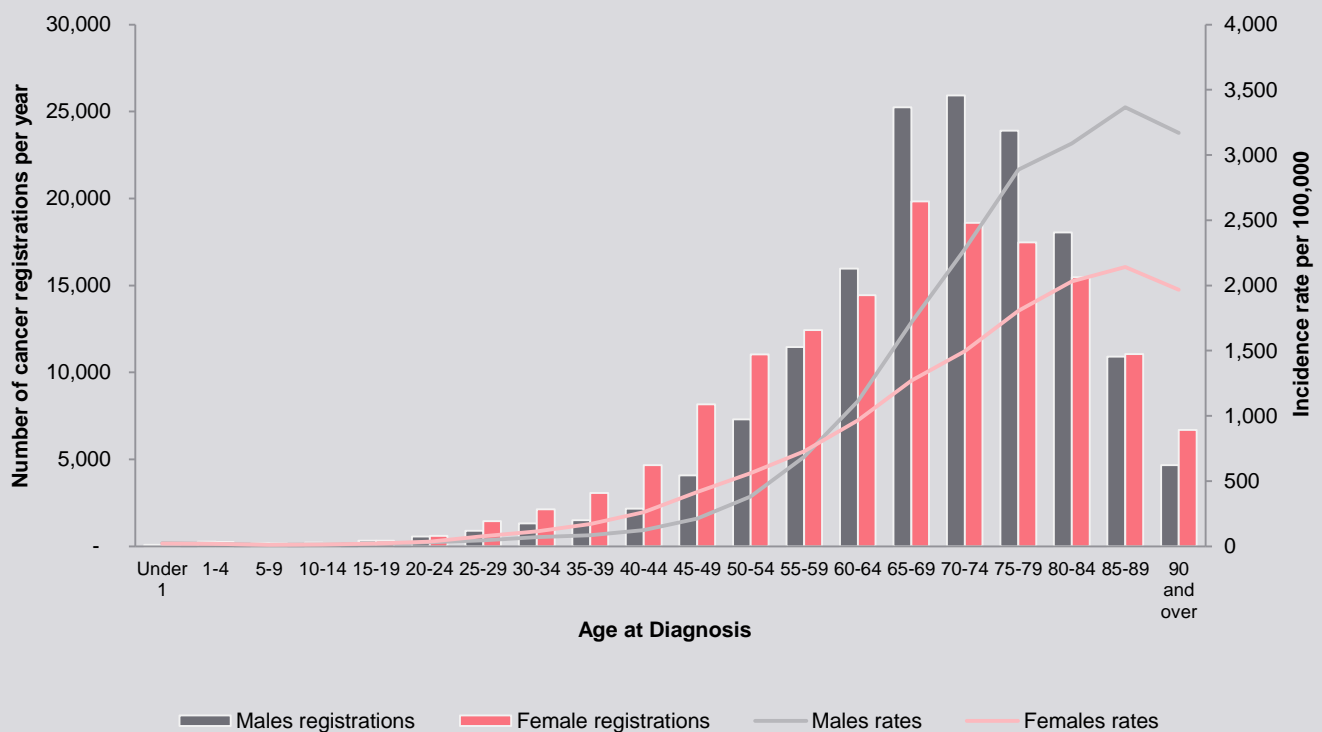
With limited research, chronic diseases and associated therapies are said to accelerate the onset of age-related changes.

This unmet need for inefficiency in managing chronic conditions in the older population is driving the healthcare burden. Following are some of the conditions that pose a major healthcare burden.

Cancer: The global cancer market accounts for approximately \$180 billion of an estimated \$1.1 trillion pharma market. Due to the increasing aging population, the number of cancer cases is expected to increase to 17 million by 2020 and 27 million by 2030. Some of the major conditions include Lung and Breast cancer, Acute Myeloid Leukemia (AML), Chronic Myelogenous Leukemia (CML), and Chronic Lymphocytic Leukemia (CLL). Incidence rates are strongly related to age for all cancers combined, with the highest incidence rates being in older people.

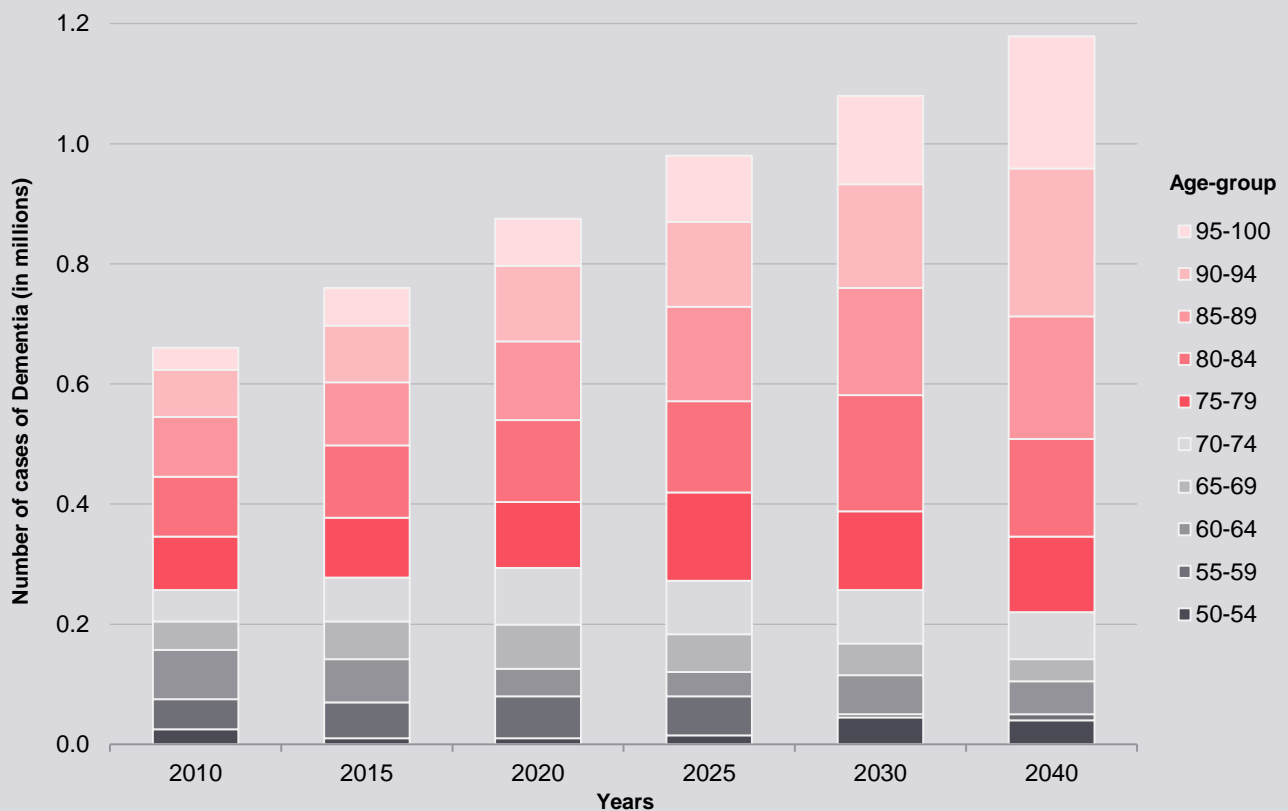
For instance, in the UK, between 2013 and 2015, on average each year, more than a third (36%) of new cases were detected in people aged 75 and above. Age-specific incidence rates rise steeply from 55 to 59. The highest rates are in the 85-89 age group for males and females.

EXHIBIT 4: Number of Cancer Registrations and Age-specific Cancer Incidence Rates (per 100,000) in England, 2016



Source: Cancer Research UK

Neurological conditions: Elderly suffer from many serious neurological conditions such as epilepsy, motor neuron disease, Spinal Muscular Disorders (MND), Multiple Sclerosis (MS) and inflammatory disorders, neuromuscular diseases, Parkinsonism and other extrapyramidal disorders/tic disorder, traumatic brain and spine injury, and tumors of the nervous system.

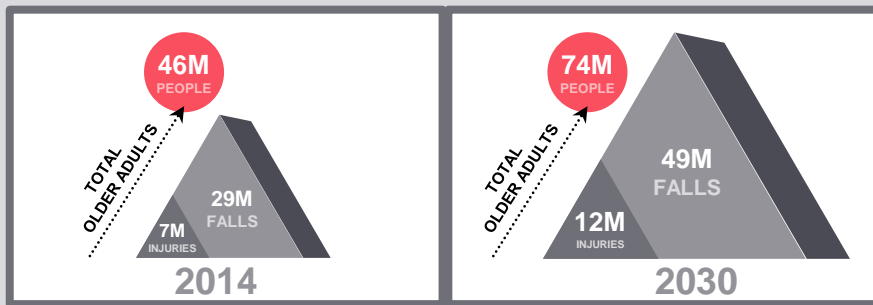
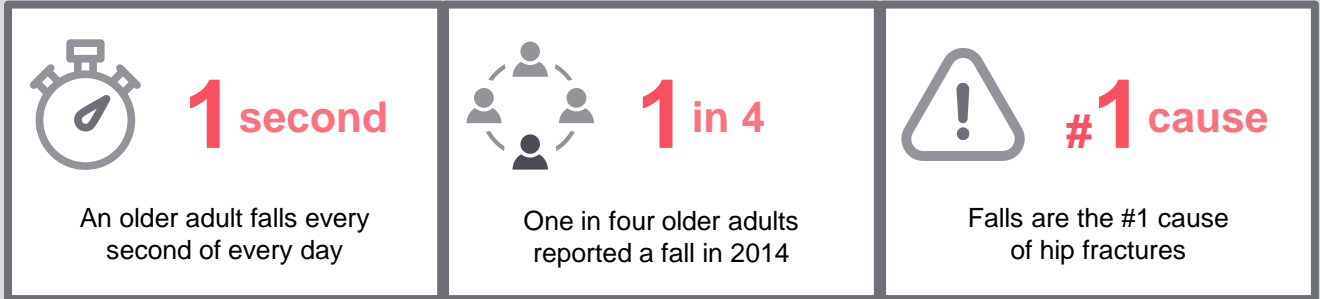
EXHIBIT 5: Number of Cases of Dementia, 2010-2040

Source: Sara Ahmadi-Abhari, Temporal trend in dementia incidence since 2002 and projections for prevalence in England and Wales to 2040: a Modelling study, 2017

It is projected that the number of individuals living with Alzheimer's disease or dementia will increase by 2050 (*Refer Exhibit 5*). In addition, the burden of dementia is expected to increase with the growing aging population.

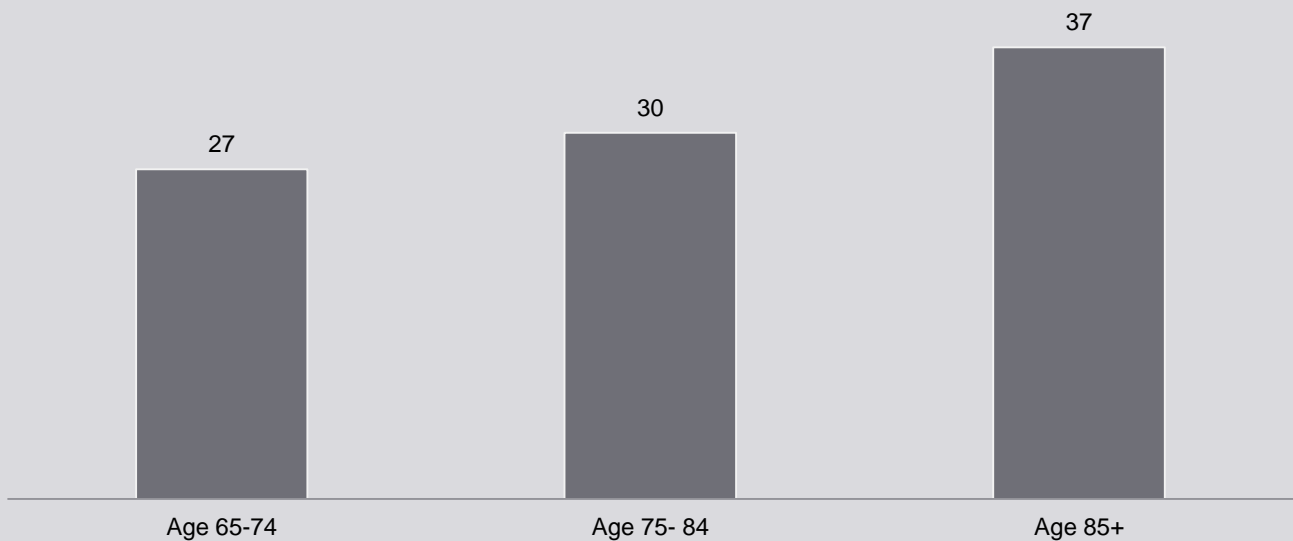
Musculoskeletal / Age-related conditions: With falls being one of the most common causes of injury in the older population, it is expected to be a major challenge to the healthcare system. This is mainly attributed to the fact that Baby Boomers are living longer, remaining active, and are possibly on medications that could lead to falls. According to a report released by the American Hospital Association (AHA), more than one-third of adults aged 65 or older fall each year. Of those who fall, 20-30% suffer moderate to severe injuries (such as hip fractures) that decrease mobility and independence. Other common musculoskeletal diseases are back pain, osteoarthritis, rheumatoid arthritis, osteoporosis, septic arthritis, gout, myasthenia gravis, and Systemic Lupus Erythematosus (SLE), among others.

EXHIBIT 6: Falls and Injuries, 2014-2030



Source: cdc.gov, Community Resources – Falls Prevention and Risk Assessment, 2014

EXHIBIT 7: Percentage of Older Adults Reporting Fall



Source: cdc.gov, National Center for Injury Prevention and Control, 2017

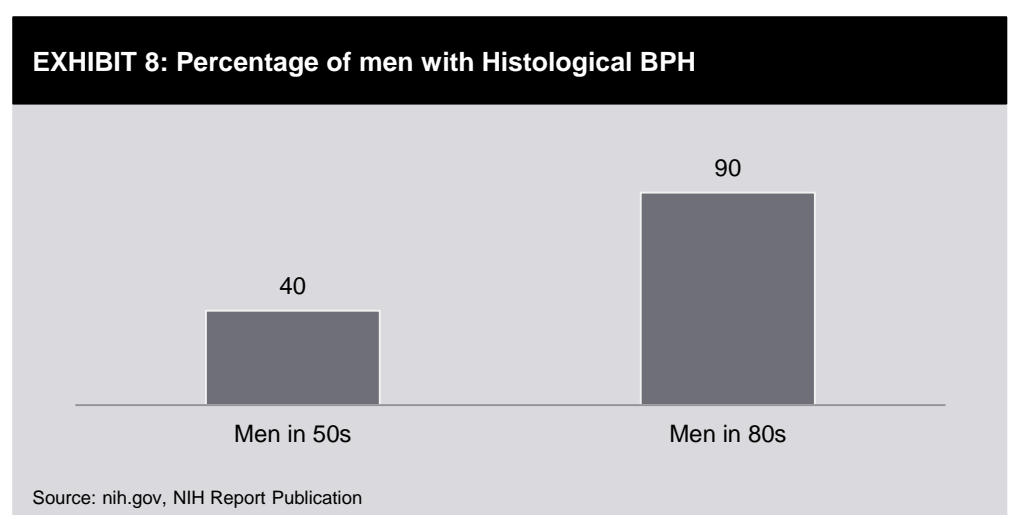
Metabolic and endocrine conditions—Obesity: The total number of individuals who are considered obese will continue to increase, which, in turn, will have a negative impact on the healthcare system. Obesity is the leading risk factor for several health conditions. Patients who are obese cost the Medicare program approximately 34% more as compared to patients with normal weight.

Diabetes: According to a report released by the American Heart Association (AHA), the number of Americans with diabetes is expected to reach 46 million by 2030, when 1 of every 4 Boomers (14 million) will be living with this chronic disease.

Malnutrition in the elderly: Aging is accompanied by physiological changes that can negatively impact nutritional status. Sensory impairment, such as decreased sense of taste and smell that occurs with aging, may result in reduced appetite. Poor oral health and dental problems can lead to difficulty in chewing, inflammation, and a monotonous diet that is poor in quality, all of which increases the risk of malnutrition.

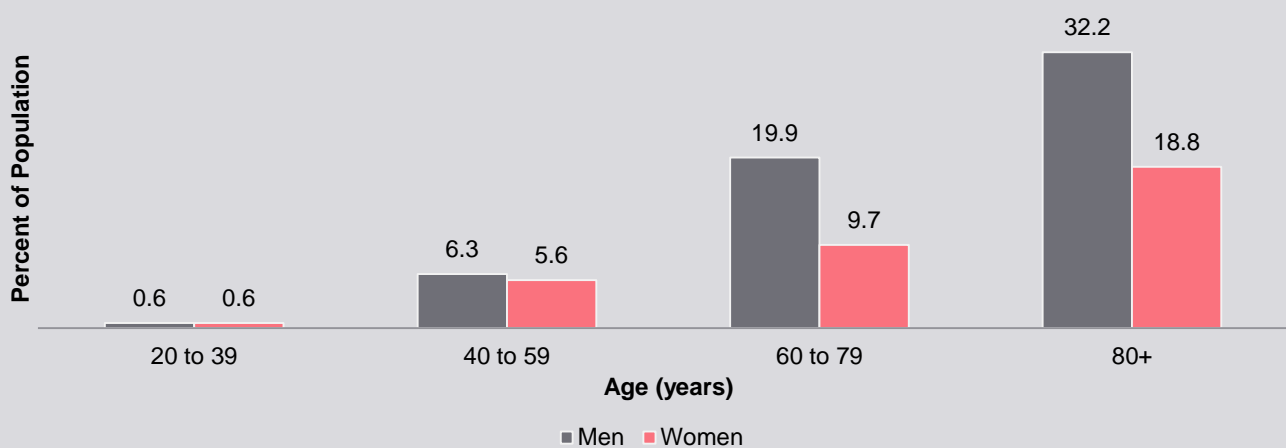
Even in developed countries, despite significant medical advances, reimbursement and awareness regarding nutrition remain a leading public health concern. According to a recent study by Adhana et. Al (2019), the prevalence of malnutrition is as high as 22.6%. Nearly 40% of hospitalized elderly and half of the elderly undergoing rehabilitation program are malnourished.

Urological issues in elderly: In the aged population, prostatic enlargement and/or bladder instability are common issues. Statistics suggest that two-thirds of geriatric patients suffer from urological problems, and almost half of them undergo urological intervention. Major geriatric urological diseases include urinary incontinence, urological cancer, and bladder outlet obstruction, such as benign prostatic hyperplasia, sexual dysfunction, and urinary tract infection. There are ~22 million men with moderate to severe symptoms in the US, and 12 million are actively managed BPH patients. (Refer to Exhibit 8)



Cardiovascular diseases: Normal aging causes heart and blood vessels to stiffen, which can lead to heart ailments, such as coronary artery disease and heart failure. For people older than 75, high blood pressure is one of the most common causes of an impaired heart condition. The pharmaceutical industry has been providing treatments from endothelial dysfunction to cardiovascular mortality. Moreover, the prevalence of cardiovascular diseases increases with age¹. (Refer to Exhibit 9)

EXHIBIT 9: Prevalence of coronary heart disease by age and sex



Source: Mozaffarian D et al., National Health and Nutrition Examination Survey: 2009–2012., 2015

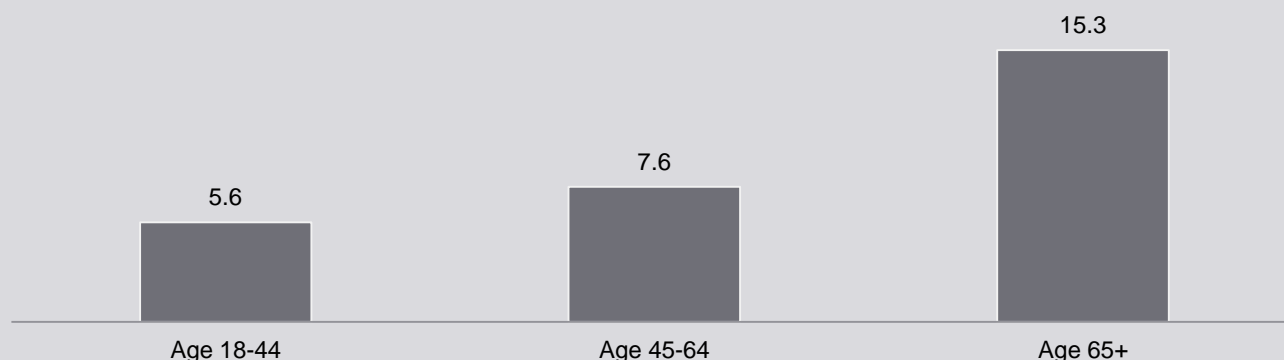
Gastrointestinal diseases: One of the most predominant problems in the aging population is constipation, especially in developed countries. Other GI disorders include functional bowel diseases such as Irritable Bowel Syndrome (IBS) and inflammatory bowel diseases such as Crohn's Disease (CD) and colitis.

¹ American Heart Association, 2015

Action plan on aging and health management

There is an increase in the aging population worldwide, with low- and middle-income countries witnessing some of the fastest changes in offering healthcare facilities to the elderly population.

Certain chronic health conditions are resulting in high healthcare burden

EXHIBIT 10: Percentage of US population with hospitalization, 2016

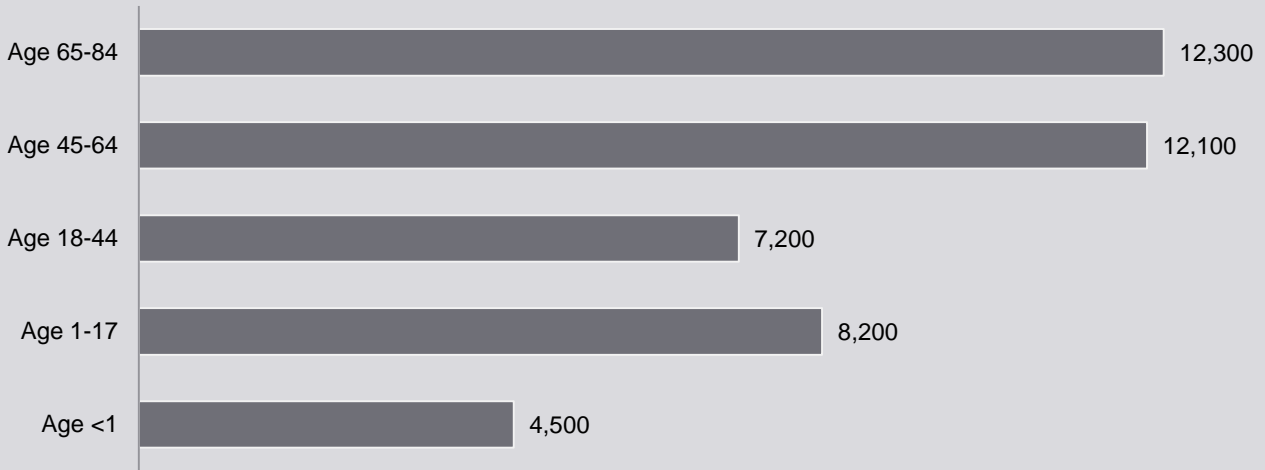
Source: Statista, Percentage of U.S. population with hospitalization in the past year from 2000 to 2016, by age

EXHIBIT 11: Average length of stay for hospital in-patients, by age group

| GEO/AGE | Total | <1 | 1-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | >95 |
|-----------------|-------|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Belgium | 6.2 | 4.2 | 3.0 | 2.8 | 3.1 | 3.0 | 3.2 | 3.3 | 3.4 | 3.4 | 3.6 | 3.9 | 4.4 | 5.0 | 5.8 | 6.6 | 7.5 | 9.1 | 10.9 | 12.8 | 13.7 | 13.9 |
| Bulgaria | 5.3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Czechia | 9.3 | 5.0 | 3.8 | 4.8 | 6.3 | 5.7 | 6.3 | 6.0 | 6.0 | 6.5 | 7.1 | 7.9 | 8.6 | 9.4 | 9.6 | 10.1 | 11.0 | 12.9 | 15.4 | 18.1 | 19.3 | 18.4 |
| Denmark | 5.4 | 5.0 | 2.8 | 3.0 | 4.8 | 5.8 | 6.1 | 5.1 | 4.9 | 5.3 | 5.7 | 5.6 | 5.4 | 5.5 | 5.5 | 5.4 | 5.6 | 5.7 | 5.8 | 5.8 | 5.9 | 5.6 |
| Germany | 8.9 | 4.6 | 4.6 | 7.1 | 8.4 | 7.5 | 7.0 | 6.7 | 7.1 | 8.1 | 9.1 | 9.8 | 10.2 | 10.3 | 9.7 | 8.9 | 9.2 | 9.5 | 9.8 | 9.7 | 9.2 | 8.4 |
| Estonia | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ireland | 5.7 | 5.8 | 2.2 | 2.2 | 2.6 | 2.7 | 2.8 | 2.9 | 3.0 | 3.2 | 4.0 | 4.6 | 5.3 | 5.9 | 6.7 | 7.4 | 8.3 | 9.5 | 11.1 | 12.5 | 13.2 | 14.6 |
| Greece | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Spain | 7.5 | 6.8 | 3.5 | 3.3 | 4.2 | 5.6 | 4.7 | 4.4 | 4.2 | 4.6 | 5.7 | 6.5 | 7.0 | 7.4 | 7.9 | 8.1 | 8.6 | 9.2 | 10.0 | 10.5 | 10.7 | 10.5 |
| France | 8.8 | 4.7 | 3.0 | 3.5 | 5.8 | 6.9 | 6.7 | 6.0 | 6.2 | 7.1 | 8.2 | 9.0 | 9.3 | 9.3 | 9.0 | 9.0 | 9.3 | 10.3 | 11.5 | 12.7 | 13.1 | 12.7 |
| Croatia | 8.5 | 5.4 | 4.6 | 4.3 | 5.4 | 6.1 | 6.7 | 6.4 | 6.6 | 7.4 | 8.8 | 9.9 | 10.1 | 10.0 | 9.7 | 9.4 | 9.5 | 9.9 | 10.1 | 10.3 | 10.0 | 9.5 |
| Italy | 7.8 | 4.6 | 4.4 | 4.2 | 4.6 | 5.5 | 5.1 | 4.8 | 4.7 | 5.0 | 5.9 | 6.6 | 7.2 | 7.7 | 8.2 | 8.7 | 9.3 | 10.2 | 10.8 | 11.0 | 10.6 | 9.8 |
| Cyprus | 6.1 | 7.7 | 3.1 | 2.9 | 3.7 | 4.9 | 5.1 | 5.6 | 5.7 | 6.0 | 5.5 | 6.8 | 5.9 | 6.6 | 6.5 | 6.8 | 6.5 | 7.2 | 7.2 | 6.7 | 6.1 | 5.8 |
| Latvia | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Lithuania | 7.6 | 4.5 | 4.9 | 5.7 | 7.5 | 6.7 | 5.8 | 5.9 | 6.3 | 7.2 | 8.1 | 8.3 | 8.3 | 8.6 | 8.6 | 8.6 | 8.7 | 9.0 | 9.1 | 9.4 | 9.2 | 8.3 |
| Luxembourg | 8.9 | 8.5 | 3.6 | 2.8 | 7.3 | 8.0 | 6.9 | 6.3 | 6.0 | 6.6 | 7.0 | 6.7 | 8.1 | 7.9 | 9.8 | 9.8 | 9.9 | 11.1 | 12.4 | 13.6 | 13.3 | 12.8 |
| Hungary | 9.6 | 4.8 | 3.4 | 3.5 | 4.1 | 4.7 | 5.8 | 6.1 | 6.1 | 6.7 | 7.6 | 8.5 | 9.6 | 10.3 | 10.4 | 10.3 | 10.7 | 12.3 | 15.0 | 18.9 | 24.0 | 32.8 |
| Malta | 8.0 | 2.3 | 2.8 | 2.7 | 5.8 | 8.1 | 6.2 | 5.6 | 5.7 | 7.0 | 7.2 | 7.8 | 7.7 | 7.0 | 7.3 | 7.4 | 8.9 | 10.8 | 14.0 | 15.6 | 14.9 | 17.4 |
| Netherlands | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Austria | 8.5 | 7.1 | 3.0 | 3.2 | 4.7 | 4.9 | 5.3 | 5.7 | 6.0 | 6.7 | 7.6 | 8.0 | 8.4 | 8.5 | 8.5 | 8.9 | 9.3 | 9.5 | 10.7 | 11.7 | 14.5 | 25.3 |
| Poland | 7.1 | 4.9 | 4.2 | 4.1 | 5.5 | 6.2 | 5.9 | 6.0 | 6.7 | 7.3 | 7.8 | 8.2 | 8.3 | 8.2 | 7.8 | 7.4 | 7.4 | 7.6 | 8.0 | 8.3 | 8.2 | 8.2 |
| Portugal | 7.6 | 4.3 | 4.3 | 3.8 | 4.4 | 5.0 | 5.0 | 4.6 | 4.6 | 5.3 | 6.4 | 7.1 | 7.5 | 8.0 | 8.3 | 8.7 | 9.3 | 10.1 | 10.6 | 10.6 | 10.1 | 10.1 |
| Romania | 7.4 | 5.5 | 4.8 | 4.9 | 5.2 | 5.3 | 5.6 | 5.9 | 6.6 | 7.4 | 8.1 | 8.6 | 8.5 | 8.3 | 8.1 | 8.0 | 8.1 | 8.3 | 8.6 | 8.9 | 9.1 | 9.1 |
| Slovenia | 6.9 | 4.3 | 3.1 | 3.2 | 4.2 | 5.1 | 5.5 | 4.8 | 4.8 | 5.3 | 6.5 | 7.5 | 7.8 | 8.2 | 7.9 | 7.9 | 8.4 | 9.4 | 10.3 | 10.7 | 10.4 | 9.2 |
| Slovakia | 7.3 | 5.6 | 4.2 | 4.3 | 5.5 | 5.4 | 5.9 | 5.9 | 6.0 | 6.5 | 7.1 | 7.5 | 7.7 | 7.8 | 7.9 | 8.0 | 8.2 | 8.8 | 9.5 | 10.0 | 10.1 | 10.3 |
| Finland | 7.8 | 5.8 | 2.6 | 4.3 | 8.0 | 9.5 | 7.5 | 7.2 | 6.3 | 6.6 | 7.4 | 6.7 | 6.1 | 6.3 | 6.2 | 6.7 | 7.2 | 8.2 | 9.4 | 10.5 | 12.4 | 13.0 |
| Sweden | 5.8 | 7.5 | 3.1 | 3.1 | 3.7 | 4.7 | 5.4 | 4.8 | 4.8 | 5.3 | 6.3 | 5.9 | 5.9 | 5.7 | 5.6 | 5.5 | 5.7 | 5.9 | 6.2 | 6.5 | 6.6 | 6.6 |
| United Kingdom | 6.8 | 3.3 | 2.3 | 2.5 | 3.3 | 4.3 | 4.2 | 4.2 | 4.2 | 4.9 | 5.9 | 6.3 | 6.2 | 6.5 | 6.9 | 7.3 | 8.0 | 9.2 | 10.6 | 12.0 | 13.0 | 13.1 |
| Iceland | 6.1 | 2.4 | 3.0 | 3.0 | 4.5 | 4.2 | 4.1 | 3.5 | 3.3 | 4.1 | 4.7 | 4.9 | 5.4 | 5.7 | 6.1 | 6.8 | 8.1 | 9.3 | 10.5 | 12.3 | 14.7 | 14.2 |
| Liechtenstein | 5.8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Norway | 5.3 | 4.1 | 3.0 | 3.4 | 4.3 | 5.5 | 6.4 | 5.8 | 5.6 | 5.9 | 6.1 | 6.0 | 5.5 | 5.5 | 5.3 | 5.3 | 5.3 | 5.4 | 5.2 | 5.1 | 4.8 | 4.5 |
| Switzerland | 8.2 | 4.5 | 3.3 | 3.9 | 7.3 | 8.7 | 7.9 | 7.0 | 6.6 | 7.0 | 7.8 | 8.3 | 8.3 | 8.2 | 8.0 | 8.3 | 8.9 | 9.7 | 10.4 | 11.1 | 11.1 | 11.3 |
| Montenegro | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| North Macedonia | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Serbia | 9.5 | 7.6 | 6.1 | 5.9 | 6.5 | 7.0 | 7.3 | 7.0 | 7.6 | 8.7 | 10.5 | 11.1 | 11.4 | 11.2 | 10.6 | 10.3 | 10.3 | 10.4 | 10.4 | 10.4 | 10.7 | 8.2 |
| Turkey | 3.9 | 3.3 | 3.4 | 2.5 | 3.1 | 2.9 | 2.7 | 2.6 | 2.8 | 3.1 | 3.4 | 3.8 | 4.2 | 4.7 | 5.1 | 5.5 | 5.9 | 6.3 | 6.9 | 7.4 | 7.8 | 7.8 |

Source: Eurostat, Average length of stay for hospital in-patients, by age group, 2016 (days) HLTH18, 2016

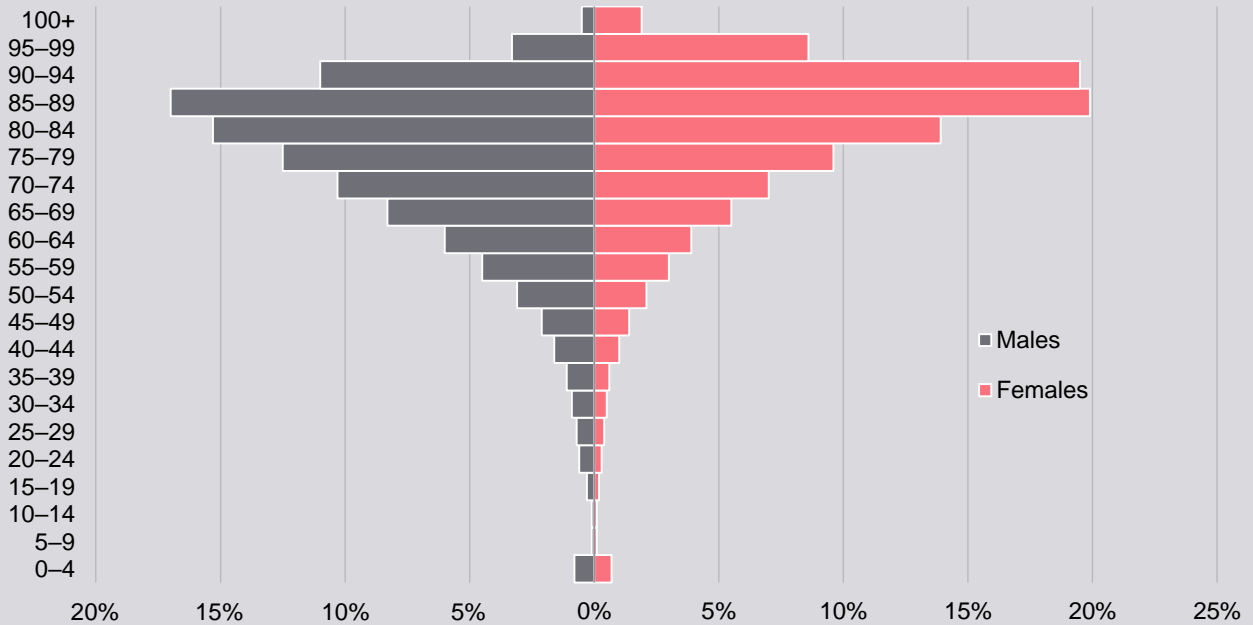
EXHIBIT 12: Average hospitalization cost (USD)



Source: Anne Pfunter, et al., Costs for Hospital Stays in the United States, 2010

EXHIBIT 13: Proportion of deaths in hospital by genders

Age-group



Source: Australian Institute of Health and Welfare, Deaths in Australian hospitals 2014-15, 2017

Promoting healthy aging and building systems to meet the needs of older adults can be considered as sound investments in the healthcare domain.

Commitment to healthy aging: Awareness with respect to recognizing the value of healthy aging, and sustained commitment and action to formulate evidence-based policies that strengthen the abilities of older persons are key areas that need to be focused on.

Aligning health systems with the needs of older populations: Health systems need to be better organized around the needs and preferences of the elderly population. Efforts in this area are closely aligned with other tasks conducted by healthcare organizations to strengthen universal healthcare and promote people-centered and integrated health services.

Developing systems for providing long-term care: The need to provide long-term care requires the development of a multi-level and well-coordinated governance system, infrastructure, and workforce capacity. It also requires enhanced universal health coverage, proper treatment of non-communicable diseases, and development of people-centered and integrated health services.

Creating age-friendly environments: The creation of an age-friendly environment is supported by actions to combat ageism, enable autonomy, and support healthy aging. These activities build on and complement WHO's work over the past decade to develop age-friendly cities and communities, including the development of the Global Network of Age-Friendly Cities and Communities and an interactive information sharing platform, Age-friendly World.

Improving measurement, monitoring, and understanding: Focused research, new metrics, and analytical methods are needed to tackle a wide range of aging issues. This builds on the extensive work WHO has performed in improving health statistics and information.

**North America**

55 Madison Ave, Suite 400
Morristown, NJ 07960
USA
T: +1 212 835 1590

**Europe**

328-334 Graadt van Roggenweg
4th Floor, Utrecht, 3531 AH
Netherlands
T: +31 30 298 2108

**United Kingdom**

5 Chancery Lane
London EC4A 1BL
United Kingdom
T: +44 207 406 7548

Asia Pacific

Millennium Business Park
Sector 3, Building # 4, Mahape
Navi Mumbai 400 710
India
T: +91 22 6772 5700

futurebridge.com