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The Implications of Healthcare Utilization of Diabetes Disease Management

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In partial fulfillment of the requirements for

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by

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Disclaimer

The views expressed in this study are those of the author and do not reflect the official policy or position of Ireland Army Community Hospital, the Department of the Army, Department of Defense, or the United States Government.

Statement of Ethical Conduct in Research

Patient confidentiality was strictly adhered to during this research study. All patients' medical information was protected at all times and under no circumstances will be discussed or released to any outside agency.

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Introduction

American healthcare costs continue to outpace the rest of the economy, and with the increasing utilization of technology and specialty care, coupled with the aging population, healthcare costs will more than likely continue to rise. Therefore, the healthcare industry needs to capitalize on savings when possible. Disease management (DM) may be one initiative that can reduce healthcare costs in the United States (U.S.).

The United States has the highest overall healthcare expenditure as well as the highest expenditure per capita of any country in the world. In 2005, the United States spent \$1.9 trillion, or 16% of the Gross Domestic Product (GDP) on healthcare. Figure 1 illustrates the national health expenditures (NHE), showing approximately \$913 billion in 1993 increasing to \$4.1 trillion by the year 2016 with the percentage of the proportion of GDP increasing from 13.7% to 19.6% (CMS, 2008). In 2004 France and Canada spent just under 10% of overall GDP on healthcare, and Germany and Switzerland spent just under 11%. These four countries have socialized healthcare, and provide healthcare in some form to every member of their population. In comparison, the U.S. had nearly 47 million Americans without healthcare in 2005 or approximately 16% of the U.S. population, a rise from 14% in 2004 (National Coalition on Healthcare, 2007).

The Disease Management Association of America (2004) defines DM as “a system of coordinated interventions and communications for populations with conditions in which patient self-care efforts are significant.” DM programs were developed under the assumption that by augmenting the traditional episodic medical care system with services and support between doctor visits, the overall cost of healthcare could be reduced.

According to Agency for Healthcare Research and Quality (2006), hospitals spent \$58 billion in 2004 on the 6 million stays of patients diagnosed with diabetes, which is 20% of the total amount spent by hospitals on the 38.6 million patient stays that year. Diabetes patients tended to be hospitalized longer than other patients. Uninsured diabetes patients, with decreased access to care, were more likely to be admitted principally to have their diabetes treated than insured patients. The number of foot or lower leg amputations per 1,000 hospital stays of diabetes patients was twice as high for the uninsured and more than two times higher for men than for women. Overall care for a patient with diabetes, including treatment in all settings and for other illnesses such as congestive heart failure, averaged more than \$10,000 annually.

Consistent with its extraordinary effect on the health of Americans, the costs of diabetes to the U.S. healthcare system are enormous. According to the American Diabetes Association (2008), the total estimated cost of diabetes in 2007 was \$174 billion, including \$116 billion in excess medical expenditures and \$58 billion in reduced national productivity. Medical costs attributed to diabetes include \$27 billion for care to directly treat diabetes, \$58 billion to treat the portion of diabetes-related chronic complications that are attributed to diabetes, and \$31 billion in excess general medical costs. The largest components of medical expenditures attributed to diabetes are hospital inpatient care (50% of total cost), diabetes medication and supplies (12%), retail prescriptions to treat complications of diabetes (11%), and physician office visits (9%). People with diagnosed diabetes incur average expenditures of \$11,744 per year, of which \$6,649 is attributed to diabetes. People with diagnosed diabetes, on average, have medical expenditures that are ~2.3 times higher than what expenditures would be in the absence of diabetes. For the cost categories analyzed, ~\$1 in \$5 healthcare dollars in the U.S. is spent caring for someone with diagnosed diabetes, while ~\$1 in \$10 healthcare dollars is attributed to diabetes. Indirect costs

include increased absenteeism (\$2.6 billion) and reduced productivity while at work (\$20.0 billion) for the employed population, reduced productivity for those not in the labor force (\$0.8 billion), unemployment from disease-related disability (\$7.9 billion), and lost productive capacity due to early mortality (\$26.9 billion) (CMS, 2008).

Conditions that prompted the study

An aging population, increasing obesity among all age groups, and a sedentary lifestyle are risk factors for diabetes. DM may improve patient outcomes and quality of life while potentially reducing overall healthcare costs. It is an important approach to integrated care. This study is significant because DM programs target patients at risk of declining health or costly medical services through the application of evidence-based care. The U.S. healthcare system can not continue to spend a larger portion of the GDP on healthcare. Although there is no silver bullet to reduce healthcare costs, DM may be one step in the right direction.

Statement of the Problem

Faced with rising healthcare costs and limited resources, healthcare costs need to be contained. The actual national burden of diabetes is likely to exceed the \$174 billion estimate because it omits the social cost of intangibles such as pain and suffering, care provided by nonpaid caregivers, excess medical costs associated with undiagnosed diabetes, and diabetes-attributed costs for healthcare expenditures categories omitted from this study. Also omitted from this analysis are expenditure categories such as healthcare system administrative costs, over-the-counter medications, clinician training programs, and research and infrastructure development. The burden of diabetes is imposed on all sectors of society, with higher insurance premiums paid by employees and employers, reduced earnings through productivity loss, and

reduced overall quality of life for people with diabetes and their families and friends. By gathering this information, the hospital may be better positioned to educate its patients and providers and to improve communication between them, leading to increased continuity of care, healthcare compliance, and a decrease in healthcare utilization.

Literature review

The Fort Knox United States Army Medical Department Activity (MEDDAC) is located in Kentucky, where the hub of their business activity is at the Ireland Army Community Hospital (IACH). In addition to Kentucky, IACH's area of responsibility also includes Ohio, Indiana, Michigan, Illinois, and Wisconsin. Within this 6 state area, the Fort Knox MEDDAC serves the active duty population, many of whom are in isolated areas where they serve as recruiters and trainers. Much of the healthcare provided to their beneficiaries in their health service area is provided through the Department of Defense (DoD) healthcare program called TRICARE, which is the military health plan that allows active duty soldiers and their family members access to health services even though they are not near a military facility. It also allows family members and retirees a choice of healthcare plans; they can elect to receive services through a military treatment facility or from a civilian network provider. Fort Knox MEDDAC provides complete medical care to over 33,000 military healthcare beneficiaries of which 1,147 beneficiaries, approximately 3.4% of their population, have been diagnosed with Type 2 Diabetes (IACH, 2008).

DM programs vary considerably among vendors. Most vendors direct their services to a specific diagnosis, especially diabetes, asthma, heart disease and lung disease. Measuring clinical outcomes is important to assess improved health status as an indication that the DM program is effective. Examples include:

- HbA1c testing for diabetics
- Retinal exams for diabetics
- Inhaler prescriptions for asthmatics
- Emergency department visits by asthmatics
- Cholesterol testing for cardiac patients
- ACE inhibitor prescriptions for congestive heart failure patients.

A successful program will demonstrate improvement in these measures if it is changing the behavior of program participants. According to Coulter (2006), there are five basic steps involved in DM:

- Identify beneficiaries who would benefit
- Assessing their illness severity and needs
- Engaging them in the program
- Educate, counsel and provide resources to enhance self-care and compliance
- Reassess periodically the need for continued services.

While there is compelling evidence that DM programs can indeed change the behaviors of beneficiaries with identified medical conditions to improve their medical outcomes and save health benefits costs, capturing those results can be difficult (Coulter, 2006). Two studies were conducted in relation to DM and healthcare costs.

Wagner, Newton, McCullon, Ramsey, & Grothaus (2001), conducted a cohort study from 1992-1997, in a staff model health maintenance organization (HMO) in western Washington State. The study analyzed the effect of improved glycemic control on healthcare costs and utilization. The objective was to determine whether sustained improvements in hemoglobin

HbA1c testing among patients are followed by reductions in healthcare utilization and costs. The participants of the study were all diabetic patients aged 18 or older, who were continuously enrolled from 1992-1996, and had HbA1c measured at least once a year in 1992-1994 (n=4744). Participants whose HbA1c decreased 1% or more between 1992 and 1993, and sustained the decline through 1997 were considered improved (n=732). All others were classified as unimproved (n=4012) (Wagner, et al, 2001).

Main outcome measures were total healthcare costs, percentage hospitalized, and number of primary and specialty visits among the cohort groups in 1992-1997. Summarized results show a mean total healthcare costs were \$685 to \$950 less each year in the improved cohort for 1994-1997. Utilization was consistently lower in the improved cohort, reaching statistical significance for primary care visits in 1994-1997, and for specialty visits in 1997. Differences for hospitalization rates were not statistically significant in any year. The conclusion of the study suggests by the data, that a sustained reduction in HbA1c level among diabetic patients is associated with significant cost savings within one to two years of improvement.

The second study was conducted by Schwerner, Mellody, Goldstein, Wansink, & Sullivan (2006). Their objective was to observe trends in payer expenditures for plan members with one of 14 chronic complex conditions comparing one group with a DM program specific to their condition (the intervention group) and the other with no specific DM program (control group) for these conditions. The authors used payer claims and membership data to identify members eligible for the program in a 12 month baseline year (October 2001 to September 2002), and a subsequent 12-month program year (October 2002 to September 2003). Two payers were analyzed:

- Health plan with members primarily in New Jersey, where the DM program was offered.
- Affiliated large plan with members primarily in the metro Philadelphia area, where the program was not offered.

The claims payment policy for both plans was identical. The intervention group showed a statistically significant ($p < 0.01$) difference in total paid claims trend and expenditures when compared to the control group. Intervention group members showed a reduction of -8%, while the control group showed an increase of +10% over identical time periods. Subsequent analyses, controlling for outliers and product lines, served to confirm the overall results. Schwerner, et al (2006) concluded that the DM program was likely responsible for the observed differences between the intervention and control group results (Schwerner, et al, 2006).

Electronic Health Records

According to Pope (2006), during the past 20 years, physicians have seen amazing advancements in technology and have witnessed their beneficial impact on the health and the lives of hundreds of patients. They have also seen the amazing impact that sound information can have on a patient's health and on the decisions made regarding that patient's care. While society as a whole has never been more connected, more integrated, more technologically advanced or more global, healthcare still has some fairly old-fashioned mores that must be challenged and reshaped to truly advance electronic health records (EHRs) on a large and sustainable scale. EHR's allow disease managers access to current, accurate and available patient information, as an essential component in providing quality health care.

First-generation EHRs converted information such as patient name, address, date of birth, social security number, and insurance carrier into computer-based records. Little or no attempt

was made to capture patient medical records in the same information database. With the advances in networking and telecommunication infrastructure in the 1970s, the integration of individual databases became possible. Geographically distributed medical treatment facilities with different medical databases were able to access information across heterogeneous platforms. When the Composite Health Care System (CHCS), a DoD owned healthcare system, was first deployed, it supported a single medical treatment facility (MTF) and maintained information on encounters between the patient and healthcare provider that have occurred at that MTF. Over the past 25 years a set of systems, including CHCS, have been developed and maintained as the Military Health System (MHS) (Mikherji and Egyhazy, 2004).

A major effort to address the limitations of CHCS was initiated in 1999. This effort resulted in a new version of CHCS now known as the Armed Forces Health Longitudinal Technology Application (AHLTA). AHLTA provides for creation and maintenance of a complete health record for military personnel and their dependents. A complete health record consists of data collected over the patient's lifetime across all treatment facilities within the MHS or outside it. AHLTA provides for an MHS enterprise-wide EHR (Mikherji and Egyhazy, 2004).

AHLTA supports a virtual EHR that extends the concept of portability far beyond that reached by other EHRs. AHLTA is deployed worldwide to 70 military hospitals/medical centers, 411 medical clinics, and 417 dental clinics. AHLTA supports 9.2 million beneficiaries of the TRICARE Program, the DoD's worldwide healthcare program for active duty and retired uniformed services members and their families. According to Smith (2006), AHLTA is a system that supports the very unique missions of the U.S. armed forces, allowing providers to have current patient health information and greater affect on DM.

MHS Population Health Portal

In January 2004, the MHS Population Health Portal that was developed by the U.S. Air Force, was expanded as a Tri-Service web-based medical informatics program. The MHS Population Health Portal transforms DoD and Network healthcare data into actionable information and identifies Military Treatment Facilities (MTF) TRICARE Prime enrollees in need of clinical preventive, disease management or case management services. The MHS Population Health Portal allows easy access to standardized metrics and predefined queries for 14 clinical preventive services, diseases and conditions. The modules include: asthma, beta-blocker use following myocardial infarction, cardiovascular risk factors, breast cancer screening, cervical cancer screening, colorectal screening, depression, diabetes, hypertension, Chronic Obstructive Coronary Disease, hyperlipidemia, low back pain and high utilizers (U.S. Army Medical Command, 2008).

In addition to assisting with population health and process improvement efforts, the MHS Population Health Portal allows IACH to assess data quality, enrollment management, demand forecasting, utilization of services, and the quality of healthcare provided to beneficiary populations. The MHS Population Health Portal also serves as the centralized data source for reporting an MTF's clinical performance in the annual AMEDD Business Plan. The MHS Population Health Portal summarizes information from:

- MHS Management Analysis and Reporting Tool (M2), such as the Standard Inpatient Data Record (SIDR), Standard Ambulatory Data Record (SADR), and Health Care Service Reports (HCSR).
- Approximately 103 CHCS hosts, to include but not limited to, laboratory, radiology, and pathology

- Pharmacy Data (PDTS), from MTF, network, and mail order
- Defense Eligibility Enrollment Registration System (DEERS)

In conjunction with DM via the MHS Population Health Portal, IACH offers a 3 week (2 hours for the first three Tuesdays of the month) Diabetes Education Program. This multidisciplinary course primary objective is educating patients on what diabetes is, how to take care of your feet, and how to improve your health using coping skills, nutrition, and exercise. Instructors include a registered dietitian, physical therapist, nurse, pharmacist, psychologist, and podiatrist (NARMC, 2008).

Purpose

The purpose of this study is to determine whether sustained hemoglobin HbA1c testing among patients is followed by reductions in healthcare utilization. The intent of which is to answer the following research question, "Is there a utilization difference in OP visits using DM to treat and manage patients with diabetes?" Linear regression analysis will be utilized to evaluate the relationship between diabetes DM HbA1c testing and the utilization of outpatient (OP) visits.

Methods

The research design was a retrospective review of collected data during a three year period from 2005-2007. This study focused on patients that were diagnosed as a type 2 diabetic, identification of these patients was made via the MHS Population Health Portal at Ireland Army Community. The diabetes patients are captured in the MHS Population Health Portal and are tracked for the diabetes Health plan Employer Data and Information Set (HEDIS) measures. There were approximately 1147 patients identified at Ireland Army Community Hospital at Fort Knox who were diagnosed as diabetic, of which all had at least one year of documented HbA1c

tests. An analysis of the HbA1c tests will be compared to the OP utilization in year three to determine if three years of consecutive HbA1c test result in lower OP utilization.

Hypothesis and Variables

Hypothesis

H_a: HbA1c testing is associated with OP utilization during a 36 month study period.

Dependent Variables

The dependent variable for this study is utilization, which includes outpatient visits for 2007, refer to Table 1, Appendix A.

Independent variables

Independent variables include, HbA1c testing for 2005, 2006, and 2007, refer to Table 1, Appendix A.

Operational Definitions

Dependent Variables

- Utilization is a continuous variable from 0 to ∞ displayed in whole numbers and captures the number of OP visits in calendar year 2007.

Independent Variables

- HbA1c is a dichotomous variable with “0” being not tested and “1” being test completed for calendar years 2005, 2006, and 2007.

Data Sources

One way to measure DM in diabetes is through sustained HbA1c testing and its relationship to healthcare utilization. Using linear regression analysis, the data will be run to determine if there is a causal relationship between HbA1c testing and the utilization of patient care. The patient population used were those who were identified as having Type 2 Diabetes as

defined by International Classification of Diseases codes (9th Ed.), and were continually enrolled in the MHS Population Health Portal at Ireland Army Community Hospital for the three year period of 2005-2007, and who had HbA1c tests available in the MHS Population Health Portal and the Composite Health Care System (CHCS) for calendar years 2005, 2006 and 2007.

Specific data elements were extracted from these databases, a de-identification of protected health information was conducted prior to receipt of data, meeting the requirements for privacy of individually identifiable health information, outlined by the Health Insurance Portability and Accountability Act (HIPAA) of 1996. According to HIPAA the de-identification of data should lead to no reasonable basis to believe that the information can be used to identify an individual is not individually identifiable health information. Statistical analysis was performed using the Statistical Package of Social Sciences software (SPSS). P values were determined using linear regression, and were considered significant at $P < .05$. Retrospective data used in the process measurement was derived from the MHS Population Health Portal and the Composite Health Care System (CHCS) for calendar years 2005, 2006 and 2007 for beneficiaries enrolled at the Fort Knox MEDDAC.

Limitations

The patient populations used in this study are MHS eligible patients. Therefore, they have no barriers to entry into the healthcare system and their utilization rates may differ from the private sector. Although the HbA1c test results were available the data was analyzed as having or not having the HbA1c test versus the actual HbA1c score. Utilization was defined as raw encounters in primary and specialty care and therefore level of effort of each encounter was not considered.

Results

Standard regression was conducted to determine the accuracy of the independent (HbA1c Testing 2005, 2006 and 2007), predicting outpatient utilization of patients at Fort Knox MEDDAC that were diagnosed with Type 2 Diabetes. Data screening led to the elimination of all patients not diagnosed with Type 2 Diabetes. Evaluation of linearity led to the natural log transformation of 2005, 2006 and 2007 HbA1c testing. Regression results indicate that the overall model significantly predicts of outpatient utilization, $R^2=.048$, $R^2_{adj}=.045$, $F=19.047$, $P<.000^a$, see Table 2 and Table 3 listed below. This model accounts for 4.8% of variance of outpatient utilization. A summary of the coefficients can be located in Table 4, which indicates that 2 of the 3 variables significantly contributed to the model.

Table 2. *Model Summary***Model Summary^b**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.218 ^a	.048	.045	12.062	.048	19.047	3	1143	.000	1.973

a. Predictors: (Constant), alc2007, alc2005, alc2006

b. Dependent Variable: OPV2007

Table 3. *Analysis of the Variance*ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8313.761	3	2771.254	19.047	.000 ^a
	Residual	166297.503	1143	145.492		
	Total	174611.264	1146			

a. Predictors: (Constant), a1c2007, a1c2005, a1c2006

b. Dependent Variable: OPV2007

Table 4. *Coefficients*Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	6.225	.845		7.370	.000					
a1c2005	-1.912	.880	-.076	-2.172	.030	.019	-.064	-.063	.677	1.478
a1c2006	.879	.966	.033	.910	.363	.078	.027	.026	.652	1.534
a1c2007	6.820	.975	.223	6.994	.000	.209	.203	.202	.821	1.217

a. Dependent Variable: OPV2

Discussion and Conclusions

This study demonstrates that aggressive management of a patient with type 2 diabetes can lead to reduced utilization rates over a three year time period. With proper monitoring and tight controls there is a statistically significant decrease in healthcare OP utilization. By tracking patients HbA1c levels as prescribed by standards of care, the goals of therapy (correct the metabolic abnormalities of diabetes and to prevent the development of microvascular and

macrovascular complications) are being met. Whether a new patient is being evaluated or an established patient is being followed up, recognized clinical practice guidelines and recommendations for ensuring good diabetes care should be practiced. IACH can use these findings to justify the health prevention and disease management initiatives they are executing. IACH and the rest of the health care community must eventually be able to justify the scarce resources being utilized to carry out DM programs. Studies like this and future studies will help ensure that funding for such programs continue. The results demonstrate that cost savings can be achieved, in the form of decreased utilization, but only for individuals who consecutively report for HbA1c testing annually, suggesting that improved glycemic control is associated with improved quality of life and a decrease in healthcare utilization in both the primary and specialty care setting.

It is recommended that future studies of this subject include, age, gender, socio-economic status, ethnicity, weight, height, relative value units associated with outpatient utilization as well as diagnosis related groups for inpatient stays. One may also choose to include the other clinical practice guidelines such as the retinal eye exam associated with type 2 diabetes and determine which measures have the most influence on predicting health care utilization rates and outcomes. Using these additional variables may assist in predicting costs relative to type 2 diabetic patients and offer additional cost implications in the treatment of this disease. Type 2 diabetes affects millions people in America. A cornerstone to the treatment of this population is appropriate glycemic control, which has been associated with better patient outcomes and may lead to cost savings from decreased utilization rates in the out years. By deploying a disease management program coupled with the appropriate means to track results and outcomes, IACH can continue to track and serve the type 2 diabetic population within their area of responsibility. This

proactive practice can lead to better patient outcomes and may lead to decreased utilization, and a cost savings to all stakeholders.

The actual national burden of diabetes is likely to exceed the \$174 billion estimate because it omits the social cost of intangibles such as pain and suffering, care provided by non-paid caregivers, excess medical costs associated with undiagnosed diabetes, and diabetes-attributed costs for health care expenditures categories omitted from this study. Other considerations when researching the impact of diabetes should include healthcare system administrative costs, over-the-counter medications, clinician training programs, and research and infrastructure development. The burden of diabetes is imposed on all sectors of society, higher insurance premiums paid by employees and employers, reduced earnings through productivity loss, and reduced overall quality of life for people with diabetes and their families and friends.

This is why DM is of interest to providers, patients, managed care organizations, insurance companies, and government agencies. Diabetes is one of the most common and costly chronic diseases. Lack of proper treatment can lead to blindness, end-stage renal disease, nerve damage and amputations, heart disease, or stroke. Diabetes care is often poorly managed, and the disease exacts a high toll on society in terms of health costs and lost productivity. Based on prior research, outpatient utilization may actually increase initially for a diabetic patient managed in a DM program. However, if the DM is successful prior research has shown that OP utilization may decrease over time. Prior research has also shown those patients that manage their HbA1c annually as prescribed may have less OP utilization. Therefore, bill payers need to look at long term cost versus the short term. When chronic diseased patients stay healthy their quality of life increases and productivity in the work force increases by reducing sick days. From a policy perspective, it may be beneficial for law makers to evaluate ways to reward doctor and patient

behavior for health prevention and health management, all of which will lend itself to a decrease in outpatient utilization.

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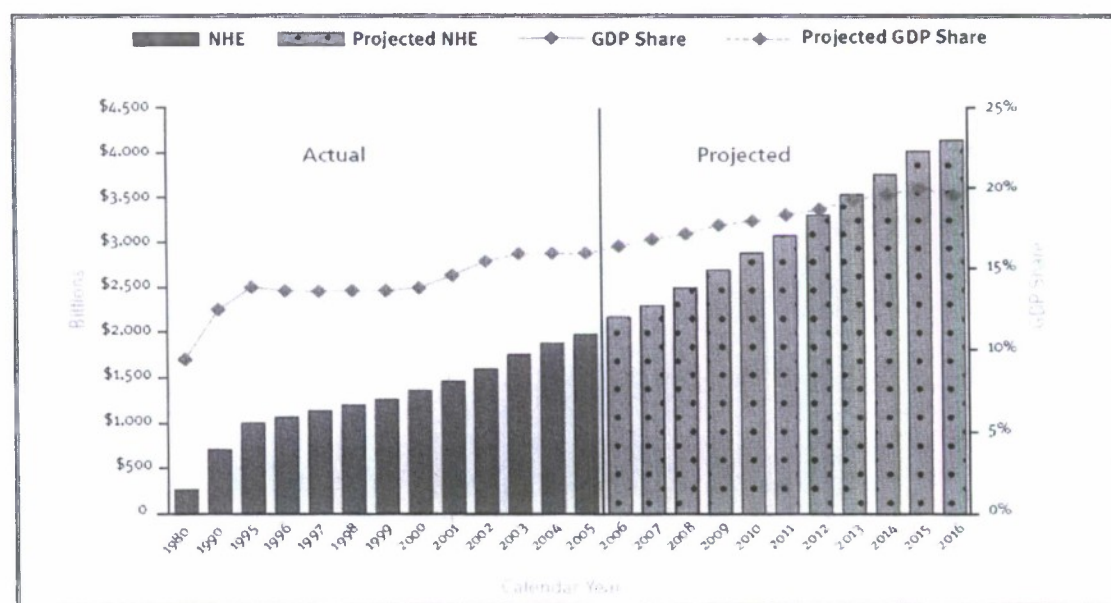
Appendix A

Table 1. *Code sheet for dependent and independent variables Outpatient Visits 2007.*

DV	Utilization	Number of Primary Care Visits 2007 Continuous data from 0 to ∞
IV	A1c 2005	A1c Test result 2005 Dichotomous Data 0 = Not tested; 1 = tested
IV	A1c 2006	A1c Test result 2006 Dichotomous Data 0 = Not tested; 1 = tested
IV	A1c 2007	A1c Test result 2007 Dichotomous Data 0 = Not tested; 1 = tested

Appendix B

Figure 1. National health expenditures and their share of the GDP, 1980 - 2016.



Source: CMS, Office of the Actuary, National Health Statistics Group.

www.cms.hhs.gov/TheChartSeries/downloads/Chartbook_2007_pdf.pdf

Figure 2. U.S. population (in thousands) and percent of U.S. population with diabetes, 2007

	Total U.S. population	With diagnosed diabetes		With undiagnosed diabetes		Total with diabetes*	
Total population*	301,736	17,486	5.8%	6,640	2.2%	24,126	8.0%
Race/ethnicity							
Non-Hispanic white	199,091	11,403	5.7%	4,520	2.3%	15,923	8.0%
Non-Hispanic black	37,002	2,775	7.5%	690	1.9%	3,474	9.4%
Non-Hispanic other	20,101	1,076	5.4%	317	1.6%	1,393	6.9%
Hispanic	45,541	2,231	4.9%	1,104	2.4%	3,335	7.3%
Sex							
Male	148,744	8,543	5.7%	3,113	2.1%	11,656	7.8%
Female	152,992	8,943	5.8%	3,528	2.3%	12,471	8.2%
Age (years)							
<18	73,878	157	0.2%	35	0.1%	192	0.3%
18-34	70,373	964	1.4%	669	1.0%	1,633	2.3%
35-44	43,356	1,686	3.9%	1,174	2.7%	2,860	6.6%
45-54	43,838	3,443	7.9%	1,327	3.0%	4,770	10.9%
55-59	18,235	2,307	12.7%	756	4.1%	3,063	16.8%
60-64	14,323	2,261	15.8%	775	5.4%	3,036	21.2%
65-69	10,690	1,879	17.6%	850	8.0%	2,729	25.5%
≥70	27,042	4,788	17.7%	1,055	3.9%	5,843	21.6%
Insurance							
Private	169,886	7,057	4.2%	3,018	1.8%	10,075	5.9%
Government	91,794	8,997	9.8%	2,891	3.1%	11,888	13.0%
Uninsured	40,055	1,432	3.6%	731	1.8%	2,163	5.4%

Source: Combined information from the 2004-2006 NHIS, 2004 NNHS, 1999-2004 NHANES, and the U.S. Census Bureau population estimates for 2007.

*Numbers do not necessarily sum to totals because of rounding.

Appendix C

AMEDD: U.S. Army Medical Department

CHCS: Composite Health Care System

CMS: Centers for Medicare and Medicaid Services

DM: Disease Management

GDP: Gross Domestic Product

HbA1c: A blood test that gives you a picture of your average blood glucose control for the past 2 to 3 months, the results give you a good idea of how well your diabetes treatment plan is working

HEDIS: Health plan Employer Data and Information Set, is a tool created by the National Committee for Quality Assurance (NCQA) to collect data about the quality of care and services provided by the health plans. HEDIS consists of a set of performance measures that compare how well health plans perform in key areas: quality of care, access to care and member satisfaction with the health plan and doctors. NCQA requires health plans to collect this information in the same manner so that results can be fairly compared to one another. Health plans can arrange to have their HEDIS results verified by an independent auditor.

HHS: Health and Human Services

HIPAA: Health Insurance Portability and Accountability Act of 1996

HMO: Health Maintenance Organization

IACH: Ireland Army Community Hospital

ICD-9 Codes: International Statistical Classification of Diseases and Related Health Problems provides codes to classify diseases and a wide variety of signs, symptoms, abnormal

findings, complaints, social circumstances and external causes of injury or disease. Every health condition can be assigned to a unique category and given a code, up to six characters long. Such categories can include a set of similar diseases.

MEDDAC: United States Army Medical Department Activity

MHS: Military Health System

MTF: Medical Treatment Facility

NCQA: National Committee for Quality Assurance is a private, 501(c)(3) not-for-profit organization dedicated to improving health care quality. Since its founding in 1990, NCQA has been a central figure in driving improvement throughout the health care system, helping to elevate the issue of health care quality to the top of the national agenda.

NHE: National Healthcare Expenditures

OP: Outpatient

SPSS: Statistical Package for Social Sciences

TRICARE: A system delivers health care through a worldwide network and supplements that care through a series of private sector contracts that provide physician and hospital networks, retail and mail order pharmacy benefits, claims processing, marketing, and medical management.

U.S. United States