

# EPI-GAZETTE



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## Re-examining Diabetes-Related Deaths in Florida, 2000-2007

*Aruna Surendera Babu, M.P.H.*

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### Introduction

Diabetes mellitus is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes is associated with serious complications and premature death, but people with diabetes can take steps to control the disease and lower the risk of complications. In Florida, 3% of all reported deaths in 2007 were due to diabetes.

Death certificates are generally used to rank the leading causes of death, estimate cause-specific and all-cause mortality, and describe trends in mortality. Diabetes is recorded on death certificates as the underlying cause or as a contributing cause of death. National estimates on diabetes are based mainly on underlying cause of death. Diabetes as a contributing cause of death is often ignored and results in underestimation of deaths related to diabetes.

### Objectives:

The objectives for this study are to:

- Examine deaths related to diabetes
  - as any cause
  - as the underlying cause
  - as a contributing cause
- Examine underlying causes of death among those who had diabetes listed as a contributing cause
- Calculate the odds ratio of cardiovascular disease and respiratory disease being reported as the underlying causes of death among deceased who had diabetes listed as a contributing cause of death.

### Methods

Florida mortality data for the years 2000 to 2007 provided by Florida Department of Health, Office of Vital Statistics were analyzed to enumerate deaths related to diabetes. ICD-10 codes E10-E14 were used to identify diabetes as the cause of death. Age-adjusted mortality rates of diabetes as the underlying cause, as a contributing cause, and as any cause of death were calculated. Age-adjusted rates were calculated for sex and race groups. Leading underlying causes of death were examined among those who had diabetes as the contributing cause of death. Odds ratio (OR) of leading underlying causes of death by diabetes were calculated. OR is the ratio of the odds of having cardiovascular

#### Also in this issue:

- Hepatitis Awareness Month
- Monthly Reportable Disease Table

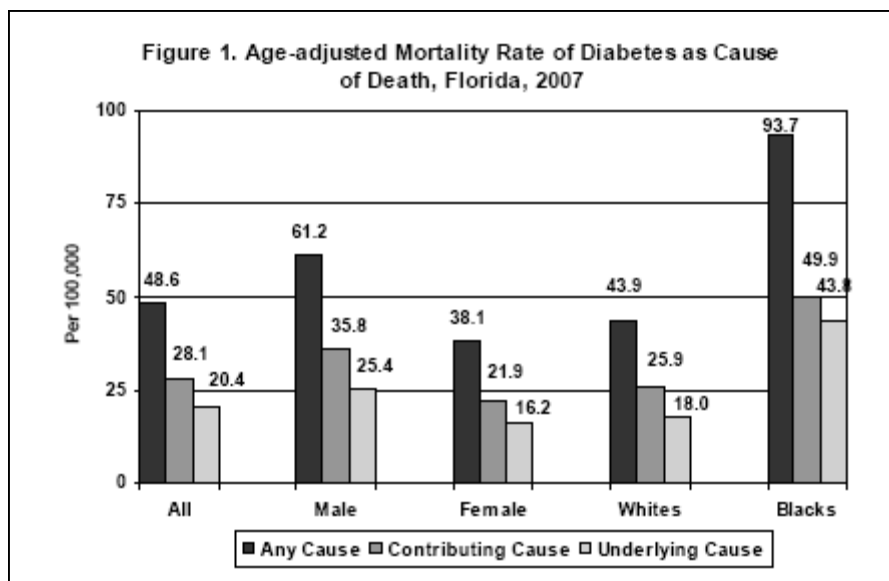
disease (or respiratory disease) listed as underlying cause of death among deceased who had diabetes as contributing cause of death to those who did not have diabetes as contributing cause of death. The table below illustrates the OR calculation.

		CVD listed as the underlying cause of Death	
		Yes	No
Diabetes listed as a contributing cause of death	Yes	Yes (a)	No (b)
	No	Yes (c)	No (d)

$$OR = \frac{(a/b)}{(c/d)} = \frac{ad}{bc}$$

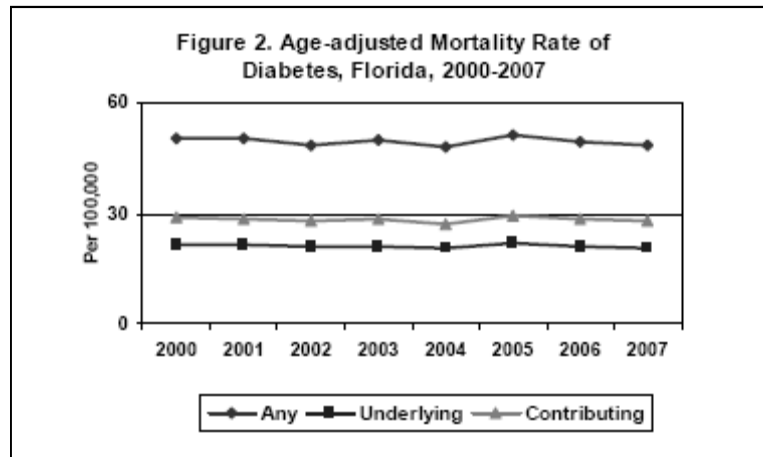
## Results

In 2007, diabetes was listed as the underlying cause of death for 5,094 in Florida, with an age-adjusted rate of 20.4 (C.I. 20.2-20.6) per 100,000 population (Figure 1). The age-adjusted mortality rate for diabetes as any cause (48.6, 48.2-48.9 per 100,000) was more than twice the rate of diabetes as the underlying cause. The mortality rate for diabetes as a contributing cause was 28.1 (C.I. 27.9-28.4) per 100,000 population. Mortality rates were significantly higher among males and blacks compared to females and whites.



## Trends in age-adjusted mortality rate of diabetes

The trends for age-adjusted rate of diabetes as any, underlying, and contributing cause did not show any statistically significant variation between 2000 and 2007 (Figure 2). Although the trends for any, underlying, and contributing causes of death related to diabetes did not vary significantly between 2000 and 2007, the age-adjusted rates were significantly lower in 2007 compared to 2000.



**Odds ratio of having cardiovascular disease and respiratory disease being reported as the underlying causes of death among those who died with diabetes**

Among those who had diabetes as contributing cause of death, the leading underlying causes were cardiovascular disease (CVD) and respiratory disease. CVD includes chronic ischemic heart disease, acute myocardial infarction, and stroke, while respiratory disease includes chronic obstructive pulmonary disease.

**The odds ratios of cardiovascular disease and respiratory disease being reported as the underlying causes of death among deceased who had diabetes listed as a contributing cause of death, Florida, 2000-2007**

Year	CVD (I00-I99)				Respiratory disease (J00-J99)			
	OR	LCL	UCL		OR	LCL	UCL	
2000	2.40	2.28	2.53	*	1.01	0.93	1.11	
2001	2.30	2.18	2.42	*	1.02	0.93	1.11	
2002	2.43	2.31	2.56	*	1.06	0.97	1.15	
2003	2.30	2.18	2.41	*	0.95	0.87	1.04	
2004	2.34	2.22	2.46	*	1.11	1.02	1.21	*
2005	2.23	2.13	2.34	*	1.11	1.02	1.21	*
2006	2.20	2.10	2.31	*	1.13	1.04	1.23	*
2007	2.17	2.07	2.28	*	1.24	1.14	1.34	*

**\*Statistically significant  $\alpha=0.05$ , C.I. does not include 1**

Among those with diabetes as a contributing cause of death, the odds of dying from CVD (ICD-10 codes I00-I99) as underlying cause was significantly higher compared to those who did not have diabetes listed as a contributing cause of death in all the years examined. From 2004 to 2007, the odds of dying from respiratory disease (ICD-10 code J00-J99) as

*(Continued on page 5)*

# Thank You For Your Participation!

The Epidemiology Program would like to thank the following healthcare practitioners for agreeing to participate in the 2009-2010 Influenza Sentinel Program, and especially for their enhanced surveillance for H1N1:

**Debra Campbell—Florida Hospital Centra Care, Sanford**  
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For more information about Florida's List of Reportable Diseases/Conditions, please contact Gregory Danyluk, PhD at 407-665-3266.

Selected Diseases/Conditions Reported to the Seminole County Health Department	2010 through Week 12	2009 through Week 12	2008 through Week 12	2008–2010 Average
AIDS*	19	18	19	19
Animal Bite to Humans**	4	9	4	6
Animal Rabies	1	3	1	2
Campylobacteriosis	1	3	1	2
Chlamydia	307	360	332	333
<b>Cryptosporidiosis</b>	<b>2</b>	2	0	<b>1</b>
Cyclosporiasis	0	1	0	0
Dengue	0	0	0	0
<i>E. coli O157:H7</i>	0	0	1	0
<b>Giardiasis</b>	<b>7</b>	4	6	<b>6</b>
Gonorrhea	85	99	53	79
<i>Haemophilus influenzae—Pneumonia</i>	0	0	0	0
Hepatitis A	0	3	0	1
Hepatitis B	18	15	17	17
Hepatitis C	65	55	67	62
Hepatitis B in Pregnant Woman	2	3	4	3
HIV*	12	26	25	21
<b>Lead poisoning</b>	<b>1</b>	0	1	<b>1</b>
Legionnaire's disease	0	1	2	1
Lyme Disease	0	1	0	0
Meningococcal Disease	0	0	0	0
<b>Pertussis</b>	<b>1</b>	0	0	<b>0</b>
Salmonellosis	8	13	13	11
<b>Shigellosis</b>	<b>2</b>	0	3	<b>2</b>
<b><i>S. pneumoniae – drug resistant</i></b>	<b>8</b>	1	6	<b>5</b>
Syphilis	7	17	13	12
<b>Tuberculosis</b>	<b>4</b>	1	2	<b>2</b>
<b>Varicella</b>	<b>10</b>	4	5	<b>6</b>

\* HIV data includes those cases that have converted to AIDS. These HIV cases cannot be added with AIDS cases to get combined totals since the categories are not mutually exclusive. Current AIDS/HIV data are provisional at the county level.

\*\* Animal bite to humans by a potentially rabid animal resulting in a county health department or state health office recommendation for post-exposure prophylaxis (PEP), or a bite by a non-human primate.

Reported cases of diseases/conditions in **Bold** are >10% higher than the current three year average for the same time period.

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the underlying cause was significantly higher among those with diabetes as a contributing cause compared to those who do not have diabetes.

## Conclusion

The data demonstrate that deaths related to diabetes are under-estimated if only the underlying cause is examined. The number of deaths related to diabetes as any cause is more than twice the deaths primarily due to diabetes. Mortality rates were significantly higher among males and blacks. The data show more deaths were from CVD or respiratory disease as underlying cause among people with diabetes listed as a contributing cause than people without diabetes.

**Aruna Surendera Babu is a statistical analyst with the Chronic Disease Section of the Bureau of Epidemiology, Florida Department of Health. Ms. Babu can be contacted at 850.245.4444, ext 2418 or by email at [Aruna\\_Surenderababu@doh.state.fl.us](mailto:Aruna_Surenderababu@doh.state.fl.us).**

# Hepatitis Awareness Month --- May 2010

*From the May 7, 2010 Centers for Disease Control and Prevention "Morbidity and Mortality Weekly Report" (MMWR)*

May 2010 marks the 15th anniversary of Hepatitis Awareness Month in the United States, and May 19 is World Hepatitis Day. Globally, viral hepatitis is the cause of most (78%) primary liver cancer, the third leading cause of cancer deaths in the world (1). Prevention of hepatitis B and hepatitis C virus transmission and treatment for early disease can prevent primary liver cancer (2). This issue of *MMWR* includes a report describing vaccination of at-risk adults with hepatitis B vaccine in California and a report on continued increases in hepatocellular carcinoma incidence in the United States.

The Institute of Medicine (IOM) recently issued *Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and Hepatitis C*. The IOM strategy has four components: 1) accurate public health surveillance, 2) innovative approaches to community education, 3) immunization capacity to eliminate hepatitis B virus transmission, and 4) development of viral hepatitis services, including screening with referral for medical management. Taken together, these strategies can reduce morbidity associated with viral hepatitis, including primary liver cancer.

Additional information about viral hepatitis is available at <http://www.cdc.gov/hepatitis>. The IOM report is available at <http://www.iom.edu>. Information about World Hepatitis Day activities is available at <http://www.nvhr.org/WHD-2009.htm>.

## References

1. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. *CA Cancer J Clin* 2005;55:74--108.
2. Cardoso AC, Moucari R, Figueiredo-Mendes C, et al. Impact of peginterferon and ribavirin therapy on hepatocellular carcinoma: incidence and survival in hepatitis C patients with advanced fibrosis. *J Hepatol* 2010;52:652--7.