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Health economics of cardiovascular disease: Defining the research agenda

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Abstract
Background: When allocating limited resources, public and private sector leaders in health policy consider both the health and economic value of new measures for cardiovascular disease (CVD) prevention. The ability to develop and prioritize policy measures is hindered by important gaps in health economics data.
Methods and Results: The Policy Research Implementation Group (PRIG) of the National Forum for Heart Disease and Stroke Prevention convened a symposium to develop priorities for research on the economics of CVD primary prevention and elimination of CVD disparities. Suggested top opportunities include expanded CVD surveillance, advances in evaluation and economic modeling of primary prevention, and use of behavioral economics to identify new prevention strategies. Enhanced policy, funding, and leadership support are vital to realizing this research agenda.
Conclusions: Targeted research on the health and economic value of CVD prevention, especially to eliminate CVD disparities, would bolster the justification for increased investment in cardiovascular health.

Introduction

As more Americans live with chronic heart disease and stroke, the need for primary prevention has never been greater to reduce risk factors that contribute to these chronic diseases [1]. Medical and public health professionals continually call for strengthening efforts that protect cardiovascular health, [1—4] and for supporting research on the health and economic value of interventions that can help shape decisions in national health reform proposals. Health reform legislation alone will not be sufficient to effect change that will reorient our health care system to emphasize effective health promotion and disease prevention. Important gaps in knowledge and practices remain.

This paper was developed by the Policy Research Implementation Group (PRIG) of the National Forum for Heart Disease and Stroke Prevention (National Forum). PRIG is one of seven implementation groups that implements *A Public Health Action Plan to Prevent Heart Disease and Stroke Prevention*, a plan that provides a comprehensive public health strategy and framework to guide health practitioners' and policy makers' actions in heart disease and stroke prevention. The National Forum was established in 2003 to address the urgent need to reduce the burden of CVD. The Forum brings together more than 80 individual organizations to collaborate in building a heart-healthy and stroke-free world [1]. The *Action Plan* is closely aligned with *Healthy People* goals and objectives for preventing CVD and eliminating disparities [1,3,5].

In an effort to identify research needed to advance CVD prevention, PRIG convened experts in heart disease, stroke, health policy, public health, health economics, epidemiology, and ethics at the *Health Economics of Cardiovascular Disease Expert Symposium: Defining the Research Agenda*, on May 14, 2009, in Washington, DC [6].

This manuscript summarizes the symposium presentations and discussions, supplemented by informal outreach to key opinion leaders and health economists. The goal of this paper is to establish priorities for research on the economics of primary prevention of heart disease and stroke to assist governmental and private sector leaders with allocating resources to CVD prevention and improving impact on population health.

The essence of research on the economics of CVD prevention is to quantify the health and economic benefits — the value — that an investment in prevention can produce [7]. The focus is on CVD primary prevention: a set of interventions, including the prevention, detection, and control of risk factors, designed to avoid the first occurrence of heart attack, heart failure, or stroke among people with identifiable risk factors [5].

Overview of CVD burden and response

Affecting one in three US adults, CVD is the leading cause of mortality and places a great strain on healthcare spending, with CVD medical care exceeding $324 billion in 2010 and an additional $137 billion cost of lost productivity from premature death, work absences, and disability [8]. The burden of preventable CVD can be significantly reduced through system level policy changes, improvements in an individual's lifestyle choices including tobacco use, and risk factor control including hypertension, hyperlipidemia, obesity, and diabetes mellitus [9—11].

Disparities

The persistence of CVD and other health disparities in US populations with economic, educational, social, cultural, age, geographic disadvantages, and gender differences is well documented [12—15]. The CVD burden is disproportionately high among persons who have low socioeconomic status, adults with less than a high school education, and residents of the southeastern US and Appalachia [16]. Among all racial/ethnic groups, Blacks have the highest mortality rates of heart disease and stroke and a disproportionately high prevalence of CVD risk factors and morbidity [16]. American Indians, Alaska Natives, and certain Hispanics also have high prevalence of CVD risk factors and morbidity [14,17].

The burden of disparities is great in terms of health, quality of life, longevity, and economics [18]. Developing cost-effective responses to CVD disparities is possible [19] and merits heightened policy attention. For example, although the evidence base is still developing, promising findings reveal community health workers (CHW) have been successful at improving appropriate utilization of services in populations with higher disparities [20]. Such practices could be potentially cost-effective and could support states to adopt policies supporting CHWs.

Unfortunately, an identified complication to the development of a cost-effective response to CVD disparities is the variation in race/ethnicity definitions at the federal, state, and local levels which hampers researchers' ability to combine datasets [21].

Recommended research priorities

What health benefits are generated by a given prevention investment is an essential question for researchers to answer and decision makers to heed, as argued by Woolf [7]. A body of knowledge establishes the value of many CVD primary prevention interventions [11], but additional research is needed to track the public's cardiovascular health, monitor the economic burden of CVD, inform resource allocation, and improve the value of specific interventions. Interdependent priority areas for future research are fourfold.

(A) *Surveillance:* Sharpen surveillance systems to ensure collection and congruence of the needed data to quantify and continuously monitor the burden, including disparities and costs, of heart disease and stroke.
(B) *Evaluation* (including comparative effectiveness research): Establish the health and economic impacts of specific interventions to prevent CVD. Because many CVD risk factors are also risk factors for other disease (e.g., smoking and diabetes), economic evaluations of CVD prevention efforts should include benefits associated with risk reduction for other diseases.
(C) *Economic modeling:* Better forecast the health and economic impacts of CVD primary prevention through advanced epidemiological and economic modeling systems.
(D) *Behavioral economics:* Inform policy and intervention design by improving understanding about how and why people make choices that affect their cardiovascular health and medical care.

This research agenda highlights CVD disparities in all areas and would inform public and private sector leaders' efforts to make evidence-supported decisions about investing in CVD prevention.

Surveillance

Surveillance — the ongoing, systematic collection, analysis, interpretation, and timely dissemination of data for planning, implementing, and evaluating public health practice, as defined by the Centers for Disease Control and Prevention (CDC) — is fundamental to informing the conceptualization of health economics and prevention [22].

Important gaps

The US lacks a nationwide data system to systematically track the incidence and prevalence of CVD, most CVD risk factors, and related costs, especially at the state and local levels. Barriers to systematically tracking and monitoring the incidence and prevalence of CVD, related risk factors, and costs, include: availability of only self-report data on risk factors, behaviors, and health history at regional levels, with some self-report measures not validated and others less reliable than clinical measurements. Also, researchers encounter multiple obstacles in combining different national datasets, e.g., merging data or minimizing double counting of costs, which inhibits large-scale or comprehensive analyses.

Insufficient CVD surveillance hinders health leaders' ability to plan effective prevention, including allocating appropriate resources and monitoring the effectiveness over time of interventions [23]. Inadequate access to objective data about CVD inequities in subgroups is a major barrier to effectively addressing disparities [14].

Priorities

Enhanced national CVD surveillance is imperative to achieving the proposed *Healthy People 2020* objectives for reductions in heart disease, stroke, risk factors, and disparities [2]. In 2007, a set of 12 recommendations were proposed to guide the essential features of a national surveillance system to support the prevention and management of heart disease and stroke [24]. Following these 12 recommendations, a comprehensive national CVD surveillance system would determine the incidence and prevalence of CVD and risks across racial/ethnic, age, gender, and socioeconomic groups at the state and local (e.g., county) levels. A more expansive surveillance system would monitor cardiovascular health and risks, and inform resource allocation and design of new prevention interventions.

This system would coordinate improvements to current surveillance components [23,24] and enhance use of existing public and private data. Near-term opportunities entail changing existing surveillance datasets to facilitate linkage; eliminating unnecessary duplication; standardizing surveillance data elements — including detailed

ethnicity and language data; and revising oversampling methods so analysts can produce meaningful estimates [21,24]. Oversampling methods are particularly needed when working with minority populations, otherwise sample sizes will be too low to generate meaningful estimates of effect.

In time, a full CVD surveillance system would collect data using two or more modes (e.g., interview surveys, physical examinations, and enhanced medical record documentation) with periodic (or continuous) resurveying [24]. The system would link administrative records, national vital statistics, and data from healthcare providers. Public health agencies and researchers could attain data on population subgroups, such as by race/ethnicity and location [12]. For instance, the National Minority Quality Forum's Health Assessment Tool (HAT®), described at www.z-atlas.com, has been integrating geographic and health status indicators to monitor changes in health outcomes, healthcare utilization, and financial implications.

Evaluation of health and economic impacts of CVD primary prevention

Economic evaluation uses applied analytic techniques to identify, measure, value, and compare the costs and outcomes of alternative interventions [25]. One type of evaluation, *comparative effectiveness research* is the rigorous evaluation of the impact of different available options for remedying a given medical condition among identified patients [26].

Evaluations document that prevention policies, programs, and services have varying levels of effectiveness, reach, costs, and impacts [27,28]. Evaluation results depend on intervention design and implementation [27] as well as analytic decisions about perspective, time horizon, and other factors [29].

Current evidence indicates that many CVD prevention interventions deliver health benefits in a cost-effective manner [31,32]. Most clinical preventive services for CVD bear a net cost but yield considerable health benefits [29,30,33], often analogous to treatment [34]. Community-based prevention can be cost-effective, and some community-based prevention programs are cost-saving [22,35–37]. In worksites, multi-component cardiovascular health promotion can yield a net savings in medical expenditures, productivity, or both [32,38,39].

However, relatively few comparative effectiveness studies on prevention have been published, most involving clinical preventive services [28,30]. New federal investment ($1.1 billion) in comparative effectiveness research from the American Recovery and Reinvestment Act of 2009 [31] presents a unique opportunity to expand rigorous evaluation of CVD prevention alternatives.

Evaluation is a research priority so health leaders have improved data about the value of primary prevention, including impact on CVD disparities. Results from cost-benefit, cost-effectiveness, return on investment (ROI), and comparative effectiveness research also support the development of best practices and help optimize limited resources.

Important gaps

Considering variation in methods, definitions, and research quality, [29,32,33] current evaluations of CVD primary prevention often generate data that cannot be readily compared or systematically reviewed [29]. Foremost barriers are the lack of standardized methods and measures to evaluate the wide range of primary prevention interventions, especially community-based measures that alter policies, environments, and systems. A standardized approach is also needed to capture intervention quality and local context, two variables that are difficult to consistently measure but affect outcomes. Moreover, many evaluations lack sufficient data to assess differential impacts of interventions on populations, and study duration varies across evaluations, with most too short to assess impact and sustainability.

Two notable gaps in the types of primary prevention evaluated are studies examining the impact of wellness services on future healthcare spending [34] and full economic evaluations of cardiovascular health promotion efforts, especially aimed at child populations [29]. More high-quality economic research is needed on worksite programs, especially once small and medium-sized employers have evidence-based guidelines [35].

Primary prevention, especially community-based interventions, has received inadequate attention in comparative effectiveness research, even with recent expansion. A recent review of comparative economic evaluations of prevention found that 87% examined clinical interventions, especially pharmacotherapy [29]. Furthermore, many comparative effectiveness studies do not assess impact on health disparities or costs, the latter being potentially controversial.

Priorities

Above all, economic evaluations should address two fundamental questions: Should we pay for prevention? How do we increase the value of prevention? To answer these questions, standardized methods and metrics are needed for rigorous evaluations of the health and economic impacts of prevention. The resulting standards must be suitable for evaluating community demonstrations, randomized trials, and usual practice [36] and support ongoing evaluations of an intervention as it is replicated. Specific strategies are needed for rapidly assessing policy innovations [37]; evaluating complex interventions (e.g., ones with both clinical and community-based components); and analyzing the value of individual components of an intervention to the value generated by multiple components (e.g., synergistic effects). The goal should be to enable systematic comparison of different types of interventions for cost-effectiveness, cost-benefit, and ROI; the last item requires standardized ROI methods for assessing the value in dollars (i.e., monetizing) of non-medical costs and savings (e.g., presenteeism for worksite health promotion interventions) [38].

The standards should produce metrics that specific decision-making audiences (e.g., employers, government officials, local health leaders) find meaningful. Established methods used internationally and facilitated dialogues between evaluators and decision makers could provide alternatives.

Considerably more systematic evaluations will be important to advance primary prevention given significant heterogeneity in populations, community environments, and settings (including worksites, schools, and healthcare, among others). Using evaluative standards, health researchers should examine how changes in individuals' level of participation in, use of, or adherence to prevention affect costs and determine the cardiovascular health and economic impacts of specific public policies. It is also important to establish changes in cost-benefit, cost-effectiveness, and ROI of an intervention as it is replicated; the drivers for the costs, impacts, and savings of this intervention in different settings; and the differential program impacts on population subgroups.

When assessing the health and economic benefits of community-based prevention programs, several estimates should be generated when possible. These include: the time interval required for ROI, short- and long-term cost-benefits, cost-effectiveness, and ROI of policies and community-based interventions that support tobacco cessation or reverse the development of clinical risk factors such as hypertension, high cholesterol, obesity, and diabetes. Similarly, evaluators must establish the cost-effectiveness of policies and programs that improve medication compliance for patient control of smoking, diabetes, hypertension, and weight management.

A close secondary priority is to ensure that comparative effectiveness research includes community-based interventions and other types of primary prevention. Ideally, these analyses would also examine cost and impact on disparities. In 2009, the Institute of Medicine (IOM) identified and ranked 100 priorities for comparative effectiveness research [39]. PRIG preserved the IOM's ranking, with the highest priority areas for research on the economics of CVD primary prevention at the top of the list (Table 1).

Economic modeling

Economic modeling organizes knowledge (via conceptual frameworks, mathematical formulas, algorithms, etc.) to understand market dynamics and predict outcomes that have yet to occur at the starting point of the study, as described by Henderson [40]. Modeling results (e.g., assessment of the health and economic effects of primary prevention and disparity reductions) are valuable in policy making [41]. For example, one model calculated that 886,202 deaths could have been averted between 1991 and 2000 by lowering the African American mortality rate to the rate for whites [42].

Modeling studies have explored the consequences of suboptimal health. Researchers have estimated that excess rates of preventable disease including diabetes, hypertension and stroke in African Americans and Latinos relative to whites will cost Medicare alone an additional $15.6 billion beyond the cost than if theses disparities did not exist [51].

Another modeling study found high rates of adolescent overweight portend approximately 100,000 avoidable CHD cases by 2035, [43] costing $46 billion in treatment and $208 billion in productivity from 2020 to 2050 [44]. A mathematical model of the potential impact of five smoking cessation treatment policies on quit attempts, treatment use, and treatment effectiveness determined that the national adult prevalence of smoking could be reduced from 20.5% to 17.5% in 1 year if these policies where fully implemented [45—47].

Important gaps

Epidemiological and economic modeling has progressed, but many models have not been validated. Other challenges include limited abilities to estimate the potential impacts of prevention on specific populations with a high CVD burden and to generate timely and more precise estimates of the economic burden of each major CVD category. There is a need to describe the economic burden of CVD on families (e.g., out-of-pocket expenses, quality of life, and opportunity costs such as reduced work hours).

Simply building sophisticated economic models cannot fill these gaps. Health economists need reliable, valid, and timely data for input, confirming the need for enhanced CVD surveillance and evaluation.

Table 1 Comparative effectiveness research on the economics of CVD primary prevention.

Priorities for comparing effectiveness and costs
• School-based interventions involving meals, vending machines, and physical education policies, for CVD risk factors in children and adolescents
• Various clinical and social interventions to prevent CVD and risks in vulnerable populations (e.g., urban poor and American Indians)
• Community-based multi-level interventions, health education, and usual care to reduce health disparities in CVD and diabetes
• Accountable care systems and usual care on costs, processes of care, and outcomes for geographically defined populations for CVD risk factors
• Alternative healthcare redesign strategies — using decision support capabilities, electronic health records, and personal health records — for increasing compliance with evidence-based guidelines and patient adherence
• Adding information about new biomarkers (including genetic information) with standard care in motivating behavior change and minimizing CVD risk
• Different quality improvement strategies in CVD prevention for diverse populations of children and adults
• Different strategies to reduce barriers and eliminate disparities to improving cardiovascular health
• Smoking cessation strategies in understudied populations such as minorities, individuals with mental illness, and adolescents
• Traditional behavioral interventions versus economic incentives in motivating behavior changes (e.g., weight loss, smoking cessation, physical activity, and avoiding alcohol abuse) in children and adults

Adapted from: Institute of Medicine. *Initial National Priorities for Comparative Effectiveness Research*. Washington, DC: National Academies Press; 2009.

Priorities

The priority is developing, testing, and validating advanced epidemiological and economic models that simulate the effects of prevention alternatives on CVD risk factors, health outcomes, disparities, and costs (medical and non-medical, including reduced social capital due to CVD morbidity and shortened lifespan). Top needs include modeling that estimates prevention impact on specific populations to assess effects on CVD disparities; compares primary prevention interventions to each other and other strategies that address CVD disparity factors (e.g., raising educational attainment, improving access to quality medical care, and lessening cultural and linguistic barriers); assesses the potential impact of a given intervention at different funding or adoption levels to identify optimal levels of investment; and generates information specifically designed to augment budget scoring (estimates of how a proposed prevention policy would impact government revenues and expenditures). Another needed advancement is altering modeling procedures to involve stakeholders in calibrating economic models for local context and exploring intervention alternatives.

Advanced modeling of the economics of CVD prevention could be informed by methods used in other disciplines and locales. When testing new models, developers should compare their results with forecasts from established models. Explanations of differences would help the research community understand potential strengths and limitations.

With advanced modeling, researchers should determine current and projected costs of CVD disparities, each major CVD category, and external CVD risks (e.g., secondhand smoke, excess sodium in processed foods) from the analytic perspectives of society, specific payers, and families. Models also should establish the health and economic impacts of developing, implementing, and maintaining CVD primary prevention efforts. For instance, projections are needed on the cost-benefit tradeoffs of urban land use and transportation policies, the impact of reducing CVD on Medicare and Medicaid budgets; and the costs and benefits of raising the standard of care for hypertension control, smoking cessation, and diabetes control.

Better access to a wide range of data is essential, as are standardized approaches for categorizing health conditions and related costs to reduce overlaps and ensure completeness of outcome inclusion (e.g., vascular dementia).

A promising approach is the development of complex systems models (e.g., system dynamics modeling) that assess prospective health outcomes and costs of policy options by using data and algorithms that replicate multifaceted, dynamic interactions in a specific local context.

The CDC Prevention Impacts Simulation Model (PRISM), Fig. 1, shows a system dynamics model that can be used for economic modeling. It simulates some of the multifaceted interactions among CVD risks, community conditions, and prevention interventions with disease progression and health and cost outcomes [48,49]. PRISM incorporates data from many sources to represent the US population. It tracks trajectories for the leading direct and indirect risk factors continuously from 1990 to 2040. Population and risk factor prevalence are represented as dynamic stocks, subdivided by sex and age group. PRISM now contains 33 system level intervention options for simulated intervention. Estimation of relative risks, effect sizes, and initial values utilized published studies, meta-analyses, and in some instances, ad hoc surveys of veteran practitioners. Because most of these parameter estimates have some level of uncertainty, lower and upper bounds are used in sensitivity analysis. The main outcomes are CVD events and consequent deaths, as well as total consequence costs, which combine medical expenditures and productivity costs associated with CVD events and risk factors.

Modeling the economic impact of legislation. A specific type of economic modeling, budget scoring, merits attention because it can greatly influence legislative prospects. Budget scoring assesses how a legislative proposal would impact a government's fiscal budget by estimating future revenue and expenditure effects over a certain period of time [50]. Due to modeling differences, budget scores can differ from health economic research conclusions.

The Congressional Budget Office (CBO) is the agency that estimates the federal government's cost of proposed legislation (see *CBO Scores Legislation*). CBO analysts use existing research to estimate costs; thus, closing gaps in health economics data, as proposed in this paper, would improve their ability to score prevention in legislation.

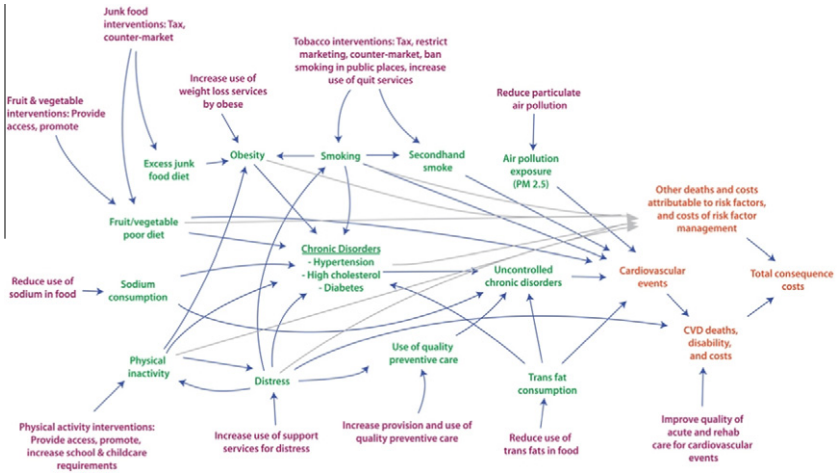

Figure 1 Conceptual system dynamics model: prevention impact simulation model (PRISM).

Some experts have suggested CBO methods provide an inadequate picture about the health and benefits of prevention because of the 10-year horizon [33,51], limited transparency about assumptions, and lack of information about the distributional impact of legislation. However, at present, CBO will continue to establish the fiscal score for national health reform and other federal legislation.CBO scores legislation

CBO scores legislation

The Congressional Budget Office (CBO) is a nonpartisan agency of Congress that provides objective and timely information about the projected impact of legislation on the federal budget and the economy. Congress also uses CBO's estimates in the federal budget process.

CBO's estimates of legislative proposals serve as the official yardstick to determine whether Congress is complying with certain budgetary rules, such as ''pay as you go.'' Members of Congress can use CBO estimates to delay or stop further action on a proposal (e.g., voting on a bill) if the cost of the legislation exceeds certain predetermined thresholds.

Each year CBO creates a baseline outlook for the federal budget under current laws by estimating spending and revenues over a 10-year period by following rules set by Congress. For specific legislation CBO projects the costs of the proposal over 10 years and compares it to the baseline projection. CBO relies on research and government data to develop these estimates and related assumptions. The ''score'' of a proposal is the incremental cost/savings the proposal would generate.

Behavioral economics

Behavioral economics brings together concepts and principles from economics and psychology and emphasizes experimental testing to understand behavior [52]. This field examines both individual behaviors and collective actions, such as those relating to social cohesion and decisions to cooperate. A core finding is that individuals (e.g., consumers, healthcare providers, and business persons) sometimes behave irrationally, that is, in ways that do not advance their own self interest [53,54]. In some cases ''asymmetrical paternalism'' — individuals adhering to polices — can help persons achieve their ''rational'' choice [55]. An example of the influence of policies has been demonstrated in tobacco control via excise tax [56] and can apply to other choices such as food consumption. (In contrast, the standard economics framework assumes individuals pursue their own economic best interests and make rational decisions based upon information, resources, and preferences [53].)

Considering that a large portion US adults are physically inactive, do not follow national dietary guidelines, and are overweight, with about 1 in 5 that smoke [8], scientists are using behavioral economics to better understand these choices, especially addictive and dietary behaviors [52,54,56,57]. A rapidly growing area of research understands how and why individuals make decisions about healthcare [58—61]. Personal emotions, interpretation of context, ethical values, trust, and individual resources are personal factors that can affect behavior. Some external factors include social pressure, information accessibility, convenience, price, and environmental context [52—56,62]. Evidence is growing that changes in the price of prevention and information provision by itself is unlikely to shift behaviors [63]; systematic problems in decision making (e.g., preferring anecdotal, random information to empirical data) hinder people's ability to make choices in their best interest [54]; and the default selection (i.e., what people get if they do not make an explicit choice) can be very influential in shaping behaviors [54—56,64].

This knowledge is informing policy and program design, including federal health reform legislation [46,47,54,65—67]. Behavioral economics is also a research priority because of the potential to identify new, effective approaches to prompting individuals to practice behaviors that support cardiovascular health. When focused on CVD disparities, behavioral economics could enhance understanding of modifiable barriers and supports.

Important gaps

A foremost need is for conceptual models that link behavioral economics, a broad discipline, to CVD primary prevention. As these models evolve, research can start on foundational evidence needed to improve understanding of individuals' cardiovascular behaviors. In particular, limited data are available about negative externalities relating to dietary and physical activity behaviors (e.g., agricultural subsidies, urban sprawl) [68].

Priorities

Health scientists should first develop and experimentally test additional conceptual frameworks that integrate behavioral economics principles into CVD prevention models. These frameworks should support identification of variables that influence individuals' cardiovascular health behaviors and healthcare choices, including the full range of market failures (i.e., when markets fail to produce or allocate goods optimally) and externalities.

Using behavioral economics methods, researchers should focus on several areas of concern. It is necessary to understand the modifiable drivers and barriers (e.g., perceptions, price, social norms, sanctions, and financing arrangements) that influence personal choices of diet, physical activity, smoking, and drinking behavior. Additional areas of study should include: specific market failures and other contextual factors that deter or limit broad based adoption of preventive practices by individuals; factors that discourage healthcare providers, payers, and local policy makers from investing in CVD primary prevention; and effective ways to incentivize people to adopt and maintain behaviors that lower cardiovascular risk.

Also, researchers should determine costs and benefits of assisting populations with marginal health literacy, cultural barriers, complex medical needs, and other disadvantages in performing behaviors associated with cardiovascular health and risk factor control. Additional priorities are studies that compare policies, programs, and services (e.g., incentives, default options, contextual changes) for effectiveness and cost-efficiency in minimizing the negative impacts of market failures on CVD prevention [65].

Table 2 Policy support for expanded health economics research on CVD prevention.

Policy action
Use findings from economic research on primary prevention of CVD in policy development and review
Integrate the research agenda proposed in this paper into federal and charitable research plans
Increase funding for research on the economics of the primary prevention of CVD
Improve access to data needed for research on the economics of CVD prevention
Expand pool of prevention economics investigators

Policy implications

Research intended to inform health policy must be evidence-based and ''translated'' to clearly communicate the value proposition of prevention [33,60]. It is vital to connect research findings to current policy debates and present such information in formats that appeal to policy makers [69,70]. Intermediaries, such as the Robert Wood Johnson Foundation's Synthesis Project, have made important contributions by successfully translating evidence for application in policy making [70].

This ambitious research agenda can only be realized with policy support and funding from governments, research institutions, and charitable foundations. Table 2 outlines five specific policy actions. In view of its importance, the first action has the most discussion.

Greater use of evidence related to the economics of preventing CVD is fundamental to sound policy decisions and could stimulate more research activity than at present. Existing data (even with current evidence gaps) is available to help public and private sector leaders develop and prioritize policy measures. Thus, the top policy action is increased use of health economics data about CVD primary prevention for purposes of policy development and review. Policy makers can, for example, direct staff to regularly incorporate research findings about health and economic impacts into their analyses of specific legislative and regulatory proposals, invite relevant research experts to testify, and organize periodic dialogues with researchers to aid in priority setting.

For this research agenda to materialize, additional policy actions are necessary. First, policy makers should direct research-funding agencies to integrate health economics research on CVD prevention into their plans, using the research recommendations in the paper. Second, both public and charitable funders of research should incrementally increase their investment in research on the economics of CVD prevention, including dissemination to policy makers. Third, to improve access to data for research, policy makers should assure health information technology systems enable qualified investigators to access data. In addition, policy makers can direct relevant agencies to standardize data elements and make similar changes that improve linkage of separate datasets. Finally, to expand the pool of investigators, policy makers and charitable foundations can establish new university centers on the economics of primary prevention and establish a time-limited program that supports two-year postdoctoral fellowships and expands in-service training for public health professionals.

Conclusions

Current evidence about CVD primary prevention has identified measures that improve cardiovascular health at reasonable costs. To support future policy action on CVD primary prevention, priority research includes better CVD surveillance, advances in evaluating and economic modeling of primary prevention, and new insights from behavioral economics research. The proposed research would enhance the data that CBO and similar agencies could use to estimate fiscal impact. Achieving this research agenda will require support from health research funders and policy makers. Policy leadership will greatly benefit from a larger body of evidence to guide decision making.

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