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Dates: Received: 10 February, 2017; Accepted: 28 March, 2017; Published: 30 March, 2017

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Keywords: Disease management; Greek health care system; Information technology; Cost control; Outcomes; Public health.

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Research Article

The Promise of Disease Management in Greece

Abstract

Background: Disease Management (DM) is an approach to health care that coordinates resources across the entire health care delivery system and throughout the course of a disease.

Objectives: The purpose of the present study was to evaluate the DM implementation in a country like Greece, with distinct geographical characteristics and non-symmetrical distribution of health care services.

Methods: Recent bibliographic data about DM were gathered from electronic databases emphasizing on the Greek status and the Greek Health Care System (GHCS).

Results: The present article discusses the current role, the future contribution and the expected results of DM in Greece. DM still is not well applied in Greece. This is due to the economical, geographical and organisational particularities of the country. There is a big gap between the GHCS and the requirements of the Institute Of Medicine. The percentage of Greek population receiving screening services is low. Post-treatment guidelines for patients are also limited. Numerous initiatives have taken place for the creation of national disease registries but remain incomplete. Despite the increased prevalence of some diseases, few seek health care services, which can be primarily attributed to erroneous beliefs, so the need for education and prevention programs is increasing.

Conclusion: We will be able to count for a high level health care system in Greece when the philosophy of DM changes and modifications is applied properly, especially when patient education and behavioral commitment will evolve as the major contributors to the successful treatment.

Introduction

Quality problems and increasing costs have resulted in widespread interest in solutions that improve the effectiveness of the health care systems. Care coordination has been identified by the Institute Of Medicine as one of the key strategies for accomplishing these improvements. Disease Management (DM) has shown great promise in reorganizing care and optimizing patient outcomes [1], and constitutes a system of coordinated health care interventions and communications for populations with conditions in which patient self-care efforts are significant [2]. Disease management supports the continuum of care by means of advocacy, research and promotion of best practices in health care management. The management philosophy is to establish quality, productivity and competitive position. Some points of attention for managers include the breaking down of barriers between departments, medical specialties and institutions, taking on leadership and constant improvement [2].

Disease management has the potential to offer coordination of health care delivery across the primary-specialty care interface and to improve outcomes [3]. Thus, it can lead to the improvement of quality of life for patients by minimizing the effects of a disease, usually a chronic condition, through integrative care and to the reduction of healthcare costs. Coronary heart disease, chronic obstructive pulmonary disease, hypertension, heart failure, obesity, diabetes mellitus, asthma, cancer, arthritis, depression and osteoporosis constitute major health problems, are related to low quality of life and increased health care costs and could be handled by DM. The underlying premise of DM is that when the right tools, experts and equipment are applied to a population, then labour costs (specifically absenteeism and direct insurance expenses) can be minimized, or resources can be provided more efficiently. Experts include physicians, nurses, physical therapists, epidemiologists and human resources professionals.

The most expensive part of DM procedure of the Greek NHS is the need for development of the primary healthcare, in order

to increase people's access to care, minimize the delay for treatment, and reduce overall costs. Greek primary healthcare is fragmented, since there are several different health providers involved, but with poor coordination between them and without a gate-keeping system, so patients go easily to find a doctor in hospitals. Equipment can include mailing systems, web-based applications (with or without interactive modes), monitoring devices, or telephonic systems. The general idea is to ease the disease path, rather than cure the disease. However, some DM systems believe that reductions in longer term problems may not be measurable today, but may warrant continuation of DM programs until better data is available in 10 to 20 years. In general, it is of great importance to select patients most likely to benefit from DM, in terms of risk factors, demographic profile and level of comorbidity [1].

A DM system involves three primary elements: a) a knowledge base that quantifies the economic structure of the disease and describes care guidelines, i.e. what care should be provided, by whom, and in what setting, for discrete patient groups, b) a delivery system of health care professionals and organizations closely coordinated to provide care throughout the course of a disease, and c) a continuous improvement process that measures clinical outcomes, evaluates and redefines treatment standards, in order to maximize the quality of health care provided.

According to the theory, focusing on patients grouped by their common medical conditions will improve clinical outcomes, control costs, and create system value [4]. Can DM live up to these objectives? Can organizations generate profits and improve their competitive position by pursuing DM? The present article explains the fundamental concepts and the philosophy of DM, offers a comparison with the traditional component management approach and a discussion on the social benefits and advantages based on early experience, which suggests that DM can lead to improved clinical outcomes, patient satisfaction, and cost. The need for DM implementation in the Greek Health Care System (GHCS) is also discussed.

Methods

A database and a manual search were conducted in Pubmed, Cochrane Library and other libraries using the key words "disease management", "Greek Healthcare System", "Greece", "information technology", "cost control", "public health", "patient care", "outcomes", "Greece", "resources" in various combinations (Table 1). Most of the included studies had methodological weaknesses and were heterogeneous in terms of participants, interventions, outcomes and settings. Moreover, it has been supported that studies about the DM effectiveness may be affected by a self-selection bias, as a DM program may attract enrolees who are already highly motivated to succeed [5]. For example, people who enrolled in one DM program differed significantly from those who did not on demographic, cost, utilization and quality parameters prior to enrolment. Clinical outcomes of DM include both traditional outcomes and patient-centered measures, such as self-management [1,4].

Table 1: Key Words and Databases of research.

Key-words	Cochrane	Pubmed
Disease Management, Greek Healthcare System, Information Technology, Cost Control, outcomes, resources, Greece, public health, patient care	2	0
Disease Management, Cost Control, outcomes, resources, Greece, public health, patient care	112	1
Disease Management, Greek Healthcare System, Information Technology, Cost Control	3	1
Disease Management, Greek Healthcare System, Cost Control, outcomes, Greece	8	0
Outcomes, resources, Greece, public health, patient care	647	0
Outcomes, resources, Greece, public health	952	9
Disease Management, public health, Greece, cost control	126	100

Results

Disease management- a brief review

Data search result in twenty seven studies published between 2000 and 2016. According to the current literature, care coordination is the organization of healthcare activities between two or more participants, including the patient, involved in a patient's care to facilitate the appropriate delivery of services. The strongest evidence shows benefit of care coordination interventions for patients who have a variety of diseases [6]. DM programs improve adherence to evidence-based guidelines for several chronic diseases, reduce hospital admission rates [7], and improve health-related quality of life [8,9]. Also, DM programs are related to positive return on investment [10]. Managed care has been credited with slowing the rate of increase in the United States health care expenditures [11].

Quality management can be considered to have four main components: planning, control, assurance and improvement. Total quality management was originally developed in manufacturing settings, and increasingly is being applied with great benefit to health care. In industry the pursuit is for similar assembly and production practices, in order to increase the efficiency and lower the cost. The realization that best practices can be identified, and variation reduced has provided major insights in the emergence of DM.

Several industry and technology trends have helped identify DM as the way to move beyond component management. An organization's effectiveness and efficiency in achieving its quality objectives are contributed by identifying, understanding and managing all interrelated processes as a system. Improved measurement techniques and more flexible information technology systems have helped health professionals and health care managers make substantial contributions to outcomes research. In addition, the emergence of integrated delivery vehicles, such as physician-hospital organizations, has provided an appropriate structure and incentives to encourage DM. It is important not to underestimate the people factors,

such as culture, in selecting a quality improvement approach. Improvements that change the culture take longer, as they have to overcome greater resistance to change. It is easier and often more effective to work within the existing cultural boundaries and make small improvements than to make major transformational changes. Also, care needs to be taken in designing recruitment strategies to minimize withdrawal rates and to ensure harder to reach people are given encouragement to participate [12].

In component management the individual health care transactional doctor's visit or a procedure is viewed as the relevant unit of cost [13]. The treatment cycle's various transactions and component categories are analyzed to establish statistical norms for unit cost and frequency in a population or a provider's practice. Incentives and penalties encourage compliance with the norms, thereby reducing some of the extreme practices, such as nonessential operations, excessive tests, and too many pharmaceuticals. The unit cost of each component is then driven as low as possible through aggressive contracting, utilization management, case management, and other cost control techniques.

Component management provided one of the first tools to address the relentless growth of health care costs. Its limitations, however, became evident in the late 1980s, as component management successes were relatively meagre and medical costs continued to outpace inflation (Figure 1). The distinction between DM and component management is critical from a competitive perspective. Component management can be a powerful approach in the first phase of cost and quality management. For example, using mostly component management techniques, some physician groups in Southern California have driven down hospital utilization dramatically [14]. Successful systems have used a combination of utilization profiling and powerful financial incentives, especially capitation. Clearly, many health systems can become more efficient using these conventional techniques, but they can only progress so far.

In DM, the unit of analysis is a patient with a disease, not an individual transaction. The most important segments are groups of patients with the same disease. This perspective gives DM several advantages over component management [15]. Firstly, DM provides a systemic view of health care management that can fundamentally change professionals' perspectives. Component management is incremental and it assumes that the overall structure of health care is directionally correct, but the mix of individual components of care may need adjustment. Secondly, DM approaches unit cost and use of services according to clinical need and system wide economic impact, while component management attempts to decrease cost and use without regard to underlying clinical drivers.

Component managers, for example, may take aim at the aggregate cost of drugs and specialist consultations for all asthma patients. In contrast, a disease manager may initially invest in higher drug and specialist cost for a severely ill segment of asthmatics in order to reduce downstream emergency room and hospital costs. Component management typically employs

a confrontational approach, policing physician and hospital care. Finally, DM emphasizes the optimal deployment of resources, ensuring that patients receive the care they need, in the most appropriate setting, from the right physician or other health professional through continuous self-correction. A DM approach may implement a specialized diabetes program to monitor brittle patients and educate them so they can self-manage elements of their treatment, such as diet and insulin injections, ensuring that holistic and individualized care is provided. Component management typically does not address the issue of how an overall health system should be designed and managed, nor is it a learning system. Disease management goes deeper and forces more fundamental rethinking than component management, with potentially more enduring results (Figure 2).

Traditional tools, such as case management and utilization review, may still be used, but in the context of an overall system approach designed to address the unique clinical and resource requirements of specific diseases. The tools are not ends in themselves; they are merely building blocks in an overall DM strategy. For organizations deciding to pursue DM, there are several strategic options (Figure 3). A health care organization can generate tremendous value if it can effectively coordinate and deploy a group of providers around a specific disease, or if it can help other health care providers to do so. The approach

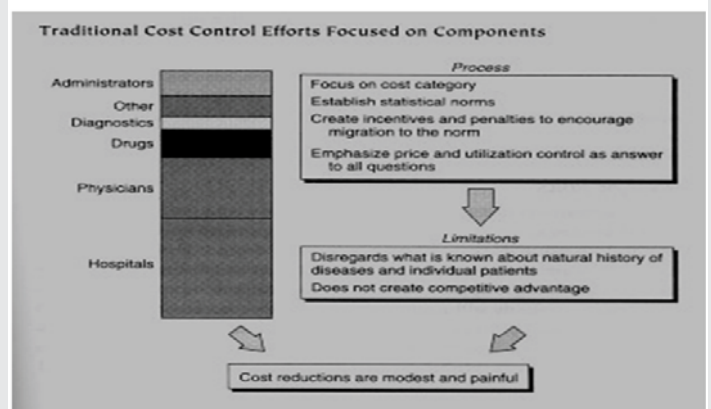


Figure 1: Traditional Cost Control Efforts Focused on Components⁴

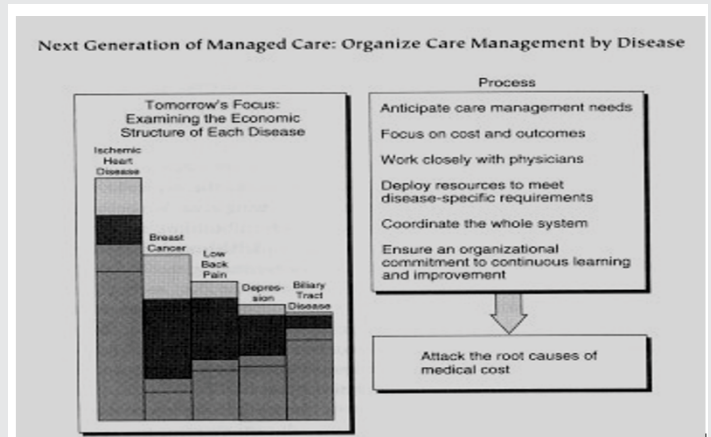


Figure 2: The next generation Managed care: Organize Care Management by Disease⁴

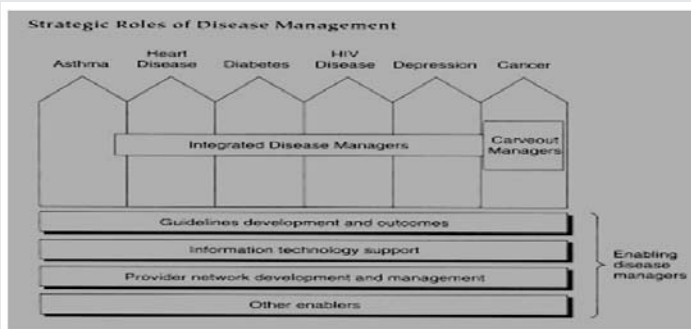


Figure 3: The Strategic Roles of Disease Management.

to DM taken by a pharmaceutical company will necessarily vary from that taken by a Health Maintenance Organization or a hospital. In broad terms, three roles are seen for organizations focusing on DM: a) Integrated disease manager, who provides care across the spectrum of diseases, b) Carve-out disease manager, who assumes responsibility for providing a range of services for a specific disease, and c) Enabling disease manager, who provides critical services, products, or information to integrated and carve-out disease managers. Choosing the best role is a critical strategic challenge that must reflect a realistic assessment of each organization's capabilities. The choice of role has significant ramifications for the type of partners required and who makes up the competitive set.

Many of today's leading health care organizations are embracing DM. Although it is hard to argue with the concepts underpinning DM, its application presents an enormous challenge [16]. For those that succeed, however, the reward will be a sustainable competitive advantage built on improved outcomes. Excelling in DM often requires a broader array of capabilities than individual organizations can marshal. Consequently, it is likely that much of the activity in DM over the next several years will focus on partnering arrangements. The challenge of assessing prospective collaborators, negotiating arrangements, and ultimately integrating elements of the health care delivery system is likely to consume tremendous management time and attention.

The need for disease management in greece

The adoption of new practices capable to bridge the gap between actual health care received and best care quality, seems to be a challenging issue for health care systems worldwide [17]. The literature of studies conducted in Greece and evaluating the effects of DM interventions, such as creation of registries, is scarce, which reflects the poor implementation of DM in Greece. Furthermore, most of the studies describe the service supply side, and few examine aspects of the demand side. There is a need for the future studies to assess the patient's view, as this will influence uptake of integration strategies and their effectiveness on community health [18].

The reasons why the Greek Health Care System (GHCS) did not manage to change include organizational and administrative difficulties, which blocked previous attempts, but are also attributed to the nature of the changes themselves. The concept of quality of health services is multidimensional

and its definition presents difficulties, due to the peculiarity of these services. The quality does not concern the medical practice only, but it is also extended in all the spectrum of health care services, as well as in all of the individuals involved i.e. patients, caregivers, and socioeconomic environment and health professionals. The amelioration of hospitals – imperative demand of society- requires, however, systematic interventions [18–20].

In spite of the attempts to improve the effectiveness, costs and quality of the GHCS being processed up to date, the existed difference between the levels of care already provided and those capable of achieving is largely due to the failure to incorporate known improvement measures into the process of care. Certainly, GHCS is not the only case: the 2001, Institute Of Medicine report asserted that the safety and quality problems of United States health care system exist because of limited infrastructure and outmoded systems unable to incorporate the improvement measures, which result in a cycle of suboptimal care being repeated throughout the many levels of care [18,21].

The basic elements for improving care in health systems on different levels include the community, the health system, self-management support and can be applied to a variety of diseases, health care settings and target populations [22]. In order to improve health outcomes more effective organization of preventive services has been recommended, which requires complex systems of care delivery and more complex interactions [23]. Treatment for chronic diseases is already complicated, involves fragmentation of care and represents a considerable risk for patients, because frequently multiple diseases coexist and further complicate the situation [24]. Furthermore, from a patient-centered perspective, greater emphasis must be placed on life satisfaction and quality of life as primary outcomes of treatment [25]. The incorporation of culturally specific messages into health promotion programs such as screening tools that increase knowledge and change attitudes represents also an essential and important step. All these issues can be addressed by the implementation of DM.

Despite the universal access of the Greek population to health care services, structural problems of the GHCS have imposed organizational barriers to the geographical distribution of health resources [20]. The percentage of Greek population receiving screening services is low and seriously affected by social factors. Public health policies should direct their efforts towards introducing good-quality screening and find culturally sensitive ways of addressing these barriers [26,27]. Of course Greece is not the only case: in spite of the Cancer Screening Recommendations of the European Council, health authorities of eight old member states have not yet started national organized implementation of screening [28].

Post-treatment surveillance guidelines for high-risk patients are also limited in Greece and depend on health providers' decisions. Additionally, there are no guidelines for measuring clinical and economical outcomes in DM, wellness and other population-based programs. Numerous initiatives have taken place for the collection of data and the creation of national registries; however, they currently remain

incomplete [20]. These registries could be used in order to define the etiology, severity, clinical course, and outcome of the disease, to compare results with previous published series, and to propose methods to improve therapy and prognosis, and also they could be used for cost estimations, identifying high risk-groups for potential intervention [20,29,30]. For example, the organization of Greece's first head injury registry offered an important preliminary core data concerning brain trauma etiology, management, and long-term outcomes [30]. Furthermore, in a study of the hospital discharge registers of 10 European countries large international differences were observed in incidence and associated costs related to hospital admissions [29].

The categorization of patients in groups of diseases can potentially be helpful in the study of the natural history of several diseases (i.e. malignant diseases), as well as in the observation of the interaction between different diseases [16]. A National Cancer Plan had been announced during the 2008-2012, but is still in the planning phases. Detailed epidemiological data would give the possibility of constructing an effective prevention policy and reduce socioeconomic inequalities in the access to treatment [20]. Similarly, it could provide a national database for epidemiological studies, which is necessary for the evaluation of the long-term social and economic benefits of prevention strategies. It is noteworthy that today both prevalence and incidence of common diseases, like prostate cancer for example, are unknown in Greece.

From cost-efficiency and public health perspectives, there have reported interventions that can be considered valuable, as they are more likely to be implemented in countries with limited resources, but further research is needed to explore determinants of willingness to participate and comply with these interventions [31]. The objective of the practice-level interventions is to overcome specific barriers in the process of care delivery so that preventive services can be effectively delivered. Despite the increased prevalence of some diseases, few seek health care services, which can be primarily attributed to erroneous beliefs. Therefore, there is an imperative need to offer health education and develop preventive programs [32]. For example, in Greece 48% of patients try to reduce their medication dose, a fact implying that compliance is not always good. These data indicate that the goals of treatment are not achieved, even under specialist care and more effort should be invested in patient education [33].

The GHCS was scheduled with the assumptions of the previous twenty years; GHCS in its present form, can only manage discrete medical episodes. Moreover, GHCS has a pyramidal architecture with many of primary care settings in the basement and few tertiary care settings in the apex. Although such configuration seems ideal, the distribution of these settings is abnormal because of the geographical characteristics of the country, which is mountainous inland combined to a wide coastal area and many islands [34-36]. Thus, in Greece there are too many tertiary settings in the capital and very few in the distant regions. Most primary settings are connected with secondary but not with tertiary

settings, few are equipped with telemedicine units, while there are no electronic health records for all Greeks [37].

People living in rural areas experience also longer delay in reaching hospital once they seek assistance. Strategies must be developed to reduce the treatment delay for residents of both urban and rural areas and to deal more effectively with medical emergencies [38,39]. Similarly to other countries [14,16]. People of low socioeconomic status, and those who live in distant regions [34-36]. Enter the health care system at more advanced stages of disease and with higher rates of uncontrolled chronic conditions, such as hypertension and diabetes. These people are reported to have greater rates of re-hospitalization in the international literature [40], but no similar study has yet been conducted in Greece. Those inequities in the existent health care system pose moral and ethical issues for providers who are obligated to provide the best care possible but who also struggle with time constraints, coordination of care, and a limited clinical support system, sometimes resulting in health care outcomes that are less than satisfying.

The utilization of primary healthcare services from the Greek population depends on self-rated health status, age, income, gender, and region. People with poor self-rated health, older people, women, and residents of mountainous regions show increased utilization of primary healthcare services, since they do not have easy access to hospitals. Individuals with better self-rated health status, as well as those who are covered by health insurance for primary care, also show decreased hospital care utilization [19]. Women, elderly, less wealthy and individuals of lower physical health status visit physicians contracted to their insurance fund. There is a positive relationship between health care need and utilisation of health services within a mixed public-private health care system [41].

The existence of too many health insurance providers directed in the insurance of different professional groups constitutes a main problem. These providers also have private first level centers of health care resembling the Health Maintenance Organization model often located next to one another further increase health related costs and topographical disparities, and also limit the data collection processes within their patient populations. Thus, connection and collaboration between primary settings and higher/ specialized levels of health care is not guaranteed, while providers are not aware of the health disparities that exist within the patient populations.

Training programs are needed in order to help health professionals on the adoption of DM, as well as liaisons to the community providing ways to improve access to care and communication between providers and patients and which serve as mediators and endorsers of the health care system. As for the continuous improvement process, the scientific community has adopted new initiatives, which provide balanced and accredited post-graduate programs of educational activities such as participation in international congresses, seminars, workshops, courses and other training programs. The specialization of health professionals in DM with the mandatory participation of doctors and nursing staff in these

programs and the creation of a National Council of Medical Personnel Evaluation can on the long term improve the quality of health care provided. Private initiative in combination with the health providers could contribute to this direction. One example can be found in the continuously updated care guidelines published every two years by the pharmaceutical companies. These guidelines are proposed by the European Association of Urology and are distributed to all urologists of the country by the Greek Urological company.

Disciplines like systems thinking are bringing more holistic approaches to quality so that people, process and outcomes are considered together rather than independent factors. For example, the framework of the European Network for Patient Safety project analyses the principles of the guidance that should be provided to those who design and implement Patient Safety Education and was developed with the participation of Greece in the European project. According to this, it is important that the different roles of the recipients are clearly distinguished and linked to their role-specific methods, proper delivery platforms and success stories. This is achieved by providing them with a framework to build upon, succeeding to build a collaborative, safety conscious and competent environment. A guidelines web platform has been developed to support this process [42], but has not yet been implemented. Thus, it seems that there are the dynamics and also a growing interest for possible applications that could be developed in the future.

Recently in an attempt to modernize the GHCS, the Greek ministry of health focused on a new version of the existing primary health care reform by constructing new rural health centers and establishing urban health centers affiliated to tertiary hospitals. These could serve as the foundation for the new GHCS, and could be an excellent model for the incorporation of DM in the GHCS. The conveyance of a large portion of patients from the whole country into the third level hospitals located in the local health centers in conjunction with the creation of an electronic patient record represents an important step in the categorization of groups of patients suffering from a particular disease. The acquisition, for instance, of shared records and telemedicine systems could become the first step in this domain. A central database providing information on the history, medical examinations performed in the past, current health status and other detailed information such as blood types and immunological condition could reduce costs by reducing both work hours and length of hospital stay. Furthermore, it can reduce dramatically the management time of sudden incidents, reduce adverse drug effects and could be used as a database for possible organ donors' candidates.

Of DM systems in existence in Greece comprising the aforementioned elements (knowledge base, delivery system and continuous improvement process) few are available and their cost seems to be enormous [43]. In UK \$60 billion were recently invested in electronic health records, while in Canada the implementation of electronic health records has been estimated in about \$10 billion, which represents 10 times the

health expenditures of Canada [14]. On the other hand, the integration of electronic health records –been characterized as foundation for improving quality care safety – to the Canadian Health Care system is estimated to save up to \$6.1 billion per year [13].

The need for changing the typical health care delivery system by coordination of health care professionals and organizations to provide care throughout the course of the disease is especially evident today because of the ageing of the population and of the high incidence of several diseases, which has reached epidemic dimensions in certain age groups.

Conclusion

DM shows benefit of care coordination interventions for patients who have a variety of diseases. In DM, the unit of analysis is a patient with a disease and the important segments are groups of patients with the same disease. By drawing patients into the process, a disease manager motivates them to become informed and rational recipients of care.

For Greece, DM is a totally new proposal in a constantly changing health care environment, beyond the uncoordinated attempts for health care improvement. The reasons why the GHCS failed to change include organizational and administrative difficulties, and also the nature of the changes themselves. The distribution of services across the country is abnormal because of the geographical characteristics of the country, while there are no electronic health records for all Greeks. The percentage of Greek population receiving screening services is low, post-treatment guidelines for patients are limited, and national disease registries remain incomplete. Training programs are needed in order to help health professionals on the adoption of DM.

If we analyze the DM policies of advanced countries such as US, UK, German or Japan we can learn that integrated care of every disease can control the broader range of outcomes. Specifically, what seems to be emerging is the value of targeted Approaches to enhance outcomes of those with complex care needs. These observations concur with other health country policies that examined the effects Of different coordinated care interventions like Germany or UK. Greek NHS is more common to European countries health models to the promise that a health care system needs to be clear about whether its goal is quality improvement or cost reduction as these two are not necessarily compatible with one another.

DM appears to be able to guarantee that all health care organizations, professional groups and recipients of health care pursue three major aims of health care: timeliness (reduced waiting times which sometimes are harmful for both the recipients and providers of care), effectiveness (services based on scientific knowledge to all who can benefit and refrain from providing services to those not likely to benefit) and efficiency (avoid waste of equipment, supplies, ideas, and energy).

It is difficult to integrate disease-oriented medical research into disease management in Greece without a new policy for

research and a new legal framework especially nowadays in the middle of financial crisis.

The integration of these criteria with a centralized national computer infrastructure of patient records should contribute to the improving of the health care services and to the reduction of the overall costs, in line with the European guidelines and recommendations for the medical sector.

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