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POLICY NOTE

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Emerging Models of Diabetes and Hypertension Prevention in Los Angeles

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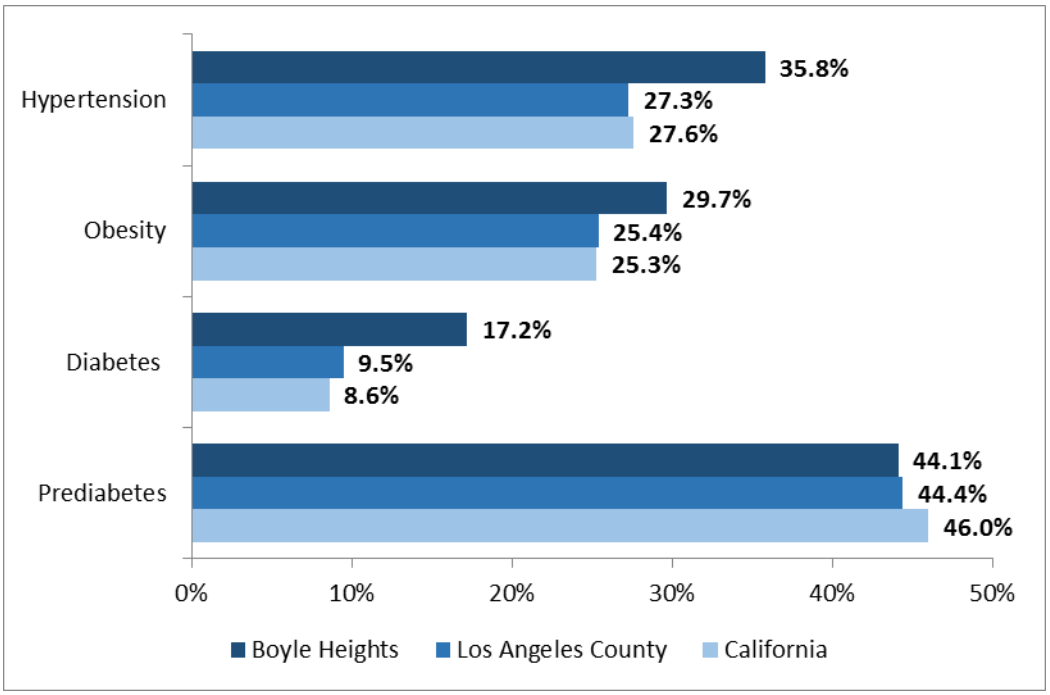
SUMMARY: The prevalence of chronic conditions (e.g., diabetes, hypertension, and obesity) in the U.S. has increased considerably over the past 30 years, with corresponding increases in associated medical costs. Recently, several innovative models of disease prevention have been implemented nationwide. These emerging models take aim at curtailing the growing rates of diabetes and cardiovascular disease in underserved communities. This policy note discusses the innovations and nuances of these models, focusing on two key issues regarding their use in disease prevention: First, how can we meaningfully measure the health impact of these programs at the population level? And second, how can we ensure that these programs are sustainable once grant funding ends? We discuss three models of practice: (1) the National Diabetes Prevention Program, (2) the emerging workforce of community health workers, and (3) the accountable health communities model. The work described was informed by extensive reviews of the literature and by discussions with key leaders in local health and public health systems. This note presents a guiding framework for improving population health. It summarizes the evidence related to these interventions by levels of medical and cost effectiveness, by the potential to measure their population health impact, and by the emerging payment models that are being considered for sustaining these programs. The note concludes by making recommendations for promoting these models and identifying some of the local opportunities for advancing this work.

Background

The United States devotes 85 percent of health care dollars to medical services.[1] However, rising health care costs and increasing rates of chronic conditions suggest the importance of investing in chronic disease prevention and health promotion. For example, the prevalence of diabetes among U.S. adults has nearly tripled over the past 30 years.[2] In 2014, 29.1 million people in the U.S. -- or 9.3 percent of the population -- had diabetes (including an estimated 8.1 million with undiagnosed diabetes).[3] In addition, more than one of every three adults in the U.S. has prediabetes (86 million). Without intervention, up to 30 percent of people with prediabetes will develop type 2 diabetes within five years, and up to 70 percent will develop diabetes within their lifetime.[4, 5]

Some low-income and minority-concentrated communities in the U.S. bear a very high chronic disease burden or high risk of developing chronic disease. Boyle Heights, in the city of Los Angeles, is a community with high rates of diabetes, hypertension, and obesity (Exhibit 1). Approximately 36 percent of adults in the community have hypertension, compared with 28 percent statewide and 25 percent in Service Planning Area (SPA) 5 (a higher-income area in Los Angeles County). More than 17 percent of adult residents also have diabetes, compared with less than 9 percent statewide and 7 percent in SPA 5. Nearly 30 percent of adults in Boyle Heights are obese, compared to 25 percent statewide and 18 percent in SPA 5. In recent years, local health agencies and community organizations have invested substantively in this community, seeking to help curtail the growing rates of diabetes, cardiovascular disease, and obesity. At present, a number of efforts are underway to systematically address these rates and to change the way health services and community resources are delivered in Los Angeles.

Exhibit 1. Example of the Local Burden of Disease in Los Angeles: Prevalence of Diabetes, Prediabetes, Hypertension, and Obesity in Boyle Heights Compared to Los Angeles County Overall and California



Source: California Health Interview Survey
Notes: Estimates for Boyle Heights are based on three zip codes: 90023, 90033, and 90063. Prediabetes estimates are modeled using 2009-2012 NHANES data and CHIS 2013-2014 data. Estimates of hypertension, obesity, and diabetes prevalence are direct estimates using data from CHIS 2011-2014.

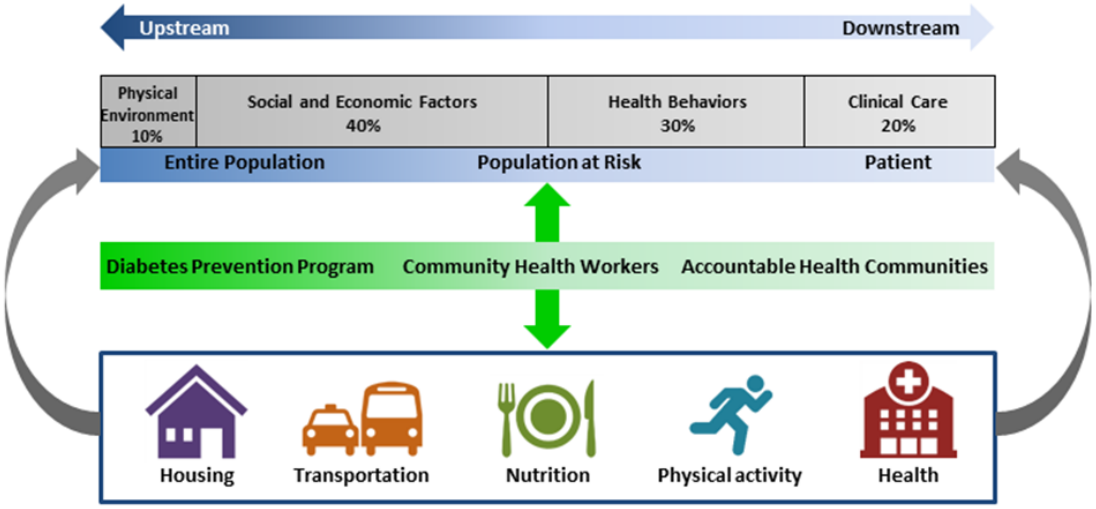
This policy note discusses several current national and local strategies to address population health as they relate to diabetes prevention and cardiovascular health promotion. These strategies include the National Diabetes Prevention Program, an emerging workforce comprising community health workers, and the accountable health communities model. Each of these models of practice encompasses the health outcomes of the individual as well as of the broader population, recognizes the importance of the "upstream" determinants of health, and calls for cross-sectoral collaborations to achieve optimum health status (Exhibit 2).

Guiding Framework for Improving Population Health and Value of Care

Approximately 80 percent of modifiable risks for diseases are attributable to nonmedical (upstream) determinants of health,[6] such as health behaviors, socioeconomic status, and environmental conditions (Exhibit 2). To prevent chronic conditions and promote health, greater emphasis should be placed on population health, which has been defined to focus on outcomes as well as on the broader factors that influence health at a population level, including medical care systems, the social environment, and the physical environment.[7]

Although the Patient Protection and Affordable Care Act of 2010 (ACA) offered numerous opportunities to innovate, this health care reform legislation also brought important challenges to and options for achieving health improvement and enhanced value of care for the entire population. For example, current widespread changes in technology, such as the increasing use of Electronic Health Records (despite its many limitations) and geographic information systems (GIS), are having a profound impact on how health and public health organizations can conceptualize and intervene in population health and health inequities. However, to make all of these interventions effective and to implement them to fidelity, it is important to expand engagement broadly to include stakeholders from different sectors of society. Jointly, a robust network of partners could help evaluators and decision makers in developing and testing population health interventions and synthesizing relevant data that can be used to inform health policies and system-level program improvements.

Exhibit 2. Guidance Framework for Improving Population Health and Value of Care



Emerging Interventions that Focus on Prevention and Coordination

At the forefront of much of the fundamental changes being made in health care delivery are emerging efforts such as the three approaches mentioned above: the National Diabetes Prevention Programs (DPP), the growing workforce of community health workers, and the emergence of accountable health communities (AHCs). The goal of all of these is to achieve what is known as the "Triple Aim": improving quality of care, improving the health of populations, and reducing per capita health care costs. Designed to optimize the performance of the U.S. health care system, the Triple Aim guided the development of the practice models described below.

National Diabetes Prevention Program

The efficacy of the National Diabetes Prevention Program (DPP) is supported by data from a clinical trial in which the incidence of diabetes was found to be reduced through a lifestyle intervention focused on diet and exercise compared to groups receiving Metformin, a diabetes medication, or to placebo; however, results varied by age.[8, 9 10 11] The National DPP, a CDC-led lifestyle change program, has more than 1,300 sites nationwide, including county public health departments, YMCAs, community health centers, health care facilities, academic institutions, and community centers. When implemented in community settings, the DPP lifestyle intervention has led to significant weight loss.[12-17] Community-based DPP interventions have also increased diabetes knowledge,[18] lowered cholesterol [12] and blood glucose levels, [15] and improved health-related quality of life [19] and health behaviors (i.e., diet and physical activity). [16]

The initial DPP trial involved individual in-person counseling, which cost about $1,400 per participant for a one-year program.[20] In comparison, annual per-person medical care costs for individuals recently diagnosed with diabetes were estimated to be more than $2,000 higher than for those without diabetes.[21] To reduce costs and expand population reach, the one-on-one DPP lifestyle intervention was transformed to a group-based program that implemented DPP in community settings[9, 14] and, more recently, in digital/online formats. The one-year program costs (i.e., cost of personnel and supplies) of community-based, group-oriented DPP programs were estimated at between $275 and $325 per person based on limited published data, although the current market rates may be higher.[14, 22] The group-oriented version of the DPP lifestyle intervention, the Group Lifestyle Balance program, has been adapted by numerous health care and community organizations across the country and has been used for vulnerable and medically underserved populations.[14] A recent review of the DPP by the Institute for Clinical and Economic Review suggests that digital formats of the program cost about $117 per participant and are potentially cost-saving and effective.[20, 23]

Community Health Workers

Community health workers (CHWs) -- also known as lay health workers, patient navigators, peer advisors/educators, community health advocates, and promotoras -- volunteer or receive payment to provide culturally appropriate health and medical information, counseling, or services to members of a community.[24] The CHWs are themselves often members of the community and share language, culture, and life experiences with those they serve. Health systems and community social services programs are starting to utilize this emerging workforce to deliver care and services, as these individuals may be uniquely qualified to work with patients who have difficulty accessing or navigating the health care system or community resources. DPP and other health programs are often facilitated by physician extenders, such as nurses, pharmacists, [25] and dieticians. CHWs represent a potential pool of providers that can assist in the scale and spread of the DPP.

Physician extenders, including CHWs and pharmacists,[25] have led care management teams in health systems, served as lifestyle coaches, and delivered home health services to Medicaid beneficiaries with chronic conditions.[16, 26, 27] While other physician extenders tend to deliver primary care, CHWs typically offer social support, make home visits, discuss the importance of adherence to treatments, and provide health education and coordination of care.[16, 18, 28-31] The use of CHWs in obesity-reduction interventions is associated with significant weight loss,[32, 33] reductions in cardiovascular (CVD) risk factors (i.e., blood pressure, cholesterol, and blood glucose levels) and in racial and ethnic disparities in CVD risk,[27, 34, 35] improvements in health behaviors,[29, 36] and

increased confidence in preparing healthy meals.[37, 38]

A few studies have demonstrated cost-effectiveness or cost savings for interventions led by CHWs.[39-41] Physician extenders and CHWs could be a cost-effective option for disease prevention and health promotion programs in communities, because the cost of employing a physician extender or CHW is lower than the cost of utilizing physicians to provide similar interventions. According to the Bureau of Labor Statistics, in 2015, the mean hourly wage of family and general physicians was $92.36, while the mean hourly wage was $48.68 for nurse practitioners and only $19.30 for community health workers.[42]

The Accountable Health Communities Model

An accountable health community (AHC) is a multisector coalition that brings together the expertise and resources of health care providers, social service providers, and various community organizations to address the health-related social needs (i.e., housing, unemployment, and food insecurity) of community members.[43-47] By addressing these health-related social needs, AHCs aim to reduce the risk for chronic diseases and improve population health.[46]

The AHC model is a recent health care delivery innovation, and while assessments of the model's effectiveness are thus limited to a few cases, the available examples are encouraging. Austen BioInnovation Institute's AHC in Sutton County, Ohio, for example, launched a community-based diabetes self-management program that helped participants achieve significant reductions in body weight, body mass index, blood sugar, cholesterol, HbA1c levels, and visits to emergency departments.[43, 47, 48] In San Diego, the AHC that was established as part of the county's Live Well San Diego initiative implemented a wellness program in one elementary school district that reduced the district's obesity rate by 3.2 percent between 2010 and 2012.[49]

To date, the cost-effectiveness of AHCs has not been formally assessed. However, by addressing people's health-related social needs, AHCs are expected to generate cost savings for local health systems by reducing unnecessary use of health services.[50, 51] For example, Hennepin Health, a county-based Medicaid managed-care organization in Minnesota, has reduced emergency department visits by 9 percent by using housing and community service specialists who are part of a tightly integrated medical and social service system. Their experience demonstrated that improvement of patients' access to social services can allow organizations to realize and reinvest savings in a broad range of programs.[52]

Exhibit 3. Population Health Measures Related to Prevention of Diabetes and Hypertension

To demonstrate accountability and assess effectiveness of these new models, population health metrics, beyond clinical measures, are needed and should be developed. As part of California's State Health Care Innovation Plan, the California Health and Human Services agency developed a list of health indicators that can be used to assess the impact of AHCs on population health.[54] These and other indicators for population health, which have focused on measuring the quality of multi-sectoral efforts, have been reorganized and grouped into 4 categories in Table 1: process/intervention measures, lifestyle/behaviors, health care access/quality, and population/community health outcomes.

Domains	Measures
Process/ Intervention Measures	Proportion of health care systems with policies or practices to refer persons with prediabetes or at high risk for type 2 diabetes to a CDC-recognized lifestyle change program (i.e., DPP)
	Number of persons with prediabetes or at high risk for type 2 diabetes who enroll in a DPP program
	Level of participation (i.e., number of DPP sessions completed)
	Percentage of population with access to CHW
	Percentage whose non-clinical needs (e.g., housing or transportation) are managed
Lifestyle/Health Behaviors	Proportion of population who meet physical activity guidelines
	Percentage of population who drank one or fewer sugary drinks yesterday
	Percentage who consumed recommended amounts of vegetables and fruit
	Adult smoking prevalence
Health Care Access/ Quality	Increased use of preventive services (e.g., at least one physician visit per year)
	Percentage of adult populations who had at least one blood pressure measurement, HbA1c test, and one LDL-C test per year
	Improved diabetes management (i.e., annual dilated eye exams, annual foot exams, kidney function testing/testing for protein in the urine, HbA1c and LDL-C testing)
	Level of adherence to CVD/anti-hypertension medication and other diet and exercise recommendations
	Percentage change in emergency room visits/hospitalizations for Ambulatory Care --Sensitive Conditions
Population/ Community Health Outcomes	Percentage of population who are obese or overweight in the targeted areas
	Number/percentage of people who achieved nationally recommended goal levels of lipids, blood pressure, HbA1c
	Reduced incidence, death, and disability due to diabetes, heart disease, and stroke in the implementation area
	Level of patient satisfaction with available programs, such as health home services
	Estimated cost savings to health care systems from coordination of care and chronic disease management

Note: Some of the measures were adapted from Community Programs Linked to Clinical Services: Resources for Diabetes and Hypertension, of the National Association of Chronic Disease Directors.

Payment Model Considerations to Sustain Effective Programs

The majority of these prevention models (interventions) are pilot studies funded by federal and state grants.[43] The sustainability of these types of programming depends on the development of long-term financing models. A shift away from fee-for-service payment to new payment methods could create new opportunities to fund and sustain these programs. There are numerous payment models being proposed or tested to support new care delivery models that improve quality and outcomes and that also lower costs. Payment models typically fall into the categories of capitation, episodes of care, shared savings, and pay for performance (Exhibit 4). Many models include some combination of these payment types to balance the incentives and disincentives inherent in each.[54] For instance, on October 14, 2016, the Department of Health and Human Services (HHS) issued its final rule with comment period to implement the Quality Payment Program that is part of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). MACRA will reform Medicare payments through Merit-Based Incentive Payment System (MIPS) and Advanced Alternative Payment Models (Advanced APMs).

Exhibit 4. Potential Payment Models for diabetes and Hypertension Prevention

Payment models	Description	Incentives
Fee for service (FFS)	ICD-10 to cover preventive and supportive care for addressing social determinants of health (e.g., factors influencing health status and contact with health services, and persons with potential health risks related to socioeconomic and psychosocial circumstances).	To deliver volume of services
Risk-adjusted or Capitated	Providers are paid a set amount for a distinct set of services (e.g., per member per month fee).	To deliver quality services
Pay for performance	Providers receive payments for meeting pre-established targets for care delivery and quality (often combined with other payment models).	Balance capitation and FFS incentives
Bundled payment	Provides a single payment for a set of clinically defined services related to treatment of a particular episode (e.g., myocardial infarction) or condition (e.g., diabetes) over a defined period of time.	Encourages various providers, including CHWs, to work together and invest in value-producing services
Shared savings (full-risk model)	Providers receive payments on the basis of savings they have achieved or are expected to achieve (e.g., Accountable Care Organization Model).	Similar to bundled payment
Population-based global budget	Providers receive a global budget for the population in a defined area. (e.g., Maryland established the rates paid to acute-care hospitals).	Similar to capitation

Observations and Recommended Actions

To promote population health, health systems, agencies, and providers could consider the following changes:

1. Use a more tailored definition of 'population' in identifying the target audience of an intervention. This definition could range from patients seeking care, to the population at risk, and finally to the entire population. Populations may be defined by geographic area, insurance enrollment, health care system, or other criteria.

2. Emphasize addressing social conditions (e.g., homelessness, food insecurity, and undiagnosed diabetes and hypertension in the community) through integration of clinical services, public health programs, and interventions targeted at upstream determinants of health. This will require establishing effective partnerships among medical care providers, social services, and public health agencies, as well as working with individuals, organizations, and businesses in the community. To facilitate these partnerships, an infrastructure that links clinical and population health activities among different sectors should be created (e.g., by establishing a community integrator team that specializes in working with social services, transportation, and housing authorities simultaneously to help clients).

3. Establish performance measures at the community/population levels to assess and track population health improvements. These performance measures can be used to assess the strengths and benefits of linking clinical and population health activities to help clients navigate public social services and the healthcare system in Los Angeles. To monitor individual as well as overall program performance, robust data-collection systems should also be strengthened – for example by encouraging the use of advanced electronic health records (EHR), population-based surveys, and other technologies (e.g., short message service/texting; GIS) in combination rather than by themselves to generate performance data.

4. Scale up proven and sustainable financial models through pooling of resources for health and social services programs and reimbursement. Of all U.S. health expenditures, it is estimated that only 3.1 percent went to public health agencies—$251 of $8,086 per capita health spending in 2009.[55] The reallocation of just a small fraction of health care funds to state and local health departments would significantly bolster public health capacity and preventive care. For instance, a population-based global budget for population health (e.g., wellness fund) could provide local health and public health systems the necessary resources to implement innovations and potentially cost-saving programs such as the DPP, community health workers, and the accountable health communities model.

Local Opportunities and Next Steps

On August 15, 2015, the County of Los Angeles Board of Supervisors approved the establishment of a single unified health agency (Health Agency) with the integration of the Department of Health Services, Department of Mental Health, and Department of Public Health to accomplish: 1) patient and community-centered health and health care, 2) population-based care and population-based community health, 3) evidence-based and evidence-informed treatment and prevention, and 4) accountable care and accountable community health. The integration of the three departments provides a unique opportunity to implement and test the models of prevention discussed in this policy note. A natural experiment can be carried out by integrating services and programs across departments to improve quality of care, promote population health, and reduce costs. To assess the success of these integrated efforts, Los Angeles could and should consider establishing a working group to identify key population health metrics, with a focus on utilizing the same metrics to gauge progress for the Health Agency and its partners (Federally Qualified Health Centers, public and private hospitals and health systems, commu-

nity-based organizations, and hospital community benefits programs). For these metrics to be meaningful, the stakeholders at the table should include schools, residents, patients, business leaders, and representatives of key sectors (e.g., transportation, education, housing, criminal justice, food systems).

Testing payment models for this region under the Health Agency infrastructure is another key opportunity and a focus area for Los Angeles. For example, the forthcoming Centers for Medicare and Medicaid Services reimbursement policy[56] and the recent proposed inclusion in California's Fiscal Year 17-18 budget of coverage for the National Diabetes Prevention Program through Medi-Cal both represent unprecedented opportunities to establish, refine, and solidify procedures that can be applied or used to support other prevention programs in the future.

Conclusion

Although the proposed actions described in this policy note are daunting, they do offer both the U.S. health care system and local health care agencies a unique opportunity to move toward a high-value, high-performing system that effectively treats and prevents illness and disease while promoting health and sustaining wellness for the entire population.

Methodology

This policy note was developed on the basis of extensive literature reviews and discussions with key leaders in the local health and public health systems.

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Endnotes

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