Our Aging Population:

Incidence, Prevalence, and Demographic Distribution of Late Life Cognitive Decline

1. Population changes in the last century

In the past 100 years, life expectancy has increased by an average of 30 years per person (Kawas, 2013). Additionally, the past century has seen a decline in birth rates and family size as women have fewer children (Teitelbaum, 1985). So, rather than a leveling-off of population size as would be expected with lower fertility rates, our population is simply growing older (Figure 1).

1.1 Population Growth of Older Adults

As baby boomers continue to age, the percentage of older adults in the population grows. Worldwide, it is estimated that the number of adults aged 60 years or more will have increased by 1.25 billion by 2050, accounting for 22% of the global population (Prince, 2013). In 2010, 13% of the US population was composed of individuals age 65 and older. By 2030, this is expected to grow to 20% (Gaugler, 2015). Population estimates from the US Census predict that by 2050 the population aged 65 and over will be 83.7 million, nearly double that of population from 2012 of 43.1 million (Figure 2).
1.2 Population Growth of the Oldest-Old

Additionally, the group at the highest risk for late life cognitive decline (LLCD), the oldest-old (85 years and older), is expected to increase dramatically. In 2013, there were only 2 million individuals over the age of 90 living in the United States, but this number is estimated to be 10 million by the year 2050 (Kawas, 2013). This is a substantial leap, from the oldest-old population constituting only 0.1% of the total US population, and 1.8% of the elderly population in 1950, to 2.5% of the total US population, and an estimated 12% of the elderly population in 2050 (Figure 3) (Kawas, 2013).
2. Prevalence of Dementia

Alzheimer’s disease (AD) is the most common form of dementia, accounting for over half of dementia diagnoses. As of 2015, an estimated 5.3 million Americans have Alzheimer’s and other dementias (Gaugler, 2015). This is an increase from 4.2 million in 2000, and it is estimated that it will increase even more drastically to 13.2 million in 2050 (Hebert, 2003). Of those with LLCD, a large majority (82%) are age 75 or older (Figure 4).

![Proportion of People with Alzheimer's Disease in the US by age](chart.png)

*Figure 4: Proportion of People With Alzheimer’s Disease in the United States by Age. Adapted from Alzheimer’s Disease Facts and Figures. Gaugler, J., James, B., Johnson, T., Scholz, K., & Weuve, J. (2015). Alz.org.*

It has been suggested that prevalence increases exponentially with age, doubling with every 5.5 year increment in age for North America, Latin America, and Asia Pacific (Prince, 2013). The Aging, Demographics, and Memory study (ADAMS) used a sample of 856 individuals age 70 or older from all regions of the country in a population-based study of dementia (Langa, 2005). They found that the prevalence of dementia for adults aged 71 and older was 13.9%, and increased with age (Plassman, 2007).

Combining prevalence data with the estimated numbers of our growing elderly population has provided estimates of the future prevalence of LLCD. In 2010, there were 4.7 million individuals in the United States with AD. By 2050, this is expected to nearly triple to 13.8 million (Figure 5).

Worldwide, the number jumps to 115.4 million people with dementia in 2050, up from 35.6 million in 2010 (Prince, 2013). It is believed that by the middle of the century, 1 in 45 people will be diagnosed with LLCD (Brookmeyer, 1998).

Prevalence of dementia among assisted living residents is even higher. Using national data, it has been estimated that seven out of ten residents in these residences have some form of LLCD, with 19% of residents having severe impairment (Zimmerman, 2014). This is an 8% increase in prevalence from a 2002 study that stated prevalence in assisted living facilities as being 62% (Matthews, 2002). This increase poses a problem for institutions, a majority of which are not equipped to handle large numbers of highly impaired patients.
3. Incidence of Dementia

In 1998, the number of new diagnoses of AD and other dementias was approximately 360,000 (Brookmeyer, 1998). Another study used US census data and found the number to be 377,000 in 1995, and estimated to grow to 959,000 in 2050, more than doubling (Hebert, 2001).

As with prevalence, the incidence of LLC increases exponentially with age. In 2015, there will be approximately 59,000 new cases among people age 65 to 74, 172,000 new cases among people age 75 to 84, and 238,000 new cases among the oldest-old, people age 85 and older (Figure 6) (Gaugler, 2015).


![Incidence Rate of Alzheimer's Disease in 2014 by Age Range](image_url)
It has been suggested the current positive trend of medical, lifestyle, demographic, and social factors have been positive for the physical and cognitive health of older Americans. With adults entering into old age healthier and happier, one would assume that the incidence rate would drop in the coming years, and may have already started to do so. In a large nationally representative survey of older Americans, the prevalence of cognitive impairment and dementia decreased from 12.2% to 8.7% between 1993 and 2002 (Rocca, 2011). Despite the apparent falling rate of cognitive impairment, rates of incidence are expected to skyrocket along with the growing older population (Figure 7).

**Birth cohort analyses of age-specific incidence rates in men and women**


**Figure 7**

4. Demographic Distribution of Dementia

There have been multiple studies investigating the demographic distribution of Alzheimer’s disease and dementia. The most commonly found difference has been between men and women: on average, two out of every three Americans with Alzheimer’s are women (Gaugler, 2015). This has not been attributed to a sex difference in the prevalence of different dementia types (Fratiglioni, 1991). Rather, the difference can be explained by the greater longevity of women compared to men (Figure 8). By age 70, there are approximately 1.5 women alive for every man. By age 90, there are three women for each man (Katz, 2013).

There are racial and ethnic differences in the prevalence and incidence of Alzheimer’s Disease and other dementias, though results have varied among different studies. Using a fixed cohort study, Whitmer found that incidence densities were highest among African Americans and Mixed races (23/1,000 person-years), and Native-Americans (21/1,000 person-years), and lowest among Asians (13/1,000 person-years). Risk was intermediate for non-Hispanic whites and Latinos (Whitmer, 2014).
Although there are more non-Hispanic whites currently living with dementia than people of any other racial or ethnic group in the United States, older African Americans are twice as likely to have Alzheimer’s and dementia than Caucasians, and Hispanics are about one and a half times as likely to have it as Caucasians (Gaugler, 2015). These differences have been attributed to variations in lifestyle, health, and socioeconomic risk factors, such as higher prevalences of diabetes and high blood pressure, lower education, and a higher prevalence of alcoholic and unspecified types of dementias (Fratiglioni, 1991).

There is also evidence that among older African Americans and Hispanics there are more missed and incorrect diagnoses of LLCD than compared to older whites. This could potentially be connected to findings that the Mini-Mental Status Exam (MMSE), a brief test commonly used by physicians to screen for cognitive deficits, may have low specificity within minority populations. Whites had only a 6% false-positive rate for cognitive impairment with the MMSE, while African Americans had up to a 42% false-positive rate (Chin, 2011). Another impediment for the timely diagnosis of Alzheimer’s disease in minority populations could be a lack of physician contact (Clark, 2005).

The epidemiology of dementia has long been studied and debated, and there is no doubt that the exponential increase in new cases is a cause for worldwide concern. Though comparing studies from different countries can be difficult, there is evidence that the prevalence of dementia is significantly lower for developing countries than for developed countries. Estimates vary between countries, but a systematic review calculated the overall prevalence of AD in developing countries to be 3.4 % (Qiu, 2009). Comparatively, the prevalence of AD has been estimated at 6.9% in North America, 7.2% in Western Europe, and 7% in Southern Latin America (see figure 9) (Prince, 2013).
Though prevalence of dementia may be lower in developing countries, 58% of all people with dementia in 2010 lived in countries with low or middle incomes. This proportion is expected to rise to 63% by 2030 and 71% in 2050. This is due to the rapid growth in the number of people over the age of 60 in these less developed countries. By 2050, the number of people aged 60 years will account for 22% of the world’s population, with 79% living in the world’s less developed regions (Prince, 2013).

5. Conclusion

With future progressions of Alzheimer’s disease and dementia on an exponential rise, early detection of cognitive impairment will be the best defense against the tide that is threatening to crush the healthcare system in America and worldwide.
References


