Long-Term Care Around the World

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The developed world is in the midst of an enormous demographic transition, with life expectancy increasing and fertility falling, leading to a rapid aging of the population. This trend has critical implications for long term care around the world. This paper serves as the introduction to a volume that brings together experts from ten countries to compare long term care systems. We find a number of important similarities: only a minority of those elderly receiving assistance rely solely on formal care (i.e. care in an institution or through paid home care) while the majority of care is provided informally by family or other unpaid caregivers; without public support, the cost of long-term care would be beyond the financial means of a large fraction of the elderly in each country, particularly for the oldest and most disabled; and the public sector bears the majority of the costs of formal long-term care in every country. There are, however, important differences across countries particularly in the extent to which formal care is delivered in institutions or at home, and in the division between the use of formal and informal care. Given the importance of informal care across all countries studied, we conclude that any estimate of the social costs of long-term care must account for the implicit costs of informal care. In undertaking such an evaluation of informal care, we find that it comprises at least one-third of all long-term care spending for all countries studied with an average portion of nearly fifty percent.

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The developed world is in the midst of an enormous demographic transition, with life expectancy increasing and fertility falling, leading to a rapid aging of the population. This transition has a wide variety of implications for all nations in a variety of areas. Health care costs rise with age and thus with the aging of the population, and are becoming the leading source of spending for governments around the world. Pension funding typically depends on the ratio of workers to the retired, a ratio that is shrinking rapidly. And the aging of the population threatens the supply of an adequate workforce to meet the needs of society. Chief among the numerous important issues arising from the aging of the population is the increase in demand for long-term care services for the growing population of the elderly.

There is substantial variation across countries in how long-term care services are provided and paid for. But while considerable attention has been paid to cross-country differences in the provision of acute health care and pensions, there has been far less attention paid to the heterogeneity in the nature of long-term care. This omission is unfortunate because countries are at very different points in their demographic trajectories and have approached the financing of long-term care in very different ways—for example in terms of the use of formal versus informal care, and the use of home care versus nursing homes. These different systems may perform very differently in terms of how effectively long-term is provided and how well it meets the needs of the aging population. It ought therefore be possible to learn much about how best to provide this care by through international comparisons.

This volume and the work that underlies it aim to fill that void in providing a summary of long-term care programs across a set of 10 nations, highlighting the similarities and differences, and aiding in our understanding of how to provide care for our elderly populations.

We view this volume as exceptionally timely in that countries are nearly all considering changes in their long-term care systems yet lack information on how well various policies serve the needs of their populations.

The volume is the work of a group of experts on long-term care drawn from ten countries: Canada, Denmark, England, Germany, Italy, Japan, the Netherlands, Singapore, Spain and the United States. This set of countries represent developed economies of varying sizes, geographic locations, and industrial mixes, and with very different structures for dealing with current long-term care and well as other health needs. Yet despite these differences, they all face the common issue of rapidly aging populations and a growing need to care for those populations. These scholars worked together over the course of two years to compile comparable statistics across countries, each focusing on their home populations. In undertaking these activities these researchers drew on original analyses of survey data, published studies, and government statistics. This book includes ten chapters which represent the significant efforts of each of the ten teams to document the long-term care systems in their countries.

In this introductory chapter we summarize the key lessons learned from the comparisons, drawing on the excellent work in each country chapter. We make every effort to acknowledge

when the information is comparable across countries and where data limitations make such comparability inexact. Our summary analysis is not a substitute for the richer picture painted in each country-specific chapter but provides an overview to set the stage for a study of the remaining chapters.

The highlights of our comparison can be summarized as follows:

1. The population is aging rapidly in each of these countries, with particularly rapid growth in the "oldest old" (those age 85 or older). This rapid aging is reflected in statistics regarding formal long-term care spending which currently comprises 2.1 percent of GDP on average, and which has grown by 60 percent as a share of GDP from 2000 to 2019. Furthermore, this growth is likely to continue to accelerate as numbers of the oldest old continue to grow.

2. The need for long-term care rises rapidly with age and with disability, while measures of well-being such as depression worsen.

3. Only a minority of those elderly receiving assistance rely solely on formal care (i.e. care in an institution or through paid home care) while informal care from family or other unpaid caregivers comprises the majority of care. This fact illustrates the importance of including the implicit costs of informal care when assessing the economic burden of long-term care.

4. Women provide the vast majority of formal care in all these countries but there is a somewhat more equal distribution of care across genders in the provision of informal rather than formal care. Even here, however, women continue to dominate with respect to the provision of personal care—care which may have less flexibility in scheduling and thus place greater demands on the provider.

5. Highly skilled formal caregivers in all countries are fairly well compensated, usually at or above the average economy-wide wage, but there is substantial variation across countries in the compensation of low-skilled caregivers, with wages ranging from less than one-half of the average wage in the United States to more than three-quarters of the average in Denmark and Japan.

6. Without public support, the cost of long-term care would be beyond the financial means of a large fraction of the elderly in each country. Moreover, the relationship between health and economic well-being in most countries means that those who are most likely to need long-term care are the least likely to be able to afford it.

7. Perhaps because of this difficulty in affording care, the public sector bears most of the cost of formal long-term care. Even in the United States, which lacks public long-term care insurance, the public sector pays well over two-thirds of the cost. Despite the similarity across countries in this respect, there is substantial variation in the share of costs borne

by the public sector, as well as a strong positive correlation between the public share and total long-term care spending as a share of GDP.

8. Countries vary substantially in their use of formal home care versus institutional care, with the share of spending on home care varying from 23 percent in Spain to 63 percent in Japan. Strikingly, there is no correlation between the share of spending on home care and total long-term care spending – that is, countries which appear to favor formal home care do not appear to spend less than those emphasizing nursing home care. We note, however, that the two countries with the largest fraction of spending devoted to home care – Japan and Germany—are also two of the oldest countries in our sample.

9. Informal care comprises a substantial portion of total long-term care and the cost of this informal care, in terms of foregone wages and other costs, should be included in any measure of the true cost of long-term care although it is missing from official tallies. In the chapters, we discuss alternative methods for valuing this informal care and argue in favor of a measure that reflects the total value of the caregivers' time including the loss of leisure. Using this measure, informal care comprises at least one-third of all long-term care spending for all nations, with an average portion of nearly fifty percent. Interestingly, the reliance of countries on informal care does not appear correlated with the amount of formal care spending.

Our chapter proceeds as follows. In Part I we present some statistics highlighting the growing need for long-term care and the increasing share of resources devoted to this sector. Part II then describes how care is currently provided in an international context. Part III focuses on the types of care and financing arrangements that exist across countries and then delves into the key differences that mark these international comparisons. Part IV incorporates the underlying costs of informal care with the more typical measures examining just formal care, to create a new internationally comparable measure of the cost of care that provides a more accurate representation of the true cost. The final section concludes.

Part I: The Growing Need for Long-Term Care Around the World

The dramatic aging of the world's population is illustrated in Figure 1, which shows the fraction of the population ages 65 or older (Panel A) and the fraction of the population 85 or older (Panel B). While there is a steady rise in the share of each nation's population over age 65, there is a particularly sharp projected rise in the oldest old. Most notable among the countries in our sample is the extremely high fraction of the population ages 85 or older in Japan—forecasted to rise to over 9 percent by 2050, less than 30 years from now. Also of note is the lower initial percentage, but rapid increase in that share in Singapore. Singapore began this period with the

smallest percentage among the oldest old but has by far the most rapid growth and is forecast to surpass all countries except Italy and Japan by 2050.

Table 1 breaks down these increases into what occurred in roughly the past 30 years (the rise from 1990 to 2020) and what is anticipated going forward (2020 to 2050). It is clear from these numbers that the most rapid increases are yet to come. In seven of the 10 countries at least 70 percent of the increase is in the coming decades, and for Singapore, as illustrated in Figure 1, nearly 90 percent of the increase is in the years ahead. In fact, for all countries, including Japan, more than one-half of the increase in the oldest-old comes in the latter half of the period. Thus, as pressing as the demand for long-term care is now among these countries, the situation is likely to deteriorate substantially in the coming years and each country faces substantial increases in the share of the population that is in the age range associated with most needing care.

Table 2 highlights the current cost of formal long-term care and the sharp rise in the recent past. The table reports the share of GDP devoted to formal long-term care in each of our sample countries in 2000 and in 2019. Two facts are immediately clear. First, long-term care is an important component of spending in nearly every country. Setting Singapore aside due to its considerably younger population, the share of GDP devoted to long-term care varies from 0.9% of GDP in Spain to more than 4% in the Netherlands. On average, in our sample, it amounted to 1.9% of GDP in 2019. For comparison purposes, the 1.3% of GDP devoted to long-term care in the U.S. may be relatively low on the list, but it is larger than the share of US GDP attributable to agriculture or auto manufacturing.

The second fact illustrated in the table is the rapid growth in LTC spending obligations over time. LTC spending has grown as a share of GDP in every country, in many cases quite rapidly. Japan, whose population is currently the oldest and aging the most rapidly, has seen the share of its GDP attributable to formal long-term care increase by 200 percent between 2000 and 2019, while Spain and Canada's have risen by over 60 percent. On the lower end, the US share has risen by a far smaller amount, approximately 20 percent from 2000 to 2019, while Italy's and Denmark's have increased by 13 and 11 percent (although it is worth noting that even with this small increase, Denmark remains among the top tier of countries in terms of absolute spending as a fraction of GDP).

Part II: Long-Term Care Provision in International Context

"Long-Term Care" is a somewhat ambiguous term that can cover a wide variety of different types of spending. In this section we highlight some of the similarities and differences that exist across countries in the nature of LTC.

To measure the need for LTC services, we focus on limitations in Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs). Limitations in the measures provide consensus indicators for the need for assistance of elders with their functioning. The standard ADL limitations used in the literature and which we adopt here are dressing, bathing, eating, getting in and out of bed, walking across a room, and using a toilet. The IADL are cooking, shopping for

groceries, using a telephone, managing money, and taking medications as prescribed. In most countries, these limitations are measured in the primary data sources employ, although occasionally questions vary slightly. In two cases – Japan and the Netherlands – a separate set of limitations is measured, but the comparability of these measures was validated using other data sources. In Singapore, the same limitations are used but the questions ask about activities where the respondents need help, as opposed to those with which they have difficulty. While there are no data sources in Canada which contain a comparable set of limitations and meet our other requirements (e.g., nationally representative samples), there do exist measures of care needs that shed light upon disability levels among the elderly Canadian population and we rely on those for comparison.[1]

Data

This project benefits enormously from a massive investment that has been made in most of these nations in creating comprehensive, longitudinal data sets for their elderly population. Many of these efforts were modeled after the Health and Retirement Study (HRS) in the U.S. including The Survey of Health, Aging, and Retirement in Europe (SHARE), the English Longitudinal Study of Aging (ELSA), and the Japan Study of Aging and Retirement (JSTAR).[2]

These studies each consist of lengthy surveys of nationally representative samples of thousands of adults typically over the age of 50. Following the HRS model, the studies elicit detailed information about respondents' health, finances, demographics, family structure, and long-term care receipt. Because these surveys are designed with comparability in mind, they elicit the same set of ADL and IADL limitations and measure a similar set of care-related outcomes. Because our focus is on the effects of population aging, we follow the standard definition of elderly and restrict analyses to those aged 65 or older whenever possible.

In some cases, HRS-style data are not available, or those data are insufficient to address all the topics we explore. To address these shortcomings, additional data sources have been used to supplement or replace these surveys. For example, the last set of interviews for JSTAR was conducted in 2013 and was not nationally representative. As a result, most analyses in Japan are performed using the Comprehensive Survey of Living Conditions (CSLC), which collects much of the information needed for our comparisons. In Canada, where no HRS-style survey has been fielded, several labor force and health surveys are used to compile the necessary information for comparisons. And in the Netherlands, the National Health Survey is used rather than SHARE because of the much larger sample size and respondent links to administrative registers.

A common limitation of the data used across countries is a lack of information on nursing home residents. The initial rounds of HRS, ELSA, and SHARE did not sample individuals living in institutional settings, so the early rounds of the survey do not have population representative

[1] The individual chapters contain detail on the measurement of these items.

[2] See Health and Retirement Study description of international family surveys. https://hrs.isr.umich.edu/about/international-family-studies

samples of nursing home residents. However, because respondents continue to be followed if they *enter* a nursing home, the sample becomes more representative over time. However, both access restrictions and high rates of sample attrition mean that despite the sampling frame, these surveys all tend to under-sample nursing home residents. In the HRS, separate weights are provided for nursing home residents so that the sample of institutional residents matches the characteristics of the national nursing home population. In most other countries where there exist administrative data on the age and gender distribution of nursing home residents (e.g. Denmark, England, and the Netherlands), we adjust sample weights of respondents to approximate this distribution.

Unfortunately, no such corrections can be made for Japan, Canada, and Singapore because micro-data on nursing home residents is unavailable. When possible, the teams employ aggregate data on nursing home resident characteristics to supplement results from survey data. However, in some cases the analyses must be restricted to the community-dwelling population.

An additional challenge with using data on nursing home care is that nursing homes can serve very different roles across countries. In the United States, for example, a large share of nursing home residents are those who are receiving short-term post-acute care (e.g. recovering from surgery) and not long-term care. This is less true in most other nations. Ideally, our measures for institutional care would be able to define exactly what type of care is being received, but that is not possible given the available data.[3]

An additional difficulty in comparing across countries is that subtle differences in the way in which measures of long-term care are collected can have substantial implications. In the HRS and ELSA, for example, measures of formal and informal home care from all sources have a *one month* look-back period. Meanwhile, SHARE asks about all sources of home care over the last *twelve months.* Given the substantially longer period of time over which care is reported, it is unsurprising that the fraction of the elderly reporting any form of home care is generally higher in SHARE countries than in the HRS or ELSA. There is no clear method to adjust the reporting period. There are also differences in the wording of questions for different types of care: In SHARE, for example, informal care received from people outside the household is reported regardless of the frequency with which it was received, while care from people within the household must be provided daily or almost daily if it is to be reported.

One way to circumvent these limitations is by focusing on cost estimates that are generally less susceptible to the issues arising from variation in survey measures, because the estimates are for a common timeframe (one year) and the overwhelming majority of costs are concentrated among people receiving higher frequency care.

In all countries, the micro-level data have been supplemented with data from other sources. For instance, OECD population data are used to measure past and projected population aging across

[3] Note that where possible, we limit our US sample to individuals with nursing home stays of more than 100 days.

countries. Labor force and population surveys are used to present information on formal care worker characteristics and when conducting our valuation of informal care. And aggregate data on spending and formal care provision is incorporated into the analysis of the formal long-term care sector. Furthermore, we rely upon aggregate information about the age composition of formal care recipients to impute the amount of long-term care spending that goes toward the elderly. The efforts made in this regard have been great. Across the ten countries, nearly different 100 data sources have been used to provide a comprehensive look at long-term care systems around the world.

Finally, it is important to note that our use of aggregate statistics across countries can mask important differences driven by the age composition of the population. Ideally, all facts below would be age adjusted within each country, but we were unable to do so. Instead, when we return to the facts on total LTC spending, we will use a crude cross-country age comparison.

Division by Age

Because of our interest in assessing the effects of population aging on long-term care, we limit our analyses to long-term care for the population ages 65 or older.[4] However, it is important to note that LTC is not solely for the elderly. Indeed, for many of the nations in our sample, a large share of LTC is devoted to those below age 65. For example, in the United States, approximately 17-18 percent of nursing home residents and home health care recipients are under the age of 65. This figure is higher in some countries, with 20 percent of LTC users in Germany and nearly one-third of institutional residents in the Netherlands under age 65.

Within the population of elderly, the need for LTC also rises rapidly with age. We illustrate this pattern in Figure 2, which shows the average across countries in the share of the population with different degrees of limitations for all elderly and for the oldest old. On average, 76 percent of the population ages 65 or over has no ADL or IADL limitations. Another 8 percent have only IADL limitations, while 16 percent have at least one ADL limitation. Among those ages 85 or older, however, the share with no limitations falls to 42 percent. While the share of those with only IADL limitations rises to 15 percent for this age group, the share with at least one ADL limitation more than doubles to 43 percent. Because that the population of individuals ages 85 or older is rising more quickly than the share 65 or older, the prevalence of limitations and the need for long-term care is expected to rise rapidly in the coming years.

Across countries, there is notable variation in the share of the population reporting limitations (Panel B of Figure 2). To some extent, this variation may be driven by the specific wording of the questions. In Singapore, for example, respondents are asked whether they need help with ADLs or IADLs, while other surveys ask whether respondents have difficulty with these activities. It is also likely, however, that a mix of cultural differences in reporting disabilities, the underlying age

[4] For some statistics in some countries, we will necessarily have a broader sample. However, when conducting survey analysis we restrict to the 65 and older population and where possible, we perform a basic imputation of aggregate spending devoted to the elderly by adjusting by the share of recipients who are aged 65+.

distribution of the elderly population (e.g., a larger fraction of the elderly population in Japan is over the age of 85 than in other countries), and general population health drive some of the variation. Notably, after restricting the samples to a smaller age band (those age 85 or older), the variation in ADL limitations across countries becomes smaller, suggesting that distribution of age may play an important role.

Which specific limitations create the largest demand for long-term care? We explore this question in Table 3. Across countries, the most prevalent IADL is grocery shopping, typically followed by cooking a meal and managing money. Meanwhile, among ADLs, getting dressed and taking a bath were the most commonly reported limitations.

The relationship between age and disability and the need for LTC is further illustrated by the deterioration in other measures of elderly well-being. Although comparable measures of subjective and emotional well-being do not exist across our sample of countries, in Table 4 we select a set of well-being measures for all those 65 or older and for those with ADL or IADL limitations, and similarly for the oldest old. Panel 1 shows a set of measures positively related to well-being, while panel 2 shows a set of negative depression-related measures. Importantly, in every country within our sample, measures of depression and of life or retirement satisfaction are worse among those with ADL or IADL limitations than without and similarly worse for those ages 85 or older relative to younger elderly. The negative effects on these well-being measures are particularly pronounced for being disabled; in the U.S., for example, those 65-year-olds who have 3+ ADLs are three times as likely to be depressed as the average 65-year-old. While these comparisons are interesting, they are of course limited by the different meanings of terms such as depression in different international contexts.

What is Long-Term Care?

The international context allows us to assess differences in how countries target resources employed under the general heading of long-term care. We focus our analysis on three specific types of LTC.

The first type on which we focus is institutional care, which we refer to as “nursing home care”. We focus here on full-service institutional care, which includes housing, food, medical services, and supports with activities of daily living. There are several subtleties involved in defining this category. First, many elders live in congregate housing, but only some of them receive help with medical care and activities of daily living. In most countries, there is a relatively clear distinction between assisted living facilities, which do not include skilled nursing services, and nursing homes, which do. This distinction is often important in determining public support, as nursing home care is covered to at least some degree by the government in all countries in our sample, whereas assisted living is typically not; the two exceptions being the Netherlands and England.

Unfortunately, in the survey data used for many analyses, institutional residents are often identified without distinguishing whether skilled nursing services are received. Because survey weights are adjusted to reflect the aggregate population in nursing homes specifically, this

limitation does not alter estimates of the overall prevalence of nursing home care. However, because at least some of the respondents included in the nursing home population may actually be living in assisted living facilities, we generally place less weight on comparisons of nursing home population characteristics coming from survey data.

The second type of care on which we focus is care from paid caregivers in the elder's home, termed "formal home care". This care can include anything from help with ADLs, to skilled nursing care at home, or to housekeeping assistance that enables the individual to remain in the community. In all countries, the government pays for most formal home care, though the degree of coverage varies substantially. In the US, for instance, roughly one-quarter of formal home care is paid for by private insurance or out-of-pocket, while in Denmark, public home care is provided with no cost-sharing requirement so almost none of it is paid for privately (although some individuals do choose to purchase private care outside of the public system). Because formal home care can include a broad range of activities, including administering medications and delivering meals, the source of financing often varies across activities. For instance, in the Netherlands, public health insurance covers home health care and personal care with ADLs while a separate program, the Social Support Act, provides supports such as housekeeping services and even pays for equipment such as mobility scooters and stair lifts. This situation also exists in United States with Medicaid waiver programs providing many ancillary services.

The third type of care on which we focus is informal (generally unpaid) care delivered in the home. This care consists primarily of unpaid care provided by relatives or other community members, though we also include care from relatives in cases in which the relative receives compensation.[5] This informal care can be particularly important for those elderly who are ineligible for publicly financed care and as such is quite prevalent, but often excluded from estimates of the total cost of long-term care. This exclusion is unfortunate because this informal care can imply significant financial cost to the caregiver in terms of foregone wages as well as to the economy as a whole in terms of productivity and economic growth due to the lost workers. As such, we place particular emphasis on measuring the provision of this form of care and quantifying its costs.

With both formal and informal home care, there is a challenge in defining exactly what we mean by long-term care, and what is other services, like general cleaning that does not depend on health. This distinction is particularly problematic in countries such as Singapore, where a sizeable portion of home services are provided by foreign nationals who provide both general home management and housekeeping services as well as long-term care. For most of the countries in our sample, survey data specifically measure care received due to a health or aging condition that is expected to last more than 3 months. Moreover, even help received with finances or other housekeeping activities can be critical for seniors if they are to remain in the

[5] In some countries, such as the Netherlands and Germany, care-needy people can receive vouchers/allowances to compensate informal caregivers. Moreover, individuals may choose to compensate family members directly from personal resources.

community. Thus, we generally do not restrict home care by the type of care received, examining the prevalence of care with both ADLs and IADLs in addition to nursing care and other community support programs, although we caution that the availability of such care through government programs differs across countries.

The degree of reliance on each of these three types of long-term care in each country is summarized in Table 5. Each column reports the fraction of the elderly (both for those aged 65+ and 85+) who receive only formal home care, only informal home care, and both types of home care, as well as the fraction living in a nursing home. Denmark, England, and United States rely to a large degree on informal care, while formal care (both institutional and at home) plays a much larger role in the Netherlands. Across all countries, reliance upon formal care increases with age. This pattern is likely due to both the reduction in the availability of informal care provided by spouses for older widows, as well as the increased intensity of care needs that accompany aging. Consistent with the latter explanation, there is also an increasing reliance upon formal care as the number of ADL limitations rises.

Importantly, though, comparisons drawn directly from survey data are sensitive to differences in measurement as well as actual differences in the reliance on types of care. Some data sources, such as SHARE, ask respondents about broad categories of care received (e.g., personal care, household help), while other sources such as the HRS, ask about care received for a specific list of activities (e.g., bathing, grocery shopping). Furthermore, as discussed earlier, variation in how different types of care is measured may affect the estimates, particularly for SHARE countries where the threshold for reporting within-household informal care is greater than that for informal and formal care provided by those outside the household. The estimates in Table 4 should therefore be interpreted with caution, as greater harmonization of survey measures is needed across countries.

Who Provides Home Care?

The increasing demand for long-term care associated with population aging creates not just fiscal challenges but an increase in demand for caregivers. With fewer workers relative to elderly as the population ages, countries are struggling to find an adequate number of caregivers, with many turning to immigration. The difficulty in the case of the availability of informal caregivers is further exacerbated by the rise in labor force participation among women. Each chapter in this volume includes details on the demographic makeup of the caregiving population. While details vary, it is generally true that the providers of formal home care are among the least skilled workers in the economy, while providers of informal care more closely match population characteristics.

One striking feature evident across countries is the gender composition of caregivers shown in Figure 3. Formal caregiving is dominated by women across all countries with an average of 87 percent of formal caregivers being women. Informal care is more balanced across genders, with the share of informal caregivers who are men being several times larger than formal caregivers,

though it remains primarily provided primarily by women. Notably, caregivers providing help with personal care or ADLs are, in most countries, more likely to be women than those providing household help or assistance with IADLs.

Table 6 shows who is providing this informal care. Across countries, spouses and children are consistently the primary informal caregivers. Moreover, daughters consistently provide more care than sons, though care from children is more evenly balanced across gender in Japan than in other countries, likely arising from the strong patrilinear traditions. It is important to note that the manner in which surveys treat informal care from inside and outside the household can impact the distribution of care across sources – in Europe, the lower fraction of caregivers who are spouses may be driven by how informal care is measured wherein, as discussed earlier, there is a greater threshold for reporting care provided by those within the household.

Countries also differ in the training requirements for formal caregivers and in their wages. Table 7 reports the wages of both high and low skilled long-term care workers by sector, measured relative to the economy-wide average wage of all workers. Due to data limitations, Italy and Spain are separated only by sector while Canada and The Netherlands are separated only by skill level. Notably, in all countries except Canada,[6] higher-skilled care workers (roughly akin to registered nurses in the United States), receive similar compensation to the average worker. However, there is considerable variation in pay for less-skilled caregivers (generally nursing assistants and home health aides). In the United States, England, and Singapore, the least skilled workers are paid approximately one-half as much as the average worker, while in Japan and Denmark, their wages are at approximately the 75th percentile. This pay differential likely reflects differences in training requirements and thus in the definitions of low and high skilled categories. For example, a nursing assistant in Denmark must complete over two years of schooling / training, whereas in most states in the United States, nursing assistants are required to have only 75 hours of training. In general, there are only limited differences between nursing home and home care workers at the same skill level.

These pay differences may have very important implications for the quality of care that is delivered and likely to the availability of care. Higher pay will make it easier for this sector to attract workers and to attract higher quality workers. This raises the key issue of the need to assess the quality of care and differences in quality across counties, an issue which we cannot address directly here, but to which we return in the conclusion.

Varying Supply of Long-Term Care

One area with significant variation across countries is the nursing home sector, both in terms of utilization and staffing. We illustrate these differences by showing the ratio of nursing home residents to the population over age 65 and the ratio of nursing home employees to residents in Figure 4. Denmark, Japan, and The Netherlands have roughly 3.5-4 nursing home residents per

[6] The data from Canada is for all nurses, though, rather than only those in the long-term care sector.

100 people ages 65 or older, while England and Italy have only 2. Strikingly, Germany has a very high 4.5 nursing home residents per 100 elderly individuals.

A key measure of supply is the availability of staff. In fact, there is also sizeable variation in the ratio of nursing home workers to residents. Japan and the Netherlands have approximately two nursing home employees per resident, while Germany and the US are around 1.[7] Importantly, these results are sensitive to how the nursing home industry is defined as well as the fraction working full-time. The correlation between the two panels in Figure 4 is fairly high,[8] with Germany being a notable outlier of high nursing home residency rates and low staffing rates.

Part III: The Financing of Long-Term Care

Long-term care is costly – particularly relative to the resources available to the elderly. In this section, we discuss the financial burden imposed by long-term care spending in an international context. We then discuss the different routes that nations take in meeting that financing burden.

The Financial Burden of Long-Term Care

Table 8 shows the distribution of income and wealth for the elderly across countries in 2019 purchasing power parity (PPP)-adjusted dollars.[9] Because of measurement differences, the goal here is not to use these data to compare income distributions across countries, but rather to make a common point: the cost burden of long-term care is outsized relative to the financial resources of the elderly.

In the United States, the median private nursing home room costs over $100,000 per year, greater than the income of over 90 percent of the elderly (Genworth, 2019). When considering all financial resources at their disposal, the median elderly person would need to exhaust nearly all of their wealth to pay for just two years in a nursing home. (This result holds true even when including less-liquid forms of wealth such as housing.) In England, the corresponding cost of a nursing home is $75,000, again more than the income of 90 percent of the elderly, though this cost represents a somewhat smaller share of wealth (Paying for Care, 2022).

In countries with public insurance, it is more difficult to measure the counter-factual scenario in which residents paid the full cost of nursing home care. For comparison, Table 9 reports a back-of-the-envelope estimate of the per person annual cost of a nursing home across countries. To arrive at this estimate, we divide total spending on nursing homes from Table 12 by the number of nursing home residents, as reported in the individual chapters. While our cost estimates are generally restricted to the 65 or older population, the number of nursing home residents reported is often unrestricted by age, likely producing an underestimate. Nonetheless, even with

[7] Our measures of workers include all those working in a nursing home regardless of occupational title.
[8] The correlation coefficient is roughly 0.6 and rises to almost 0.7 when Germany is excluded.
[9] Purchasing power parity attempts to control for differences across countries in the true cost of living or the amount of "purchasing power" of a unit of currency.

estimates that are likely to be biased downward, the imputed cost of a nursing home is greater than the income of at least 90 percent of the elderly population in all countries except Germany and Japan (notably two of the oldest countries in our sample and countries with national long-term care insurance programs).

Although it is more expensive than institutional care on a per hour basis, formal home care is generally less intensive and in turn less costly form of formal care. Nonetheless, the costs can be substantial – in the US, the median hourly cost of a home health aide is over $20 per hour, so hiring an aide for 40 hours per week for a single year would cost almost $45,000, more than the income of a majority of elderly. Cost data are more difficult to obtain in other countries, particularly those with publicly supplied home care, but even the annual cost of paying the full-time wages of home health aides from Table 6, without considering any overhead costs, is more than the income of most elders in nearly all countries.

Importantly, the need for care is primarily concentrated among those with the most limited ability to pay. Table 10 shows the distribution of income and wealth by ADL limitations across countries. The numbers in the columns show the fraction of elderly with no limitations, some limitation (1 ADL) and severe limitations (3+ ADLs). We also show the shares with income below 50% of the median, and for those above 200% of the median, of either income or wealth. For example, in the United States, 14 percent of those with no ADL or IADL limitations have an income below 50 percent of the elderly median income, while 40 percent of those with 3+ ADL limitations have incomes below 50 percent of the median.

Two striking conclusions can be drawn from this table. First, in most countries, the share of people with the lowest income and wealth levels is increasing with the number of limitations, suggesting that those with the greatest care needs have the least ability to pay. Second, there are striking differences across countries in the strength of this relationship. In Japan, for example, the income distribution shows very little difference by limitation, while in the US and Germany, the share in the lowest income category is nearly three times larger for those with 3+ ADL limitations relative to those with no ADL or IADL limitations. While the pattern is obvious, we note that relationship could stem in part from those who have the greatest needs having spent much of their wealth to purchase care.

The Financing of Long-Term Care

Given the substantial costs of long-term care and the generally negative relationship between ability to pay and need for care, it is unsurprising that public support for long-term care is widespread. In all the countries in our study, the majority of formal long-term care costs are paid for by the government. When care is not paid for through public programs, individuals and their families shoulder much of the burden through out-of-pocket expenditure (only the US, and to a lesser extent Germany, have a meaningful share of expenses covered by private insurance).

Details of the division of payments are provided in Table 11. In every country except Singapore, the public sector pays for at least 70 percent of formal long-term care costs, but there is also

sizeable variation. Only 6-10 percent of costs are paid for privately in Denmark, the Netherlands and Japan, while in the US, England, Germany, and Italy private sources pay for at least 25 percent of costs.

There is a strong positive correlation between the public sector share and total formal spending on long-term care (shown in Table 2). Denmark, the Netherlands, and Japan are three of the top four spenders on long-term care within our sample, while the US, England, and Italy are three of the bottom four. Interestingly, Germany is an outlier here, with both a high private share of spending and a high level of spending as a share of GDP (recall also the higher fraction of elderly in nursing homes in Germany show in Figure 4.) In countries with public insurance, coverage of room and board appears to be an important driver of cross-country differences. Public systems in The Netherlands and Japan pay for room and board for all nursing home residents (at least those in public facilities), while in Germany they do not, though there exist means tested social assistance programs to aid those who cannot afford the out-of-pocket expenses.

There are also important differences across countries in the degree to which they rely on nursing home versus formal care and in the amount spent on these services (Table 12). Japan spends very little on nursing home care relative to other countries, with just over one-third of its long-term care spending used to pay for institutional care; it is also the lowest in terms of spending per elderly individual, this despite an age distribution that skews far older than other countries. In contrast, Spain devotes 77 percent of its long-term care spending to nursing home care and has the second lowest per capita amount. As these differences illustrate, it is not just the type of care, but the use of formal care at all that drives much of the differences across countries. We revisit this point below when we consider the value of informal care.

The heterogeneity in spending is often a product of the unique aspects of the long-term care systems in each country. Many countries with high out-of-pocket spending – the US, Canada, England, and Italy – have both need-based and means-based systems, determining public eligibility by both the level of disability and by the availability of the financial resources to meet that need. In contrast, the Netherlands, Denmark, and Japan have universal systems, with eligibility for public support based upon care needs alone (though copayments are still means-tested in these countries). Others, such as Germany and Singapore, have public long-term care systems, but rely upon substantial cost-sharing, resulting in a significant private share of spending.

Meanwhile, the relative reliance on institutional versus home-based care at times reflects the emphasis of each system. In the Netherlands, for example, public benefits can be directed towards assisted living communities as well as to more intensive forms of institutional care. This flexibility results in a high level of institutional spending. In contrast, as was apparent in Table 12, Japan has made a concerted increase the use of home care relative to institutional care, an emphasis that has led to greater formal home care spending. The United States differs from other countries in relying on nursing homes to provide post-acute care in an effort to reduce

hospital stays, while other countries reserve the use of nursing homes for those needing long-term around-the-clock care.

There is also heterogeneity in the degree of centralization of policies within countries. Some countries, such as the Netherlands, Singapore, and Spain, have strong centralized systems. Others rely upon a mix of local and central government administration. For example, in Japan and Denmark the administration of a universal system is at the municipal level, while in the United States, long-term care systems differ across states in eligibility and types of support. Italy also displays substantial variation in eligibility for public support across regions. Lastly, in Canada, formal long-term care systems are largely decentralized, with large differences across provinces in the mix of private and public care, the level cost-sharing, and the universality of public support.

Part IV: The Full Costs of Long-Term Care

Importantly, focusing only on formal care spending ignores the critical role played by informal home care across countries. Countries that lack a universal public long-term care insurance system, such as the United States and England, may in turn rely more heavily on informal care. If the measurement of costs was confined solely to formal spending, we would underestimate the true cost of long-term care in each country and would miss important differences in patterns of long-term care use.

To address the importance of informal care, we provide estimates of the total cost of informal care across in each countries using a novel approach that relies on estimates of the opportunity cost of caregiver time in terms of both foregone wages and foregone leisure. In most past work, the cost of informal caregiving has been estimated by valuing hours of care either at the average (or median) wage rate for formal home caregivers, or at the opportunity cost of informal caregivers, defined as the wage a caregiver would earn if caregiving hours were spend working (Hurd et al., 2013; Meijer et al., 2022). There is some appeal to these approaches, which we refer to as the "proxy good" and "foregone wage" methods, as these represent what a potential caregiver would need to pay to hire either a formal caregiver or the amount of earnings the caregiver could obtain were every caregiving hour spent in the labor market at their current (or imputed) wage rate.

In theory, the true opportunity cost of each hour of informal care provided is the potential wage that could be earned during that hour of work. In practice, proxying this by actual wages earned raises a host of problems. For example, caregivers may have moved to a job with a lower wage in exchange for more flexibility in their schedule or to move to part-time employment. Alternatively, caregivers may face hours limitations at their jobs, such that all those caregiving hours could not be gainfully employed at the current wage. Moreover, for many caregivers a current wage is not observable because they have left the workforce completely to provide care, while others may have previously retired of their own accord so they would not be working even

if not providing care (this would be particularly true for older spouses who themselves are past typical retirement ages when a partner needs care).

To address these concerns, we proceed in two steps. First, rather than using actual wages which may be biased through caregiving or unobserved, we use predicted wages. Specifically, we use country-specific labor market data to predict the wage rate for informal caregivers based upon their observable characteristics including age, education, and gender. We also use the same model to predict the probability that caregivers are working to account for the fact that many caregivers (particularly spouses) would not be working even if not caregiving. We then construct a foregone wage measure as predicted probability of work multiplied by the predicted wage.

However, this approach ignores completely the value of leisure time (or time spent on other activities such as caring for one's own children.) As a second step, we therefore combine the "foregone wage" method with the "proxy good" method, valuing non-work hours at wage of a home care worker (or more specifically multiplying the wage of a home health aide by the probability of *not* working). Our "combined" valuation method therefore reflects the weighted average of each caregiver's valuation under the foregone wage and the proxy good methods. In the country chapters, we also offer a second alternative as a lower bound, where we value the foregone leisure hours at zero.

To see how this methodology works in practice, consider a 55-year-old caring for their aging parent. Because most people at this age are working and are at the peak of their earnings trajectories, the unconditional predicted wage of this caregiver will be quite high as would be the probability of working. The foregone wage component would thus itself be high. However, because the probability that this person is not working is relatively low, the predicted proxy good cost will also be low, and most of the valuation of their caregiving time will be driven by the predicted foregone wage. In contrast, consider a 75-year-old caring for their spouse. At this age, most people do not work, so the probability of working and thus the foregone wage component will be relatively low, and predicted proxy good component will comprise the majority of the imputed value of care.

Table 13 reports the ratio of our informal care cost estimates to the total cost of formal long-term care in each country. The first feature to note is that in every country, there is meaningful spending on informal care relative to formal care; informal care cannot be ignored as a cost of long-term care. But it is also important to note that these ratios vary dramatically, ranging from around 0.5 in the Netherlands, Denmark, and Singapore to 2.03 in Italy.

In Table 14, we then report our estimates of the total cost of long-term care across countries as a fraction of GDP, reporting the division between private versus public financing, institutional versus at-home settings, and formal versus informal provision of care.

In each country, informal care plays a substantial role. As a result, including the cost of informal care reduces the relative reliance of each country on publicly provided care. However, even with these informal care costs included as part of the privately borne costs, the Netherlands, Denmark,

and Japan rely more on public than private care. Canada, the United States, and Germany share these costs more evenly divided between public and private sources, though private costs remain greater in all three. And finally, in England, Italy, Spain, and Singapore, public costs are strictly dominated by private costs.

The importance of including the cost of informal care is also clear when drawing comparisons in the reliance of each country on home versus institutional care settings. Whereas most countries spend more on formal nursing home care than formal home care, home care costs are unsurprisingly higher than nursing home costs when the cost of informal care is included. However, the degree to which this is the case varies, with home care costs more than twice the cost of nursing home costs in Japan, England, Italy, and Germany, but only about 25 percent greater in Denmark.

Perhaps the most substantial differences lie in the relative reliance on care from formal versus informal sources. On one hand, formal sources of care are dominant in the Netherlands, with formal costs approximately twice those of informal care. Formal costs are also larger than informal costs in the United States, Japan, Denmark, Canada, Germany, and Singapore. In contrast, informal costs in Spain, Italy, and England are larger than formal costs, with each country relying upon family and friends to care for their aging populations.

In making these tabulations, countries intentionally excluded the cost of programs designed to compensate informal caregivers directly, because doing so would result in a double-counting of those costs—the value of an informal caregiver's time would be included in both the publicly paid component and in the estimate of the cost of informal care. However, it is notable that in every country with programs that compensate informal caregivers, the costs of these programs are still far below our estimates of the true informal care costs. For example, in Germany, the total spending for compensating informal caregivers was approximately one- third of our imputed value of that informal care. (The estimate of the publicly paid compensation for caregivers is biased upward because the allowances can be used to purchase private formal care rather than to compensate caregivers).

A similar issue exists in Italy wherein public support for home care is provided primarily through cash payments that can be spent on either purchasing formal care or compensating informal caregivers. The amount of this support is equivalent to approximately 0.6 percent of GDP. By excluding this spending from the formal home care category, the results shown here underestimate the extent of formal home care, because at least some of the cash support is spent on formal care. However, it is also important to note that the cost of informal care in Italy remains well over twice the amount spent on these cash payments. Finally, in England, spending on the "Carer's Allowance" to compensate informal caregivers is equivalent to only 10 percent of the imputed cost of informal care.

An important factor driving differences across countries in these costs is the difference in the degree of population aging. In Japan the age 65 or older population comprises nearly 30 percent

of its population while in Singapore the share is less than 15 percent. To demonstrate the importance of the age distribution in driving our results, we regress total LTC spending (formal and informal) as a fraction of GDP on the fraction of the population over age 65. We then add the fitted values from this regression to the residual from each country to produce age-adjusted cost estimates. These are reported in the last row of Table 14. As noted earlier, this is a crude adjustment, but allows for a sense of the importance of age differences for our results.

In many cases, the effect of this exercise is relatively minor. However, for a handful of countries at either extreme of population aging – Japan and Italy as the oldest and the US and Singapore as the youngest – the adjusted estimates are notably different. In both Japan and Italy, the overall percentage of GDP from LTC costs after adjustment falls from 2.8 and 2.1% to 2.0 and 1.7%; in Singapore and the US, the percentages rise from 0.5 and 1.8% to 1.0 and 2.1%.

Based upon our analyses, we propose categorizing long-term care systems on four dimensions: eligibility (need versus means based), setting (institutional versus home), cost burden (public versus private), and provision (formal versus informal). To be clear, this is a subset of the potentially interesting dimensions of heterogeneity across these national systems. But given our limited set of countries we have decided to create a broad classification for illustration and then to provide more specific details below.

We illustrate the results of this exercise in Table 15. Column 1 of the table classifies systems by eligibility, while Columns 2-7 report the relevant fractions of GDP based on the estimates in Table 13. We summarize these dimensions below:

1. While Germany, Denmark, Japan, Spain, and the Netherlands have universal public systems that focus primarily on care needs (though often determine copayments based upon means), the US, England, Canada, and Italy base eligibility for support on both needs and financial means. It should be noted, however, that Spain's universal care system is geared toward home care rather than nursing homes, which remain means tested, and that Singapore's system is designed as compulsory savings program, the deposits to which can be spent on long-term care in the future.

2. In the formal care sector, only Japan spends more on home care than nursing homes, while Singapore and Germany devote a similar fraction of GDP to each. Most countries devote substantially higher shares to nursing homes, including The Netherlands, Denmark, Canada, England, and Spain spending more than twice as much on nursing homes.

3. In Japan, The Netherlands, and Denmark, the majority of long-term care costs are borne by the public sector, while over two thirds of the cost are borne by private sources in Italy, England, Spain, and Singapore.

4. In all countries, regardless of the generosity of their public systems, informal care plays an important role, with wider variation in the amount of formal care spending than informal care.

Notably, the universality of coverage is not necessarily a good proxy for the generosity of LTC systems as measured by the distribution of public versus private costs, and there appears to be little relationship between the generosity of formal care systems and the costs borne by informal sources.

It is important to recognize that there are a wide range of factors that impact differences between countries in cost estimates, even beyond differences in the long-term care systems of each country. We have already illustrated the importance of the fraction of the population over age 65 in the fraction of GDP countries spend – this is particularly the case in Japan, where we estimate a 40 percent increase in relative costs due to population aging, and in Singapore, where we estimate that the younger population reduces costs by 50 percent.

Of course, this broad summary misses important country-specific context. In the United States the patchwork public support system means that obtaining a perfect estimate of long-term care costs on the elderly is impossible – much nursing home spending is actually spending on post-acute care through Medicare (included in cost totals) rather than on what is traditionally considered long-term care, and much of the spending through home and community-based services (excluded from cost totals) goes toward people under age 65.

In contrast, in England, the reported total cost of care includes all residential care, in facilities both with and without nursing care, both of which receive some public support. And in Japan, per person nursing home costs are far lower than elsewhere, in part due to a stronger reliance on unskilled aides rather than more skilled nurses.

In several countries, the variation in wages drives differences in cost. Denmark has some of the highest wages for home care aides relative to the average wage within the country, although the effect on costs is somewhat mitigated by a relatively high reliance on aides rather than nurses. Italy, in contrast, has both a relatively low fraction of the population living in nursing homes as well as relatively low pay in the nursing home sector compared to the average wages.

Relatedly, differences in the composition of caregivers can drive differences in the predicted conditional or unconditional wages of informal caregivers, which in turn can yield higher estimates of the value of informal care. In Canada, the predicted wage conditional on working is quite high compared to the average wage, while in the Netherlands, the caregiving population is on average younger than elsewhere, also resulting in a high predicted unconditional wage.

Utilization is also an important factor. Germany has the highest ratio of nursing home residents to its elderly population, over twice the rate of some countries in our sample, while Spain's administrative statistics indicate a strikingly low ratio (roughly 3 percent) of home care recipients to the elderly population.

The age distribution of those over the age of 65 is also an important factor driving cost differences. For example, Singapore has a far younger elderly population as measured by the fraction of the elderly who are over age 85. In turn, its elderly population appears considerably healthier as measured by limitations with daily activities.

Finally, one striking feature should be noted about the U.S. relative to other countries. While the U.S. has lower total long term care spending, spending on formal long-term care, and public long term care spending, is at about the median of our sample. The U.S. is actually a particular outlier in terms of low private long term care spending, and in terms of low informal care. This is inconsistent with the view of the U.S. as having a more privately financed system than other countries.

Conclusion

As this introduction clearly demonstrates, the provision of long-term care is a key issue around the world. While countries differ in their spending and modes of long-term care delivery, every country is facing a rapid rise in the oldest old population and the associated need for long-term care services. To facilitate thinking about this issue in a global perspective, the project brings together the foremost experts in the economics of long-term care, for 10 of developed nations, to understand the approaches that different countries take to the issue of long-term care and the resulting costs.

We outline here the current trends and policies existing in each country. In future work we will delve into more detail on various topics under the umbrella of long-term care, examining types of care, forecasts of coming needs and potential solutions for this growing worldwide problem.

Key topics going forward will be an examination of long-term care needs for those with Alzheimer's Disease and related dementias, the impact of caregiving on the financial and emotional well-being of informal caregivers, how we might improve the provision of formal care, attract more workers to this sector and improve their training and support, and the potential for technological and medical advances to alleviate some of the caregiving burden.

We hope this current volume and any subsequent studies will fill an important void in the literature on caregiving by providing cross-country comparisons, highlighting similarities and differences, and learning what policies and practices are most effective. Each of the chapters is organized in a parallel structure with tables being largely comparable across countries and arranged in a similar order. In structuring the chapters this way, we hope it will be relatively easy for the interested reader to move back and forth across chapters to compare the various statistics. While we have highlighted here what we think are some of the most striking patterns, we encourage readers to explore the individual chapters in depth to understand the full richness and complexities of the various systems.

We note that this work only begins to scratch the surface of what is a wide variety of important economic and policy issues surrounding long-term care and related government policies and programs and how countries will deal with these issues and others in the face of rapidly aging societies. Complicating the issues is the fact that changes in one program or policy will likely impact other programs. Consider for example, changes designed to increase the normal retirement age or make early retirement less affordable. Changes along these lines will increase the cost to potential caregivers of leaving the labor force and perhaps reduce the availability of informal care.

On a more optimistic note, there may be labor saving technological advances (such as the use robots as discussed in the Japan chapter) that reduce the demand for labor, freeing up workers for other jobs in a society facing a declining workforce due to population aging.

Immigration, a highly controversial topic around the world, will likely play an important role as many countries have become dependent on immigrants to provide long-term care. Other policies such as increases in wage rates, improvements in training and working conditions may make employment in the long-term care sector more attractive.

Perhaps most importantly, medical advance can dramatically change the landscape. A cure or treatment for Alzheimer's disease may greatly reduce the need for care, while other advances may lengthen life and lead to more care albeit at older ages.

The chapters in this volume also raise important questions about the governance of long-term care. In many countries, the responsibility for the organization and financing of long-term care resides with local governments, rather than existing at a central level. While this policy may align with local political preferences, given geographic differences in the demographic characteristics of the population (difference in the age structure, wealth, and family structure), there may be a need for more cost-sharing at a national level.

An important issue that we do not address is the quality of care provided and what governments can do to measure and ensure high quality care. One of the most significant weaknesses of our cross-country comparisons is that we have no means of comparing quality or intensity of care beyond a measure of hours, nor can we accurately measure the severity of need. An important goal for future work in this area should be to develop internationally comparable measures of quality to assess how the long-term care strategies of different nations are reflected in the quality of care received. This is a difficult task, as even families which care greatly about the well-being of a family member have difficulty in assessing care received and elderly individuals, particularly those with cognitive impairments, may be unable to provide input in this regard.

Finally, this volume has had relatively little to say regarding the role of private insurance markets in addressing these issues in the long run. Private long-term care insurance currently plays a minor role around the world and future work could examine the barriers to the development of these markets and how they might evolve given the growing need in our aging world. Other solutions to providing for care include the assets elders have tied up in housing or life insurance.

Programs allowing the elderly to access these funds to finance long-term care needs could provide relief for many.

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Tables and Figures

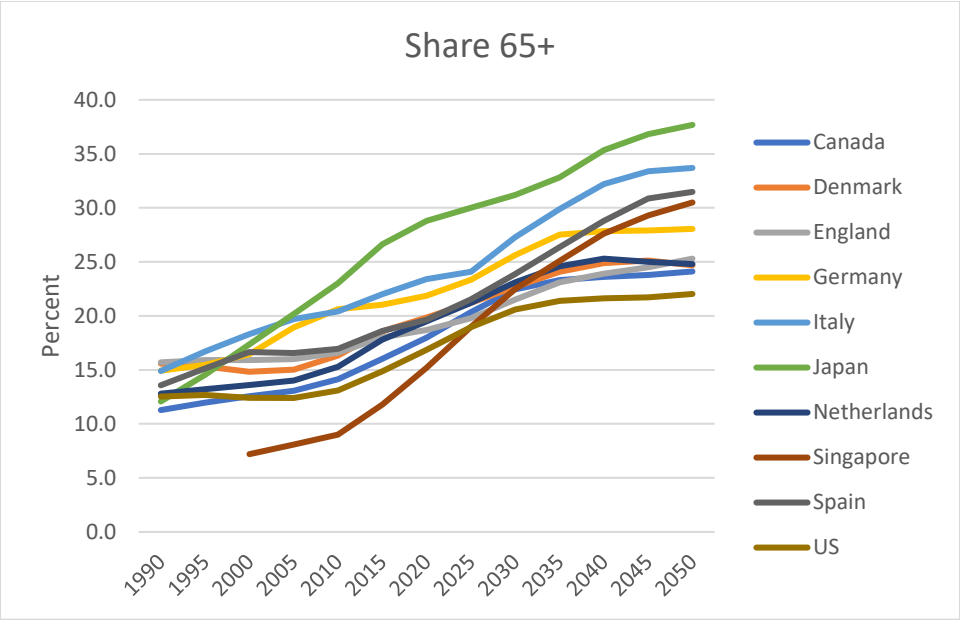
Table 1: Decomposing the Change in the Age 85+ Population Share

	Total Change	1990-2020 Change	2020-2050 Change	2020-2050 Share
Canada	4.6	1.3	3.4	0.73
Denmark	3.7	0.6	3.1	0.83
England	3.8	1.1	2.7	0.71
Germany	5.2	1.5	3.6	0.70
Italy	6.4	2.5	3.9	0.61
Japan	8.6	4.0	4.5	0.53
Netherlands	4.4	1.0	3.3	0.76
Singapore	6.7	0.9	5.9	0.87
Spain	5.5	2.2	3.3	0.60
US	3.5	0.8	2.8	0.78

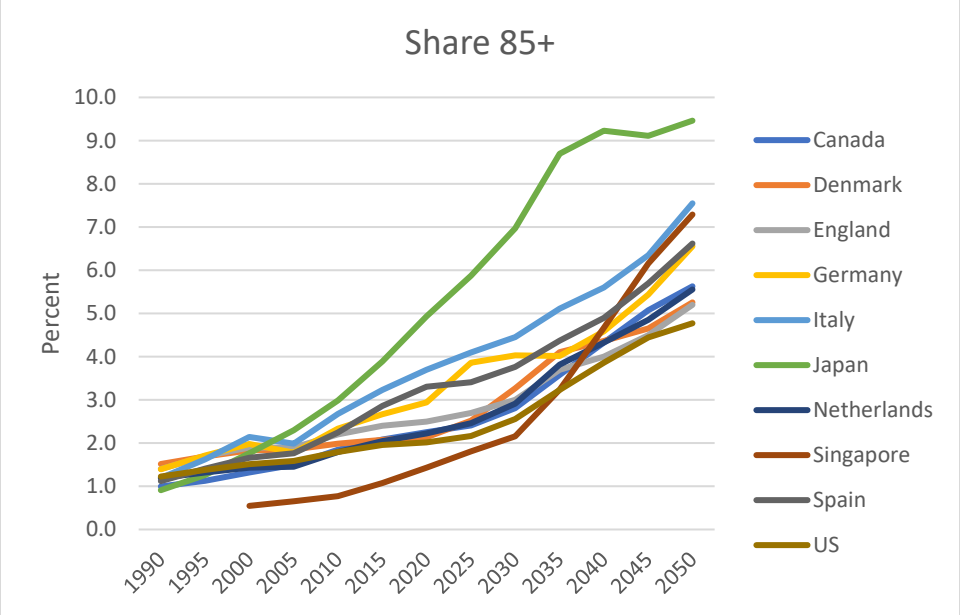
Column 1 shows the percentage point change in the fraction of the population aged 85 of older between 1990 and 2050. Columns 2 and 3 split this change into pre- and post-2020 changes, respectively. Column 4 reports the share of the change that is accounted for by the change from 1990 to 2020. Due to data limitations, the base year for Singapore is 2000 rather than 1990.

Figure 1: An Aging Global Population

Part A: Share of the Population Age 65



Part B: Share of the 65+ Population Age 85+



Notes: Each figure displays the corresponding fraction of the population per country in 5-year intervals. Data were not available in Singapore until 2000.

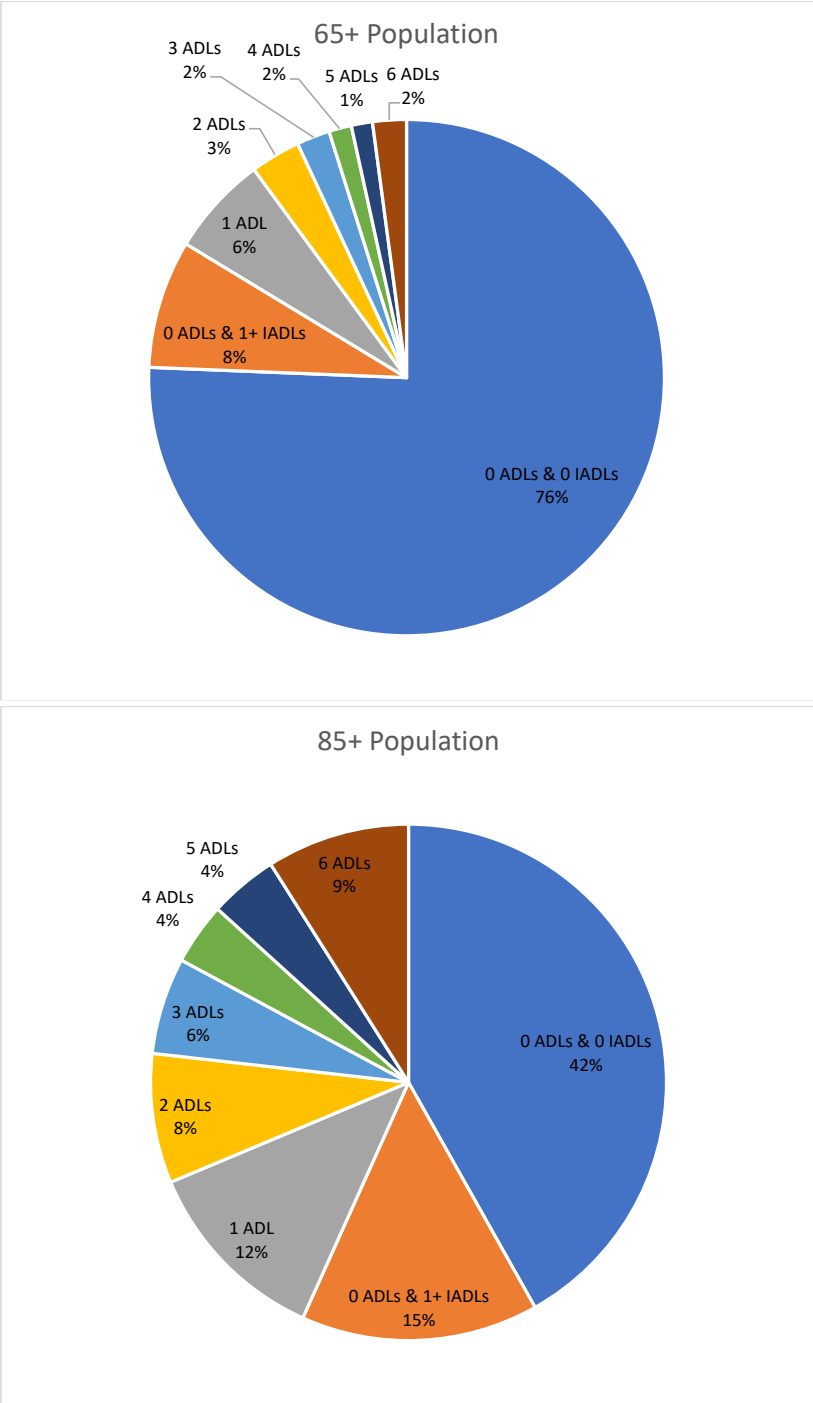
Table 2: Share of GDP Spent on Formal Long-Term Care Over Time

Country	Share GDP 2000 or Nearest	Share GDP 2019	Change: 2000 to 2019	Percentage Change
Canada	1.3	2.1	0.8	61%
Denmark	1.9	2.1	0.2	11%
England	-	2.3	-	-
Germany	1.4	2.2	0.8	55%
Italy	1.6	1.8	0.2	13%
Japan	0.7	2.1	1.4	212%
Netherlands	2.7	4.1	1.4	50%
Spain	0.5	0.9	0.3	62%
US	1.1	1.3	0.2	17%
Mean	1.4	2.1	0.7	60%

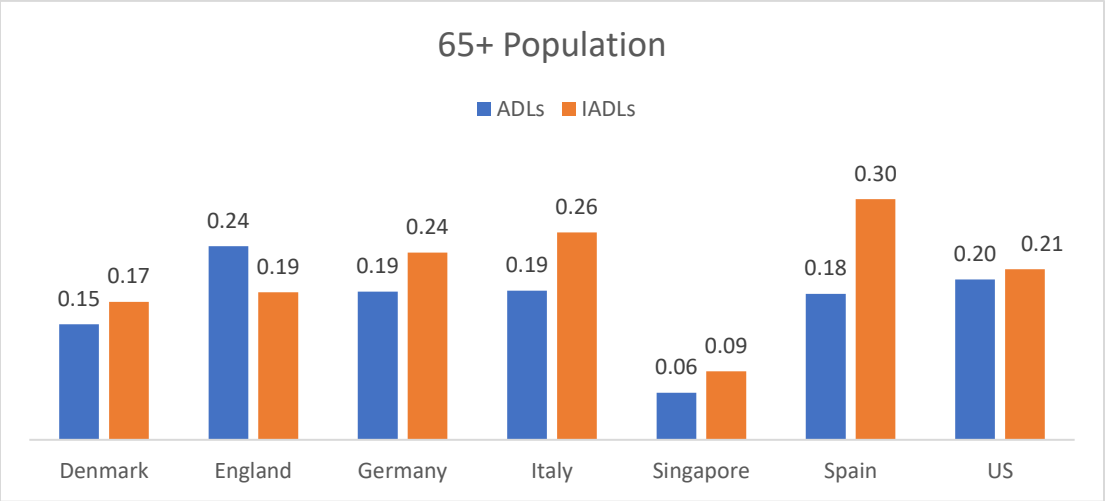
Notes: The reported fractions of GDP are for all formal LTC expenditures, regardless of the age of the care recipient. As a result, the estimates do not align perfectly with those reported in later tables. Because of data availability limitations, Spain's estimates are for 2003 and 2019, while Italy's are for 2004 and 2019. England cannot obtain data from before 2013.

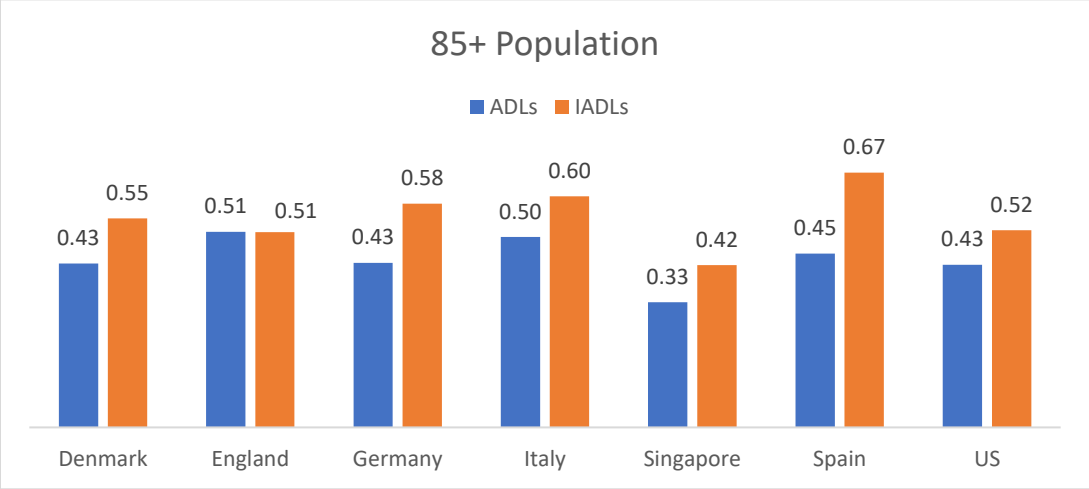
Figure 2: Distribution of Limitations by Age

Panel A: Average Distribution of Limitations



Panel B: Fraction with Any Limitations by Country





Notes: Each figure shows the fraction of individuals with ADL/IADL limitations by age group in each country. The figures are generally comparable, although the question structure differs somewhat in Singapore, asking about activities with which an individual needs help rather than those with which they have difficulty.

Table 3: Prevalence of Specific Activity Limitations

Share	Denmark	England	Germany	Italy	Singapore	Spain	US
Panel 1- IADLs:							
IADL – Use a Phone	0.36	0.37	0.20	0.25	0.37	0.25	0.29
IADL – Manage Money	0.79	0.45	0.41	0.36	0.68	0.40	0.51
IADL – Take Meds as Prescr.	0.57	0.38	0.32	0.28	0.46	0.25	0.21
IADL – Shop for Groceries	0.87	0.80	0.80	0.52	0.35	0.47	0.62
IADL – Prepare a Meal	0.78	0.52	0.47	0.34	0.34	0.40	0.54
Observations	244	*747*	494	667	521	992	*2,195*
Panel 2- ADLs:							
ADL – Use the Toilet	0.45	0.30	0.24	0.33	0.54	0.44	0.36
ADL – Get Dressed	0.87	0.75	0.72	0.70	0.67	0.70	0.58
ADL – Take a Bath	0.87	0.58	0.60	0.74	0.71	0.77	0.47
ADL – Walk Across a Room	0.53	0.29	0.19	0.33	0.71	0.35	0.47
ADL – Eat	0.36	0.20	0.22	0.27	0.37	0.27	0.24
ADL – Get In/Out of Bed	0.52	0.39	0.26	0.44	0.51	0.51	0.38
Observations	*208*	*1,051*	707	467	347	599	*2,033*

Notes: Each cell in panel 1 shows the fraction of people aged 65+ by country with any IADL limitation who have difficulty with the given activity, while the rows in panel 2 report the fraction of those with any ADL limitation who have difficulty with the activity.

Table 4: Well-Being Measures by Age and Limitation

Country	Question	65+	65+, 3+ Limitations	85+	85+ 3+ Limitations
Panel 1: Positive Well-Being Measures					
Denmark	Good life satisfaction for those retired	0.85	0.63	0.80	0.70
England	Satisfied with life	0.66	0.38	0.61	0.40
Germany	Life satisfaction (0-10)	7.83	6.94	7.71	7.31
US	Very satisfied with retirement	0.55	0.33	0.55	0.43
Panel 2: Negative Well-Being Measures					
Italy	Depressed in the last month	0.38	0.78	0.55	0.75
Japan	Kessler 6 Scores (0-24)	2.97	6.12	3.89	6.03
Netherlands	Depression score: moderate or high	0.43	0.88	0.67	0.88
Singapore	Self-Report Depression	0.03	0.08	0.06	0.08
Spain	Depressed much of the Time	0.29	0.35	0.35	0.35
US	Depressed Much of Time	0.10	0.29	0.12	0.19

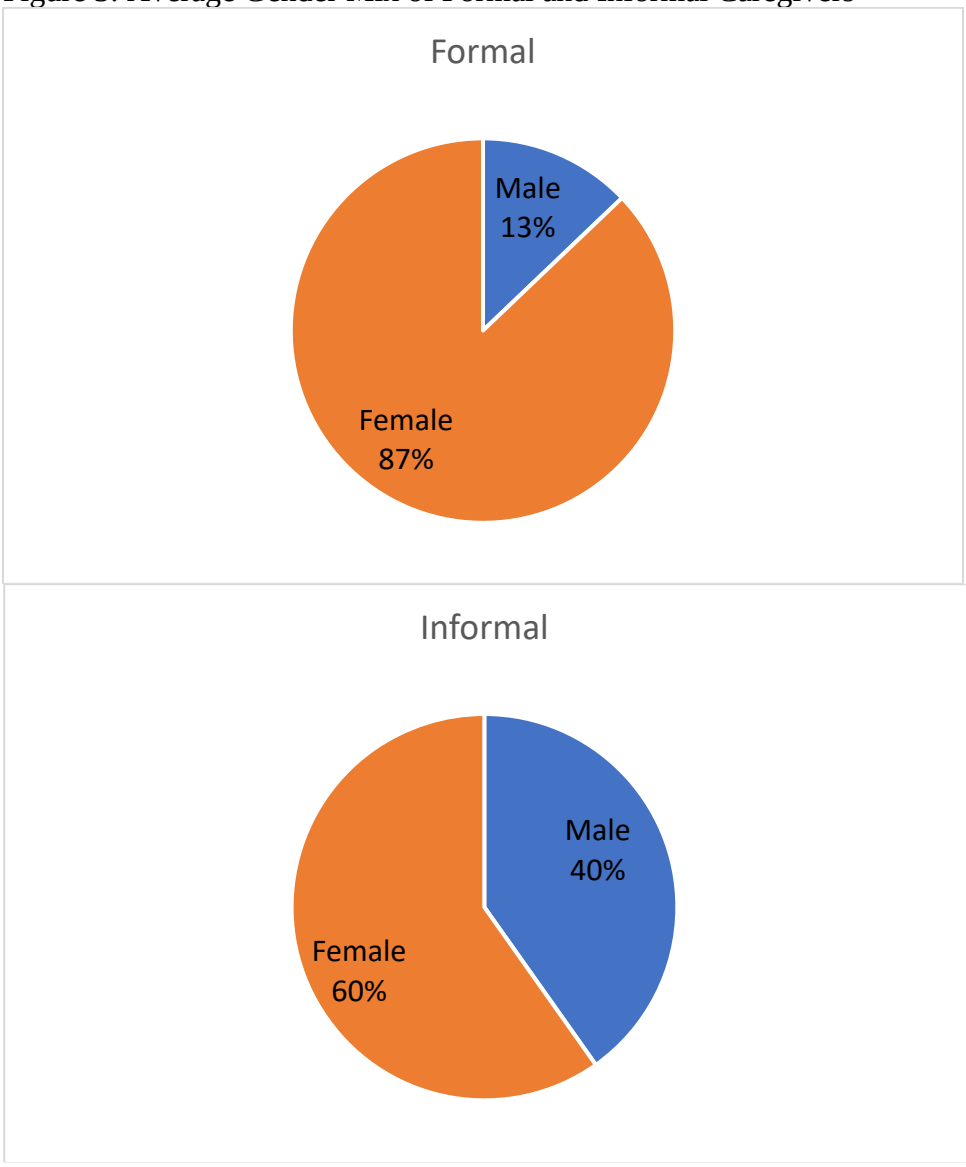
Notes: Limitations are defined broadly to include both ADL and IADL limitations. Details of specific measures (such as the Kessler score) can be found in specific chapters. Panel 1 includes measures for which a higher fraction or value indicates higher well-being, while panel 2 is for measures where higher values indicate worse well-being.

Table 5: Composition of Long-Term Care Types Across Countries

	Home Care			
Country	Only Formal	Only Informal	Both	Nursing Home
Panel 1: 65+				
Canada	8	35	40	17
Denmark	4	78	8	10
England	6	70	11	14
Germany	15	54	24	7
Italy	21	55	15	8
Japan	17	21	46	16
Netherlands	29	19	23	29
Singapore	18	66	18	-
Spain	27	49	10	14
US	5	69	13	13
Panel 2: 85+				
Canada	5	27	41	28
Denmark	5	57	12	27
England	5	58	11	25
Germany	20	21	42	17
Italy	24	47	21	9
Japan	16	15	48	22
Netherlands	22	8	24	45
Spain	19	51	14	16
Singapore	22	47	32	-
US	5	57	20	18

Notes: Each cell shows the portion of people receiving any LTC who receive each mode of care. Singapore lacks survey data on nursing home residents and cannot obtain aggregate statistics on the age distribution of residents.

Figure 3: Average Gender Mix of Formal and Informal Caregivers



Notes: The fractions reported are the average across countries in the sample.

Table 6: Informal Caregivers by Relationship to Care Recipient

Country	Spouse	Son	Daughter	Child	Son/Daughter In-Law	Grandchild	Other Rel.	Unpaid Non-Rel.
Canada	36	15	31	46	3	-	7	8
Denmark	5	-	-	38	5	3	15	35
England	35	15	25	40	-	8	5	11
Germany	11	-	-	41	5	-	14	28
Italy	21	10	19	30	7	-	27	16
Japan	32	17	21	39	14	-	16	-
Netherlands	13	-	-	41	-	-	25	21
Singapore	24	18	48	66	6	-	4	
Spain	30	19	40	59	-	-	11	
US	32	13	27	40	6	8	7	7

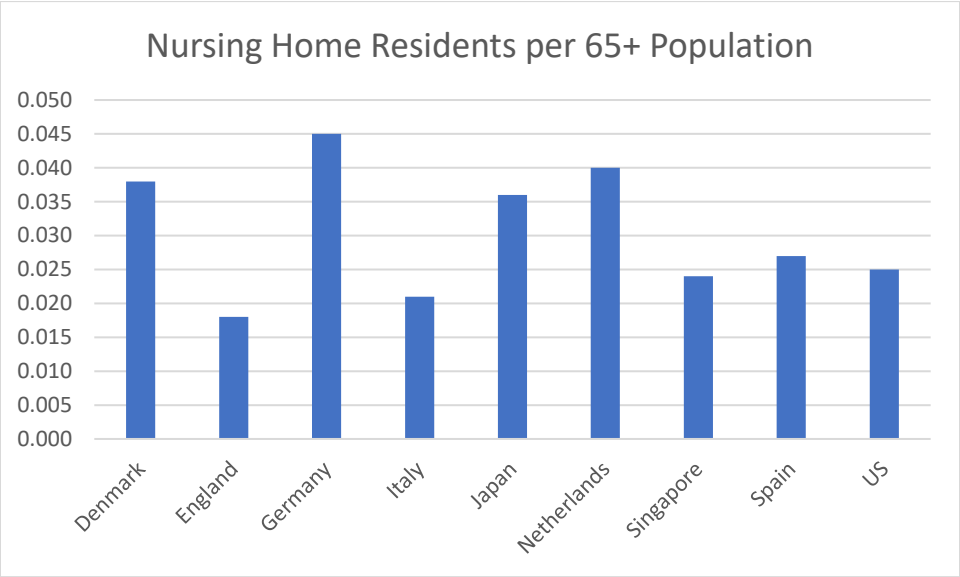
Notes: Each cell reports the fraction of informal caregivers by relationship category in the given country. Missing categories are those not reported in the individual chapter. Other relative and unpaid non-relative categories are combined for Singapore and Spain.

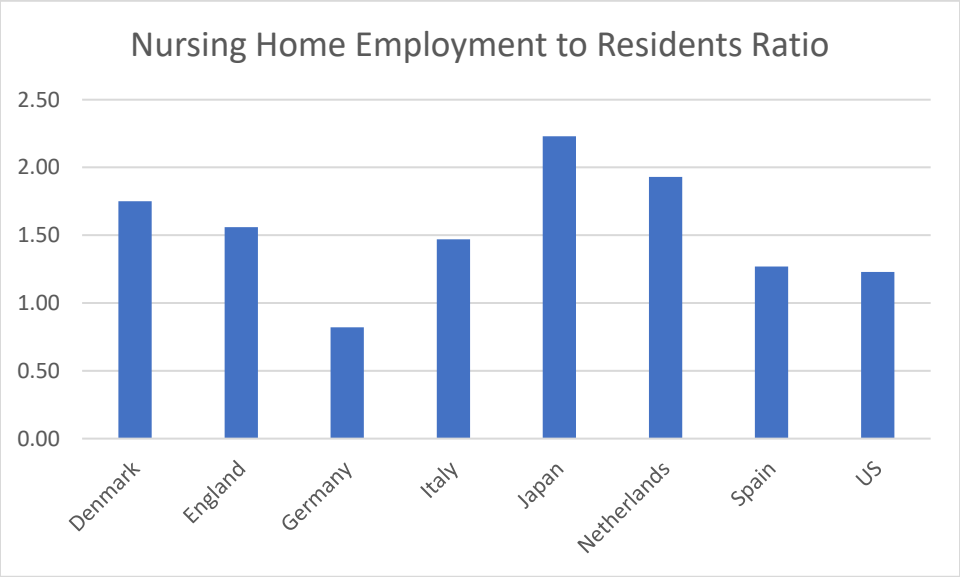
Table 7: Ratio of Average Wages for Long-Term Care Workers to the Average Wage of All Workers

	Nursing Home Industry			Home Care Industry			Both Industries	
	Higher Skill	Lower Skill	All	Higher Skill	Lower Skill	All	Higher Skill	Lower Skill
Canada							1.57	0.86
Denmark	0.96	0.78		0.93	0.73			
England	0.94	0.50		0.96	0.52			
Germany	0.86	0.74		0.82	0.62			
Italy			0.75			0.72		
Japan	1.13	0.79		1.13	0.78			
Netherlands							0.99	0.78
Singapore	1.01	0.57		1.03	0.54			
Spain			0.97			0.101		
US	1.00	0.47		1.02	0.43			

Notes: Higher skill refers to registered nurses or the country-specific equivalent, while lower skill refers to nursing assistants/home health aides or the country-specific equivalent. More details on the specific definitions for each worker type can be found in the specific country chapters. Canada's ratio is the median occupation-specific wage compared to the median economy-wide wage.

Figure 4: Variation in Nursing Home Supply, Staffing, and Availability





Notes: The residents to population ratio uses the total number of residents, because in many cases the total number of residents over age 65 is not available. The number of residents is also based upon point-in-time estimates. Nursing home employment includes all employees, regardless of occupation.

Table 8: Elderly Income and Wealth by Country (PPP-adjusted 2019 $)

	Income				Wealth			
Country	10th Pctile	50th Pctile	90th Pctile	Mean	10th Pctile	50th Pctile	90th Pctile	Mean
Canada	16,000	26,000	51,000	31,000	7,000	309,000	1,244,000	515,000
Denmark	23,000	31,000	57,000	39,000	-2,000	108,000	684,000	291,000
England	14,000	26,000	53,000	32,000	8,000	357,000	1,072,000	510,000
Germany	16,000	29,000	53,000	33,000	0	96,000	490,000	220,000
Italy	5,000	18,000	34,000	19,000	3,000	166,000	479,000	225,000
Japan	11,000	30,000	72,000	39,000	0	49,000	306,000	116,000
Netherlands	20,000	29,000	49,000	33,000	1,000	112,000	521,000	253,000
Spain	8,000	24,000	62,000	34,000	13,000	179,000	772,000	332,000
US	13,000	35,000	93,000	52,000	2,000	217,000	1,345,000	612,000

Notes: All values are normalized by the OECD equivalence scale and adjusted to be in 2019 PPP-adjusted dollars.

Table 9: Spending per Nursing Home Resident (PPP-adjusted 2019 $)

Country	Nursing Home Spending per Resident
Canada	118,000
Denmark	101,000
England	49,000
Germany	59,000
Italy	35,000
Japan	25,000
Netherlands	81,000
Singapore	66,000
Spain	48,000
US	108,000

Notes: Nursing home spending per resident is defined as the spending on nursing homes divided by the number of residents. It is likely an underestimate in many cases as the numerator excludes those under age 65 while the denominator often does not. All values are in 2019 PPP-adjusted dollars.

Table 10: Distribution of Income and Wealth by Limitations

Country	% Median HH Income/Wealth	Income			Wealth		
		0 ADLs and 0 IADLs	1 ADL	3+ ADLs	0 ADLs and 0 IADLs	1 ADL	3+ ADLs
England	Share < 50	0.07	0.10	0.07	0.21	0.35	0.44
	Share 200+	0.12	0.06	0.06	0.25	0.15	0.09
Germany	Share < 50	0.07	0.12	0.23	-	-	-
	Share 200+	0.08	0.04	0.02	-	-	-
Italy	Share < 50	0.15	0.28	0.23	0.21	0.39	0.47
	Share 200+	0.11	0.04	0.05	0.22	0.17	0.13
Japan	Share < 50	0.17	0.24	0.19	0.36	0.42	0.35
	Share 200+	0.16	0.15	0.14	0.38	0.31	0.38
Netherlands	Share < 50	0.01	0.01	0.01	0.30	0.53	0.53
	Share 200+	0.07	0.02	0.02	0.38	0.24	0.25
Singapore	Share < 50	0.33	0.41	0.44	0.21	0.39	0.34
	Share 200+	0.25	0.16	0.13	0.24	0.10	0.14
Spain	Share < 50	0.05	0.05	0.22	0.21	0.26	0.30
	Share 200+	0.15	0.10	0.08	0.25	0.19	0.09
US	Share < 50	0.14	0.26	0.40	0.29	0.46	0.63
	Share 200+	0.21	0.09	0.07	0.39	0.21	0.17

Notes: Each cell conditions on the column – in other words, it is the fraction of people in the limitation category (column) that fall in each income and wealth category. The full tables in the chapters also include columns for 1+ IADLs and no ADLs and for 2 ADLs, as well as rows for 50-100%, 100-150%, and 150-200% of median income and wealth. In these tables, the columns sum to 1.

Table 11: Financing of Long-Term Care by Source

Country	Public	Out-of-Pocket	Private Insurance
Canada	78	18	3
Denmark	90	10	0
England	*74*	26	0
Germany	70	*24*	*6*
Italy	75	25	<1
Japan	92	8	0
Netherlands	94	6	0
Singapore	51	40	0
Spain	79	21	0
US	71	19	10

Notes: These figures are for all formal long-term care spending, regardless of the age of the care recipient. Additionally, 9% of spending in Singapore is attributed to charitable donations, which is why the totals do not sum to 100.

Table 12: Formal Long-Term Care Spending by Sector per 65+ (PPP-adjusted $2019)

		Total Spending		**Share Accruing to**	
Country	All	Nursing Home	Home Care	Nursing Home	Home Care
Canada	4.8	3.2	1.6	0.67	0.33
Denmark	5.1	3.6	1.5	0.71	0.29
England	2.5	1.7	0.9	0.66	0.34
Germany	4.5	2.3	2.2	0.51	0.49
Italy	1.3	0.8	0.5	0.60	0.40
Japan	2.5	0.9	1.6	0.37	0.63
Netherlands	7.7	5.1	2.6	0.66	0.34
Singapore	2.6	1.6	1.0	0.60	0.40
Spain	1.6	1.3	0.4	0.77	0.23
US	4.4	2.7	1.7	0.61	0.39

Notes: Spending is for formal care only and restricted to (or imputed) spending on the elderly. It is expressed per person age 65+ in the population, in units of $1000.

Table 13: Informal Care Cost as a Fraction of Formal Spending

Country	Informal to Formal Care Ratio
Canada	0.72
Denmark	0.53
England	1.56
Germany	0.70
Italy	2.03
Japan	0.75
Netherlands	0.52
Singapore	0.53
Spain	1.21
US	0.65

Notes: Informal care estimates are for the combined valuation approach and are for the 65+ population, as are the formal care spending totals.

Table 14: Total Costs of Long-Term Care Across Countries

Care Type	Source	Canada	Denmark	England	Germany	Italy	Japan	Netherlands	Singapore	Spain	US
Nursing Home	Public	0.9%	1.1%	0.4%	0.5%	0.3%	0.5%	1.6%	0.1%	0.3%	0.5%
	Private	0.4%	0.1%	0.2%	0.4%	0.1%	0.1%	0.2%	0.1%	0.3%	0.2%
	All	1.2%	1.2%	0.6%	0.9%	0.4%	0.6%	1.8%	0.2%	0.6%	0.7%
Home Care	Public	0.4%	0.4%	0.3%	0.7%	0.2%	1.0%	0.9%	0.1%	0.1%	0.3%
	Private	0.2%	0.1%	<0.1%	0.2%	<0.1%	0.1%	<0.1%	0.1%	<0.1%	0.1%
	All	0.6%	0.5%	0.3%	0.9%	0.3%	1.0%	0.9%	0.2%	0.2%	0.4%
Informal Care	Private	1.3%	0.9%	1.4%	1.2%	1.4%	1.2%	1.4%	0.2%	0.9%	0.7%
Total	Public	1.3%	1.5%	0.6%	1.3%	0.5%	1.5%	2.5%	0.1%	0.5%	0.8%
	Private	1.8%	1.1%	1.7%	1.8%	1.5%	1.3%	1.6%	0.4%	1.2%	1.0%
	All	3.1%	2.7%	2.3%	3.0%	2.1%	2.8%	4.1%	0.5%	1.7%	1.8%
Age-Adjusted Total		3.3%	2.7%	2.4%	2.9%	1.7%	2.0%	4.2%	1.0%	1.8%	2.1%

Notes: Each cell reports the fraction of GDP spent by each country (column) on the specific category of care (row). In the total section, informal care costs are included as private costs. The age adjusted total is computed by regressing total care costs in our sample on the fraction of the population over age 65, then adding the residuals back to the predicted cost for the average fraction aged 65+.

Table 15: Categorization of Long-Term Care Systems

Country	**Eligibility**	**Formal Setting**		**Cost Burden**		**Provision**	
		Nursing Home	*Home Care*	*Public*	*Private*	*Formal*	*Informal*
Canada	Means Tested	1.2%	0.6%	1.3%	1.8%	1.8%	1.3%
Denmark	Universal	1.2%	0.5%	1.5%	1.1%	1.8%	0.9%
England	Means Tested	0.6%	0.3%	0.6%	1.7%	0.9%	1.4%
Germany	Universal	0.9%	0.9%	1.3%	1.8%	1.8%	1.2%
Italy	Means Tested	0.4%	0.3%	0.5%	1.5%	0.7%	1.4%
Japan	Universal	0.6%	1.0%	1.5%	1.3%	1.6%	1.2%
Netherlands	Universal	1.8%	0.9%	2.5%	1.6%	2.7%	1.4%
Singapore	Universal	0.2%	0.2%	0.1%	0.4%	0.3%	0.2%
Spain	Universal	0.6%	0.2%	0.5%	1.2%	0.8%	0.9%
US	Means Tested	0.7%	0.4%	0.8%	1.0%	1.1%	0.7%

Notes: Column 1 shows if eligibility (but not necessarily cost sharing) is universal or means tested; Columns 2-3 are based upon formal care only, while Columns 4-7 use the combined cost totals that include both formal and informal care costs. Columns 2-7 are derived from Table 13. The percentages reported in the table express costs as a fraction of GDP.