Resource Guide for
California Accountable Communities for Health (ACH)

A Review of Emerging Evidence On Interventions for Asthma, Diabetes, and Cardiovascular Care

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Introduction

It is widely recognized that improving population health will require extensive collaboration across many sectors including but not limited to health systems, health insurance plans, public health, education, housing, and transportation among others. There is an explicit need to address the underlying social and behavioral determinants of health through concerted actions that involve all of the above sectors. While the Accountable Care Organization (ACO) concept of providing financial incentives for individual care delivery organizations to keep their own patients healthy is a step in the right direction, it is insufficient for achieving community-wide population health (Noble & Casalino, 2013; Shortell, 2013). What is needed are incentives for improving the health of the entire population of a geographically defined community of people that cuts across any given provider organizations' own patient base.

Given the prevalence and cost of chronic illness, a useful starting point for such community-wide collaborative action is to address people with or likely to be diagnosed with asthma, cardiovascular disease, and diabetes. This Resource Guide is designed to assist those communities wishing to create a cross-sector "Accountable Community for Health" (ACH) entity that addresses one or more of these conditions. It provides a systematic review of the evidence to date for interventions focused on each of the three conditions organized by type of intervention and related characteristics such as ease of implementation, time to achieve impact, and scalability among others. The Guide reflects what is currently known at this point in time. It does not reflect interventions currently underway in which results will emerge in the future or, of course, those that may be in the planning stages. Thus, the Guide should be viewed as an evolutionary baseline against which to consider future interventions whose results will further populate the evidence-based matrix that is provided.

In particular, it is important to note several gaps in the current evidence base. Among the most prominent of these is the lack of information on the return on investment (ROI) for the interventions undertaken. Many of the studies did not include relevant information on the costs of implementing the intervention or on the economic benefits of the outcomes achieved. Further information on ROI will be particularly important for purposes of making community-wide investments that cut across different sectors.

A second area where more work is needed is on documenting the relative ease of implementing different interventions. This depends not only on the nature of the intervention itself but also on the capabilities of the implementing ACH. These include data collection, data analysis, and data sharing capabilities; cross-training of staff; and the extent to which the intervention can be rolled out sequentially and adapted as experience is gained.

A third gap in the evidence base to date is in regard to multi-faceted or "packaged" interventions that cut across different levels or categories such as combined clinical and community interventions. It is likely that population-wide initiatives will require such multi-faceted interventions. In the absence of a strong evidence base to date on such interventions, it may be that simulation models such as Rethink Health can be used to

assess the likely effects of such interventions (Hirsch et al., 2012). A key factor in such modeling may be the amount of investment in data infrastructure needed to coordinate such multi-faceted interventions across different conditions and community groups over time.

In the meantime, the evidence summarized in this Guide can serve as a starting point and provide an important baseline of information to guide ACHs in establishing their priorities for interventions likely to achieve desired results. This Guide also provides a framework with which to assess future intervention studies and, in that sense, is a living document to help chart progress over time.

Background

The California State Health Care Innovation Plan is designed to advance the triple aim of lower cost, better healthcare, and better health for all Californians through a number of inter-related initiatives. Among these is an Accountable Communities for Health (ACH) pilot program.

The ACH program would pilot a new population health model linking the healthcare system and community resources to improve health on a population-wide, community basis. A portfolio of interventions that span clinical, community, clinical-community linkages, system-policy, and environmental approaches to health and disease prevention is a core aspect of the ACH model. A Work Group convened by the California Health and Human Services Agency (CHHS) and the California Department of Public Health (CDPH) developed the following working definition of an Accountable Community for Health:

> *"An Accountable Community for Health is a multi-payer, multi-sector alliance of the major health care systems, providers, and health plans, along with public health, key community and social services organizations, schools, and other partners serving a particular geographic area. An ACH is responsible for improving the health of the entire community, with particular attention to achieving greater health equity among its residents.*
>
> *The goals of an ACH are to 1) improve community-wide health outcomes and reduce disparities with regard to particular chronic diseases; 2) reduce costs associated with the health care and, potentially, non-health sectors; and, 3) through a Wellness Fund, develop financing mechanisms to sustain the ACH and provide ongoing investments in prevention and other system-wide efforts to improve population health."*

In order to have an impact on the health of the community, the ACH must choose health improvement related interventions. Likely targets for an ACH will be prevalent chronic disease conditions like asthma, cardiovascular disease, or diabetes.

This resource guide was designed to help interested communities understand the current evidence based interventions at the clinical, community, clinical-community linked, system-policy, and environmental levels. These intervention levels are defined as follows.

- *Clinical services*: Services delivered by the health care system, including primary and secondary prevention, disease management programs, as well as coordinated care, provided by a physician, health team, or other health practitioner associated with a clinical setting.

- *Community and social services programs*: Programs that provide support to patients and community members. These can be based in governmental agencies, schools, worksites, or community-based organizations, such as the YMCA.

Community-based interventions frequently target lifestyle and behavioral factors, such as exercise and nutrition habits, and also include peer support groups and social networks.

- *Clinical-community linkages*: Mechanisms to connect community and social services and programs with the clinical care setting to better facilitate access to and coordination between healthcare, preventive, and supportive services. Interventions in the community-clinical linkages domain can help form strong bonds between community and healthcare practitioners and, ideally, involve bi-directional feedback systems between the two.

  In particular, there is growing evidence that Community Health Workers are effective in providing a bridge between the health care system and community resources and can help improve patient health outcomes and achieve savings. One of the Innovation Plan's six building blocks is workforce, and increased utilization of CHWs and other frontline workers is a key goal of that building block; a separate Workforce Work Group is exploring issues associated with how to expand the use of CHWs in the various initiatives. CHWs could play a number of critical roles in an ACH, and ACHs should strongly consider mechanisms for incorporating them.

- *Environment*: Social and physical environments that facilitate people being able to make healthy choices. Environmental interventions may include community improvements such as building parks or bike lanes, making farmers markets more available or transforming corner stores to carry more fruits and vegetables. Such environment changes aim to improve opportunities for physical activity, social connectedness, and support healthy behaviors.

- *Public policy and systems change*: Policy, regulatory and systems changes that affect how the health care and other systems operate and influence the overall ability for people to be healthy. These interventions can address environmental issues, school policies, health and social systems coordination, as well as financing to support prevention-related activities.

This report is intended as an easy-to-use resource to guide both the planning process and the implementation of ACHs. It outlines the evidence base for achieving health outcomes and, where available, return on investment (ROI) for various interventions associated with asthma, cardiovascular disease, or diabetes including the evidence base for the **portfolio of interventions** that span clinical and community domains and can accelerate achieving health outcomes and ROI for communities. The report assesses the strength of evidence for interventions with regard to health outcomes, return on investment/savings/cost, timeframe needed for the intervention to produce results, indicators of success or progress, and data needs/data sources. The work was guided by the following two sets of questions.

1. What is the evidence base for achieving health outcomes and ROI for various interventions associated with the three proposed chronic conditions and are there other conditions for which there is stronger evidence for outcomes?

2. What is the evidence base for a comprehensive set of interventions or portfolio of activities that span clinical and community domains and can accelerate achieving health outcomes and ROI? Where, if at all, has this type of comprehensive approach been implemented and for which conditions, and what evidence exists regarding the potential additive or synergistic affects with regard to health, cost outcomes, and equity?

While no research can expect to be comprehensive and include all current interventions available to individuals interested in improving health in a community, our approach follows a rigorous methodology and includes both the peer-reviewed and non peer-reviewed or "gray" literature published over the past ten years. These categories span the clinical, community, clinical-community, policy, and environment domains for the three chronic conditions of interest: asthma, cardiovascular disease, and diabetes. The discussion section describes implications of applying these interventions at the community level and addresses ways of implementing cross-institutional intervention approaches for Accountable Communities for Health.

Methods

The literature search aimed to systematically identify interventions associated with the three conditions proposed in the State Health Care Innovation Plan – asthma, cardiovascular disease, and diabetes. Additionally, a review of literature detailing evidence for programs, policies, and environmental approaches for obesity interventions not captured in clinical studies was conducted, focusing on evidence for improved outcomes to support their inclusion in an ACH.

Analytic framework. An in-depth review of both published and gray literature was undertaken to assess and outline the evidence base for interventions that achieve health outcomes and a ROI. The framework developed for assessing interventions is presented as Figure 1.

The review focused on assessing the strength of evidence for interventions with regard to five key areas:

1) **Health outcomes** – did the intervention improve health outcomes for the population of interest?
2) **Return on investment** – did the intervention demonstrate financial savings relative to the cost of implementation, and where applicable, customary systems, policies, or modes of care?
3) **Timeframe** – what period of time was needed for the intervention to demonstrate results, and could interventions be classified as short term (1-3 years), medium term (4-7 years), or long term (8-10 years)?
4) **Indicators of success or progress** – what measures or metrics indicated the intervention was effective?
5) **Data needs** – what data sources were needed to assess success, and how easily were such data available?

Figure 1. ACH Assessment Framework

Intervention Description	
Intervention Code	
Setting for Intervention	Clinical
	Community
	Community/Clinical Linkages
	Policy/Systems
	Environment
	Single
	Multiple

Ease of Implementation	Easy
	Intermediate
	Difficult
Strength of Evidence	Strong
	Limited
Time to Likely Impact	Short (1-3 years)
	Medium (4-7 years)
	Long (8-10 years)
Impact/Scalability	Outcomes
	ROI/Savings/Cost
	Data Needed
	Indicators of Success

Refining topic. Key questions of interest were formulated based on the scope of work prepared by the ACH Work Group, and informed by review of relevant background material and exploration of the body of literature describing the ACH model. Review objectives were defined using the PICOTS framework, noting the **p**opulation and **i**nterventions of interest, **c**omparator interventions, **o**utcomes of interest, **s**tudy timing, and **s**tudy setting.

Analysis. The research team queried PubMed for clinical and/or community interventions for asthma, cardiovascular disease, and diabetes, limiting the search to journal articles published January 2004 through August 2014. Queries identified the condition of interest, and the terms "intervention," "community," and "clinical". The initial PubMed search yielded 355 describing potential interventions for asthma, 606 describing potential interventions for cardiovascular disease, and 1,261 abstracts describing potential interventions for diabetes. Examples of journals and publications represented in the set of abstracts included: the American Journal of Cardiology, CHEST, the American Journal of Diabetes, Diabetes Care, the American Journal of Preventive Medicine, Public Health Reports, the Journal of General Internal Medicine, the European Journal of Public Health, JAMA, and the New England Journal of Medicine.

The potential abstracts were manually screened based on relevance, particularly target condition, type of intervention, and outcomes measured. To be eligible for review, abstracts had to describe and report the results of interventions addressing any of the conditions of interest (or systematically summarize the results of multiple studies). Of the 2,222 original potential abstracts, the list was pared to 144 'near-gold-standard' abstracts: 50 for asthma, 40 for cardiovascular disease, and 54 for diabetes.

The 144 ‘near-gold-standard’ citations were reviewed using the Figure 1 framework, and relevant data regarding the specific intervention(s) were summarized. Multiple reviewers assessed a subset of abstracts to assess inter-rater reliability with high agreement. Interventions were classified by type (e.g., educational, physical activity, pharmacist on the care team). The frequency of each intervention type was then tabulated, noting intervention pairs and sets presented concurrently where applicable. The quantitative data on intervention types were then aggregated and analyzed.

Analysis of the results of the systematic review were also informed by a review of reports and gray literature published on the web sites of Kaiser Permanente, NIH, AHRQ, IHI, and CDC, and six key informant interviews with experts in the implementation and study of Accountable Communities for Health (list of interviewees presented as Appendix 4).

Additionally, interventions were categorized on the strength of the evidence presented when possible, and into four preliminary domains: community, clinical, community-clinical linkages, system-policy, and environmental level. Any studies in which multiple interventions were used to produce overall health outcomes and an ROI were noted, in an attempt to ascertain whether evidence exists for calculating an ROI based on a portfolio of simultaneously implemented interventions, rather than individual ones and to determine where, if at all, this type of comprehensive approach has been implemented.

The study team also sought to determine what if any evidence exists regarding the potential additive or synergistic effects of multi-focal interventions with regard to health and cost outcomes. Where relevant, an attempt was made to assess what is known about which combinations of strategies can intensify the strength and reach of either/all when implemented in conjunction with one another, and to identify conditions for which strong evidence exists for a portfolio approach amplifying intervention “dose” with respect to ROI and health outcomes. Research regarding “dose” suggests that the dose of a particular intervention can be increased when complementary strategies target the same defined population.

Finally, the study team sought to assess whether evidence existed that any of the selected intervention approaches might help influence a “norms change,” particularly among health care stakeholders.

Literature Review Findings

Overview

The findings are organized from a broad, system level perspective down to individual interventions and conditions. Abstracts were reviewed that contained single or multi-faceted interventions and approaches, including meta-analysis, and multi-level interventions. After completing a multi-stage process that reduced the number of condition specific abstracts, we defined a set of twenty health intervention categories that summarized the most promising interventions across the three conditions (asthma, cardiovascular disease, and diabetes). We display these twenty categories and describe them in Appendix 1. The section "summary of intervention category levels" describes how our twenty intervention category types correlate to the intervention levels (clinical, community-based, clinical-community linkages, systems-policy, and environmental) and how interventions may involve different degrees of complexity. Tables 1 through 3 describe condition specific promising interventions for asthma, cardiovascular disease, and diabetes respectively. An additional summary of intervention examples targeting obesity completes the findings section. A comprehensive list of the 144 abstracts divided by condition for asthma, cardiovascular disease, and diabetes can be found in Appendix 2.

Summary of Intervention Category Levels

Below we briefly describe five levels of interventions and health interventions associated with each category. The level of complexity generally increases as interventions broaden in scope from clinical focused to community focused to clinical-community linkages, and finally system and environmental level changes.

Clinical interventions primarily consisted of strategies that aim to modify clinical processes, target either the provider or the patient in behavior changes, or focus on changes to the provider and patient interactions. Among single focus interventions, provider training could include education about the target condition or dissemination of practice guidelines through written materials, practice coaching, and continuing medical education sessions. Several interventions also promote shared decision making with slight variations depending on the condition. More comprehensive, clinic-based strategies include the medical home and the chronic care model (e.g., a whole-person focus, team-based care, and coordination across providers). Clinic-based disease management interventions were identified in the abstracts as well.

Community based interventions include community and social services to support community members. Intervention locations may include community-based non-profit organizations, churches, schools, and individual homes. Community-based interventions frequently target lifestyle and behavioral factors. Exercise and nutrition habits are particularly important building blocks of good health. Peer support groups and social networks are a common community-based intervention approach, though web-based Internet alternatives are emerging vehicles for health tracking and patient education.

Interventions that are culturally tailored and also address mental and emotional well-being likely have greater impact.

Clinical-community linkages interventions involve both health-care teams and community resources, ideally with bi-directional feedback systems. These linkages help ensure more people have access to healthcare, preventive, and supportive services both in the doctor's office and in the communities where they live. More focused clinical-communities linkage interventions may include using a pharmacist as part of the care team either in the clinic or in a community (e.g., drugstore) setting; assigning a nurse case manager to assist patients between physician visits and help connect them to community resources; and telephone-based support. Additional clinical-communities linkage interventions include the use of community health workers/ lay health workers, patient and caregiver education, population health screenings, and school-based care.

System-policy interventions aim to improve broader physical and social environments to make healthy decisions and behaviors easier to fulfill. Policies may include legal and regulatory changes to promote community development or change healthcare payment structures. Development of multi-stakeholder community collaboratives may help influence systemic issues and can advocate for policy changes. Taxes, subsidies, prohibitions, and incentives are examples of policy tools that governments can implement to shape health choices.

Environmental interventions utilize the structure of the physical, social, or built environment of communities to impact the health of individuals or populations. Environmental interventions may include community improvements such as building parks or playgrounds or adding streetlights with the aim of improving physical activity, social connectedness, and mental health.

Table 1: Condition Specific Interventions - Asthma [*]

Several communities and health systems have developed promising interventions to control asthma. Common strategies include deployment of community health workers or health coaches (5, 6) and home visits (7). Approaches are commonly multidisciplinary (4). Toolkits to help healthcare organizations enhance asthma management as well as national education and prevention guidelines (3) are also available. One intervention considers cultural sensitivity by focusing on bilingual education materials (2).

The Allies Against Asthma project, a collaborative effort by coalitions in seven regions to address childhood asthma, is an evidence-based multi-faceted regional intervention example. The collective focus was to make health care more coordinated, systematic, and community-wide. Strategies included training for children, families, community-based organizations, and health providers as well as advocating for policy changes to improve

[*] Numbering in text corresponds with intervention numbering in "Promising, Condition Specific Interventions" tables.

indoor and outdoor environments and ensure adequate access to care and resources for asthma control (Clark et al., 2006). Program evaluation found that overall, coalitions did successfully implement policy and systems changes and children in Allies communities experienced significantly fewer symptoms and were significantly less likely to have an asthma-related hospitalization, ED visit, or urgent care visit than children in comparison communities (Clark et al., 2006; Clark et al., 2013).

Table 2: Condition-Specific Intervention - Cardiovascular Disease

Evidence for interventions targeting cardiovascular disease is strong, in particular among interventions implemented at the community level. Several interventions address weight loss, blood pressure (1, 2, 3), and cholesterol (4), or include physical activity programs (2, 3, 6), while others focus on improving physical activity, functioning, and ability to perform activities of daily living (5) by reducing disability resulting from heart conditions, in turn improving cardiovascular health. Clinical-community linkage interventions to reduce CVD relied most significantly on community pharmacists (4) and nurse care managers (5).

Most studies describing interventions for CVD report results in a short timeframe (1-3 years), and while very few studies report ROI, impact on health care expenditures is favorable when reported.

Among interventions targeting CVD, data needed to implement interventions and monitor their success is observational (e.g. monitoring of improvement in physical activity or functional status, patient reported outcomes) or clinical (e.g. lipid values, blood pressure, or BMI).

Table 3: Condition Specific Interventions - Diabetes

Most diabetes interventions in the literature review used education through group settings to promote better health and disease management. In particular, the original Diabetes Prevention Program (DPP) was a clinic-based intervention that showed substantial, long term impact (3) and several programs have translated this program to community settings (7, 4, and others). Nurse care managers and community health workers have an important role in promoting diabetes prevention and management (1). Culturally relevant classes (6), involving family support (5), and leveraging faith-based networks (4) are also valuable considerations for program design. Education can also be delivered by telephone or through other forms of communication (2).

All diabetes interventions demonstrated some impact within 1-3 years or less, however less is known about the sustainability of lifestyle changes. The original Diabetes Prevention Program suggests changes can be sustained long term and are cost effective from a payer perspective (3). The DPP's intensive lifestyle intervention focused on weight loss and physical activity for patients with pre-diabetes outperformed both

placebo and metformin interventions. DPP participants reduced their risk of developing diabetes by 58% compared to the placebo group, while participants taking metformin reduced risk of diabetes by 31% compared to the placebo group (3).

Interventions Targeting Obesity

To augment the literature search aimed to systematically identify interventions associated with asthma, cardiovascular disease, and diabetes, a separate review of literature detailing the evidence for programs, policies, and environmental approaches for obesity interventions not captured in clinical studies was also conducted. National experts in community-based prevention programs were consulted, who in turn recommended key publications describing high-value interventions addressing obesity. Publications were reviewed focusing on evidence for interventions reporting improved outcomes, noting in particular those interventions that may benefit from or contribute a dose-additive effect with interventions otherwise recommended for inclusion in an ACH.

Two categories of interventions emerged as demonstrating strong evidence for moderate or better success—combined diet and physical activity interventions implemented at the community level and neighborhood and community improvement projects targeting the community environment.

Combined diet and physical activity interventions were particularly effective at preventing obesity when conducted in the community with a school component (Bleich, Segal, Wu, Wilson & Wang, 2013) and notably were the most effective school based interventions to prevent weight gain in children (Brennan, Castro, Brownson, Claus & Orleans, 2011).

Neighborhood and community improvement projects such as safe routes to school, improved or expanded availability of parks and playgrounds, and point of decision prompts such as signs encouraging stair use also demonstrated evidence for significant impact on treating and preventing obesity (Brennan, Brownson, & Orleans, 2014).

Of special note, school-based and environmental interventions were particularly successful among low socioeconomic status individuals at risk of obesity (Beauchamp, Backholer, Magliano & Peeters, 2014), and highly synergistic with interventions targeting asthma, cardiovascular disease, and diabetes, suggesting both a potential spillover effect of interventions targeting the three conditions proposed in the State HealthCare Innovation Plan and the possibility of communities' selecting or prioritizing multifocal interventions based on available resources or need.

Summary

Overall, the studies with the strongest evidence base were primarily single focus/easier to implement, short-term impact (one to three years), and targeted the community or clinic-

communities linkages. Of the three focus conditions reviewed (asthma, cardiovascular disease, and diabetes), strong strength of evidence studies were most commonly reported for diabetes-focused interventions (about four out of five), and less frequent among asthma studies (about half). The fact that nearly all studies (about 90%) were designed for short-term likely impact in one to three years coincides with one interviewee's observation that impact or savings within one year are definitely possible for interventions at a focused, project level, but larger health initiatives will require a longer time frame to achieve a desired return on investment.

The most common interventions were lifestyle/behavioral, pharmacist on the care team, community health worker (CHW)/ lay health worker, and education of the patient or caregiver. However, an ACH may want to consider multiple approaches in order to increase the intervention "dose." Interventions commonly found as part of multi-component strategies included primary care quality improvement efforts, exercise, a community collaborative, nurse care managers, and school-based initiatives.

Key Informant Interview Findings

In the fall of 2014, six healthcare system experts with prior experience of accountable communities for health concepts were interviewed (interviewees are listed in Appendix 4). A semi-structured one-hour interview protocol was used and both notes and transcription of the one-hour interviews were analyzed. Some common themes that emerged from these interviews included the importance of the super-convener role, participant engagement, and alignment and collaboration. One of the strongest and most emphasized success factors described were data needs, both in terms of patient registries as well as data analytic ability across a region. Prior relationships and previous work experience in cross collaborative work was seen as essential for the successful implementation of an Accountable Community for Health. Some of these and related major themes are highlighted below.

Defining Size: Community based healthcare collaborative work

A community may be less defined by the number of people, and more by where the locus of decision and control is around health related issues. For example, with Rethink Health, communities tend to be around 100,000 people, but size is driven by hospital referral regions rather than the population count.

Activating providers and patients for health in the community

The importance of community and patient activation was emphasized. This was described in terms of "healthcare ecosystem activation" needed on a regional basis. The importance of bringing participants together to review the literature, review guidelines, and build their own versions was mentioned. Pilot sites that used guidelines where participants had the opportunity to provide feedback were more engaged because the guidelines were not perceived as imposed on the community.

Achieving short term financial ROI is hard to do at the community level

Some health systems don't like the term "captured savings," so it is important to be careful about language. Terms like "savings" and "rebalancing investment" tend to be more agreeable. It is important to ensure that the hospital leadership involves legitimate voices in the community and invests upstream. Reliance on a large, single source of funding can be risky if grant money is not invested to generate new funds, as the collaborative may perish when grant money runs out.

Where do you start? Evidence based interventions? Guidelines? Disease states?

Some interviewees believed that if you start from a behavior standpoint of exercise, eating well and tobacco use, the savings will not accumulate fast enough to achieve the return on investment that CMMI is looking for. It might be better to focus on disease state work and preventing avoidable admissions and re-admissions. It was also noted that new disease surveillance methods might actually increase prevalence in the early years, rather than reduce it. It is important to make the connection between disease specific approaches and overall community health indicators.

Financing and short-term ROI is challenging at the community level

The importance of convening aligned leader organizations through developing common goals, pooled financing, shared outcomes, and shared best practices was emphasized. Accountable Communities for Health need to address issues such as childhood obesity, but should not expect a quantifiable short-term financial ROI from those efforts.

Are there other conditions for which there is stronger evidence for outcomes?

Alcohol related car crashes and domestic violence were mentioned in regard to the above question. Preterm birth and reproductive health were also mentioned as areas for attention. Environmental tobacco smoke and air pollution are also critical challenges for healthy community initiatives.

Clear goals that span organizational boundaries and are supported by data

Combining the reality of competition with cooperation was mentioned and labeled "coopetition." This framework helps to set the agenda, bringing people together around a shared goal. Developing metrics to judge performance against goals was emphasized, requiring the development of a data infrastructure.

Strong data analytic and exchanges

All of the experts interviewed by our team members mentioned the importance of a robust clinical data information exchange system. A strong regional health information exchange is important. Being able to aggregate data from various sources is key. "Region wide patient registries are critical to ensuring seamless data exchange," one responded said. Another sees a shared EMR as a critical baseline before trying an Accountable Community for Health.

Super-convener and stewardship role

The role of a super-convener is to act as a catalyst and facilitator. There is such a thing as a "good start," and it can be valuable to have a **neutral champion,** i.e., retiring chief executive of a community hospital. It is important that this champion is not likely to be seen as representing their institution, but rather is typically a wise physician who has been around for a long time and can speak with moral authority. The neutral champion also does not necessarily champion a particular problem or clinical condition. It is important for conveners to set aspirations and not just to focus on solving a particular problem.

Stewardship involves leading the group as a whole, not representing particular institutions. The role of a stewardship group is to gather participants around a table that have roughly 80% of decision making in their hands.

The **neutral convener role** is an entity that doesn't pay for care, deliver care or purchase care, but provides the environment to have these conversations. In one group, the neutral convener provided space for guideline workgroups and invited citizens and patient representatives to participate. In addition, the neutral convener created an **advisory council** where citizens from different organizations are asked to review the guidelines for patient usability.

Having a trusted "backbone organization," typically a community foundation, is important. Also, having a city council member or mayor behind the initiative will help, but the initiative should be sustainable after changes in leadership.

Pre-existing collaborations and partnerships are important for success

Prior collaboration between members and stakeholders is helpful. Strong communication and collaboration vehicles that are well-established helps improve coordination. In addition, improving the interface that enhances organizational alignment between healthcare-healthcare and community-healthcare organizations takes time. Many interviewees mentioned that pre-existing relationships between participants is important.

Focusing on learning helps engagement of participants

When launching an initiative like an Accountable Community for Health, experiments are meant to teach something about how to move forward. Taking a learning/ experimentation stance as a norm is key to establishing successful collaboration. Several experts mentioned the use of data analysis or patient registry building as activities that promoted learning and alignment among partners.

Having all success factors present is important, not just being good at any one of them

It is important to have all the factors for success; data infrastructure, convener role, good relationships, shared goals, collective investment, organizational alignment, health information exchanges, and “coopetition.”

Concluding Discussion

Based on our research, the intervention categories identified are a starting point for beginning collaborative discussions. However, successful efforts will need to build on strong relationships between providers and community members and across sectors. The capabilities of the community coalitions or "integrator" or "backbone" organizations need to align with the requirements and demands of the interventions to be implemented. A useful framework to consider these requirements is that offered by Relational Coordination (RC) (Gittell, 2006). This framework identifies seven dimensions needed for successful collaborative work. These include shared goals, shared knowledge, mutual respect, accurate, timely, and frequent communication and communication that is focused on problem solving. Communities might want to assess themselves on these seven dimensions to identify strengths as well as areas for improvement as they consider becoming Accountable Communities for Health (ACH).

There is also a developing literature on the characteristics of effective community wide population health initiatives. For example, evaluation of the 25 Community Care Networks (CCN) sponsored by the Health Research and Educational Trust (HRET) of the American Hospital Association (AHA) and funded by the Robert Wood Johnson Foundation, the W.K. Kellogg Foundation, DHSS, and the California Wellness Foundation (among others) identified six characteristics that separate the high performing communities from those that did less well (Shortell et al., 2002). These included; 1) the ability to manage both scale and diversity – to have sufficient size to exert leverage and at the same time to manage the diversity of community organizations and groups typically associated with the large size; 2) multiple component leadership – involving core individual "champions"; an organizational driver such as a widely respected local institution; and subsidiary leadership emphasizing the empowerment of those with the necessary expertise closest to the decision to be made; 3) maintaining focus on priorities; 4) managing and channeling conflict by anticipating problems and trouble spots; 5) recognizing life cycles involving when to know it is time to "hand off the baton" to another person or organization better able to deal with a given issue; and 6) the ability to "patch" – that is, to re-position assets, competencies, and resources to address changing needs and priorities. Our interviews with expert informants reinforced the importance of many of the above practices particularly in regard to obtaining buy-in from the necessary cross-sector leaders and having the necessary information to facilitate coordination and evaluation. A recent report on hospital-public health partnerships provides further support for the above findings (Prybil, Scutchfield, and Killian et al., 2014).

Finally, as ACHs will want to consider multiple approaches to increase the intervention "dose," the evidence for the effectiveness of multi-faceted interventions is of particular relevance. Though it is commonly believed that multifaceted interventions are more effective than single-component interventions at improving the health of populations, there is limited evidence for this to date (Squires, Sullivan, Eccles, Worswick & Grimshaw, 2014). The exceptions appear to be in regard to bundled interventions involving primary care quality improvement efforts, interventions promoting physical activity, community collaboratives for health, and the inclusion of nurse care managers in health promotion strategies, and in school-based initiatives. In addition to dose, ACHs may wish to consider bundled intervention strategies where the 'spillover' of interventions targeted to a single condition to other related conditions is likely. Investing in start-

up costs and infrastructure that can support multiple interventions can reduce the marginal costs associated with implementing further interventions, and, thus, increase the effective return on investment of the overall intervention-set.

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Clark, N. M., Lachance, L. L., Benedict, M. B., Doctor, L. J., Gilmore, L., Kelly, C. S., … Wilkin, M. (2013). Improvements in health care use associated with community coalitions: Long-term results of the Allies Against Asthma initiative. American Journal of Public Health, 103(6), 1124-1127.

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Shortell, S. M. (2013). Bridging the divide between health and health care. JAMA, 309(11), 1121-1122.

Squires, J. E., Sullivan, K., Eccles, M. P., Worswick, J., & Grimshaw, J. M. (2014). Are multifaceted interventions more effective than single-component interventions in changing health-care professionals' behaviours? An overview of systematic reviews. Implementation Science, 9, 152.

Table 1. Promising, Condition Specific Interventions - Asthma

Intervention	Description	Time frame	Health Outcomes	ROI	Ease of Implemen-tation	Indicators of success	Data needs	Citation
Clinical								
1. Pharmacist-delivered guideline asthma care program	Based on an evaluation of each patient's inhaler technique and adherence to controller medications, pharmacists sent to the prescriber a fax containing a recommendation for patients with proper technique and appropriate adherence to prescribed controller medications.	1-3 Years	Emergency Room use, inhaler techniques, medication usage.	Not reported	Intermediate	Decreased emergency department use, improved self-management	N/A	E. Laufenberg-Horstmann, E. DeVore and K. Bassuener "The Coulee Region Community Pharmacy Asthma Intervention Study." J Amer Pharm Assoc.46.6 (2006): 738-46.
2. Bilingual Asthma Approach	A bilingual education program, including brochures, was developed for asthma patient education in an interdisciplinary clinical practice.	1-3 years	Trigger-related knowledge, trigger reduction behaviors and allergen or exposure levels, and asthma-related health outcomes: change in lung function, medication use, asthma symptoms, activity limitations,	Not reported	Intermediate	Decreased asthma symptoms, daytime activity limitations, and emergency and urgent care use	N/A	J. Postma, C. Karr and G. Kieckhefer " Community health workers and environmental interventions for children with asthma: a systematic review" J Asthma 46.6 (2009): 564-76.

3.Improving asthma care for high-disparity populations through a safety net practice-based research network	Increase compliance with national asthma care guidelines in primary care safety nets	1-3 years	Quality of life Improvement	Not reported	Intermediate	Enhanced guidelines implementation and adherence to guideline specifications	Intervention data needs include: resources (asthma kits including peak flow meter, MDI spacer device, asthma flow sheets and standing orders).	E. C. Daniels, J. Bacon, S. Denisio, Y. W. Fry, V. Murray, A. Quarshie and G. Rust "Translation squared: improving asthma care for high-disparity populations through a safety net practice-based research network" J Asthma. 42.6 (2005): 499-505.
Community								
4. Boston Children's Community Asthma Initiative	Proactive community based asthma services, multi-disciplinary, coordinated disease management programs to prevent costly complications and hospitalizations	1-3 years	Reduced ED visits, Improved quality of life	Significant	Intermediate	Reduced cost, improved quality of life	Not Reported	U. Bhaumik, K. Norris, G. Charron, S. P. Walker, S. J. Sommer, E. Chan, D. U. Dickerson, S. Nethersole and E. R. Woods. "A cost analysis for a community-based case management intervention program for pediatric asthma." J Asthma 50.3 (2013): 310-317.
5. Asthma Medical Home Intervention	Ensuring a scientific basis for community interventions for asthma		Decreased blood pressure, BMI	Not reported	Intermediate	Improved lung function but not self-reported asthma control	Clinical Outcomes	L. P. Boss, D. Evans, C. Ramos-Bonoan, W. Liao, V. Taggart and S. C. Redd. "Ensuring a scientific basis for community interventions for asthma." Int J Hyg Environ Health. 208.1-2 (2005): 21-25.

Clinical-Community								
6. Waianae Coast Comprehensive Health Center community-based health worker asthma management	Developed an asthma tracking system, established culturally sensitive standards of care based on the National Asthma Education and Prevention Program (NAEPP Guidelines), and used team-based care with community health workers.	1-3 years	Improved utilization patterns, decreased costs, increased quality of life	Not reported	Intermediate	Improved utilization patterns, decreased costs, increased quality of life	Tracking system, standards of care	S. Beckham, D. Kaahaaina, K. A. Voloch and A. Washburn. " A community-based asthma management program: effects on resource utilization and quality of life." Hawaii Med J. 63.4 (2004): 121-126
Policy-System								
7. Effectiveness of home-based, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity: a community guide systematic review	Home-based, multi-trigger, multicomponent intervention aimed at changing policy for environmental impacts on Asthma	1-3 years	Emergency Room visit reduction, reduced asthma symptom reduction	Not reported	Intermediate	Reduction of asthma symptoms	Self-Reported	D. D. Crocker, S. Kinyota, G. G. Dumitru, C. B. Ligon, E. J. Herman, J. M. Ferdinands, D. P. Hopkins, B. M. Lawrence, T. A. Sipe and S. Task Force on Community Preventive. " Effectiveness of home-based, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity: a community guide systematic review." Am J Prev Med. 41 (2011): S5-32.

Environment								
8. Improvements in health care use associated with community coalitions like allies against asthma initiative	Critical Environmental Factors related to Asthma in low-income communities. Regional approach: Policies to reduce asthma in vulnerable communities	1-3 years	Significant reduction in healthcare use for asthma in vulnerable populations	Not reported	Intermediate	Hospitalizations emergency department (ED) use, and physician urgent care visits	N/A	N. M. Clark, L. L. Lachance, M. B. Benedict, et al. "Improvements in Health Care Use Associated with Community Coalitions: Long-Term Results of the Allies Against Asthma Initiative. AJPH. 103.6 (2013): 1124-1127.

Table 2. Promising, Condition Specific Interventions - Cardiovascular Disease

Intervention	Description	Time frame	Health Outcomes	ROI	Ease of Implemen-tation	Indicators of success	Data needs	Citation
Clinical								
1. Health Living Pharmacy (HLP)	Delivering health and wellbeing services through community pharmacies, tailored to the local requirements for tackling health inequalities	1-3 years	Prevention of Cardiovascular Disease (and prevention or improved treatment of hypertension and diabetes)	Not reported	Intermediate	Improved general health, maintaining health of chronically ill.	Observational, Clinical	Brown, David, Jane Portlock, and Paul Rutter. "Review of services provided by pharmacies that promote healthy living." *International journal of clinical pharmacy* 34.3 (2012): 399-409.
Community								
2. Physical activity and weight loss	Translating weight loss and physical activity programs into the community to preserve mobility in older, obese adults in poor cardiovascular health	1-3 years	Mobility, weight loss	Not reported	Easy	Improved mobility as measured by time needed to complete a 400m walk	Observational	Rejeski, W. Jack, et al. "Translating weight loss and physical activity programs into the community to preserve mobility in older, obese adults in poor cardiovascular health." *Archives of internal medicine* 171.10 (2011): 880-886.

3. Comprehensive therapeutic lifestyle changes (TLC)	Participation in a community-based program of TLC, including exercise training, nutrition, weight management, stress management, and smoking cessation interventions	1-3 years	Decreased blood pressure, BMI	Not reported	Intermediate	See Health Outcomes	Clinical	Bavikati, Venkata V., et al. "Effect of comprehensive therapeutic lifestyle changes on prehypertension." *The American journal of cardiology* 102.12 (2008): 1677-1680.
Clinical-Community								
4. Multidisciplinary, pharmacy-focused partnership to improve cardiac wellness	An educational intervention regarding cardiovascular risk and cholesterol (lipid) management in a community-based senior population.	1-3 years	Changes in CV risk profile, specifically, total cholesterol, low-density lipoprotein (LDL-C), high-density lipoprotein (HDL-C), triglycerides (TG), blood glucose levels	Not reported	Intermediate	See Health Outcomes; improved lipid/glucose screening	Clinical Outcomes	Miller, Susan W., et al. "Outcomes of a multidisciplinary partnership to improve cardiac wellness: an opportunity for pharmacists." *The Consultant Pharmacist* 25.2 (2010): 105-116.

5. Health promotion nurse intervention for elderly adults with heart conditions	A multi-component health promotion nurse intervention for community-living Medicare beneficiaries with heart conditions.	1-3 years	Improved physical functioning and reduced health expenditures	Average total health care expenditures were 6.5% ($1,981, 95% CI: -$8,048, $4,087) lower in the nurse group.	Intermediate	Fewer impairments to ADLs, reduced total health care expenditures	Medicare data, ADL/IADL	Meng, Hongdao, et al. "Impact of a health promotion nurse intervention on disability and health care costs among elderly adults with heart conditions." *The Journal of Rural Health* 23.4 (2007): 322-331.
Policy-System								
6. Policy and environmental interventions that promote physical activity and nutrition for cardiovascular health	Interventions to increase stair use, access to places for physical activity, school based physical activity, and nutrition.	1-3 years	Increased physical activity, improved nutrition.	Not reported	Easy	See Health Outcomes	Observational	Matson-Koffman, Dyann M., et al. "A site-specific literature review of policy and environmental interventions that promote physical activity and nutrition for cardiovascular health: what works?." *American Journal of Health Promotion* 19.3 (2005): 167-193.
Environment								
6. Policy and environmental interventions that promote physical activity and nutrition for cardiovascular health	Interventions to increase stair use, access to places for physical activity, school based physical activity, and nutrition.	1-3 years	Increased physical activity, improved nutrition.	Not reported	Easy	See Health Outcomes	Observational	Matson-Koffman., et al. "A site-specific literature review of policy and environmental interventions that promote physical activity and nutrition for cardiovascular health: what works?." *American Journal of Health Promotion* 19.3 (2005): 167-193.

Table 3. Promising, Condition Specific Interventions - Diabetes

Intervention	Description	Time frame	Health Outcomes	ROI	Ease of Implementation	Indicators of success	Data needs	Citation
Clinical								
1. Nurse Practitioner/CHW Teams	A nurse practitioner/ CHW team provided education and behavioral counseling for lifestyle modification; pharmacologic management; and between visit telephone follow-ups	1 year	HbA1c Blood Pressure Cholesterol	Cost per patient: $627 Cost effectiveness (per 1% decrease): $157 systolic BP $149 HbA1c $40 LDL	Intermediate	See Health Outcomes	Clinical & Observational	J. K. Allen, C. R. Dennison Himmelfarb, S. L. Szanton and K. D. Frick. "Cost-effectiveness of nurse practitioner/community health worker care to reduce cardiovascular health disparities" *J Cardiovasc Nurs* (2014).
2. Outsourced telephone-based diabetes educator	A telephone-based diabetes educator provided counseling services with action plans. (Outcomes were compared to a similar clinic-based approach)	2 ½ years	HbA1c Blood Pressure Cholesterol	Not measured. Interventions did not provide additional financial resources.	Intermediate	See Health Outcomes + -Patient recall of action plan -Patient experience	Clinical & Observational	M. S. Wolf, H. Seligman, T. C. Davis, D. A. Fleming, L. M. Curtis, A. U. Pandit, R. M. Parker, D. Schillinger and D. A. Dewalt. " Clinic-based versus outsourced implementation of a diabetes health literacy intervention." *J Gen Intern Med* (2014).

Community								
3. Diabetes Prevention Program	Intensive, group-based intervention to prevent full onset of diabetes by promoting lifestyle changes, particularly physical activity and weight loss.	<1 year	Weight loss Physical Activity HbA1c	"Over 10 years, from a payer perspective, lifestyle was cost-effective and metformin was marginally cost-saving compared with placebo."	Difficult per protocol due to training and intensity specifications	See Health Outcomes, Time to Onset of Diabetes	Clinical & Observational	Knowler WC, Barrett-Connor E, Fowler SE et al. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. (2002): 393-403. Diabetes Prevention Program Research Group. The 10-year cost effectiveness of lifestyle intervention or metformin for diabetes prevention. *Diabetes Care* (2012): 723-730
4. Fit Body and Soul	Behavioral, faith-based diabetes prevention program using community-based participatory approach (church ministers trained to deliver intervention)	< 1 year	Weight loss	Not measured	Easy	See Health Outcomes	Observational	S. Dodani and J. Z. Fields. "Implementation of the fit body and soul, a church-based life style program for diabetes prevention in high-risk African Americans: a feasibility study." *Diabetes Educator*, (2010).

5. Dyad-based health behavior intervention for high-risk Latinas	Mother-daughter dyads attended group meetings, and received home visits and phone calls with a community lifestyle coach	1-3 years	Weight loss Diet (glycemic load & saturated fat)	Not measured	Easy	See Health Outcomes, Report of Social Support	Observational	D. H. Sorkin, S. Mavandadi, K. S. Rook, K. A. Biegler, D. Kilgore, E. Dow and Q. Ngo-Metzger. " Dyadic collaboration in shared health behavior change: the effects of a randomized trial to test a lifestyle intervention for high-risk Latinas." *Health Psychology*, (2014).
Clinical-Community								
6. Project Dulce	Nurse care management and peer-led self empowerment training	1-3 years	HbA1c Blood Pressure Cholesterol	Not statistically significant, but economically meaningful	Intermediate	See Health Outcomes	Clinical & Observational	T. P. Gilmer, A. Philis-Tsimikas and C. Walker. " Outcomes of Project Dulce: a culturally specific diabetes management program." *Annals of Pharmacotherapy*, (2005).

7. Group Lifestyle Balance Program	A community-based adaptation of the Diabetes Prevention Program	1-3 years	Weight loss Glucose Cholesterol Blood Pressure	Not measured	Intermediate	See Health Outcomes	Clinical & Observational	M. K. Kramer, J. R. McWilliams, H. Y. Chen and L. M. Siminerio. "A community-based diabetes prevention program: evaluation of the group lifestyle balance program delivered by diabetes educators." *Diabetes Educator* (2011).
Policy-System								
None identified in literature review, however interventions from obesity/nutrition scan tend to overlap with diabetes prevention strategies.								
Environment								
None identified in literature review, however interventions from obesity/nutrition scan tend to overlap with diabetes prevention strategies.								

Appendix 1. Accountable Communities for Health Interventions Categories

Interventions from the 144 abstracts reviewed were classified into 20 intervention categories. The interventions categories are divided into the clinical, community, clinical-community linkages, and system-policy/environment domains and are also divided into whether the intervention is single or multi-dimensional. Reading the table from left to right, the table's intervention settings increase in complexity, level, and scope from clinically based to system-policy wide. Reading from top to bottom, interventions at the top are either single interventions, or target a single condition. The interventions further down represent an increasing amount of complexity, i.e., multiple conditions, or multiple interventions, as well as becoming harder to implement in terms of cost, time, or multi-stakeholder engagement. In summary, interventions at the top left of the table are the simplest, targeted, and easiest to implement type of interventions while interventions at the bottom right of the table signify complex, multi-stakeholder, more expensive, larger scale type interventions. A description of the intervention categories with reference to examples from the literature review follows the table.

Interventions Categories Summary Table

	Clinical Interventions Health systems interventions to more effectively deliver quality preventive services and treatment and help patients more effectively access, use and benefit from those services	**Community Interventions** Community and social services that provide support to patients and community members. These can be in schools, worksites or community-based organizations.	**Clinical Community Linkages** Clinical-Community linkages to help ensure more people have access to healthcare, preventive, and supportive services both in the doctor's office and in the communities where they live. Clinical-Community linkages can help form strong bonds between community and healthcare leaders to work together. Ideally, there is a bi-directional feedback systems between the two.	**System-Policy/ Environment** Improvements in social and physical environments to make healthy behaviors easier and more convenient for Americans. Policy includes legal and regulatory changes to change incentives in the health care delivery system and improve systems and environments
Single (One intervention and/or targeting one condition)	Primary Care QI (7) Provider training (4) Shared decision making & motivational interview (2)	Lifestyle/behavioral Intervention (29) Exercise (10) Nutrition (3)	Pharmacist on the care team (20) Nurse care manager (6) Telephone-based support (3)	
Portfolio (Addresses multiple conditions and/or uses multiple approaches, e.g., structural, process, cultural, technology, etc.)	Medical home, chronic care model (4) Disease Management (1)	Web-based/Internet (3) Social Network (2)	Community health worker (CHW), lay health worker (25) Education Intervention (for patients & caregivers) (23) Health screenings (1) School-based (5)	Community collaborative (11) Built environment (4) Government policies (1)

Increasing in complexity

Increasing in complexity

* The (#) after the category name indicates number of abstracts assigned to that category. Some abstracts were assigned to multiple categories.

Interventions Categories Summary Descriptions

Note: Citations in brackets refer to Appendix 2, list of key articles.

Clinical

Primary care QI

Primary care quality improvement strategies modify clinic processes to target the health condition.

For example, in a review of 3 studies [ASTH-9], asthma clinic participants experiences fewer exacerbations leading to hospitalization, less use of reliever and preventer medication and improved quality of life.

Provider training

Provider training includes any activity to educate providers about the targeted condition and current practice guidelines. Training may include written materials, practice coaching, and continuing medical education sessions.

For example, [ASTH-41] is a randomized controlled trial that distributed asthma guidelines to one group, provided resources training to all staff along with the guidelines in another group. While guideline dissemination alone did not yield improvements, the additional resources and training helped improve care.

Shared decision making

Shared decision making can enhance provider-patient communication and engage patients in better managing their health.

Medical home, chronic care model

Medical homes and the chronic care model seek to provide comprehensive, patient-centered care to better support patients with managing chronic conditions. Medical home components include a personal physician, team-based care, caring for the whole patient, integrating care across the health care system often facilitated by electronic health records, promoting quality, safety, and access, and incorporating principals of value based payment.[1]

[1] Rittenhouse, D. R., Casalino, L. P., Gillies, R. R., Shortell, S. M., & Lau, B. (2008). Measuring the medical home infrastructure in large medical groups. *Health Affairs, 27*(5), 1246-1258.

The medical home is a package, with individual components often implemented to varying degrees. Evidence is mixed.

Disease Management

Disease management includes any effort to systematically track patients with chronic conditions and ensure that they receive care in accordance with quality guidelines, potentially reducing higher-cost services such as emergency department use.

Lifestyle/behavioral interventions

Exercise and nutrition are building blocks of good health and may potentially reduce asthma symptoms [ASTH-10]. Interventions often find improvements in the short-term, but improvement can be difficult to sustain.

Lifestyle interventions that are culturally tailored [CVD-15, CVD-7] and also address mental and emotional well-being [CVD-7] may improve impact.

Exercise
(See lifestyle/behavioral interventions)

Nutrition
(See lifestyle/behavioral interventions)

Web-based/Internet

Web-based interventions offer an alternative health platform for patient health tracking and education.

Web-based interventions can enhance usual care and have been found to lower HbA1c and cholesterol [DM-44, DM-46]. However, further study is needed to identify the elements that promote successful patient-web interaction and long-term effectiveness.

Social network

Social network interventions take advantage of peer support groups to share experiences, promote health problem solving, and ultimately better health.

Government policies

Government policies include taxes, subsidies, prohibitions, and incentives. For example, taxes can discourage unhealthy behaviors such as smoking or corporate polluting. (http://content.healthaffairs.org/content/21/6/142.full)

Built environment

Safe sidewalks, designated bike routes, greenery and mixed development are all built environment elements that promote health.

Built environment gains in health may be small on an individual level, but summed over population improvements can have large impacts, as modeled in Northern Ireland's Connswater Community Greenway project [CVD-6].

Community collaborative

Grass-roots initiatives have great potential for engaging community members and contributing to development and evaluation of community health improvement projects.

Pharmacist on the care team

Services by which pharmacists support patients and providers can include health screening, conducting medication reconciliation (asking patients to bring all medications with them and comparing medications in-hand with a health record), educating patients about their medications and treatments, and recommending alternative medications to enhance effectiveness or reduce side effects. Pharmacists can be both embedded in the clinic or in a community (e.g., drugstore) setting.

Systematic reviews find that pharmacist on the care team significantly reduces total cholesterol [CVD-1], blood pressure,[2] and asthma.

Nurse case management

Nurse case management assists patients between visits and helps patients connect with resources provided by the healthcare organization and the community.

[2] Carter, B. L., Ardery, G., Dawson, J. D., James, P. A., Bergus, G. R., Doucette, W. R., ... & Xu, Y. (2009). Physician and pharmacist collaboration to improve blood pressure control. *Archives of internal medicine*, *169*(21), 1996-2002.

A review of nurse case management for cardiovascular disease [CVD-23] finds the strategy can lead to meaningful reductions in cardiovascular morbidity and mortality in numerous settings including post-hospital discharge, primary care clinics, low-income settings, and the workplace.

Telephone-based support

Telephone case management can provide patients with advice and keep them connected with care, for example, after discharge from the hospital or as a substitute for more resource-intensive home visits.

A review of telephone care interventions after discharge from a cardiovascular event [CVD-3] found lower blood pressure, greater likelihood to stop smoking, and lower depression and anxiety scores. When used as an alternative to home visits for Asthma patients in a low-income community, visits to the clinic increased [ASTH-34].

Community health worker (CHW)/Lay health worker

Community health workers are lay health providers who offer education on health conditions. Often, the community health worker may have experience dealing with the condition him/herself.

Education Interventions (patients & caregivers)

Examples of education classes include the Diabetes Prevention Project, a series of classes focusing on lifestyle changes. The Diabetes Prevention Project has been shown to be more effective at reducing diabetes onset through lifestyle changes than common pre-diabetes medications, and has been translated to numerous settings and populations.

Health screenings

National guidelines recommend regular health screenings for cardiovascular risk factors and preventive care. Screenings are also an opportunity to educate patients about risk factors and ways to reduce risk and can be conducted as part of systematic clinical care or through community outreach.

School-based interventions

School-based interventions offer the opportunity to create population-level impact through existing community structure, especially for interventions targeted toward young people. The most common school-based intervention, physical education, is part of California state law: every ten school days 200 minutes of physical education is required in grades one through

six, and 400 minutes are required in grades seven through twelve [CA Dept. of Education Standards: http://www.cde.ca.gov/be/st/ss/documents/pestandards.pdf].

Studies find school-based interventions can be effective for improving health knowledge [CVD-35]. School-based health centers in particular can be a valuable health collaborator. In one asthma intervention, a school-based health center coordinated with the local hospital, FQHC, public health department, and parents to lower asthma-related activity restriction and emergency department usage [ASTH-32].

Appendix 2. List of Key Articles By Condition

ASTHMA (ASTH)

	Author	Year	Title	Journal
1	M. Bellin, P. Osteen, K. Collins, A. Butz, C. Land and J. Kub	2014	The Influence of Community Violence and Protective Factors on Asthma Morbidity and Healthcare Utilization in High-Risk Children	J Urban Health
2	B. J. Bereznicki, G. Peterson, S. Jackson, E. H. Walters, J. George, K. Stewart and G. J. March	2013	Uptake and effectiveness of a community pharmacy intervention programme to improve asthma management	J Clin Pharm Ther
3	M. Fathima, P. Naik-Panvelkar, B. Saini and C. L. Armour	2013	The role of community pharmacists in screening and subsequent management of chronic respiratory diseases: a systematic review	Pharm Pract (Granada)
4	L. Cicutto, T. To and S. Murphy	2013	A randomized controlled trial of a public health nurse-delivered asthma program to elementary schools	J Sch Health
5	D. Goeman, C. Jenkins, M. Crane, E. Paul and J. Douglass	2013	Educational intervention for older people with asthma: a randomised controlled trial	Patient Educ Couns
6	N. M. Clark, L. L. Lachance, M. B. Benedict, L. J. Doctor, L. Gilmore, C. S. Kelly, J. Krieger, M. Lara, J. Meurer, A. F. Milanovich, E. Nicholas, P. X. Song, M. Rosenthal, S. C. Stoll, D. F. Awad and M. Wilkin	2013	Improvements in health care use associated with community coalitions: long-term results of the allies against asthma initiative	Am J Public Health

7	U. Bhaumik, K. Norris, G. Charron, S. P. Walker, S. J. Sommer, E. Chan, D. U. Dickerson, S. Nethersole and E. R. Woods	2013	A cost analysis for a community-based case management intervention program for pediatric asthma	J Asthma
8	J. C. Podjasek and M. A. Rank	2013	Have expert guidelines made a difference in asthma outcomes?	Curr Opin Allergy Clin Immunol
9	E. Baishnab and C. Karner	2012	Primary care based clinics for asthma	Cochrane Database Syst Rev
10	F. B. Adeniyi and T. Young	2012	Weight loss interventions for chronic asthma	Cochrane Database Syst Rev
11	C. Licskai, T. Sands, M. Ong, L. Paolatto and I. Nicoletti	2012	Using a knowledge translation framework to implement asthma clinical practice guidelines in primary care	Int J Qual Health Care
12	M. P. Labre, E. J. Herman, G. G. Dumitru, K. A. Valenzuela and C. L. Cechman	2012	Public health interventions for asthma: an umbrella review, 1990-2010	Am J Prev Med
13	B. Bereznicki, G. Peterson, S. Jackson, E. H. Walters and P. Gee	2011	The sustainability of a community pharmacy intervention to improve the quality use of asthma medication	J Clin Pharm Ther
14	**J**. Policicchio, B. Nelson and S. Duffy	2011	Bringing evidence-based continuing education on asthma to nurses	Clin Nurse Spec
15	B. Bereznicki, G. Peterson, S. Jackson, E. Haydn Walters, I. DeBoos and P. Hintz	2011	Perceived feasibility of a community pharmacy-based asthma intervention: a qualitative follow-up study	J Clin Pharm Ther
16	H. Tapp, L. Hebert and M. Dulin	2011	Comparative effectiveness of asthma interventions within a practice based research network	BMC Health Serv Res
17	S. A. Fisher-Owens, G. Boddupalli and S. M. Thyne	2011	Telephone case management for asthma: an acceptable and effective intervention within a diverse pediatric population	J Asthma

18	D. D. Crocker, S. Kinyota, G. G. Dumitru, C. B. Ligon, E. J. Herman, J. M. Ferdinands, D. P. Hopkins, B. M. Lawrence, T. A. Sipe and S. Task Force on Community Preventive	2011	Effectiveness of home-based, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity: a community guide systematic review	Am J Prev Med
19	S. Q. Davis, J. A. Krishnan, K. Lee, V. Persky and E. T. Naureckas	2011	Effect of a community-wide asthma intervention on appropriate use of inhaled corticosteroids	J Urban Health
20	M. Lara, T. Bryant-Stephens, M. Damitz, S. Findley, J. G. Gavillan, H. Mitchell, Y. U. Ohadike, V. W. Persky, G. R. Valencia, L. R. Smith, M. Rosenthal, S. Thyne, K. Uyeda, M. Viswanathan and C. Woodell	2011	Balancing "fidelity" and community context in the adaptation of asthma evidence-based interventions in the "real world"	Health Promot Pract
21	P. Chamnan, K. Boonlert, W. Pasi, S. Yodsiri, S. Pong-on, B. Khansa and P. Yongkulwanitchanan	2010	Implementation of a 12-week disease management program improved clinical outcomes and quality of life in adults with asthma in a rural district hospital: pre- and post-intervention study	Asian Pac J Allergy Immunol
22	C. Bobb, T. Ritz, G. Rowlands and C. Griffiths	2010	Effects of allergen and trigger factor avoidance advice in primary care on asthma control: a randomized-controlled trial	Clin Exp Allergy
23	S. Benavides, J. C. Rodriguez and M. Maniscalco-Feichtl	2009	Pharmacist involvement in improving asthma outcomes in various healthcare settings: 1997 to present	Ann Pharmacother
24	E. B. Fisher, R. C. Strunk, G. R. Highstein, R. Kelley-Sykes, K. L. Tarr, K. Trinkaus and J. Musick	2009	A randomized controlled evaluation of the effect of community health workers on hospitalization for asthma: the asthma coach	Arch Pediatr Adolesc Med

25	M. A. Martin, C. D. Catrambone, R. A. Kee, A. T. Evans, L. K. Sharp, C. Lyttle, C. Rucker-Whitaker, K. B. Weiss, J. J. Shannon and T. Chicago Initiative to Raise Asthma Health Equity Investigative	2009	Improving asthma self-efficacy: developing and testing a pilot community-based asthma intervention for African American adults	J Allergy Clin Immunol
26	G. R. Bloomberg, C. Banister, R. Sterkel, J. Epstein, J. Bruns, L. Swerczek, S. Wells, Y. Yan and J. M. Garbutt	2009	Socioeconomic, family, and pediatric practice factors that affect level of asthma control	Pediatrics
27	C. C. Keirns	2009	Asthma mitigation strategies: professional, charitable, and community coalitions	Am J Prev Med
28	J. Postma, C. Karr and G. Kieckhefer	2009	Community health workers and environmental interventions for children with asthma: a systematic review	J Asthma
29	I. A. Basheti, C. L. Armour, S. Z. Bosnic-Anticevich and H. K. Reddel	2008	Evaluation of a novel educational strategy, including inhaler-based reminder labels, to improve asthma inhaler technique	Patient Educ Couns
30	E. A. Parker, B. A. Israel, T. G. Robins, G. Mentz, L. Xihong, W. Brakefield-Caldwell, E. Ramirez, K. K. Edgren, M. Salinas and T. C. Lewis	2008	Evaluation of Community Action Against Asthma: a community health worker intervention to improve children's asthma-related health by reducing household environmental triggers for asthma	Health Educ Behav
31	V. B. Petkova	2008	Pharmaceutical care for asthma patients: a community pharmacy-based pilot project	Allergy Asthma Proc
32	M. E. Mansour, B. Rose, K. Toole, C. P. Luzader and H. D. Atherton	2008	Pursuing perfection: an asthma quality improvement initiative in school-based health centers with community partners	Public Health Rep

33	C. Armour, S. Bosnic-Anticevich, M. Brillant, D. Burton, L. Emmerton, I. Krass, B. Saini, L. Smith and K. Stewart	2007	Pharmacy Asthma Care Program (PACP) improves outcomes for patients in the community	Thorax
34	V. Kritikos, C. L. Armour and S. Z. Bosnic-Anticevich	2007	Interactive small-group asthma education in the community pharmacy setting: a pilot study	J Asthma
35	E. National Asthma and P. Prevention	2007	Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma-Summary Report 2007	J Allergy Clin Immunol
36	E. Laufenberg-Horstmann, E. DeVore and K. Bassuener	2006	The Coulee Region Community Pharmacy Asthma Intervention study	J Am Pharm Assoc (2003)
37	P. D. Scariati, L. Roberge and T. Dye	2006	Beating asthma: a community-based asthma education initiative	J Am Osteopath Assoc
38	S. G. Williams, C. M. Brown, K. H. Falter, C. J. Alverson, C. Gotway-Crawford, D. Homa, D. S. Jones, E. K. Adams and S. C. Redd	2006	Does a multifaceted environmental intervention alter the impact of asthma on inner-city children?	J Natl Med Assoc
39	M. Lara, M. D. Cabana, C. R. Houle, J. W. Krieger, L. L. Lachance, J. R. Meurer, M. P. Rosenthal and I. Vega	2006	Improving quality of care and promoting health care system change: The role of community-based coalitions	Health Promot Pract
40	A. S. Love and J. Spiegel	2006	The Inner-City Asthma Intervention tool kit: best practices and lessons learned	Ann Allergy Asthma Immunol
41	E. C. Daniels, J. Bacon, S. Denisio, Y. W. Fry, V. Murray, A. Quarshie and G. Rust	2005	Translation squared: improving asthma care for high-disparity populations through a safety net practice-based research network	J Asthma
42	S. A. Moonie, R. C. Strunk, S. Crocker, V. Curtis, K. Schechtman and M. Castro	2005	Community Asthma Program improves appropriate prescribing in moderate to severe asthma	J Asthma

43	L. P. Boss, D. Evans, C. Ramos-Bonoan, W. Liao, V. Taggart and S. C. Redd	2005	Ensuring a scientific basis for community interventions for asthma	Int J Hyg Environ Health
44	J. M. Tschopp, J. G. Frey, J. P. Janssens, C. Burrus, S. Garrone, R. Pernet, K. Imhof, F. Besse, S. Marty, C. Rosset and J. P. Assal	2005	Asthma outpatient education by multiple implementation strategy. Outcome of a programme using a personal notebook	Respir Med
45	K. K. Edgren, E. A. Parker, B. A. Israel, T. C. Lewis, M. A. Salinas, T. G. Robins and Y. R. Hill	2005	Community involvement in the conduct of a health education intervention and research project: Community Action Against Asthma	Health Promot Pract
46	C. A. Jones, L. T. Clement, J. Hanley-Lopez, T. Morphew, K. Y. Kwong, F. Lifson, L. Opas and J. J. Guterman	2005	The Breathmobile Program: structure, implementation, and evolution of a large-scale, urban, pediatric asthma disease management program	Dis Manag
47	W. Smith, K. Downey, B. Frampton, A. Collings and J. Fletcher	2004	Regional paediatric asthma centre: An intervention model	Paediatr Child Health
48	T. Charrois, S. Newman, D. Sin, A. Senthilselvan and R. T. Tsuyuki	2004	Improving asthma symptom control in rural communities: the design of the Better Respiratory Education and Asthma Treatment in Hinton and Edson study	Control Clin Trials
49	S. Cowan, P. Ernst, A. Cartier and L. P. Boulet	2004	A population-based evaluation of a regional asthma education centre	Can Respir J
50	S. Beckham, D. Kaahaaina, K. A. Voloch and A. Washburn	2004	A community-based asthma management program: effects on resource utilization and quality of life	Hawaii Med J

CARDIOVASCULAR DISEASE (CVD)

	Author	Year	Title	Journal
1	A. Willis, P. Rivers, L. J. Gray, M. Davies and K. Khunti	2014	The effectiveness of screening for diabetes and cardiovascular disease risk factors in a community pharmacy setting	PLoS One
2	I. Vaid, K. Ahmed, D. May and D. Manheim	2014	The WISEWOMAN program: smoking prevalence and key approaches to smoking cessation among participants, July 2008-June 2013	J Womens Health (Larchmt)
3	A. Kotb, S. Hsieh and G. A. Wells	2014	The effect of telephone support interventions on coronary artery disease (CAD) patient outcomes during cardiac rehabilitation: a systematic review and meta-analysis	PLoS One
4	M. M. Khare, A. Koch, K. Zimmermann, P. A. Moehring and S. E. Geller	2014	Heart Smart for Women: A Community-Based Lifestyle Change Intervention to Reduce Cardiovascular Risk in Rural Women	J Rural Health
5	L. Desveaux, M. Beauchamp, R. Goldstein and D. Brooks	2014	Community-based exercise programs as a strategy to optimize function in chronic disease: a systematic review	Med Care
6	M. A. Dallat, I. Soerjomataram, R. F. Hunter, M. A. Tully, K. J. Cairns and F. Kee	2014	Urban greenways have the potential to increase physical activity levels cost-effectively	Eur J Public Health
7	C. R. Albarran, M. V. Heilemann and D. Koniak-Griffin	2014	Promotoras as facilitators of change: Latinas' perspectives after participating in a lifestyle behaviour intervention program	J Adv Nurs
8	G. Mudd-Martin, M. C. Martinez, M. K. Rayens, Y. Gokun and J. C. Meininger	2013	Sociocultural tailoring of a healthy lifestyle intervention to reduce cardiovascular disease and type 2 diabetes risk among Latinos	Prev Chronic Dis

9	R. Goeree, C. von Keyserlingk, N. Burke, J. He, J. Kaczorowski, L. Chambers, L. Dolovich, J. Michael Paterson and B. Zagorski	2013	Economic appraisal of a community-wide cardiovascular health awareness program	Value Health
10	B. Fernhall	2013	Long-term aerobic exercise maintains peak VO(2), improves quality of life, and reduces hospitalisations and mortality in patients with heart failure	J Physiother
11	H. Cai, H. Dai, Y. Hu, X. Yan and H. Xu	2013	Pharmacist care and the management of coronary heart disease: a systematic review of randomized controlled trials	BMC Health Serv Res
12	A. R. Branham, A. J. Katz, J. S. Moose, S. P. Ferreri, J. F. Farley and M. W. Marciniak	2013	Retrospective analysis of estimated cost avoidance following pharmacist-provided medication therapy management services	J Pharm Pract
13	A. Altowaijri, C. J. Phillips and D. Fitzsimmons	2013	A systematic review of the clinical and economic effectiveness of clinical pharmacist intervention in secondary prevention of cardiovascular disease	J Manag Care Pharm
14	J. van Dalem, I. Krass and P. Aslani	2012	Interventions promoting adherence to cardiovascular medicines	Int J Clin Pharm
15	F. Rodriguez, L. Christopher, C. E. Johnson, Y. Wang and J. M. Foody	2012	Love your heart: a pilot community-based intervention to improve the cardiovascular health of African American women	Ethn Dis
16	K. P. McNamara, S. L. O'Reilly, J. A. Dunbar, M. J. Bailey, J. George, G. M. Peterson, S. L. Jackson, E. D. Janus, S. Bunker, G. Duncan and H. Howarth	2012	A pilot study evaluating multiple risk factor interventions by community pharmacists to prevent cardiovascular disease: the PAART CVD pilot project	Ann Pharmacother

17	R. E. Glasgow, D. Kurz, D. King, J. M. Dickman, A. J. Faber, E. Halterman, T. Woolley, D. J. Toobert, L. A. Strycker, P. A. Estabrooks, D. Osuna and D. Ritzwoller	2012	Twelve-month outcomes of an Internet-based diabetes self-management support program	Patient Educ Couns
18	K. J. Coleman, M. A. Farrell, D. A. Rocha, T. Hayashi, M. Hernandez, J. Wolf and S. Lindsay	2012	Readiness to be physically active and self-reported physical activity in low-income Latinas, California WISEWOMAN, 2006-2007	Prev Chronic Dis
19	D. Brown, J. Portlock and P. Rutter	2012	Review of services provided by pharmacies that promote healthy living	Int J Clin Pharm
20	W. J. Rejeski, P. H. Brubaker, D. C. Goff, Jr., L. B. Bearon, J. W. McClelland, M. G. Perri and W. T. Ambrosius	2011	Translating weight loss and physical activity programs into the community to preserve mobility in older, obese adults in poor cardiovascular health	Arch Intern Med
21	D. Parra-Medina, S. Wilcox, J. Salinas, C. Addy, E. Fore, M. Poston and D. K. Wilson	2011	Results of the Heart Healthy and Ethnically Relevant Lifestyle trial: a cardiovascular risk reduction intervention for African American women attending community health centers	Am J Public Health
22	T. L. Lenz and M. S. Monaghan	2011	Implementing lifestyle medicine with medication therapy management services to improve patient-centered health care	J Am Pharm Assoc (2003)
23	K. Berra	2011	Does nurse case management improve implementation of guidelines for cardiovascular disease risk reduction?	J Cardiovasc Nurs
24	O. Z. Soran, A. M. Feldman, I. L. Pina, G. A. Lamas, S. F. Kelsey, F. Selzer, J. Pilotte and J. R. Lave	2010	Cost of medical services in older patients with heart failure: those receiving enhanced monitoring using a computer-based telephonic monitoring system compared with those in usual care: the Heart Failure Home Care trial	J Card Fail
25	M. Pennant, C. Davenport, S. Bayliss, W. Greenheld, T. Marshall and C. Hyde	2010	Community programs for the prevention of cardiovascular disease: a systematic review	Am J Epidemiol

26	S. W. Miller, E. Darsey, T. J. Heard, J. Williams, M. Kelly, A. Norman and L. B. Ter Riet	2010	Outcomes of a multidisciplinary partnership to improve cardiac wellness: an opportunity for pharmacists	Consult Pharm
27	T. Hayashi, M. A. Farrell, L. A. Chaput, D. A. Rocha and M. Hernandez	2010	Lifestyle intervention, behavioral changes, and improvement in cardiovascular risk profiles in the California WISEWOMAN project	J Womens Health (Larchmt)
28	A. C. Villablanca, S. Arline, J. Lewis, S. Raju, S. Sanders and S. Carrow	2009	Outcomes of national community organization cardiovascular prevention programs for high-risk women	J Cardiovasc Transl Res
29	E. Thompson, D. Berry and L. Nasir	2009	Weight management in African-Americans using church-based community interventions to prevent type 2 diabetes and cardiovascular disease	J Natl Black Nurses Assoc
30	E. D. Crook, N. B. Bryan, R. Hanks, M. L. Slagle, C. G. Morris, M. C. Ross, H. M. Torres, R. C. Williams, C. Voelkel, S. Walker and M. I. Arrieta	2009	A review of interventions to reduce health disparities in cardiovascular disease in African Americans	Ethn Dis
31	M. Machado, N. Nassor, J. M. Bajcar, G. C. Guzzo and T. R. Einarson	2008	Sensitivity of patient outcomes to pharmacist interventions. Part III: systematic review and meta-analysis in hyperlipidemia management	Ann Pharmacother
32	V. V. Bavikati, L. S. Sperling, R. D. Salmon, G. C. Faircloth, T. L. Gordon, B. A. Franklin and N. F. Gordon	2008	Effect of comprehensive therapeutic lifestyle changes on prehypertension	Am J Cardiol
33	H. Meng, B. R. Wamsley, G. M. Eggert and J. F. Van Nostrand	2007	Impact of a health promotion nurse intervention on disability and health care costs among elderly adults with heart conditions	J Rural Health
34	D. M. Matson-Koffman, J. N. Brownstein, J. A. Neiner and M. L. Greaney	2005	A site-specific literature review of policy and environmental interventions that promote physical activity and nutrition for cardiovascular health: what works?	Am J Health Promot

35	T. K. Harrell, B. M. Davy, J. L. Stewart and D. S. King	2005	Effectiveness of a school-based intervention to increase health knowledge of cardiovascular disease risk factors among rural Mississippi middle school children	South Med J
36	L. K. Staten, K. Y. Gregory-Mercado, J. Ranger-Moore, J. C. Will, A. R. Giuliano, E. S. Ford and J. Marshall	2004	Provider counseling, health education, and community health workers: the Arizona WISEWOMAN project	J Womens Health (Larchmt)
37	B. E. Molnar, S. L. Gortmaker, F. C. Bull and S. L. Buka	2004	Unsafe to play? Neighborhood disorder and lack of safety predict reduced physical activity among urban children and adolescents	Am J Health Promot
38	B. C. Focht, L. R. Brawley, W. J. Rejeski and W. T. Ambrosius	2004	Group-mediated activity counseling and traditional exercise therapy programs: effects on health-related quality of life among older adults in cardiac rehabilitation	Ann Behav Med
39	R. DeBate, M. Plescia, D. Joyner and L. Spann	2004	A qualitative assessment of Charlotte REACH: an ecological perspective for decreasing CVD and diabetes among African Americans	Ethn Dis
40	S. J. Biddle, T. Gorely and D. J. Stensel	2004	Health-enhancing physical activity and sedentary behaviour in children and adolescents	J Sports Sci

DIABETES (DM)

	Author	Year	Title	Journal
1	J. K. Allen, C. R. Dennison Himmelfarb, S. L. Szanton and K. D. Frick	2014	Cost-effectiveness of nurse practitioner/community health worker care to reduce cardiovascular health disparities	J Cardiovasc Nurs
2	C. Duggan, E. Carosso, N. Mariscal, I. Islas, G. Ibarra, S. Holte, W. Copeland, S. Linde and B. Thompson	2014	Diabetes prevention in Hispanics: report from a randomized controlled trial	Prev Chronic Dis
3	S. K. Rothschild, M. A. Martin, S. M. Swider, C. M. Tumialan Lynas, I. Janssen, E. F. Avery and L. H. Powell	2014	Mexican american trial of community health workers: a randomized controlled trial of a community health worker intervention for mexican americans with type 2 diabetes mellitus	Am J Public Health
4	I. Ryabov	2014	Cost-effectiveness of Community Health Workers in controlling diabetes epidemic on the U.S.-Mexico border	Public Health
5	F. T. Shaya, V. V. Chirikov, D. Howard, C. Foster, J. Costas, S. Snitker, J. Frimpter and K. Kucharski	2014	Effect of social networks intervention in type 2 diabetes: a partial randomised study	J Epidemiol Community Health
6	D. H. Sorkin, S. Mavandadi, K. S. Rook, K. A. Biegler, D. Kilgore, E. Dow and Q. Ngo-Metzger	2014	Dyadic collaboration in shared health behavior change: the effects of a randomized trial to test a lifestyle intervention for high-risk Latinas	Health Psychol
7	T. S. Tang, M. Funnell, B. Sinco, G. Piatt, G. Palmisano, M. S. Spencer, E. C. Kieffer and M. Heisler	2014	Comparative effectiveness of peer leaders and community health workers in diabetes self-management support: results of a randomized controlled trial	Diabetes Care
8	D. Vincent, M. M. McEwen, J. T. Hepworth and C. S. Stump	2014	The effects of a community-based, culturally tailored diabetes prevention intervention for high-risk adults of Mexican descent	Diabetes Educ

9	K. J. Wilson, H. S. Brown, 3rd and E. Bastida	2014	Cost-Effectiveness of a Community-Based Weight Control Intervention Targeting a Low-Socioeconomic-Status Mexican-Origin Population	Health Promot Pract
10	M. S. Wolf, H. Seligman, T. C. Davis, D. A. Fleming, L. M. Curtis, A. U. Pandit, R. M. Parker, D. Schillinger and D. A. Dewalt	2014	Clinic-based versus outsourced implementation of a diabetes health literacy intervention	J Gen Intern Med
11	A. M. Castejon, J. L. Calderon, A. Perez, C. Millar, J. McLaughlin-Middlekauff, N. Sangasubana, G. Alvarez, L. Arce, P. Hardigan and S. E. Rabionet	2013	A community-based pilot study of a diabetes pharmacist intervention in Latinos: impact on weight and hemoglobin A1c	J Health Care Poor Underserved
12	L. G. Gilstrap, R. Malhotra, D. Peltier-Saxe, D. Slicas, E. Pineda, C. Culhane-Hermann, N. Cook, C. Fernandez-Golarz and M. Wood	2013	Community-based primary prevention programs decrease the rate of metabolic syndrome among socioeconomically disadvantaged women	J Womens Health (Larchmt)
13	N. S. Islam, J. M. Zanowiak, L. C. Wyatt, K. Chun, L. Lee, S. C. Kwon and C. Trinh-Shevrin	2013	A randomized-controlled, pilot intervention on diabetes prevention and healthy lifestyles in the New York City Korean community	J Community Health
14	J. A. Katula, M. Z. Vitolins, T. M. Morgan, M. S. Lawlor, C. S. Blackwell, S. P. Isom, C. F. Pedley and D. C. Goff, Jr.	2013	The Healthy Living Partnerships to Prevent Diabetes study: 2-year outcomes of a randomized controlled trial	Am J Prev Med
15	R. A. Krukowski, R. A. Pope, S. Love, S. Lensing, H. C. Felix, T. E. Prewitt and D. West	2013	Examination of costs for a lay health educator-delivered translation of the Diabetes Prevention Program in senior centers	Prev Med

16	M. S. Lawlor, C. S. Blackwell, S. P. Isom, J. A. Katula, M. Z. Vitolins, T. M. Morgan and D. C. Goff, Jr.	2013	Cost of a group translation of the Diabetes Prevention Program: Healthy Living Partnerships to Prevent Diabetes	Am J Prev Med
17	G. A. Piatt, M. C. Seidel, R. O. Powell and J. C. Zgibor	2013	Comparative effectiveness of lifestyle intervention efforts in the community: results of the Rethinking Eating and ACTivity (REACT) study	Diabetes Care
18	E. A. Prezio, D. Cheng, B. A. Balasubramanian, K. Shuval, D. E. Kendzor and D. Culica	2013	Community Diabetes Education (CoDE) for uninsured Mexican Americans: a randomized controlled trial of a culturally tailored diabetes education and management program led by a community health worker	Diabetes Res Clin Pract
19	H. S. Brown, 3rd, K. J. Wilson, J. A. Pagan, C. M. Arcari, M. Martinez, K. Smith and B. Reininger	2012	Cost-effectiveness analysis of a community health worker intervention for low-income Hispanic adults with diabetes	Prev Chronic Dis
20	S. E. Choi and E. B. Rush	2012	Effect of a short-duration, culturally tailored, community-based diabetes self-management intervention for Korean immigrants: a pilot study	Diabetes Educ
21	I. S. Ockene, T. L. Tellez, M. C. Rosal, G. W. Reed, J. Mordes, P. A. Merriam, B. C. Olendzki, G. Handelman, R. Nicolosi and Y. Ma	2012	Outcomes of a Latino community-based intervention for the prevention of diabetes: the Lawrence Latino Diabetes Prevention Project	Am J Public Health
22	R. T. Ackermann, E. A. Finch, H. M. Caffrey, E. R. Lipscomb, L. M. Hays and C. Saha	2011	Long-term effects of a community-based lifestyle intervention to prevent type 2 diabetes: the DEPLOY extension pilot study	Chronic Illn
23	J. M. Boltri, M. Davis-Smith, I. S. Okosun, J. P. Seale and B. Foster	2011	Translation of the National Institutes of Health Diabetes Prevention Program in African American churches	J Natl Med Assoc

24	J. A. Katula, M. Z. Vitolins, E. L. Rosenberger, C. S. Blackwell, T. M. Morgan, M. S. Lawlor and D. C. Goff, Jr.	2011	One-year results of a community-based translation of the Diabetes Prevention Program: Healthy-Living Partnerships to Prevent Diabetes (HELP PD) Project	Diabetes Care
25	M. K. Kramer, J. R. McWilliams, H. Y. Chen and L. M. Siminerio	2011	A community-based diabetes prevention program: evaluation of the group lifestyle balance program delivered by diabetes educators	Diabetes Educ
26	K. Lee, C. Palacio, I. Alexandraki, E. Stewart and A. D. Mooradian	2011	Increasing access to health care providers through medical home model may abolish racial disparity in diabetes care: evidence from a cross-sectional study	J Natl Med Assoc
27	A. Philis-Tsimikas, A. Fortmann, L. Lleva-Ocana, C. Walker and L. C. Gallo	2011	Peer-led diabetes education programs in high-risk Mexican Americans improve glycemic control compared with standard approaches: a Project Dulce promotora randomized trial	Diabetes Care
28	M. C. Rosal, I. S. Ockene, A. Restrepo, M. J. White, A. Borg, B. Olendzki, J. Scavron, L. Candib, G. Welch and G. Reed	2011	Randomized trial of a literacy-sensitive, culturally tailored diabetes self-management intervention for low-income latinos: latinos en control	Diabetes Care
29	H. R. Bogner and H. F. de Vries	2010	Integrating type 2 diabetes mellitus and depression treatment among African Americans: a randomized controlled pilot trial	Diabetes Educ
30	S. Dodani and J. Z. Fields	2010	Implementation of the fit body and soul, a church-based life style program for diabetes prevention in high-risk African Americans: a feasibility study	Diabetes Educ
31	J. P. Jameson and P. J. Baty	2010	Pharmacist collaborative management of poorly controlled diabetes mellitus: a randomized controlled trial	Am J Manag Care
32	R. Otero-Sabogal, D. Arretz, S. Siebold, E. Hallen, R. Lee, A. Ketchel, J. Li and J. Newman	2010	Physician-community health worker partnering to support diabetes self-management in primary care	Qual Prim Care

33	I. Ryabov	2010	The impact of community health workers on behavioral outcomes and glycemic control of diabetes patients on the U.S.-Mexico border	Int Q Community Health Educ
34	L. M. Vadheim, C. McPherson, D. R. Kassner, K. K. Vanderwood, T. O. Hall, M. K. Butcher, S. D. Helgerson and T. S. Harwell	2010	Adapted diabetes prevention program lifestyle intervention can be effectively delivered through telehealth	Diabetes Educ
35	K. K. Vanderwood, T. O. Hall, T. S. Harwell, M. K. Butcher, S. D. Helgerson, D. Montana Cardiovascular and W. Diabetes Prevention Program	2010	Implementing a state-based cardiovascular disease and diabetes prevention program	Diabetes Care
36	H. A. Amundson, M. K. Butcher, D. Gohdes, T. O. Hall, T. S. Harwell, S. D. Helgerson, K. K. Vanderwood, D. Montana Cardiovascular and W. Diabetes Prevention Program	2009	Translating the diabetes prevention program into practice in the general community: findings from the Montana Cardiovascular Disease and Diabetes Prevention Program	Diabetes Educ
37	K. S. Babamoto, K. A. Sey, A. J. Camilleri, V. J. Karlan, J. Catalasan and D. E. Morisky	2009	Improving diabetes care and health measures among hispanics using community health workers: results from a randomized controlled trial	Health Educ Behav
38	T. L. Gary, M. Batts-Turner, H. C. Yeh, F. Hill-Briggs, L. R. Bone, N. Y. Wang, D. M. Levine, N. R. Powe, C. D. Saudek, M. N. Hill, M. McGuire and F. L. Brancati	2009	The effects of a nurse case manager and a community health worker team on diabetic control, emergency department visits, and hospitalizations among urban African Americans with type 2 diabetes mellitus: a randomized controlled trial	Arch Intern Med
39	M. T. Kim, H. R. Han, H. J. Song, J. E. Lee, J. Kim, J. P. Ryu and K. B. Kim	2009	A community-based, culturally tailored behavioral intervention for Korean Americans with type 2 diabetes	Diabetes Educ

40	M. K. Kramer, A. M. Kriska, E. M. Venditti, R. G. Miller, M. M. Brooks, L. E. Burke, L. M. Siminerio, F. X. Solano and T. J. Orchard	2009	Translating the Diabetes Prevention Program: a comprehensive model for prevention training and program delivery	Am J Prev Med
41	R. T. Ackermann, E. A. Finch, E. Brizendine, H. Zhou and D. G. Marrero	2008	Translating the Diabetes Prevention Program into the community. The DEPLOY Pilot Study	Am J Prev Med
42	J. G. Christian, D. H. Bessesen, T. E. Byers, K. K. Christian, M. G. Goldstein and B. C. Bock	2008	Clinic-based support to help overweight patients with type 2 diabetes increase physical activity and lose weight	Arch Intern Med
43	K. A. Peterson, D. M. Radosevich, P. J. O'Connor, J. A. Nyman, R. J. Prineas, S. A. Smith, T. J. Arneson, V. A. Corbett, J. C. Weinhandl, C. J. Lange and P. J. Hannan	2008	Improving Diabetes Care in Practice: findings from the TRANSLATE trial	Diabetes Care
44	G. E. Bond, R. Burr, F. M. Wolf, M. Price, S. M. McCurry and L. Teri	2007	The effects of a web-based intervention on the physical outcomes associated with diabetes among adults age 60 and older: a randomized trial	Diabetes Technol Ther
45	M. H. Chin, M. L. Drum, M. Guillen, A. Rimington, J. R. Levie, A. C. Kirchhoff, M. T. Quinn and C. T. Schaefer	2007	Improving and sustaining diabetes care in community health centers with the health disparities collaboratives	Med Care
46	T. I. Lee, Y. T. Yeh, C. T. Liu and P. L. Chen	2007	Development and evaluation of a patient-oriented education system for diabetes management	Int J Med Inform
47	J. Lujan, S. K. Ostwald and M. Ortiz	2007	Promotora diabetes intervention for Mexican Americans	Diabetes Educ

48	D. M. Scott, S. T. Boyd, M. Stephan, S. C. Augustine and T. P. Reardon	2006	Outcomes of pharmacist-managed diabetes care services in a community health center	Am J Health Syst Pharm
49	T. P. Gilmer, A. Philis-Tsimikas and C. Walker	2005	Outcomes of Project Dulce: a culturally specific diabetes management program	Ann Pharmacother
50	W. H. Polonsky, J. Zee, M. A. Yee, M. A. Crosson and R. A. Jackson	2005	A community-based program to encourage patients' attention to their own diabetes care: pilot development and evaluation	Diabetes Educ
51	E. Stern, C. A. Benbassat and M. Goldfracht	2005	Impact of a two-arm educational program for improving diabetes care in primary care centres	Int J Clin Pract
52	T. S. Tang, M. L. Gillard, M. M. Funnell, R. Nwankwo, E. Parker, D. Spurlock and R. M. Anderson	2005	Developing a new generation of ongoing: Diabetes self-management support interventions: a preliminary report	Diabetes Educ
53	J. Two Feathers, E. C. Kieffer, G. Palmisano, M. Anderson, B. Sinco, N. Janz, M. Heisler, M. Spencer, R. Guzman, J. Thompson, K. Wisdom and S. A. James	2005	Racial and Ethnic Approaches to Community Health (REACH) Detroit partnership: improving diabetes-related outcomes among African American and Latino adults	Am J Public Health
54	G. D'Eramo-Melkus, G. Spollett, V. Jefferson, D. Chyun, B. Tuohy, T. Robinson and A. Kaisen	2004	A culturally competent intervention of education and care for black women with type 2 diabetes	Appl Nurs Res

Appendix 3. Additional Resources on Community Interventions

1) The Community Guide: Increasing Physical Activity: Environmental and Policy Approaches

   http://www.thecommunityguide.org/pa/environmental-policy/index.html

   The Community Preventive Services Task Force, which is administered by the CDC, conducted systematic reviews of five community strategies. These were published between 2001 and 2005. They were early and seminal publications highlighting the impact of the built environment on physical activity. The three strategies with "sufficient evidence" on impact on physical activity habits were:

   - Community-Scale Urban Design and Land Use Policies,
   - Creation of or Enhanced Access to Places for Physical Activity Combined with Informational Outreach Activities,
   - Street-Scale Urban Design and Land Use Policies

2) Active Living Research

   Originally a program office of the Robert Wood Johnson Foundation, Active Living Research monitors the growing evidence base on the relationship between community environments and physical activity habits. Both research summaries and strategy recommendations are available on their website: http://activelivingresearch.org/

3) CDC Community Strategies and Measurements to Prevent Obesity

   - Keener, D., Goodman, K., Lowry, A., Zaro, S., & Kettel Khan, L. (2009). "Recommended community strategies and measurements to prevent obesity in the United States: Implementation and measurement guide." Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. http://www.cdc.gov/obesity/downloads/community_strategies_guide.pdf

   This document delineates 24 recommended strategies for creating healthy community environments to prevent obesity. It was supported by a commissioned literature review.

4) MAPPS Interventions for Communities Putting Prevention to Work

http://www.cdc.gov/chronicdisease/recovery/PDF/MAPPS_Intervention_Table.pdf

The CDC assembled a great deal of evidence on community and systems change as part of their administration of the Communities Putting Prevention to Work program (approximately 2010). This document includes hundreds of relevant citations on evidence-based interventions to change community environments, divided into five categories: Media, Access, Point of decision information, Price, and Social support/services.

5) Institute of Medicine Reports

Both of the following IOM reports examine systems and environmental change. We understand your focus in not on children. However, many of the strategies for community level changes to improve eating and activity habits apply to adults as well.

- Institute of Medicine. Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation. Washington, DC: The National Academies Press, 2012. http://www.iom.edu/~/media/Files/Report%20Files/2012/APOP/APOP_rb.pdf

- Institute of Medicine and National Research Council. Local Governments Actions to Prevent Childhood Obesity. Washington, DC: The National Academies Press, 2009. http://www.iom.edu/reports/2009/local-government-actions-to-prevent-childhood-obesity.aspx

6) A Practitioner's Guide for Advancing Health Equity: Community Strategies for Preventing Chronic Disease

The CDC's Practitioner's Guide includes a collection of evidence-based strategies for addressing health disparities related to systems and environmental change:

- Centers for Disease Control and Prevention – Division of Community Health. A Practitioner's Guide for Advancing Health Equity: Community Strategies for Preventing Chronic Disease. Atlanta, GA: US Department of Health and Human Services; 2013. http://www.cdc.gov/nccdphp/dch/pdf/HealthEquityGuide.pdf

7) A Compendium of Proven Community-Based Prevention Programs

http://healthyamericans.org/assets/files/Compendium_Report_1016_1131.pdf

The New York Academy of Medicine produced this document, which includes hundreds of citations for community-based prevention programs, with sections related specifically to chronic disease.

8) Healthy Eating Research

Healthy Eating Research is a national program of the Robert Wood Johnson Foundation (RWJF). The program supports research on environmental and policy strategies that have strong potential to promote healthy eating among children. Research is conducted in order to advance RWJF's efforts to reverse the childhood obesity epidemic, especially among lower-income and racial and ethnic populations at highest risk for obesity.
http://healthyeatingresearch.org/

Appendix 4. List of Key Informant Interviews

1. **Bobby Milstein**, PhD, MPH, Director of ReThink Health (Boston University/MIT)

2. **Ruth Wageman**, PhD, Director of ReThink Health Stewardship (Rippel Foundation/Harvard)

3. **Bill Dietz,** MD, PhD, Director of the Sumner M. Redstone Global Center for Prevention and Wellness (George Washington University)

4. **Ray Baxter**, PhD, Senior Vice President of Kaiser community Benefit, Research and Health Policy (Kaiser Permanente)

5. **Nick Yphantides**, MD, MPH, Chief Medical Officer of San Diego County (AHP, San Diego)

6. **Gary Offendal**, MD, Former Chief Knowledge Officer, Institute for Clinical Systems Improvement (Blue Shield Twin Cities, Alina/Fairvie