



Webinar: Engaging Community Health  
Workers to Prevent and Manage  
Disease

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12-1 p.m. Eastern

# Webinar: Engaging Community Health Workers to Prevent and Manage Diseases

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## Objectives

- **Discuss who are CHWs and what they do.**
- **Discuss how community health workers can contribute to promote health and enhance health equity.**
- **Describe CDC investment that has facilitated work between states and community health workers for prevention and management of chronic conditions including diabetes, heart disease, stroke, and obesity.**

## Who is a CHW? (1)

- **American Public Health Association definition:**

- *Frontline public health worker who is a **trusted** member of and/or has an unusually close understanding of the community served,*

- *trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community,*

- *to facilitate access to services and improve the quality and cultural competence of service delivery.*

## Who is a CHW? (2)

- *The CHW also **builds** individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as:*
- *outreach, community education, informal counseling, social support and advocacy.*

## Community Health Workers: Known by Many Names

- **Community Health Workers - CHWs**
- **Peer Educators**
- **Promotores**
- **Community Health Representatives**
- **Outreach Workers**
- **Community Health Educators**
- **Navigators (some)**
- **And many more...**

**Many names, many hats.....**



## Big Steps

- 1.1970/2000– American Public Health Association
- 2.1998– National Community Health Advisor Study
- 3.2007– HRSA National Workforce Study)
- 4.2010– Bureau of Labor Statistics
- 5.2013– Centers for Medicare and Medicaid Services
- 6.Community Health Worker Core Consensus (C3) Project



“The simple things are the most extraordinary and only the wise can see them” - Paulo Coelho.

Using Double-Posting and Other Features in Your Page



February 13, 2017

### Task Force Recommends Community Health Workers for Diabetes Prevention

Are you working to prevent or control type 2 diabetes in your community? Using community health workers (CHWs) may be an effective solution.



Based on a systematic review of evidence, the **Community Preventive Services Task Force** (Task Force) now recommends **interventions engaging CHWs for diabetes prevention**. The interventions included in the review showed that CHWs helped improve blood sugar control and weight-related outcomes among people at increased risk for type 2 diabetes.

Community health workers (including promotores de salud, community health representatives,



THE JOURNAL OF CLINICAL AND APPLIED RESEARCH AND EDUCATION

VOLUME 40 | SUPPLEMENT 1

# Diabetes Care

[WWW.DIABETES.ORG/DIABETES CARE](http://WWW.DIABETES.ORG/DIABETES CARE)

JANUARY 2017

SUPPLEMENT  
**1**

AMERICAN DIABETES ASSOCIATION

## STANDARDS OF MEDICAL CARE IN DIABETES—2017

## What Makes CHWs Unique?

- Do not provide clinical care
- Generally do not hold another professional license
- Expertise is based on shared culture and life experience with people served

## **What Makes CHWs Unique?**

- Rely on relationships and trust more than on clinical expertise**
- Relate to community members as peers rather than purely as client**
- Can achieve certain results that other professionals can't (or won't)**

## Overlapping Roles in Occupations Related to CHWs

- Care management and coordination (nurses, social workers)
- Health education (nurses, health educators, diabetes educators, dental hygienists)
- Counseling (social workers, therapists)
- Patient follow-up (nurses, medical assistants)
- Direct care (nursing assistants, personal care aides)

Promoting Policy and Systems Change to Expand Employment of Community Health Workers

(CHWs) E – Learning Course

[https://www.cdc.gov/dhdsp/chw\\_elearning/index.html](https://www.cdc.gov/dhdsp/chw_elearning/index.html)

## **Dilemmas in the Nature of the CHW Work**

- 1. Accountability**
- 2. Unawareness or limited understanding of the occupation**
- 3. Proliferation of job titles for CHWs, related to funding**
- 4. No common standards or definitions across programs**
- 5. Boundaries with other occupations often unclear**

## How CHWs can Contribute to Promote Health and Enhance Health Equity

- **CHWs are all about community strategies:**
  - *Inform and involve community members*
  - *CHWs build on resiliency factors- which are present in communities of colors*
  - *CHWs customize popular education to incorporate the culture and beliefs systems in the communities they serve*
  - *CHWs build advocacy coalitions that put power and tools in hands of the communities impacted most by disparities*

## How CHWs Contribute to Promote Health and Enhance Health Equity?

- **CHWs are all about healthcare system strategies:**

- *Assist individuals and families to obtain and retain a health insurance*
- *Reduce unnecessary use of ER or urgent care*
- *Increase access and use of preventive education, treatment, screenings and services*
- *Encourage the use of primary care and medical homes*

## **How CHWs Contribute to Promote Health and Enhance Health Equity?**

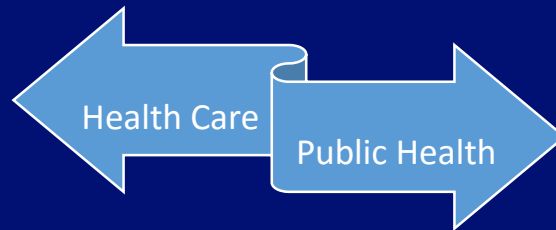
- Provide community perspective to local, state and national public health policy**
- Provide education and interventions in the community (outside the walls)**
- Identify and remove barriers to preventive /wellness care and services**

**“Got CHWs? You got a community champion, we have a role to play at many levels .” Durell J. Fox 2013**



## Growing Emphasis on Population Health

- Health care system facing increased pressure and incentives to address population health
- CHWs in unique position to “bridge” health care and public health



*Association of State and Territorial Health Officials (ASTHO).*

## DDT Cooperative Agreement Investments To Date

1385

*State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health*

1422

*State and Local Public Health Actions to Prevent Obesity, Diabetes, and Heart Disease and Stroke*

1705

*Scaling the National Diabetes Prevention Program in Underserved Areas*

[http://www.chronicdisease.org/mpage/domain4\\_chw\\_strategy](http://www.chronicdisease.org/mpage/domain4_chw_strategy)



A WORLD FREE OF THE DEVASTATION OF DIABETES AND IT'S COMPLICATIONS

Betsy Rodriguez bjr6@cdc.gov





The Community Guide



# **Interventions Engaging Community Health Workers for Cardiovascular Disease and Diabetes**

## **Systematic Reviews, Recommendations, and Economic Findings from the Community Preventive Services Task Force**

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**Verughese Jacob, PhD**

Community Guide Branch

Division of Public Health Information Dissemination

Center for Surveillance, Epidemiology, and Laboratory Services

# Disclaimer

The findings and conclusions in this presentation do not necessarily represent the official position of the Centers for Disease Control and Prevention.

The Centers for Disease Control and Prevention “provides administrative, research, and technical support for the Community Preventive Services Task Force.”

[PHS Act §399U[c]]

# Agenda

- Introduction to the Community Guide and the Community Preventive Services Task Force (CPSTF)
- Findings from systematic reviews on the effectiveness of Community Health Worker (CHW) interventions
  - Cardiovascular disease prevention
  - Diabetes prevention
  - Diabetes management
- Findings from systematic assessments of the economic evidence for these interventions
- Community Guide resources



# **Introduction to The Community Guide and the Community Preventive Services Task Force**

Purpose, People, Processes, and Products

# What is The Community Guide?

- Credible source of systematic reviews and findings of the Community Preventive Services Task Force  
([www.thecommunityguide.org](http://www.thecommunityguide.org))

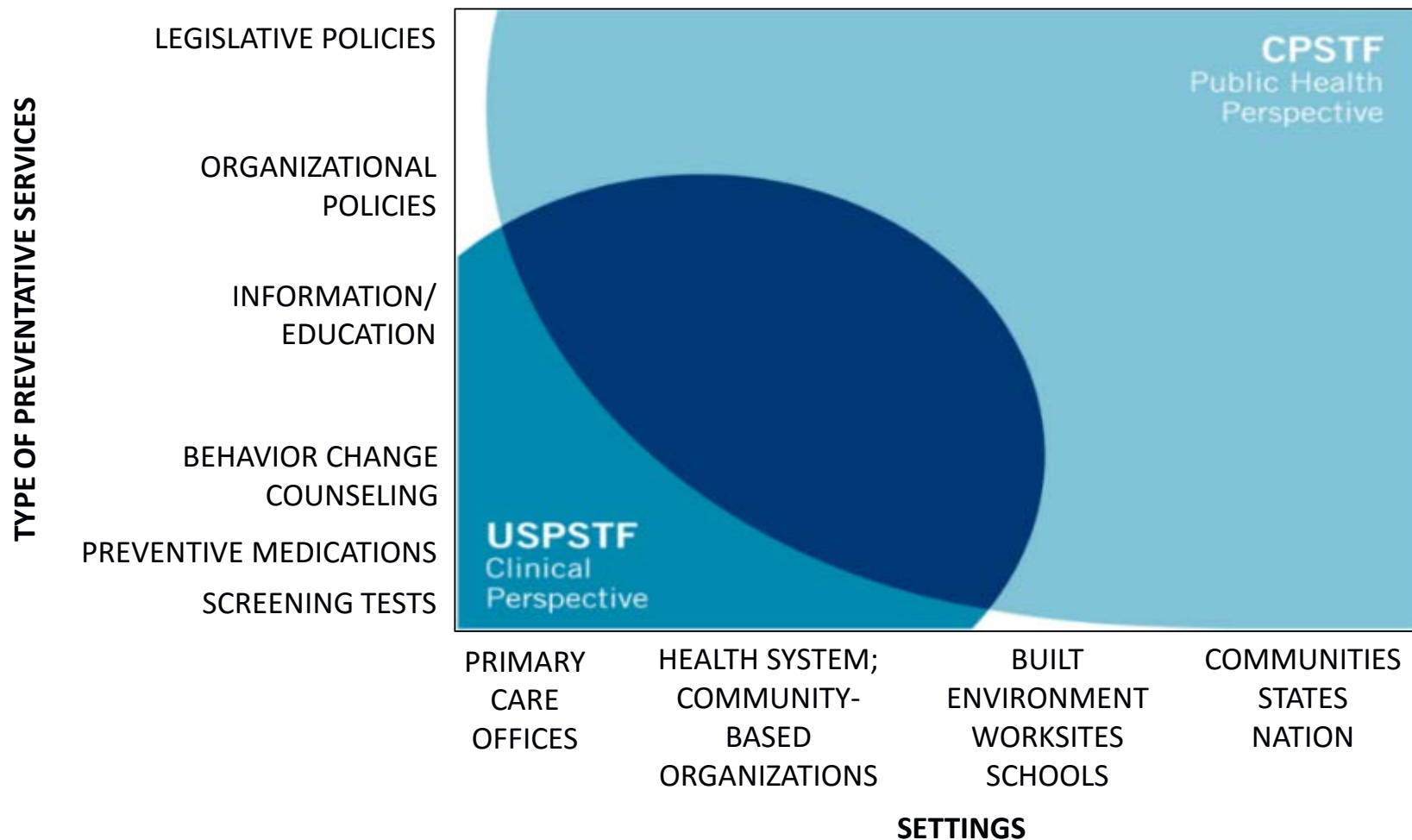
- Focuses on population-based interventions
  - Communities
  - Health care systems



# Community Preventive Services Task Force (CPSTF)

- Independent, nonfederal panel of 15 public health and prevention experts that provides evidence-based findings and recommendations about community preventive services, programs, and other interventions to improve health
- Members represent a broad range of research, practice, and policy expertise in community preventive services, public health, health promotion, and disease prevention

# Complementary Nature of United States Preventive Services Task Force and Community Preventive Services Task Force\*



\*Community Preventive Services Task Force First Annual Report to Congress. <https://www.thecommunityguide.org/content/2011-annual-report-to-congress> 28

# Topics for CPSTF Systematic Reviews (as of 2017)

## Reviews Organized by Environment

Health equity (Social Environment)

## Reviews by Risk Behavior

Alcohol abuse/misuse

Tobacco use

Poor nutrition

Physical inactivity

Unhealthy sexual behaviors

Cardiovascular disease prevention

## Reviews by Specific Condition

Cancer prevention

Mental health

Vaccine-preventable disease

Violence prevention

Motor vehicle injuries

Diabetes

Oral health

## Reviews Organized by Setting

Worksite health promotion

## Reviews Organized by Life Stage

Adolescent health

## Special Projects

Health communication

Emergency preparedness

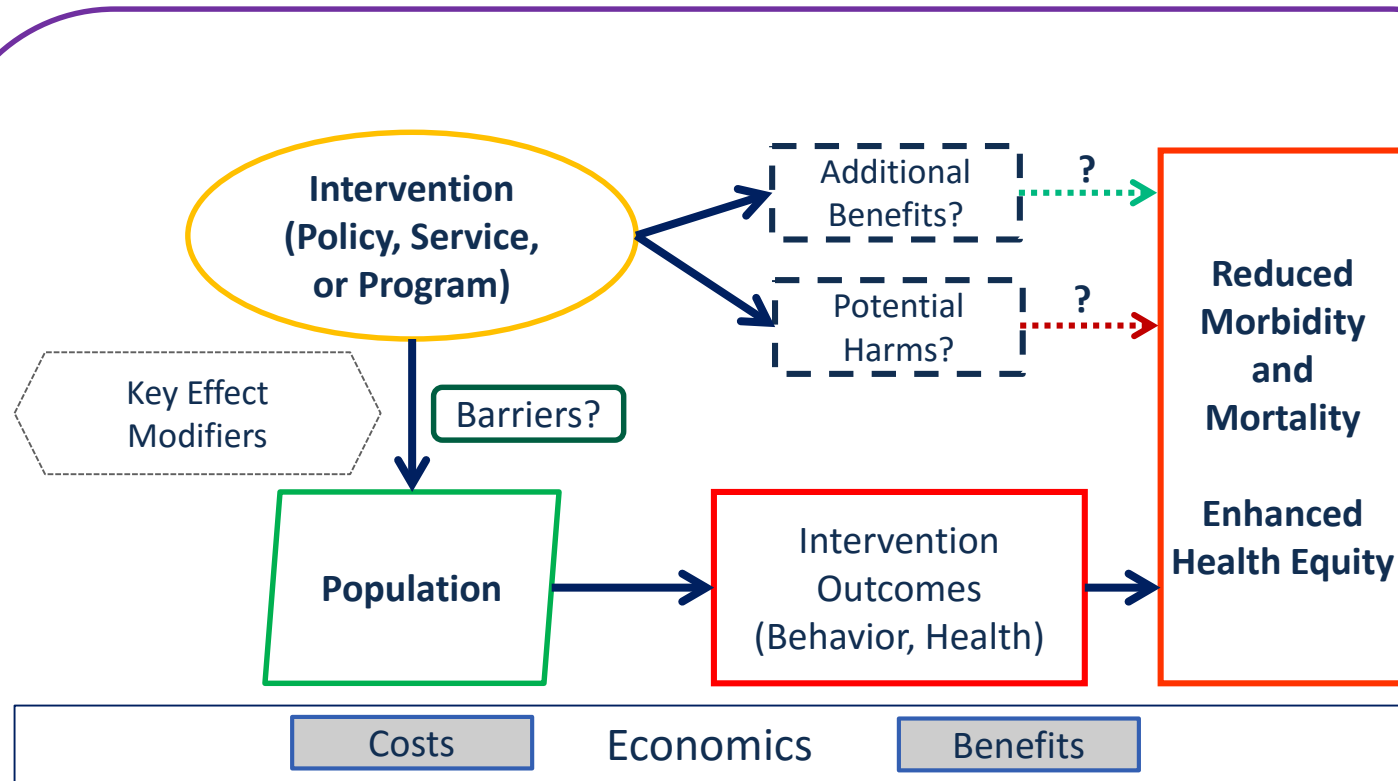
# Critical Questions to Ask When Evaluating a Public Health Intervention

- First question: Does it work?
- If the intervention works, then
  - How well does it work?
  - For whom?
  - Under what conditions?
  - How does it influence health disparities?
  - What is the cost?
  - Does it provide value?
  - What are important considerations for implementing the intervention?
- Tentative answers to these questions (especially the latter ones) are preferable to no answers

# Steps in a Community Guide Systematic Review

- Recruit a multidisciplinary team appropriate for the topic
- Identify interventions to review and outcomes to evaluate
- Search for evidence, evaluate studies, summarize findings
- Present evidence, results, and team assessments to the CPSTF
- CPSTF adopts consensus conclusions
  - Recommend for use of the intervention
  - Recommend against use of the intervention
  - Insufficient Evidence to determine if the intervention works
- Disseminate review results and research gaps
  - Website summaries, subscriber notices
  - Dissemination products, social media
  - Papers for publication

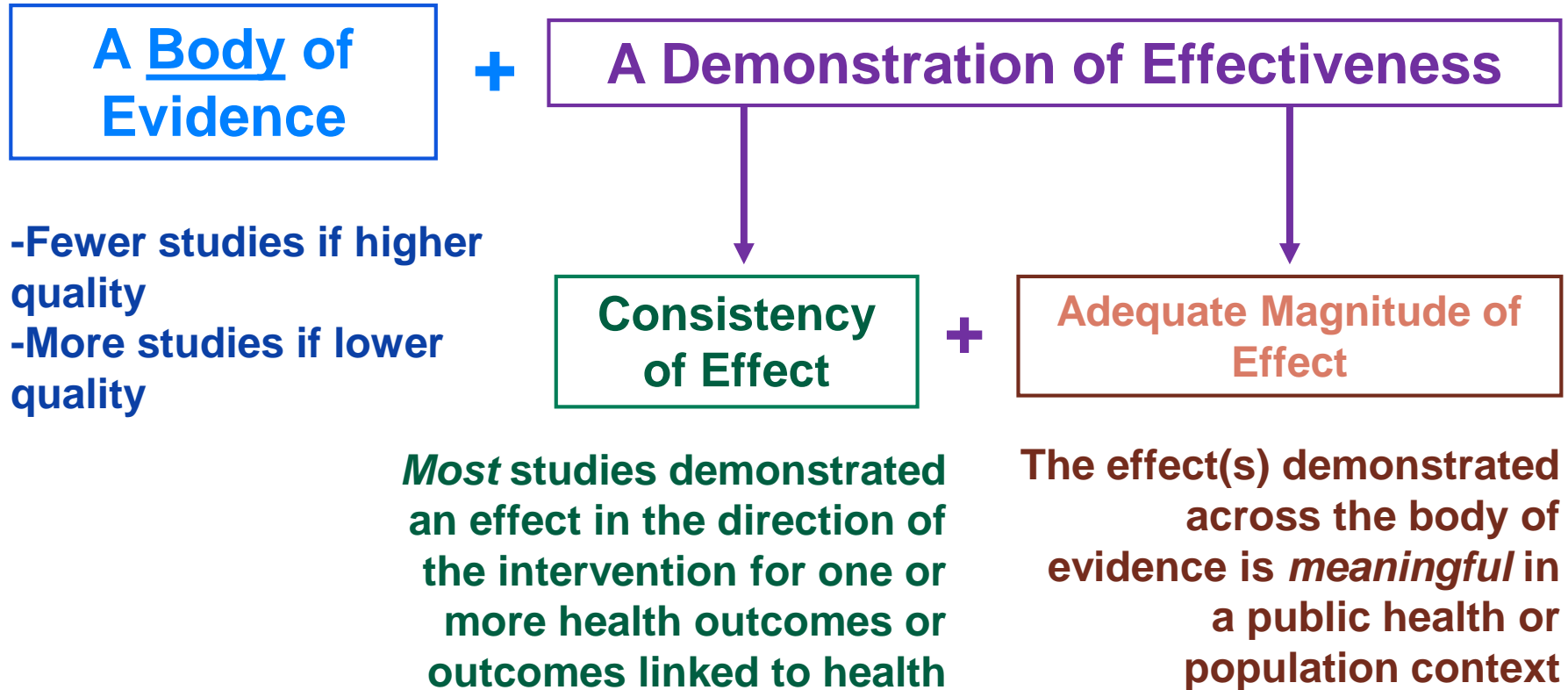
# What is Considered in a Community Guide Review?



Is the evidence applicable to important U.S. populations and settings?

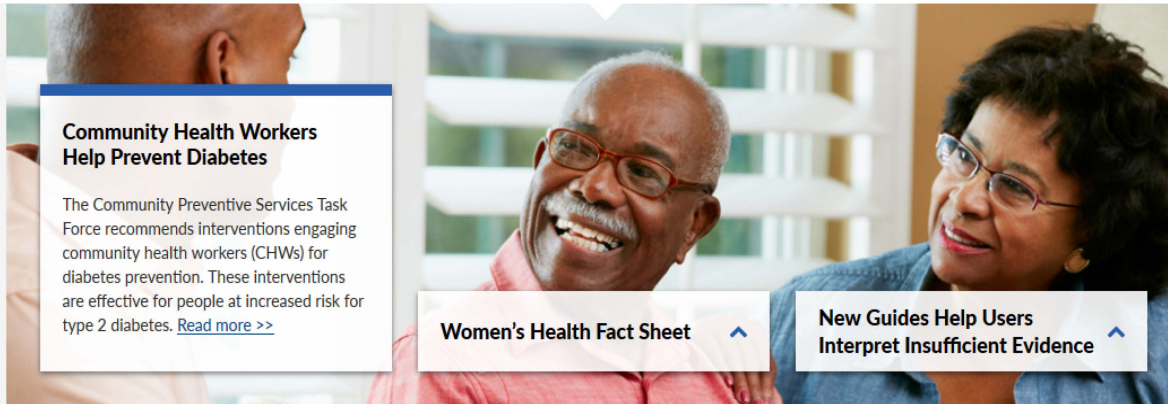


# Minimum Requirements for a CPSTF Conclusion on Intervention Effectiveness



## Your online guide of what works to promote healthy communities

[About the Guide](#) >



### Community Health Workers Help Prevent Diabetes

The Community Preventive Services Task Force recommends interventions engaging community health workers (CHWs) for diabetes prevention. These interventions are effective for people at increased risk for type 2 diabetes. [Read more >>](#)

### Women's Health Fact Sheet

### New Guides Help Users Interpret Insufficient Evidence

## Explore Popular Features of The Community Guide



### [The Community Guide in Action: Stories from the Field](#)

Learn about people from across the country who have used The Community Guide to make



### [Simplify Your Search with GuideCompass](#)

Try the simple way to help you find a public health content for a variety of uses within your community.



### [PHAB \(Public Health Accreditation Board\) Crosswalk](#)

This tool helps health departments identify Community Guide interventions that could be used to

# Achieving Impact: Who are the Priority End Users of The Community Guide?

- State, tribal, local, and territorial health departments (STLTS)
- Organizations and agencies accountable for the health of their populations, or who benefit from their populations being healthy
- Researchers, decision makers, and funders of public health programs

# Using Community Guide Reviews and CPSTF Findings

- Support programs, services, and other interventions
  - Plan and evaluate programs
  - Strengthen applications for programmatic funding
  - Justify program support/funding
  - Plan/modify systems
- Agenda for future research
  - Address identified gaps

# Findings from Community Guide Systematic Reviews on the Effectiveness of Interventions Engaging Community Health Workers

Cardiovascular disease (CVD) prevention

Diabetes prevention

Diabetes management

# Community Guide Coordination Team for the CHW Systematic Review Projects

## CDC Staff Team

- David Hopkins
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- Tim Levensgood
- Megan Cotter
- Jeff Reynolds
- Sajal Chattopadhyay

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- John Clymer (National Forum for Heart Disease and Stroke Prevention)

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- Yvonne Mensa Wilmot (DDT)
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- Gloria Ortiz (Health Resources and Services Administration)
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- Ethan Balk (Brown University, School of Public Health)
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- Leslie Kolb (American Association of Diabetes Educators)
- Peter Kim (American Association of Diabetes Educators)
- Cheryl Anne Boyce (National Institutes of Health (NIH)-National Heart, Lung, and Blood Institute (NHLBI))
- Susan Shero (NIH-NHLBI)
- Sherri Ohly (Wisconsin Department of Health Services)

# Community Health Workers (CHWs)

- Trained frontline public health workers
- Close relationship to the community
- Health advocate for individuals and families
- Demand for information on appropriate and effective interventions engaging CHWs
  - Important providers of targeted, community-based interventions to advance health equity
  - Centers for Medicare and Medicaid Services now support billing for CHW-delivered preventive services when authorized by a health care provider

# Community Health Workers: Updated Roles and Models

## Now 10 CORE ROLES\*

1. Cultural mediation
2. Culturally appropriate education and information
3. Ensuring people get services
4. Informal counseling or social support
5. Advocacy
6. Direct services
7. Building individual or community capacity
8. Implementing individual and community assessments
9. Conducting outreach
10. Participating in evaluation and research

## 5 MODELS OF CARE†

1. Screening and health education provider
2. Outreach/enrollment/information agent
3. Member of care delivery team
4. Navigator
5. Community organizer

\* The Community Health Worker Core Consensus (C3) Project 2016

† HRSA 2007



# CPSTF Findings on CHW Interventions

- Interventions engaging community health workers for cardiovascular disease prevention
  - Economic finding

Recommended (March 2015)  
Cost effective (April 2017)
- Interventions engaging community health workers for diabetes prevention
  - Economic finding

Recommended (August 2016)  
Cost effective (April 2017)
- Interventions engaging community health workers for diabetes management
  - Economic finding

Recommended (April 2017)  
Cost effective (August 2017)
- Interventions engaging community health workers for cancer  
February 2018 CPSTF Meeting

# Intervention Definition: CHW Description

- Community health workers (including promotores de salud, community health representatives, community health advisors, and others) are trained frontline public health workers who serve as a bridge between underserved communities and healthcare systems.
- They are from, or have an unusually close understanding of, the community served. Community health workers may address a broad range of health issues, or provide a wide range of services for patients with a specific health issue.
- Community health workers often receive on-the-job training and work without professional titles. Organizations may hire paid community health workers or recruit volunteers to act in this role.

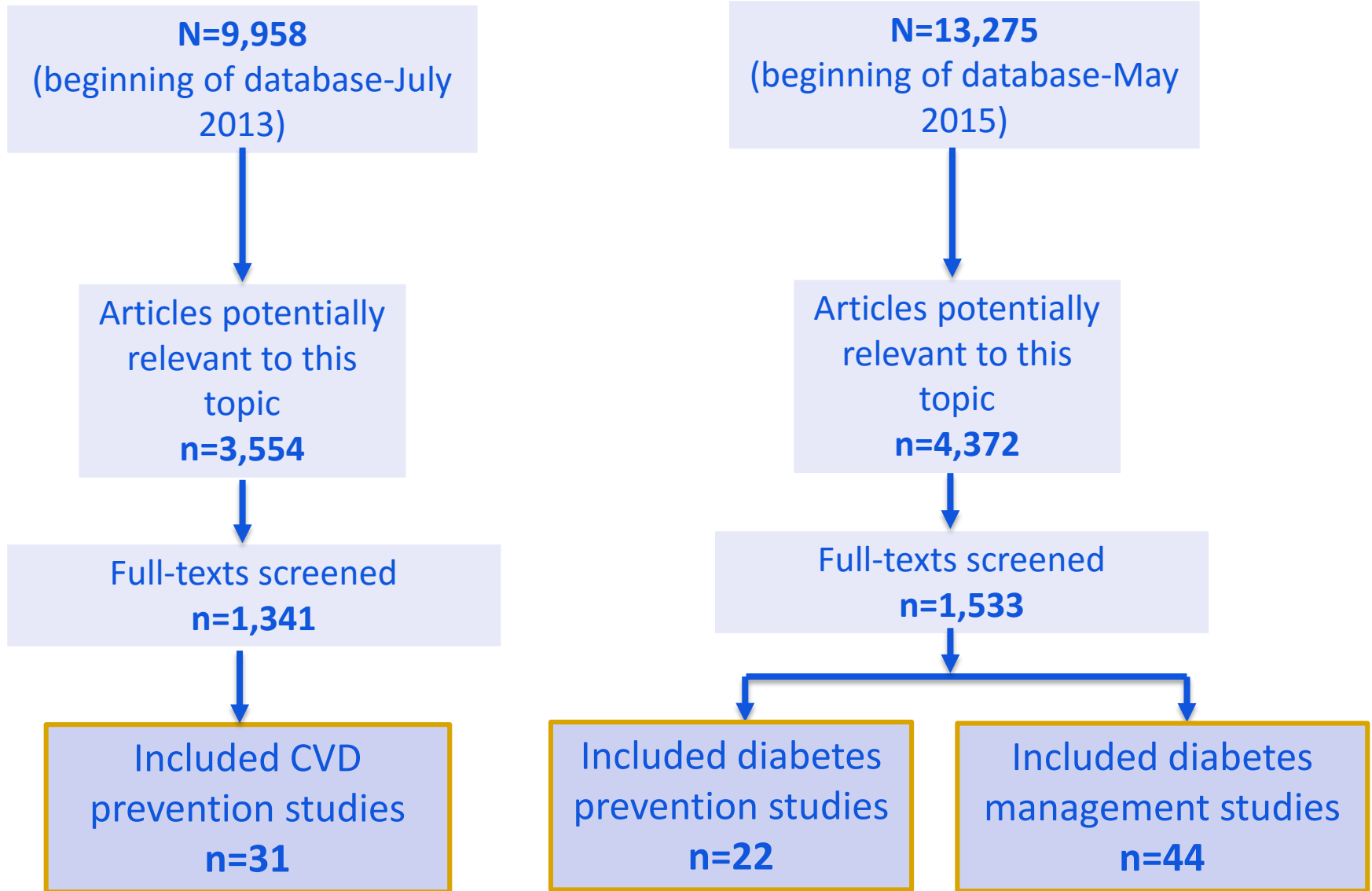
# Intervention Definition: Models of Care

- Community health workers engage in one or more of the following models of care:
  - **Screening and health education.** CHWs deliver individual or group education on health behavior change and self-management, provide adherence support for medications, and monitor or screen for patient's blood pressure, cholesterol, and behavioral risk factors.
  - **Outreach, enrollment, and information.** CHWs reach out to individuals and families who are eligible for medical services, help them apply for these services, and provide proactive client follow-up and monitoring, such as appointment reminders and home visits.
  - **Member of a care delivery team.** CHWs partner with the patient, their primary care provider, and other health professionals to improve coordination of care, education, and support.
  - **Patient navigation.** CHWs help individuals and families navigate complex medical service systems and processes to increase their access to care.
  - **Community organization.** CHWs facilitate self-directed change and community development by serving as liaisons between the community and healthcare systems.

# Systematic Review Methods: Search for Evidence

- Broad search of all potentially relevant articles from the following electronic databases
  - PubMed (MEDLINE), Cochrane, Google Scholar, CINAHL, CAB Abstracts, Global Health, HealthStar
- Inclusion criteria
  - Study must be in English
  - Study must be from a high income country\*
  - Study designs: RCTs/Quasi-RCTs, other design with concurrent comparison, before/after with/without comparison
  - Included one or more of 5 models of care (HRSA 2007)
  - All settings
- Exclusion criteria
  - Study design: cross-sectional

# Overall Search Results Summary



# Review Considerations on Applicability

- Settings
  - U.S./Non-U.S.
  - Clinic/hospital/community/worksite
- Population
  - Race/ethnicity
  - Socioeconomic status
  - Risk factor status
- Intervention delivery team
  - CHW role
  - CHW as part of a team
  - CHW as primary provider
- Intervention
  - Delivery format
  - Sessions/contact
  - Duration/follow-up

# **Cardiovascular Disease Prevention:**

Interventions Engaging Community Health Workers

# Research Questions for this Systematic Review

- How effective are these interventions in
  - Increasing recommended screening for CVD risk factors?
  - Improving outcomes for CVD risk factors (i.e., blood pressure, lipids)?
  - Improving patient health behavior (i.e., physical activity, diet, smoking, medication adherence)?
  - Reducing CVD-related health disparities?
  - Improving patient satisfaction with care?
  - Reducing morbidity and mortality?



# Results: Characteristics of Included Studies (n=31)

## ■ Location and setting

- Majority conducted in U.S. (28 studies)
- Settings: Healthcare system (13 studies ), community (11 studies), or both (7 studies)
- Most studies took place in urban areas (22 studies)
- There were few studies with >500 participants (5 studies)

## ■ Population

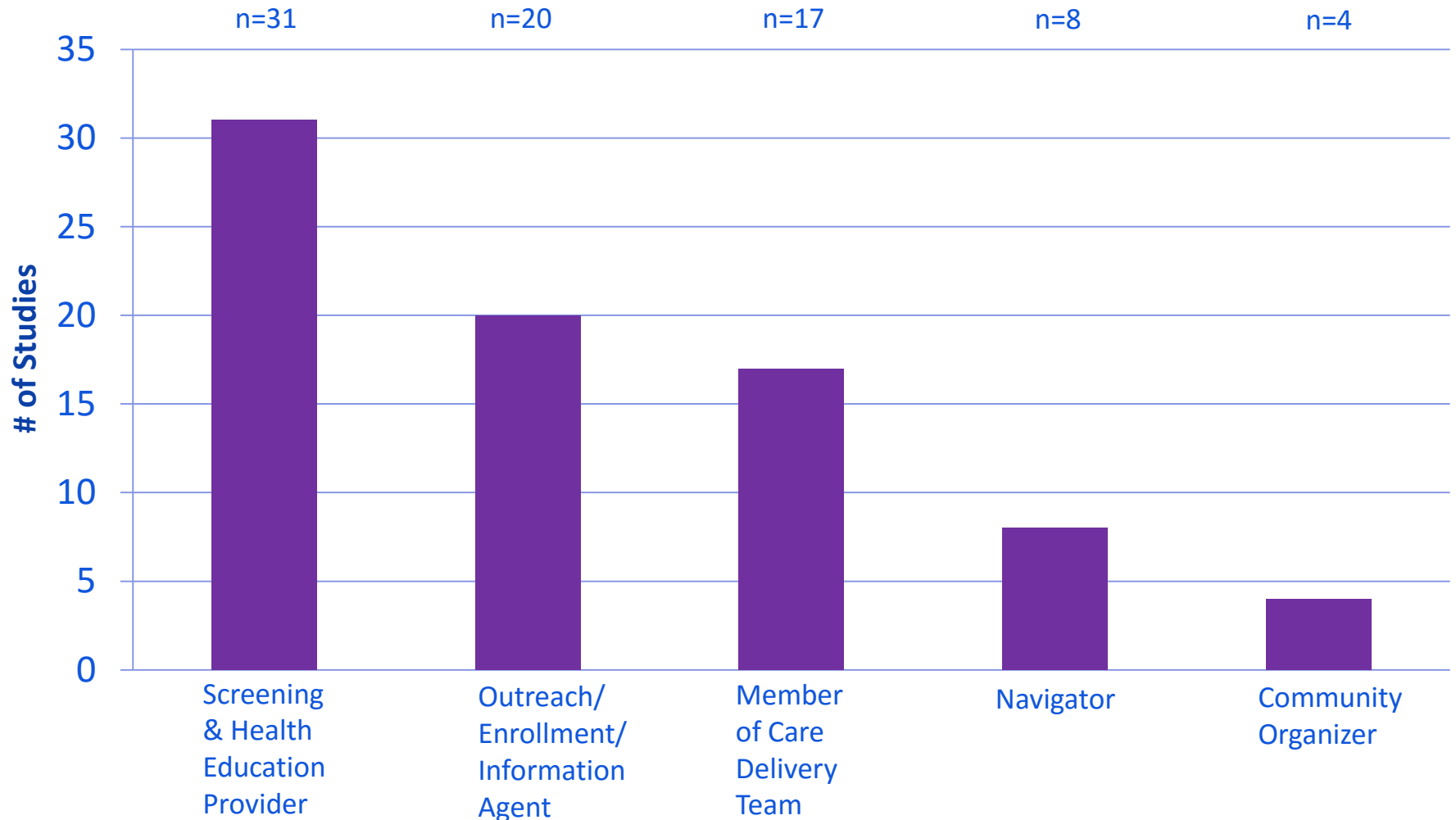
- Included adults and older adults with even distribution of males and females
- Mainly enrolled clients from medically underserved populations
  - ≥ 75% African American (9 studies)
  - ≥ 75% Hispanic (8 studies)
  - ≥ 75% low-income (12 studies)
- Most common risk factor addressed: high blood pressure

# Results: Intervention Characteristics of Included Studies (n=31 studies with 35 study arms)

- CHW interactions were one-on-one (10 study arms), group sessions (4 study arms), or a combination (19 study arms)
  - Approx. 1/3 of studies had weekly regular meetings (10 study arms)
  - Another 1/3 varied in frequency (10 study arms)
- Many of the interventions lasted  $\leq 12$  months (18 studies)
- CHW matched to population typically by location (16 studies), race/ethnicity (17 studies), and language (15 studies)
- Many studies reported some form of CHW training usually focused on CVD risk factors (20 studies)



# Distribution of Models of Care (n=31 studies)\*

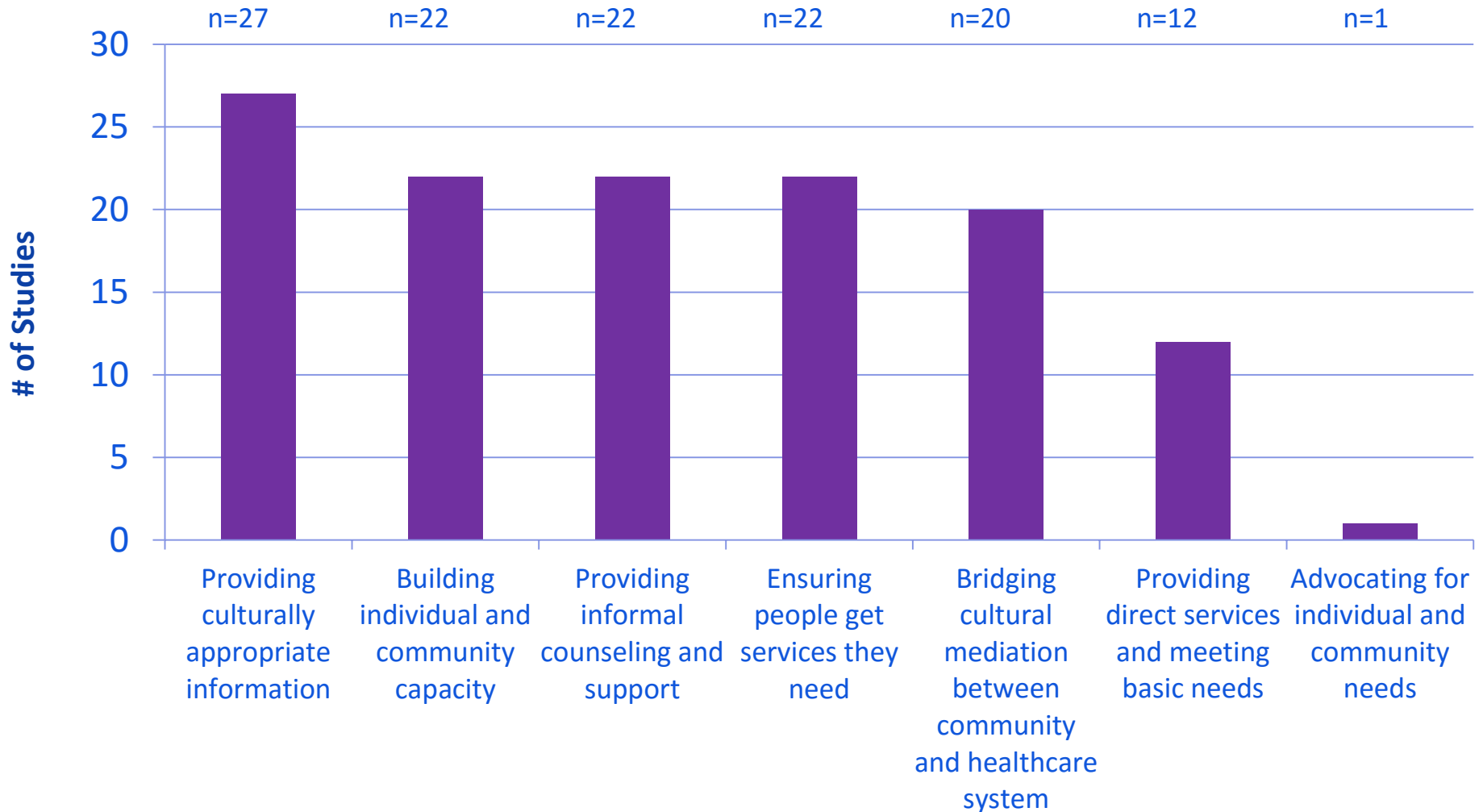


## CHW Models of Care

\*Not mutually exclusive



# Distribution of Core Roles Met (n=31)\*



## CHW Core Roles (7)

\*Not mutually exclusive

# Summary Results: Blood Pressure (BP) Outcomes

Outcome	Suitability of Study Design	# of Study (arms)	Median Change	IQI or Range
Proportion of clients with BP at goal	Greatest or Moderate	7 studies	<b>+3.8 pct pts</b>	-2.4, +17.9 pct pts
	Least	4 studies	<b>+7.7 pct pts</b>	+1.6, +14.5 pct pts
Change in mean Systolic Blood Pressure	Greatest or Moderate	12 study arms	<b>-3.3 mmHg</b>	-6.2, +2.3 mmHg
	Least	6 studies	<b>-5.6 mmHg</b>	-15.8, -0.9 mmHg
Change in mean Diastolic Blood Pressure	Greatest/Mode rate	12 study arms	<b>-1.2 mmHg</b>	-3.1, +0.8 mmHg
	Least	4 studies	<b>-2.1 mmHg</b>	-11.4, +5.0 mmHg

IQI: inter quartile interval  
Pct pts: percentage points

# Overall Summary of CVD Prevention Outcomes

Outcome	Design Suitability	# of Study Arms	Summary of Results
Blood Pressure (BP at goal, Change in mean SBP & DBP)	Greatest/ Moderate	17	Overall median favorable for all outcomes;
	Least	8	Overall median favorable for all outcomes;
Lipids (Lipids at goal; Change in mean TC, LDL, HDL & TG)	Greatest/ Moderate	10	Overall median favorable for all outcomes; < 3 studies for HDL at goal
	Least	5	Overall median favorable for LDL & TG. Unfavorable for HDL; < 3 studies for TC and lipids at goal
Diabetes (HbA1c at goal, change in HbA1c, blood glucose)	Greatest/ Moderate	7	Overall median favorable for all outcomes; IQI crosses 0 for HbA1c
	Least	5	Overall median favorable for all outcomes
CVD Risk/Risk Score (Framingham Risk Score, Other CVD risk score)	Greatest/ Moderate	6	Overall median favorable for FRS; < 3 studies for other CVD risk measures
	Least	0	----
BMI/Weight	Greatest/ Moderate	8	Overall median favorable for BMI; Unfavorable for weight
	Least	3	<3 studies for BMI and weight

# Subset Analysis: CVD Risk Factor Outcomes Summary

## CHW Models of Care

- Blood pressure outcomes
  - Team-based care/Member of care delivery team (TBC) model studies seem to drive improvements in BP outcomes (for overall body of evidence)
  - Some evidence of improvement in mean SBP with screening and health education model (without TBC) but not maintained for BP at goal outcome
  - Too few studies of other models (without TBC)
- Lipid outcomes
  - Number of studies stratified by lipid outcomes are small
  - Trends of improvements with TBC model continues
  - Some evidence of improvements also for mean total cholesterol, mean LDL and mean HDL for screening and health education model (without TBC)

# Other Outcomes Reported in Included Studies

- Utilization of healthcare services
  - One study reported a decrease in the proportion of patients with no health insurance and an increase in the proportion of patients with a primary care provider
  - One study reported reductions in length of hospital stays and decreases in Medicaid reimbursements
- Morbidity and mortality
  - Two studies reported reductions in heart attacks, heart failure, stroke, ER admissions, hospital admissions and in-hospital deaths
- Subset: Physical activity (PA) and nutrition (self reported)
  - Improvements seen for PA and nutrition outcomes for “screening and health education” model and “outreach/enrollment/information agent” model (without TBC)



# Applicability

- Based on results for interventions in different settings and populations, findings are applicable to the following:
  - Adults and older adults at increased risk for cardiovascular disease with at least high blood pressure and high cholesterol
  - Females and males
  - African American, Hispanic, and low-income populations
  - Urban environments
  - U.S. healthcare system and community settings

# CPSTF Finding

- Community Preventive Services Task Force recommends interventions that engage community health workers (CHW) to prevent cardiovascular disease (CVD)
- Strong evidence of effectiveness for interventions that engage CHW in a team-based care model to improve blood pressure and cholesterol in patients at increased risk for CVD
- Sufficient evidence of effectiveness for interventions that engage CHW for health education, and as outreach, enrollment, and information agents to increase self-reported health behaviors (e.g., physical activity) in patients at increased risk for CVD

## CPSTF Finding (cont.)

- Small number of studies suggest that engaging CHWs improves appropriate use of healthcare services and reduces morbidity and mortality related to CVD.
- When interventions engaging community health workers are implemented in minority or underserved communities, they can improve health, reduce health disparities, and enhance health equity.

# Evidence Gaps

- CHW reimbursement and funding
  - More information is needed on reimbursement arrangements including CMS implementation and funding of CHW services through clinic- or community-based providers
- Models of care
  - More evidence on interventions engaging CHWs as navigators and community organizers
- Lack of reporting on CHW characteristics
  - More information is needed on recruitment, supervision and performance evaluation of CHWs
- More evidence on the sustainability and maintenance of a CHW intervention

# Diabetes Prevention:

Interventions Engaging Community Health Workers

# Research Questions for this Systematic Review

- When delivered to members of the community who are at increased risk for developing type 2 diabetes, how effective are CHW-engaged interventions for diabetes prevention in
  - Improving diet
  - Increasing physical activity
  - Achieving weight loss
  - Maintaining weight
  - Improving glycemic measures
  - Improving blood pressure and lipids
  - Reducing incident diabetes
  - Reducing diabetes- and cardiovascular-related clinical events
  
- To what extent are effects of the intervention modified by CHW roles or characteristics of the setting or target population?

## Results: Characteristics of Included Studies (n=22)

- Almost all were from the U.S. (21 studies); some were conducted in urban areas (7 studies)
- Population
  - Included adults and older adults with majority female
  - Mainly enrolled clients from medically underserved populations
    - 100% Hispanic (9 studies)
    - 100% African American (1 study)
    - 100% Asian (3 studies)
    - Low-income ( $\leq$ \$30,000) (5 studies)
    - Median education less than high school (11 studies)
  - Limited information on youth and older adults

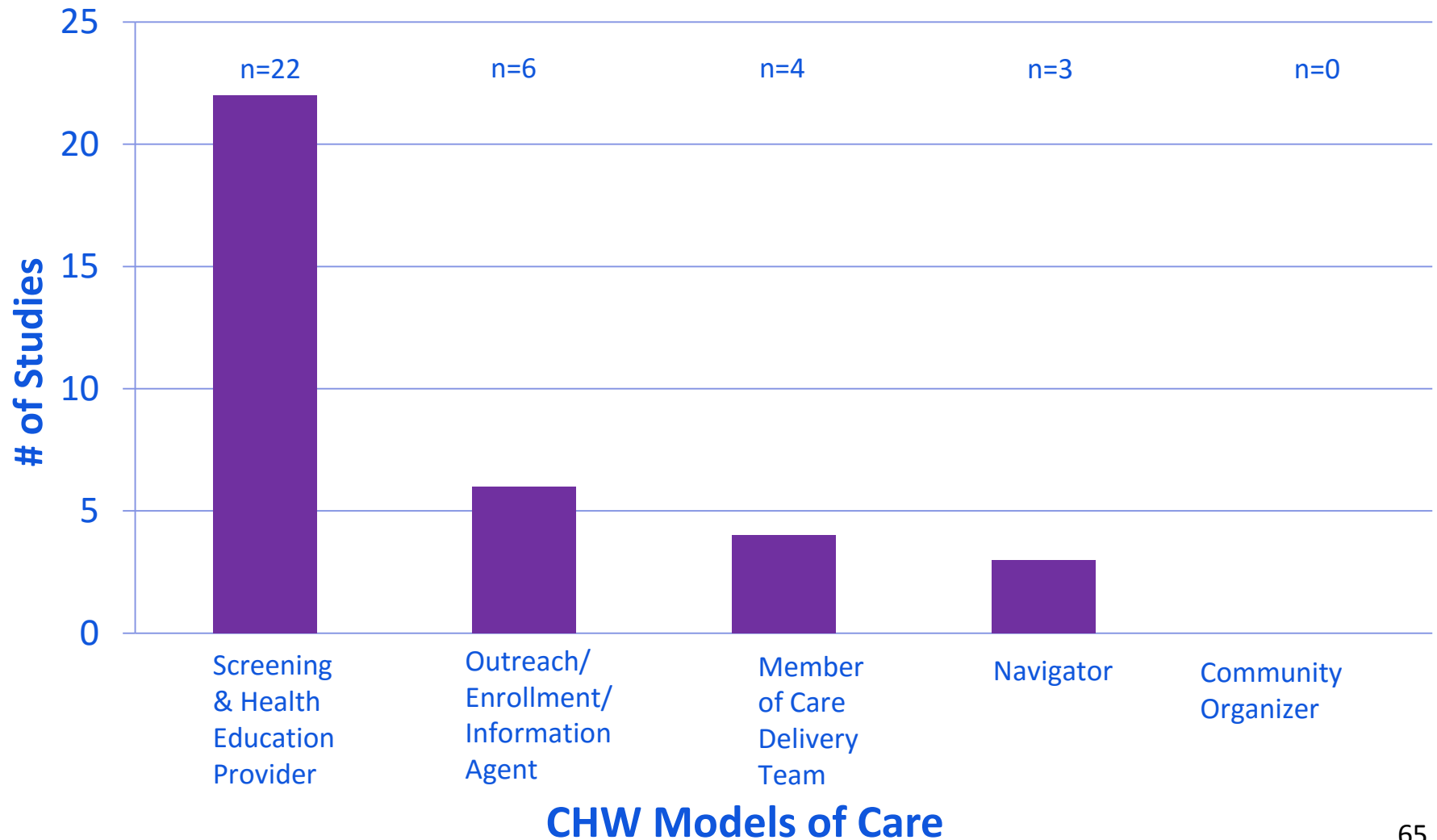
## Results: Characteristics of Included Studies

- CHW interactions were one-on-one (4 studies), group sessions (7 studies), or a combination (8 studies; most often group sessions followed by in-person contact or telephone contact)
- More than half of interventions lasted  $\leq 12$  months (19 studies)
- Half of the studies  $\leq 100$  participants (11 studies)



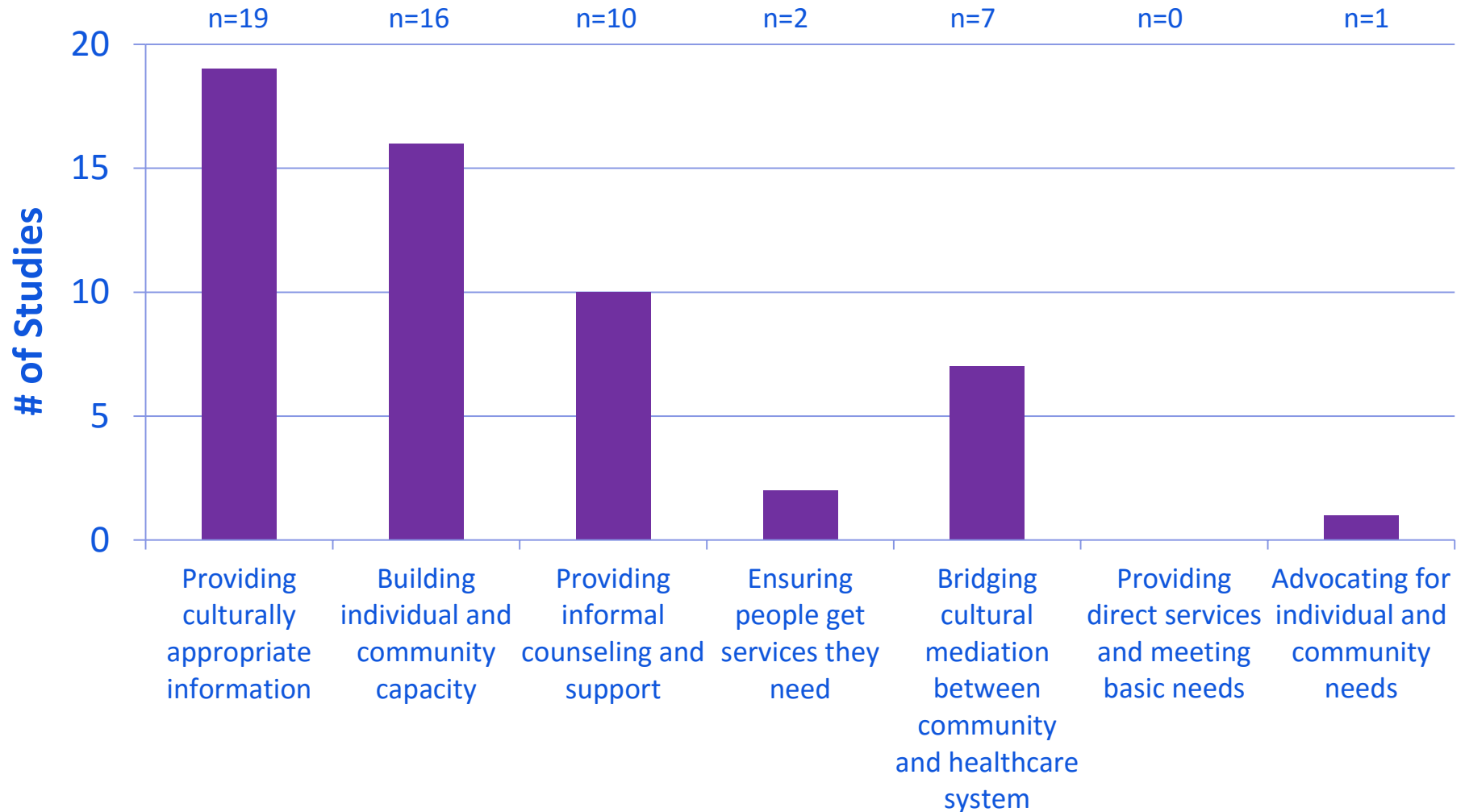


# Distribution of Models of Care (n=22)





# Distribution of Core Roles Met (n=22)



## CHW Core Roles (7)

# Overall Summary of Outcomes

Outcome	Suitability of Study Design	# of Studies	Effect Estimate: Median (IQI or Range)
Reduced progression to type 2 diabetes	Greatest	2	-3.7 percentage points (Range: -5.1, -2.2)
	Least	0	NA
Change in mean HbA1c	Greatest	3	-0.07% (Range: -0.18, 0)
	Least	3	-0.10% (Range: -0.23, 0.9)
Change in mean weight	Greatest	7	-3.7 lbs (IQI: -4.8, -1.9)
	Least	7	-2.8 lbs (IQI: -3.6, -1.5)
Change in mean BMI	Greatest	6	-0.6 kg/m <sup>2</sup> (IQI: -1.0, -0.4)
	Least	7	-0.5 kg/m <sup>2</sup> (IQI: -0.6, -0.5)

# Applicability

- Intervention components delivered by CHW
  - Patient education, lifestyle counseling, home visits
- Underserved populations
- Female (majority) and male participants
- U.S. and urban settings

# Community Preventive Services Task Force Finding

- The Community Preventive Services Task Force recommends interventions engaging community health workers for diabetes prevention based on sufficient evidence of effectiveness in improving glycemic control and weight-related outcomes among people at increased risk for type 2 diabetes.
- Some evidence suggests interventions adapted from the U.S. Diabetes Prevention Program (Diabetes Prevention Program Research Group 2002, NIDDK 2016) reduce rates of progression to type 2 diabetes, though more research is needed.
- Interventions engaging community health workers for diabetes prevention, which are typically implemented in underserved communities, can improve health, reduce health disparities, and enhance health equity.

# Evidence Gaps

- Population density was mostly urban
  - More evidence on programs conducted in rural areas
- Additional information on socioeconomic status (SES) factors
  - Race/ethnicity other than African American and Hispanic
  - Insurance status
- Intensity of intervention
  - More evidence on the frequency and length of each interaction
- Models of care
  - More information on the other models (not including screening and health education)

# **Diabetes Management:**

Interventions Engaging Community Health Workers

# Research Questions

- When delivered to members of the community who have diabetes, how effective are interventions engaging CHWs in:
  - Improving patient self-management behaviors?
  - Improving glycemic measures?
  - Improving weight management?
  - Improving CVD risk factors?
  - Reducing diabetes-related complications?
  - Reducing mortality?
- To what extent are effects of the intervention modified by characteristics of the
  - Intervention (components, mode of interaction, frequency, duration, CHW characteristics and role)
  - Target population (demographic variables such as age, gender, race/ethnicity, SES)
  - Setting (location, organization, scale of implementation)



## Results: Characteristics of Included Studies (n=44)

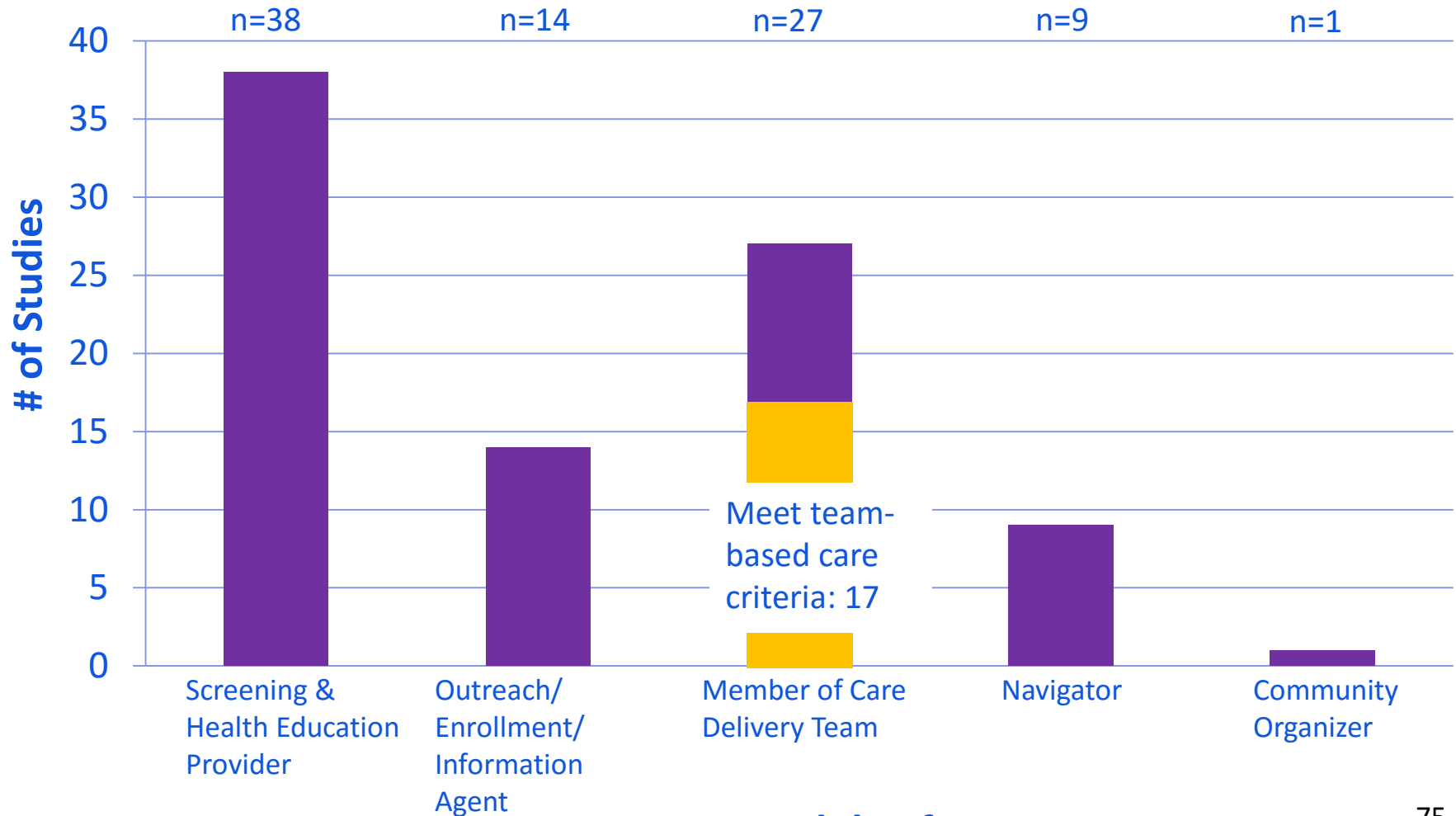
- Most were from the U.S. (39 studies); nearly half were from urban areas (21 studies)
- Population
  - Included adults and older adults with majority female
  - Mainly enrolled clients from medically underserved populations
    - ≥75% or 100% Hispanic (17 studies)
    - 100% African American (2 studies)
    - 100% Asian (3 studies)
    - Low-income ( $\leq$ \$30,000) (17 studies)
    - Median education less than high school (15 studies)
  - Limited information on youth, older adults, type 1 diabetes

## Results: Characteristics of Included Studies

- CHW interactions were one-on-one (9 studies), phone calls (3 studies), group sessions (10 studies), or a combination of all three (19 studies)
- More than half of interventions lasted between 6 and 12 months (26 studies)
- Half of the studies had more than 100 participants (22 studies)

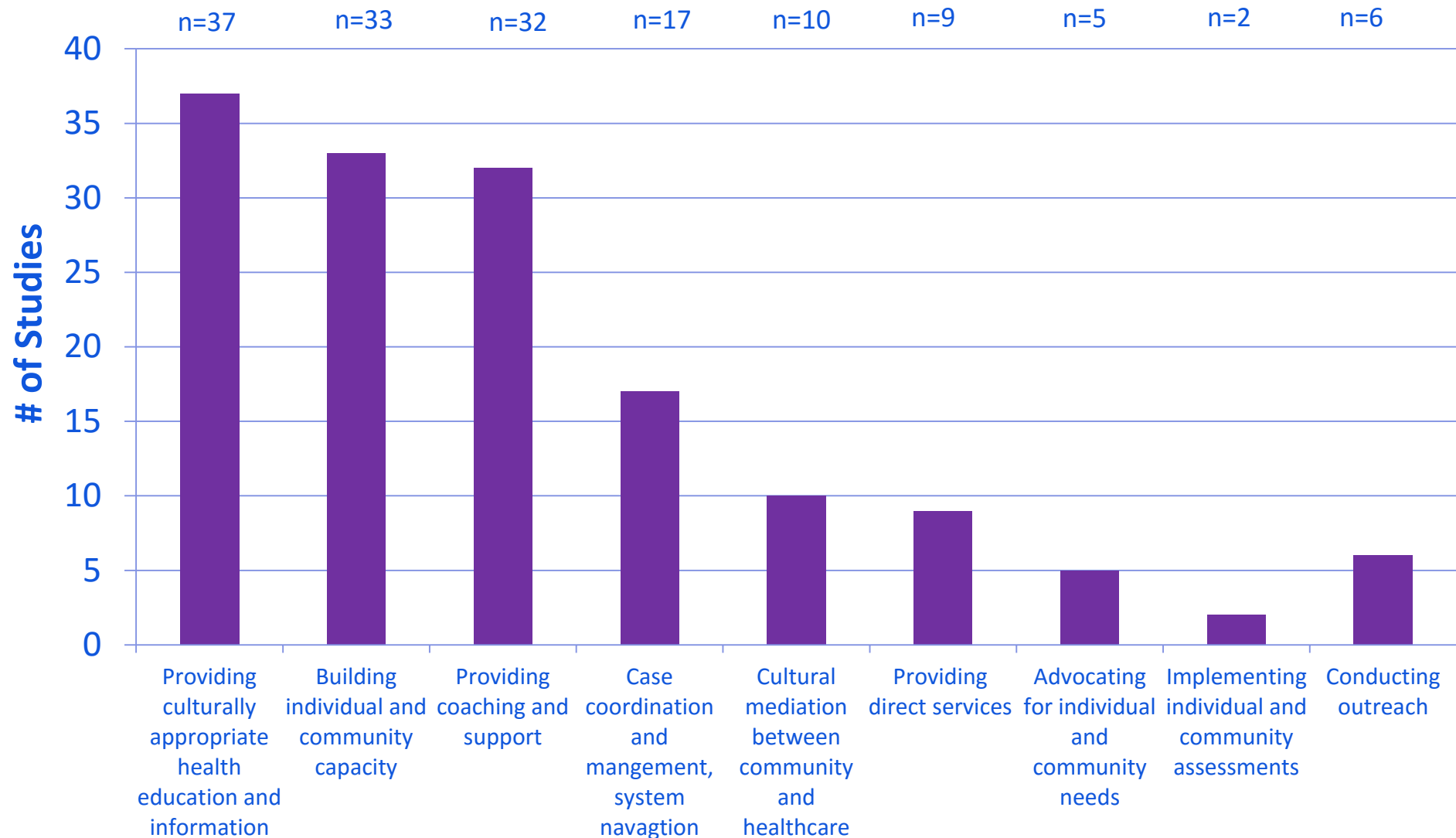


# Distribution of Models of Care (44 studies)\*





# Distribution of Ten Core Roles Met (44 studies)\*



## CHW Core Roles

\*Not mutually exclusive

# Overall Summary of Outcomes

Outcome	Suitability of Design	# of Studies	Summary of Results
Glycemic control (A1c at goal, change in A1c, FBG)	Greatest/Moderate	31	Overall median favorable for all outcomes
	Least	10	Overall median favorable for all outcomes
Lipid control (change in mean TC, LDL, HDL & TG)	Greatest	12	Overall median favorable TG + TC; No change for LDL + HDL
	Least	4	Overall median favorable for TC < 3 studies for TG, LDL, and HDL
Healthcare utilization	Greatest	3	2 favorable (1 significant, 1 non-significant) 1 mixed
	Least	1	Favorable (non-significant)
Health-related quality of life	Greatest	6	5 favorable (all non-significant) 1 no change
	Least	2	2 no change

FBG: Fasting blood glucose  
 TC: Total cholesterol  
 TG: Triglycerides

LDL: Low-density lipoprotein  
 HDL: High-density lipoprotein

# Applicability

- Delivery of intervention
  - Team-based care approach
  - CHW as member of care delivery team
  - CHW as primary implementer of intervention
- Underserved populations
- Female (majority) and male participants
- U.S. and urban settings

# Community Preventive Services Task Force Finding

- The Community Preventive Services Task Force recommends interventions engaging community health workers for diabetes management based on strong evidence of effectiveness in improving glycemic and lipid control among participants with diabetes and reducing their healthcare use.
- Interventions engaging community health workers for diabetes management are typically implemented in underserved communities and can improve health, reduce health disparities, and enhance health equity.

# Evidence Gaps

- Many studies included fewer than 100 participants
  - More evidence is needed on effectiveness of large-scale programs (i.e. >500 participants)
- The population was majority female across the interventions
  - More information on the recruitment and retention of males would be useful
- A1c as primary outcome only
  - Studies are not designed to detect or do not frequently report on blood pressure control, lipid control, and weight control
  - Improved study designs and reporting methods are needed to evaluate the impact of A1c changes on other clinical outcomes



# Summary and Considerations on Implementation

# Considerations for Implementation

- The Centers for Medicare and Medicaid Services
  - Reimbursement for preventive services delivered by CHWs when recommended by a physician or other licensed practitioner
  - States are working on implementation
  
- Few studies provided information on CHW training standards, credentialing and certification
  - Training and certification programs are being established or planned through laws, regulations, and statutes in many states (ASTHO, 2016)
  - Provide ongoing continuing education and training
  - Training includes aspects on collaboration with other providers
  
- CHW integration into health care systems
  - Scope of work considerations
  - Communication with other providers
  - Centralizing CHW services through an organization such as a health department

# Considerations for Implementation (cont.)

- CHWs act in a broader range of roles and models in diverse settings
  - As a member of team-based care (TBC)
  - As a member of a care delivery team (e.g. nutritionist, exercise physiologists)
  - As the primary implementer of intervention
  - CHWs provide services for clients in both community and clinical settings
- CVD prevention
  - TBC model studies had large improvements for BP outcomes and many lipid outcomes
- Diabetes prevention
  - National Diabetes Prevention Program provides a growing infrastructure for community-based programs
    - Information and tools for public, health care providers, and programs
    - Program standards (content, intensity, format, training)
    - Trained CHWs as lifestyle coaches

# Economics of Interventions Engaging Community Health Workers for

Cardiovascular disease prevention

Diabetes prevention

Diabetes management

# Systematic Economic Reviews: Purpose and Objective

- Review of economic evidence necessary to inform decision makers about cost and economic benefit of interventions found to be effective
- Systematic economic reviews produce
  - estimates for intervention cost
  - estimates for benefits from averted healthcare cost and increased productivity due to improved health
  - economic value of intervention based on cost-effectiveness or cost-benefit estimates

# CHW Interventions: Systematic Effectiveness and Economic Review Findings

Intervention Engaging CHWs for	CHW Role in Most Included Studies	Effectiveness Review and Basis of CPSTF Finding	CPSTF Economic Finding
Cardiovascular Disease Prevention	Member of team-based care	Recommended—strong (2015)	Cost-effective (Feb 2017)
	Health education provider; other	Recommended—sufficient (2015)	
Diabetes Prevention	Health education provider (sole)	Recommended—sufficient (2016)	Cost-effective (Feb 2017)
Diabetes Management	Health education provider; other	Recommended—strong (2017)	Cost-effective (June 2017)

# Economic Evidence: Characteristics of Included Studies

- Body of economic evidence: 29 studies of interventions engaging CHWs
  - 9 studies for CVD prevention
  - 7 studies for diabetes prevention
  - 13 studies for diabetes management
- Type of economic analysis
  - Majority of studies provided cost of intervention (28 studies)
  - About half of studies assessed effect on healthcare cost (15 studies)
  - Cost-effectiveness was reported or computable for 12 studies

# Summary of Economic Results

CVD Prevention	Diabetes Prevention	Diabetes Management
<p>Intervention Cost</p> <p>Median (IQI) \$329 (\$98 to \$422); 8 studies</p>	<p>Intervention Cost</p> <p>Median (IQI): \$600 (\$369 to \$731); 7 studies</p>	<p>Intervention Cost</p> <p>Median (IQI) \$585 (\$389 to \$1,578); 13 studies</p>
<p>Change in Healthcare Cost</p> <p>Median (IQI) -\$82 (-\$415 to \$14); 7 studies</p>	<p>Change in Healthcare Cost</p> <p>-\$1,242 and No change; 2 studies</p>	<p>Change in Healthcare Cost</p> <p>Median (IQI) -\$72 (-\$364 to \$856); 4 studies</p>
<p>Productivity Effects</p> <p>\$34; 1 study</p>	<p>Productivity Effects</p> <p>No studies</p>	<p>Productivity Effects</p> <p>No studies</p>

<sup>1</sup>Estimates are per patient per year



## Summary of Economic Results (continued)

CVD Prevention	Diabetes Prevention	Diabetes Management
<p>Total Cost</p> <p>Median (IQI) \$311 (\$16 to \$375); 7 studies<sup>1</sup></p> <p>Benefit-Cost Ratio</p> <p>1.8:1.0, 1 study</p>	<p>Total Cost</p> <p>-\$856, \$48, and \$600; 3 studies<sup>1</sup></p>	<p>Total Cost</p> <p>Median (IQI) \$1,454 (\$504 to \$3,504); 4 studies<sup>1</sup></p>
<p>Cost per QALY gained</p> <p>Median (IQI) \$17,670 (\$8,233 to \$24,149); 4 studies<sup>2</sup></p>	<p>Cost per QALY gained</p> <p>\$4,720, \$41,154, and \$436,257; 3 studies<sup>2</sup></p>	<p>Cost per QALY gained</p> <p>Median (IQI) \$38,276 (\$22,720 to \$82,000); 7 studies<sup>2</sup></p>

Total Cost = Intervention cost + change in healthcare cost

<sup>1</sup>Per patient per year; <sup>2</sup>Per patient

# Economics Evidence Gaps

- More evidence needed on complete reporting of components
  - Intervention cost
  - Healthcare cost
- Inclusion of major drivers of
  - Intervention cost
  - Healthcare cost
- More information on physiological outcomes
  - Fasting blood sugar, blood pressure

# CPSTF Economic Finding and Rationale

<b>CVD Prevention</b>	<b>Diabetes Prevention</b>	<b>Diabetes Management</b>
<p><b>Finding</b></p> <p>The economic evidence indicates that interventions engaging community health workers to prevent cardiovascular disease are cost-effective.</p>	<p><b>Finding</b></p> <p>The economic evidence indicates that interventions engaging community health workers for diabetes prevention are cost-effective.</p>	<p><b>Finding</b></p> <p>Economic evidence indicates that interventions engaging community health workers for diabetes management are cost-effective.</p>
<p><b>Rationale</b></p> <p>4 studies show intervention is cost-effective based on cost per QALY gained below \$50,000 benchmark.</p>	<p><b>Rationale</b></p> <p>2 studies show intervention is cost-effective based on cost per QALY gained below \$50,000 benchmark.</p>	<p><b>Rationale</b></p> <p>7 studies show intervention is cost-effective based on median cost per QALY gained below \$50,000 benchmark.</p>

# Implications for Public Health Practitioners

- Cost-effective
  - Public health encourages adoption of billable sustainable funding
  - Provide support for implementation of this funding

## Thank You!

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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