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Promoting Healthy Aging to Reduce the Risk of Dementia: A Public Health Imperative

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Abstract

Alzheimer's disease and related dementias place an enormous burden on individuals, families, health and long-term care systems, and governmental budgets. As the burden escalates with rising prevalence, attention has increasingly focused on how the risk of developing dementia can be reduced. Evidence indicates there are ways, from a population perspective, to reduce the risk of cognitive decline and possibly dementia, including through healthier lifestyles. It is imperative that the public health community lead the effort to address modifiable risk factors and social determinants of health for dementia and promote healthy aging through public health action.

Keywords

Alzheimer's disease; dementia; dementia risk reduction; public health; social determinants of health

Alzheimer's dementia is a subtype of dementia affecting an estimated 6.5 million people ages 65 and older in the United States, with the prevalence projected to reach 13.8 million by 2060 (Alzheimer's Association, 2022a). Of this population, a disproportionate number are from historically underserved groups. Studies have indicated that Black Americans are about twice as likely and Hispanic Americans are about 1.5 times as likely as White Americans to develop Alzheimer's dementia (Alzheimer's Association, 2022a). It

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is projected that in 2060, nearly 40% of all Americans living with Alzheimer's dementia will be Black or Hispanic (Matthews et al., 2018). Individuals with Alzheimer's and other dementias experience impaired memory and executive functioning, which eventually disrupts daily functioning. Over time, people with dementia need increased assistance with basic activities of daily living (e.g., dressing, bathing, cooking, and communicating), creating a potential burden for family and friends. Persons with Alzheimer's dementia live an average four to eight years after being diagnosed; however, it is not uncommon for individuals to live as long as 20 years depending upon their health status (Alzheimer's Association, 2022a).

Furthermore, it is reported that in 2021 more than 11 million family members and other unpaid caregivers provided an estimated 16 billion hours of care to people with Alzheimer's or other dementias. The combination of the increasing prevalence of the disease and the intensity and duration of care required has begun to strain the healthcare and long-term care systems as well as federal and state government budgets (Alzheimer's Association, 2022a). In 2022, the cost of caring for people with Alzheimer's dementia was estimated to be \$321 billion, with nearly two-thirds of those costs borne by Medicare and Medicaid. Costs by mid-century are projected to reach nearly \$1 trillion (Alzheimer's Association, 2022a).

Finding ways to reduce the burden of dementia on families, society, and governments has been a focus of policymakers in recent years. While much of the effort has revolved around funding for research on effective treatments, increasing attention is turning to the need for the public health community to address risk factors for cognitive decline and dementia to reduce dementia prevalence (Livingston et al., 2020; Lee et al., 2022). It is imperative that the public health community lead the effort to address modifiable risk factors and social determinants of health for dementia and promote healthy aging through public health action.

Risk Factors: Modifiable Risk Factors

The evidence on modifiable risk factors for dementia is not yet sufficient to indicate on a clinical level how any individual can prevent dementia. However, a growing body of research, largely from epidemiological and observational studies, has identified certain modifiable risk factors for cognitive decline and dementia from a population-level perspective that can serve as the basis for public health action. Several reports have reviewed and summarized dementia risk-reduction research and reached the conclusion that cognitive decline may be slowed, and dementia may be delayed or prevented, through the implementation of interventions that address certain risk factors (Baumgart, 2015; Blazer et al., 2015; Livingston, 2020; U.S. Department of Health and Human Services, 2021a).

While reports have reached varying conclusions overall, there is consistent belief that, on a population basis, diabetes, midlife hypertension, physical inactivity, and smoking increase the risk for cognitive decline and/or dementia. All but one of these reviews also included midlife obesity as a risk factor with sufficiently strong evidence.

‘ON A POPULATION BASIS, DIABETES, MIDLIFE HYPERTENSION, PHYSICAL INACTIVITY, AND SMOKING INCREASE THE RISK FOR COGNITIVE DECLINE AND DEMENTIA.’

The association between these five risk factors (i.e., diabetes, midlife hypertension, physical inactivity, smoking, and midlife obesity) and an increased risk for cognitive decline and dementia was underscored in the recent analysis of data from 31 states and Washington, DC, which administered the cognitive decline module from the Behavioral Risk Factor Surveillance System (BRFSS), an annual public health survey (Omura et al., 2022). The analysis found the presence of these risk factors increased the likelihood of an individual reporting increased memory or thinking problems, known as subjective cognitive decline (SCD)—one of the earliest warning signs of potential future dementia. As illustrated in Figure 1, below, smokers were 82% more likely to report SCD than non-smokers, and those with diabetes were 76% more likely to report SCD than individuals without diabetes (Omura et al., 2022).

Figure 2, below, illustrates that among adults ages 45 and older, 49.9% have hypertension, 35.3% have obesity, 18.6% have diabetes, 14.9% smoke, and 49.7% do not meet aerobic physical activity guidelines (Omura et al., 2022). Two-thirds (67.1%) of all adults ages 18 and older in the United States have at least one of these five risk factors, and nearly one-third (30.9%) have two or more risk factors (Alzheimer’s Association, 2022b).

As shown in Figure 3, below, more than three-quarters (75.8%) of Black adults and 70.8% of Hispanic adults have at least one of these five risk factors (Alzheimer’s Association, 2022b).

Other possible risk factors for cognitive decline and dementia have been identified by recent reviews and include poor quality sleep, a poor diet, traumatic brain injury, and social isolation. In total, assuming a causal link between the risk factors and dementia, the Lancet Commission on Dementia estimated that 40% of worldwide dementia cases can be attributed to 12 modifiable risk factors (Livingston et al., 2020). A similar analysis estimated that the same 12 modifiable risk factors were responsible for as many as 41% of cases in the United States (Lee et al., 2022).

Risk Factors: Social Determinants of Health (SDOH)

SDOH are the conditions in which people live, play, work, grow, and age. These conditions may have a role in driving disparities in healthcare access and health outcomes among individuals of different racial, ethnic, gender, and socioeconomic statuses, and serve as points of intervention. While these disparities affect an individual’s health, they have a significant adverse impact on neighborhoods, communities, and society—making SDOH a crucial concern for public health.

SDOH play a role in dementia risk. For instance, education is a protective factor against cognitive decline and dementia (Sando et al., 2008). In addition, research has found associations between dementia risk and air pollution (Weuve et al., 2021), economic status (Cadar et al., 2018), neighborhood environments (Zaheed et al., 2019), and racial discrimination (Pohl et al., 2021).

SDOH contribute to the prevalence of many modifiable risk factors that in turn may elevate dementia risk—and act as barriers to addressing individually modifiable risk factors for dementia. For example, socioeconomic position, racism, social support, culture and language, access to care, and residential environment all have been linked to higher risk and poorer outcomes for cardiovascular disease (Havranek et al., 2015). A neighborhood’s lack of safe spaces (e.g., sidewalks, bike lanes, parks, low crime) could hinder the ability to engage in physical activity leading to negative outcomes. Furthermore, the economic need for an individual to hold multiple jobs may interfere with quality sleep.

U.S. Government Action

In 2018, the U.S. Congress passed the Building Our Largest Dementia (BOLD) Infrastructure for Alzheimer’s Act, which seeks to expand public health capacity to address cognitive health and dementia (Centers for Disease Control and Prevention [CDC], 2021a). Under the law, the CDC funded a Public Health Center of Excellence on Dementia Risk Reduction to develop tools and resources to assist state, local, and tribal public health agencies in undertaking action in their communities. In addition, 20 states, one city, one county, and one Indian Health Board have received BOLD programmatic grants, some of which include work to address dementia risk (CDC, 2021b).

CERTAIN SDOH MAY ACT AS BARRIERS TO HEALTHY LIFESTYLES AND QUALITY CARE.

In 2021, to further spur action, including at the state and local level, the U.S. Department of Health and Human Services (HHS) added a sixth goal to the National Plan to Address Alzheimer’s Disease (U.S. Department of Health and Human Services, 2021b). The National Plan, first released in 2012, provides a framework for coordinating and integrating actions to address Alzheimer’s disease and related dementias across federal, state, and local governments and community organizations. Originally containing five goals, the 2021 update added an additional goal with six strategies and 26 actions to “accelerate action to promote healthy aging and reduce risk factors for Alzheimer’s disease and related dementias.” One of the central strategies to achieve the National Plan’s new risk reduction goal is to expand and implement evidence-based public health actions to support healthy aging and to prevent and control modifiable risk factors for dementia.

Public Health Action

Assuming a causal link between risk factors and dementia, an aggressive public health effort to reduce the prevalence of dementia risk factors could result in about 1 million fewer Americans living with Alzheimer’s dementia in 2050 compared with currently projected levels (Norton, 2014; U.S. Department of Health and Human Services, 2021a). Public health efforts may take several forms, including education via integrating messaging on dementia risk reduction into existing relevant public health campaigns; expanding interventions to address risk factors; and promoting environmental and systems change.

Public Health Action: Integrating Messages

The *Healthy Brain Initiative State and Local Public Health Partnerships to Address Dementia: The 2018–2023 Road Map* calls for public health agencies to integrate messages on brain health and risk factors for cognitive decline and dementia into existing public health initiatives and campaigns. Particularly for public health agencies with limited resources, this is a no-cost option to begin raising awareness of dementia risk factors. For example, brain health messaging can be integrated into existing chronic disease promotion campaigns (e.g., Partner Resources ([cdc.gov](https://www.cdc.gov)), NACDD Action on Healthy Aging and Brain Health—National Association of Chronic Disease Directors).

Public Health Action: Implementing Interventions

Directly addressing modifiable risk factors for cognitive decline and dementia by expanding existing, or implementing new, public health interventions may improve the physical health of communities while also addressing dementia risk. Successful programs exist for several modifiable risk factors.

Hypertension.

Antihypertensives have been shown to effectively treat hypertension, and some studies have demonstrated effects on lowering dementia risk (Mukadam et al., 2020). However, only 24% of adults with hypertension in the United States are managing the chronic condition (CDC, 2021b). Public health agencies can educate the public and healthcare providers on the importance of preventing and managing high blood pressure. The *Mind Your Risks* campaign by the National Institutes of Health includes print and social media materials to aid educational efforts.

Smoking Cessation.

Public health campaigns have long sought to reduce the prevalence of smoking, with rates dramatically decreasing across the past 40 years. Despite these efforts, about one in eight adults in the United States smoke (CDC, 2022c). Few smoking cessation campaigns have linked smoking to an increased risk for cognitive decline and dementia. Doing so might help to further reduce smoking rates, particularly among middle-age and older adults. In addition, public health can increase efforts to promote nicotine replacement therapy (such as nicotine gum), an effective intervention for quitting smoking (Mukadam et al., 2020).

Physical Activity.

While the precise frequency, duration, and intensity of physical activity necessary to reduce the risk for cognitive decline and dementia remains unknown, most evidence indicates that moderate to vigorous aerobic activity is the most helpful. *Active People, Healthy Nation* is an initiative aimed at helping 27 million Americans become more physically active. The effort provides tools and resources for public health to implement evidence-based strategies to increase physical activity, including through community-wide campaigns, individual support, and school and youth programs.

‘SUCCESSFUL PROGRAMS EXIST FOR SEVERAL MODIFIABLE RISK FACTORS FOR DEMENTIA.’

Diabetes Prevention.—The CDC’s *National Diabetes Prevention Program* encourages lifestyle changes among adults by cultivating partnerships with public and private organizations to offer evidence-based, cost-effective interventions to prevent the onset of type 2 diabetes. The lifestyle-change program, focusing on healthy eating and physical activity, may reduce the risk of developing diabetes. State, local, and tribal public health agencies could work to implement or replicate the partnerships and program in their communities.

Cardiovascular Health.—Addressing many of the noted risk factors is collectively part of the federal government’s Million Hearts campaign, which seeks to prevent 1 million heart attacks and strokes within five years. Blood vessel blockage, such as that which occurs with a stroke, is a common cause of vascular dementia (Alzheimer’s Association, 2022a). An estimated 90% of strokes are preventable (Feigin et al., 2016). The areas of focus of the Million Hearts campaign include decreasing tobacco use, increasing physical activity, reducing air pollution exposure, and improving blood pressure control. Public health agencies can join the campaign—or draw upon the campaign’s set of evidence-based health interventions—to improve cardiovascular health in their states and communities. In addition, the Association of State and Territorial Health Officials, in partnership with the International Association for Indigenous Aging, has developed heart health communications materials tailored for American Indian and Alaska Native communities.

These are just some examples of interventions that public health can undertake to address risk factors for cognitive decline and dementia. Other possibilities can be found in *The Guide to Community Preventive Services*, a compilation of evidence-based interventions that public health agencies can implement.

Public Health Action: Promoting Environmental and Systems Change

In reducing the prevalence of risk factors for cognitive decline and dementia, changing environments could be considered for the broadest reach and sustainable impact. One example is improving nutrition through environmental change. “Heart-healthy foods” include foods such as fruits, vegetables, whole grains, fish, chicken, nuts, legumes, and healthy fats such as olive oil. Public health may have a role in creating healthy food environments, where not only do individuals have affordable access to and are empowered to choose healthier foods but also have affordable access to them. Communities could partner with farmers’ markets and grocery stores to increase the supply of heart-healthy foods and teach customers how prepare those foods. Similarly, public health can adopt nutrition standards for childcare facilities and schools, and work to ensure nutrition information and caloric content is included on restaurant menus. Other possibilities for environmental change related to nutrition can be found in the *Heart-Healthy & Stroke-Free A Social Environment Handbook*.

Another area ripe for environmental and systems change is physical activity. Achieving success in increasing physical activity among the half of U.S. adults who do not meet

aerobic activity guidelines will be limited if individuals do not have access to places to be physically active. Public health should work in partnership with other government agencies to create built environments that support physically active lifestyles, such as through sidewalks, public parks, playgrounds, and bike lanes. In addition, free or low-cost fitness and recreational facilities can provide safe places for individuals to engage in physical activity, particularly if they have mobility limitations or chronic health conditions. Furthermore, schools can also provide safe facilities for physical activity participation among community members during non-school hours. Other possibilities for environmental change related to physical activity can be found on CDC's Physical Activity State and Local Strategies page.

Conclusion

The projected increase in the number of people living with dementia and the associated implications for the public health burden highlight the need for public health to promote healthy aging and healthy behaviors to reduce the modifiable risk factors for cognitive decline and dementia. The public health agenda to reduce dementia risk factor prevalence may yield significant savings to government and healthcare budgets, while improving the health and well-being of middle-aged and older adults. Moreover, implementing evidence-based interventions to prevent chronic conditions such as diabetes and hypertension and promote healthy behaviors such as smoking cessation and physical activity may improve not only brain health but physical health in general. Thus, working to increase participation in interventions among members of populations at elevated risk for dementia, including racially and ethnically diverse communities, may help minimize disparities in dementia outcomes and maximize the potential reduction in dementia prevalence. Multidimensional factors related to SDOH and modifiable risk factors point to a need for public health to work within a diverse communities and alongside a diverse group of stakeholders to address not just individual behaviors but also the environments in which individuals live, play, work, grow, and age.

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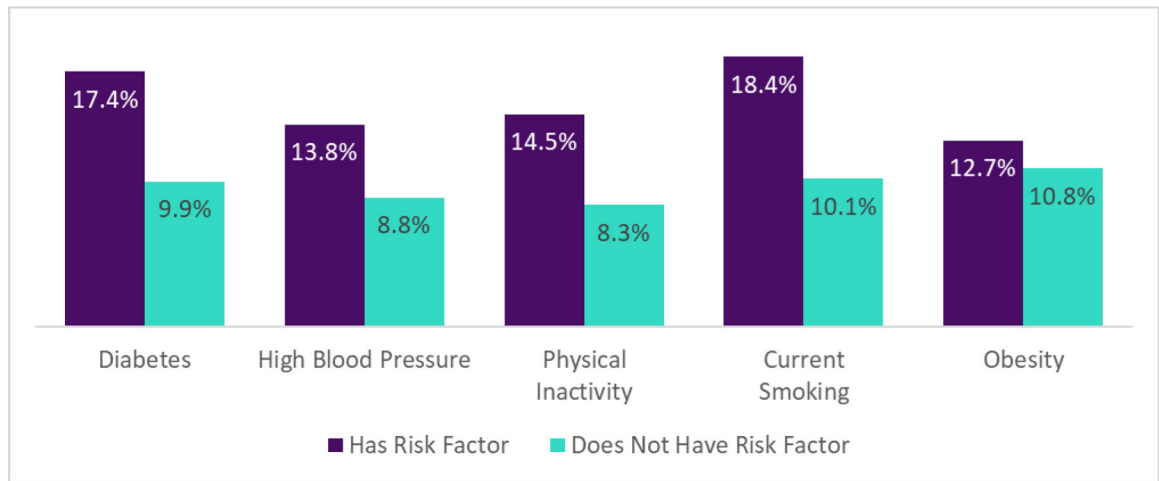


Figure 1.
Percentage of People Ages 45 With Subjective Cognitive Decline, by Presence or Absence
of Modifiable Risk Factor, 2019
Created from Omura, et al. 2022.

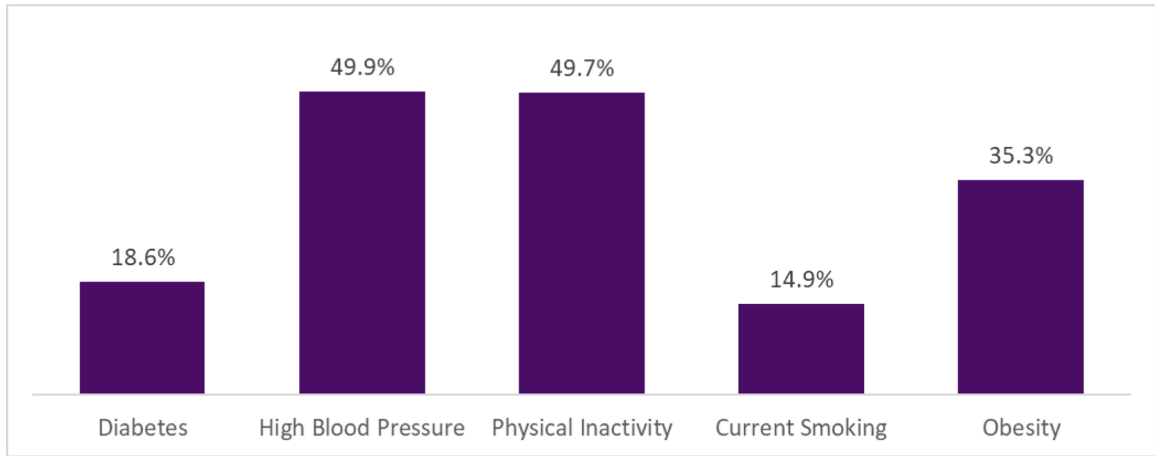


Figure 2. Percentage of People Aged 45 With Modifiable Risk Factors, 2019
Created from Omura, et al 2022.

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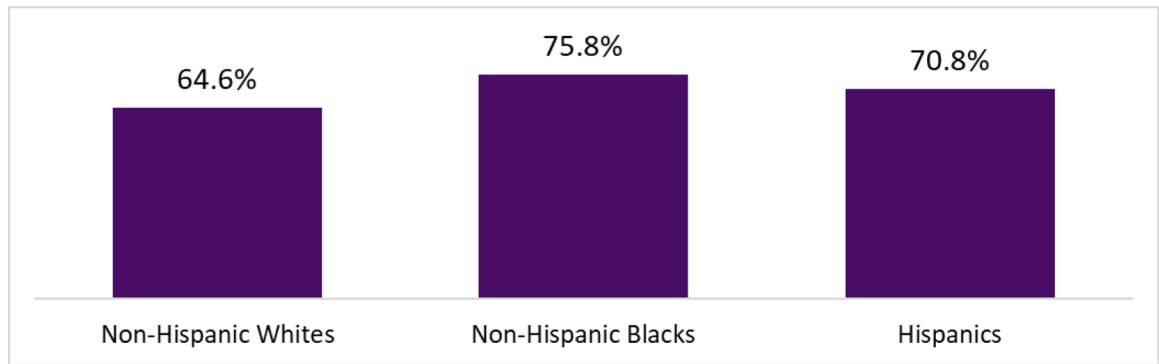


Figure 3. Percentage of Adult Population With 1 of 5 Modifiable Risk Factors (Diabetes, Hypertension, Physical Inactivity, Smoking, Obesity), 2019
Analysis of data from the 2019 Behavioral Risk Factor Surveillance System.