



Is Israel Ready for Disease Management?

Ariel Linden DrPH MS

Linden Consulting Group, Portland, OR, USA

Oregon Health & Science University, School of Medicine and School of Nursing, Portland, OR, USA

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Abstract

Approximately 60% of all worldwide deaths are caused by chronic disease resulting from modifiable health behaviors. In the United States, structured programs tailored to identify and modify health behaviors of patients with chronic illness have grown into a robust industry called disease management. DM is premised upon the basic assumption that health services utilization and morbidity can be reduced for those with chronic illness by augmenting traditional episodic medical care services and support between physician visits. Given that Israel and the U.S. have similar demographics in their chronically ill populations, it would make intuitive sense for Israel to replicate efforts made in the U.S. to incorporate DM strategies. This paper provides a conceptual framework of how DM could be integrated within the current organizational structure of the Israeli healthcare system, which is uniquely conducive to the implementation of DM on a population-wide basis. While ultimately the decision to invest in DM lies with stakeholders at various institutional levels in Israel, this paper is intended to provide direction and support for that decision-making process.

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According to the World Health Organization, it is estimated that 60% of all worldwide deaths in 2005 were caused by chronic disease, most of which are explained by common modifiable risk factors such as unhealthy diet, physical inactivity, and tobacco use [1]. The burgeoning incidence of chronic disease has rapidly become the most expensive problem with which healthcare systems have to contend. In the United States alone, the medical care of people with chronic disease accounts for more than 83% [2] of the nation's \$1.7 trillion total medical care costs [3].

Age is highly correlated with chronic illness, with an estimated 77% of chronic disease deaths occurring in people 60 years and older [1]. In this regard, as well as others, Israel is highly comparable to the U.S. Both countries have the same top five leading causes of death – all chronic illnesses [Table 1]; identical elderly dependency ratios (19 persons aged 65 and over per 100 population aged 20–64) [4,5]; a similar percentage of the population over age 65 (10% and 12.4% for Israel and

the U.S. respectively) [4,5]; similar percentages of the elderly who are married (60% and 56%) [4,7]; similar percentages of the elderly living in nursing homes (4.1% and 4.5%) [4,5]; and similar disability adjusted life-years (70.4 and 70.0 years) [8].

In contrast, Israel has a higher percentage of elderly with self-care disability; e.g., difficulty in taking care of personal needs like dressing and bathing (15% and 9.5% for Israel and the U.S., respectively) [5,9]. Moreover, during the past two decades the number of disabled elderly in Israel has increased more than 2.5 times and is expected to increase by an additional 23% by the year 2010 [4].

In order to address the burden of chronic illness, the U.S. has adopted a strategy of systematically identifying and assisting individuals at risk. Due to the financial opportunity, it is no surprise that, in its short existence, disease management has asserted itself as an integral component of the U.S. healthcare industry, with specialty disease management companies' annual revenues projected to reach \$20 billion in the U.S. market by the year 2010 [10]. Given that Israel and the U.S. have similar demographics in their chronically ill populations, it would make intuitive sense for Israel to replicate efforts made in the U.S. to incorporate DM strategies in the health system.

DM is premised upon the basic assumption that health services utilization and morbidity can be reduced for those with

Table 1. Leading causes of death, as a percentage of total deaths, in the United States and Israel

	USA (2001)*		Israel (1998-2000)**	
	Male	Female	Male	Female
Disease of the heart	29	29	24	23
Malignant neoplasms	24	22	23	24
Cerebrovascular diseases	5	8	6	8
Diabetes mellitus	3	3	6	8
Chronic lower respiratory disease	5	5	3	3
Top 5 as a percentage of total deaths	66	67	62	66

Sources:

* Anderson RN, Smith BL. Deaths: Leading Causes for 2001: National Vital Statistics Report. Vol. 52, no. 9. Hyattsville, MD: National Center for Health Statistics, 2003.

** Department of Health Information, Ministry of Health, Central Bureau of Statistics, Israel.

DM = disease management

chronic illness by augmenting traditional episodic medical care with services and support between physician visits [11]. In addition, for many chronic diseases there is significant opportunity to improve the quality and continuity of care. Examples include ensuring that diabetics get regular tests of glucose control (HbA1c), or individuals with known coronary disease take a beta blocker. DM program interventions are intended to assist physicians and their patients in identifying and closing gaps in care due to the fragmented nature of the current system [12-14].

DM programs attempt to achieve these goals by: a) accurately identifying those in the population with the disease or at significant risk of developing the disease; b) inviting those with the greatest risk of morbidity and health services utilization to participate in the program; and c) intervening with physicians and patients to effect some change in health behavior including compliance with treatment and self-management. For many DM programs, the primary means to execute these intervention strategies is through telephonic interactions between a DM nurse, the patient, and the physician. According to the Disease Management Association of America, a full-service disease management program must include all of the following: population identification processes, evidence-based practice guidelines, collaborative practice models to include physicians and support-service providers, patient self-management education, process and outcomes measurement, evaluation and management, and routine reporting/feedback loops (which may include communication with patient, physician, health plan/ancillary providers, and practice profiling) [14].

Israel should seriously consider implementing disease management at the healthcare system level as an approach to reducing morbidity of its chronically ill population

Recent meta-analyses and review articles have suggested that DM interventions (e.g., patient education, provider education, provider feedback, and provider reminders) are successful in increasing provider adherence to guidelines, improving patients' disease control, and enhancing patient satisfaction [15-18]. However, the scant literature available on the economic effectiveness of DM has shown conflicting results [16,17,19,20]. The most significant impact is made in situations where hospital admission and emergency room visit rates are high and there is opportunity to reduce these utilization costs [21]. Proponents of DM make the argument that this strategy is the responsible action to take, regardless of economic savings [14].

Given the potential benefits to a health system from implementing DM programs, countries outside of the U.S. have recently shown keen interest in the concept. However, they are learning fairly quickly that the DM model developed for the U.S. market must be tailored to the idiosyncrasies of their own systems

before adopting DM on a population-wide basis. Since the enactment of the National Health Insurance Law in 1995 [22], Israel's healthcare system has become the most suitably structured of all systems to develop and implement comprehensive DM.

The purpose of this paper is to provide a philosophical discussion addressing how DM could be introduced into the Israeli healthcare system. While ultimately the decision to invest in DM lies with stakeholders at various institutional levels in Israel, this paper is intended to provide direction and support for that decision-making process. Now the question remaining is whether or not Israel is ready for disease management.

The Israel healthcare system as a structure for disease management

The U.S. healthcare system is an entanglement of many differing payers, providers, and consumers. For example, public healthcare is financed through general income taxes to insure retirees (Medicare), those in poverty (Medicaid), and, indirectly, the 48.5 million uninsured (15.7% of the population) [23]. Private healthcare is financed through employers who self-insure or obtain health insurance through a third party, and individuals who purchase insurance on their own or pay out-of-pocket for services. Providers can get reimbursed from any of the payers stated above, via direct fee-for-service payment, a fee schedule, or capitation. In many cases, consumers are the payers as well, yet the lack of adequate information forces them to rely on direct advertising or questionable advice as to which services they really need.

Given this state of affairs, disease management programs in the U.S. are developed, implemented, and paid for by all the entities described above. This leads to systemic confusion, lack of support by providers, and, ultimately, difficulties for the program to carry out the task of coordinating care and ensuring continuity in treatment across settings for each patient [24]. In contrast, the reforms adopted in the Israel healthcare system have removed most of the barriers that face population-based DM in the U.S. and elsewhere.

Financing the Israeli healthcare system

Currently healthcare in Israel is funded by three primary sources: a) a health tax that is imposed on each adult resident and paid directly to the National Insurance Institute (Social Security); b) monies passed down to the NII from the treasury derived from income tax and general revenues; and, to a much lesser degree, by c) voluntary insurance premiums and out-of-pocket costs paid directly by individuals. The NII funnels funds to the system by paying risk-adjusted capitation to health management organizations, which, in turn, reimburses providers of inpatient and outpatient hospital services according to a fee schedule or fixed rates.

The financing of DM in Israel could easily be accomplished with little modification to the current structure. Taking the current German healthcare system as an example, Statutory Health

NII = National Insurance Institute

Insurance reimburses HMOs at a higher level for their DM program participants. This is meant to provide incentive for HMOs to enroll chronically ill patients rather than “cream-skimming” only the healthy ones [25]. Given that the NII in Israel already uses a risk-adjusted mechanism for capitating HMOs, there currently exists a platform on which to build an incentive program for HMOs to enroll patients with these conditions. The German approach is well worth considering as a financing model for Israel.

The role of government

In this single-payer system, the Israeli government controls not only the flow of money to finance the system, but how that money is used. Assuming a system-wide adoption of DM and as illustrated in Figure 1, the role of government, vis-à-vis the NII, could mirror that of Centers of Medicare and Medicaid Services (CMS) in the U.S. which sets reimbursement rates and pays for healthcare services, contracts with DM organizations to implement programs, and ensures the quality and effectiveness of each program. In addition, the Ministry of Health could develop specific requirements of a DM program and provide accreditation to organizations contracting to fulfill this role.

The role of HMOs

Having only four health funds in the Israeli system that offer an identical basket of services at the same price to nearly the entire population is an advantage over other systems in that it affords tighter control over equity of access to health services. HMO reimbursement from the NII covers all primary, secondary, and tertiary services, excluding long-term and mental healthcare. As a result, HMOs could play a central role in coordinating and implementing DM.

In this model, health funds would choose to either contract with a vendor to provide DM services (similar to the U.S. Medicare system), or build a program based on internal competencies and coordination with providers within the network [26]. As shown in Figure 1, the HMOs would be tasked with identifying patients suitable for the program, persuading them to participate, overseeing coordination and continuity of care for each patient within the network of service providers, funding the program (through reimbursement from the NII), and measuring the program’s clinical and economic effectiveness.

The role of a DM program

Once patients are identified, either by the HMO or as a referral from a care provider, the DM program is tasked with contacting

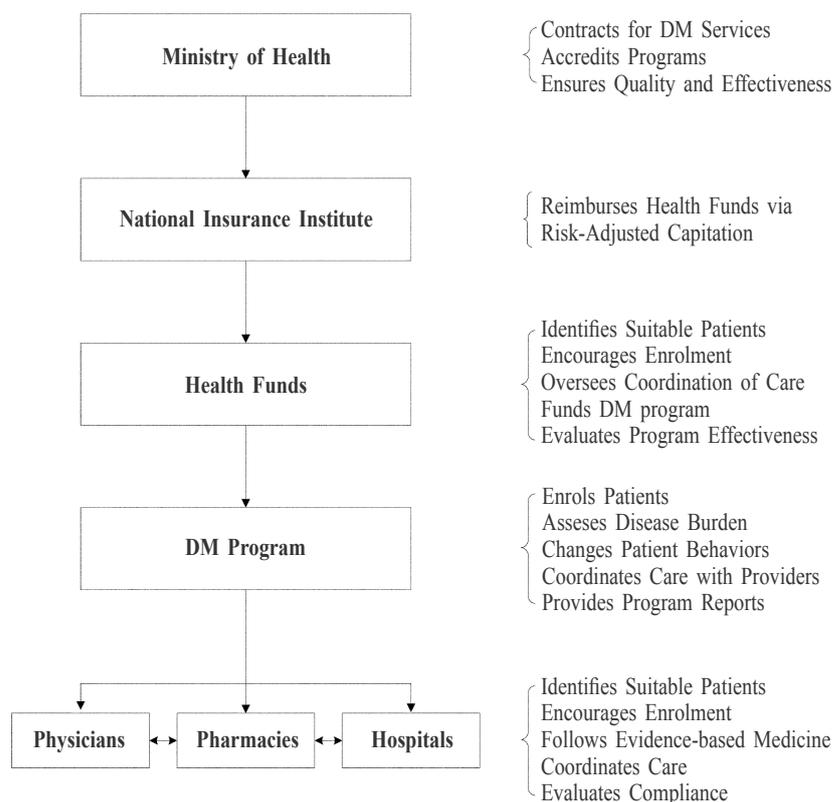


Figure 1. A proposed system-wide approach for implementing disease management in Israel

the patient and encouraging their enrollment into the program. Upon enrollment the participant’s disease burden or health status should be assessed and used to determine the type and level of intervention the patient will require. There are two avenues that DM must pursue to achieve program success. First, patients must receive timely and appropriate care for their condition. As the DM program staff will be in regular communication with patients, any noticeable change in health status or presentation of acute symptoms should trigger an immediate referral to the appropriate healthcare provider.

Second, patients must be taught self-management techniques. This requires behavior modification and health education. It is extremely important that DM staff who consult with patients be trained in psychosocial behavioral models in order to facilitate that learning and behavioral change process [27,28]. At the most fundamental level, a program’s success is heavily dependent on the patient’s interest and ability to better manage his/her own disease processes.

The role of the healthcare provider

One of the foremost barriers to successful implementation of any DM program is lack of provider involvement and support [29-31]. Doctors, pharmacists, and other healthcare specialists represent the patient’s physical point of contact with the system. Providers not only have the ability to identify suitable participants for the program that other systematic methods may not catch, but they also have tremendous influence in persuading patients to enroll

HMO = health management organizations

in the program. The reverse is also true. Unsupportive providers can dissuade patients from participating in DM programs; moreover, even well-intentioned providers who are not knowledgeable about effective behavior change strategies can actually cause resistance to appropriate health-related behaviors [32,33].

As the provider ultimately holds the responsibility for patient care, a DM program must elicit the support and involvement of the provider network. This involvement can manifest as provider-driven development of practice guidelines, choice of therapies and alternatives, and operational flows to ensure coordination and continuity of patient care throughout the system. Moreover, during face-to-face contact with the patient, providers are in the best position for assessing patient compliance with the intervention and encouraging their continued commitment.

Evaluating program effectiveness

Evaluating the effectiveness of disease management is essential to ensure that the economic and clinical goals of the program are achieved. In the U.S., programs implemented for private payers are typically evaluated by the DM program administrators and validated by either the payer or an independent third party. Programs implemented for Medicare are evaluated on their behalf by a contracted third party.

The type of research design used in the evaluation is extremely important and is the subject of ongoing debate in the U.S. Historically, the most widely used method in the disease management industry for evaluating program effectiveness is referred to as the "total population approach" in which the entire population's healthcare cost experience is measured for the year prior to program implementation and then again after each program year. This model is a pretest-posttest design, with the most basic limitation being that, without a control group, there may be sources of bias and/or competing extraneous confounding factors that offer plausible alternative explanations for the change from baseline [34]. Alternatively, more rigorous evaluation designs have recently been proposed to supplant the weaker total population approach [35-39].

In the proposed Israeli system, there are several options available regarding who would conduct the program evaluation. First, the HMOs could conduct the evaluation and present the results to the Ministry of Health. Second, the DM program could conduct the evaluation, providing results to both the HMO fund and the Ministry. Thirdly, the Ministry could conduct the evaluation. Since all of these parties (Ministry, HMO, and DM program) have a vested interest in the outcomes, there will be concerns of bias in the results favoring the organization conducting the assessment. The preferred route would be to have an independent third party evaluate the outcomes and present the overall results in a public forum to ensure transparency of the process. It is obvious that the more stringent research designs should be built into each DM program.

Conclusions

While the U.S. and Israel have very similar chronically ill populations, the U.S. healthcare system has positioned disease manage-

ment as one of the primary means of providing care to this population. The Israel healthcare system has an organizational structure that is much better suited to implementing DM on a population-wide basis than the U.S. That is not to say that barriers do not exist in embracing the concept of DM. The system in Israel has many diverse and competing forces, such as strong unions and professional associations among healthcare workers, political affiliations among health funds, and the changing importance in the role of the Ministry of Health and healthcare in Israel as a function of the political parties in power. Both Germany [25] and the Netherlands [40] have similar healthcare systems to that of Israel and serve as good models for how these barriers can be overcome in order to implement a system-wide approach to chronic disease management. Whether Israel is ready to embrace DM as a concept for improving health status of the chronically ill now remains a matter of discussion for policy-makers and stakeholders in the healthcare system.

References

1. World Health Organization. Preventing Chronic Diseases: A Vital Investment. Geneva: World Health Organization, 2005.
2. Partnership for Solutions. Chronic Conditions: Making the Case for Ongoing Care – September 2004 Update. Available from URL: <http://www.rwjf.org/research/researchdetail.jsp?id=1502&ia=142>. [Accessed 7 Jan 2006]
3. National Center for Health Statistics. Health, United States, 2005: with chartbook on trends in the health of Americans. Hyattsville, MD, 2005.
4. Brodsky J. The challenges of success: the aging of Israeli society. *IMAJ* 2003;(5):375-8.
5. McDevitt TM, Rowe PM. The United States in International Context: 2000. Census 2000 Brief, C2KBR/01-11. Washington, DC: U.S. Census Bureau, 2002.
6. Hetzel L, Smith A. The 65 years and older population: 2000. Census 2000 Brief, C2KBR/01-10. Washington, DC: U.S. Census Bureau. October 2001.
7. Gist YJ, Hetzel LI. We the People: Aging in the United States: Census 2000 Special Reports, CENSR-19. Washington, DC: U.S. Census Bureau. December 2004.
8. World Health Organization. The World Health Report 2000. Geneva: World Health Organization, 2005.
9. Stern SM, Waldrop J. Disability: 2000; Census 2000 Brief, C2KBR-17. Washington, DC: U.S. Census Bureau, March 2003.
10. Matheson D, Robinson T. Disease Management Takes Flight. Boston, MA: The Boston Consulting Group, October 2000.
11. Linden A, Adams J, Roberts N. Evaluation methods in disease management: determining program effectiveness. Position Paper for the Disease Management Association of America (DMAA), October 2003.
12. Ellrodt G, Cook DJ, Lee J, Cho M, Hunt D, Weingarten S. Evidence-based disease management. *JAMA* 1997;278(20):687-92.
13. Hunter DJ, Fairfield G. Disease management. *Br Med J* 1997;315: 50-3.
14. Disease Management Association of America. Definition of disease management. Available from URL: <http://www.dmaa.org/definition.html>. [Accessed 7 Jan 2006].
15. Weingarten SR, Henning JM, Badamgarav E, et al. Interventions used in disease management programmes for patients with chronic illness-which ones work? Meta-analysis of published reports. *Br Med J* 2002;325(7370):925-32.
16. Congressional Budget Office. An Analysis of the Literature on Disease Management Programs. Washington DC: Congressional

- Budget Office. 13 October 2004. Located at: <http://www.cbo.gov/showdoc.cfm?index=5909&sequence=0>. [Accessed 7 Jan 2006].
17. Ofman JJ, Badamgarav E, Henning JM, et al. Does disease management improve clinical and economic outcomes in patients with chronic diseases? A systematic review. *Am J Med* 2004;117(3):182–92.
 18. Knight K, Badamgarav E, Henning JM, et al. A systematic review of diabetes disease management programs. *Am J Manag Care* 2005;11(4):242–50.
 19. Krause DS. Economic effectiveness of disease management programs: a meta-analysis. *Dis Manage* 2005;(8):114–34.
 20. Goetzel RZ, Ozminkowski RJ, Villagra VG, Duffy J. Return on investment on disease management: a review. *Health Care Fin Rev* 2005;26:1–19.
 21. Linden A. What will it take for disease management to demonstrate a return on investment? New perspectives on an old theme. *Am J Manag Care* 2006;12(4):61–7.
 22. Chinitz D. Israel's health policy breakthrough: The politics of reform and reform of politics. *J Health Polit Policy Law* 1995;20:909–32.
 23. DeNavas-Walt C, Proctor BD, Lee CH. U.S. Census Bureau, Current Population Reports, P60-229, Income, Poverty, and Health Insurance Coverage in the United States: 2004, U.S. Government Printing Office, Washington, DC, 2005.
 24. Crippen DL. Disease Management in Medicare: Data Analysis and Benefit Design Issues: A CBO testimony before the Special Committee on Aging: United States Senate. Washington DC: Congressional Budget Office. 19 September 2002. Located at: <http://www.cbo.gov/showdoc.cfm?index=3776&sequence=0>. [Accessed 18 Mar 2006].
 25. Busse R. Disease management programs in Germany's Statutory Health Insurance system. *Health Affairs* 2004;23(3):56–67.
 26. Linden A, Roberts N, Keck K. The complete "how to" guide for selecting a disease management vendor. *Dis Manage* 2003;6(1):21–6.
 27. Linden A, Roberts N. Disease management interventions: What's in the black box? *Dis Manage* 2004;7(4):275–91.
 28. Linden A, Butterworth SW, Roberts N. Disease management interventions. II: What else is in the black box? *Dis Manage* 2006;9(2):73–85.
 29. Edlin M. Disease management, care guidelines win physician support. Health plans provide tools to assist doctors. *Healthplan* 2003;44(3):58–60.
 30. Leider, H.L. HMOs need to share gains of DM programs. *Managed Care* 2001;10(7):33–4.
 31. Wagner EH. Chronic disease management: what will it take to improve care for chronic illness? *Effect Clin Pract* 1998;1(1):2–4.
 32. Miller WR. Enhancing patient motivation for health behavior change [Editorial]. *J Cardiopulm Rehab* 2005;25(4):207–9.
 33. Francis N, Rollnick S, McCambridge J, Butler C, Lane C, Hood K. When smokers are resistant to change: experimental analysis of the effect of patient resistance on practitioner behaviour. *Addiction* 2005;100:1175–82.
 34. Linden A, Adams J, Roberts N. An assessment of the total population approach for evaluating disease management program effectiveness. *Dis Manage* 2003;6(2):93–102.
 35. Linden A, Adams J, Roberts N. Evaluating disease management program effectiveness: an introduction to time series analysis. *Dis Manage* 2003;6(4):243–55.
 36. Linden A, Adams J, Roberts N. Evaluating disease management program effectiveness: an introduction to survival analysis. *Dis Manage* 2004;7(3):180–90.
 37. Linden A, Adams J, Roberts N. Evaluating disease management program effectiveness adjusting for enrollment (tenure) and seasonality. *Res Healthc Fin Manage* 2004;9(1):57–68.
 38. Linden A, Adams J, Roberts N. Using propensity scores to construct comparable control groups for disease management program evaluation. *Dis Manage and Health Outc* 2005;13(2):107–27.
 39. Linden A, Adams J, Roberts N. Evaluating disease management program effectiveness: an introduction to the regression-discontinuity design. *J Eval Clin Pract* 2006;12(2):124–31.
 40. Schrijvers G, Spreeuwenberg C, van der Laag H, et al. Disease Management in the Dutch Context. Utrecht, NL: Utrecht Publishing & Archiving Services, 2006.

Correspondence: Dr. A. Linden, 6208 NE Chestnut Street, Hillsboro, OR 97124, USA.
Phone: (1-503) 547-8343
email: ariellinden@yahoo.com