

# Eye examinations for VA patients with diabetes: standardizing performance measures

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## Abstract

**Objective.** To demonstrate the potential of the Health Plan Employer Data and Information Set (HEDIS) for the calculation of a performance measure for eye exams in the diabetic population using Veterans Health Administration (VA) administrative data.

**Design.** We calculated a 1-year HEDIS-defined patient denominator and three alternative denominators that considered coding factors in identifying a VA patient as diabetic. We calculated the HEDIS-defined numerator, along with alternative specifications that captured other types of eye exams. Finally, we supplemented national data with VA pharmacy and Medicare claims data to identify all VA diabetic patients at 14 selected VA facilities and to establish a more accurate picture of non-VA health care utilization.

**Results.** The national average annual HEDIS-defined eye exam rate in the VA was 26% in fiscal 1997 compared with 39% for managed care organizations. Medicare utilization raised this by 15 percentage points at 14 northeastern VA hospitals. Over 2 years, at least two-thirds of diabetic VA patients had some type of eye exam through VA or Medicare.

**Conclusion.** A HEDIS measure of eye exams for VA patients with diabetes can be calculated using VA administrative data only. However, the question remains to what extent the denominator and numerator accurately and completely identify all diabetic patients using VA services and all appropriate eye exams. We recommend caution in interpreting the results of performance measurement across different health care sectors based on what we currently know are data system limitations.

**Keywords:** diabetes mellitus, outcomes and process assessment (health care)

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In the USA, health care performance measures potentially aid purchasers' contracts and consumers' provider choices [1]. In other countries, performance measures can help policymakers to evaluate their national systems and target areas for improvement. Different data systems, however, make standardization difficult in many countries. This paper reports on the potential for using Veterans Health Administration (VA) administrative data to calculate a measure for its diabetic population. Veterans are persons who served in and were honorably discharged from USA military service, and the VA is the largest, integrated health care system in the USA: it employs salaried providers and its information is not based on claims for payment. Therefore its data may be comparable to data in single-payer health systems outside the USA or to staff model health maintenance organizations (HMOs).

Performance measures such as those in the Health Plan Employer Data and Information Set (HEDIS) are an important beginning for measuring quality of care, but our evaluation underscores the need for caution in using them to compare services delivered by different health care systems. This paper addresses the following questions: (i) do patient characteristics influence eye exam rates for veterans with diabetes? (ii) to what extent does non-VA health service use by veterans bias VA performance measures? (iii) how does VA compare with managed care organizations in the private sector in providing eye exams for diabetic patients? and (iv) are the difficulties inherent in calculating VA performance measures similar in the private sector? Our findings are relevant to the USA, where both public and private payers exist, and for countries wishing to compare the quality of their health care systems to systems elsewhere.

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## Background

HEDIS contains standardized measures designed to provide payers and consumers with information to compare the performance of managed care plans. The National Committee for Quality Assurance (NCQA), an independent, not-for-profit organization, developed HEDIS with input from private and public purchasers, consumers, organized labor, medical providers, public health officials, and health plans. HEDIS 3.0 (the third release of HEDIS) includes 75 standardized performance measures providing information on effectiveness of care, access, patient satisfaction, health plan stability, service use, cost, informed choices, and plan information [2]. Most HEDIS indicators measure administrative performance, but measures of effectiveness of care, e.g., eye exams for people with diabetes, assess the process of care delivered to populations enrolled in health plans.

HEDIS measures now apply to populations covered by commercial and public (Medicaid for poor people; Medicare for elderly people) insurance in the USA. 'Medicaid HEDIS' was released in 1996. Another set of measures, providing information relevant to the Medicare program, was incorporated into HEDIS 3.0 and mandated in federal risk and cost contracts in 1997. The Health Care Financing Administration (HCFA) is committed to developing valid and useful performance measures for Medicare fee for service (FFS) comparable to those in managed care. However, the applicability of the current measures to the FFS sector overall and to FFS group practices in particular is uncertain [3]. There are similar concerns that HEDIS might not apply to VA. Performance measures based on enrolled populations pose special problems because many veterans use services from other health care systems [4–5]. Further, VA lacks the incentives to code services as the private sector does.

### HEDIS rates of eye exams for diabetic patients in other sectors

Diabetes is a leading cause of adult blindness and regular eye exams facilitate early diagnosis and treatment of retinopathy. How often patients with diabetes should have their eyes examined is a matter of debate [2]. In 1997, VA issued clinical practice guidelines on the assessment and treatment of diabetes mellitus recommending an annual eye exam for adult-onset diabetic patients on insulin and an every-other-year exam for non-insulin-requiring diabetic patients whose baseline or subsequent exams are normal [6]. Health plans have pressured NCQA to include biannual eye exams for controlled patients with diabetes [7].

State-specific HEDIS estimates of retinal examinations for people with diabetes have been reported for the commercial HMO population (excluding Medicare and Medicaid beneficiaries) for 1996. The data represented 320 HMOs in 42 states and the District of Columbia and reflected HMOs nationwide by HMO type, regional location, and tax status. Among diabetic patients aged 31–64 years,

a median of 39.5% (range, 19.2–67.7%) had retinal examinations during the previous year [8].

NCQA's 1997 HEDIS results for 447 managed health care plans in its Quality Compass database show a 2.2% increase for plans reporting eye exam rates for diabetic patients in both 1996 and 1997 compared with 1.0% among plans overall. A comparison of NCQA-accredited and non-accredited health plans found a statistically significant difference in the rates of eye exams for people with diabetes (40.3% versus 36.5%) and a dramatic difference (41.5% versus 33.8%) between publicly reporting plans and plans that did not disclose their performance [9].

In the Medicare FFS sector, 94% of Medicare beneficiaries with diabetes had at least two physician visits in 1994, yet only 42% received an eye exam [10]. Preliminary findings from the Medicare FFS setting indicate that 45.1% of Medicare FFS beneficiaries with diabetes received an annual eye exam in 1997 [11].

## Methods

We tested the stability of the VA measure to alternative specifications of the denominator and numerator. To address potential data limitations, we calculated a 1-year diabetic patient denominator as defined by HEDIS and less restrictive definitions that assessed the impact of including patients diagnosed as diabetic through only one outpatient visit or who visited VA diabetes clinics without a diabetes diagnosis. We also compared 1- and 2-year numerators calculated according to the HEDIS definition with those including a wider range of ophthalmology procedures and visits to VA ophthalmology clinics and ophthalmologists. We supplemented our VA diagnosis data with VA pharmacy and Medicare claims data to identify all diabetic patients at 14 selected VA facilities and to establish non-VA health care utilization.

### Creating the denominator

We identified all diabetic patients using the VA health care system nationally in fiscal 1997 (October 1 1996–September 30 1997). This process involved searching eight inpatient and outpatient VA databases for patients with hospital stays or outpatient visits with ICD-9-CM diagnosis codes 250.xx, 357.2x, 362.0x, or 366.41 in fiscal 1997. The denominator for the proposed VA HEDIS diabetes measure was all patients, aged 31 years or older as of September 30 1997, identified as diabetic through two face-to-face encounters in an ambulatory setting or one face-to-face encounter in an inpatient or emergency room setting with a diagnosis of diabetes [2]. We excluded all patients who were not veterans.

We searched outpatient data files to identify patients who were seen in VA diabetes clinics but did not have any ICD-9 diabetes codes or who had only one face-to-face outpatient visit with a diagnosis of diabetes. We

examined these cohorts separately because these patients may only have been screened for diabetes.

### Creating the numerator

The HEDIS-defined numerators were the number of patients in each denominator who had at least one retinal ophthalmoscopic exam (CPT-4 codes 92002, 92004, 92012, 92014, 92018, 92019, 92225, 92226, 92235, or 92250) performed by an eye-care professional during fiscal 1997 and during fiscal 1997–1998 (for the biannual exam rate). The specific CPT-4 eye exam codes required by HEDIS are a subset of intermediate, comprehensive, and special ophthalmology services. We then examined the stability of the HEDIS rate to varying definitions of the numerator by including the broader range of ophthalmology CPT-4 codes (92003–92287), VA Ophthalmology Clinics, and ophthalmology providers.

The data file for bills to VA for non-VA outpatient services captures only one CPT-4 code. To address this limitation, we accessed a VA vendor file and identified vendors for ophthalmology and optometry services and the broad range of ophthalmology CPT-4 codes.

### Adding VA pharmacy and Medicare claims data

We supplemented national databases with VA pharmacy data and Medicare inpatient and outpatient claims data for two VA networks representing 14 VA facilities in the northeast. We also identified prescriptions for insulin and oral hypoglycemic drugs in VA pharmacy files to confirm patients as diabetic, assess severity, and identify diabetic patients who did not have an inpatient stay or an outpatient visit in fiscal 1997. Descriptive analyses assessed the comparability of the patients at these 14 facilities relative to the national VA diabetic population with respect to the definition of a diabetic patient and patients' VA eligibility. For veterans identified as diabetic based on medications only, we asked: (i) were these newly-identified diabetic patients disproportionately from any of the 14 VA hospitals? (ii) did these patients tend to be on oral hypoglycemic medications? and (iii) did these patients only have prescriptions filled?

To estimate the extent of health care utilization by VA patients with access to services in the private sector, we purchased 1 year of Medicare claims data from HCFA. We sent HCFA a list of 283 940 unique social security numbers for veterans using inpatient or outpatient health care services in fiscal 1995–1997 at the 14 VA hospitals. After excluding spouses and dependents and collapsing records for individuals with multiple Medicare IDs, we found 167 609 Medicare primary claimants matching the unique social security numbers we sent to HCFA. Combining three Medicare files (Institutional Inpatient, Institutional Outpatient, and Physician/Supplier Files) yielded 98 868 individuals (59% of the 167 609 primary claimants in the Medicare cross-reference file) who used Medicare services in 1996.

We identified diabetic patients in the Medicare files by ICD-9-CM diagnosis codes or service type. Eye exams were identified in the physician files by CPT-4 procedure codes, provider specialty, and type of service and in the institutional

files by CPT-4 codes and Revenue Center codes. We created a uniform format for the Medicare Physician/Supplier eye exams and the Institutional Outpatient eye exams, then combined these files with our VA eye exams file to identify patients in the new denominator file who received eye exams.

### Patient characteristics

We collected information on VA eligibility status, complications of diabetes, presence and type of retinopathy, coding of diabetes as primary or secondary diagnosis, and insulin use. Eligibility is determined largely on the basis of income levels and 'service-connected' conditions, i.e. injuries or diseases incurred or aggravated during active military service. Veterans with service-connected conditions rated 50% or more disabling have the highest priority for available VA services. Veterans with no service-related disability and incomes above established levels (Category C) have the lowest priority and are subject to a co-payment.

The presence and degree of retinopathy was determined by ICD-9-CM diagnosis code, i.e. ICD-9 code 250.5 [362.01] indicating background diabetic retinopathy and ICD-9 code 250.5 [362.02] for proliferative diabetic retinopathy. Other complications of diabetes included ketoacidosis, hyperosmolar coma, other coma, renal manifestations, neurological manifestations, peripheral circulatory disorders, and other specified and unspecified complications (ICD-9-CM codes 250.1–250.4 and 250.6–250.9).

## Results

### Demographic characteristics

Table 1 shows selected characteristics of VA patients with HEDIS-defined diabetes. The typical VA diabetic patient is a white male with non-insulin dependent diabetes and no known complications from his diabetes. To overcome a problem of small numbers, we collapsed VA's seven priority groups into five by combining veterans who had a 10–49% service-connected disability with those who were prisoners of war or exposed to radiation or Agent Orange. More than half of the veterans met the eligibility criteria for category A, no service-connected disability and low income.

### Eye exam rates for different diabetic groups

Table 2 shows annual and biannual eye exam rates for all potential VA diabetic patients, the HEDIS-defined population, and four subgroups: patients diagnosed as diabetic (i) during one or more hospitalizations; (ii) at two or more outpatient visits; (iii) through only one visit or telephone contact; or (iv) those with a visit to a VA diabetes clinic but no diabetes diagnosis. Biannual rates were always higher than those for 1 year, but did not approach 50%. Diabetic patients diagnosed during an inpatient stay (group 1) had a slightly lower rate than those with two or more outpatient visits that defined their diagnosis (24% versus 27%). The groups that

**Table 1** Demographic characteristics of HEDIS-defined diabetic VA patients, fiscal 1997

Characteristic	<i>n</i>	%
Eligibility status		
≥ 50% Service connected	54 995	16.7
10–49% Service connected	71 547	21.7
Category A, non-service connected	175 878	53.3
0–9% Service connected	15 285	4.6
Category C	12 003	3.6
Complications of diabetes		
Manifestations include ophthalmic	32 260	9.8
Non-ophthalmic manifestations	83 084	25.2
No complications	214 364	65.0
Type of retinopathy		
Proliferative retinopathy	1840	0.6
Background retinopathy	8392	2.5
No retinopathy	319 476	96.9
Diabetes diagnosis		
Primary diagnosis	285 598	86.6
Secondary diagnosis	44 110	13.4
Insulin usage		
Insulin dependent	132 308	40.1
Non-insulin dependent	197 400	59.9
Total	329 708	100.0

failed to meet HEDIS criteria for ‘diabetic’ had even lower rates (< 20% annually and < 25% biannually).

**Eye exam rates by patient characteristics**

Table 3 shows biannual eye exam rates by VA eligibility status and selected characteristics related to the severity of

the diabetic condition. (Annual rates showed the same relationships.) The likelihood that a patient received a biannual HEDIS-defined eye exam increased with his eligibility priority ( $P < 0.001$ ). It was highest for patients considered 50% or more service-connected disabled and lowest for veterans who had higher incomes and no service-connected disability. Patients with more severe diabetes, as indicated by ophthalmic manifestations, insulin dependence, etc. were more likely to receive eye exams in the VA ( $P < 0.001$ ) but these severity measures were highly correlated. In multivariate logistic calculations of odds ratios (Table 3), background retinopathy and insulin dependence were not statistically significant predictors of having an eye exam.

**Rates with alternative definitions of the numerator and denominator**

Among the 414 919 potentially diabetic patients, only 23.4% received HEDIS-defined eye exams, but up to 45.1% received either HEDIS-defined or other types of ophthalmology or optometry examinations in fiscal 1997 (data not shown). For the 329 708 patients who met the HEDIS criteria for designation as diabetic, 26.0% received HEDIS-defined eye exams and as many as 49.7% received some type of eye exam.

Figure 1 shows the variation in biannual eye exam rates by diabetic group and with alternative definitions of the numerator. Rates of biannual eye exams fluctuated under the alternative definitions of the numerator for the different eligibility categories. Higher priority veterans with diabetes received more eye exams. The tendency toward higher rates of eye exams among insulin-dependent diabetic patients was also evident with the alternative definitions of the numerator.

More than 85% of the HEDIS-defined eye exams fell

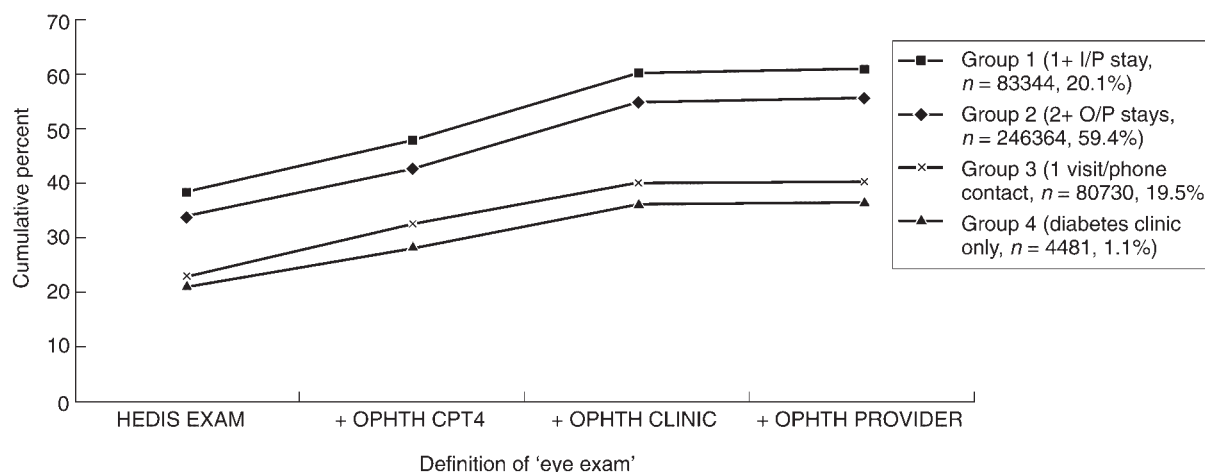
**Table 2** Number and percentage of VA patients with diabetes who received an annual/biannual HEDIS-defined eye exam by diabetic group<sup>1</sup>

Diabetic group	<i>n</i>	Annual eye exam		Biannual eye exam	
		<i>n</i>	(%)	<i>n</i>	(%)
Population of possibly diabetic patients (groups 1–4)	414 919	97 191	23.4	140 299	33.8
HEDIS-defined diabetic patients only (groups 1–2)	329 708	85 870	26.0	122 062	37.0
Patients diagnosed as diabetic during one or more hospitalizations (group 1)	83 344	20 058	24.1	28 151	33.8
Patients diagnosed as diabetic at two or more visits (group 2)	246 364	65 812	26.7	93 911	38.1
Patients diagnosed as diabetic through only one visit or telephone contact (group 3)	80 730	10 566	13.1	17 235	21.3
Patients who visited a VA diabetes clinic but had no diabetes diagnosis (group 4)	4481	755	16.8	1002	22.4

<sup>1</sup>All differences between pairs of annual or biannual eye exam rates are statistically significant at  $P \leq 0.01$  except for the comparison of groups 3 and 4. For this pair, the difference in the annual rates is significant at  $P = 0.05$  while the difference in the biannual rates is not statistically significant.

**Table 3** VA patients with diabetes who received a biannual HEDIS-defined eye exam by selected patient characteristics

Patient characteristics	n	Received eye exam		Odds ratio (95% CI)
		n	%	
<b>Eligibility status</b>				
≥ 50% Service connected	54 995	25 386	46.2	2.02 (1.93–2.11)
10–49% Service connected	71 547	27 117	37.9	1.49 (1.43–1.56)
Category A, non-service connected	175 878	61 015	34.7	1.29 (1.24–1.35)
0–9% Service connected	15 285	5165	33.8	1.27 (1.21–1.34)
Category B/C	12 003	3379	28.2	1.00
<b>Complications of diabetes</b>				
Ophthalmic manifestations	32 260	21 219	65.8	3.45 (3.34–3.55)
Other types of manifestations	83 084	30 543	36.8	1.09 (1.07–1.11)
No complications	214 364	70 300	32.8	1.00
<b>Type of retinopathy</b>				
Proliferative retinopathy	1840	1318	71.6	1.30 (1.17–1.45)
Background retinopathy	8392	5467	65.1	0.99 (0.94–1.04)
No retinopathy	319 476	115 277	36.1	1.00
<b>Diabetes diagnosis</b>				
Primary diagnosis	285 598	112 686	39.5	2.16 (2.11–2.22)
Secondary diagnosis	44 110	9376	21.3	1.00
<b>Insulin usage</b>				
Insulin dependent	132 308	53 159	40.2	1.01 (0.99–1.02)
Non-insulin dependent	197 400	68 903	34.9	1.00



**Definition of 'eye exam'**

- HEDIS EXAM = 10 CPT-4 procedure codes as specified by HEDIS 3.0: 92002, 92004, 92012, 92014, 92018, 92019, 92225, 92226, 92235, or 92250.
- OPHTH CPT4 = broad range of ophthalmology CPT-4 codes (92003 - 92287), excluding HEDIS-based CPT-4 codes.
- OPHTH CLINIC = VA Ophthalmology Clinic stop code only
- OPHTH PROV + ophthalmology provider speciality only

**Figure 1** (a) Percentage of all VA diabetic patients aged 31 years or more who received biannual eye exams, according to diabetic group. (b) Definition of eye exam.

within four of the ten HEDIS-specified CPT-4 codes: either intermediate or comprehensive ophthalmic services for a new or established patient. They were administered primarily in VA ophthalmology clinics (57%) and optometry clinics (41%) by optometrists (31%), ophthalmologists (28%) and other specialists (27%). Most of the procedures with ophthalmology CPT-4 codes not in the HEDIS-defined subset were a visual field examination or determination of refractive state.

### **Incorporating VA pharmacy and Medicare data: a 14-hospital subanalysis**

Two subanalyses for diabetic patients at 14 VA hospitals used VA pharmacy data to test the definition of the diabetes population – the denominator for the eye exam rates – and 1 year of Medicare data to calculate eye exam rates for dually eligible veterans.

#### **VA pharmacy data**

We extracted 94 560 prescriptions for insulin and oral hypoglycemic drugs written or dispensed in fiscal 1997 at the 14 VA facilities. Demographic information was also obtained for the 25 254 patients who were issued these prescriptions: 36.6% were insulin dependent and 98% were male. Patients had multiple prescriptions for diabetes (1–24 for insulin, 1–44 for oral hypoglycemic drugs) and 8% had prescriptions for both insulin and oral hypoglycemic medications. Most (93.4%) veterans who received diabetic medications through VA were already identified in the study as diabetic through their VA diagnoses. The 6.6% identified only through pharmacy data were not concentrated in particular facilities, were as likely to be on oral hypoglycemic medications as the other patients, and most (84.2%) had visits to a VA provider.

Patients with prescriptions but no VA provider visit were diagnosed and treated primarily at VA facilities outside the two networks chosen for study. Excluding patients who had long-term care stays only, 1364 patients on insulin or oral hypoglycemic medications did not have any VA diagnosis of diabetes (5.4% of all diabetic patients in our 14-hospital subanalysis). These patients had VA ambulatory visits, non-VA ambulatory visits, and VA hospitalizations in which no diagnosis was recorded indicating a diabetic condition during fiscal 1997.

Among patients diagnosed as diabetic during a hospitalization, 76% received VA outpatient medications for diabetes. For patients diagnosed as diabetic at two or more visits, 83.6% received VA diabetes medications. In contrast, 34.5% of patients who were diagnosed as diabetic through only one visit or telephone contact received VA diabetic medications and 1.5% of patients who visited a VA diabetes clinic but had no diabetes diagnosis.

#### **Medicare data**

Of the 98 868 VA patients who used Medicare-covered health care, 10 815 aged 31 years or more had one inpatient or two outpatient encounters with a diabetes diagnosis. Only 53.2% of these (5751) were identified as patients with diabetes from VA diagnoses. Another 69 veterans received only extended

care in VA and were not included in the diabetes denominator.

The remaining 4995 veterans (46.2%) with diabetes diagnoses in the Medicare files had no record of the condition in any VA administrative database for fiscal 1997. Of these, 4501 veterans were identified as diabetic solely through their Medicare utilization; the other 494 veterans had prescriptions for diabetic medications from the VA but no accompanying diagnosis of diabetes in their VA data. Given the number of unmatched Medicare diabetic patients, we searched inpatient and outpatient data in fiscal years 1994–1996 and 1998 for diagnoses of diabetes and VA diabetes clinic visits. We found 1165 inpatient stays (for 555 patients or 11.1% of the unmatched Medicare patients) in these years that identified these patients as diabetic. We also found 2112 visits to a VA Diabetes Clinic for another 698 patients in the outpatient files for these years. (Lack of diagnoses in the outpatient files before 1997 limited further identification of patients as diabetic.) Combining the findings from the inpatient and outpatient files for these additional years identified 1138 patients as diabetic or potentially diabetic (22.8% of the 4995 unmatched Medicare patients).

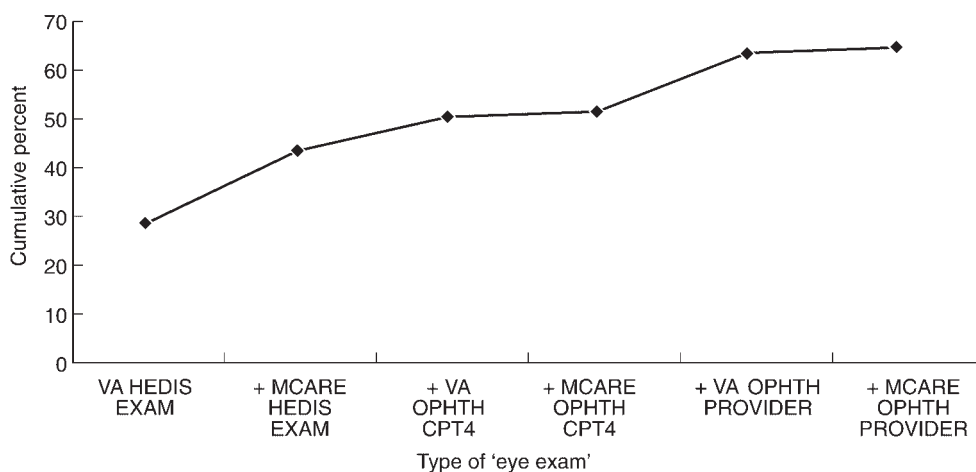
### **The denominator and numerator with VA pharmacy and Medicare data**

We combined the 1216 new diabetic veterans identified through VA pharmacy data and the 4501 veterans identified through Medicare data with the 31 418 diabetic veterans in the 14-hospital patient denominator file to create a more accurate estimate of diabetic patients at these hospitals. The resulting 37 531 represented a 19.5% increase in the denominator.

We assessed the numerator when Medicare-covered eye exams were included for diabetic patients at these 14 hospitals (Figure 2). For HEDIS-defined eye exams only, annual rates increased from 22.9% to 39.9%, and biannual rates from 28.6% to 43.7%, when Medicare utilization was included. At least 65% of these diabetic patients received either HEDIS-defined or another type of biannual eye exam through Medicare or the VA health care system. The rate would be higher with a second year of Medicare data.

## **Discussion**

The HEDIS performance measure for eye exams can be calculated for veterans with diabetes using administrative data not based on payment claims. Diabetic VA patients who are insulin dependent, 50% or more service-connected disabled, and who manifest ophthalmic, renal or other types of diabetic-related complications are more likely to receive eye exams in VA. The question remains, however, to what extent the denominator and numerator accurately and completely identify all diabetic patients using VA services and all appropriate eye exams. We found that 46% of the dually-eligible diabetic patients identified through Medicare claims had no diabetes diagnoses in any VA database for the reporting year. Including them increased the diabetic patient denominator



Type of 'eye exam'

- VA HEDIS EXAM = any of 10 CPT-4 procedure codes specified by HEDIS 3.0 in VA data
- MCARE HEDIS EXAM = any of 10 CPT-4 procedure codes specified by HEDIS 3.0 in Medicare data
- VA OPTH CPT4 = broad range of ophthalmology CPT-4 codes (92003 – 92287), excluding HEDIS-based CPT-4 codes, used to identify exam in VA data
- MCARE OPTH CPT4 = broad range of ophthalmology CPT-4 codes (92003 – 92287), excluding HEDIS-based CPT-4 codes, used to identify exam in Medicare data
- VA OPTH PROVIDER = exam by VA ophthalmology provider
- MCARE OPTH PROVIDER = exam by Medicare ophthalmology provider

**Figure 2** (a) Variation in the percentage of all VA diabetic patients ( $n=37\,531$ ) aged 31 years or more who received biannual eye exams: results of a 14-hospital subanalysis. (b) types of eye exam.

by 12%. It is not feasible to assess utilization for veterans with commercial health insurance or Medicaid coverage, but Medicare enrollees comprise the majority (60%) of veterans using VA.

This study is further limited by the lack of medical record review to evaluate the sensitivity and specificity of VA administrative data used to calculate the performance measure. Limited clinical information and variability in coding practices can compromise the quality of administrative data [12]. We did compare two different methods of identifying patients with diabetes in the VA databases: diagnoses and medication use. We found that we could potentially miss 4% of patients with diabetes by omitting pharmacy data and relying solely on VA inpatient and outpatient diagnoses. Conversely, we could miss 3% of patients with diabetes by relying solely on pharmacy data.

Taking Medicare utilization into account, the VA system compares favorably with managed care organizations in the private sector. The national average annual HEDIS-defined eye exam rate in the VA was 26% in fiscal 1997 compared with 39% for managed care organizations [13], but Medicare utilization raised the rate by 15 percentage points at 14 northeastern VA hospitals. Expanding the numerator to include all eye exams provided to diabetic patients through VA and Medicare increased the rate by another 11 percentage

points. Over 2 years, at least two-thirds of diabetic VA patients had some type of eye exam through VA or Medicare.

We explored whether the difficulties inherent in calculating performance measures in the VA also exist in the private sector. There is currently little incentive for VA clinicians to accurately code their services. As documented by a 1996 Medicare audit, private sector managed care organizations have also experienced difficulty in creating the HEDIS diabetes measure [14]. Health plans experienced problems with the denominator, sampling, and the numerator. In defining the denominator, the audit found that nearly one-fifth of the health plans had difficulty applying continuous enrollment criteria and 12% defined a diabetic member using proprietary codes that could not be mapped back to standard codes. Furthermore, 11% of the health plans used incorrect standard codes to define the ophthalmic service. Due to the high rate of failure and the difficulties experienced by health plans in reporting this measure, the audit contractor recommended that HCFA not use this measure for health plan comparison [14].

Given that providers are themselves responsible for preparing HEDIS measures, auditing is essential [15]. The 1996 audit detected errors from several sources, including limitations of health plan systems, misinterpretation of HEDIS specifications, and random errors in computer programming

[14]. In fact, health plans that successfully reported measures often had to use a variety of processes to overcome system and data limitations.

The NCQA's Report Card Pilot Project in 1993 and study of Maryland HMOs in 1994 confirmed concerns that differences in the basic reporting document (i.e. billing versus encounter forms) influence the content, completeness, and quality of information submitted by providers. Provider arrangements with organizations that provide 'carve-out' services and that use their own reporting systems further complicate data. Differences in processing and classifying information may be due to a plan's particular system of coding diagnoses or procedures, or the resources allocated to assure accuracy in processing [16]. The standardization in NCQA's Quality Compass is not perfect either, since some health plans use administrative data to calculate measures, while others use both administrative data and information abstracted from medical charts [17].

The difficulties inherent in standardized performance measurement are unlikely to decline with the continuing refinement of HEDIS measures. NCQA released a comprehensive set of diabetes measures that will require separate rates for six different aspects of diabetes care, including hemoglobin A1c tested, HbA1c poorly controlled, lipid profile performed, lipids controlled, kidney disease monitored, and dilated eye exams. Reporting these measures is voluntary for HEDIS 1999 and mandatory for HEDIS 2000. The numerator for the eye exam measure will change. Plans can count an eye exam performed in the year prior to the reporting year if the member meets at least two of the following three criteria: (i) not taking insulin during the reporting year; (ii) most recent HbA1c value (during the reporting year) less than 8.0%; and (iii) an examination by an eye-care professional with no evidence of retinopathy during the year prior to the reporting year [13].

We are not optimistic that USA providers are ready and able to rise to this challenge. Certainly, we must view performance measurement across different health care systems with circumspection. Fink has noted that there is no universally accepted format for HMO databases and sees little incentive at present for HMOs to alter their data collection and production practices [16]. We recommend caution in interpreting the results of HEDIS or other performance measures across different USA health care sectors based on what we currently know are system limitations. Other countries that provide health care through both public and private systems concurrently would be well advised to supplement their public data sources to more accurately assess the extent of private health service use that is reflective of their populations.

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