



## Diabetes Prevention and Control: Progress Towards Healthy People 2010 Goals

Annie Gjelsvik, PhD, Dona Goldman, RN, MPH, and Marilyn Moy, RN, MSW

**Diabetes is the seventh leading cause of death in the United States.** People with diabetes have twice the risk of death of people without diabetes of the same age,<sup>1</sup> and complications from the disease can diminish the quality of life. However, people with diabetes can take steps to control the disease and minimize the risks of complications.<sup>1</sup> Rhode Island tracks several **Healthy People 2010 goals (HP2010)** goals for diabetes.<sup>2</sup> The RI Diabetes Prevention and Control Program is preparing to lead the **Statewide Diabetes Health System (SDHS)** in strategic planning for the next five years. Prevalence estimates and progress towards clinical preventive services and mortality goals are presented here.

### METHODS

RI Behavioral Risk Factor Surveillance System (RI BRFSS) data were used to obtain prevalence estimates, track clinical preventive services and obtain denominator data for mortality rates.<sup>3</sup> Methodology of the BRFSS is described elsewhere.<sup>4</sup> In order to increase the statistical reliability of the estimates three years of data (2006, 2007 and 2008) were combined for prevalence estimates among subgroups.

RI mortality data were obtained using the Office of Vital Records of the Rhode Island Department of Health death certificate data. Diabetes (ICD-10 E10-E14) was coded if it was mentioned on the death certificate as either the underlying or a contributing cause of death. A cardiovascular death had cardiovascular disease (ICD 10 I00-I78) listed as the underlying cause and diabetes as any other listed cause. Denominators were obtained from the 2007 US census population estimates.<sup>5</sup> Census denominators were adjusted to produce estimates of the number of diabetics through weighting with three-year age-, race-, and sex- specific average prevalence rates for diabetes from the RI BRFSS.

Prevalence and death rates were age-adjusted to the 2000 United States Standard Population using age groups 0-44, 45-64 and 65+ for general population estimates and age groups 18-44, 45-64 and 65+ for diabetic population estimates. To allow comparisons between groups age-adjusted estimates are reported.

US age-adjusted estimates for clinical preventive services were downloaded from the Centers for Disease Prevention and Control (CDC) Division of Diabetes Translation's Diabetes Data and Trends webpage.<sup>6</sup> US age-adjusted estimates for diabetes related mortality were downloaded using CDC's WONDER system.<sup>7</sup>

### RESULTS

The increase in diabetes among adults in RI closely resembled the nation's trend. In 2007, an estimated 7.2% of Rhode Island adults aged 18 years or older had diagnosed diabetes compared to 8.0% of United States adults.<sup>8</sup> The propor-

tion of adults in RI with diabetes rose to 11% when the approximately 30,000 adults with diabetes but who were undiagnosed were included with the known 60,000 cases.<sup>9</sup>

Older adults had a high prevalence of diagnosed diabetes compared to younger adults (3% age 18-44, 9% age 45-64 and 17% age 65+). Men had a higher prevalence compared to women (8.1% compared to 6.5%). In Rhode Island the prevalence of diagnosed diabetes was highest among Black, non-Hispanic adults (15.7%) and Hispanic adults (11.3%) compared to White non-Hispanic adults (6.7%) and adults of other or multiracial identity (6.9%). People who preferred to speak Spanish had a higher prevalence (14.4%) compared to those whose preferred language was English (7.1%).

**Table 1: Prevalence of diagnosed diabetes among civilian, non-institutionalized adults age 18+**

Population Group	Age-adjusted prevalence estimate	95% Confidence Interval
<b>All</b>	7.2	6.8, 7.7
<b>Age Group</b>		
18-44	2.6	2.0, 3.2
45-64	9.2	8.3, 10.1
65+	16.9	15.7, 18.3
<b>Sex</b>		
Male	8.1	7.3, 8.9
Female	6.5	5.9, 7.0
<b>Race/Ethnicity</b>		
White, Non-Hispanic	6.7	6.2, 7.2
Black, Non-Hispanic	15.7	11.7, 19.7
Hispanic	11.3	8.7, 13.9
Other/multi-racial	6.9	4.5, 9.3
<b>Preferred Language</b>		
English	7.1	6.6, 7.6
Spanish	14.4	10.5, 18.3
<b>Income</b>		
Less than \$25,000	11.4	9.9, 13.0
\$25,000 - \$74,999	7.3	6.5, 8.1
\$75,000+	5.2	4.4, 6.0
<b>Education</b>		
Less than High School	11.9	9.9, 14.0
High School Graduate	7.5	6.6, 8.5
At least Some College	6.4	5.8, 7.0
<b>Insurance Status</b>		
Medicare	16.2	12.0, 20.5
Private	6.6	5.9, 7.2
Fee for Service Medicaid	16.4	11.4, 21.5
Uninsured	4.4	1.5, 7.3
Rlite Care	8.9	0.0, 19.9
Other	9.4	7.3, 11.4

**Table 2: Healthy People 2010 Diabetes Goals for RI adults age 18+**

<b>Clinical Preventive Services Goal</b>	<b>HP 2010 Goal</b>	<b>2007 US (Age-Adjusted)</b>	<b>2007 RI (Crude)</b>	<b>2007 RI (Age-Adjusted)</b>
At Least 2 A1c Tests in Past Year	50%	69.6%	73.1 (67.7, 78.6)	73.1 (66.3, 80.0)
Annual Dilated Eye Exam	75%	66.3%	81.8 (77.6, 86.0)	78.7 (73.1, 84.3)
Annual Foot Exam	75%	69.4%	74.9 (70.0, 79.9)	75.1 (68.9, 81.4)
Attended Diabetes Outpatient Education Ever	60%	57.7%	46.8 (41.0, 52.5)	45.5 (38.3, 52.7)
Ever had Pneumococcal Vaccine	60% (18-64) 90% (65+)	38.9%	59.0 (53.3, 64.7)	47.7 (40.8, 54.6)
Annual Influenza Vaccine	60% (18-64) 90% (65+)	51.3%	69.4 (64.0, 74.7)	62.3 (55.4, 69.3)
<b>Mortality Goal</b>	<b>HP 2010 Goal</b>	<b>2006 US (Age-Adjusted)</b>	<b>2007 RI (Crude)</b>	<b>2007 RI (Age-Adjusted)</b>
Reduce diabetes-related deaths among people with diabetes	78 per 10,000 adults with diabetes	62	15.5 (15.0, 16.0)	78.9 (75.1, 82.7)
Reduce deaths from cardiovascular disease in people with diabetes.	30.9 deaths per 10,000 adults with diabetes.	20.2	58.7 (55.6, 61.8)	29.0 (26.8, 31.1)
Reduce the diabetes death rate.	4.5 deaths per 10,000 population.	7.4	8.8 (8.5, 9.1)	7.8 (7.5, 8.2)

Nationally, low income populations have a diabetes prevalence of up to two times higher compared to wealthy populations.<sup>10</sup> In RI 11.4% of those with an income less than \$25,000, 7.3% of those with an income between \$25,000 and \$75,000, and 6.9% of those with an income greater than \$75,000 had diagnosed diabetes. A similar trend was seen in education: those without a high school education had the highest prevalence of diagnosed diabetes (11.9%) compared to high school graduates (7.5%) or people who had attended college (6.4%). In addition, prevalence of diabetes differed by insurance status. The highest prevalence was among those with Medicare (16.2%) and Fee-for-Service-Medicaid (16.4%) compared to those with RIte Care (8.9%), private insurance (6.6%), other insurance (9.4%), or the uninsured (4.4%). It should be noted, however, that those without insurance were less likely to be screened for diabetes (only 40% screened in the past three years compared to greater than 57% for all other groups).

## HEALTHY PEOPLE 2010 GOALS

RI met or exceeded the HP2010 goals for adults with diabetes having at least two A1C test in the past year, having an annual dilated eye exam, and for having an annual foot exam. (Table 2) In addition, while RI has not yet met the HP2010 goal for having ever had a pneumococcal vaccine or having had an annual influenza vaccine, RI was substantially higher than the national averages for these clinical preventive services (and for the age group 45-64 RI has met the HP2010 goal for annual influenza vaccine). Only in ever having attended diabetes outpatient education has RI not surpassed the national average or met the HP2010 goal.

RI reduced diabetes-related deaths from 86.3 in 1999 to 78.9 per 10,000 people with diabetes in 2007. This met the HP2010 goal but was higher than the national rate. Cardiovascular disease is a major cause of death among persons with diabetes. Adults with diabetes have heart disease rates about two to four times higher than adults without heart disease.<sup>1</sup> RI reduced deaths due to cardiovascular disease among persons with diabetes from 50.5 in 1999 to 29.0 per 10,000 people with diabetes in 2007. This exceeded the HP2010 goal but was higher than the national rate. Perhaps due to the increasing prevalence of diabetes, diabetes-related deaths among the general population rose from 6.4 in 1999 to 7.8 per 10,000 general population, failing to meet the HP2010 goal and remaining higher than the US average.

## DISCUSSION

While RI met or exceeded five HP2010 goals, more work remains for the SDHS, to reduce the prevalence of diabetes and meet patients' needs for clinical preventive services.<sup>11</sup>

**Acknowledgement:** We thank Kathy Taylor from the Center for Health Data and Analysis for providing death certificate data.

This work supported in part by the Rhode Island Collaborative Chronic Disease, Health Promotion, and Surveillance Award (1U58DP001988-01)

## REFERENCES

- Centers for Disease Control and Prevention. National diabetes fact sheet. Atlanta, GA: US Department of Health and Human Services, CDC, 2008.
- US Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: US Government Printing Office, November 2000.
- Rhode Island Behavioral Risk Factor Surveillance System, [2006-2008] Center for Health Data and Analysis, Rhode Island Department of Health, and supported in part by the National Center for Chronic Disease Prevention and Health Promotion Programs, Centers for Disease Control and Prevention, Cooperative Agreement (2003 – 2007), 5U58DP122791 (2007 – 2008).

4. Centers for Disease Control and Prevention. CDC's Behavioral Risk Factor Surveillance System Website. [http://www.cdc.gov/brfss/]
5. <http://www.census.gov/popest/states/asrh/files/SC-EST2008-AGESEX-RES.csv>
6. [http://www.cdc.gov/diabetes/statistics/preventive\\_national.htm](http://www.cdc.gov/diabetes/statistics/preventive_national.htm) accessed on 9/8/09
7. <http://wonder.cdc.gov/data2010/>
8. Behavioral Risk Factor Surveillance System: Prevalence Data. *Centers for Disease Control and Prevention*. (2007). <http://apps.nccd.cdc.gov/brfss/list.asp?cat=DB&yr=2007&qkey=1363&state=All>.
9. Prevalence of Diabetes and Impaired Fasting Glucose in Adults — United States, 1999–2000. *MMWR* 2003;52:833–837.
10. Rabi DM, et al. Association of socio-economic status with diabetes prevalence and utilization of diabetes care. *BMC Health Services Research*. 2006; 6:124.
11. Kondilis B, Lindenmayer J, Goldman G. Diabetes: An epidemic of a chronic disease. *Health by Numbers*. RI Department of Health (April 2002) 4: 4.

*Annie Gjelsvik PhD, is the Epidemiologist for the RI Diabetes Prevention and Control Program. She is an Assistant Professor (Research) at the Warren Alpert Medical School at Brown University.*

*Dona Goldman, RN, MPH, is the lead for the RI Chronic Care and Disease Management Team and Director of the Diabetes Prevention and Control Program.*

*Marilyn Gurney Moy, RN, MSW, is the Program Coordinator of the RI Diabetes Prevention and Control Program.*

#### **Disclosure of Financial Interests**

The authors have no financial interests to disclose.

## *Point of View*

### **Prevention of Relapsing Mediocrity: How to Maintain Performance Improvement in Hospitals**

*John S. Coldiron, MD, MPH*

**Anyone experienced in performance measurement and improvement has felt the frustration of maintaining high performance levels. Complex systems that we frequently rely on in hospitals are subject to breakdown through distracting forces such as changing priorities, staff turnover without adequate training, shortcutting due to excessive workload, etc. These systems that are codified as policies, procedures and processes seem subject to unforgiving degradation. This predictable deterioration can be referred to as “relapsing mediocrity”. *How can one maintain high levels of performance?***

#### **IMPLEMENTATION ISSUES**

It is a basic tenet that processes and procedures should be simple and unambiguous in design. Complexity begets errors through the possibilities of poor handoffs, misapplication, etc. Secondly, complex processes are high maintenance systems that require more resources to keep them functioning at the top level. Managers often do not recognize, or overlook, this second reality. Resources for the ongoing orientation of new employees, refresher training for existing staff, performance measurement of sufficient frequency to be meaningful, periodic feedback reports at both the group and individual level, and, if necessary,

revision and retraining must be anticipated in order to avoid relapse (deterioration of performance). A myriad of once-touted creative initiatives that have fallen to mediocre levels because of lost leadership or shifted resource priority can be cited. While organizations can, with fanfare, implement data-based “best practices,” it can be difficult to sustain those initiatives.<sup>1</sup>

The evidence is that reimbursement concerns have long had a higher priority than the quality of care, including patient safety. Concern for the accuracy of financial data in the hospital information system has exceeded the concern for accurate clinical data at the individual provider level. The funds to purchase software and consulting for fiscal services have exceeded those available for risk management and quality management. Quality managers’ failure to maintain many of the past improvements in performance has not helped to forward the argument for resources. Staffing levels of the typical medical staff office and quality management and risk management programs are usually very small compared to the expectations demanded by even the basic requirements of the Joint Commission. The reason seems related to the focus on *short term* “return-on-investment” priority in resource allocation. Organizations may be

reluctant to implement or sustain improved care practices unless they can project a financial benefit.<sup>2</sup> Clinical outcomes have only recently become a consideration in this decision-making process. There are and will be increasing financial consequences of quality problems that will work to shift this balance.<sup>3</sup>

#### **HOLDING THE LEVEL OF PERFORMANCE**

*What can be done now?*

Most important is the establishment of genuine organizational support. If there is not commitment and advocacy within senior management that includes willingness to create the proper organizational structure, develop and enforce the necessary policies and procedures and provide adequate resources, it will not be possible to sustain and improve the level of performance within the organization. “Proper organizational structure” is an organizational chart that groups the departments that are key to execution of the collection, performance monitoring, training for performance improvement, performance measurement, quality, risk management/patient safety, physician credentialing and profiling and all related reporting into one administrative division. The “necessary” policies and procedures must be writ-