Investing in Health to Create a Third Demographic Dividend

Linda P. Fried, MD, MPH
Literature Review

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Abstract

The world is aging as a result of unprecedented successes worldwide adding 30 years of life expectancy and presenting great opportunities for all of society, but only if we invest effectively. This article, written as a requested background article for the World Health Organization 2015 World Report on Aging, proposes that creating health into the oldest ages could lay the basis for a third demographic dividend resulting from the societal benefits from the generative social capital of older adults, on top of the second demographic dividend’s savings associated with longer lives. The combination would contribute to stronger and wealthier societies, greater success of the young, and increased societal ability to provide the humane supports needed at the end of life, plus a dividend that would endure. We now know that prevention works at every age and into the oldest ages. A life-course approach to prevention and health promotion is the key investment. The creation of geriatrics knowledgeable and integrated public health, medical and social care systems has the potential to amplify capabilities and well-being to the end of life. Healthy older populations bring both desire for engagement and unique talents. Institutions designed to create impactful roles for older adults to contribute to the success of the young can activate the societal benefits and further enhance health at older ages. Creating a new vision for the opportunities of an older age is the first critical step toward experiencing the benefits of our longer lives and creating a sustained third demographic dividend.

Key Words: Demographic dividend, Prevention, Social capital, Public health systems, Aging population

The world is aging. This simple fact has raised many fears about how societies will cope with, plan for, or even afford, a population where a quarter to a third will be older than 60 years of age. Developed countries have a head start in experiencing this seismic shift, but neither developed nor developing countries are prepared. And yet, it is clear that preparation will be key.

One lens through which we look at this unprecedented transition to a world of longer lives is through societal anxieties about having more people to support, and the economic peril that might ensue. But the evidence supports adopting a very different framing. In fact, the scientific data indicate that the aging of a population could be affordable and could be a great benefit for both developing and developed countries (Bloom, Börsch-Supan, McGee, & Seike, 2012; United Nations [UN], 2002)—and that many of the fears are myths that will only come to pass if we fail to invest appropriately and to track success.

This article focuses on how public health investments can optimize health for our longer lives and sets the stage for realizing their full benefits. Such investments could make possible a new concept of a third demographic dividend, with sustained benefits due to the social capital of older adults as well as accrued wealth across longer lives.

Creating a Third Demographic Dividend

Most countries of the world are emerging from the first or are in various stages of the second demographic transition. The first transition is from an agrarian society with high mortality and fertility rates to one where mortality, starting with child mortality, falls; this is followed by declines in fertility. As the “bulge” of children surviving (Bloom, Canning, & Sevilla, 2003) ages into employability, the
labor supply becomes greater than the dependent population of children, potentially creating economic growth. This results in what is called a first demographic dividend. This period is time limited. The stage that follows is one in which persisting declines in mortality lead to a population that is living longer. Combined with low fertility, the age structure changes with higher proportions of the population at older ages. Evidence indicates that longevity induces the accumulation of capital, including individual savings in anticipation of retirement (Bloom, Canning, & Graham, 2003; Lee & Mason, 2006). A country's wealth rises (Bloom, Canning, & Sevilla, 2003). This is termed the second demographic dividend. If policies are constructive and effective, the second dividend can lead to sustained positive economic outcomes (Lee & Mason, 2006).

Mounting evidence suggests that the second demographic dividend does not encompass, by itself, the full potential benefit that society could derive from a larger population of older and aging adults. Additional and sustainable benefits could arise if people arrive at old age healthy and if the large, unrealized social capital of older adults can be activated, conferring benefits both economically and in other measures of societal well-being (Bloom et al., 2015).

To accomplish this would require a new frame of goal setting for successfully aging societies with investments needed in (a) education (not addressed further in this article), (b) disease prevention and health promotion so that the people arrive at older age healthier and stay healthier longer, and (c) new social institutions and roles to enable paid work by older adults or new high impact generative roles, bringing new social capital to solve major unmet societal needs, while enhancing well-being for the older adults who are accomplishing this. Proposed here is the idea that such investments could lead to a third demographic dividend for aging societies, in addition to the increased wealth of the second demographic dividend.

The Value of Investing in the Social Capital of Older Age

There is increasing recognition globally of the opportunities offered by an aging society, and its multiple dimensions (Bloom et al., 2012; Bowen, Noack, & Staudinger, 2010; Fried, Freedman, Endres, & Wasik, 1997; Harper, 2006; Rowe & Kahn, 1987; UN, 2002). Older adults are the world’s only increasing natural resource; in developed countries, the current generation of older adults has greater education and health than ever before (Lowsky, Olshansky, Bhattacharya, & Goldman, 2013), and the benefits of a floor of social protection, all of which enable goals of further engagement. Research indicates that they also bring unique assets of accrued knowledge and problem-solving ability and the subjective judgment about what is important in life as well as a more optimistic outlook. Combined, these can add up to the elements of wisdom (Carstensen & Fried, 2012; Staudinger, Marsiske, & Baltes, 1995). These attributes are assets to the workplace. As a result, their contributions are increasingly valued by employers (Bowen et al., 2010; Erikson, 1998) with new approaches to phased retirement and flexibility of time commitments being developed to amplify their employment options.

As people age, many also want to ensure a better future for generations to follow and to help solve society’s needs (Erikson, 1998). This concept is known as “generativity” (Bloom et al., 2012; Fried et al., 2004), which is an important component of successful aging (Rowe & Kahn, 1987), and involves leaving a legacy that will last beyond oneself. Although some individuals have the opportunity to “give back” through their paid employment, in some instances and cultures, volunteering is another approach through which to accomplish this. Globally, no society has developed the social institutions that, on a large scale, can productively harness this social capital via national or local service, volunteer roles (if adequate pensions), or even paid work, although there are now useful models. Roles that effectively utilize the assets of older adults and confer both generative impact and health are a high value win–win for individuals and society (Biggs, Carstensen, & Hogan, 2012; Carlson et al., 2008b; Fried et al., 2004). Health benefits derive from meaning, life satisfaction, and structured activities, as well as cognitive, physical, and social activity. Some of the resulting outcomes will be monetizable; for example, when there is a high return on investment in terms of increased societal productivity. Other outcomes are qualitative, such as well-being and quality of life. In either case, the potential transformative impact of the social capital of older adults is substantial.

This win–win concept can be observed through two new approaches. One innovative model is vocational training for rural youth who have migrated to cities developed by the Uganda Rural Development and Training University (URDT). Older adults from the rural areas trained the young adults in trades, partnering with middle-aged adults who focused on business skills. The approach brought many young people back to their rural communities, positioned for successful roles and improved standards of living while simultaneously offer meaning, engagement, and income to older adults who served as the trainers (URDT, 2014).

The Experience Corps program is another example that brings together best practices for improving children’s early school success and best practices in senior volunteering to improve the health and compress the morbidity of the older volunteers (Carlson et al., 2008b; Fried et al., 2004, 2013; Rebok et al., 2004). Now operating in more than 20 U.S. cities and multiple other countries (Experience Corps, 2014), this program was created to demonstrate that building a new social institution to harness the social capital of older people could improve school success for young children (Fried et al., 2004; Morrow-Howell, Jonson-Reid, McCrory, Lee, & Spitznagel, 2009; Rebok et al. 2004), while also creating generative impact.

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for the older volunteers and improving strength, mobility, cognition, and mental health, and lessening disability, frailty, falls, and cognitive decline in older adults (Bowen et al., 2010; Carlson et al., 2008b; Fried et al., 2004, 2013; Varma et al., 2014). Early evidence is strongly supportive of these benefits for both children and the older volunteers (Carlson et al., 2008b; Fried, 2010; Frieden, 2014; Rebok et al., 2004; Tan, Xue, Li, Carlson, & Fried, 2006).

The cost-effectiveness and return on investment in social institutions that support the engagement of older adults can be high. In the Experience Corps program, for example, the outcomes for children and older adults would appear to be cost saving (Frick et al., 2004).

As these examples demonstrate, two things are key to experiencing this potential dividend throughout a society: new social institutions that can deploy the social capital of older adults in roles with societal impact and that older people value and benefit from—a true win-win (Fried et al., 2004; Parisi et al., 2009), and the health of the older adults themselves. Research indicates that chronic health problems are an important obstacle preventing older adults from being engaged (Fried, 1996); further, older adults in fair or poor health are unlikely to volunteer (Barron et al., 2009; Fried et al., 2004). Thus, investing in health promotion and disease prevention is critical to society's benefitting from the social capital of older adults and experiencing a third demographic dividend. There is a virtuous cycle here, as well: active engagement and productivity are also keys to health for the old as well as the young (Bowen et al., 2010; Carr, Fried, & Rowe, 2015; Fried, et al., 1997; The Lancet, 2015; Rowe, 2015; Rowe & Kahn, 1987; United Nations Population Fund and HelpAge International [UNFPA] and HelpAge International, 2012; World Health Organization [WHO], 2002).

To create a world of both longer and healthier lives in which we could reap a third demographic dividend, one which endures, requires investing in social institutions and roles which harness the untapped social capital of older adults in an aging society (Carr et al., 2015) and in public health. Seventy percent of health comes from prevention and population-level approaches to create the conditions for health (Schroeder, 2007). These approaches are critical at every age and stage of life and continue to optimize health and function into the oldest years.

The full benefits of an aging society would be experienced if older adults stay healthy and then can stay engaged, whether by continuing to work or through contributing to societal well-being in new roles, from volunteering to informal caregiving, or other roles for societal benefit. An extended period of paid work or volunteerism would create stronger and wealthier communities and greater affordability of the supports that people need as they approach the end of life, but could also promote greater success for the young and strengthen intergenerational benefits and cohesion. Further, staying engaged promotes more health. The combination could well lower health care costs at older age. Theoretical, health system, policy, and metric frame changes will be needed to harness the opportunities presented, permitting us to emerge into “mature societies” (Harper, 2006).

As is true for the first and second demographic dividend, the theoretical benefit of a third demographic dividend would be conditional on appropriate policies and investments. Rapid aging in low- and middle-income countries brings the risk of inadequate time for transition to new policies, health systems and institutions needed to capture the social capital and other opportunities and to mitigate the risks. However, investing in health systems to create health into the oldest ages and prevent noncommunicable diseases would play a critical role in mitigating risks and improving benefits in rapidly aging as well as already aged countries (Bloom et al., 2015). The realization of all of these components could result in a new third demographic dividend, adding to the wealth accumulation of the second demographic dividend. These goals focus our attention for the remainder of this article on a synthesis of the evidence as to the combination of environments, institutions, policies, and health systems that best accomplish health in older age.

Creating Health Itself Requires Healthy Environments and Policies that Ensure Social Protection

The WHO and many others have pointed out that there are three key pillars of “health, security, and participation” (WHO, 2002, 2012b, 2015) that underlie active ageing and support the capabilities of older adults. Security, above, refers to social protections including pensions, assurance of basic needs (housing and food), social capital enhancement through education and training, employment and volunteer opportunities, and public health systems that support prevention as well as care (Cannuscio, Block, & Kawachi, 2003; Duflo, 2003). This provides the floor of security for a society and unlocks the capabilities of the entire population.

This article suggests adding the built environment—from urban design to housing and transportation—as a fourth pillar, one that potentiates engagement, activity, safety, access to resources, and well-being. This is consistent with the WHO’s separate initiatives to design age-friendly cities (WHO, 2007).

There are multiple benefits to each of these investments. Education level is a potent predictor of late-life health outcomes (Cadar et al., 2015). Notably, social protections of all types are family policies: if one age group does better, all do better (Duflo, 2003). Participation, and the institutions that support it, is key.

Investing in Public Health: Effective Public Health Contents and Systems that Promote Health in Older Age will Unleash the Potential of a Third Demographic Dividend

Health and function are essential to the well-being of people of all ages. Preventing disease and functional decline is
essential to compressing morbidity and disability into the latest years of life (Fries, 1980), so that people are healthy, have high function, and can remain active as they grow old. To date, there is no convincing evidence that a compression of morbidity is being accomplished in the United States—when defined as major disease and mobility functioning loss (Crimmins & Beltrán-Sánchez, 2011). In fact, the aging of the population globally is associated with rising incidence and prevalence of many chronic diseases and of multimorbidity and years of life disabled (Global Burden of Disease Study, 2015), even though mortality due to disease may be declining in some instances. It is clear that “only the decrease in disease onset due to primary prevention is clearly going to be related to longer disease-free life” (Crimmins & Beltrán-Sánchez, 2011). There is now significant knowledge of the combination of investments that could help accomplish it and some proof of concept that “compression of morbidity can occur in specific settings and at specific times,” although it is not inevitable (Fries, Bruce, & Chakravarty, 2011). These are summarized in this article. The compression of morbidity has the potential to decrease health care costs and needs and unleash the social capital of older adults and their ability to engage, as well as lowering burden of disease and disability. Realizing the compression of morbidity has been characterized as the essential public health goal for societies of longer lives (Crimmins, 2015; Fries, 1980; Gutiérrez-Robledo, 2002).

Public Health Roles

There are several major definitions of public health, and all pertain here. The first, most commonly recognized one, is the public (i.e., governmentally funded) provision of medical care or ensuring universal access to care. The second is the creation of a publicly funded system that is designed to deliver health promotion and prevention for the whole population or targeted subsets. In this dimension, the population is the patient and prevention of disease and disability and maintenance of health and function is the goal. The third dimension is led by Schools of Public Health (or other research and educational organizations), creating the knowledge for how to prevent disease and disability and promote health and the design of health systems to accomplish this. This knowledge is, ideally, then translated into the many layers of public health systems including global organizations, and national and local governmental systems. This article will primarily focus on the second definition.

General principles have emerged for 21st century public health systems that are designed to optimize population health for people of all ages. First, there is high return on investment for governmental public health systems designed to make health promotion and disease prevention the default option, complemented by interventions that prevent disease from the individual to population level (Frieden, 2010). Many health behaviors see greater improvement when the individual’s goals are supported by interventions at the policy, community, environmental, and population level, as well as targeted clinical care, counseling and education for individuals. For example, smoking prevention is most effectively accomplished through a combination of counseling individuals, information to communities and education, taxation, and policies that prohibit smoking in public places. Together, these greatly amplify the success of clinical prevention and smoking cessation treatments (Frieden, 2010). Overall, the return on investment for primary prevention has been assessed to be four- to sixfold (Trust for America’s Health, 2009).

Second, the return on investment is heavily weighted toward public health interventions in the three bottom tiers of Frieden’s Health Impact Pyramid (Frieden, 2010) (Figure 1). Milstein, Homer, Briss, Burton, and Pechacek (2011) have demonstrated that the lower three components of the triangle complement and augment the effects of clinical care and coverage for care. Their simulations indicate that when coverage, care, and population-based public health interventions are delivered to the same population, after only 10 years the addition of the public health approaches to the clinical ones saves 90% more lives and reduces costs by 30%; after 25 years, 140% more lives are saved while lowering costs by 62%. This is consistent with evidence from multiple sources that 10%–20% of health is saved while lowering costs by 30%; after 25 years, 140% more lives are saved while lowering costs by 62%. This is consistent with evidence from multiple sources that 10%–20% of health is created from clinical care, whereas 60%–70% comes from prevention, largely through public health and population-based approaches (Schroeder, 2007).

There are now additional public health approaches being developed and implemented through public–private partnerships intended to align multiple sectors to better accomplish population health. Additionally, a number of corporations have created both workplace wellness approaches for their own employees and innovative approaches that incentivize healthy behavior (e.g., Discovery health insurance products) or improve access to care. Further, the World Economic Forum’s “Future of Healthy” program has identified high potential return on investment from cross-sectoral public health approaches (World Economic Forum, 2015). In
general, the potential for these approaches is high. However, impact remains to be evaluated.

A Healthier Aging Society: Public Health’s Role

There are two major public health approaches to accomplishing a compression of morbidity and health into the oldest ages: (a) Implementing prevention and developing public health systems that deliver prevention needed across the life course and (b) for older adults specifically, implementing a geriatically knowledgeable, integrated health system, including public health and clinical approaches spanning primary, secondary, and tertiary prevention for populations and individuals, respectively, and effective geriatric medical and social care. The remainder of this article identifies, broadly, recommendations in these areas.

(1) Preserving health across the life course is the essential investment so that individuals arrive at old age healthy and health is maintained into oldest ages, rather than sick, frail, or dependent.

As described by the WHO (2000) and depicted in Figure 2, success in this life-course approach requires investment in prevention of disease, disability, and injury and preserving health and well-being at each age and stage of life. There is now a strong knowledge base that prevention works, and matters, at every age and stage of life. Some contents apply at every age, like physical activity and nutrition, and a healthy environment. Others are at specific ages. For societies, this approach is critical to decrease health disparities between individuals, socioeconomic and age groups and nations, which develop cumulatively and can be predicted by exposures in each point of the life course (Kuh & Shlomo, 2004; Martin et al., 2010; Trust for America’s Health, 2009). Further, these investments lay the basis for compressing morbidity into the latest ages. People who arrive at old age healthy are positioned to remain healthier into the oldest ages (Adler & Newman, 2002). This approach can lead to lower long-term health care costs and a healthier and more productive society (Adler & Newman, 2002; Bloom, Canning, & Jamison, 2004; Milstein et al., 2011).

The potential for prevention of chronic diseases and geriatric conditions is high at every age and stage of life. Consider these highly modifiable risk factors and their effects:

- Higher educational level and literacy consistently predict late-life health, less disability (Bloom et al., 2004; Martin et al., 2010), lower risk of obesity (Patterson, Frank, Kristal, & White, 2004), and late-life diseases including Alzheimer’s (Katzman, 1993) and cardiovascular diseases (Winkleby, Jatulis, Frank, & Fortmann, 1992). Secular improvements in education may be contributing to decreasing dementia incidence in several countries; however, the association has not been confirmed in longitudinal studies (Cadar et al., 2015).
- The effects of unhealthy lifestyles in childhood and adolescent are manifested in young adulthood as atherosclerosis in arteries (Berenson et al., 1998), a precursor to cardiovascular disease.
- Prevention or treatment of hypertension and diabetes at every age is associated with decreased risk of heart disease, stroke, and recurrent events (Perry et al., 2000).
- Individuals with fewer social and economic resources manifest chronic diseases and disability earlier in their lives than those with greater resources and access to healthier lifestyles (Berenson et al., 1998; Cooper, 2007; Miller, Wolinsky, Malmstrom, Andresen, & Miller, 2005).
- In middle adulthood, cognitive enrichment in occupational and other exposures is protective against late-life dementia (Carlson et al., 2008a).
- Cognitive activity in late life can improve cognitive reserves and delay or prevent cognitive decline (Carlson et al., 2008b).
- Exercise and appropriate nutrition can increase muscle mass and strength in frail nursing home patients and decrease incidence of frailty (Fiatarone et al., 1994).

Based on substantial data, the WHO (2000) and others (Kuh & Shlomo, 2004) have identified a life-course approach to prevention, from cradle—and before—to grave as critical to creating health and function into the oldest ages. It is beyond the scope of this article to review the contents at

Figure 2. Life-course perspective for maintenance of the highest possible level of functional capacity. Reprinted from WHO (2000).
every age that matter as an investment in health. However, early-, mid-, and late-life interventions all matter to prevent future onset of diseases and slow disease progression and resulting functional decline.

(2) Health risk factors in older ages

Across our lives, we are exposed to three types of factors that affect later health: social factors and our environment, including behaviors that modify our own health status; exposure to infectious diseases; and our intrinsic aging-related changes and biologic vulnerabilities (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006). As people age, they are increasingly likely to manifest the consequences of these processes, with great heterogeneity in health status depending on lifelong exposures.

By older ages, “noncommunicable diseases,” for example, cardiovascular disease, lung disease, diabetes, and cancers, are frequent, and risk for cognitive decline and dementia, frailty, disability, and loss of independence rises greatly with age (Population Reference Bureau, 2007), resulting in higher mortality rates due to these conditions at the older ages (Lopez et al., 2006). Although the ages at which these develop vary widely between low-, middle-, and high-income countries, noncommunicable diseases account for more than 87% of the disease burden for the 60-and-older population globally (Population Reference Bureau, 2007). Increasing rates of noncommunicable diseases are anticipated for those aged 60 and older unless successful approaches to prevention are implemented (Lopez et al., 2006).

Physiological changes of aging, sometimes compounded by chronic disease, lead to additional “geriatric conditions” that also emerge in older age and are amenable to prevention. Frailty and falls are serious geriatric adverse outcomes. Both increase substantially after age 75–80 years, now known as the “4th age” or the “old-old.” Frailty is a newly defined and diagnosable medical syndrome resulting from fraying of the physiological safety net and compromised energy production and utilization (Fried et al., 2001; Morley et al., 2013). Its presence identifies a subgroup with low resilience and at high risk of disability, dependency, falls, and mortality, as well as risk for compromised recovery after illness, hospitalization, or surgery, and poorer response to therapy. Falls and their resulting injuries lead to a high proportion of emergency room visits and hospitalizations among older adults in the developed world and are risk factors for disability, long-term care needs, and for mortality (Moyer, 2012).

Disability and loss of independence result from chronic diseases, frailty, falls, and dementia. Specific chronic diseases, for example, stroke, chronic obstructive pulmonary disease, and diabetes (Kinsella & He, 2009; WHO, 2011), have substantially higher disability rates for people aged 60 and older in developing countries than developed ones. This is likely a result of lower access to prevention and medical care, more adverse circumstances, and changing risk factors. Combined, these are resulting in both earlier onset and greater severity of disability in older age (Supplementary Table 1), as well as in disease. Overall, the aggregate burden for developing countries generally exceeds that for developed countries (UNFPA, 2012).

Role of Prevention and Health Promotion in Older Ages

There is now strong evidence that primary, secondary, and tertiary prevention are effective in preserving or improving health and function in older adults. Notably, both primary and secondary prevention of noncommunicable diseases (NCDs)—especially for hypertension, smoking, obesity, diabetes, cardiovascular diseases, and select cancers—implemented after age 50 and after age 65 are highly effective, as are interventions to prevent other geriatric conditions such as falls. In addition, stroke prevention has shown good potential for also preventing cognitive decline and dementia (Vermeer et al., 2003). There is also strong potential for the prevention of disability and frailty through multiple approaches: treatment to decrease disease severity, prevention of additional diseases which could interact with a pre-existing disease, frailty prevention through maintenance of strength and exercise tolerance, and nutrition. Tertiary prevention, such as with rehabilitation after a stroke, is critical to improve functioning and reduce disability. Overall, prevention could substantially improve the health of older adults and “could achieve such benefits with little or no additional lifetime medical spending” (Goldman et al., 2009).

Take the example of physical activity, which is important as primary, secondary, or tertiary prevention of many NCDs, cognitive and mobility decline, frailty, and falling. As suggested in Table 1, to maintain mobility and strength, robust older adults living in the community may seek to engage in higher intensity sports, whereas those with one or more chronic diseases but no disability may exercise safely at a lower intensity and those who are disabled but living independently may benefit from strengthening, flexibility, and balance exercises. For older adults who are disabled or dependent and in assisted living or long-term care, exercise remains critical to maintaining mobility, cognition, and independence. In mobility-compromised or dependent individuals, tertiary prevention might be implemented through home visits to promote exercise, maintain strength, prevent falls and frailty, and simultaneously assess for polypharmacy or vaccination status. A public health system is needed to guide and create opportunities for physical activity—in safety—for older adults across the full continuum of prevention and settings (Anderson & Prohaska, 2014).

Prevention and health promotion for older adults is effective and most impactful when it is matched to the person’s specific needs and challenges, and addresses, as appropriate, prevention of noncommunicable diseases, obesity, mental health compromise, and disability, as well as geriatric conditions including falls, frailty, cognitive decline and supports for social care needs and isolation (Berenson et al., 1998; Cooper, 2007; Kuh & Shlomo, 2004; Vartiainen et al., 2000).
Achieving Health in the Oldest Ages: Investing in Public Health-Led Systems for Improving Health and Resiliency at Older Ages

There are four types of public health systems needed to carry out primary, secondary, and tertiary prevention and health promotion for older adults, utilizing public health science to optimize health into the oldest ages. They implement Figure 1, Frieden’s Health Pyramid (Frieden, 2010).

The first is governmentally assured universal health coverage with clinical screening for health risks and provision of a geriatrically knowledgeable continuum of medical care, plus vision, dental, and rehabilitation services. Medical care systems designed to provide a coordinated continuum of evidence-based geriatric care models (Supplementary Figure 1) lead to better health outcomes for the most frail and vulnerable of older adults, and at lower costs (Fried & Hall, 2008). They understand the complexity of health needs associated with aging with a focus on patient goals and using team-based approaches that are more cost effective (Ruggiano, Shtompel, & Edvardsson, 2014).

The second is the generally governmentally-led public health functions that foster health at a population level; for example, community preventive services including screening, immunizations, health management education and support, assuring access to healthy food, safe physical activity, and a healthy environment. This can involve collaboration with other sectors, including social care or senior centers to offer services or home-based evaluations and protective services, and public–private partnerships. Public health prevention science also serves as a basis for clinical and population-directed prevention.

The third is the integration of public policy, architectural and environmental leadership to create age-friendly urban environments (Finkelstein, 2008; WHO, 2015) and social institutions and roles for older adults that promote health through continued engagement (Carr et al., 2015).

Table 1. Public Health: Broad Approaches to Targeting and Optimizing Health in Aging

<table>
<thead>
<tr>
<th>Functional status spectrum</th>
<th>Community</th>
<th>Dependent home-based or institutionalized care</th>
<th>End of life/hospice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics/issues</td>
<td>30%</td>
<td>30%</td>
<td>10%–15%</td>
</tr>
<tr>
<td>A. Financial security</td>
<td></td>
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<tr>
<td>B. Mobility</td>
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<td></td>
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<tr>
<td>C. Health behaviors</td>
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<td></td>
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<tr>
<td>D. Housing</td>
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<td></td>
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<tr>
<td>E. Social engagement</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>F. Mental health</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>G. Issues of isolated older adults</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Transportation and safety, including emergency preparedness/ monitoring</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I. Access to geriatrically knowledgeable clinical screening, prevention, and care</td>
<td></td>
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<tr>
<td>J. Community-based self-management of chronic diseases and prevention</td>
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<tr>
<td>K. Community-based supportive services</td>
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</tbody>
</table>

Note: All topics relevant across spectrum of health status, but type of integration and location may vary. Reprinted from Fried (2012).
Fourth, there should be an integration of public health services and surveillance with both geriatric medical care and social and long-term care, to offer secondary and tertiary prevention to vulnerable, frail, cognitively impaired, or home-bound elders. This proposed system requires workforce education in geriatrics for public health and all health care professionals (Fried, 2012; Fried & Hall, 2008; Scharlach, Graham, & Berridge, 2014; WHO, 2012a, 2015). To meet society’s needs, their expertise must now span primary, secondary, and tertiary prevention in the context of aging, understanding the physiology of aging and how that modifies vulnerabilities, and prevention and management of geriatric conditions including frailty, falls, and dementia.

A governmental public health system could be an organizer or coordinator of all of these functions, supporting integrated public health, medical care, and social care systems for the full continuum of older adults, from the robust to the most vulnerable and across all settings: community, home, and clinics. Public health knowledge and leadership is critical to the design of systems that optimize the health of the population. Each sector can incorporate geriatrically informed preventive contents for key issues and as appropriate to the population (Figure 3), combined with targeting for subsets and individuals, as appropriate (Table 1), and distributed across sectors of a health system consistent with Frieden’s Health Impact Pyramid (Figure 1; Frieden, 2010). These approaches are component building blocks of a modern public health system, both population-based and integrated with provision of clinical and social care. This can be envisioned through Figure 4, which graphically displays the many geographic locations, approaches, and institutions which together comprise a 21st century system that creates optimal health into the oldest ages.

Conclusions

The Madrid declaration (UN, 2002) stated that low- and middle-income nations that ignore aging put their development agendas at risk. More positively, WHO states that ageing is part of the development agenda and that the goal for active ageing needs to be to promote healthy lifestyles for an active older life; prevent risks that lead to loss of independence; and maximize capabilities and quality of life for people with disabilities (WHO, 2002, 2015).

The high potential for prevention of disease and disability sets the stage for 21st century public health goals: to invest appropriately at every age and stage of life so that people arrive at old age healthy, and health and function are optimized in old age. By compressing morbidity and disability to the latest points in the human life span, people can live their long lives independent, healthy, active, and engaged (Figure 2; (WHO, 2000). A life-course approach to prevention, with adequate investments, is the approach most likely to create a compression of morbidity, lower health care costs, and lower need for long-term care (Bloom et al., 2004). All of this will contribute to improved health, productivity, and strengthened economies and development of a sustained third demographic dividend.

Investing in older adults is, ultimately, a family policy where all generations benefit from the interventions that improve health and well-being for older adults. In the next 30–40 years, low- and middle-income countries will grow old to the current level of developed countries as their current generation of young adults ages. We need to build the systems now that will secure their future health and be ready for their old age. This will be predicated on how we envision future success of a mature society, and invest for it.

Overall, these proposed investments position nations to capitalize on the opportunities of the second demographic dividend and to build for a third demographic dividend. Timing is crucial here. The first and early second demographic dividend, in particular, offers a time when societal resistance to such long-term investments may be lower than when the population has aged, because the working age population is relatively large. Importantly, each area of investment that prepares for more older adults—whether designing cities, social institutions for engagement, prevention and health promotion across the

![Figure 3](https://academic.oup.com/gerontologist/article-abstract/56/Suppl_2/S167/2605367/167)
life course, or geriatric public health, social, and medical care—will be wise investments in the opportunities that longer lives offer (Carstensen & Fried, 2012) and improve the well-being for all ages, strengthening cohesion, economies, and societies.

Supplementary Material

Please visit the article online at http://gerontologist.oxfordjournals.org/ to view supplementary material.

References


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