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Disseminating an Evidence-Based Disease Self-Management Program for Older Americans: Implications for Diversifying Participant Reach Through Delivery Site Adoption

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1. Introduction

As life expectancy among the American population increases, healthcare costs associated with aging will continue to represent a growing proportion of overall national health expenditures (Shortell et al., 2010). Much of this cost is associated with burgeoning chronic disease burden experienced by our aging society. Over the past decade, public health initiatives have focused additional effort on preventive behaviors and self-management skills to offset or address chronic disease and enhance the availability and accessibility of community- and home-based health-related resources and services (United States Senate, n.d.). Increasing the delivery and utilization of health-related programs in various settings enables older adults to receive vital education and support necessary to modify health behaviors while becoming more physically and socially active and embracing self-care practices. Such programs have shown benefit to prolong healthy life years and reduce the high costs associated with emergency care and institutionalization (Centers for Disease Control and Prevention, 2011a). As such, policymakers and practitioners alike continue to seek efficient ways to implement evidence-based community interventions and improve delivery networks to facilitate lower cost and more personalized solutions for aging Americans (National Prevention Council, 2011; U.S. Department of Health and Human Services, 2000). Despite recent successes in the United States, many questions remain

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concerning which types of community settings are best matched with certain demographic profiles of seniors to most effectively deliver health-related programs on a grand scale.

Organized by components of the RE-AIM framework (i.e., Reach and Adoption), this chapter uses data collected during a nationwide dissemination of the Chronic Disease Self-Management Program (CDSMP) through the aging services network to: 1) illustrate the geographic dispersion of the CDSMP in the United States between 2006 and 2009; 2) describe CDSMP delivery site types in terms of their neighborhood characteristics; 3) describe the personal and neighborhood-level characteristics of older adults who enrolled in CDSMP by delivery site type; and 4) discuss policy and practice implications for disseminating community-based interventions to serve diverse populations of older Americans.

1.1 Health of an aging population

While many older adults report being healthy and independent, older Americans often report high rates of chronic illnesses that threaten that health and independence (U. S. Census Bureau, 2008). Going beyond the often–cited statistic that over 80 percent of older adults (65+) have at least one chronic illness (Centers for Disease Control and Prevention, 2011b; Martin, Freedman et al., 2010), there is growing attention to multiple co-morbidities and calls for a new multiple conditions framework for better understanding the health and societal burdens of chronic illnesses (Alliance for Health Reform, 2011; Interagency Workgroup on Multiple Chronic Conditions, 2010). Chronic conditions are a leading cause of death and account for more than three-quarters of all health expenditures in the United States (Goodman et al., 2004). A multi-pronged, multi-level approach is needed to address the prevention and management of chronic conditions and enable older adults to age more successfully (Centers for Disease Control and Prevention, 2011b). Effective strategies for: 1) reducing the onset or exacerbation of chronic conditions include building healthy communities to make it easy for residents to select the 'right' lifestyle choices (Ory et al., 2009; Satariano et al., 2011); 2) promoting stronger linkages between clinical and community resources (Bolin et al., 2011); 3) helping older adults develop skills to better communicate with healthcare providers (Ory, et al., 2006); and 4) empowering older adults to take a more active role in their healthcare through adoption of evidence-based self-management strategies (Hughes et al., 2011). Despite the well-documented importance of self-management for minimizing the burdens of chronic illnesses and disabilities (Centers for Disease Control and Prevention, 2011a; Ory, et al., 1998), many barriers to self-management have been identified among older adults including diminished mental and physical functioning, lack of knowledge or confidence in engaging in self-management behaviors, and minimal familial or community supports for engaging in such activities (Center for Healthy Aging, n.d.). Evidence-based interventions that address these types of barriers are essential to promoting healthy aging.

1.2 Chronic Disease Self-Management Program (CDSMP)

Over twenty years of research at Stanford University has resulted in a widely disseminated self-management program for people with chronic conditions, the Chronic Disease Self-Management Program (CDSMP). Developed by Dr. Kate Lorig and her colleagues at the Patient Education Research Center at Stanford University (http://patienteducation.stanford.edu), there have now been several rigorous clinical

trials testing and replicating the original research (Lorig et al., 2002; Lorig et al., 2001; Lorig, Sobel, et al., 2001; Lorig et al., 1999).

As a result of attending CDSMP, health status and behavioral improvements have been reported for participants of diverse ages, cultures, and ethnicities. For examples, in demonstrating the evidence-based, positive outcomes were identified in terms of self-rated health, reduced disability, social and role activities, and health distress; reduced fatigue and pain symptomatology; increased physical activity; greater skill in coping strategies and symptom management; better provider-patient communications; and reduced healthcare utilization (Lorig, et al., 2002; Lorig, Ritter, et al., 2001; Lorig, Sobel, et al., 2001; Lorig, et al., 1999).

Based on social-cognitive theory, CDSMP has translated fundamental behavior science change principles into practice. As the program has developed, it has become well scripted so original findings can continually be reproduced in different settings and populations. Whether taught in New York or Texas, the workshops' structure will be similar because trained facilitators follow a detailed implementation manual (http://patienteducation.stanford.edu).

Classes are held for persons with chronic conditions in a small group setting (e.g., 10-16 participants) over a six week period for 2.5 hours each session. The workshop welcomes participants with all types of chronic diseases recognizing individuals suffering from any specific chronic condition face common problems. These common problems include: pain management, diet, sleep and fatigue, medications, exercise and communicating with clinicians. The workshop is designed to help participants develop skills at managing symptoms and learn coping strategies using well-tested behavior change strategies such as action planning and feedback, behavior modeling, problem-solving techniques, and decision making (Ory, et al., 2002). In recognition of the importance of outreach to potential participants who can benefit from increased self-management skills, the workshops are offered in multiple community settings such as senior centers, churches, libraries, and healthcare settings.

To maintain quality control, Stanford University requires certification and licensure for all parties who deliver CDSMP. The program developers offer a training program for Master Trainers to learn and develop skills necessary to train and supervise the Lay Leaders (class facilitators) and ensure the quality of local programs. Implementation protocols call for two trained Lay Leaders (i.e., at least one of the leaders is a non-health professional with a chronic disease) to co-facilitate the program. Ideally, Lay Leaders are matched to the CDSMP program participants by race/ethnicity, culture, gender, and/or age. Stanford has trained Master Trainers from all 50 states as well as countries around the world (e.g., Canada, Australia, China, Japan, Norway and other Scandinavian countries, and the United Kingdom).

Several aspects make CDSMP a unique evidence-based self-management program. Its benefits have been documented in multiple settings and populations. Its well-specified implementation manual assists in scalability and makes further dissemination easier and more structured. Additionally, the well-honed training infrastructure and continual feedback via fidelity checklists helps ensure program uniformity as it is disseminated in different locations.

1.3 The Administration on aging's evidence-based disease prevention initiative

In 2003, the Administration on Aging (AoA) began funding pilot programs to test the translation of the Evidence-Based Disease and Disability Prevention programs (EBDDP),

including the CDSMP program, in the Aging Services Network's community-based settings. Based on the positive results of these pilot programs, the AoA increased its Federal support of EBDDP in 2006. A total of $4,542,300 USD was allocated between 16 states to support collaborations between the aging and public health networks at the state and local level to implement these programs for older adults. In 2007, $5,841,680 USD was allocated between eight additional states. The AoA continued supporting these grants through competitive supplements of $5,091,680 USD in 2008 and $5,091,680 USD in 2009. Since 2006, the AoA has awarded $22 million and leveraged an additional $20 million to support evidence-based programs in 27 States. This funding supported the development of a delivery infrastructure for evidence-based programs to serve older adults in various community-based settings. The AoA leads the EBDDP initiative in partnership with the Centers for Disease Control & Prevention (Centers for Disease Control and Prevention (CDC)), Agency for Healthcare Research & Quality (AHRQ), Centers for Medicare and Medicaid Services (CMMS), Health Resources & Services Administration (HRSA), Substance Abuse & Mental Health Services Administration (SAMHSA), and over 30 private foundations.

1.4 The role of the RE-AIM framework

To be effective and meet predetermined expectations, the CDSMP national roll-out necessitated a broad public health perspective. In consultation with translational researchers, AoA administrators drew upon the RE-AIM framework as an organizing framework for program planning and evaluation (Glasgow, et al., 2001; Glasgow, et al., 1999). As part of funding requirements, AoA grantees were expected to describe their use of the RE-AIM model to plan, implement, evaluate, and sustain their proposed health promotion programming.

Fig. 1. The RE-AIM Framework

The RE-AIM framework has been employed to encourage program planners, evaluators, researchers, funders, and policy-makers to heed the essential program elements that can improve the implementation, adoption, and sustainability of effective, evidence-based health promotion programs.

RE-AIM is a mnemonic that helps community practitioners focus on program *reach, effectiveness, adoption, implementation,* and *maintenance.*

In the following section, we briefly describe the different RE-AIM components (Administration on Aging, 2010; Glasgow, et al., 2001; Glasgow, et al., 1999).

Reach focuses on the extent to which a program reaches the intended target population. Monitoring *reach* is important to determine if the target audience is participating in the program, in what numbers, and the percentage of program completion and attrition. It also helps to determine the adequacy of marketing efforts, recruitment and retention of participants and whether certain program sites are having problems with filling workshops or attendance (retention).

Effectiveness focuses on whether a program is achieving the same participant outcomes and having the same impact as in the original research design. Monitoring *effectiveness* helps to assess whether a program is producing positive changes in participants' health and well-being and whether there are any unintended (positive or negative) outcomes. Demonstrating such program value and return on investment is important to key stakeholders.

Adoption focuses on the extent to which host agencies and implementation sites deliver and embed the program into routine activities and the level of organizational support that is provided. Monitoring *adoption* helps to determine whether there are enough partners, implementation sites, frequency of workshops and personnel to deliver the program and to reach the target population; how well partners and sites are supporting the programs; whether the settings are appropriate and accessible for those to be reached; and whether the program can "go to scale."

Implementation focuses on fidelity monitoring, that is, the consistency of a program's delivery in different settings and with different instructors. Fidelity monitoring may include assessing consistency with the intended program design, training, delivery, and participant mastery and application. Monitoring *implementation* helps to ensure the program is delivered in a quality manner, no matter how often, by whom or in what setting. This, in turn, helps to document that the participant outcomes can really be attributed to the program and can help to identify areas of need for improvement or changes in training or program delivery.

Maintenance focuses on assessing: 1) at the program level, the extent to which a program becomes institutionalized or part of the routine organizational practice and policy and, 2) at the individual level, the extent to which participants sustain long-term benefits from completing the program. Monitoring *maintenance* enables program managers to assess marketing effectiveness; expansion of accessibility to new partners, program sites and new populations and the capacity to scale state-wide; and the extent to which the program is sustained and embedded within the state's evidence-based prevention program distribution and delivery system and other health and long-term supportive services systems.

1.5 An emphasis on reach and adoption

While all elements of the RE-AIM Framework are essential to develop, organize, deliver, and evaluate programs disseminated on a grand scale, this chapter specifically emphasizes the aspects of Reach and Adoption in this national AoA initiative. The authors elected to highlight these RE-AIM elements because they are indicative to the success of providing access to diverse populations. Below, we briefly describe our rationale in focusing on these two RE-AIM elements as a way of examining the relationship between program reach and delivery site. We see the types of participants reached as influenced by the types of agencies and organizations who adopt and deliver the program. Theoretically, there is an association between Reach and Adoption with a larger number of participants enrolling in a program if more organizations adopt the program and deliver it in close proximity to the participants' place of residence. Moreover, organizations and delivery site types typically service older adults with varying characteristics (e.g., age, race/ethnicity, residential rurality). A diversification of the types of delivery sites that offer the program may be needed to increase the likelihood that a diverse group of older adults are attracted to and enrolled in an evidence-based program. Additionally, some organizations and agencies are generally located in geographic areas with varying neighborhood-level characteristics. Thus, they attract different clientele, which is often influenced by the types of individuals who reside in the area.

Expanding the number of delivery sites (regardless of types) over a wide geographic community landscape may increase the chances that participants will have access to the program, enroll in the program, and complete the program. Offering the program in close proximity to the participants' residence reduces the distance they must drive (or have someone else drive them) to access the program or service. This follows the basic community health development principle that programs and services will be utilized more frequently if offered in areas where people live, work, play, and/or pray.

This chapter reports participant (i.e., Reach) and delivery site (i.e., Adoption) characteristics associated with data collected nationwide by Senior Services between September 2006 and August 2009 for the CDSMP program. Within each grantee state, a designated data manager collected participant-level demographics, participant-level program attendance, and course or workshop data (i.e., including the delivery site type and host organization). The data manager completed a standardized template provided by AoA (accompanied by a data dictionary and user guide) for completed workshops each 6-month reporting period. These de-identified data were sent to AoA, exported from the state's internal data management system, and compiled into a centralized master database. Senior Services personnel then performed data quality checks to validate the integrity of the data. Data errors were referred to the state data managers for correction.

Although CDSMP was delivered beyond this AoA-funded initiative, we only included data collected as part of these grant efforts. Additionally, in the 2006-2009 initiative AoA did not require the systematic collection of outcome data, given that CDSMP was a proven evidence-based program. Thus, health-related outcomes are not reported in this chapter.

2. Participants and procedures

The data collected during this initiative was geocoded with ArcGIS ArcMap 10 using the ArcGIS Online U.S. Streets Geocode Service. Of the 1,339 CDSMP delivery site addresses, 1,306 (97.5%) were geocoded to their street location. Participant records were geocoded

using their residential ZIP Code. Of the 23,091 CDSMP participants, 16,356 (70.8%) were geocoded. Of the 6,735 participant cases that could not be geocoded, 75 (0.3%) had invalid ZIP Codes, and 6,660 (28.9%) had missing ZIP Code data.

The neighborhood-level demographic data (i.e., median income, percent of the population age 65 years and older, percent of the population that was non-Hispanic white) was obtained from the U.S. Census Bureau, Census 2000, Summary File. This information was linked to participant records based on the ZIP Code of the participants' residence and program delivery site address. Data used to determine rurality (i.e., metro versus non-metro), was based on the county in which the participant resided and/or delivery site was located and are from the United States Department of Agriculture's 2003 Rural-Urban Continuum Codes (United States Department of Agriculture, 2004).

2.1 Measures

To examine personal and neighborhood characteristics associated with CDSMP delivery sites during this nationwide dissemination effort, a variety of measures were used.

Delivery Site Types. Data pertaining to CDSMP delivery site types were gathered administratively, as previously described. Participant cases attending the five most prevalent delivery site types were compared in these analyses: senior centers or Area Agencies on Aging (AAA), residential facilities, healthcare organizations, community or multi-purpose centers, and faith-based organizations. Participants attending CDSMP at any other delivery site types were omitted because of inadequate case sizes. The following delivery site types were omitted from analyses: State and County Public Health Departments (n = 29, 0.3%); municipal government (n = 58, 0.5%), workplace (n = 95, 0.8%), and Parks Department facilities (n = 108, 0.09%). Further, delivery sites categorized as "other" (n = 802, 7.0%) were omitted because of the potential difficulty to interpret findings associated with this delivery site type.

Note: Area Agencies on Aging (AAA) were established under the Older Americans Act (OAA) to serve the needs of older Americans (i.e., aged 60 and older). This nationwide network of agencies spans all 50 of the United States in an effort to keep older adults residing independently in their homes while providing valuable social services and community-based programs (Bookman, et al., 2007).

Neighborhood Characteristics. Using participants' residential ZIP Codes, geographic information system (GIS) software was used to generate neighborhood-level variables for each participant. Neighborhood characteristics included residential rurality (i.e., metro residence [urban] or non-metro [rural] residence based on the rural-urban commuting area codes (RUCA)), median household income for residents residing in the participants' ZIP code (i.e., interpreted in increments of $10,000 USD), the percent of residents aged 65 years and older residing in the participants' ZIP code, and the percent of non-Hispanic white residents residing in the participants' ZIP code. Using organizational ZIP codes, geographic information system software was used to generate neighborhood-level variables for each delivery site (i.e., site rurality, median household income, percent of residents aged 65 years and older, and percent of non-Hispanic white participants).

Personal Characteristics. Personal characteristics of the participants included age (i.e., ranging from 51 to 103 years), sex (i.e., male, female), race/ethnicity (i.e., non-Hispanic white, African

American or Black, Hispanic or Latino, Other/Multiple races), and the highest level of education received (i.e., less than high school, graduated high school, more than high school). Participants also self-reported their living situation (i.e., lives alone, lives with others).

2.2 Data analysis

For the purposes of this study, analyses were limited to participants who enrolled in CDSMP. Additionally, participant cases were omitted for those who attended programs hosted at delivery sites other than the five most prevalent sites noted above. All statistical analyses for this study were performed using SPSS (version 17). Frequencies were calculated for all major study variables which were examined in relationship to the program delivery site type. Frequency distribution differences for categorical variables were assessed using Pearson's chi-squared tests. One-way analyses of variance (f statistics) were used to identify mean differences between program delivery site types for continuous variables. Multinomial logistic regression was used to identify personal characteristics and participants' neighborhood-level characteristics associated with the type of delivery site they attended (i.e., senior center or Area Agency on Aging sites served as the referent group).

3. Nationwide dissemination of CDSMP

Our initial goal is to depict the geographic dispersion of CDSMP delivered nationwide via the AoA initiative between 2006 and 2009 in the five most prevalent types of delivery sites. As indicated in Figure 1, over this funding period, a total of 1,339 CDSMP workshops were delivered across 26 states. Nationwide, 358 (26.7%) workshops were delivered at senior centers/AAA, 271 (20.2%) at residential facilities, 195 (14.6%) at healthcare organizations, 142 (10.6%) at community or multi-purpose centers, and 131 (9.8%) at faith-based organizations.
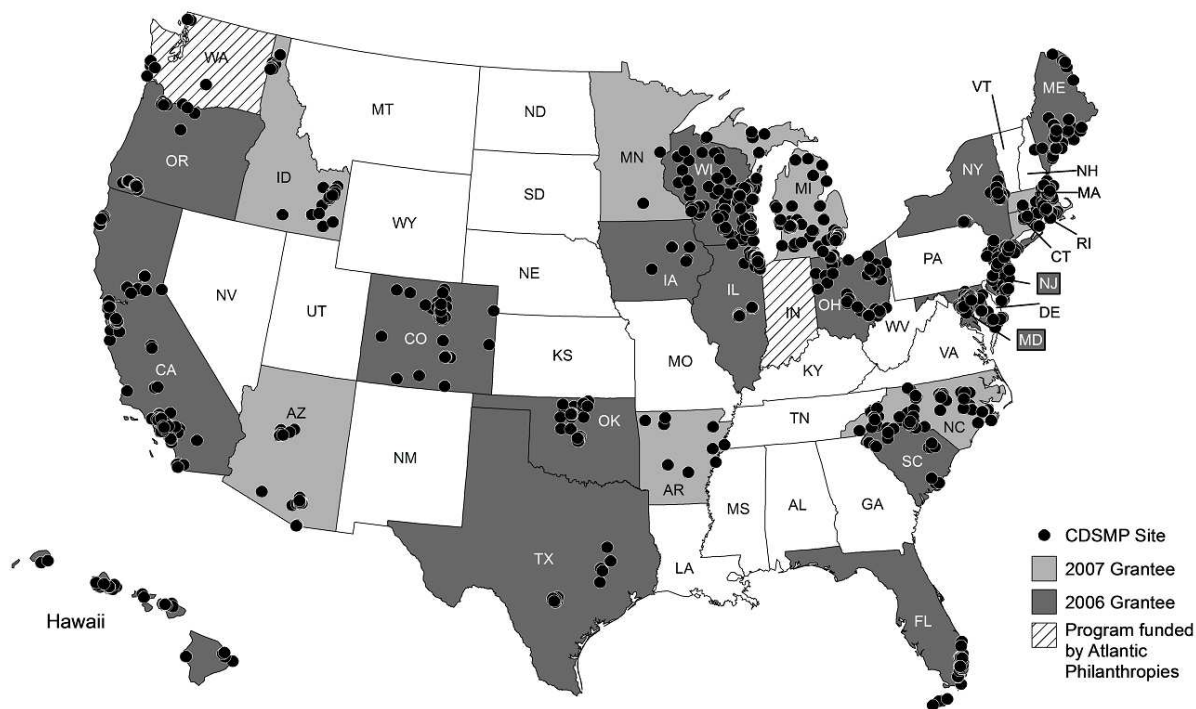

Fig. 2. National CDSMP Delivery Site Dispersion: 2006 to 2009

Patterns of CDSMP workshop delivery differed within states and could be classified as concentrated regionally (as in Texas and Florida) or dispersed statewide (as in Wisconsin and Michigan). The delivery dispersion of CDSMP was influenced by the AAA infrastructure, funding timeline, and allocation within each state. Generally speaking, those states funded in earlier years of the initiative delivered a larger number of CDSMP workshops.

3.1 Neighborhood characteristics of CDSMP delivery site types

A major research and practice question is the relationship between CDSMP delivery sites and socio-demographic neighborhood characteristics. As indicated in Table 1, 84% percent of participants attended CDSMP workshops delivered in metro (or urban) areas. On average, participants attended workshops delivered in ZIP codes where the median household income was $56,700 USD (±$31,700) and in areas where 13% (±6%) of the population was age 65 years and older. On average, CDSMP participants attended workshops delivered in ZIP codes comprised of 71% (±26%) non-Hispanic white residents.

When comparing these neighborhood characteristics by delivery site type, a larger proportion of CDSMP workshops in non-metro (or rural) areas were delivered in senior centers/AAA (19.9%) and faith-based organizations (18.2%) compared to community/multi-purpose centers (13.8%) and residential facilities (11.0%). On average, workshops at healthcare organizations were delivered in more affluent areas (median household income of $71,400) whereas workshops at residential facilities were delivered in less affluent areas (median household income of $47,200). On average, CDSMP workshops at community/multi-purpose facilities (64% non-Hispanic white) were delivered in more racially/ethnically diverse areas compared to workshops offered at residential facilities (75% non-Hispanic white) and senior centers/AAA (73% non-Hispanic white).

3.2 Personal characteristics of CDSMP participants by delivery site type

Another primary goal was to understand if there was a relationship between delivery site type and participant characteristics. Personal characteristics of study participants are also presented in Table 1. Of the 10,242 CDSMP participants with complete data on all variables of interest, 34.8% (n = 3,562) attended workshops at senior centers/AAA, 18.2% (n = 1,860) at residential facilities, 26.7% (n =2,738) at healthcare organizations, 10.8% (n = 1,108) at community or multi-purpose centers, and 9.5% (n = 974) at faith-based organizations.

Overall, the average age of participants was 72 years (±9.71). The majority of CDSMP participants were female (78.8%), non-Hispanic white (62.8%), lived with others (53.9%), and resided in metro areas (84.3%). Over 44% of participants had more than a high school education, whereas 28.0% graduate high school and 27.5% had less than a high school education. On average, participants resided in ZIP codes where the median household income was $43,000 USD (±$15,400) and in areas where 13% (±0.6%) of the population was age 65 years and older. On average, CDSMP participants resided in ZIP codes comprised of 70% (±26%) non-Hispanic white residents.

Table 1. Delivery Site and Participant Characteristics by Delivery Site Type

Delivery Site Characteristics	SC/AAA (n = 6441)	RF (n = 4523)	HO (n = 5809)	C/MPC (n = 3072)	FB((n = 2
Metro (Delivery Site)	5161 (80.1%)	4024 (89.0%)	4889 (84.2%)	2648 (86.2%)	1773 (81
Non-Metro (Delivery Site)	1280 (19.9%)	499 (11.0%)	920 (15.8%)	424 (13.8%)	395 (18
Median Income for ZIP: Delivery Site	5.02 (±2.98)	4.72 (±2.94)	7.14 (±2.99)	5.95 (±3.31)	5.54 (±
Percent of Delivery Site ZIP Population: Age 65+	0.14 (±0.05)	0.15 (±0.06)	0.12 (±0.05)	0.13 (±0.06)	0.13 (±
Percent of Delivery Site ZIP Population: Non-Hispanic White	0.73 (±0.26)	0.75 (±0.24)	0.68 (±0.25)	0.64 (±0.27)	0.71 (±

Participant Characteristics	SC/AAA (n = 3562)	RF (n = 1860)	HO (n = 2738)	C/MPC (n = 1108)	FB((n = 9
Age	73.35 (±8.90)	76.39 (±9.86)	69.03 (±9.29)	70.54 (±9.97)	70.52 (±
Male	695 (19.5%)	251 (13.5%)	809 (29.5%)	239 (21.6%)	177 (18
Female	2867 (80.5%)	1609 (86.5%)	1929 (70.5%)	869 (78.4%)	797 (81
Less than High School	709 (19.9%)	458 (24.6%)	1023 (37.4%)	392 (35.4%)	235 (24
Graduated High School	1095 (30.7%)	612 (32.9%)	636 (23.2%)	261 (23.6%)	262 (26
More than High School	1758 (49.4%)	790 (42.5%)	1079 (39.4%)	455 (41.1%)	477 (49
Non-Hispanic White	2274 (63.8%)	1253 (67.4%)	1810 (66.1%)	554 (50.0%)	536 (55
Hispanic	356 (10.0%)	273 (14.7%)	419 (15.3%)	195 (17.6%)	130 (13
African American	477 (13.4%)	182 (9.8%)	322 (11.8%)	125 (11.3%)	148 (15
Other / Multiple Races	455 (12.8%)	152 (8.2%)	187 (6.8%)	234 (21.1%)	160 (16
Lives with Others	1804 (50.6%)	462 (24.8%)	1950 (71.2%)	683 (61.6%)	622 (63
Lives Alone	1758 (49.4%)	1398 (75.2%)	788 (28.8%)	425 (38.4%)	352 (36
Metro (Participant)	2805 (78.7%)	1680 (90.3%)	2407 (87.9%)	959 (86.6%)	778 (79
Non-Metro (Participant)	757 (21.3%)	180 (9.7%)	331 (12.1%)	149 (13.4%)	196 (20
Median Income for ZIP: Particpant Residence	4.34 (±1.45)	4.18 (±1.59)	4.64 (±1.58)	4.27 (±1.65)	4.05 (±
Percent of ZIP Population: Age 65+	0.13 (±0.05)	0.14 (±0.06)	0.12 (±0.06)	0.13 (±0.06)	0.13 (±
Percent of ZIP Population: Non-Hispanic White	0.71 (±0.27)	0.74 (±0.24)	0.69 (±0.25)	0.66 (±0.26)	0.70 (±

*SC/AAA = Senior Center/Area Agency on Aging; RF = Residential Facility; HO = Healthcare Organization; C/MPC = Community/Multi-pu
**Means, standard deviations, and t-tests reported for continuous variables

To fully gauge how participant Reach differs by delivery site type relative to those enrolled at senior centers/AAA, we must first briefly describe the profile of participants who attended CDSMP workshops at senior centers/AAA. On average, these participants were age 73 years (±8.90). The majority of these CDSMP participants were female (80.5%), non-Hispanic white (63.8%), lived with others (50.6%), and resided in metro areas (78.7%). Over 49% of CDSMP participants who attended workshops at senior centers/AAA had more than a high school education, whereas 30.7% graduate high school and 19.9% had less than a high school education. On average, participants resided in ZIP codes where the median household income was $43,400 USD (±$14,500) and in areas where 13% (±5%) of the population was age 65 years and older. On average, CDSMP participants resided in ZIP codes comprised of 71% (±27%) non-Hispanic white residents.

When comparing participant characteristics by delivery site type, significant variation was observed relative to those who attended CDSMP workshops at senior centers/AAA. Residential facilities enrolled an older group of participants (76 years ±9.86), whereas healthcare organizations enrolled a younger group of participants (69 years ±9.29). The largest proportion of male workshop participants was reached in healthcare organizations (29.5%), whereas the smallest proportion was reached in residential facilities (13.5%). A larger proportion of participants with less than a high school education were reached in healthcare organizations (37.4%) and community or multi-purpose centers (35.4%). The greatest racial and ethnic diversity among CDSMP participants was observed among workshops delivered at community or multi-purpose centers and faith-based organizations. The largest proportion of participants living alone attended workshops at residential facilities (75.2%), whereas the smallest proportion of attended workshops at healthcare organizations (28.8%). While the largest proportion of rural-residing residents were reached in senior centers/AAA (21.3%), faith-based organizations also reached a larger proportion of these participants (20.1%), especially compared to the proportion of rural-residing residents reached by residential facilities (9.7%). CDSMP participants who attended workshops at faith-based organizations resided in the least affluent areas ($40,500 USD ±$13,900), whereas those who attended workshops at healthcare organizations resided in the most affluent areas ($46,400 USD ±$15,800). Participants who attended workshops at community or multi-purpose centers resided in the most racially/ethnically diverse areas (66% non-Hispanic white residents ±26%).

3.3 Delivery site type profiles by neighborhood characteristics

Little is known about the relationship between neighborhood-level characteristics of where CDSMP workshops were attended and delivery site type (i.e., Adoption characteristics). In this section, we will briefly describe each neighborhood-level delivery site type profile relative to workshops attended at senior centers/AAA. Using multinomial logistic regression, we fit a model with delivery site type as the dependent variable (attending CDSMP workshops at a senior center/AAA served as the referent group) and delivery site neighborhood characteristics were entered as independent variables. Table 2 contains the results of this analysis.

Residential Facilities. Compared to workshops attended at senior centers/AAA, participants were less likely to attend workshops delivered at residential facilities in rural areas (OR = 0.440, P < 0.001). Participants who attended workshops at residential facilities did so in areas that were less affluent (OR = 0.981, P = 0.002) and had larger proportions of the population who were non-Hispanic white (OR = 1.648, P < 0.001) and age 65 and older (OR = 8.942, P < 0.001).
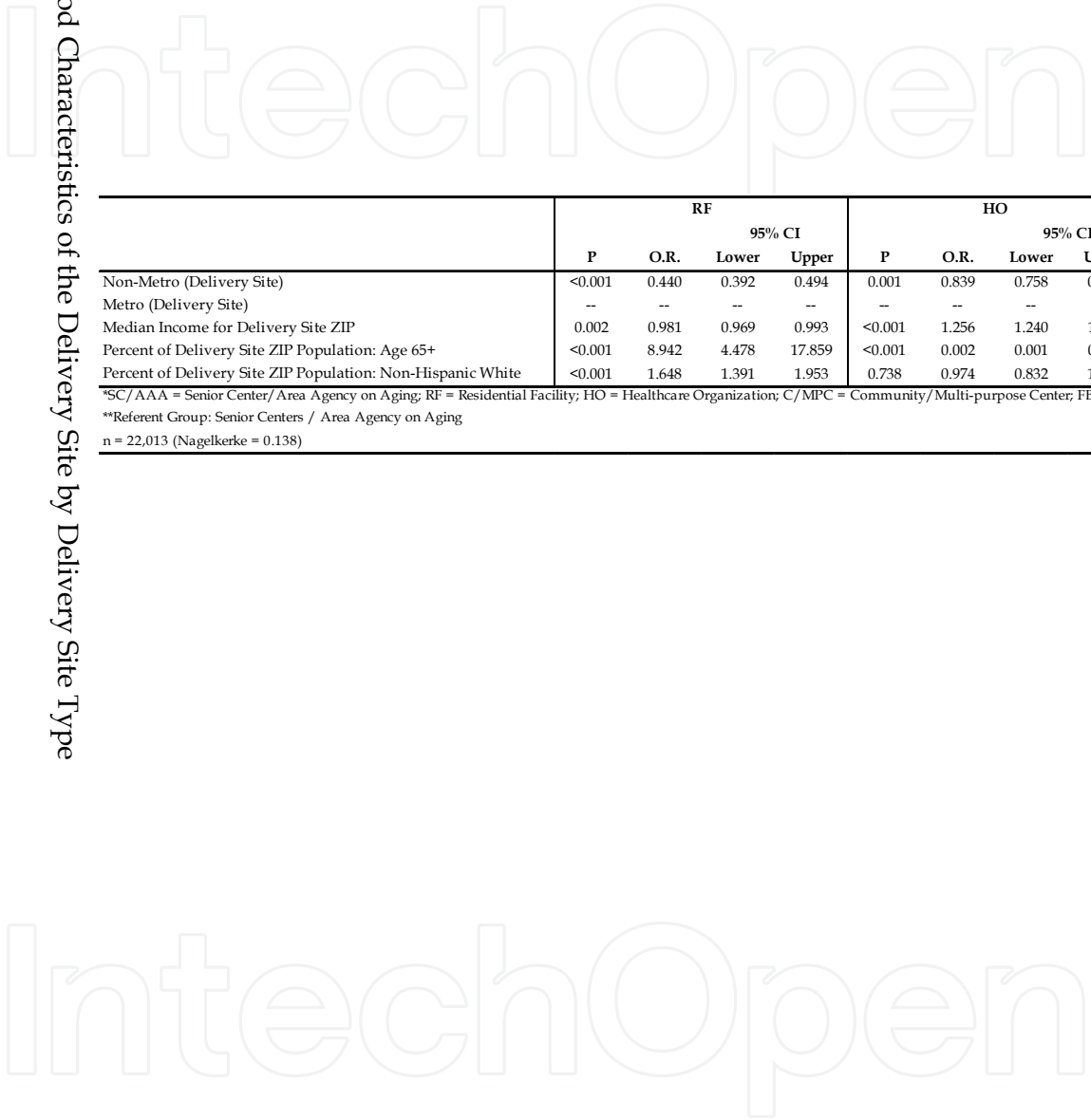
Table 2. Neighborhood Characteristics of the Delivery Site by Delivery Site Type

	RF				HO				C/MPC		
			95% CI				95% CI				
	P	O.R.	Lower	Upper	P	O.R.	Lower	Upper	P	O.R.	Lo
Non-Metro (Delivery Site)	<0.001	0.440	0.392	0.494	0.001	0.839	0.758	0.930	<0.001	0.786	0.0
Metro (Delivery Site)	--	--	--	--	--	--	--	--	--	--	-
Median Income for Delivery Site ZIP	0.002	0.981	0.969	0.993	<0.001	1.256	1.240	1.272	<0.001	1.090	1.0
Percent of Delivery Site ZIP Population: Age 65+	<0.001	8.942	4.478	17.859	<0.001	0.002	0.001	0.005	<0.001	0.167	0.0
Percent of Delivery Site ZIP Population: Non-Hispanic White	<0.001	1.648	1.391	1.953	0.738	0.974	0.832	1.139	<0.001	0.362	0.3

*SC/AAA = Senior Center/Area Agency on Aging; RF = Residential Facility; HO = Healthcare Organization; C/MPC = Community/Multi-purpose Center; FBO = Faith-Based Organization

**Referent Group: Senior Centers / Area Agency on Aging

n = 22,013 (Nagelkerke = 0.138)

Healthcare Organizations. Compared to workshops attended at senior centers/AAA, participants were less likely to attend workshops delivered at healthcare organizations in rural areas (OR = 0.839, P = 0.001). Participants who attended workshops at healthcare organizations did so in areas that were more affluent (OR = 1.256, P < 0.001) and had smaller proportions of the population who were age 65 and older (OR = 0.002, P = 0.001).

Community or Multi-purpose Centers. Compared to workshops attended at senior centers/AAA, participants were less likely to attend workshops delivered at community or multi-purpose centers in rural areas (OR = 0.786, P < 0.001). Participants who attended workshops at community or multi-purpose centers did so in areas that were more affluent (OR = 1.090, P < 0.001) and had smaller proportions of the population who were non-Hispanic white (OR = 0.362, P < 0.001) and age 65 and older (OR = 0.167, P < 0.001).

Faith-Based Organizations. Compared to workshops attended at senior centers/AAA, participants who attended workshops at faith-based organizations did so in areas that were more affluent (OR = 1.048, P < 0.001) and had smaller proportions of the population who were age 65 and older (OR = 0.009, P < 0.001).

3.4 Participant profiles by personal and neighborhood characteristics

We also have limited information on the relationship between participant characteristics and type of CDSMP delivery site attended (i.e., participant Reach). In this section we will briefly describe each participant-level delivery site type profile relative to workshops attended at senior centers/AAA. Using multinomial logistic regression, we fit a model with delivery site type as the dependent variable (attending CDSMP workshops at a senior center/AAA served as the referent group) and participants' personal and neighborhood characteristics were entered as independent variables. Table 3 contains the results of this analysis.

Residential Facilities. Compared to workshops attended at senior centers/AAA, participants who attended workshops delivered at residential facilities were more likely to be older (OR = 1.023, P < 0.001) and female (OR = 1.242, P = 0.010). These individuals were less likely to have more than a high school education (OR = 0.771, P = 0.001) and less likely to be African American (OR = 0.664, P < 0.001) or of other/multiple races (OR = 0.760, P = 0.017). Participants who attended workshops delivered at residential facilities were more likely to live alone (OR = 2.644, P < 0.001) and less likely to reside in rural areas (OR = 0.362, P < 0.001). These participants also resided in areas that were less affluent (OR = 0.877, P < 0.001) and had larger proportions of the population who were non-Hispanic white (OR = 1.568, P = 0.006) and age 65 and older (OR = 4.097, P = 0.008).

Healthcare Organizations. Compared to workshops attended at senior centers/AAA, participants who attended workshops delivered at healthcare organizations were less likely to be older (OR = 0.950, P < 0.001) and female (OR = 0.634, P = 0.010). These individuals were less likely to have graduated from high school (OR = 0.424, P < 0.001) or have more than a high school education (OR = 0.372, P < 0.001). They were less likely to be Hispanic (OR = 0.701, P < 0.001), African American (OR = 0.578, P < 0.001), or of other/multiple races (OR = 0.309, P < 0.001). Participants who attended workshops delivered at healthcare organizations were less likely to live alone (OR = 0.518, P < 0.001) and reside in rural areas (OR = 0.648, P < 0.001). These participants also resided in areas that were more affluent (OR = 1.138, P < 0.001) and had smaller proportions of the population who were non-Hispanic white (OR = 0.567, P < 0.001) and age 65 and older (OR = 0.118, P < 0.001).

Table 3. Participant Personal and Neighborhood Characteristics by Delivery Site Type

	RF		95% CI		HO		95% CI		C/MPC		
	P	O.R.	Lower	Upper	P	O.R.	Lower	Upper	P	O.R.	Lo
Age	<0.001	1.023	1.016	1.030	<0.001	0.950	0.945	0.956	<0.001	0.970	0.9
Female	0.010	1.242	1.054	1.464	<0.001	0.634	0.559	0.718	0.423	0.932	0.7
Male	--	--	--	--	--	--	--	--	--	--	-
More than High School	0.001	0.771	0.658	0.903	<0.001	0.372	0.324	0.428	<0.001	0.526	0.4
Graduated High School	0.141	0.884	0.750	1.042	<0.001	0.424	0.365	0.492	<0.001	0.495	0.4
Less than High School	--	--	--	--	--	--	--	--	--	--	-
Other / Multiple Races	0.017	0.760	0.607	0.952	<0.001	0.309	0.250	0.383	<0.001	1.666	1.3
African American	<0.001	0.664	0.533	0.828	<0.001	0.578	0.477	0.701	0.097	0.806	0.6
Hispanic	0.075	1.194	0.982	1.453	<0.001	0.701	0.583	0.843	0.008	1.356	1.0
Non-Hispanic White	--	--	--	--	--	--	--	--	--	--	-
Lives Alone	<0.001	2.644	2.321	3.011	<0.001	0.518	0.462	0.580	<0.001	0.749	0.6
Lives with Others	--	--	--	--	--	--	--	--	--	--	-
Non-Metro (Participant)	<0.001	0.362	0.300	0.436	<0.001	0.648	0.553	0.759	<0.001	0.609	0.4
Metro (Participant)	--	--	--	--	--	--	--	--	--	--	-
Median Income for ZIP: Particpant Residence	<0.001	0.877	0.838	0.917	<0.001	1.138	1.096	1.182	0.384	0.977	0.9
Percent of ZIP Population: Age 65+	0.008	4.097	1.453	11.555	<0.001	0.118	0.040	0.346	0.894	1.092	0.2
Percent of ZIP Population: Non-Hispanic White	0.006	1.568	1.137	2.163	<0.001	0.567	0.426	0.755	0.478	0.882	0.6

*SC/AAA = Senior Center/Area Agency on Aging; RF = Residential Facility; HO = Healthcare Organization; C/MPC = Community/Multi-purpose Center; FBO = Faith-Based Organization

**Referent Group: Senior Centers / Area Agency on Aging

n = 10,242 (Nagelkerke = 0.243)

Community or Multi-purpose Centers. Compared to workshops attended at senior centers/AAA, participants who attended workshops delivered at community or multi-purpose centers were less likely to be older (OR = 0.970, P < 0.001). These individuals were less likely to have graduated from high school (OR = 0.495, P < 0.001) or have more than a high school education (OR = 0.526, P < 0.001). They were more likely to be Hispanic (OR = 1.356, P = 0.008) or of other/multiple races (OR = 1.666, P < 0.001). Participants who attended workshops delivered at community or multi-purpose centers were less likely to live alone (OR = 0.749, P < 0.001) and reside in rural areas (OR = 0.609, P < 0.001).

Faith-Based Organizations. Compared to workshops attended at senior centers/AAA, participants who attended workshops delivered at faith-based organizations were less likely to be older (OR = 0.977, P < 0.001). These individuals were less likely to have graduated from high school (OR = 0.754, P = 0.008) or have more than a high school education (OR = 0.820, P = 0.047). They were more likely to be African American (OR = 1.360, P = 0.016) or of other/multiple races (OR = 1.725, P < 0.001). Participants who attended workshops delivered at faith-based organizations were less likely to live alone (OR = 0.616, P < 0.001) and reside in rural areas (OR = 0.764, P = 0.006). These participants also resided in areas that were less affluent (OR = 0.823, P < 0.001), had larger proportions of the population who were non-Hispanic white (OR = 2.525, P < 0.001), and had smaller proportions of the population who were age 65 and older (OR = 0.036, P < 0.001).

4. Delivering CDSMP to a diverse set of adults

By examining the Reach and Adoption aspects of this nationwide Chronic Disease Self-Management Program (CDSMP) dissemination, we see the program has the capacity to serve large numbers of heterogeneous older adults through a growing network of delivery site organizations. This initial nationwide roll-out represents many different geographic sites throughout the country and reflects the diversity of older adults' personal (e.g., sex, education levels, race/ethnicity, living situation) and residential characteristics (e.g., residential rurality).

Between the years 2006 and 2009, CDSMP was delivered in 26 states to over 22,000 participants via funding from the Administration on Aging's (AoA) Evidence-Based Disease and Disability Prevention Initiative. In terms of adoption, CDSMP workshops were predominantly attended in areas considered urban (84%), relatively affluent (average ZIP code median income of $56,700 USD), and non-Hispanic white (average ZIP code composition of non-Hispanic white residents was 71%). Overall, workshops delivered at senior centers/AAA (34.8%) and healthcare organizations (26.7%) reached the largest number of participants. In terms of reach, analyses suggest that delivery sites were most successful in recruiting older, non-Hispanic white females residing in urban areas with median incomes of $43,000 USD. However, certain delivery site types were more successful in recruiting diverse seniors, which provides insight into the utilization of delivery site types to attract more diversity among program participants.

To increase the diversity of participants reached by CDSMP, additional efforts are needed to recruit delivery sites that serve diverse populations. For example, to increase CDSMP participation among African Americans, possible strategies may be to encourage more faith-based organizations to offer the program. Or, to increase participation among Hispanic

individuals, program adoption among community or multi-purpose centers may be a central focus. Delivering classes at residential facilities and senior centers/AAA may increase program delivery to older participants. Further, more males can be reached by increasing adoption among healthcare organizations and places where older men congregate (e.g., Veteran of Foreign Wars social clubs). And, based on neighborhood-level characteristics, senior centers/AAA and faith-based organizations may be best to reach rural-residing seniors because they are most likely to be adopted in geographically non-metro areas [Table 2] and reach rural-residing seniors [Table 3]. It may also be important to emphasize efforts to recruit participants considered to be at-risk that those attending programs at residential facilities and faith-based organizations resided in less affluent areas.

Given the established effectiveness of CDSMP for improving self-reported health outcomes, it remains especially important to reach seniors more vulnerable to chronic conditions and multiple chronic conditions because these individuals remain at increased risk for premature morbidity and other negative health ramifications. For this reason, it is essential that CDSMP community deliverers build partnerships with those community sectors representing and serving specific populations. Increasing program adoption among a larger and more diverse group of organizations within the aging services network and public health system will improve the delivery infrastructure and enable additional at-risk adults receive these health services. While increasing the delivery infrastructure through partnership building is important, it must be noted that a training infrastructure for community-based Lay Leaders is also needed. Much like recommendations to deliver programs in areas where participants reside, similar considerations should be made when training Lay Leaders to deliver CDSMP in the areas in which they reside (i.e., reducing the time and travel expectations).

This chapter has emphasized Reach and Adoption, initial RE-AIM processes. However, to disseminate self- management programs like CDSMP widely, it is critical to plan for long term-sustainability. In addition to reaching out to partners who can help leverage resources, it is important to develop local program champions who can help sustain and grow evidence-based programs. Similarly, outreach efforts to older adults concerned about managing their chronic conditions can help create demand for these programs. There is a growing evidence-base on the best strategies for reaching out to previously underserved populations. Creating the proper balance between program supply and demand is important and involves continued outreach to potential participants with simultaneous nurturing of Workshop leaders and participating organizations. Another major caution is the need for understanding that this data reflects programs sponsored through the Administration on Aging's initiatives. We recognize there are other CDSMP programs being delivered outside of the aging services network. Unfortunately, there is no systematic data system for collecting participant and delivery setting characteristics.

Current efforts to estimate the cost of evidence-based programs and the cost savings associated with their dissemination are important for strategic planning about how to sustain the program after the end of external grant funding. Guidance for sustainability efforts may be identified by examining processes for building evidence-based programming into existing organizational structures by mandating the use of evidence-based programs for federal funding. Similarly, efforts are underway to examine how lay-led evidence-base programs can receive support from healthcare funding streams traditionally restricted to

professional care. Since the roll-out of the 2006-2009 initiative (i.e., the focus of this chapter), there has been increased attention to the potential of evidence-based self-management strategies under the Affordable Care Act (United States Senate). This has enabled CDSMP to be disseminated in 46 States and 2 territories (as of 2010). However, the long-term sustainability of this program is dependent upon a national prevention strategy which makes self-management programs a federal priority that are financially supported (National Prevention Council, 2011).

4.1 Limitations and future directions

This chapter utilized nationally-collected data, which was not without limitation; there are advantages and difficulties when using administrative records for data analysis. First, there were missing data for participants' personal characteristics. This missing data may be attributed to a limited data collection and reporting infrastructure (or fidelity to implemented protocol) in earlier years of the national dissemination. However, trends of missing data were less in later years due to improved data collection. For example, missing data for sex was 24.7% in Year 1, 14.7% in Year 2, and 11.3% in Year 3. Data collection of personal characteristics took place on site and during workshop time. To minimize missing data future program dissemination efforts, it is important to establish data-related expectations for program implementers and reduce the time and resource-related burdens on workshop leaders and program participants. This chapter is limited to findings associated with administrative data. Additionally, this chapter only included data collected from AoA-funded CDSMP workshops, thus it does not represent all CDSMP-related data during the study period. It would be instructive to obtain reports from program deliverers to determine what they identify as the major successes and barriers in the roll-out of evidence-based disease prevention programs for different populations in diverse settings.

Analyses performed in this chapter reinforce the value of using the RE-AIM Framework to assess grand scale translational research efforts/roll-outs in terms of who delivers the program and the types of participants they reach. Although these data provide a valuable glimpse into the reach and adoption-related aspects of this grand scale, national dissemination of CDSMP, less information can be ascertained about the program's implementation, effectiveness, or maintenance. Thus, additional studies are needed to research these aspects. Future efforts to examine the translated CDSMP include monitoring the fidelity associated training procedures and content delivery; determining factors associated with trainer retention, trainers' ability to retain participants, and participant attendance; and examining the influence of distance traveled to workshops (i.e., for participants and trainers) on class attendance and program completion. As ongoing evaluation is critical for continuous quality improvement and seeking external funding, we recommend attention to ways of conducting practical translational research in field settings than can assess self-reported improvement in health-related outcomes among participants (e.g., pain, fatigue, physical functioning) and identify the return on investment or costs associated with healthcare utilization as a result of attending the program (e.g., hospital admissions, emergency room use, preventive screening rates, medication adherence). We foresee the ability to answer some of these questions in a new National Study of Chronic Disease Self-Management which is assessing participants' self-reported health behaviors

and health outcomes and linking these outcomes with actual healthcare utilization and cost data (Department of Health and Human Services, 2011).

5. Conclusion

As healthcare resources become increasingly scarce, evidence-based program managers and deliverers at national, state, and local levels continue to explore ways to achieve maximum public health benefit while expending minimal resources. This chapter provides a valuable contribution to these planning efforts by describing how various demographic profiles interact with different community-based program implementation settings. Such knowledge may influence program deliverers to purposively offer programs in settings that reach participants most likely to utilize them. Simultaneously, this chapter provides insight into strategies to increase program adoption in underserved community settings, which have potential to expand participant reach to at-risk and vulnerable senior populations. In addition, this research highlights points of delivery that may be underutilized by practitioners. Demonstrating the value of lesser utilized delivery sites, such as faith-based organizations, is an exceptional way to improve the dissemination of public health programs to improve health outcomes and reduce disparity.

6. Acknowledgement

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