Chronic Disease Management in Rural Areas

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CHRONIC DISEASE MANAGEMENT IN RURAL AREAS

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Chronic Disease Management in Rural Areas	
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Executive Summary

The structure of American health care delivery continues to undergo changes in the way services are offered and paid for, as well as the way diseases are treated. Nowhere is this change so evident as in the approaches to chronic disease management. Chronic Disease Management (CDM) offers the potential for improvement in the overall health of individuals with chronic diseases, such as congestive heart failure (CHF), diabetes, chronic obstructive pulmonary disease (COPD) and asthma, while at the same time reducing overall costs of patient care by minimizing occurrence of acute events and slowing disease progression. Life in rural America may be particularly difficult for individuals with chronic illnesses and diseases. The combined effects of rural poverty and fewer numbers of health providers increase the prevalence and effects of chronic diseases for rural Americans. Effective disease management (DM) has been shown to more effectively maintain a person's health, and in the case of rural patients, may help to reduce the impact of travel time and other barriers to accessing needed health care.

This report provides organizational case descriptions and health professional survey results that reflect the efforts of health plans and clinics providing disease management in rural areas. The following clinics and health plans participated in our study: **The Carle Clinic** (in Champaign-Urbana, Illinois), **The Marshfield Clinic** (Marshfield, Wisconsin), **The Scott & White Health Plan** (Temple/Central Texas), **The Geisinger Health Plan** (Central Pennsylvania and Southern New York State), **The Health Plan of the Upper Ohio Valley** (Eastern Ohio and West Virginia) and **St. Elizabeth of Hungary Clinic** (Arizona Uninsured DM Program).

The results of onsite interviews and surveys of DM leaders, DM nurses, and participating physicians provide insights into organization challenges and outcomes in DM. Of special interest are the additional challenges identified in extending DM to rural populations. This and subsequent reports address issues that may enable other health providers, plans, and policy makers to support the wider implementation of DM for urban and rural populations.

Insights on organization factors

Although the health plan is a principal sponsor of DM programs in four of the six sites, there remains wide variation in the *relative roles of physician organizations (clinics) and health plans in the sponsorship of DM* across the systems studied. Comparing the four rural integrated delivery systems, the health plan is the sole sponsor of DM, the sponsor of a DM program that is

independent of and parallel to a clinic sponsored DM program, co-equal sponsor with the clinic of a single DM program, and a collaborator with a DM program sponsored solely by the clinic. In the other two rural systems considered, the health plan is the sole sponsor in one and a clinic is the sponsor in the other.

Close collaboration between the plan and clinic is practiced in most of the systems. Although the health plan may be viewed as the major beneficiary (along with the patients) of DM in these systems, physician buy-in is of significant importance. Moreover, opportunities for integration of DM into clinic-based quality improvement efforts may flow from a strong clinic role in DM.

The patients served by DM programs vary across the systems and within some of the systems. The availability of formal DM programs may be limited to health plan patients where the health plan is the sponsor, or particular DM programs can be included in employers contracting directly with a clinic. A system's clinic physicians may prefer that DM services offered by the health plan be available, also, to his/her patients not enrolled in the system's health plan. The non-plan patients, too, may seek DM services offered by the health plan. Two of the systems offer DM services to patients without regard to payer. Given the near unanimity of opinion on the DM value added to clinical quality and patient benefit, continuing consideration should be offered by health plans and clinics on how to extend DM programs to the largest possible range of patients.

There is widespread and strong belief among DM leaders, physicians, and DM nurses alike that DM programs contribute significantly or greatly to a wide variety of care, quality, and patient satisfaction elements and to efficient use of resources. DM nurses are the key to delivery of DM programs. DM nurses may serve as intermediaries, connecting the physician and patient between physician visits. This role in some systems involves regular contact with both the patient and physician regarding DM, with the nurse alerting the patient and physician when a physician visit and/or modification in medications may be required. In other systems, the DM nurse communication to both physician and patient parties, particularly to physicians, may be less continuous. Physicians recognize the important contribution that the DM nurses bring to patient care and to the physician's timely contribution to that care.

Electronic information systems devoted to DM programs are in place in several systems. In two of the integrated delivery systems, DM nurses have access to electronic medical records (EMR), as well. DM participants value the latter arrangement, supporting rapid and continuous communication between the nurse DM and physician, regarding DM patients. At the same time, there remain opportunities for integrating or regularly querying DM information systems and EMR to generate reports of DM contributions on an ongoing basis.

The DM leaders, physicians, and DM nurses recognize that the services provided by nurses in patient education and care coordination, and physician "buy in" or commitment, as being among the most important factors in DM success. Stakeholder support for DM programs tends to be rated somewhat higher for health plan administrators and DM nurses than for physicians (with the exception of physician support for diabetes DM) or clinic administrators. Unequivocal support among the latter groups will most likely depend on strong and continuous evidence of clinical quality benefits to patients that are directly attributable to DM.

A majority of the respondents perceive DM programs to be beneficial financially to the health plan and clinic. There is generally only moderate support for the notion that DM programs contribute to attracting employer contracts, attracting those with higher risk employees, or supporting health plan Medicaid services. DM leaders in two systems suggested, in interviews, that DM programs do attract some employers, are highly rated in patient satisfaction surveys, and, in some instances are requested by patients not associated with the health plan offering the DM services.

The professionals surveyed estimate that one-half to two-thirds of DM eligible patients comply with DM recommended behaviors. This may spell the difference in a particular program or contract being a profit or loss for a health plan. The availability of a particular set of DM programs may make the difference in the ability of a health plan to accept a Medicaid contract or to make a Medicare risk contract profitable in additional geographic areas. Increased savings by the plan might translate into better rates for clinic providers and/or may contribute to sufficient volume in remote sites or for particular services that might prevent closure of sites or discontinuation of a service.

Disadvantages (and advantages) for rural populations in DM programs

Both on-site interviews with DM leaders and survey responses from these leaders, physicians, and DM staff members underscore similar challenges for rural patients. Rural patients are viewed as disadvantaged relative to urban patients with regard to laboratory services, access to transportation, supportive social services, and pharmacy services. Rural patients' physicians, respondents suggest, may be less likely to participate in DM.

Rural patients are viewed as having some advantage in participation in telephonic case management, having friends and neighbors support in DM, receiving family support in DM, recognizing advantages offered by DM, and being satisfied with DM.

Survey responses suggest, too, that rural patients may be more dependent than urban patients on DM activities. The DM connection may substitute on occasion for a rural patient's travel to a distant provider on matters than can be responded to over the phone.

DM program respondents are overwhelmingly confident that DM provides high quality patient care. This DM contribution to quality is reflected in research reports from the systems (health plan or clinic) and in published high satisfaction levels with DM activities on the part of patients (e.g., as reflected in HEDIS). At least two of the systems have published papers that point to significant financial savings associated with DM programs, as well.

Although a majority of respondents saw their DM programs as being financially beneficial to the health plan and clinic, the perspective is not as strong or as widely shared as are attitudes toward DM's clinical value. This may suggest that continuing work is required to analyze and communicate the financial benefits associated with DM program to both physicians and health plan staff. The increased recognition of financial savings may contribute to identification of strategic benefits that DM programs might offer in enabling a clinic and health plan to manage the care of higher risk populations.

Rural health care plans and providers are faced with many challenges that extend beyond controlling costs. Efforts to deliver health care services to rural patients with chronic illnesses must be delivered and managed more efficiently without dilution of quality. Key to the success of these programs are leaders with vision and determination, willingness to work across specialties, training and "traditional" roles, and openness to new or alternative technologies in health care delivery and management.

Future Research

Important demonstration programs assessing DM programs serving Medicare patients and evaluation of disease management programs in Community Health Centers are underway. Additional studies are needed internal to integrated rural health systems and among provider organizations and health plans across the nation that can demonstrate the contributions of DM to the following:

- Reducing cost of care through gaining quality improvements along the continuum of care addressed by specific DM programs;

- Extending the benefits of DM to the largest number of patients and enrollees who might benefit from it; and

- Enabling health plans and providers to extend coverage and reduce cost impacts of uninsured by increasing rural access to quality health care by employees of companies with higher risk, to Medicare (risk contracts), for Medicaid (risk contracts or primary care case management) and for other vulnerable populations.

Introduction and Project Overview:

In a number of health areas, rural populations show higher incidence of heart disease, respiratory disease, disability associated with chronic health conditions, and obesity (*Health, United States 2001 with Urban and Rural Health Chartbook*, 2001; Gamm et al., 2003). Disease management (DM) is an appropriate tool to coordinate health care and improve health outcomes for such populations and to reduce needs for more costly care (Fos, Fine, & Zuniga, 1998; Gamm, 2003). DM is defined as "a systematic, population-based approach to identifying persons at risk, intervening with specific programs of care, and measuring clinical and other outcomes" (Epstein & Sherwood, 1996, p. 833). DM, however, has been most widely utilized in urban settings where it is promoted by large health plans interested in efficiently reaching significant numbers of enrollees to reduce costs of care while improving outcomes. There is some evidence that DM-related activities are less prevalent among provider organizations in rural areas (Vaughn et al., 2002).

The goal of the Chronic Disease Management in Rural Areas project is to advance knowledge of the use of DM to address chronic conditions among rural populations. Of particular interest is information from participating health plans and providers about special challenges and effective strategies in DM initiatives targeting rural populations (Chen et al., 2000). Based on analyses of this information, the project team identified issues and factors relating to rural disadvantage and service management that can affect successful implementation of DM in rural populations.

Background

Definition of disease management

In 2001, the Disease Management Association of America (DMAA) promulgated an industry-wide definition for disease management. Disease management is defined as a "system of coordinated healthcare interventions and communications for populations with conditions in which patient self-care efforts are significant." Additionally, a set of minimum requirements was determined to characterize a comprehensive disease management program and to clarify roles for disease management component providers and support organizations. This important step enabled healthcare providers to know what they were purchasing or developing, and regulators and accreditors to determine what they were

regulating and accrediting (Glaser, 2002). The DMAA articulated the following minimum requirements for a DM program. A DM program must:

- support the physician or practitioner/patient relationship and plan of care;
- emphasize prevention of exacerbations and complications utilizing evidence-based practice guidelines and patient empowerment strategies; and
- evaluate clinical, humanistic, and economic outcomes on an on-going basis with the goal of improving overall health.

Underlying Disease Management programs are formal and informal processes and standards that provide a foundation upon which to shape patient care models. These components include the following:

- 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 compliance/surveillance)
- Process and outcomes measurement, evaluation, and management
- Routine reporting/feedback loop (may include communication with patient, physician, health plan and ancillary providers, and practice profiling)

Evolution of disease management

Disease management's chief feature is its population-based approach for assisting people with chronic diseases. Early efforts to coordinate care were focused on disease-specific approaches. The initial concerted efforts of disease-specific management approaches led to the realization that people with "chronic diseases frequently have more than one" (Glaser, 2002), and a new generation of programs dealing with all of a patient's co-morbidities is evolving. Beginning in the mid 1990s, the industry began focusing its attention on the five most prominent chronic diseases: diabetes, heart failure, coronary artery disease, chronic obstructive pulmonary disease, and asthma (Glaser, 2002). Presently, DM efforts are coordinated and concurrent endeavors to manage diseases through

specific programs and departments located within health plans and insurance companies.

Elements of disease management

Disease management programs integrate elements from quality improvement initiatives to standardized care processes to evidence-based health outcomes. Through a process of determining best practices, DM-related education of all DM stakeholders takes a prominent role in assuring care coordination for people with chronic diseases. Patients' education empowers them to take control of basic but important steps to self-management (Fulton et al., 2001; Barlow et al., 2002; Bodenheimer et al., 2002; Rollins, 2002; Tattersall, 2002). Educational efforts use media available to aid self-management activities. Examples of media used are the telephone, the Internet, educational mailings, telehealth or face-to-face interaction. These efforts persuade patients to contribute to their care by improving medication compliance, diet, exercise, weight and pedal pulse monitoring, smoking cessation, etc. The goal of having "expert patients" is ideal for patient self-care who are able, with more refined skills and insights, to contribute and improve chronic care services (Tattersall, 2002). Gains in health education are sustained by the continued reinforcement of specialized health educators. Physicians also benefit from health education. The process of adapting to a team-approach to care coordination is founded in the continuous interaction and communication of DM staff and physicians.

The best practice principle in DM is strengthened by the adaptation, implementation and utilization of clinical practice guidelines (Jamison, 1998; Abisheganaden, 2002). The national support of practice guidelines by professional organizations is an important stimulus to adapt standards of care in DM programs.

Case management is another important element of DM programs. The continued communication and support of the chronic disease population is enhanced by case-managers. Furthermore, case managers play an important role in DM program management. A particularly robust form of DM calls for case managers to provide condition-specific "baseline assessment, perform economic analyses of diseases and their respective associated resource utilization, develop and/or implement care guidelines or algorithms, contribute to educational interventions, participate in disease management program implementation, and collaborate in outcomes assessment" (Huston, 2002, p. 223).

Monitoring the patient's clinical condition is another important element of DM programs. The ability to collect clinical data at the point of service, and remotely using available technologies, provides the foundation for continuity and success of any DM program (Hospital Case Management, 1997; Disease

Management Advisor, 2000; Kibbe, 2001). A health plans' critical master member index facilitates the identification of members at risk and/or members diagnosed with targeted conditions. Group practices' availability of electronic and paper medical records aid in determining additional clinical and program specific variables to create a DM specific dataset (Armstrong & Manuchehri, 1997; Roitman et al., 1998; Feifer et al., 2001).

Research Methodology

In Year-1 of our study the research team made on-site visits to five clinics or health plans providing DM to rural populations. Based on these visits, the research team prepared a survey for DM leaders, physicians and nurse/case managers. We first describe and summarize our visits to the five clinics and health plans. Following that we provide some initial results of our survey.

Project site selection—The initial sites were selected to represent integrated delivery systems in different regions of the country that serve significant rural populations and that have a clearly defined DM program and/or who have an interest either on the clinical site or health plan side of the organization to develop a DM program. At the same time, the team was interested in systems that also have a mix of urban and rural sites and patients such that comparisons and contrasts could be made in providing DM for rural versus urban populations. As the design evolved, members of the research team became aware of two other sites, distinctly different from the four multi-specialty practice integrated delivery systems—one an IPA model HMO in a rural east region and a DM program serving an uninsured Hispanic population in the Southwest.

Onsite interviews were conducted with DM leaders, with executives of health plans and/or clinics in a few instances, and DM administrative staff and DM practice professionals (nurse patient educators, care coordinators, and/or telenurses). During the site visits carried out in early 2002, interviews were conducted with three to 12 individuals at each site. Notes from the interviews were transcribed and reviewed along with documentation provided by the sites.

The surveys were developed with guidance from the results of the interviews and from the published literature on DM. The mail surveys were administered during November 2002 through February 2003 to DM leaders, selected physicians, and DM nurses. Surveys were distributed to a total of 315 individuals, including 43 DM leaders, 145 participating physicians, and 127 DM nurses. A total of 71 surveys were returned by mail to the research team for a response rate of 23 percent. The length of the survey, designed to be completed in 15 to 20 minutes, may have accounted, in part, for a low response rate.

Follow-up encouragement from the local DM leaders increased, somewhat, the rate of return.

Site Descriptions

The Scott & White Health System was founded in 1897. Its three components - Hospital, Clinic, and Health Plan became a single administrative entity in 2001. The staff model multi-specialty practice has approximately 515 physicians. Clinical services are provided in clinics throughout central Texas with both a hospital and several specialty clinics located in Temple, Texas a city with a population of approximately 50,000. Scott and White Health Plan covers approximately 186,000 members, but also accepts patients from outside the plan from other insurers, including Champus and Medicare. Scott & White has a central 450-bed hospital with on-site hospital-based specialty clinics. Additionally, there are 16 satellite clinics, with seven (7) of those located in primarily rural settings.

Scott and White Clinic started chronic disease management (CDM) services as a homegrown pilot in 1998, coordinating care for members with diabetes and congestive heart failure (CHF), with the funding structured under the health plan. The pilot CDM program was started in five clinics, (Belton, Killeen, Northside, Temple and Santa Fe) all of which serve patients who live in rural areas. Scott & White has not tracked members in DM programs based on place of residence, thus rurality has not been employed as an indicator for measuring program progress. Data mining the electronic medical record and health plan member files support patient selection and tracking. An additional PC-based data tracking application was developed to enter patient specific data by approximately 10 health educators and case managers. Dr. Michael Reis is the medical director who reports directly to the physician executive board provides leadership to the program. Barbalee Symm, R.N. M.S.N. provides leadership for the several registered nurses who work with the primary care physicians. The Scott & White DM program has adapted nationally recognized and available clinical practice guidelines to standardized patient management. These include the following:

- Monitoring patients daily, weekly, and as patients' conditions warrant;
- Ordering routine laboratory tests, as indicated by the patients' condition, and reflective of the primary care physician's philosophy of care;
- Scheduling appointments with physician as indicated by patients' conditions; and
- Assessing patient and/or family learning needs and providing appropriate education.

In the fall of 2003 Scott and White CDM services expects to expand to include all of its health plan members with a diagnosis of diabetes or congestive heart

failure. This will entail expanding services to all regional clinics, and to a small number of contractual providers in Central Texas.

The Carle Clinic Association located in Champaign-Urbana, Illinois evolved from a private physician group practice to a fully integrated managed care organization in east central Illinois in 1980. The Carle Clinic Association operates branch clinics throughout east central Illinois, many of which are in rural areas. A separate health plan, "Health Alliance Medical Plan" provides managed care (including HMO, PPO and Point of Service products) throughout the Carle Clinic service area. The Carle Foundation Hospital is a non-profit 295-bed facility offering a full range of medical and surgical services, including a Level III Perinatal Center and the region's only Level I Trauma Center. Carle Clinic was selected as one of 16 national sites to offer CMS's new Medicare Coordinated Care Demonstration (MCCD) demonstration programs in 2001.

Disease management services are coordinated and carried out on the clinic side of the Carle organization by Dr. Cheryl Schraeder, Ph.D. R.N., Cindy Fraser, M.A. and other specialists at Carle Clinic's Health Systems Research Center. Chronic diseases, which are managed and followed by the team, include type 2 diabetes, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), asthma, atrial fibrillation, and coronary artery disease. Under the direction of Dr. Schraeder and Ms. Fraser, Carle was awarded a grant to implement a Medicare Coordinated Care Demonstration (MCCD) program. The purpose of the MCCD is to test whether care coordination interventions can be applied to Medicare fee-for-service beneficiaries with chronic conditions as well as assess the impact of a "team approach" to healthcare for patients with chronic health conditions. Carle's MCCD will address the following issues important to the future of Medicare:

- Improve health outcomes for persons with chronic conditions.
- Improve the quality of care through research based clinical guidelines.
- Improve patients' clinic health status and preventive health practices
- Lower Medicare costs by reducing hospitalization rates and length of stay.

The Marshfield Clinic is a 664-physician multi-specialty clinic headquartered in Marshfield, Wisconsin, with 39 remote clinics serving 27 counties of North and Central Wisconsin. The Clinic is the sole sponsor of Security Health Plan (SHP) which operates a commercial HMO with 120,000 members, a Medicaid managed care plan, a low-income state sponsored health plan (BadgerCare), a Medicare Supplemental program, and since August 2002, a Medicare MC+ program.

Marshfield Clinic has approximately six years experience with formal DM programs. Starting with asthma protocols for all patients, one or more

components of the system now offers programs addressing asthma, diabetes, cardiac risk reduction, anti-coagulant management (ACM), depression, and, since August 2002, congestive heart failure (CHF) for one or more groups of patients.

Most of the DM activities are centered in ProActive Health (PAH), a unit within the clinic; and, more specifically located in the Call Center within PAH. PAH and its Call Center and nascent DM programs, including tobacco prevention program, were transferred from the Security Health Plan to the Clinic in 1997. The Call Center, a 24/7 operation with a staff of 57 full-time and part-nurses (totaling 35 FTEs), focuses about 30 percent of its work on DM related activities. It also provides triage and after-hours on-call services for several medical departments within the Marshfield Clinic.

The DM services offered by the Call Center are almost entirely telephonic. The ACM program and many of the other DM activities are supported by the ability of the Call Center nurses to access electronic medical records (except for behavioral health portions) and record the nurse activities on the chart for communication with the physician.

The new Medicare MC+ program strengthens SHP reliance upon the Call Center, adds a health assessment survey, screens patients for CHF and starts a CHF management program. The location of DM within the clinic recognizes the pre-eminent role of the physicians within the system and enables the Call Center to take on more practice management responsibilities in addition to DM activities. For example, the ACM pilot project, a pharmaceutical prescription refill program and on-call services, might not have evolved to the Call Center without its presence in the Clinic.

There are continuing efforts to keep DM possibilities in front of physicians, and ongoing considerations of how to present DM within the administrative structure. There are physician champions for each of the DM activities and loosely structured but important ties between DM activities and Quality Improvement functions. Similarly, disease registries and a strong epidemiological data set, all of which might give additional support to DM related activities, are located within the clinic.

Recognizing the importance of physician support in the Clinic and the long-standing reliance of these physicians on medical assistants, rather than nurses, the predominant reliance upon nurses for DM activities is providing cautious education about the role nurses can play in ambulatory care. Although the 524 bed Catholic-owned hospital, St. Joseph's, which provides hospital services immediately adjacent to Marshfield Clinic, employs hundreds of nurses, 90 percent of the nurses within the Marshfield Clinic are located in ProActive Health, especially in the Call Center.

Finally, the coordination of DM activities across units and with Quality Improvement is handled principally by cross-linked committees. Such committees serve to coordinate these activities between the clinic and the hospital and between the clinic and the health plan.

The Geisinger Health Plan is part of the Geisinger Health System, a multi-specialty group practice-based integrated delivery system headquartered in rural Danville, Pennsylvania. The system includes a 437 bed flagship hospital and several other inpatient facilities, over 450 physicians at the central clinic and 49 primary care clinics serving over 38 counties of Northeast and Central Pennsylvania, and Geisinger Health Plan (GHP), the country's largest not-for-profit rural HMO serving approximately 250,000 members in 38 counties. The GHP DM programs work with the Geisinger sites and physicians, as well as with hundreds of physicians who are not are not a part of the Geisinger Clinic but who have contracts with the GHP.

Geisinger Health System has approximately ten years experience with formal DM programs. These programs have been the responsibility of the GHP, except during the short-lived merger between Geisinger Health System and the Penn State Medical Center in the late 1990s when, for about two years, the DM programs were located on the clinic-side of the then merged system. Starting with tobacco in 1992, one or more components of the programs now addresses tobacco cessation, asthma, diabetes, CHF, COPD, osteoporosis, and hypertension for one or more groups of patients. In 2001, GHP began its efforts to extend DM to contracted/panel physicians who are not Geisinger staff physicians but who serve GHP patients in their independent offices.

The DM programs rely principally upon just over 50 nurses, divided evenly between nurse patient educators and nurse case managers. Considering the two major DM programs of GHP, the former group of nurses is primarily responsible for diabetes DM and the case managers for CHF enrollees. The nurse patient educators operate out of the various Geisinger clinic sites and at a number of non-Geisinger physician office sites. The nurse case managers conduct their work from a variety of locations.

Both patient educator nurses and group practice nurses rely upon specialized DM software and upon the Geisinger Clinic electronic medical record (EMR). The DM nurses and physicians value immediate access to both information systems at Geisinger sites or at home. The EMR access is particularly beneficial to physician and DM communication, medication adjustments for patients, and the like, between patient office visits. Lack of such access at the non-Geisinger physician office sites remains a concern.

Evaluation of GHP's DM programs has relied on comparisons of claims data and utilization and clinical indicators. Reductions in patient costs have been noted once patients enter the health plan's DM program. Also, comparing plan enrollees in the diabetes DM program with a control group not in the plan offering DM, charges among patients in diabetes DM program were substantially lower than among patients who were not. More generally, DM contributes to increases in the use of primary care services and reductions in inpatient charges for patients in the DM programs. Improvements are observed, too, in clinical quality indicators such as HbA1c levels of patients with diabetes, use of steroid inhalers among patients with asthma, and level of blood pressure control among patients with hypertension. Monetary savings attributed to GHP DM programs have exceeded their costs by as much as seven-to-one.

There is convincing evidence, as well, that patients value strongly DM, with this program consistently being the highest rated item on the health plan's patient satisfaction survey. There are anecdotal reports, too, of the strong desire voiced by clinic patients who are not GHP members to gain access to the GHP DM services. The DM program is identified as helping to bond enrollees to the health plan.

The Health Plan ["THP"] of the Upper Ohio Valley is a Not-For-Profit health insurance corporation started in 1979 by a group of physicians. THP's primary product is employer-sponsored insurance offered in the St. Clairsville, Ohio area, and in other rural areas in eastern Ohio and West Virginia through contracts with local physicians. THP also offers an HMO product to employees of the West Virginia University and has a Medicaid contract in the northern West Virginia area. The supervisor of THP's disease management programs is Kathleen Parsons, R.N. M.B.A. Ms. Parsons reports to the Vice President of Operations at THP.

THP's disease management leadership structure is non-physician centered, however physicians have played a critical role in the development of DM protocols. At the present time THP has four DM initiatives in place: CHF, COPD, Diabetes and Pre-Natal care. CHF and COPD were originally outsourced to CorSolutions®, a for-profit DM company. However, in the summer of 2002 THP assumed responsibility for COPD and CHF and in the fall of 2002 initiated efforts to begin a fourth DM program in prenatal care. Most of THP's DM is provided to persons living in rural areas. THP has experienced some physician challenges and reluctance to embrace DM. THP distributes DM information to physicians and also provides effectiveness rankings of each physician by DM measure or outcome. THP has also relied on written notices to members to ask doctors about such things as diabetic eye exams or appropriate medications for CHF and COPD.

THP identifies new DM patients through its payment system and classifies patients through risk stratification. Nurses play critical roles as leaders of the program, serve as health educators and have been the key component to the DM program. THP's DM program funding comes from administrative dollars. In 2001, THP estimated that for every $1.00 spent on DM services, THP saved $2.83. Rural obstacles faced by THP are the declining economy in steel and coal and the fact that rural employers are struggling to provide benefits. THP is accredited by NCQA, and NCQA standards have played a big role in the development of THP's programs.

St. Elizabeth of Hungary Clinic in Tucson, Arizona, is a large primary and specialty care clinic for the uninsured, and is an agency of Catholic Community Services. It has an informal partnership with Carondelet Health Network (CHN), of Tucson. The relationship between the two organizations is informal, though a member of CHN's board of trustees also sits on the board of St. Elizabeth of Hungary.

Since its founding in 1961, the clinic has often received assistance from CHN and its member organizations. For example, many of the clinic's 150 volunteer physicians are based at Carondelet hospitals, in Tucson. CHN provided funds and managerial expertise to St. Elizabeth Clinic to continue the home health program. In addition, CHN has, among other things,

- Helped the clinic operate a parish nurse program for three parishes in a low-income section of Tucson.
- Provided funding, equipment, and educational tools for a program the clinic offers to pregnant women.
- Contributed funds for a planned expansion and renovation of the clinic, scheduled to begin this fall.
- Collaborated with the clinic's Well Women Check program for women over 50.
- Instituted a multidisciplinary disease management program for the uninsured.

St. Elizabeth of Hungary Clinic implemented a multidisciplinary disease management program in 2000 after an internal chart audit revealed an alarming 12% rate of diabetes, twice the national average. The program is directed by Donna Zazworsky, R.N. M.S.N., a key collaborator on the Chronic Disease Management in Rural Areas research project. Developing the FAST® approach to Disease Management, Zazworsky and colleagues have been able to demonstrate the relationship between interventions and patient outcomes.

With an annual budget of $1.6 million, the clinic provides care through its 35 salaried staff/providers and several hundred volunteers, for 8,000 to 12,000

area residents, most of whom are uninsured working people or Medicaid recipients.

Comparisons Across the Six Study Sites

On-site interviews with DM leaders, key staff persons, and selected DM personnel revealed some important differences across the six sites. First, the sites differ from one another in *years of experience with DM*. Of the four rural integrated delivery systems, two had been engaged in some form of DM for about a decade, two others had been so involved only for about five or six years. The two other systems had been engaged in DM for a shorter number of years.

Second, there is variation in the *relative roles of physician organizations (clinics) and health plans in the sponsorship of DM* across the systems. One of the systems finds the DM sponsored entirely by the health plan component with DM staff working in cooperation with clinic physicians and nurses. Another system places the responsibility for DM in the hands of the clinic, but the clinic DM activities are coordinated with the health plan via liaison committees. A third system has separate DM activities sponsored by the health plan and others sponsored by the clinic. A fourth system joins the health plan and the clinic under a centralized control structure and the clinic administration of the DM programs are tightly linked to the health plan, as well. In the IPA model health plan, the DM program is entirely under the control of the health plan. In at least two of the systems, control of DM has transferred from clinic control to health plan control, or vice versa.

The systems vary, too, with respect to the *patient populations and type of plans served by DM*. In two instances (one system and the IPA), only patients enrolled in the health plan are served by the health plan DM activities. In another instance, the system's health plan provides DM to health plan patients and the clinic offers some DM activities for health plan and non-health plan patients. In another system, the clinic delivers various DM services to patients according to different types of health plan contracts. Another system provides the DM activities to patients without regard to health plan participation.

Although, as is reinforced by the survey findings, most of the systems do not appear to employ the availability of *DM as a marketing tool*, comments given by professionals from two systems suggest this potential. In one system, leaders noted that some businesses request DM services as part of their contract with the clinic. In another, the health plan's discontinuation of coverage for two groups of patients was followed by requests from many patients in these groups to purchase the system's DM services despite being covered by a new plan.

There is more similarity across the systems in terms of *roles played by physicians and nurses in DM*. That is, four integrated delivery systems find DM leadership shared between a physician, or medical director, and a non-physician program administrator, typically a nurse. At the same time, nurses and physicians carry out the day-to-day DM program activities. DM nurses play the principle role in two of the systems, extending from patient education, to monitoring, recommending changes in medications, and other activities in regular communication with the physician via email and/or electronic medical record. In one system, the nurses rely on telephone interaction with the DM patients and relay information to the relevant physicians. In another system, the nurses are involved in patient education, but play a less active role in monitoring and communicating on an ongoing basis with the physicians or interacting with the electronic patient record. The IPA model HMO relies almost entirely on nurses to conduct DM activities.

As is suggested above, the systems vary, also, in terms of *reliance upon electronic information systems* to support or enhance DM programs. Most of the systems appear to have one or more types of DM specific software, and in two cases, DM nurses have access to electronic medical records (EMR), as well. In one system, in particular, the availability of EMR, and DM staff access to it, is given a major share of credit for the success of their DM program.

Survey Results

A total of 71 usable surveys were collected from the project sites during the survey period. Respondents were nurse/case managers (45%), physicians (40%), and program leaders (15%). The most common conditions managed by the program were diabetes, CHF, COPD, asthma, and depression. Additionally, the project sites reported DM interventions in people with hypertension, osteoporosis, tobacco cessation, and prenatal care.

Respondents had an average of approximately 12 years of work with health system (range 6 months – 30 years) and approximately four years (range 4 months – 10 years) participating in DM programs. Approximately one-half of the physician respondents were family practitioners. Respondents described their current place of work as rural in 52.2 percent of the responses, and a rural/urban mix in 41.8 percent of the responses. For the survey items included in the following figures, five point response scales were employed. For most items the response choices were 5 = great (contribution, impact, etc.), 4 = significant, 3 = moderate, 2 = slight, 1 = none/not at all. In all instances, the items were recoded into three categories—significant or great, moderate, slight or none. The responses are presented in this report in aggregate for two reasons. First, one is focusing on small numbers if responses are considered separate for the six systems or across the three categories of respondents—DM leaders, DM nurses, and Physicians. Second, there are notable differences in responses across the three groups of respondents only with respect to a few items.

Figure 1 shows the distribution of respondents' perceptions of how DM programs contribute to factors related to patient care, care quality, and financial concerns. The DM program is given credit, most frequently, by the respondents for contributing to the patient's care, satisfaction, and quality of care. 80 percent to 90 percent of the respondents view the DM program contributing significantly or greatly to these care, quality, and satisfaction elements and to efficient use of resources. In contrast, from 54 percent to 67 percent of the respondents see such a high contribution by DM to saving the physician time or keeping him/her current with the patient's condition, or contributing financially to the clinic or plan. If one takes into consideration that as many as a quarter or more rate DM as making a moderate contribution to these latter elements, only about 15 and 20 percent claim that DM contributes only slightly or not at all to the clinic financially or saving physicians time. Less than 10 percent rate the DM program's contribution as slight or none for the other nine elements considered in Figure 1. (From 4 to 6 respondents did not respond to the questions addressing DM contribution to clinic or health plan quality or finances.)

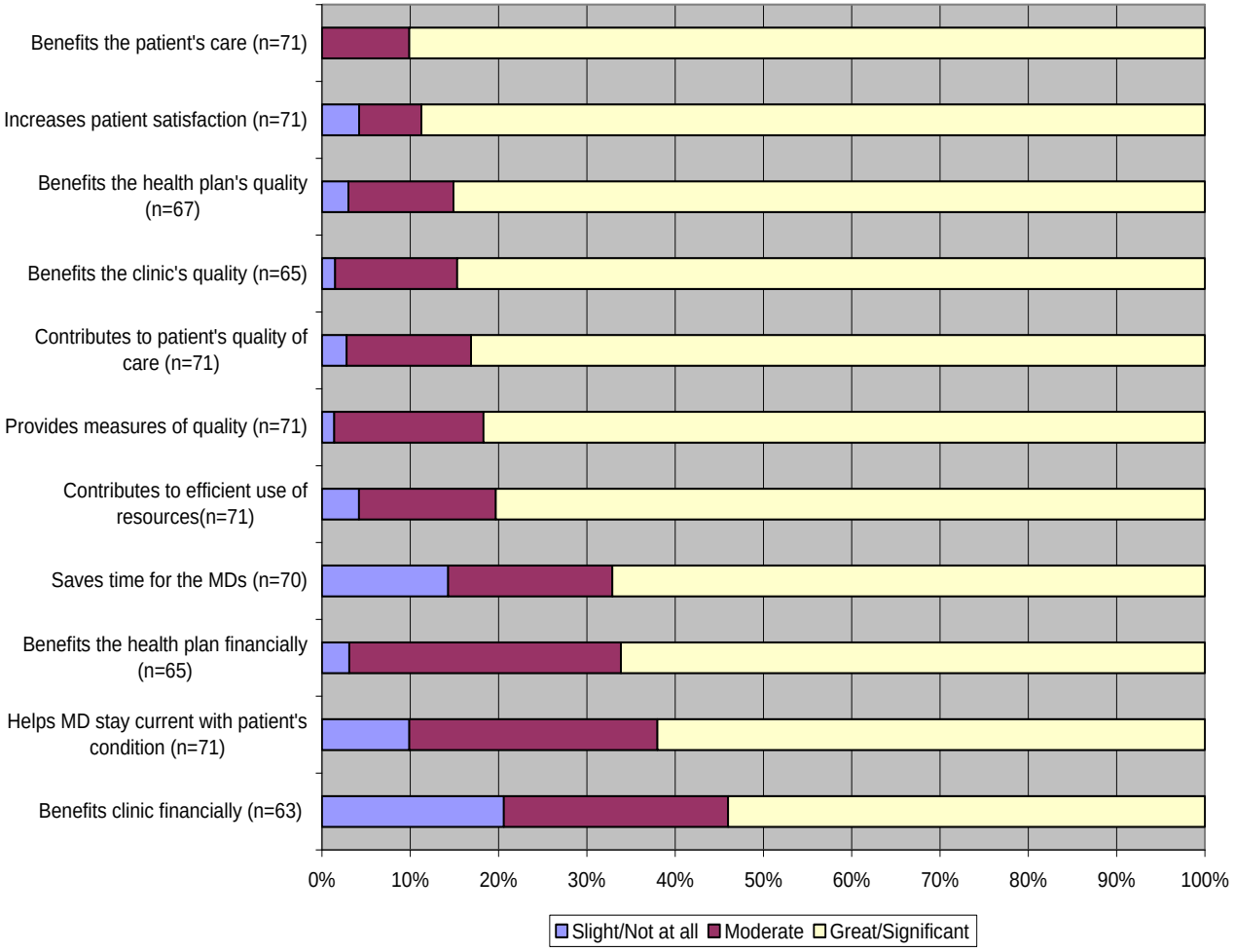

Figure 1: The DM Program's contribution to organization, professional, and care-giving factors (Response range: 63 - 71).

Figure 2 presents respondents' perceptions of how well their organization's DM program reflects some more specific benefits related to the patient, clinical quality efforts, or the health plan. The DM program is viewed by large proportions of the respondents as supporting patient-centered elements, (supporting patient's self-care and meeting patients' needs), and clinical quality elements (e.g., CQI, use of practice guidelines); over 80 percent rate DM as offering a significant or great reflection of the benefits. Taking into consideration the "moderate" responses, six percent or fewer of the respondents credit the DM program with slight or no reflection of the first six elements in Figure 1.

Less than one-third of the respondents see the DM program as reflecting significant or great support for health plan Medicaid services, contracting with higher risk employers, or attracting other employers to the plan. Yet, nearly one-half of the respondents do make such claims for DM's maintaining patient loyalty.

Only about one-third or fewer of the respondents credit DM with slight or no effect on these contract related elements. (Although 70 respondents answer most of these items, from 18 to 31 respondents did not respond to items about attracting employers, attracting those with higher risk employees, or supporting Medicaid populations).

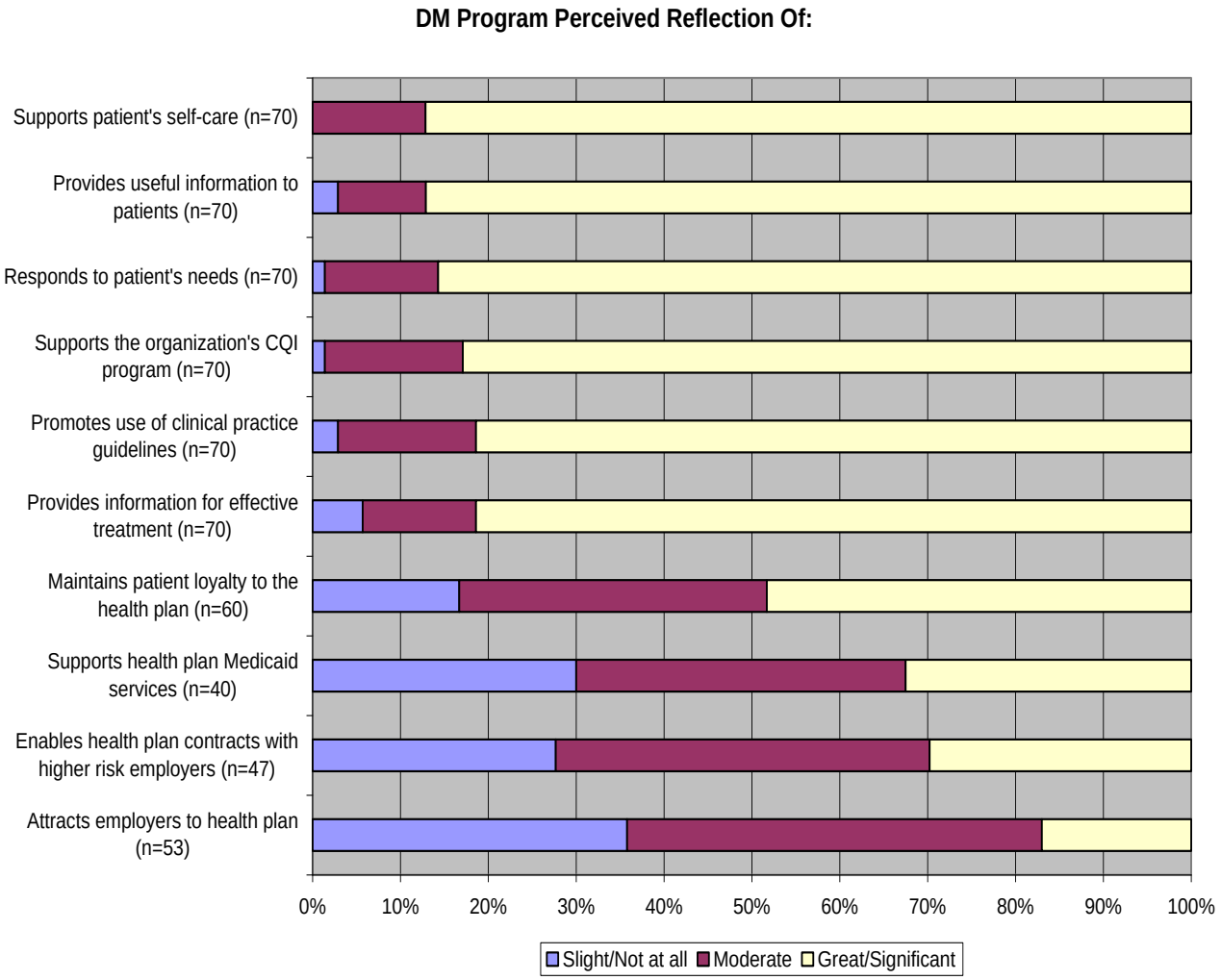

Figure 2. DM Program's reflection of, or support for, specific elements in the health plan and patient care (Response range: 40 -71).

Physicians and DM nurses offer ratings of the importance of eight factors in supporting their own work in DM programs. As reflected in Figure 3, it is the role of DM in improving quality of care and communication and DM staff access to patient information that are most frequently rated as great or significant in importance, 84 to 93 percent. Less often viewed as significantly or greatly important to supporting physicians' and DM nurses' work in DM is other information from the DM program or the ability it offers to compare to others—

48 percent and 56 percent rating these elements as of great or significant importance. Finally, rated lowest in importance among the factors is DM's potential for generating revenue. More than one-third of the respondents regard it as only of slight or no importance in supporting their work in DM. A concern for cost, however, is revealed when only 7 percent rate "potential for cost savings" as being of only slight or no importance in supporting their work with DM. (Ten of the 71 respondents chose not to reply to the item addressing "potential for generating revenue." From three to seven chose not to respond to most of the other items in Figure
3.)

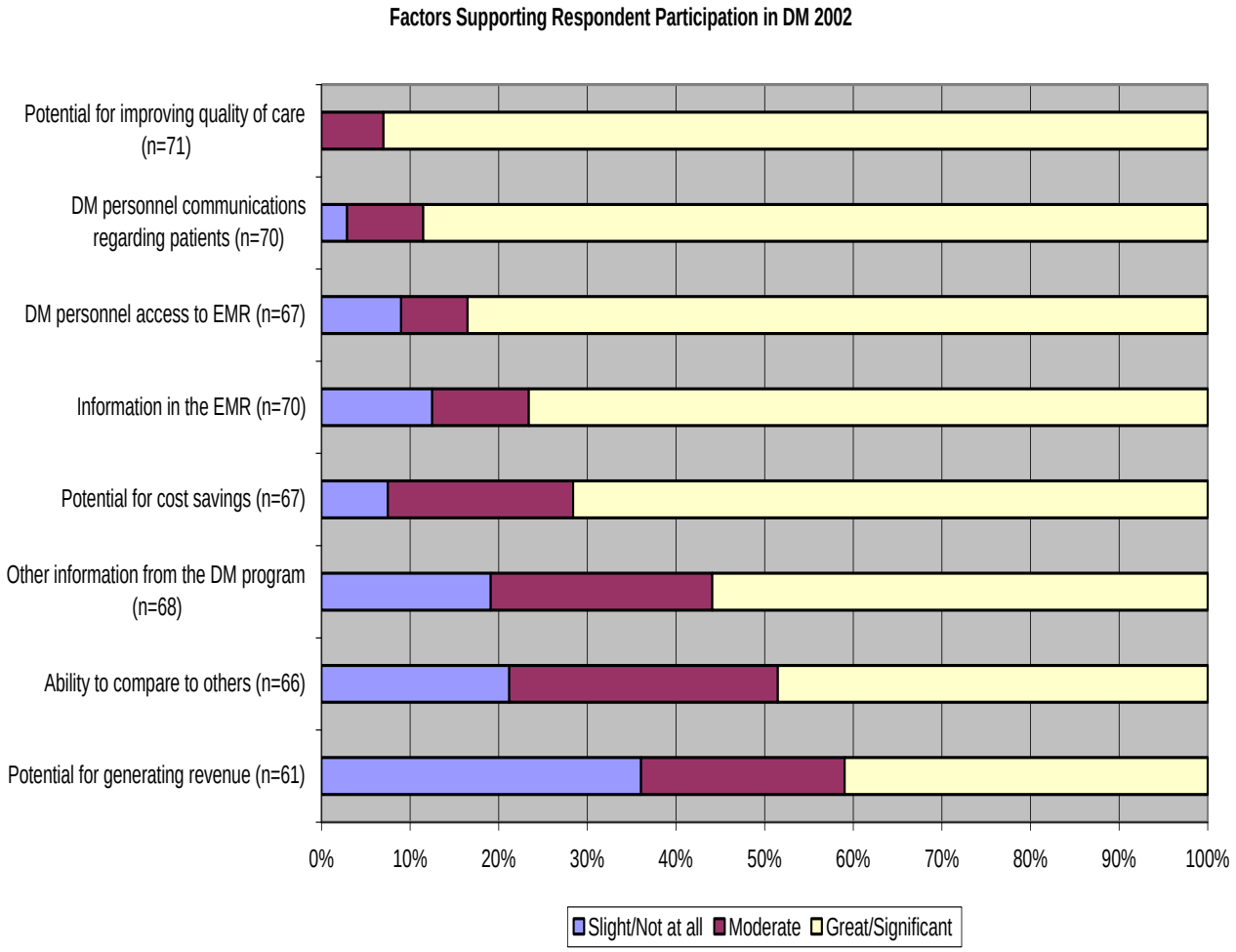

Figure 3: Factors Supporting Respondent Participation in DM (Response range: 61 - 70).

The ratings of importance of elements to the success of the DM programs are presented in Figure 4. Patient education and care coordination provided by DM personnel and local clinic and central clinic physician buy-in and support to DM are rated as factors of great or significant importance to DM program success by

84 percent or more of the respondents. Six percent or fewer of the respondents view these elements as being of slight or no importance. Patient education offered by physician or his/her staff, buy-in and support from contracted physicians, and the patient's ability to ask physicians for DM-relevant tests or exams were viewed as greatly or significantly important factor for the success of the DM program by 43 percent to 51 percent of the respondents. In contrast, only from 16 to 24 percent view these elements to be of slight or no importance to DM program success. (For most items, no more than 4 respondents failed to answer; however, 21 and 9, respectively, did not answer the items about contracted physicians or central clinic physicians.)

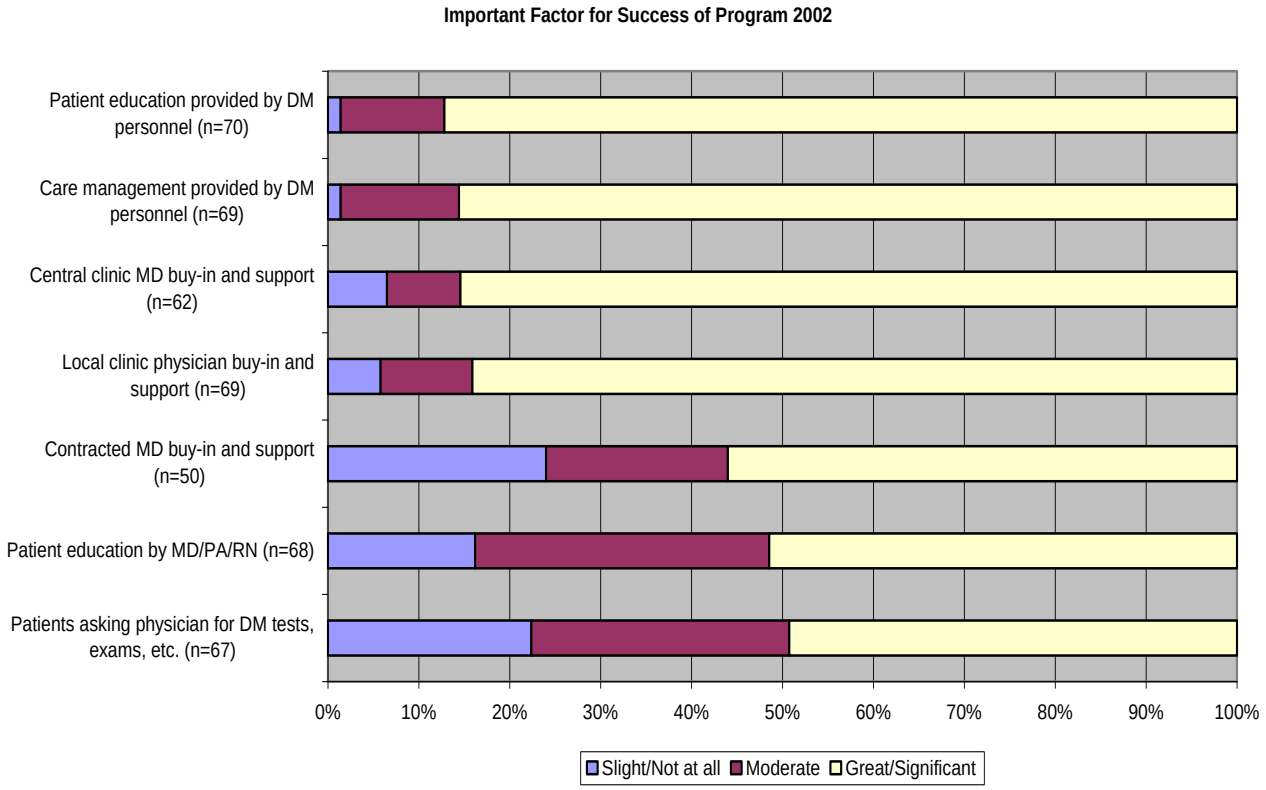

Figure 4: Important Factors for Success of DM Program (Response range: 50 - 70).

Estimated compliance with DM program instructions

Respondents estimate that approximately one-half to two-thirds of the patients in the DM programs for Diabetes, CHF, COPD, Asthma, and Depression are likely to comply (range 55 percent to 64 percent) with DM program instructions. Factors frequently identified by the respondents as affecting patient's compliance are:

- Cost of drugs
- Ability to make lifestyle changes
- Ability to understand program instructions
- Physician support
- Co-morbidities
- Denial of disease
- Distance to clinic
- Family support

Stakeholder support for specific DM programs

Respondents were asked to rate the degree to which specific types of DM programs had attained the various forms of support, communication, or other factors (that might be associated with DM program success). To compare stakeholder support for different disease specific DM programs, responses are combined into only two categories, a great or significant attainment category and a moderate, slight, or not at all category.

As is reflected in Figure 5, survey responses suggest that diabetes DM receives relatively great or significant support from the majority of all types of stakeholder groups, except for clinic administrators (falling just short at 48 percent). There is variation noted across disease types as well as across types of respondents.

Stakeholder support (great or significant) tends to be highest from DM nurses and health plan administrators. With the exception of high physician support for diabetes, DM program support from physicians and clinic administrators is viewed as relatively lower than from the other two stakeholder groups.

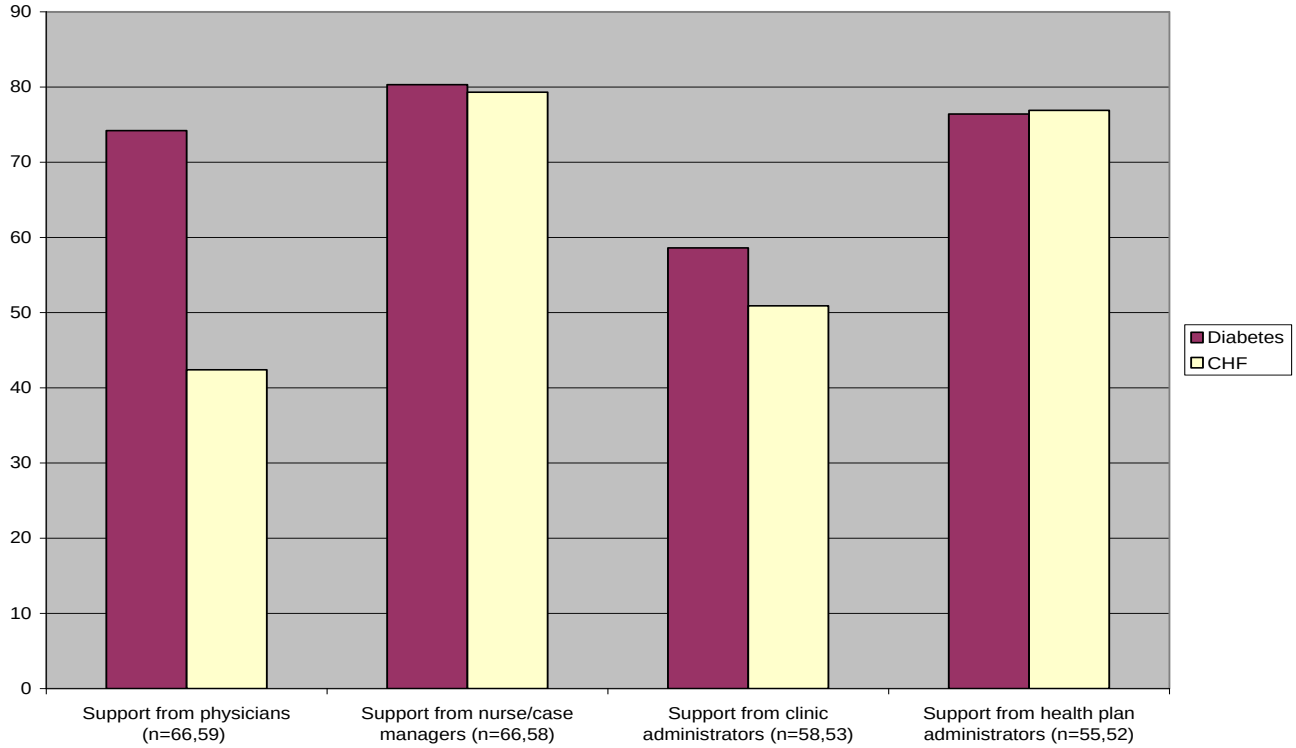

Figure: 5 DM Program Attainment of Strong Support from Stakeholders.

Factors related to Diabetes Program Experience

Because diabetes DM is offered by all the systems considered in this study, responses from all respondents specific to diabetes are examined here. Specifically addressed are achievements of the diabetes DM program associated with communications, standards of care, documentation, and program outcomes.

For diabetes DM, attainment of communications between patients and disease management staff is rated great or significant by four-fifths of the respondents. Communications attainment between DM staff and physicians and health plans is rated as great or significant by nearly two-thirds of the respondents. At least moderate attainment for these three areas of communication is reported by 92 percent or more of the respondents. Communication attained between clinic nurses and DM staff earns at least a moderate rating by three-quarters of the respondents and great or significant by 45 percent.

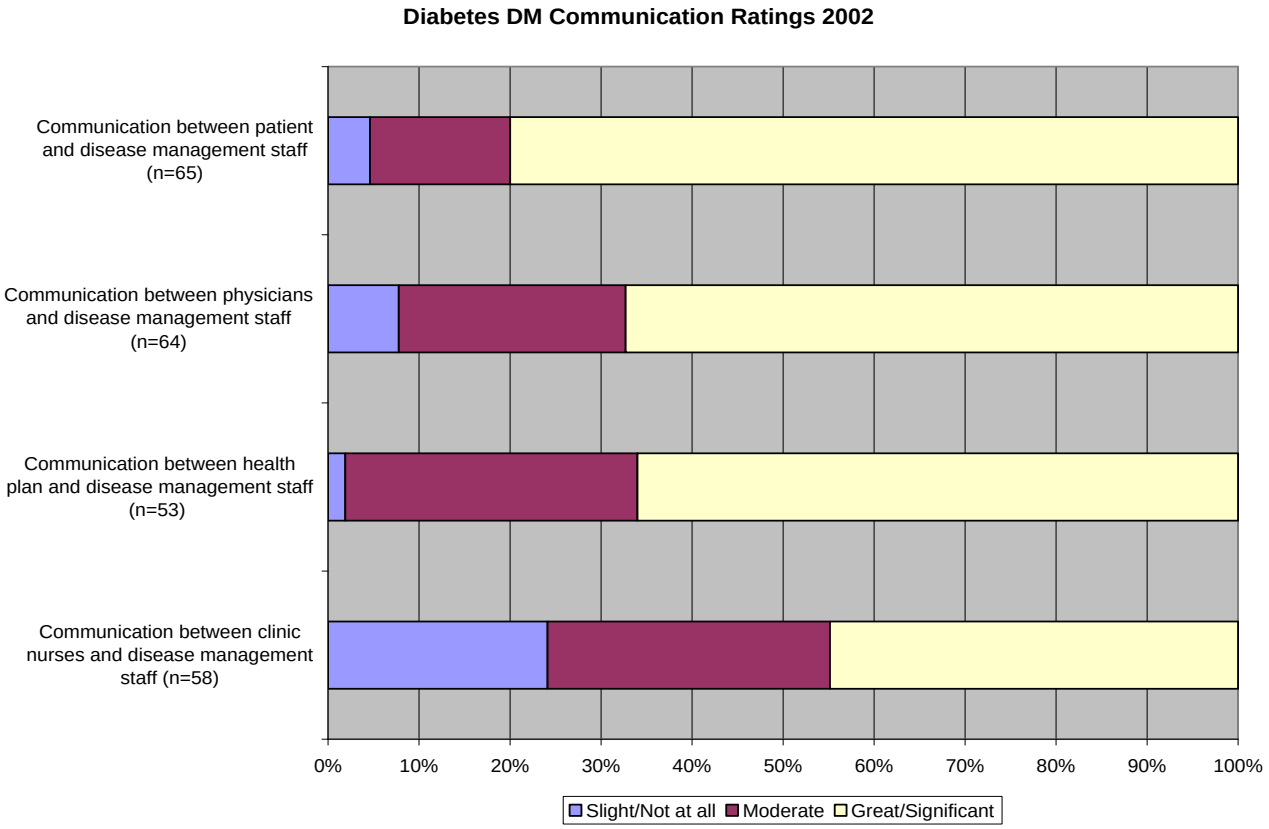

Figure 6: Diabetes DM Communication Ratings (Response range: 53 - 65).

Attainment of standards of care elements related to the DM program is presented in Figure 7. Attainment of patient follow-up by DM personnel receives high ratings (great or significant) from three-quarters of the respondents. Such high attainment is attributed to monitoring need for treatment changes and physician agreement on diabetes disease management pathways by approximately 60 percent of the respondents. Attainment of physician agreement on clinical protocols and clinical practice guidelines and attainment of documentation associated with them receive high ratings from just over one-half of the respondents. Notably, at least moderate attainment for each of these standards-related items is reported by 86 percent or more of the respondents.

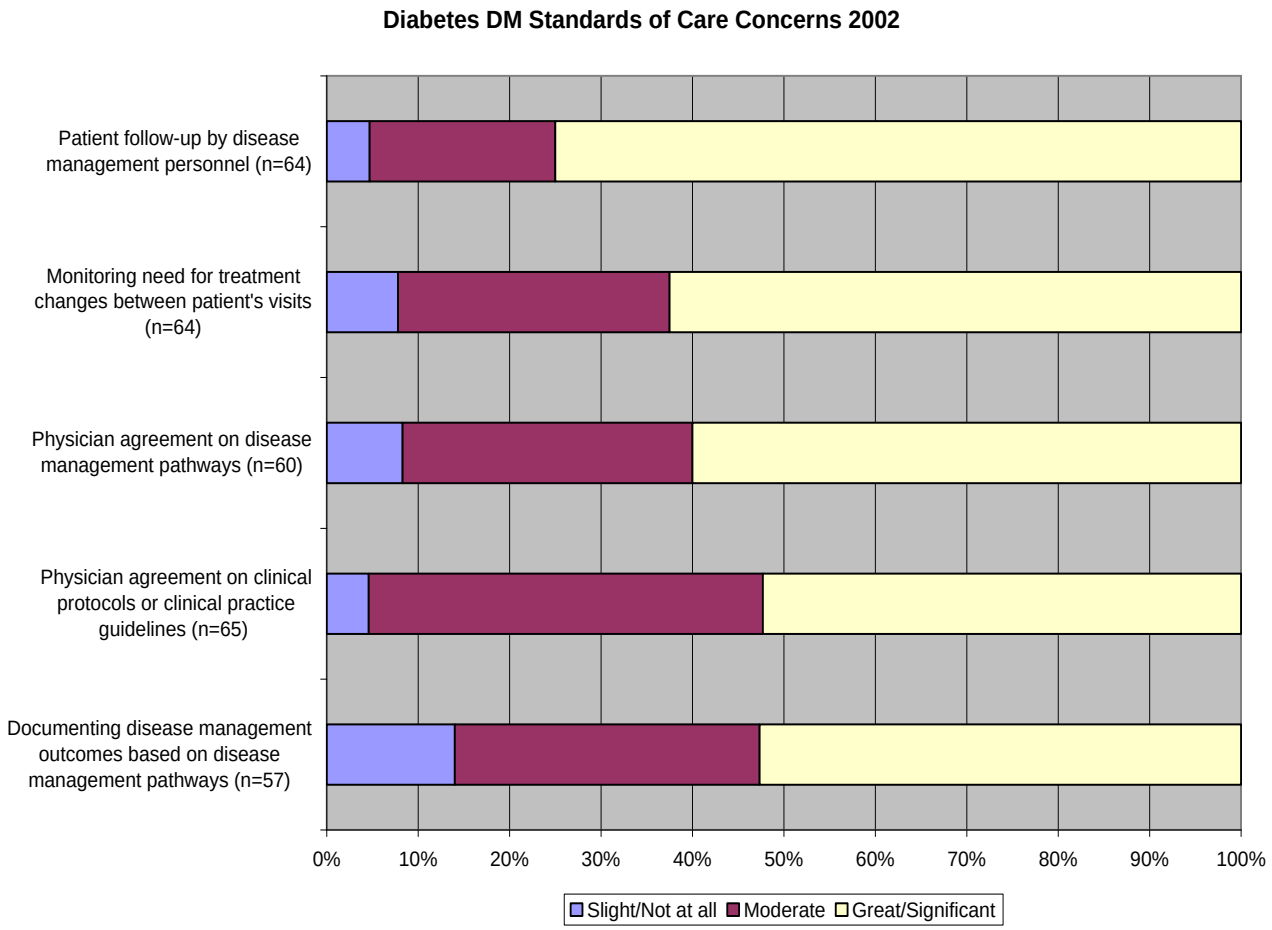

Figure 7: Diabetes DM Standards of Care Concerns (Response range: 57 - 65).

Among diabetes DM program documentation issues in Figure 8, attainment of DM personnel access to electronic and/or paper medical records and the capture of essential DM information is rated at moderate or higher by 93 percent or more of the respondents. Attainment of analysis of disease management data and feedback on the outcomes of the diabetes DM program are rated moderate or higher by approximately 85 percent of the respondents.

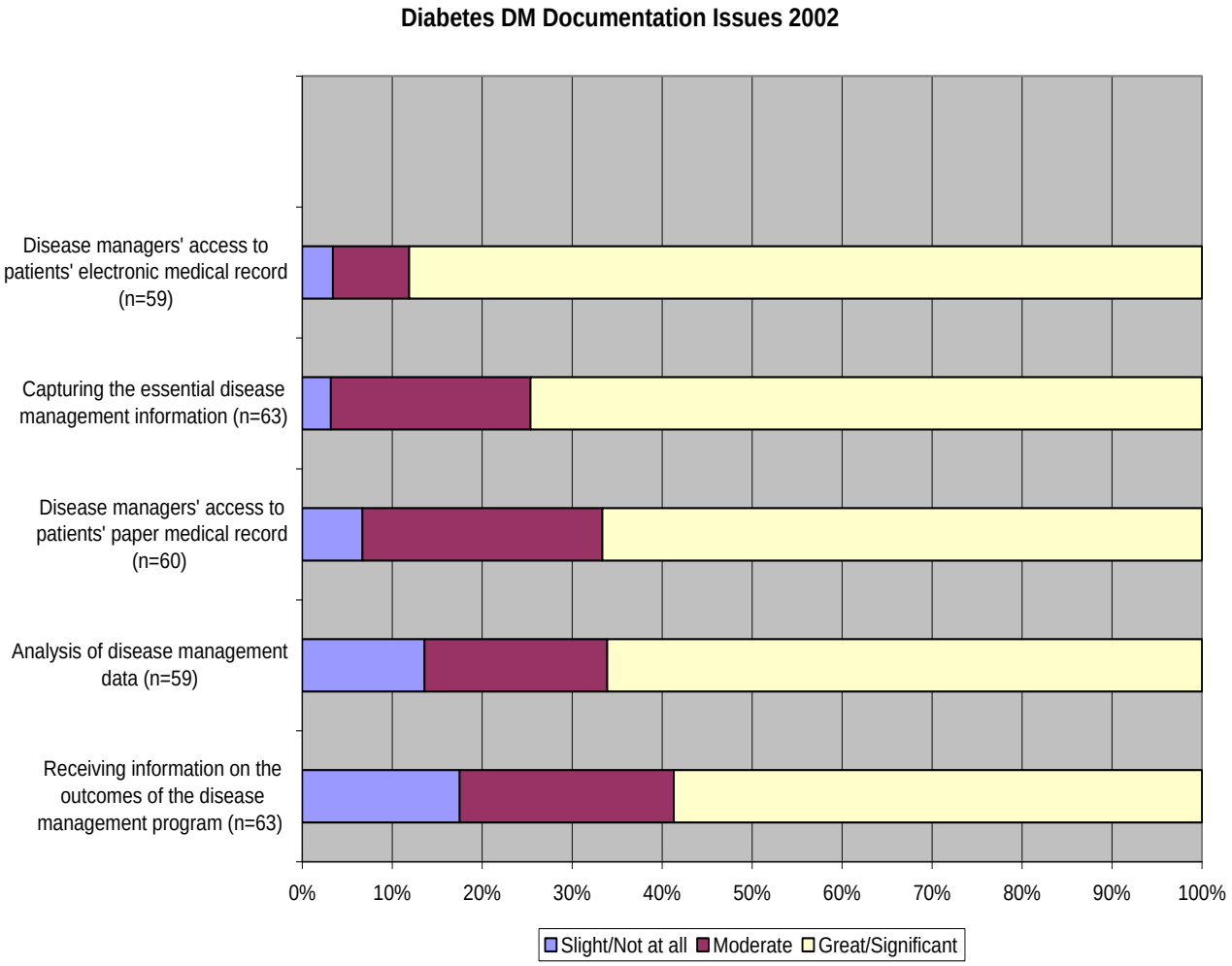

Figure 8: Diabetes DM Program Documentation Issues (Response range: 59 - 63).

Other attainments associated with the diabetes DM program are less clear-cut. Far fewer respondents replied to items regarding attainment of demonstrated improvement in diabetes care, demonstrated cost savings, or diabetes DM accreditation. Those responding, typically from one or two systems, indicate high levels of attainment of these elements in their diabetes DM program.

Rural disadvantages for rural patients and providers

A key element of the study was to identify and examine any possible rural disadvantages and barriers to DM, a process that had been adopted earliest in larger populations. In both our onsite interviews with DM leaders and selected staff and in our survey of DM leaders, DM staff, and physicians, questions or items were included to investigate this issue. In the interviews we asked whether there are any areas or elements of the DM program where rural patients may be at a disadvantage relative to urban patients. Table 10 lists the types of responses received across the six sites during these interviews.

Table 1: Rural Disadvantages for Disease Management
(Identified in Interviews with Staff of Clinics and Plans)

Limited Health Resources
Lack of urgent care facilities Reduced access to health resources (e.g., labs or pharmacies) Limited access to specialty care Physician compliance in rural areas Rural doctors or nurses sometimes have less training
Travel Barriers and Transportation
Increased time for DM nurses to drive to rural locations Winter travel limitations to/from rural locations Difficulty with transportation to clinic
Social conditions
Patients less likely to participate in screenings or fairs Rural prevalence of young, single mothers Poverty and/or cannot afford health care Lack of phone or phone failure Rural employment increases morbidity or injuries Employment lay-offs

Based on results of the interviews, the research team designed items for the subsequent surveys to determine how widespread perceptions of rural disadvantage in DM were among DM leaders, staff and physicians. At the same time, the team was interested in any advantages that rural areas might offer to the effective implementation of DM. The survey results for the 14 items included in the survey support and enhance the information gained during the earlier on-site interviews. See Figure 9.

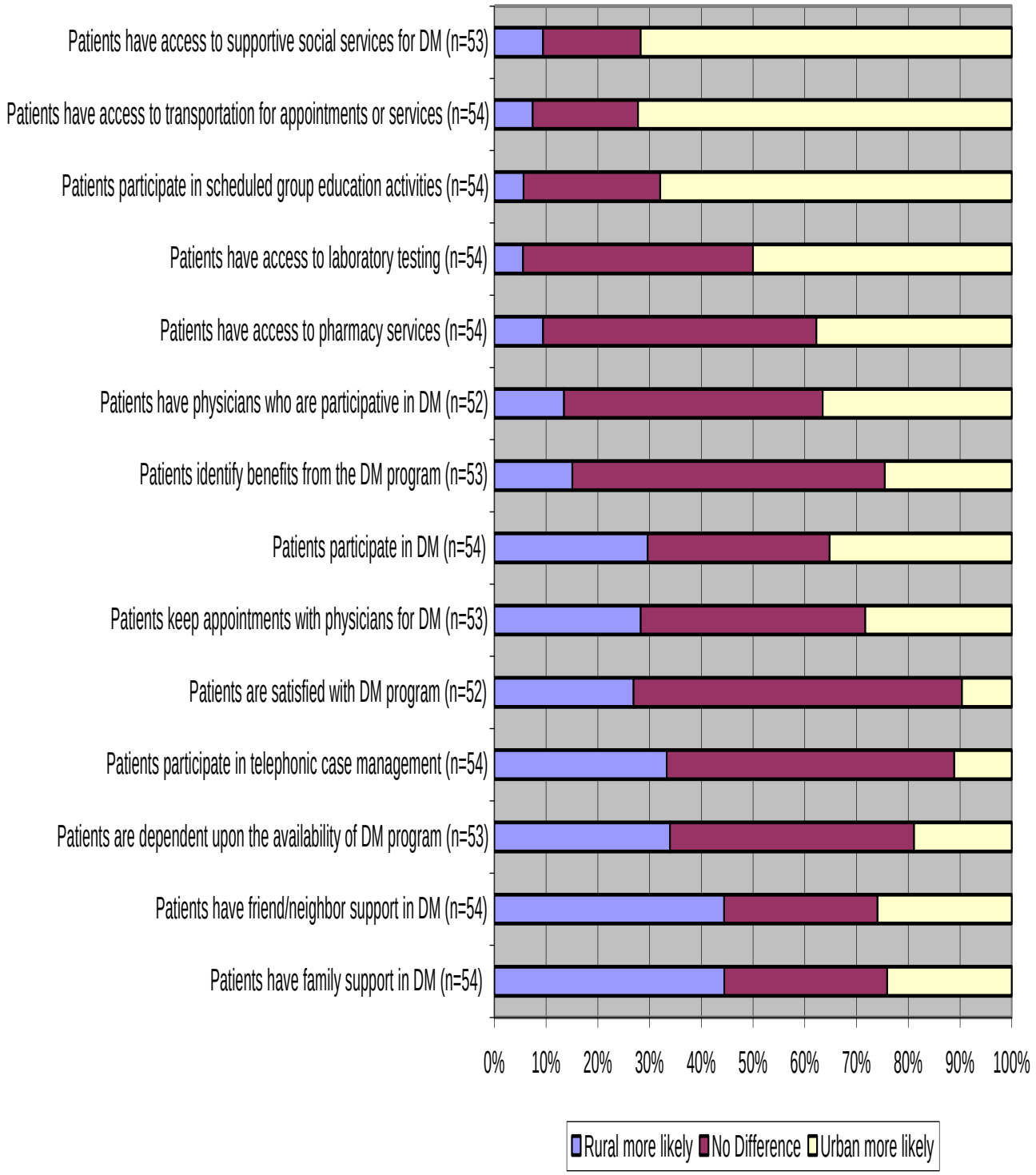

Figure 9: Rural Versus Urban Patient Advantages in Disease Management Programs (Response range: 52 - 54).

One-half or more of the survey respondents saw no difference in advantage between rural and urban patients on 5 of 14 items that might affect participation in DM programs. However, on six items the ratio of respondents noting an urban advantage over a rural advantage ranged from nearly 3-to-1 to more than 10-to-1. These areas of "relative rural disadvantage" include rural patient's relatively poorer access to supportive social services, transportation for appointments or services, laboratory services, pharmacy services, and scheduled group DM activities. Also, rural patients are viewed by many respondents as less likely to have a physician who provides DM services.

In three areas, there appears to be little difference between rural and urban patients, or less consensus by respondents on which group of patients is advantaged. These are (1) identification of benefits from DM, (2) participation in DM, and (3) keeping physician appointments for DM.

Of the five elements where there appear to be a rural patient advantage, for only one element is there as much as a 3-to-1 ratio of responses indicating a rural patient advantage over responses suggesting an urban patient advantage. Just under one-half (45 percent) of respondents identified an advantage for rural patients in the form of friends' and neighbors' support in DM and family support in DM. One-third of the respondents noted a relative rural advantage in patient participation in telephonic case management and patient dependence on the availability of a DM program. Finally, a modest advantage is accorded more frequently to rural patients than to urban patients on the element of satisfaction with the DM program.

Conclusions and Recommendations

Our on-site visits and survey have identified several major themes, issues and future research questions:

1. Rural health systems are providing DM and, in the process, are supplying insights on organization factors that may assist other health providers, planners, and policy makers to support the wider implementation of DM.

2. There is widespread agreement on the strong contribution of DM to quality of services, perceived financial benefit of DM to the plan or clinic as significant or great. There is less agreement on strategic implications for the larger integrated delivery system, its components, and its ability to offer a wider assortment of plans and products to a larger portion of the population in its respective market areas.

3. There are some agreed upon disadvantages faced by rural populations who seek to participate in DM programs, but also some possible advantages in social support.

We will briefly address each of these themes.

Insights on organization factors

Interviews with DM leaders reveal wide variation in the *relative roles of physician organizations (clinics) and health plans in the sponsorship of DM* across the systems studied. The health plan is most often the sponsor of DM in the four rural integrated delivery systems. The health plan is the sole sponsor in one of these systems, the sponsor of a DM program independent of but parallel to a clinic sponsored DM program in another, and co-equal sponsor of a single DM program in another. The clinic is the sole sponsor of the DM program in another rural integrated delivery system. In the other two rural systems considered, the health plan is the sole sponsor in one system and a clinic is the sponsor of the other. The health plan is viewed as being the major beneficiary (along with the patients) of DM in several of these systems and, thus, is an appropriate sponsor. The DM leaders of all these DM programs, however, recognize the importance of acceptance of DM programs, if not strong support, by clinical leaders. The DM leaders within one of the systems where the DM program is sponsored by the clinic argues that clinic control enables the DM plan to integrate more smoothly into other clinical quality improvement efforts.

Physician confusion and patient resentment can result from situations where the health plan's DM program applies only to patients enrolled in the plan. The system's clinic physicians who serve patients not covered by their system's

health plan can be confused by the non-availability of DM for these non-plan patients. The non-plan patients, too, can be resentful that the same "array of services—including DM" is not available to them that is available to the patient enrolled in the system's health plan. However, even in a system where clinic control of DM is more prominent, employers can contract for various preventive and DM activities not offered to other patients. Given the near unanimity on the DM value-added to clinical quality and patient benefit, continuing consideration should be given by health plans and clinics on how to extend DM to the largest possible range of patients.

There is widespread and strong belief among all DM leaders, physicians, and DM nurses alike that the DM programs contribute significantly or greatly to a wide variety of care, quality, and patient satisfaction elements and to efficient use of resources. DM nurses in two systems play a strong and continuing intermediary role with the physician and patient, akin to a three-member team, ensuring that the patient is monitored by the DM nurse between physician visits and that both the patient and physician are alerted when a physician visit and/or modification in medications may be required. In other systems, the DM nurse communication to both physician and patient parties, particularly to physicians, may be less continuous. Where the "team" approach is employed, however, a number of physicians recognize the important contribution it brings to patient care and to the physician's timely contribution to that care.

In most of the health care systems, the role of the DM nurse is supported by access to one or more electronic information systems to support or enhance DM programs. In addition to access to DM specific software, DM nurses in two of the integrated delivery have access to the electronic medical record (EMR), as well. In these two systems, access to the EMR is credited with supporting rapid and continuous communication between the nurse DM and physician regarding the status of DM patients. Although all the health care systems recognize the importance of information systems and recognize progress in this regard, there appear to be opportunities for improving the ability to integrate or query DM information systems and EMR in order to support DM work and to generate reports of DM contributions on an ongoing basis.

Among the most important factors identified to DM success, are the DM nurses' work in patient education and care coordination, along with local and central clinic physician "buy in" or support for DM. Stakeholder support for DM programs tends to be rated somewhat higher for health plan administrators and DM nurses than for physicians (with the exception of physician support for diabetes DM) or clinic administrators. This finding is consistent with other studies investigating innovations in chronic disease management which have found that "physician resistance or inertia remains the single biggest barrier to effectiveness, followed closely by lack of expertise in the methods of clinical

improvement (RWJF, 2000; MacColl, 1998) Stronger support among physician groups will most likely depend on firm and continuous evidence of clinical quality benefits to patients, physician time saved, and/or revenues generated as a direct result of DM. As models of reimbursement begin to account for physician efforts in DM, medical culture will be more likely to follow with broader acceptance of the population-based approach that DM offers.

Majorities of the respondents perceive DM programs to benefit financially the health plan and clinic. DM leaders, DM nurses, and physicians are likely to see no more than moderate support from DM programs for attracting employer contracts, attracting those with higher risk employees, or supporting health plan Medicaid services. Nearly one-half, however, did associate DM with significant or great connection to maintaining patient loyalty to the health plan. DM leaders in interviews, point to DM programs attracting the interest of some employers and/or being attractive enough that some patients who were not enrolled in the health plan were seeking to buy the DM services.

Although only an estimated one-half to two-thirds of DM eligible patients are viewed as complying with DM recommended behaviors, this may spell the difference in a particular contract being a profit or loss for a health plan. The availability of a particular set of DM plans (e.g., asthma, diabetes, prenatal care), may make the difference is the ability of a health plan to accept a Medicaid contract. Similarly, the availability a CHF, COPD, and diabetes DM may make a Medicare risk contract profitable in a county where it would contribute to a loss without supportive DM in place. Increased savings by the plan might translate into better rates for clinic providers and/or may contribute to sufficient volume in remote sites or for particular services that might prevent closure of sites or discontinuation of a service. Although large rural integrated delivery systems would seem to have an advantage in "discovering" and acting upon such possible synergies, it is possible, too, that other arrangements focused more fully on primary care may find it easier to extend the benefits of DM to a wider range of payers and patients. Many rural communities are able to offer better collaborative networking by their provider community rather than "stand-alone" health care. Opting instead to offer collaborative DM as best for the overall health of the community, rural providers may not be as driven by "turf wars" as their urban colleagues.

Attainment of specific objectives within diabetes DM programs is reported by most of the respondents from the six sites. For example, regular communication among the parties, monitoring of patients, and physician acceptance of relevant guidelines receive high ratings of attainment. Effective use of electronic records, documentation, and analysis of results are reported. Lower response rates make it difficult to conclude that more than one or two

sites have regularly or successfully reported the positive impacts on diabetes DM to internal or external stakeholders

Disadvantages (and advantages) for rural populations in DM programs

There is substantial agreement about the types of disadvantages that rural patients face when compared to patients in urban settings. Both on-site interviews with DM leaders and survey responses from these leaders, physicians, and DM staff members underscore similar challenges for rural patients. Rural patients are viewed as disadvantaged relative to urban patients on access to transportation, laboratory services, supportive social services, and pharmacy services. They may be less likely to have a physician who participates in DM.

The on-site interviews point to three general areas of disadvantage for rural patients in accessing DM programs. Although the health system is ultimately responsible for providing needed health resources in rural areas, DM programs can help to ensure that the most effective use is made of available resources. Likewise, with respect to travel and transportation challenges for rural patients, disease management programs can help to reduce patient visits to distant health care facilities or to emergency rooms. Most of the social conditions that are deemed to present disadvantages for rural patients, although not directly addressable by DM programs, may underscore the importance of the availability of timely, accessible DM programs.

Rural patients are viewed as having some advantage in participation in telephonic case management, having friends and neighbors support in DM, having family backing in DM, recognizing advantages offered by DM, and being satisfied with DM.

It appears that rural patients may be at a relative disadvantage in being able to comply with DM activities, yet the responses suggest, too, that rural patients may find DM activities more important. It seems likely that the DM connection may substitute on occasion for a rural patient's travel to a distant provider on matters than can be responded to over the phone. Such connections may offer immediate response or may be forwarded by the DM staff member to the physician and then communicated back by the DM staff member to the rural patient. Some differences, yet unexplored, may be attributed to cultural differences and/or the level of cultural competency of the provider/educator. For example cultural differences in rural Native American, Hispanic or African-American populations may place greater importance on family, religion or the beliefs of elders within the extended family (Berger, 1998; Saha, Komaromy, Koepsell & Bindman, 1999; Kim & Kwok, 1998; AMA, 1999). Moreover, the quality of provider-patient communication at all points along the DM continuum

is contingent upon the patients' ability to understand directions and instructions and should be given in the patient's native language. Providers tend to overestimate patients' understanding of treatment plans and should take steps to improve communication (Calkins, Davis, Reiley, Phillips et al, 1997).

DM program respondents are overwhelmingly confident that DM provides quality care in patient care giving. This DM contribution to care quality is reflected in research reports from the systems (health plan or clinic) and in published high satisfaction levels with DM activities on the part of patients (e.g., as reflected in HEDIS). Although survey respondents are likely to see at least a moderate contribution of DM to the financial benefit of the clinic, agreement on this is not as strong as it is for DM contributions to care quality. Nonetheless, at least two of the systems have published papers that point to significant financial savings associated with DM programs, as well (Sidorov, Fisher, Girolami, & Wolke, 2001). Such findings suggest that information on both clinical outcomes and financial outcomes need to be communicated frequently to physicians, clinic leaders, and others. Also, there is need for more widespread discussion of possible strategic benefits of a DM program for health plans and provider organizations. That is, an effective DM program may enable a health plan to better manage higher risk employer populations, Medicaid populations or Medicare risk contract enrollees. Benefits of this type can simultaneously serve the interests of health plans and providers and increase access to care among rural populations.

Future Research

Additional studies are needed internal to integrated rural health systems and among provider organizations and health plans on a regional or federal level that can demonstrate the contributions of DM to the following:

- Reducing cost of care through gaining quality improvements along the continuum of care addressed by DM (and associated care coordination and case management);
- Extending the benefits of DM to the largest number of patients and enrollees who might benefit from it;
- Enabling health plans and providers to extend coverage and reduce cost impacts of uninsured by increasing rural access to quality health care by employees of companies with higher risk, to Medicare (risk contracts), for Medicaid (risk contracts or primary care case management) and other vulnerable populations.

Integrated delivery systems should pursue additional studies that report both quality improvements and/or financial savings. Such studies may address, for

example, DM-associated quality improvements according to contact, episode, and chronic disease state; and improved health benefits to patients (test results, savings in sick days, savings in costs of care). Research under other sponsorship might also address DM costs for the health system (employers, other organizations, and community), financial savings to health plans and employers, and absentee reduction benefits for employers.

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