

The Effectiveness of Disease Management Programs in the Medicaid Population

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The Effectiveness of Disease Management Programs in the Medicaid Population

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Highlights

Disease management programs are more cost-effective and improve quality of care when dealing with severely ill enrollees with co-morbidities.

1

Significant Episodes of Cluster Activity (SECA)

SECA patients enrolled six months or more showed a 60% reduction in ER visits and acute readmissions with a 22% reduction in overall annual medical costs.

2

Savings from improved prescription drug adherence

Cost savings, as a result of one DM program improving patient prescription drug adherence, exceeded the cost of medication therapy by a ratio of more than 12 to 1.

3

Chronic disease

162 million Americans affected

Half suffer from two or more chronic conditions

Chronic diseases cost America more than \$1 trillion annually

The care of chronic illness consumes approximately 75% of total healthcare expenditures annually

The 5 leading chronic conditions account for half of US healthcare spending

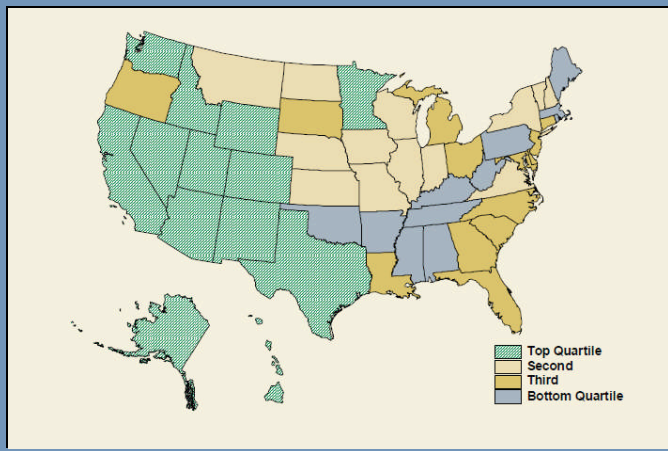
Medicaid population

Over 60% of adult Medicaid enrollees have a chronic condition

4% of Medicaid enrollees account for half of all Medicaid spending

Dual-eligible Medicaid-Medicare beneficiaries make up 15% of the Medicaid population, but account for 40% of Medicaid spending

State Chronic Disease Index



Disease Management Success

To (1) improve health outcomes and (2) reduce costs successful chronic disease management programs in the Medicaid population utilized one or more of the following:

- nurse care management;
- telephonic care management; and/or
- physician-directed population management (with aligned incentives).

Sample savings ranged from 9 -14% ; sample ROIs ranged from 1.15 to 32.70.

The health benefits from DM most frequently cited included:

- Improved prescription adherence;
- Greater therapeutic successes;
- Reduced hospitalizations;
- Fewer hospital readmissions;
- Reduced number of emergency room visits;
- Lifestyle changes;
- Increased numbers of patients receiving flu shots;
- Reduced depression; and
- Utilization of fewer unnecessary drugs.

The Care Continuum Alliance’s Definition of Disease Management:

Disease management is a system of coordinated health care interventions and communications for populations with conditions in which patient self-care efforts are significant. Disease management supports the physician or practitioner/patient relationship and plan of care, emphasizes prevention of exacerbations and complications utilizing evidence-based practice guidelines and patient empowerment strategies, and evaluates clinical, humanistic, and economic outcomes on an on-going basis with the goal of improving overall health. Disease management components include:

- Population identification processes;
- Evidence-based practice guidelines;
- Collaborative practice models to include physician and support-service providers;
- Patient self-management education (may include primary prevention, behavior modification programs, and adherence/surveillance);
- Process and outcomes measurement, evaluation, and management; and
- Routine reporting/feedback loop (may include communication with patient, physician, health plan and ancillary providers, and practice profiling).

Full-service disease management programs must include all six components. Programs consisting of fewer components are disease management support services.

Medicaid by the Numbers

“According to the Office of the Actuary of the Centers for Medicare and Medicaid Services the states’ Medicaid programs enrolled just under **70 million individuals** in 2007. Combined federal and state spending totaled **\$385 billion** in 2010. On average, 57% of this amount was paid by the federal government. From 2009 to 2019, **spending is forecast to increase by an annual rate of 8.4%**. Medicaid expenditures represent about 15% of total health expenditures and 2.3% of GDP.

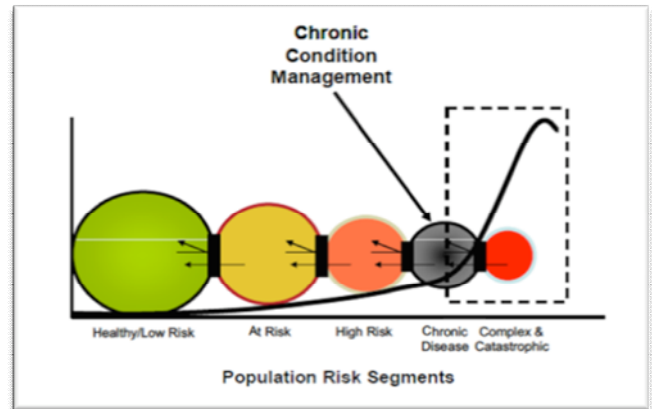
DM is effective in the management of chronic disease in the Medicaid population both in terms of improving health outcomes and saving money.

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Evolution of DM Programs

Original DM Programs



DM Programs To-day

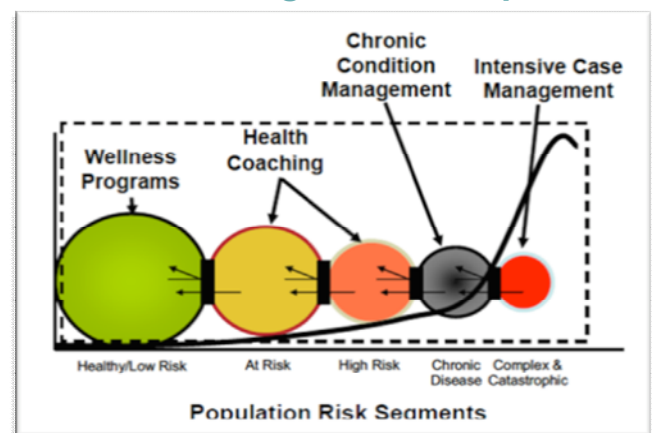


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EXECUTIVE SUMMARY

In the midst of rising health care expenditures, increasingly limited health care budgets and economic uncertainty, the efficient use of government funds and other resources is of the utmost importance. In March 2010, the *Patient Protection and Affordable Care Act (ACA)* expanded Medicaid, to help reduce the number of uninsured, thus potentially further increasing tremendously the fiscal burden on the states. According to the Office of the Actuary of the Centers for Medicare and Medicaid Services the states' Medicaid programs pending is forecast to increase by an annual rate of 8.4% from 2009 to 2019.

Some of the cost increase is due to the inefficiencies inherent in the highly fragmented nature of the delivery of Medicaid between state and private enterprise, between stand-alone and coordinated services models, between individual and population health management strategies, and among the 50 states themselves.

As a consequence, policymakers are making difficult decisions regarding program expenditures, available benefits, eligibility requirements and provider payments. Although reductions on these fronts may generate costs savings, they also reduce access to care and can exacerbate poor health outcomes. As an alternative, disease management (DM) programs are seen as one of the few policy options left, facilitating cost containment through improved health outcomes in chronically ill populations

It is currently estimated that 162 million Americans suffer from chronic disease; half of this population suffers from two or more chronic illnesses. The most common chronic disease conditions are costing the economy more than \$1 trillion annually; just five chronic conditions account for close to half of US healthcare spending and the care of chronic illness consumes approximately 75% of total healthcare expenditures annually.

The disproportionate burden becomes more obvious in an examination of government programs. More than 60% of adult Medicaid enrollees have a chronic or disabling condition; a mere 4% of Medicaid enrollees absorb half of all Medicaid funding. The cost burdens of these chronic conditions vary by condition and by state.

Unless significant steps are taken on a population level to modify lifestyle behaviors and other risk factors for chronic disease the future holds much more of the same. It has been estimated that the rates of growth of the major chronic diseases far outstrip the population growth rate of the US between 2003 and 2023.

The Cameron Institute reviewed and analyzed the available literature from the last decade on disease management programs with an eye to determining their effectiveness in the Medicaid population. Although it was somewhat challenging to extrapolate the studies' results to a larger context, several recurring themes emerged which provided perspective on the current state of knowledge:

- The robust results of many studies, across disease types, showed that disease management programs were most cost-effective and improved quality of care when dealing with severely ill enrollees who are at high risk for hospitalization, near-term

hospital readmission and for emergency room visits as well as those patients who have co-morbidities.

- In-person care management - the most costly intervention overall - was found to be the most significant intervention for high-risk patients in terms of achieving overall patient improvement goals and cost savings; less intensive care worked better in lower risk patients.
- Self-management and monitoring was found to be especially significant.
- Provider education of patients was found to be effective in increasing medication adherence, vaccination rates and screening.
- Telephonic care management also was found to be effective.
- Physician- and pharmacist-led interventions positively influenced prescription medication adherence and attainment of guidelines for lipid and HbA1c levels.

The health benefits from DM most frequently cited included:

- Improved prescription adherence;
- Greater therapeutic successes;
- Reduced hospitalizations;
- Fewer hospital readmissions;
- Reduced number of emergency room visits;
- Lifestyle changes;
- Increased numbers of patients receiving flu shots;
- Reduced depression; and
- Utilization of fewer unnecessary drugs.

As clinical outcomes improved, so did savings, although not all studies documented net cost savings or a return on investment (ROI).

- Net savings reported in two studies conducted during 2002-2005 reported net savings of 9 and 14% respectively.
- Four 2008 studies reported ROIs of 1.15, 2.20, 2.72 and 32.70 respectively.
- Disease management programs that decreased hospitalization admissions by as little as 10% covered associated program costs.

Comparability and generalizability by the authors was prevented by the lack of standardized measurement tools and data. Not all DM programs have been studied extensively and further research is needed, especially in the area of standardized cost-savings analysis. However, the strength of the evidence reviewed herein has led the authors to conclude that DM used in the management of chronic disease in the Medicaid population improves health outcomes and saves money.

The Effectiveness of Disease Management Programs in the Medicaid Population

BACKGROUND

In the midst of rising health care expenditures, increasingly limited health care budgets and economic uncertainty, the efficient use of government funds and other resources is of the utmost importance. This is particularly true at the state and local levels as financial restraint becomes a necessity. States are projected to have a combined deficit of \$125 billion in Fiscal Year 2012 and expected to spend \$195 billion in Medicaid, a 48% increase over 2010 budgets (PBS, 2011).

Originally, Medicaid was established as a welfare program intended to provide access to acute care services. By 2000, the elderly and disabled – those at the highest risk of chronic disease and chronic healthcare spending - accounted for 25% of Medicaid beneficiaries (DMAA 2003). Today, Medicaid is the largest payor for long-term care institutional care.

In March 2010, the *Patient Protection and Affordable Care Act* (ACA) expanded Medicaid, to help reduce the number of uninsured, thus further increasing tremendously the fiscal burden on the states which, by their constitutions (except Vermont), must balance their operating budgets annually. Although the federal government will pay about 90% of the cost of Medicaid expansion, states are presently in a cycle of diminished tax revenues and increased demand. Over the first five years of ACA's implementation, Kaiser (June 2010) estimated that 16 million currently uninsured individuals will be covered by the states' expanded Medicaid programs. While not all of the 16 million will have one or more chronic diseases, just the pent-up demand for basic medical services alone will strain state budgets severely.

According to the Office of the Actuary of the Centers for Medicare and Medicaid Services (CMS) the states' Medicaid programs enrolled just under 70 million individuals in 2007. Combined federal and state spending totaled \$385 billion in 2010. On average, 57% of this amount was paid by the federal government. From 2009 to 2019, spending is forecast to increase by an annual rate of 8.4% (Office of the Actuary). Medicaid expenditures represent about 15% of total health expenditures and 2.3% of GDP. Figure 1 shows how overall healthcare costs have shifted from the private sector to the public sector over the past 40 years from 1965, when Medicaid was established, to the near-present.

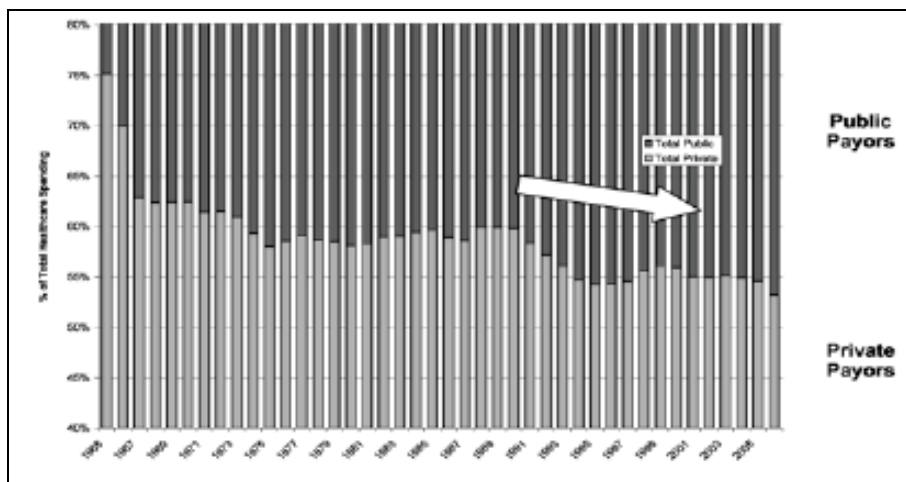
Most Medicaid services are reimbursed through traditional fee-for-service (FFS) arrangements, though many states also contract with Medicaid Health Plans (MHPs) to co-ordinate care and reimburse for care services typically on a capitated basis. Within traditional Medicaid, DM

programs are delivered in the context of a FFS environment that is uncoordinated and rewarded by the volume of services that providers deliver. Often DM programs are add-on programs and not integrated with local providers, creating special challenges in coordinating care and delivering both cost savings and patient health improvement.

MHPs cover about half the costs of low-income families and children in Medicaid and about 20% of people with disabilities in Medicaid who are not also covered by Medicare. MHPs, therefore, typically serve a healthier Medicaid patient than is served under the FFS system (Avalere Health, 2002). Medicaid MHPs are increasingly deploying internal DM capabilities and contracting with DM organizations for the management of chronic diseases with high costs.

States vary significantly in the extent to which managed care (and DM) is used as a cost containment strategy. Some states use the Medicaid waiver process to require Medicaid patients' enrollment in MHPs where other states provide a choice between FFS and MHP coverage. Some states use a blend of FFS and managed care, whereby MHPs are contracted to provide coverage for a high cost, high-risk population (such as HIV/AIDS, high-risk pregnancy, etc.) within Medicaid.

Figure 1: Government payors pick up a greater share of the healthcare bill



Source: Centers for Medicare and Medicaid Services; Morgan Stanley Research June, 2008.

Policymakers are making difficult decisions regarding program expenditures, available benefits, eligibility requirements and provider payments. Medicaid programs are also a major source of employment and provider income, and cutbacks in state appropriations result in a loss of significant federal funding. As an alternative to cutbacks in programs that serve vulnerable populations, disease management (DM) programs are seen as one of the few

policy options left, facilitating cost containment through improved health and avoidance of high unit cost hospital services in chronically ill populations.

Disease management programs - a derivative of managed care - began as chronic condition management plans and have developed into wellness programs, dietary instruction, and health coaching in addition to chronic condition management and intensive care management (see Figures 2 and 3 respectively). There are two fundamental types of disease management programs: one based on primary care which is embedded in a managed care organization (MCO) and the alternative, a non-integrated, commercial vendor contracted to provide disease management protocols to employers and health plans (Geyman 2007). Several of the important differences between these contrasting paradigms are explored in Figure 4 below.

Figure 2: Original disease management programs

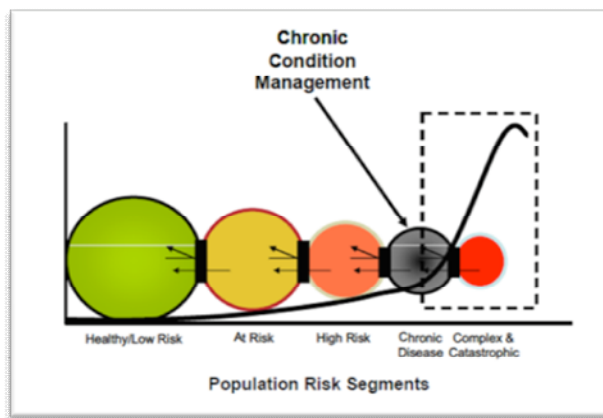
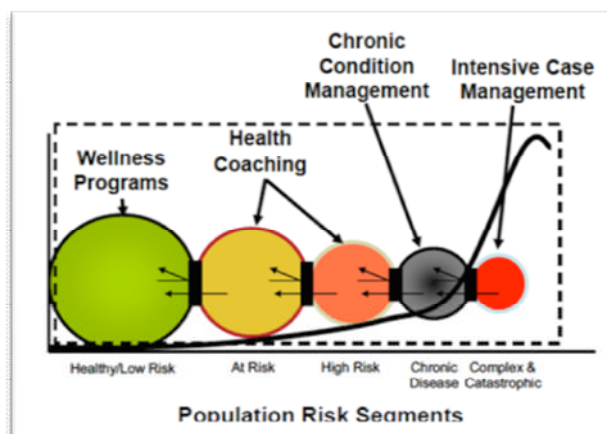


Figure 3: Disease Management Programs To-day



Source: C. A. Peck. Are Disease Management Programs Cost-Effective? LifeMasters Supported Selfcare Inc. 2008:210, pp. 9,10.

Early studies cast doubt on the effectiveness of disease management as a cost-containment strategy, though more recent analysis provides greater evidence of their potential for reduced health spending. However, it is important to recognize that a majority of studies have shown disease management programs to deliver quality improvements, especially those that employed integrated care models in which the physician was actively engaged.

Figure 4: Basic Types of Disease Management Programs

Characteristic	Integrated	Non-integrated
Ownership	Not-for-profit managed care organizations	For-profit commercial vendors
Locus	Institutional-based	Outsourced
Linkage to primary care physicians	Strong	Weak to none
Patient participation	System-based for all	Optional
Program horizon	Long-term	Short-term
Motivation	Quality-oriented	Profit-oriented

Source: Geyman 2007, p.260.

The importance of disease management programs is evident in the stewardship of scarce resources and making the most effective use of limited funding. However, the value of these programs extends beyond these objectives to estimating future health care needs within specific disease cohorts. Effective management of the health of a population is a significant challenge requiring information about the prevalence and distribution of disease burdens and medical problems. This information is also essential in predicting future treatment costs, estimating necessary resources, and adjusting staffing needs to accommodate new and aging populations.

About \$1.2 billion was invested in DM programs in 2005. It is further estimated that 95% of the top 150 private health insurers offer DM products to corporate accounts and the public sector. The role of private DM companies has increased as state Medicaid programs have contracted with DM organizations as an alternative to building their own delivery infrastructure.

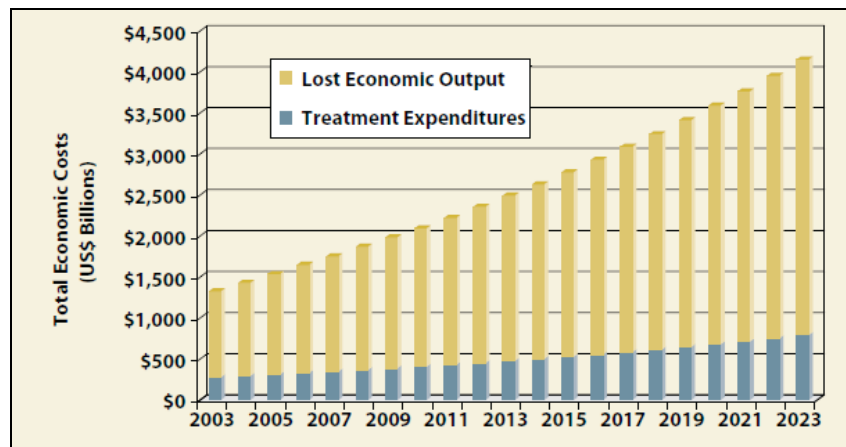
OBJECTIVE

The Cameron Institute reviewed and analyzed the available literature from the last decade on disease management programs with an eye to determining their effectiveness in the Medicaid population. The national economic burden of the disease conditions most frequently targeted by DM programs in the Medicaid population was examined utilizing existing economic evaluations of DM programs, descriptions of the health benefits and cost savings provided by disease management programs, the criticisms and problems which are prevalent in disease management studies, and the lessons learned and their value for the future.

DISEASE CONDITIONS and COST BURDEN

It is currently estimated that 162 million Americans suffer from chronic disease (Milken Institute 2007, p.5); half of this population suffers from two or more chronic illnesses (Geyman 2007, p.257). According to calculations by the Milken Institute (2007), the most common chronic disease conditions are costing the economy more than \$1 trillion annually (see Figure 5). Just five chronic conditions account for close to half of US healthcare spending and the care of chronic illness consumes approximately 75% of total healthcare expenditures annually (Geyman 2007, p.257; Holmes, et al. 2008).

Figure 5: Projected Treatment Costs and Economic Losses due to Chronic Disease, 2003-2023



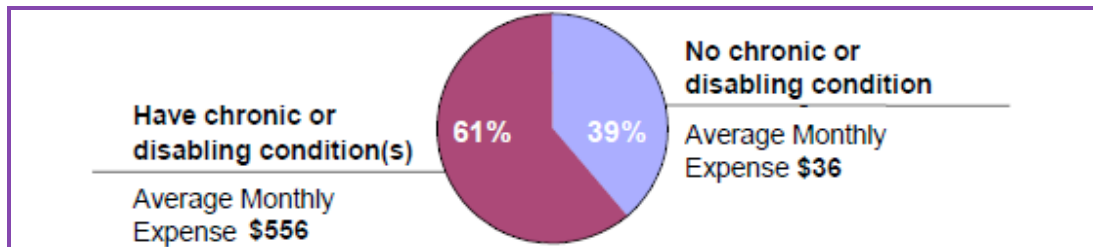
Source: Milken Institute 2007, p. 12.

The disproportionate burden becomes more obvious in an examination of government programs. Williams (2004) noted that more than 60% of adult Medicaid enrollees have a chronic or disabling condition (see Figure 6). While Medicare and Medicaid programs incur

46% of US healthcare spending, a mere 4% of Medicaid enrollees absorb half of all Medicaid funding (Billings & Mijanovich 2007). There is clearly a need to better understand the healthcare needs of this population in order to more accurately predict future trends and resource needs.

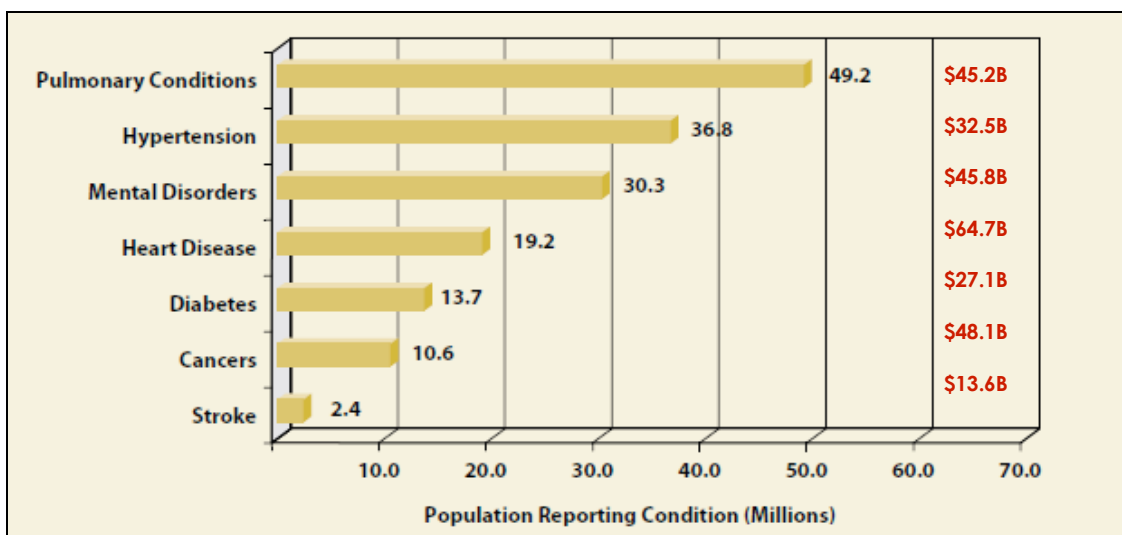
A recent study by the Milken Institute (2007) examined seven of the most common chronic disease conditions (see Figure 7). At a national level, the study claimed that more than one in three Americans reported having at least one of these seven chronic diseases. Figure 7 also illustrates how the cost burden of chronic disease varies greatly across disease conditions.

Figure 6: Percentage of Adult Medicaid Enrollees with a Chronic or Disabling Condition



Source: HCFA State Medicaid research files for California, Georgia, New Jersey and Kansas, 1995

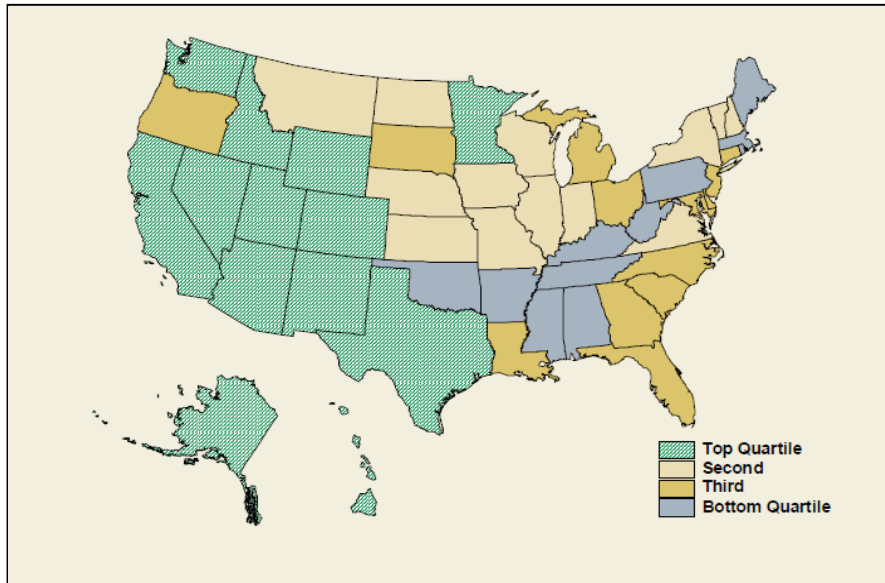
Figure 7: Number of People Reporting Selected Chronic Diseases, and the Related Treatment Expenditures, 2003



Source: Milken Institute (2007), p.11. (MEPS data)

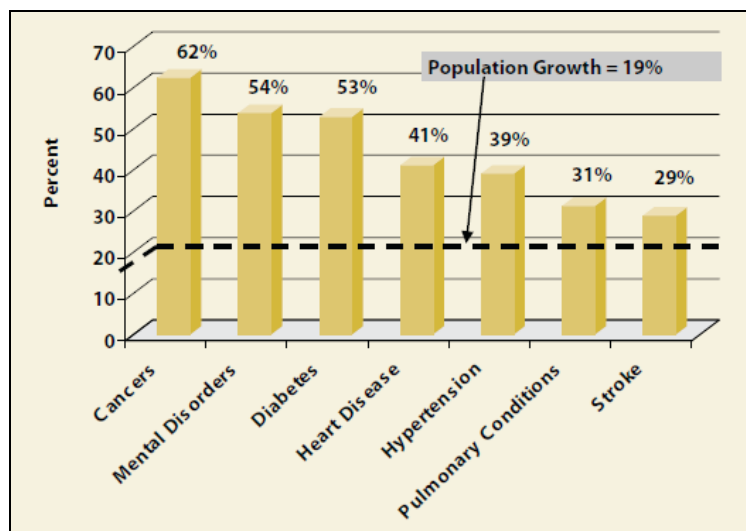
The cost burden of these chronic conditions also varied geographically across US states – as depicted in Figure 8 - due to regional differences in lifestyle, demographics and urbanization. Those states with the greatest levels of behavioral risk factors and the highest percentage of elderly residents would benefit most from cost containment, prevention, and improved quality of care.

Figure 8: State Chronic Disease Index



Note: States in the top quartile have the lowest rates of seven common chronic diseases.

Figure 9: Projected US Population and Chronic Disease Growth Rates, 2003-2023



Source: Milken Institute 2007, pp. 25, 11.

It has been estimated (Milken Institute 2007, p. 11) that the US population will grow 19% between 2003 and 2023. The projected growth rates of the major chronic diseases far outstrip the population growth rate (see Figure 9) thus compounding existing health and financing issues.

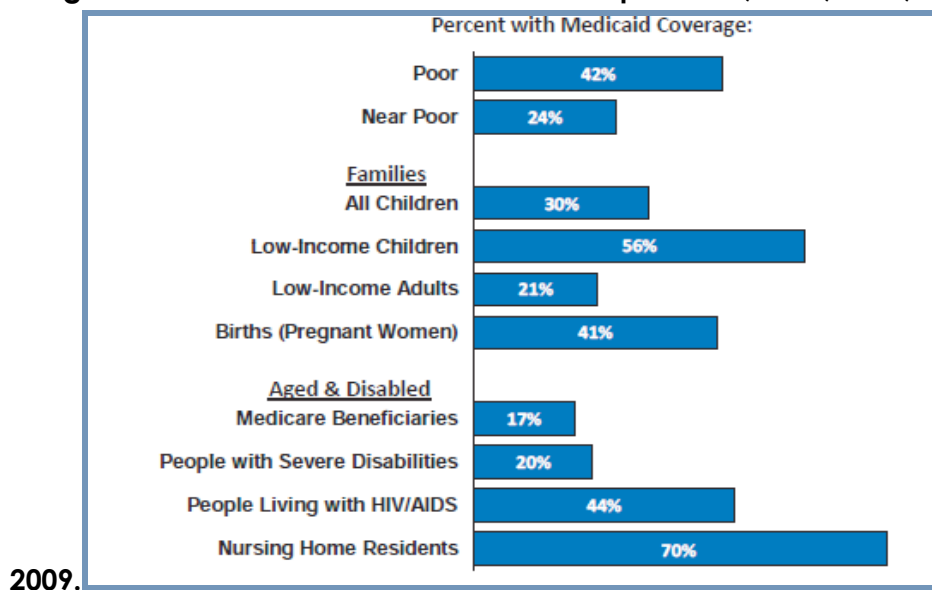
MEDICAID

Enacted in 1965 as Title XIX of The Social Security Act, Medicaid was designed as a Federal-State partnership to provide essential health services to persons in poverty. Over time Medicaid expanded to low-income individuals who were medically indigent or who meet other requirements but who were not eligible for states' welfare programs.

CMS, which administers Medicaid, sets broad directives to ensure that a basic set of services are provided by the states but allows states to set policies. This latitude has the effect of creating variation amongst the states in terms of eligibility requirements, the level of basic benefits offered, provider reimbursement rates, and delivery systems.

Basic services covered by Medicaid include physicians' services, hospital or inpatient care, laboratory tests & X-rays, nursing home care for persons aged 21 and over, federally-qualified and rural health center services and others. Prescription drugs - although covered by all 50 states - and care management programs are considered supplemental, not basic, services. Figure 10 provides an overview of Medicaid's role for selected hi-need populations

Figure 10: Medicaid's Role for Selected Populations, 2007, 2008,



Source: Kaiser Commission on Medicaid and the Uninsured, June 2010, p.3

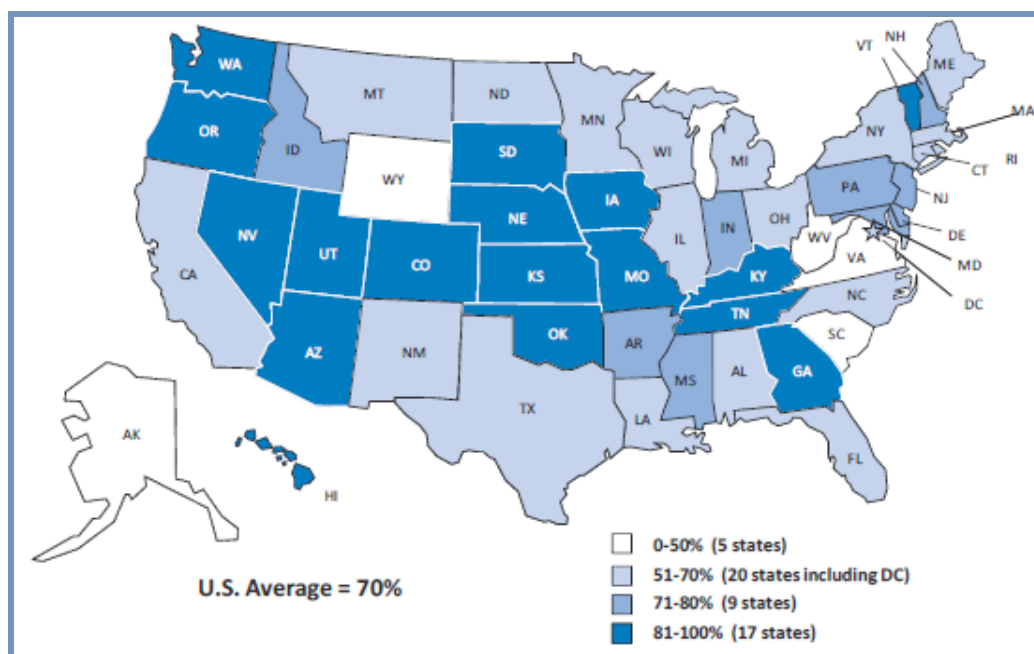
As noted, Medicaid is a partnership between the states and the Federal governments. The Federal share of a state’s Medicaid budget varies from a minimum of 50% to a maximum of 76% based on a state’s income. The average contribution by the federal government is 57%.

Although a public program, Medicaid reimburses from private sector providers and institutions. Medicaid programs may reimburse providers on a discounted fee-for-service (FFS) basis or contract with managed care organizations. Over time, managed care has become the more common financing system in terms of individual served (70%) but many of the chronically ill, older enrollees receive their care via FFS (see Figure 11 below).

Managed care contracting generally takes two forms: a state’s program can enter into a fully-capitated, at-risk contract with a MCO for all basic services or a Primary Care Case Management Program (PCCP). PCCPs, which are primarily found in rural areas, are a blend of FFS and capitation whereby the patient’s primary physician is paid a capitated monthly fee to handle referrals for specialty care while receiving FFS for basic services.

CMS uses a waiver program to permit states to develop new delivery models and quality enhancement and to allow the Federal match for new programs designed for special populations that would otherwise not be eligible for the match. The waiver program has been used by states extensively in creating and expanding DM programs.

Figure 11: Medicaid Managed Care Penetration Rates by State, as of December 31, 2008



Source: Kaiser Commission on Medicaid and the Uninsured, June 2010, p.23

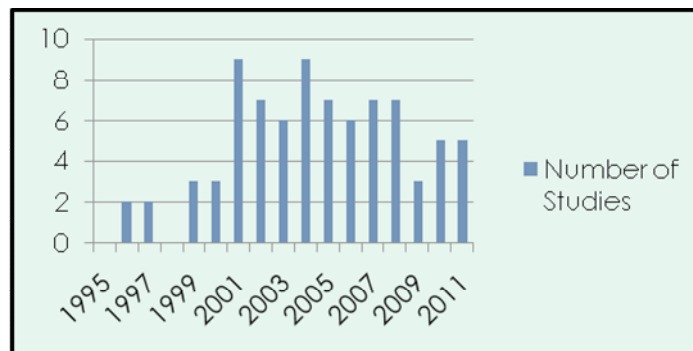
Clearly the increasing use of managed care is an attempt to both improve quality and reduce or contain Medicaid spending through coordinated care and disease management in all their configurations.

OVERVIEW OF THE LITERATURE

The authors reviewed more than 80 studies published since 2000 that conducted or included an economic analysis of disease management programs for chronic diseases in the Medicaid population

Overall, the studies reviewed in this report are described in the following three figures. Figure 12 depicts the number of studies by year of publication. The studies considered dated from 1996 to 2011. Figure 13 provides a count of the number of times various disease conditions were included. Studies prior to 1996 showed that disease management programs were most common for diabetes, asthma, hypertension and high cholesterol (Geyman 2007). The studies reviewed below mirrored those trends. Finally, Figure 14 provides a count of the number of times each state is featured in the studies considered here. While most states appear in at least one study, there are a handful of states that have been studied repeatedly: Florida, Virginia, California, Indiana, North Carolina, Washington, and Texas.

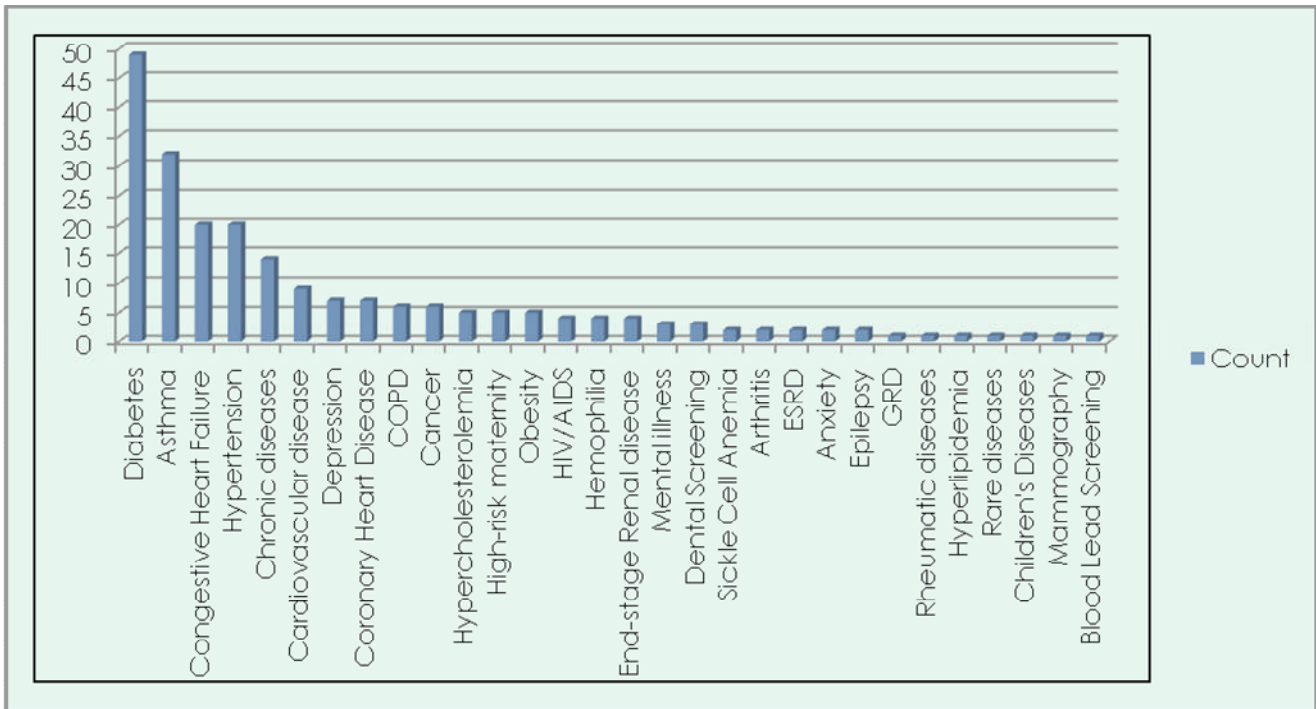
Figure 12: Number of Studies by Year



Objectives of DM Program Studies

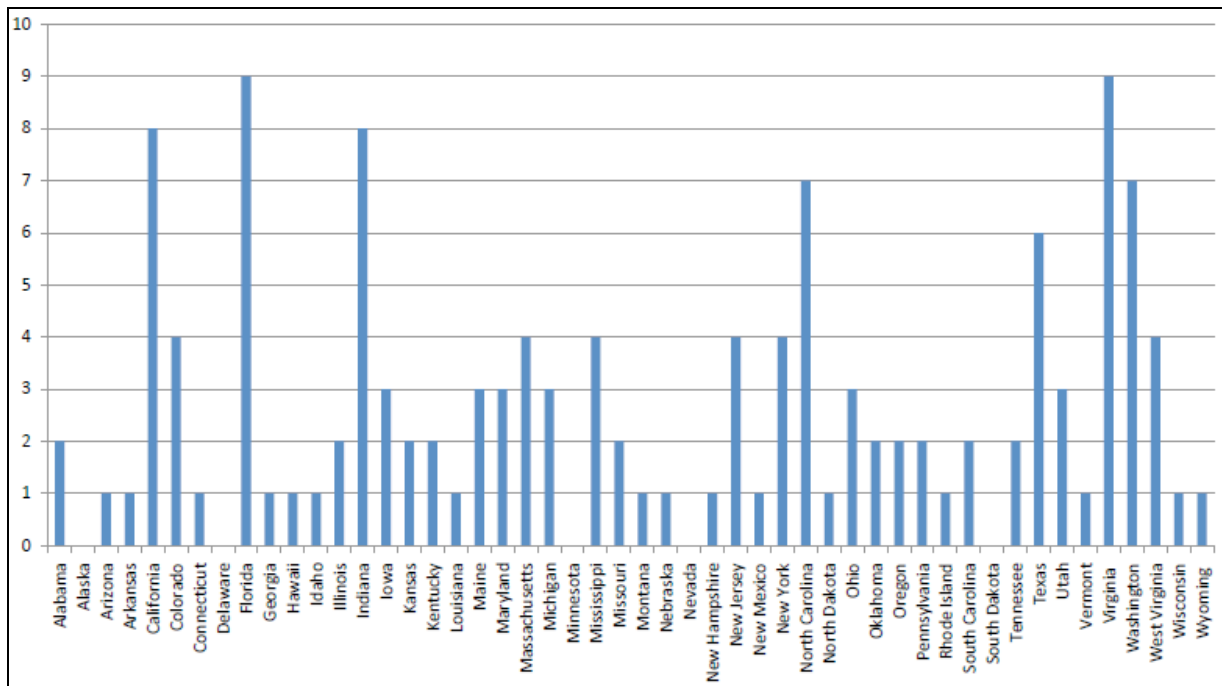
The objectives of the disease management program studies were expansive and included standard elements such as improved quality of care and cost containment, as well as alternative aims such as predicting the resource needs of high-cost patients and patient education.

Figure 13: Number of Times Disease Conditions Included in Studies



Though not exhaustive, the objectives discussed included: encouraged self-management (Brady et al. 2003; Clarke, Crawford & Nash 2002; Wagner, et al. 2001;), improved quality of care (Tsai, et al. 2005; Wheatley 2002; Fireman, Bartlett & Selby 2004; Villagra & Ahmed 2004; Ellrodt, et al. 1997; Mattke, Seid & Ma 2007; among many others), fostered cost containment (Roebuck, Liberman, Gemmill-Toyama & Brennan 2011; Wheeler 2003; Villagra & Ahmed 2004; Wu et al. 2011; among many others), facilitated enrollment of populations with special needs (Rawlings-Sekunda, Curtis & Kaye 2001), education (Neumeyer-Gromen, Lampert, Stark & Kallischnigg 2004; Meyer & Markham Smith 2008), developed programs with an emphasis on prevention (The Health Strategies Consultancy 2004; Rawlings-Sekunda, Curtis & Kaye 2001), improved adherence to medication and testing regimens (Roebuck, Liberman, Gemmill-Toyama & Brennan 2011; Williams 2004; Benner et al. 2002; Thiebaud et al. 2007; Svarstad et al. 2001; Wheelan et al. 2001; Dailey, Kim & Lian 2001; among many others), predicted resource needs of high-cost patients (Li, et al. 2005; Billings & Mijanovich 2007; Zhao, et al. 2002).

Figure 14: Number of Times Individual States Included in Studies



Data Sources

Where identified, the most frequent data sources were program cost data from providers, insurance claims data, CHIP data, and Medicaid data on claims and health care utilization. Some studies utilized clinical outcomes data, case management assessments, quality of life calculations and information on processes of care. The type of data extracted and the sources were clearly dependent on the groups being studied. The most frequently studied populations were Medicaid patients with diabetes, asthma, congestive heart failure and other conditions. Some studies specified high-cost Medicaid patients (Billings & Mijanovich 2007), children and youth (Zuckerman, et al. 2000; Lozano, et al. 2003; Medicaid and CHIP Payment and Access Commission 2011; and Clark, et al. 2009), elderly and specifically elderly women (Hughes 2004; Chodash, et al. 2005 and Wheeler 2003; Peck 2008); Medicare and Medicaid dual-eligible patients (Prela, et al. 2009), and culturally specific, ethnic groups (Gilmer, Phillis-Tsimikas & Walker 2005).

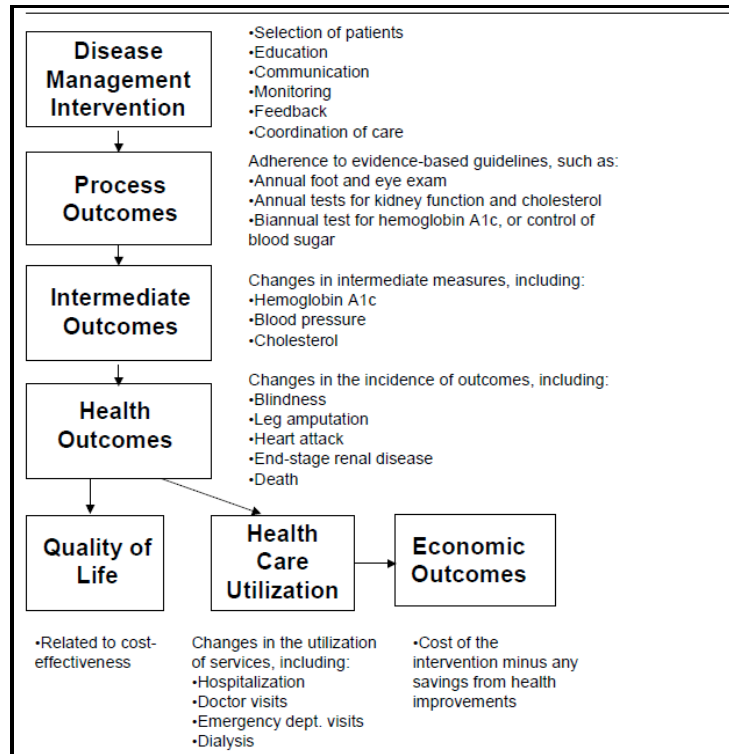
In terms of the specific program interventions included, the studies utilized nurse care management, telephonic care management, web-based education, remote monitoring devices, home visits, reminder and educational mailings, and physician-directed population management (pay-for-outcomes incentives).

SIGNIFICANT TRENDS AND FINDINGS

There were several recurring themes which provide some perspective on the current state of knowledge. The studies examined herein provide evidence to support the claim that disease management programs improve quality of care as well as create cost savings in the Medicaid population. Figure 15 provides a model of how DM programs improve health outcomes and quality of life while reducing costs.

- Disease management programs are more cost-effective and improve quality of care when dealing with severely ill enrollees and those with co-morbidities (Krause 2005; Piecoro et al. 2001). These results appeared to be robust across disease types.
- The health benefits most frequently cited stemmed from improved prescription adherence (Krause 2005; Piecoro et al. 2001). The number of patients described as non-adherent was striking and exceeded 70% for some disease conditions. Improvements in prescription adherence contributed to greater therapeutic successes, reduced hospitalizations, fewer hospital readmissions, and a reduced number of emergency room visits.
- Additional health benefits included lifestyle changes, increased numbers of patients receiving flu shots, reduced depression and utilization of fewer unnecessary drugs (Krause 2005; Piecoro et al. 2001).
- Peck (2008) found that as clinical outcomes improved, so did savings.
- Billings and Mijanovich (2007) estimated that disease management programs that decreased hospitalization admissions by as little as 10% covered associated program costs.
- While greater prescription adherence may increase pharmacy costs, the improved adherence frequently resulted in fewer ER visits and hospitalizations thus generating overall cost savings (Krause 2005; Piecoro et al. 2001).
- Patients with a recent history of Significant Episodes of Cluster Activity (SECA) - defined as two or more acute inpatient readmissions or four or more ER visits over the previous six months – and who had not been captured in traditional DM programs drive a lot of chronic disease costs. Medicaid Health Plans of America (2010-2011) reported that Pennsylvania identified and enrolled SECA patients in a minimum one year DM program with a Medical Home to treat comprehensively all clinical, behavioral and demographic needs. On average, SECA patients enrolled six months or more showed a 60% reduction in ER visits and acute readmissions with a 22% reduction in overall annual medical costs.

Figure 15: A DM Program Model for Diabetes that improves Outcomes and Reduces Cost



Source: Congressional Budget Office, p. 5.

The Agency for Healthcare Research and Quality (AHRQ) conducted a comprehensive review of structural elements commonly found in DM programs across a number of chronic diseases: asthma, diabetes, CAD, CHF, and COPD. The objective of the review was to determine if sufficient evidence was present to determine patient outcomes. The review was designed to provide a guide to states considering DM initiatives for their Medicaid programs.

Across all chronic diseases AHRQ reported the following:

- In-person care management was found to be the most significant intervention in terms of achieving overall patient improvement goals and cost savings. By its nature, it was also the most costly intervention overall. Its effectiveness in achieving cost savings was thought to be through changing utilization patterns for asthmatics and diabetics. Across all diseases, in-person management affected the most patient and economic endpoints.
- Self-management and monitoring was found to be especially significant in CHF where fewer deaths were reported in the self-management group.

- Provider education of patients was found to be effective in increasing medication adherence, vaccination rates and screening. Behavioral counselling alone did not have a significant effect.
- Telephonic care management was found to be effective but its relative effectiveness was higher for asthma patients than for diabetics.
- Provider interventions were found to be the most significant intervention in achieving process and surrogate endpoint objectives. In particular, physician- and pharmacist-led interventions positively influenced prescription medication adherence and attainment of guidelines for lipid and HbA1c levels.

The strength of the evidence led AHRQ to conclude that DM is effective in the management of chronic disease.

EFFECTIVE STATE DM PROGRAMS

The states have used DM for over two decades. The Kaiser Foundation (Williams 2004) summarized 12 states' experiences with DM. The specific states selected for the review were chosen on the basis of geographic diversity, diseases selected for DM interventions, and long-term experience with DM programs and their evaluation. Notable findings include the following:

- State DM programs have migrated away from a disease-by-disease approach in favor of DM programs that address co-morbid conditions that are typically prevalent in chronic disease patients.
- Due to the pressure legislators put on DM programs, states have had to address short-term economic goals and not address health reform at the structural level, and therefore have contracted one or more DM vendors for the delivery of DM programs.
- Related to the issue of political pressure, states have been slow to incorporate chronic care management programs fully into their DM programs, although there is clear evidence that commercial DM vendors and Managed Health Plans are being required to incorporate care management into the design of DM programs.
- Patients with chronic conditions, especially the dual eligible population, often have depression as a clinically significant co-morbidity. Treating depression is expensive and the outcomes are less clear than those associated with CHF, CAD, diabetes and

asthma. A next step will be to identify the most effective, evidence-based intervention paradigm for depression that can be incorporated into chronic care/DM programs.

Specific State DM Successes

North Carolina

Since 1998 North Carolina has used The Community Care of North Carolina system to provide care management services to its Medicaid recipients. Care networks comprised of primary care physicians and institutions use the Medical Home concept as a point of access to essential services with a case worker for patients who have been identified as being high-risk of hospitalization and ER utilization. Following identification and referral into the CCNC system, an individual care plan is developed by a case manager who works with the patient to ensure compliance with scheduled physician visits and compliance with treatment plans.

The Shepps Center at the University of North Carolina has evaluated economic outcomes resulting from the CCNC program and reported a savings of \$2.1 million over three years for diabetic patients, primarily achieved by a 9% decrease in hospitalizations. Three-year cumulative savings in asthma were \$3.3 million, primarily attributable to a sustained decrease in ER visits and reduced hospitalizations (Meyer and Smith, p. 22)

Indiana

Indiana has also used the Medical Home concept to provide care/disease management programs to high-risk Medicaid patients. A delivery system named Care Select was created (out of successful experiences the Indiana Chronic Disease Program had) which was developed to manage CHF, diabetic, asthmatic, CAD, and end-stage renal disease patients. Similar to North Carolina's CCNC program, a care manager is assigned to a high-risk patient and delivers intensive personalized services to lower the immediate risk of hospitalization and help patients establish self-management goals. After the initial intensive personalized intervention, case/DM services shift to a lower level of intensity.

Using a randomized study approach over time, the Indiana program was found to be effective in significantly reducing costs to treat CHF by \$720 per member per month (PMPM) or \$36 million per year. (Meyers and Smith, pg. 22)

For more examples of successful state DM programs by disease and condition see Figure 16.

HEALTH BENEFITS

The existing healthcare system within the United States is, and historically has been, designed to be focused on acute care, the short-term medical treatment of a patient's episodic illness or injury. As the prevalence of chronic diseases grows, the treatment costs thereof increase, and the US population ages, it is increasingly clear that this system is ill-suited to the needs of

those with chronic diseases where care instead of cure is the primary objective (Geyman 2007).

Figure 16: Reported Outcomes of Selected State DM Programs

	Savings	Health Outcomes
Asthma	<p>Colorado: Costs for participants declined by 37.4 percent. Costs for control group declined by 23.8 percent in the same period.</p> <p>North Carolina: Average cost of an asthma episode was 24 percent lower for children in disease management. Rate of pediatric hospitalization for asthma and ER use was 8.2 and 242 (per 1,000 member months) respectively for non-participating providers compared to 5.2 and 158 respectively for participating providers.</p> <p>Florida: Reductions in inpatient stays (2 percent), ER use (3 percent) and office visits (1 percent).</p> <p>Virginia: Projected \$3 to \$4 savings for every dollar on disease management support.</p> <p>Washington: \$250,000 in first year of the program*</p>	<p>North Carolina: Proportion of enrollees with documentation of staging increased from 47 to 63 percent.</p> <p>Proportion of enrollees (with II-IV staging) on inhaled corticosteroids increased from 49 to 95 percent.</p> <p>Washington: Percentage of asthma clients receiving flu shots increased from 45 to 65 percent. Percentage of clients with an action plan increased from 12 to 24 percent. Percentage of clients with daily preventative medications increased from 63 to 80 percent. Percentage of clients who are not a current smoker increased from 61 to 70 percent.</p>
Diabetes	<p>Washington: \$900,000 for first year of the program*</p>	<p>Nationally: Based on a systemic review of 27 studies, the Guide to Community Preventive Services strongly recommends disease management for improving diabetes care – findings apply to community clinics or managed care.</p> <p>North Carolina: Six out of eight process measures improved.</p> <p>Washington: Percentage of diabetics taking daily aspirin or anti-platelets increased from 41 to 64 percent. Testing rate for HbA1c increased from 40 to 59 percent. Percent of clients with a lipid profile increased from 72 to 88 percent. Percentage with a flu vaccine increased from 51 to 69 percent.</p>
CHF	<p>Washington: \$375,000 for first year of the program*</p>	<p>Washington: Percentage of CHF clients weighing themselves daily increased from 32 percent to 64 percent. Percentage using an ACE inhibitor increased from 60 to 72 percent. Percentage with a flu vaccine increased from 51 to 66 percent.</p>
Other	<p>Washington: \$680,000 for ESRD*</p> <p>Florida: Guaranteed savings of \$18 million for FY 2002</p>	

*First-year savings (totaling more than \$2 million) are guaranteed by contract.

Source: Williams, 2004 p. 20.

Medicaid is not immune from the demographic and chronic disease prevalence forecasts cited above. The challenges will worsen as another 16 million individuals are added to Medicaid in the first five years of health reform, of which approximately two-thirds will have one or more chronic conditions to be treated in a system that will still be funded, structured, and incented as an acute care system.

Disease management programs address this disparity with an explicit focus on improved quality of care and health outcomes. Health outcomes directly affect both quality of life and

the utilization of health care. Quality of life is difficult to measure, but health economists have tried to capture it with a “QALY” (quality-adjusted life year) which reflects both quantity and quality of physical and emotional well-being. While this measure is frequently featured in cost-effectiveness analyses used in provision decisions, most of the studies considered here employed more straightforward measures of service utilization.

Prescription Adherence

The vast majority of the studies included in this report placed significant focus on improved prescription adherence. There were several reasons for this:

1. Problem identification - In the context of disease management programs, non-adherence was described as a problem very early on, identified in studies dating back to the early 1980s.
2. Measurement - Drugs, their utilization, effects and costs are measurable with long-established protocols by which to do so.
3. Available Funding - Research-based pharmaceutical manufacturers funded such studies as part of their post-market surveillance efforts as well as funds being provided by the National Institutes of Health, major foundations like Kaiser, and the states themselves.

Strikingly, one in four Americans, numbering 75 million, do not follow directions in taking prescription medications (Cauchi 2010). As expected, these percentages vary by medical condition and frequency of drug administration.

Svarstad, et al. (2001) found a rate of irregular use of 31% among patients with schizophrenia or schizoaffective disorder, 33% among those with bipolar disorder, and 41% in those with other severe mental illnesses. Non-adherence in statins encompassed 65% of patients at one year (Wu, et al. 2011). In a 2002 study of coronary heart disease by Benner et al., 29% of patients were non-adherent at six months and the percentage rose to 56% at 60 months. Davis, Candrilli & Edin (2007) estimated that 39% of epilepsy patients were non-adherent with their drug regimens.

Prescription adherence is a challenge among populations of all ages, including children and the elderly. Of children presenting to the emergency room with symptoms of asthma, 82% did not regularly use their inhaled anti-inflammatory therapy (Zuckerman, et al. 2000). In a study of drug therapy in the elderly, Barat & Damsgaard (2001) found dose deviations in 71% of patients. Adherence to drug therapy is also negatively affected by some Medicaid recipients losing coverage either partially or completely during a fiscal year. One publication showed that just over half of Medicaid recipients had pharmacy benefits (NMSS 2010.) Unlike Medicare, which is a social insurance program, Medicaid eligibility is reviewed on a continuous basis during a fiscal year.

Contributing factors to non-adherence

Prescription adherence is dependent upon access, a process known as “A2A” (Kelman 2011). Hughes (2004) argued that non-adherence was compounded in populations with multiple morbidities requiring multiple drug therapies. In a study of Medicaid chronic disease patients, depression was shown to be a clear barrier to adherence (Roth, et al. 2010). Non-adherence was also a function of increased overall health care costs. Davis, Candrilli & Edin (2007) identified health care costs as being important in explaining the extent of refill non-adherence with anti-epileptic drugs. In addition to rising health care costs Kennedy, et al. (2008) studied the event of unfilled prescriptions among beneficiaries; they found that the subpopulations at higher risk for non-adherence included working-age beneficiaries, dual-eligible beneficiaries and those with multiple chronic conditions.

Benefits from drug adherence

Prescription non-adherence is a significant problem and a major barrier to effective treatment. Given how widespread it appears to be across a variety of chronic disease populations, it was worth exploring the consequences of non-adherence. In a general sense, non-adherence is associated with increased hospitalizations as well as increased health care utilization and costs. Improvements in prescription adherence lead to decreased hospitalizations and lower inpatient costs, though clinic visits increased as did primary care visits (Whellan, et al 2001; Sidorov, et al 2002).

Munger, et al (2007) claimed that between one-third and two-thirds of all medication-related hospital admissions were due to non-adherence. This was particularly compelling in light of their finding that only 20% of elderly patients in Medicaid programs exhibited good adherence. Improved prescription adherence appears to be a clear avenue for both improving the health of chronically ill patients and reducing hospitalizations and ER visits.

Reduced Hospital Admissions/Readmissions and ER Visits

The most significant results of improved prescription adherence were fewer emergency room visits and reduced hospitalizations. This outcome was mentioned in the majority of studies included in this report: Wheatley (2002); The Health Strategies Consultancy (2004); Meyer & Markham Smith (2008); Geyman (2007); Clark & Nash (2002); Lozano, et al. (2003); Piecoro, et al. (2001); Gilmer, Phillis-Tsimikas & Walker (2005); Szelc, et al. (2000); Villagra & Ahmed (2004); Linden (2006); Roebuck, Liberman, Gemmill-Toyama & Brennan (2011); Gillespie & Rossier (2003); Bodenheimer, Wagner & Grumbach (2002); Fitzner, et al. (2005); Lorig, et al. (1999); Sidorov, et al. (2002); Lorig, et al. (2001); Davis, Candrilli & Edin (2007); and Sokol, et al. (2005).

Success of DM in reducing institutional care costs can be traced to far more than prescription adherence. Specifically:

- In a study of asthmatic children enrolled in Medicaid, Szec, et al. (2000) reported that 50% of the subjects in the intervention group had fewer hospitalizations and 58% made fewer visits to the emergency room.
- In a recent study published in *Health Affairs*, diabetes disease management programs resulted in 30% fewer hospital admissions in the intervention group (Villagra & Ahmed, 2004).
- According to Wheatley (2002), asthma disease management programs generated a 41% decrease in ER visits for patients with DM-trained physicians in Virginia.
- Meyer & Markham Smith (2008) found a decrease in hospital admissions from 21-48% in congestive heart failure patients, and a decline in hospitalizations for seniors with multiple conditions 9-44%.
- In another study on the congestive heart failure population, Clarke & Nash (2002) found that participants realized an 18.5% reduction in hospital admissions, a decrease of 22.2% in hospital days, and a 24.6% reduction in ER admissions.
- In a 2011 study of a Vermont pilot program for chronic disease patients, Bielaszka-DuVernay found that the intervention group participants were seen more frequently by health care teams, but hospital admissions and ER visits were lower. In addition, inpatient hospitalizations decreased 21%, and ER use decreased 31%.

Screening and Secondary Prevention

There was strong evidence that DM programs for diabetes patients succeeded in reducing patients' HbA1C levels as well as increasing their adherence to recommended testing for LDL cholesterol, diabetic retinopathy, foot examinations, lipids, and microalbuminuria (Clarke & Nash 2002; Congressional Budget Office 2004; Patric, et al. 2006). In an examination of Medicaid disease management for diabetics, Williams (2004) noted an increase in HbA1c testing from 40 to 59% and a jump in diabetics taking daily aspirin from 41 to 64%.

In a study of Medicaid beneficiaries in Illinois, The Robert Graham Centre (2010) reported improved preventive services for patients and numerous key clinical achievements: a 15.5% increase in vaccinations, a 20% rise in asthma self-management action plans, and a 7% increase in retinal exams for diabetics.

In Washington, a Medicaid disease management program resulted in an increase in flu shot adherence for asthma patients from 45 to 59%, while the number of congestive heart failure patients regularly weighing themselves rose from 28 to 67% (The Health Strategies Consultancy 2004).

Symptom and Side-effect Mitigation

A study of chronic disease self-management in California (Lorig, et al. 2001) observed reduced disability, fatigue and distress which resulted in fewer outpatient visits across populations with diverse chronic diseases.

Similar improvements were found in rheumatic disease populations. Brady, et al. (2003) found that DM programs in this population provided a 16% improvement in pain control, 22% improvement in depression, and an 8% gain in disability condition.

Medication Among Seniors

In a study of North Carolina Medicaid pharmacy costs, a recent initiative resulted in drug change recommendations for 72% of patients involved in the nursing home pilot program. While these changes generated cost savings, the effort also ensured that appropriate medications were being prescribed to patients (Community Care of North Carolina 2007).

Process Improvements

Besides studies that focused on prescription drug adherence and reduced hospital costs, other studies varied greatly in their emphasis, their outcome measurements, and the regions studied. In a study sponsored by RAND, Mattke, Seid & Ma (2007) noted that disease management programs improved processes of care and led to better intermediate outcomes and improved disease control.

Fitzner, et al (2005) found that DM programs improved patient relationships with physicians.

Regional variations were noted in an evaluation of Washington State Medicaid chronic care management projects conducted by Qualis Health (2008). They traced this result to the differences in available resources across regions.

Physician Engagement

Most familiar among DM programs was the successful nurse care management and telephonic care management paradigms; but other program designs were also in use. One study reported on a physician-directed population management program with tremendous results. Springrose, Friedman, Gumnit & Schmidt (2010) described an intervention by OptumHealth that engaged physicians in reducing risk factors among their patients. Focusing on patients who exhibited claims markers for diabetes, coronary artery disease and/or hypertension, physicians were asked to improve health measurements for blood pressure, body mass index, cholesterol, hemoglobin HbA1c, and smoking status. In exchange, they were offered a modest pay-for-outcomes incentive. The authors found that the 6-month intervention period exhibited a 10-fold improvement in the trend rate of risk factor management relative to the 6-month period prior to DM intervention. The study results clearly indicated that physician-directed population management with aligned incentives presents a

viable alternative and promising method for achieving beneficial health care outcomes and wellness goals.

COST SAVINGS

The most comprehensive, systematic review of only peer-reviewed literature concerning DM's potential impact on reducing health care expenditures was prepared in 2004 by the Congressional Budget Office (CBO). CBO examined Medicare DM programs, not Medicaid, but there were clear implications for the older, chronically ill Medicaid patient. CBO concluded that, based on the evidence, investments in DM may be warranted on the sole criterion of improving health outcomes.

One study cited by CBO (Rich et al., 1993) reported a 33% cost savings due to a lower hospital readmission rate but this was offset by increased utilization of other medical services, yielding a 9% net cost saving on a per member per month (PMPM) basis.

In 2007, The Rand Corporation released its systematic review of 317 unique DM studies gleaned from 29 evaluations, meta-analyses and systematic reviews. Rand concluded that DM programs may produce cost savings in CHF because of the opportunity to lower the risk of hospitalization. For the other chronic conditions (asthma, CAD, diabetes, depression, chronic obstructive pulmonary disease and depression) evidence of cost saving was not found.

Peikes et al. (2009) analyzed 15 Medicare demonstration projects to determine if nurse-administered, telephonic, coordinated care (medication adherence, disease education, communication skills with physicians, etc.) would decrease medical care costs. Although conducted from Medicare's perspective, Medicaid and privately insured patients also were allowed to enroll. The time frame for the analysis was 2002-2005. The net finding of the study was that only two of the 15 demonstration projects produced cost savings through reduced hospitalizations and other reductions in medical care utilization. A particular strength of the demonstration programs was that volunteers were randomized to "usual care" and "the coordinated care" group. The authors concluded that the two programs with net cost-savings were also the two most service-intensive programs, lowering expenditures by 9% and 14% respectively. Although 13 programs were deemed to have no effect, it is important to note that many of the problems were due to low participation rates and heterogeneity in the delivery of DM services.

Return on Investment

As an alternative cost-saving metric, a number of attempts have been made to measure return on investment (ROI) from DM programs. ROI is a widely recognized financial tool and its interpretation is straightforward and facilitates communication among legislators, Medicaid program officials, plan administrators, health care providers and the public. One of the

advantages of using ROI was that it required the inclusion of DM start-up and ongoing costs in the analysis. Given that state Medicaid programs are often mandated by legislators to achieve a specified level of cost savings, ROI can be designed to incorporate these targets explicitly.

Goetzel et al. (2005), following specific study inclusion criteria to account for strength of evidence, reviewed 44 studies; positive ROIs were found for CHF and multiple conditions. One study cited by the AHRQ (2008) produced a ROI of 1.15 for CHF. In a study of prescription adherence, Cauchi (2010) demonstrated that savings exceeded the cost of medication therapy by more than 12 to 1.

Recognizing the increasing interest in ROI, The Robert Wood Johnson Foundation supported, in part, the development of The ROI Forecasting Calculator for Quality Initiatives by The Center for Health Care Strategies (CHCS). With further assistance from the Commonwealth Fund, eight states were enabled to purchase the calculator, suggest improvements and test ROI findings from their own quality initiatives. Released in 2008, two states have employed the calculator with the following results (The Commonwealth Fund 2008):

1. Arizona used the calculator to estimate the ROI from a pay-for-performance (P4) program that would incentivize physicians financially to achieve a threshold target of diabetic patients who meet surrogate endpoints deemed critical in diabetes care. The ROI from this program was estimated to yield a 3-year outcome of 2.20, suggesting that every dollar spent in achieving these targets would save \$2.20.
2. The Commonwealth of Pennsylvania applied the ROI to its chronic DM programs, estimating that the ROI from its diabetes and other DM programs was 1.80 for the first year. Although specific ROIs were not reported, Pennsylvania found that the greatest ROIs could be attained by expanding its DM program to address co-morbid conditions.

CHCS has reported that approximately half of the states' Medicaid programs and Medicaid DM vendors were using the calculator to design and test DM programs. It is unknown at this time if and when proprietary analyses will enter the public domain.

Prerequisites for Cost-Savings

Meyer and Smith (2008, p. 2) conducted a review of the peer-reviewed literature on the effectiveness of care management and concluded that sufficient evidence existed to conclude that well-designed and targeted care management programs were effective in improving patients' quality of care and lowering costs. They argued that cost-saving is predictable if the conditions set out in Figure 16 are met.

Figure 16: 11 Conditions Necessary for Successful Care Management Programs

1) Targeting the intervention to sicker patients who are likely to generate high costs in the future
2) Strong individualization, with interventions customized to the particular patient
3) Intensive, multi-disciplinary hospital pre-discharge planning and counselling
4) Intensive interventions in terms of time spent with the patient and multiple providers, frequency of contact, face-to-face patient contact, early access to physicians, and sustained follow-up
5) Engagement of patients with multi-disciplinary teams, both pre-hospital discharge and post-discharge, to provide support and treatment across multiple interventions, e.g. dietary, pharmaceutical, social service support, self-management, early symptom spotting and access to physicians to prevent exacerbations
6) Home visits after hospital discharge and pre-natal and post-partum home visits with high-risk pregnancies
7) Education combined with treatment interventions
8) Chronic disease management by the patient's treating physicians, nurses, or other professionals
9) Intensive home environmental assessment and amelioration for asthma
10) Telephonic interventions that initially are time-intensive, frequent, and individually engage the patient regarding clinical metrics and subjective assessments of conditions over time
11) Health information technology that is frequent, highly interactive with patients, facilitates contact

Source: Meyer and Smith, 2008, p.2.

Meyer and Smith found that the greatest potential savings are in CHF (with ROIs ranging from 2.72 to 32.7 dollars saved per dollar spent) and asthma. For CHF, the savings accrued from fewer hospitalizations and readmissions; for asthma, the savings accrued from reductions in ER visits. Consistent with other reviews, they found that intensive, personalized interventions that are integrated with other treatment paradigms were the most effective in producing savings and improving patient outcomes. They recommended that provider incentives need to be incorporated into the design mix to increase program effectiveness.

LIMITATIONS OF THE LITERATURE

Availability and Heterogeneity of Studies

DM's effectiveness in the Medicaid population is difficult to definitively establish given the paucity of published studies. In addition, this may be traced to the difficulty of meta-analysis and comparisons across programs. The studies varied greatly in specific disease conditions that individual programs targeted, differences in administrative practices, data collection, the medical services and professionals which were included, the length of the study, and outcomes tracked. As a result, cross-study comparisons and generalizations were difficult to make. The lack of standardization and challenges of cross-study comparisons are characteristics that are noted in several of the studies reviewed within this report (Qualis Health 2008; Rawlings-Sekunda, Curtis and Kaye 2001; Elliott et al. 2005; Pelletier 1999). It is particularly important to recognize the following limitations and challenges to the study and analysis of disease management programs:

1. The disease management programs included in the studies reviewed utilized a number of different methods to improve health outcomes and patient compliance; this heterogeneity makes generalization difficult.
2. Not all of the interventions included in the studies reviewed have been analyzed extensively and further research is needed, especially regarding telephonic care management, and self-management and monitoring.
3. The health outcome effects of disease management programs may only become evident after several years. As such, studies based on brief follow-up periods may miss significant long-term health benefits or resource requirements. The typical time frame of analysis, about one-year's duration, was also insufficient to measure economic outcomes adequately (RAND 2007, among many others).
4. A universal standard for calculating ROI does not exist and its application is subject to the same limitations found in traditional health economic analyses.

5. Finally, regional variations were noted in an evaluation of Washington State Medicaid chronic care management projects conducted by Qualis Health (2008). They traced this result to the differences in available resources across regions.

Methodological Constraints

Methodologically, DM research is not conducted using the randomized trial design, which is the most effective way of ruling out the effects of confounding variables. While DM patients can be randomly assigned to groups such as “usual care” (the control) and “DM” (the experimental), problems arise for the following reasons:

1. Contact with patients in a DM program is variable in amount and content of information delivered at each patient encounter and is influenced by the interpersonal dynamics between the DM counsellor and patient. This makes standardized administration impractical.
2. DM services are delivered in the unique context of a local medical environment, where practice standards vary among communities even within the same state. This is a source of confounding that, for the most part, cannot be isolated and analyzed.
3. The inclusion of multiple outcome variables (resource utilization, clinical surrogate and terminal endpoints) presents challenges in data collection, quality control and statistical analysis.
4. The variables are often politically driven or limited by data availability and other program constraints.
5. Process variables often have been used as proxies for outcome variables under the assumption that process improvements lead to improved outcomes.
6. Randomized trials have costs that are usually far in excess of a state Medicaid program’s financial resources and, therefore, are impractical.
7. As an alternative to the randomized trial, a number of DM evaluations have used prospective, cohort studies to assess DM outcomes. The primary challenge in this design is to ensure that the study groups are equivalent at baseline.
8. Federal regulations prevent mandatory participation of Medicaid recipients in both Medicaid managed care programs and DM programs, therefore studies largely rely on patient volunteers thereby preventing generalizations to the entire Medicaid population.

9. Physicians are not mandated to either participate in Medicaid DM programs or accept clinical suggestions.

Data Quality and Availability

In addition to research design issues, the quality of Medicaid claims data - a key source of information used to identify potential patients for a disease management program and conduct an initial risk assessment of about patients of interest - is a problem for several reasons:

1. Medicaid claims for pharmacy, hospital and physician services are typically not integrated and are subject to late reporting and coding errors.
2. Parts of a state's Medicaid data base may be electronically available for reimbursement purposes, but key parts of the medical record will not.

LESSONS LEARNED

1. DM programs that delivered services to patients that were high risk for imminent hospitalization, hospital readmission and ER utilization showed stronger evidence of immediate cost-savings and clinical benefits. The evidence was stronger and more consistently demonstrated in CHF and asthma; further research is needed, especially in diabetes.
2. DM programs that were integrated into medical care delivery systems and that had physician engagement appeared to be more effective in meeting clinical and economic goals than did DM programs that operated independently.
3. States that have used data mining and predictive modelling to stratify patients by level of risk and disease severity have been particularly successful in designing and delivering DM programs across chronic disease groups.
4. DM programs that incorporated principles of coordinated care that addressed co-morbidities, in addition to the primary disease, offered more potential in reducing health care costs than did DM programs that did not.
5. The state of research into DM's effectiveness in reducing costs and improving patient outcomes is still evolving and incrementally providing higher levels of evidence about programmatic effectiveness. The use of randomized studies has increased substantially and is providing the empiric-based evidence that identifies which specific program designs are effective.

6. Political support for DM at the federal and state level remains high but expectations about cost savings in the short-term should be realistically tempered and viewed as part of a bigger economic prosperity picture.

A step in the right direction was taken by the US Department of Health and Human Services just before the publication of this report when it announced that four initiatives were being launched “to give states more flexibility to adopt innovative new practices and provide better, more coordinated care for people with Medicaid and Medicare while helping reduce costs for states and families” (DHHS, April 14, 2011). These initiatives are intended to improve the co-ordination of care and the use of information technology.

CONCLUSION

The strength of the body of evidence reviewed herein has led the authors to conclude that DM is effective in the management of chronic disease in the Medicaid population both in terms of improving health outcomes and saving money.

Although patient benefits and cost-savings vary by program and disease state, DM's potential for achieving additional efficiencies remains high. Specifically, many chronically ill Medicaid patients remain in the fragmented FFS system. Increasing DM program availability to this population coupled with provider and institutional financial incentives (pay-for-performance) to improve health outcomes has the potential of achieving additional cost-containment goals.

As more DM initiatives become available to Medicare-Medicaid dual eligibles, further savings are possible, although financial incentives must be made available to the states, since the savings of improving outcomes for dual eligibles accrue primarily to the Medicare program, not to the states.

In conclusion, the evidence underlying DM's real and potential benefits is sufficiently robust to justify further experimentation in and expansion of states' Medicaid programs.



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