



Bundling Preventive Services for Community-Dwelling Seniors: Rationale for Multi-Faceted Public Health Interventions

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Abstract

Background: Many older adults do not obtain important preventive services, which are critical for avoiding disease and disability. This is due in part to guidelines and interventions that take a “one disease at a time” approach, a lack of strategies to promote adherence to key services, and fragmented delivery systems. Many conditions common in older adults have overlapping risk factors; therefore, preventive services may be delivered more effectively as a “bundle,” especially given limited resources available for such programs.

Methods and results: We outline a rationale for bundled preventive interventions by describing 5 “Ps”: priorities (preventive services of greatest benefit in older adults), place (clinical vs. community settings for delivery of services, including the integration of the public health system); package (rationale for bundled interventions, including examples), population/promotion (reaching those in greatest need); and policy implications.

Conclusions: We conclude that new approaches to delivery of prevention and adherence to prevention for older adults are needed, and suggest an agenda for future comparative effectiveness research in this area.

Keywords: Older adults; Prevention; Public health

Introduction

By 2030, one out of every five Americans—about 72 million people—will be 65 years or older [1]. This so-called “silver tsunami” has major implications for health and health care costs in the US [2]. Older adults will reach old age as individual life expectancy is increasing [1]. However, about 80 percent of older adults have at least one chronic health condition, and the majority suffers from multiple chronic conditions, many of which may be preventable [3]. The growing population of older adults and resultant burden of disease and disability makes the adequate provision of preventive services for older adults a timely and important topic.

Until recently, there was a lack of public health information and clinical guidelines for providing preventive services for older adults in spite of the fact that risks and benefits of preventive services vary markedly by age. Guidelines developed by professional societies tend to focus on one disease state at a time; organizations like United States Preventive Services Task Force (USPSTF) that issue cross-cutting guidelines tend to focus more on comprehensiveness and less on prioritization. Providing a list of needed services without a mechanism for prioritizing them can possibly overwhelm healthcare consumers barraged with health news stories and healthcare providers struggling to fit multiple needs for preventive, diagnostic, and treatment services into short office visits.

Prevention strategies should reflect the complex relationship between risk factors and diseases in older adults. Single risk factors impact multiple diseases; for example, tobacco use can increase risk of cardiovascular disease, stroke, cancer, pneumonia, and dementia. Similarly, conditions common in older adults can be best prevented or managed by addressing multiple risk factors; for example, cardiovascular disease prevention entails advice for tobacco cessation, blood pressure control, weight management, physical activity, and diet. Given the tremendous overlap in risk factors and diseases that affect older adults’ health and functional status, it is important to consider how public health interventions may best combine or “bundle” delivery of preventive services for older adults, but little is known about whether bundled interventions are more effective.

In this essay, we review current recommendations and approaches to delivering preventive services to older adults. We consider both primary and secondary prevention to be relevant in discussing the older adult population, and especially the latter given a high burden of pre-existing disease in older adults. We will offer a rationale for and discuss advantages of providing bundled preventive services, including approaches for reaching populations in greatest need, using cardiovascular disease as a case study. We frame this rationale for bundled preventive interventions by describing 5 “Ps”: priorities (preventive services of greatest benefit in older adults), place (clinical vs. community settings for delivery of services, including the integration of the public health system); package (rationale for bundled interventions, including examples), population/promotion (reaching those in greatest need); and policy implications.

We close with a brief review of recent policy changes that have important implications for delivery of preventive services among older adults and an agenda for future research in this field.

Priorities: Preventive Services in Older Adults: Leading Causes of Death and Disability vs. Current Goals and Guidelines

Causes of death in older adults in US

Many of the deaths in the United States are attributable to modifiable behavioral risk factors, such as tobacco use and physical

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inactivity [4]. More recently, Danaei and colleagues have examined the comparative and cumulative risks of individual risk factors on mortality [5]. They demonstrate that tobacco use and hypertension, both treatable conditions, are responsible for the largest number of deaths in the US for adults 70 years and under (Table 1). Other dietary, lifestyle, and metabolic risk factors for chronic diseases also cause a substantial number of deaths in the US. They also observe that mortality attributable to tobacco, for example, is related to cardiovascular, cancer and respiratory-related deaths. In other words, a single risk factor impacts multiple diseases; therefore, an effective tobacco intervention could prevent mortality from multiple causes (Table 2).

Current public health guidelines for preventive services in older adults and their limitations

Several organizations have published guidelines about preventive services and public health goals; the CDC preventive services guidelines and Healthy People 2020 objectives are the most relevant public health guidelines developed specifically for older adults. Recently, the Centers for Disease Control (CDC) published “Enhancing Use of Clinical Preventive Services among Older Adults – Closing the Gap” [6]. The CDC report focuses on the public health benefit of concentrating preventive efforts for older adults on “more consistent use of a small number of preventive services,” arguing that this may yield a better outcome than a more diffuse approach. It is possible that narrowing the focus of prevention could increase adherence to the most critical elements. The CDC report prioritizes their recommendations by organizing them into two categories: “featured preventive services” for which they have state and national data about use of services and “additional preventive services” which are given less emphasis. “Featured” services include influenza and pneumococcal vaccinations; breast and colorectal cancer screening; diabetes, lipid disorder, and osteoporosis screening; and smoking cessation counseling. “Additional” services include zoster vaccination; cervical cancer screening; alcohol use, depression, and obesity screening and counseling; aspirin use; and

blood pressure screening. The use of the term “featured” implies that these preventive services are more important for older adults. However, the CDC classification does not align with actual causes of morbidity and mortality in older adults. Notably, hypertension control is listed as an “additional” service, which is at odds with the fact that this condition is a major risk factor for death and disability in older adults (Table 1).

The CDC report goes on to advocate for an “expanded chronic care model” for delivery of preventive services, which would link health system and community efforts. However, the report stops short of making concrete recommendations about mechanisms through which preventive services may be delivered or bundled. They recommend use of The Guide to Community Preventive Services (Community Guide), a group of recommendations made by the Task Force on Community Preventive Services based on systematic reviews by experts in public health [7]. The Community Guide does advocate for a type of bundled approach by recommending “offering multiple services in one location and at the same time for expedient ‘one-stop shopping’ [7]. Certainly, the “one-stop shopping” approach may need to be tailored to the individual. For example, prevention topics may be addressed sequentially rather than at a single visit, depending on individual preferences and complexity of topics addressed.

In addition to the CDC clinical preventive services recommendations, the U.S. Department of Health and Human Services has also added, for the first time, specific recommendations for older adults to its Healthy People 2020 goals [8]. The objectives for older adults are divided into two categories: prevention and long-term services and support. The second prevention objective is to bring “older adults up to date on clinical preventive services,” although there is no specific mechanism suggested beyond the use of the first prevention objective, the Welcome to Medicare benefit, which is a health care service rather than community or public health effort. Like the CDC, Healthy People 2020 also endorses the use of recommendations in the Community Guide that apply to older adults, specifically “Behavioral and Social Approaches to Increase Physical Activity: Social Support

	Men	Women	Both	Diseases Involved
Smoking	248 (226-269)	219 (196-244)	467 (436-500)	Cardiovascular, cancer, diabetes, respiratory
High blood pressure	164 (153-175)	231 (213-249)	395 (372-414)	Cardiovascular
Overweight/obesity	114 (95-128)	102 (80-119)	191 (164-222)	Cardiovascular, cancer, diabetes
Physical inactivity	88 (72-105)	103 (80-128)	190 (163-217)	Cardiovascular, cancer, diabetes
High glucose	102 (80-122)	89 (69-108)	190 (163-217)	Cardiovascular, cancer, diabetes
High lipids	60 (42-70)	53 (44-59)	113 (94-124)	Cardiovascular

Table 1: All-cause mortality for adults age 70 and under (thousands of deaths) attributable to risk factors and the 95% confidence intervals of uncertainty (adapted from Danaei, et al [5]).

	Cardiovascular disease	Stroke	Cancer	Diabetes	Pneumonia	Dementia	Osteoporotic Fracture	Arthritis	Depression
Smoking cessation	X	X	X		X				
Blood pressure control	X	X				X			
Weight management	X	X		X				X	
Physical activity	X	X	X	X		X	X	X	X
Glucose control	X	X		X		X			X
Lipid lowering	X	X				X			
Flu and pneumonia vaccines					X				
Cancer screening			X						
Calcium, vitamin D							X		
Depression screening									X
Social activity									X

Table 2: Many conditions common in older adults can be addressed by overlapping interventions.

Interventions in Community Settings” and “Diabetes Prevention and Control: Self-Management Education.”

Current clinical health guidelines for preventive services in older adults and their limitations

Since the CDC and Healthy People 2020 guidelines rely on providers in traditional health care settings to meet preventive service targets for older adults, it is important to assess whether clinical guidelines that focus on older adults are aligned with these public health guidelines. The USPSTF convened a geriatrics workgroup to adapt their methodology and work flow to better address the preventive needs of older adults. In a recent article, Leipzig and colleagues highlighted the efforts of the USPSTF geriatrics workgroup, using fall prevention as an example [9]. They recommend that agencies such as USPSTF reconsider the standard approach to guidelines, given that conditions that affect older adults are multifactorial in nature, require interventions with multiple and sometimes disparate components, and include domains such as quality of life. They go on to acknowledge that older adults are often not well-represented in clinical trials and evidence is not currently synthesized to represent important outcomes for older adults. Leipzig and colleagues propose an analytic framework that takes into account screening for multiple risk factors, multimodal interventions, and outcomes relevant to older adults, both related to outcomes of interest, functional status and health-related quality of life. However, the new USPSTF framework is an “overlay” connecting various disease-specific guidelines and checking them for consistency rather than a comprehensive overhaul of the approach to prevention in older adults, and does not prioritize preventive services.

Previous work on prioritization of clinical preventive services

Previous literature in prioritizing clinical preventive services has established a framework and methodology for ordering preventive tasks based on evidence base, including cost effectiveness data. For example, work by Maciosek, Coffield, and colleagues has assigned points to various prevention services based on clinically preventive burden (CPB) and cost effectiveness [10,11]. CPB includes estimates of both the burden of disease targeted by a preventive service and the effectiveness of the service in reducing disease burden. Topics relevant to older adults that receive a high priority score include tobacco counseling, vision screening, colon cancer screening, hypertension screening, and influenza vaccine and more recently aspirin chemoprophylaxis [10,11]. The prioritization scores could inform both clinical and community-based interventions, but as evidenced by lack of prioritization in recent guidelines for older adults, there has possibly been limited uptake of these scores in practice. This may be partially due to the fact that prevention services included in this work include recommendations for children, adolescents, adults, and older adults, rather than focusing on one population and audience. As the authors point out themselves, “the literature on which to base decisions about the relative value of clinical preventive services is vast, inconsistent, and confusing” [11].

Prioritization is especially important when considering providing preventive services in an overburdened health care system. One study estimated that it would take a clinician approximately 7.4 hours per working day to discuss all of the current preventive guidelines relevant to a typical primary care panel [12]. Even objectives that fall within the traditional purview of the medical community such as blood pressure control are often not achieved in older adults, again underscoring the importance of adherence (on the part of both physicians and patients) to achieving prevention goals in older adults. A shortcoming of the USPSTF approach is that the current recommendations for adults is a long list of topics (in alphabetical order or grouped by topic) lacking

any prioritization schema beyond the USPSTF grading system for individual recommendations.

Another issue to consider when discussing priorities for prevention is overuse of certain health care services. Korenstein and colleagues recently reported on the overuse of procedures, tests, and medications, and found that overuse is not uncommon for diagnostic preventive screening, with overuse rates from 7.6% to 60.8%, depending on the test [13]. For example, one study reported 60.8% overuse of repeat screening colonoscopy in primary care, where another found that 58% of ineligible women were screened for cervical cancer with a Pap test [13]. With limited resources for prevention, overuse or inappropriate use of preventive services also needs to be addressed.

Place: Thinking outside the clinical setting for delivery of preventive services

Despite the shortcomings of the clinical setting in addressing prevention in older adults, this is where most preventive services are delivered and current guidelines focus. It is likely that a continued model of addressing prevention in such settings will persist and may be necessary given that many older adults require drug therapy to meet prevention goals, especially in hypertension control. The Systolic Hypertension in the Elderly Program (SHEP) established the benefit of treating systolic hypertension with drug therapy with regards to reduced stroke and congestive heart failure incidence and decreased long-term mortality [14-16]. However, community settings, such as pharmacies, senior centers, and churches, offer possible alternate locations for providing preventive services. Advantages to community settings for older adults may include ease of accessibility or transportation, familiarity and trust, and increased interaction with peers and neighbors. These factors may be particularly important to consider for ensuring longer-term adherence to preventive strategies or programs.

Current approaches to prevention emphasize the doctor-patient relationship and the primary care system, in that there is a limited role for communities and the public health system in addressing prevention in older adults. There is a great need to articulate the roles, boundaries and interfaces between individual health care and public and community health care. There are currently very few resources devoted to chronic disease prevention through public health departments. Community-based prevention programs, which can support and enhance the engagement of older adults with physicians and provide support and opportunity for preventive practices, are also being reduced. There is great potential for community agencies, such as aging services providers or family support programs, and health departments to play a larger role in supporting primary care physicians in ways that are efficient and affordable and will promote adherence to evidence-based guidelines.

The ability of community agencies and health departments to play this role depends first of all on coordination of their efforts, both with each other and with the existing health care system. Here too progress has been slow. The Aging States Report drew attention to overlap and gaps in prevention efforts between state health departments and aging units [17]. More recent efforts by CDC and the Administration on Aging have encouraged greater coordination, such as recent Community Transformation Grants and the new focus on evidence-based programming required for use of Title IIIID funds (Older Americans Act) to support health promotion efforts. However, linking community-wide prevention efforts to primary care, required for effective health promotion in older people, remains a key challenge.

Package

Examples of Bundled Preventive Interventions Conducted in Community Settings, with Cardiovascular Disease as a Case Study

We use cardiovascular disease (CVD) to illustrate how preventive services can be packaged in community interventions because it is the leading cause of morbidity and mortality for older Americans [18]. It is not surprising that there are several examples of bundled prevention interventions designed to improve cardiovascular health. Targeted behaviors include overall awareness of CVD risk, blood pressure self-monitoring, smoking cessation, diet, physical activity, and prevention of risk factors such as diabetes and hyperlipidemia.

Table 3 shows a summary of 4 recent trials that aimed to reduce CVD risk through a bundled intervention delivered in the community [19-25]. Although only the Cardiovascular Health Awareness Program (CHAP) (23-24) was specifically designed for adults aged 65 years and older, participants in the other studies listed had an average age of mid-fifties. Two of the interventions were targeted for all community adults, whereas 2 were targeted for women only [20-25]. The programs included 2-6 elements each. The CHAP program focused mostly on blood pressure control but also assessed overall cardiovascular risk and gave formal feedback to the participant and his/her primary physician [23,24]. The CHAP program was successfully implemented in 20 communities and served close to 16,000 unique participants [23]. The CHAP intervention resulted in a 9% relative reduction in composite hospital admissions for acute myocardial infarction, stroke, and congestive heart failure when comparing intervention to non-intervention communities [23]. The other programs did not formally establish links with primary care physicians, with the exception of the Strongwomen study, which required permission from the PCP to participate in the intervention for CVD risk reduction in midlife and older women [22]. The outcomes examined in the studies varied, with most measuring CVD risk factors and only CHAP examining actual CVD outcomes and health care utilization.

In addition to these more recent studies, there is a previous history of community programs targeted at CVD prevention, and these were summarized in a 2010 systematic review by Pennant and colleagues [26]. To be included in this systematic review, trials had to target at least 2 of the following cardiovascular risk factors: smoking, poor diet, insufficient physical activity, high blood pressure, high cholesterol, obesity, diabetes, psychosocial stress, and high alcohol consumption. The authors do not include data about whether interventions were

delivered in a bundled fashion. The authors excluded studies targeted to high-risk groups only or those for persons with existing diagnosis of CVD. The average net reduction in 10-year CVD risk in these programs was a fairly modest 0.65% and the authors concluded that community programs for preventing CVD deserve continued consideration as an approach for preventing CVD. Of note, although all of the programs reviewed targeted adults, there was no intervention that specifically targeted older adults. Therefore, to the best of our knowledge, the CHAP is the strongest example of a bundled community intervention to reduce risk of CVD that has been targeted to older adults and has the added advantage of directly and proactively linking the community intervention effort to ongoing medical care [23,24].

Population/Promotion

Bundled Interventions Addressing Multiple Services and Risk Factors in a Community Setting: The 10 Keys to Healthy Aging Experience

An example of a bundled approach to delivering preventive services to older adults is the “10 Keys”™ program [27,28]. The program includes evidence-based elements that provide education and strategies on risk factor control for highly prevalent chronic diseases, listed in Table 4. A health promotion approach is used to disseminate the information and to empower older adults to seek preventive services and participate in certain health behaviors, with a focus on increasing adherence to services with a high level of evidence. This information is then used to help participants carry on a more effective dialogue with their physicians and to become more comfortable with spreading the messages as Health Ambassadors. The program consists of a 120-page course curriculum that presents the 10 Key strategy at a fifth grade level. The program is presented as self-study on-line, in short 1 hour seminars, intensive 10-hour classes that certify participants as Ambassadors, or as intensive classes in which participants have anthropometry and bloods drawn to mark progress toward prevention goals.

During a demonstration project in a low-income community, 389 men and women aged 65 and older who were free of disability were enrolled the “10 Keys”™ program [28]. Participants were evaluated at baseline 12 and 24 months. At baseline, fewer than half of the participants met goals for LDL cholesterol, 72% for systolic blood pressure, 60% for physical activity, and 69% for pneumonia immunization. After 12 months, significant increases were seen for the proportion of participants meeting goals for LDL cholesterol (+14%), blood pressure control in hypertensives (+10%), blood glucose control in diabetics (+11%) and colon cancer screening (+7%). In groups

Study	Target audience	Design	MD input	Intervention staff	Intervention components	Intervention intensity	Outcomes
Cardiovascular Health Awareness Program (CHAP) (20)	Adults ≥ 65 (mean age 74 years)	Community cluster RCT	Yes	Pharmacist, peer volunteer	Blood pressure management; CVD risk assessment	10-week intervention	Fewer hospital admissions for acute myocardial infarction or congestive heart failure in intervention group
Rockford Complete Health Improvement Program (CHIP) (17)	Adults ≥ 21 (mean age 55 years)	Pre-post evaluation of community intervention	No (except encouraged to work with MD)	Not specified	Smoking; Physical activity;	40-hours, 2 hours daily for 4 weeks	Significant decrease in CVD risk factors, especially among those at highest risk
Strong Women-Healthy Hearts Program (19)	Women ≥ 40 (mean age 57.5 years)	Community cluster RCT (clustered at county level)	No (except needed MD permission)	Health educators	Physical activity; Diet	2 days/week for 12 weeks	Intervention decreased weight, WC, calories consumed and increased PA levels and self-efficacy
National Community Organization CVD Prevention (22)	Minority women (no mean age, but 25% of ppts >60 years)	Pre-post evaluation of community intervention	No	Lay and medically trained personnel	Smoking; DM; HTN; Cholesterol; Obesity; Physical activity	8 biweekly sessions	Improvement in multiple secondary outcomes

RCT=randomized controlled trial; MD=medical doctor; WC=waist circumference; PA=physical activity

Table 3: Examples of recent bundled community interventions targeting cardiovascular disease (CVD) risk reduction

Key and goals	Total (N=389)		
	Baseline	Follow-up	Difference
Stop smoking (% indicates smokers)	4%	4%	0%
Control systolic blood pressure to <140 mmHg	73%	76%	3%
Hypertensive at baseline	59%	68%	9%*
Prescribed medications for hypertension	45%	49%	4%
Be physically active at least 2.5 hours per week	64%	61%	-3%
Regulate blood glucose to <100 mg/dL	86%	81%	-5%
Diabetic at baseline	26%	23%	-3%
Prescribed medications for diabetes	10%	11%	1%
Lower LDL-C to <100 mg/dl	31%	45%	14%***
History of coronary heart disease at baseline	51%	73%	22%***
Baseline LDL-C >130 mg/dl	0%	16%	16%
Get regular immunizations			
Had influenza vaccine in the past year	71%	54%	-17%***
Subgroup with no influenza vaccine at baseline	0%	49%	49%
Ever had pneumonia vaccine	66%	77%	11%***
Subgroup with no pneumonia vaccine at baseline	0%	31%	31%
Participate in cancer screenings			
Mammogram	79%	79%	0%

Table 4: Proportion of Participants Achieving the Goals of the “10 Keys”™ to Healthy Aging at Baseline, 24-month Follow-up, and Change (Adapted from Robare et al.[28]).

CES-D: Center for Epidemiologic Studies Depression Scale; LDL-C: low-density lipoprotein cholesterol

*p ≤ 0.05. **p ≤ 0.01. ***p ≤ 0.001.

without prior vaccination, influenza vaccine increased by 25% and pneumonia vaccine by 20%. At the 24 month follow-up there was a significant decrease in the systolic blood pressure in the total sample (-3.2 mmHg) and those with hypertension (-5.1 mmHg). The program is currently being disseminated throughout the state of Pennsylvania in partnership with the Area Agencies on Aging. Additionally, a collaborative project with the Arthritis Foundation is examining the effectiveness of integrating the “10 Keys”™ into the existing Arthritis Foundation Exercise Program.

Reaching older adults in greatest need

Bundled interventions to increase provision of preventive services to older adults will have the greatest impact if interventions reach those in greatest need. Data showing life expectancy disparities in the United States demonstrate that disparities are large and have persisted over time [29]. Danaei and colleagues have expanded their work in comparative and cumulative risks of individual risk factors to examine how the risk factors vary among the “Eight Americas” or population subgroups defined by race, locations and socioeconomic characteristics of county of residence [29]. Their work suggests that disparities in smoking rates, blood pressure and glucose control, and adiposity explain a significant amount of the disparity in mortality from CVD and cancer. Community-based interventions could be helpful in addressing disparities by reducing problems with access to care and the increasing fragmentation in the health care system [30]. Bundled interventions should be targeted to communities where need is greatest and take steps to increase awareness and adherence to guidelines.

Policy Implications

Improving the efficiency of delivery of preventive services is especially important given administrative and financial changes currently facing the health care system. Devising evidence-based approaches to delivering preventive services to older adults is particularly salient at this moment in time because of three key

changes brought about by the Affordable Care Act (ACA) [31]. First, the ACA authorized coverage of an annual wellness visit or Medicare beneficiaries that includes a health risk assessment. The health risk assessment must identify chronic diseases, injury risks, modifiable risk factors, and urgent health needs of beneficiaries. Currently, the annual wellness visit must be delivered by a health professional, such as a physician, a qualified non-physician practitioner (e.g., physician assistant or nurse practitioner), or by a medical professional (e.g., health educator or registered dietitian), or a team of such medical professionals who are working under the direct supervision of a physician. Annual wellness visits support a sort of “bundled” approach by requiring documentation of having addressed multiple risk factors and routine screening topics with a patient in order to be reimbursed. Second, the ACA also eliminates cost-sharing (e.g., coinsurance and deductibles) for all prevention benefits rated A or B by the U.S. Preventive Services Task Force including treatment of cardiovascular disease risk factors, cancer screening and other preventive services. This is consistent with recommendations from the CDC to reduce cost-sharing for preventive services and should help to boost their use by reducing financial barriers to adherence [32]. Third, the ACA will bring about changes to delivery systems in Medicare. The legislation establishes a system of payment for accountable care organizations (ACOs) – groups of doctors, hospitals and other providers who combine forces to provide coordinated care to Medicare beneficiaries. An important component of ACOs is improving provision of primary care, and particularly preventive services, to older adults. ACO’s performance will be evaluated based in part on the ability of providers to meet performance targets including delivery of recommended preventive services.

Conclusion

Future directions and research needs

More integrated approaches are needed to ensure high quality preventive care for older adults. This integration with an emphasis on bundled services and adherence to proven preventive strategies should take place on the individual, health system and public health levels. New models of primary care, including group visits and “mini clinics” focusing on prevention could be explored and delivered in community based programs or prevention centers. Examples of bundled interventions, such as the 10 Keys program, show the potential of this strategy, but to the best of our knowledge there are no studies to date that have made a direct comparison between bundled prevention interventions and those that are disease-or condition-specific. In addition to comparing health outcomes between bundled and single risk/condition interventions, individual satisfaction and adherence should be addressed. Another research need is for ongoing work on maintenance of healthy lifestyle and prevention behaviors, as adherence and longer-term follow-up are key factors to the success of any prevention program. This is relevant as many prevention tasks, such as maintaining healthy body weight, require ongoing effort from an individual rather than a one-time intervention. On a system level, prevention programs should emphasize sustainability, so that their efforts can continue long-term.

More comparative effectiveness research on delivery of prevention and adherence to prevention for older adults is needed. Such research should account for the fact that older adults vary in functioning, life expectancy, and burden of pre-existing disease; therefore, there may not be a “one size fits all” approach, but rather a variety of approaches to consider. Similarly, outcomes of future studies should not be total mortality for each individual intervention but rather composite measures based on multiple interactions between interventions.

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