

Public Health Response to Dementia in Developing Countries (A Case of India)

Dr Prateek Pratyaya¹, Akanksha Singh², Neena Gupta³

Department of Public Health, Shalom Institute of Health and Allied Sciences, SHUATS, India

Abstract: *The growing levels of dementia have been a worldwide concern. Not only does it create dependency and disability, especially among older adults, but it also affects cognitive abilities and behavioural underpinnings. As a public health issue, it is a cause of concern not only in terms of fiscal and monetary budgeting but also because it mars longevity gain by reducing economic productivity and increasing dependency. Identifying the causes and risk factors for dementia is crucial, and understanding its trajectory in the demographic landscape is paramount to addressing it in public decision - making. This article reviews the current trends in dementia worldwide and in developing countries with a more nuanced understanding of the Indian context. It traces the aetiology of dementia to underscore the most significant risk factors and types of dementia. The current issues identified with dementia risk and its trend have been further mapped with policy measures that are in place, and gaps in current discourse have been noted to aid future policymaking. Finally, the article makes public health recommendations to mitigate the burden of dementia.*

Keywords: Dementia, Alzheimer's, Ageing, Palliative care, Elderly care

1. Introduction

Dementia is a syndrome that can be caused by several diseases that, over time, destroy nerve cells and damage the brain, typically leading to deterioration in cognitive function, i. e., the ability to process thought. This, in turn, inhibits an individual's ability to conduct routine activities. As per WHO estimates, more than 55 million people worldwide are affected by dementia, with 10 million new cases added annually, of which nearly two - thirds reside in low - and middle - income countries (LMIC) [1]. Due to the high cost of care, dementia imposes a significant financial burden and loss in productivity on the individual, their families, and the economy. By one estimate, global costs for dementia are around US\$ 1 trillion annually and are expected to double by 2030 [2]. It is, therefore, essential to understand the risk factors and the current interventions to tackle the growing burden of dementia.

a) Dementia - Risk Factors & Global Scenario

Traversing the etiopathogenesis of dementia, the Lancet Commission Report 2020 on dementia prevention, intervention, and care identified 12 potentially modifiable risk factors that account for almost 40% of all dementia cases: "lack of educational attainment affects cognitive ability in early life (<45 years); mid - life (45 - 65 years) risk factors such as hypertension, hearing impairment, alcohol, traumatic brain injury (TBI), and obesity affect cognitive reserve; and later - life (>65 years) risk factors of smoking, depression, physical inactivity, diabetes, social isolation and air pollution trigger neuropathological developments" [3]. The remaining 60% of dementia cases are either related to risks associated with genetics and ageing or remain largely unknown [4]. With declining mortality rates and increasing longevity, population ageing is increasingly surpassing all other age groups, resulting in one in every 11 people being above 65 years old, poised to rise to one in 6 by 2050 [5]. Following a 117% increase in dementia between 1990 - 2016 due to ageing, the burden of dementia will continue to

rise as people continue to live longer [6]. It is pertinent to note that ageing doesn't inevitably lead to dementia, nor is it exclusively experienced in the older population alone.

High - income countries (HIC) such as the US, the UK, and France have experienced a fall in age - related incidences of dementia rate in recent cohorts, while Asian economies such as Japan, Hong Kong, South Korea and Taiwan as well as LMIC are experiencing an upward trends in age - specific prevalence [3]. This trend may be subject to reverse in HIC and intensify among LMIC if the current development in non - communicable diseases resulting from diabetes, sedentary lifestyle, obesity, and substance use disorders continues to rise. Among LMIC, population growth is expected to increase dementia cases in African nations, while population ageing will contribute to more such incidences among Asian economies [7]. In HIC, the oldest adults (aged >90 years) are at an increased risk of dementia. Today, dementia is the seventh - largest cause of mortality and one of the prime reasons for disability and dependency among the older population [8].

b) Situation Analysis - India

As per the Global Burden of Disease 2019 report, 3.84 million Indians (of a total 1.36 billion) suffered from dementia, which is expected to almost triple by 2050 [7]. However, due to limited data points, this figure may be conservative, given that the Dementia in India 2020 report estimates that about 5.3 million people above the age of 60 have dementia in the country [9]. India's population of adults 60 years and above is projected to increase from 101.5 million in 2011 to 227.4 million in 2036 [10]. Within India, there is heterogeneity among states in the demographic landscape: the southern states have a more significant number of older adults than the northern states, as per the Census 2011 data shown in Fig1. Such disparities are also profound among males and females and in India's urban and rural regions, as shown in Fig 2 [11].

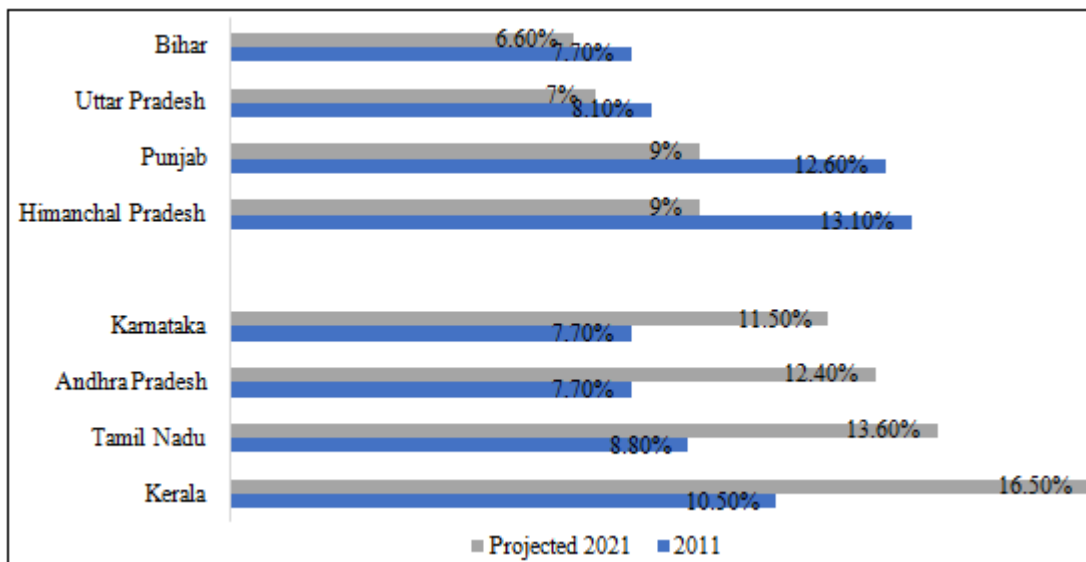


Figure 1: Elderly population (>60 years) as a proportion of the state population

Data Source: Elderly in India, 2021 [12]

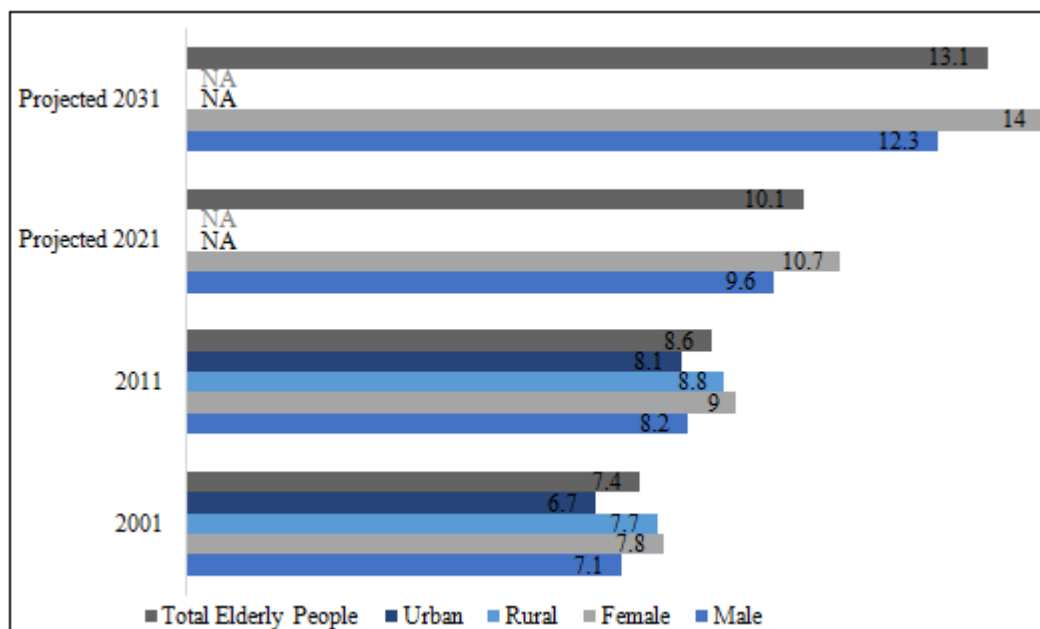


Figure 2: Percentage share of the elderly population in the total population

Data Source: Elderly in India, 2021 [12]

Not only the age - related risk is high, but also disease - related risks are equally potent in the country. India is only second to China in the global epidemic of diabetes in 2022, with over 77 million diabetics and about 74.2 million of them above 60 years of age [13]. Compounded by over 65 million cases of hypertension, it puts many people at risk of developing cardiovascular diseases [14]. As these are frequent chronic conditions among older persons, poorly managed hypertension or diabetes may predispose to hearing impairment through the establishment of chronic arteriosclerosis, which causes a decrease in the blood flow to the inner ear. About 63 million Indians have hearing loss, whose vulnerability increases with ageing; auditory loss tendencies rise by 40 - 66% in people above 75 years of age and by >80% in people above 85 [15]. In the absence of clinical diagnosis and treatment, which is often the case in India, dementia prevalence is likely to be high.

As per the World Obesity Federation, clinically obese adults in India are growing at 5.2%, which is “very high”. Most of the physical movements in current times are left to mechanical gadgetry. Thus, an increasingly sedentary lifestyle and confinement to built spaces have added to the woes of obesity in India. Given the high density of Indian cities, it is very difficult for children and adults to find enough public space for sports and physical activity. The adversities of overcrowding have been aggravated by poor air quality in Indian cities; India is the second most polluted nation out of 240 countries, as per the Air Quality Life Index [16]. Even the average dwelling unit sizes and apartment - style constructions have constrained movement for people. For those living in informal settlements, there is no avenue for a fit lifestyle save the vagaries of physical labour - intensive work. This is also why people are increasingly socially isolated as they migrate to alien cities for work and end up with deficient social networks. The result is an

increasing rate of depression, especially as a mid - life risk factor, with a prevalence rate of 31 - 57% estimated by UNICEF [17].

One of the direct consequences of rising depression in mid - life is an increase in the consumption of alcohol and smoking. Among the Indian men, about 30% are alcohol consumers, while 45% are tobacco consumers, as per the National Family Health Survey - 4, 2015 - 16 [18]. Alcohol consumption is such a menace that 15 - 20% of TBIs directly result from drunk driving - related injuries, of the annual 1 million TBI cases in India. TBIs are caused mainly by road traffic injuries (60%), followed by falls (20% - 25%) and violence (10%) [19].

Finally, educational attainment in the Indian context has improved in the last decade, but disparities exist across genders. In a study across 14 states among elderly Indians, women fared much poorer than males in most cognitive categories [20]. One of the prime reasons for this difference can be seen in the education levels, where, as per the 2011 Census, the primary school completion rate in males was 62.2% compared to 40% among women aged 25 years and above. In summation, poor health, societal disadvantages, and lower educational attainment adversely affect mental health and increase the chance of dementia in people.

Understanding dementia is essential to diagnose its underlying causes and progression in the current affected population and its likely trend in future. With longevity gains, more and more people will continue to age, outstripping the current productivity gains and public health budget. Increased incidences of non - communicable diseases and dementia comorbidities will further outweigh economic and social dependency. For these reasons, this article aims to understand the dementia - related profile of LMIC and the public health responses to tackle the current and likely forecasts of such incidences. The article reviews the aetiology of dementia to underscore the most significant risk factors and types of dementia. It explores dementia in India in greater detail and the types of public policy measures that have been adopted to deal with the issue. Finally, the conclusions are translated into policy measures that can help improve and enrich public discourse and decision - making in the field of dementia.

Objective

This review article aims to understand public health responses to dementia in developing countries with a more nuanced understanding of the Indian context.

2. Method

This paper weaves a coherent narrative on dementia and its current public health discourse by collating abstruse trends and analysis into a consistent story. For this purpose, this study has reviewed several reports from reputed organisations such as the World Health Organisation, Alzheimer’s Disease International, the United Nations, Lancet, Johns Hopkins Medicines, UK National Health Services, and the Government of India. Some of the deeply cross - examined articles for this paper include “Dementia Prevention, Intervention, and Care: 2020 Report of the Lancet Commission”[3]; “Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the Global Burden of Disease Study 2019” [7]; “Dementia Care in Developing Countries: The Road Ahead”[21]; “Dementia in India”[9]; “Decomposing rural - urban Differences in Successful Ageing among Older Indian Adults”[11]; and “Changing Demography and the Challenge of Dementia in India, ”[20].

3. Literature Review

Often, dementia is classified based on aetiology, sites affected inside the individual’s brain or those that develop because of infection from other diseases, as shown in Fig 3. Alzheimer's, associated with memory loss, is the most common cause of dementia, accounting for over 60% of all cases [1]. Vascular dementia, the second most common type of dementia, is caused when blood vessels in the brain are damaged, meaning less blood reaches the brain than usual [22]. Dementia with Lewy bodies stops brain cells from working properly, causing dementia symptoms such as memory loss [23]. Parkinson’s disease arises from decreased dopamine production in the brain, which makes it hard for the brain to coordinate muscle movements. Frontotemporal dementia is caused by damage to the front and side lobes of the brain [24]. Higher cortical abnormalities lead to cortical dementia, wherein subcortical dementia is accompanied by apathetic forgetfulness and poor ability to use knowledge concomitant with other neurological signs and movement disorders [25]. Creutzfeldt - Jakob disease is a rare fatal brain disorder (misfolded prion protein) occurring in about one in 1 million people annually worldwide [26]. It causes dementia that gets worse unusually fast, unlike Alzheimer’s, Lewy or frontotemporal. HIV encephalopathy (AIDS - dementia complex) is an infection that spreads throughout the brain and causes dementia, which worsens with the spreading of the infection [27].

Based on aetiology	Based on site in brain	Based on Infection
<ul style="list-style-type: none"> • Alzheimer’s • Vascular • Lewy Bodies • Parkinson’s • Others 	<ul style="list-style-type: none"> • Frontotemporal • Cortical • Subcortical 	<ul style="list-style-type: none"> • Creutzfeldt-Jakob disease • HIV encephalopathy (AIDS-Dementia Complex)

Figure 3: Classification of Dementia

Source: Management of LUTS in patients with dementia and associated disorders [28]

The symptoms of dementia are further aggravated by age and risk factors. Dementia cases continue to rise globally, with a substantial increase in such incidences in older adults. As more and more people become susceptible to cardiovascular diseases, finding roots in physical inactivity, diabetes, obesity and hypertension, there is likely to be a rise in dementia cases in the coming times, with over 132 million instances predicted globally by 2050 [8]. Loss of hearing and TBI have been linked to the early onset of Alzheimer's, increasing the chances of dementia. Although clinical dementia is diagnosed years later, social isolation and depression have been associated with the prodrome of dementia neuropathology. Smoking and excessive alcohol consumption could lead to cognitive impairment, a high - risk factor for dementia. Air pollution has been associated with accelerating neurodegenerative processes through cerebrovascular and cardiovascular diseases, as the Lancet Commission Report 2020 observed [3]. The earliest risk of dementia arises from a lack of education, which often leads to less developed cognitive functions and, hence, the inability to compensate for its effects [29].

4. Result

India does not have universal health coverage like the UK or prominent European nations. It uses a combination of public and private health insurance funds and tax - funded government hospitals, which stresses the current curative systems immensely. The situation analysis underscores the requirement for public health interventions in general and targeted measures for worse - off groups like the rural populace, women, and elderly adults, in particular.

The Pain and Palliative Care Society in India has developed a network of palliative care clinics across Kerala where trained volunteers from the community assist in providing care [21]. Family members are empowered to ensure continuity of treatment. This has become a reliable resource for community care and provides strong support for home - based care. Volunteers from the local community are trained to identify problems of the chronically ill and intervene effectively, with the active backing from a network of trained professionals. Community volunteers manage the program. Interestingly, their clients include many functionally impaired older adults with dementia.

Environment and surroundings are the most significant factors affecting an individual's health indicators. Irrespective of the level of urbanisation, walking and moderate levels of exercise activities such as yoga can significantly improve life expectancy levels. Even though the URDPFI 2014 Guidelines recommend a minimum of 25 - 35% green cover and recreational space zoning in urban areas, adherence levels are low in most Indian cities. This needs to be rigorously administered by authorities.

Further, low awareness levels due to a lack of educational attainments contribute to societal stigmatisation and isolation. People with dementia are frequently denied their human rights and freedoms. Some countries still allow physical and chemical constraints on people with dementia. This is an abuse of human rights and should not be used.

Dementia treatments are still under clinical trials; no definitive cure is available. As such, family support and care of loved ones are very crucial in helping cope with dementia onset. It is essential to help build a social network by running housing programs that allow individuals to remain in proximity to their elderly relatives. One such innovative program is Singapore's Proximity Housing Grant. It helps Singaporeans buy a resale flat with or near their parents or married children, which helps in furthering the cause of elderly care [30]. On the other hand, dementia can also be overwhelming for families and caregivers. Psychological and social support systems catering to both the patients and immediate caregivers are essential in the treatment of dementia.

Data points on dementia are currently very low and primarily outdated, especially in India. This has constrained the research community in carrying out a large - scale and planned study on the epidemiology, genetics, risk factors, and preventive factors that are desperately needed. This is especially important if community - based methods of dementia care must be designed since they are seen to be more effective than individual clinical ones.

5. Conclusion

Knowledge networks are now being fostered to help with dementia diagnosis, prevention, and early detection. This article has studied the risk factors in greater detail for India and suggested some policy measures to generate awareness about dementia and help track its morbidities. Based on the principles of palliative care, community - based services can address the needs of people affected by various disabling and incurable conditions. Doctors and nurses with experience and expertise in palliative care can be networked with such services and provide guidance to develop locally sustainable home care programs further.

6. Recommendations

If India is to continue its demographic potential and convert longevity gains into better productivity and, hence, economic outcomes, it must build a culture of preventive healthcare rather than relying heavily on curative healthcare. India should invest more in such research and collaborate with other countries and global organisations.

First and foremost, it is to create a general awareness about dementia. If routine check - ups suggest deteriorating cognitive abilities, the patient must be made aware of risk factors. When concerns are raised about dementia, it should be clinically diagnosed so that help and medical attention are provided promptly. Proper medication and cognitive training activities should precede the diagnosis. Neuropsychiatric symptoms should be clinically treated along with psychiatric sessions, psychosocial care and support to family members and caregivers. Dementia cases are often complicated by multimorbidity and difficulty in organising care. Putting dedicated palliative care units in clinical settings can help tackle such cases. Some of the HICs, such as the US and Japan, also have in place end - of - life care for dementia patients at later ages with faster declining physical fragility.

Bringing in the culture of walking and moving away from vehicle - oriented transport planning will significantly reduce physical inactivity and obesity levels in the population. This has a two - way advantage; it not only creates more green and open spaces but also reduces the pollutants in the air, especially in urban areas. Health camps should be set up monthly to monitor vitals and common lifestyle diseases such as diabetes, hypertension, and cardiovascular health. Dietary and nutritional awareness should be part of all such camps. Even though the government has taken active steps to dissuade the consumption of alcohol and tobacco in cancer awareness campaigns, other side effects, such as dementia, can be dovetailed with the current efforts. People should be encouraged to maintain more socially integrated lifestyles by establishing extensive social networks and frequently participating in social, physical, and intellectually stimulating activities in middle age and later in life.

Educational attainments and literacy levels need to be improved, especially in rural areas and among women. People should be generally made aware of the vices of dementia and associated risk factors through campaigns and social media outreach. People with dementia should be treated with dignity, and psychosocial interventions should be first - line treatment. Families should also have legal, social and financial support from the government and the community. Every individual has a right to a dignified life, and well - being is an essential core of this right. Dementia patients must be treated with utmost respect and care and socially integrated in daily activities.

References

- [1] World Health Organisation, "Dementia, " 2023. [Online]. Available: <https://www.who.int/news-room/fact-sheets/detail/dementia>. [Accessed 03 09 2023].
- [2] C. Patterson, "World Alzheimer Report 2018, " Alzheimer's Disease International, London, 2018.
- [3] G. Livingston, J. Huntley, A. Sommerla, D. Ames, C. Ballard, S. Banerjee and et. al, "Dementia prevention, intervention, and care: 2020 Report of the Lancet Commission, " vol.396, pp.413 - 46, 2020.
- [4] M. Shelly, "The hopeful guide to preventing and treating dementia, " Aetna, [Online]. Available: <https://www.aetna.com/health-guide/preventing-treating-dementia.html>. [Accessed 03 09 2023].
- [5] Population Division, "World Population Ageing, " UN DESA, New York, 2019.
- [6] N. E, S. CEI, S. Vollset and et al., "Global, regional, and national burden of Alzheimer's disease and other dementias, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016, " *Lancet Neurol*, vol.18, pp.88 - 106, 2019.
- [7] G.2. D. F. Collaborators, "Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the Global Burden of Disease Study 2019, " *Lancet Public Health*, vol.7, pp.105 - 125, 2022.
- [8] World Health Organisation, "Global action plan on the public health response to dementia, 2017 - 2025, " WHO, Geneva, 2017.
- [9] Alzheimer's and related disorders Society of India (ARDSI), "Dementia in India, " University of Science & Technology, Cochin, 2020.
- [10] MOSPI, "Population Statistics, " Government of India, Delhi, 2022.
- [11] T. Muhammad, S. Srivastava, B. Hossain and et. al., "Decomposing rural–urban differences in successful aging among older Indian adults, " *Nature*, vol.12, pp. DOI: <https://doi.org/10.1038/s41598-022-09958-4>, 2022.
- [12] MOSPI, "Elderly in India 2021, " Government of India, Delhi, 2021.
- [13] International Diabetes Federation, "Diabetes Atlas, " IDF, 2021.
- [14] Ministry of Health & Family Welfare, "Hypertension: Background Document, " Government of India, 2016.
- [15] S. Angadi and V. Kotrannavar, "A case discussion on presbycusis, " *Journal of Ayurveda and Integrative Medicine*, Vols.4 (1); DOI: 10.4103/0975 - 9476.109555. PMID: 23741163; PMCID: PMC3667435, pp.48 - 51, 2013.
- [16] Energy Policy Institute, "Air Quality Life Index, " University of Chicago, 2021. [Online]. Available: <https://aqli.epic.uchicago.edu/country-spotlight/india/?visitorCountryCode=IN>. [Accessed 05 09 2023].
- [17] UNICEF, "Rise of depression amongst young adults in India, " Times of India, 24 04 2023. [Online]. Available: <https://timesofindia.indiatimes.com/blogs/voices/rise-of-depression-amongst-young-adults-in-india/>. [Accessed 05 09 2023].
- [18] Hindustan Times, "These 9 charts reveal smoking and drinking habits of Indians, " 20 02 2018. [Online]. Available: <https://www.hindustantimes.com/india-news/how-india-gets-high/story-rGlrZdK7uxpTwSdEO4XUIM.html>. [Accessed 05 09 2023].
- [19] G. G, "Epidemiology of traumatic brain injuries: Indian scenario, " *Neurol Res*, vol.24 (1); DOI: 10.1179/016164102101199503. PMID: 11783750, 2002.
- [20] V. Ravindranath and J. Sundarakumar, "Changing demography and the challenge of dementia in India, " *Nature Reviews; Neurology*, Vols.17; DOI: <https://doi.org/10.1038/s41582-021-00565-x>, pp.747 - 58, December 2021.
- [21] K. S., "Dementia care in developing countries: The road ahead, " *Indian J Psychiatry*, vol.1, no. PMID: 21416017; PMCID: PMC3038540, 2009.
- [22] Johns Hopkins Medicine, "Vascular Dementia, " [Online]. Available: <https://www.hopkinsmedicine.org/health/conditions-and-diseases/dementia/vascular-dementia>. [Accessed 04 09 2023].
- [23] Alzheimer's Association, "Dementia with Lewy Bodies, " [Online]. Available: <https://www.alz.org/alzheimers-dementia/what-is-dementia/types-of-dementia/dementia-with-lewy-bodies>. [Accessed 10 09 2023].
- [24] NHS UK, "Frontotemporal dementia, " 16 01 2020. [Online]. Available: <https://www.nhs.uk/conditions/frontotemporal-dementia/#:~:>

text=Frontotemporal%20dementia%20affects%20the%20front, affect%20younger%20or%20older%20people. . [Accessed 04 09 2023].

- [25] D. Salmon and M. Bondi, "Neuropsychological assessment of dementia," *Annu Rev Psychol*, vol.60, no. DOI: doi: 10.1146/annurev.psych.57.102904.190024, pp.257 - 82, 2009.
- [26] Alzheimer's Association, "Creutzfeldt - Jakob Disease," [Online]. Available: <https://www.alz.org/alzheimers-dementia/what-is-dementia/types-of-dementia/creutzfeldt-jakob-disease>. [Accessed 04 09 2023].
- [27] Johns Hopkins Medicine, "HIV and Dementia," Johns Hopkins University, [Online]. Available: <https://www.hopkinsmedicine.org/health/conditions-and-diseases/hiv-and-aids/hiv-and-dementia#:~:text=HIV%20encephalopathy%20is%20an%20infection,complex%20or%20HI%20V%2Dassociated%20dementia>. [Accessed 04 09 2023].
- [28] M. Averbeck, A. Altaweel, A. Manu - Marin and H. Madersbacher, "Management of LUTS in patients with dementia and associated disorders," *Neurology and Urodynamics*, vol.36, no.2, p. <http://dx.doi.org/10.1002/nau.22928>, 2015.
- [29] University of Cambridge, "Why more education lowers dementia risk," 23 October 2010. [Online]. Available: <https://www.cam.ac.uk/research/news/why-more-education-lowers-dementia-risk>. [Accessed 04 September 2023].
- [30] T. Ho, "Guide To Understanding The HDB Proximity Housing Grant (PHG)," 27 November 2022. [Online]. Available: <https://dollarsandsense.sg/guide-understanding-hdb-proximity-housing-grant-phg/>. [Accessed 06 September 2023].