Methodology for Diabetes projections

Baseline Prevalence

To project the future prevalence of diabetes for adults in the State of Texas and for Texas Counties, we began with prevalence distributions from the Behavioral Risk Factor Surveillance Survey (BRFSS) for the State of Texas for 2007. We calculated prevalence rates for groups defined by age, gender, race and Hispanic origin for the State of Texas, for adults ages 18 and older. We applied these group specific rates to population denominators from the Texas State Data Center 2007 population estimates to get baseline prevalence estimates for 2007.

We estimate a state-wide prevalence rate for adult diabetes in 2007 of 9.9 percent. The prevalence estimates do not match exactly the estimates from the BRFSS itself because of differences in the population denominators. BRFSS state-wide prevalence estimates were 10.3 percent for 2007. Prevalence was defined with respect to affirmative answers to the question "Have you ever been told by a doctor that you have diabetes". No classification of diabetes by type is presented in the analysis. There is no attempt to correct for or estimate undiagnosed cases.

Inputs to change in projection model

Future prevalence was projected from this base using inputs from the Texas State Data Center 2000-2004 migration scenario projection model, incidence rates estimated from 2005-2006 Behavioral Risk Factor Surveillance Survey for Texas, and modifications to mortality rates by diabetes status based on analysis of NHANES Epidemiological follow-up data reported by Gu, Cowie and Harris (1998), as described below.

Texas State Data Center 2000-2004 Migration Scenario Projection Model

The Texas State Data Center produces cohort-component projections of the future population of the State of Texas. Input fertility and mortality rates by age, race, Hispanic origin and (for mortality) gender were calculated from vital statistics registered births and deaths linked to census denominators,

as described at the Texas State Data Center website. Net migration rates were calculated by the residual method comparing 2004 population estimates to census counts by age, sex, race, and Hispanic origin as described in the same source. Changes to population based on fertility and migration were directly adopted from the standard projection model. Baseline mortality rates were modified as described below. (http://txsdc.utsa.edu/tpepp/2008projections/2008_txpopprj_method.php). New entrants were assumed to share the age, sex, race, Hispanic origin-specific prevalence of obesity and diabetes as the resident population.

The 2000-2004 migration scenario was adopted to reflect growth patterns in this decade. It is preferred for purpose of building longer range projections to the 2000-2007 migration scenario, because the latter was distorted by the impacts of migration flows to the state after Hurricane Katrina displaced Gulf Coast residents to Texas from impacted areas.

We have previously reported projections of prevalence rates for obesity in Texas, that were also based on the 2000-2004 migration scenario, and are summarized here: (http://txsdc.utsa.edu/download/pdf/obesity/THI_Obesity_Summary_Appendix.pdf). We used these projections of obesity to modify projected incidence, using rates developed as described below.

Incidence Rates

Incidence rates were calculated from responses to two questions from the 2005/2006 BRFSS. The first question, as reported above, was self-report of a doctor's diagnosis. Respondents who replied affirmatively were asked age at diagnosis. Age at diagnosis was converted to years since diagnosis by subtraction from current age, and all cases with 0 years and one-half of cases with 1 year since diagnosis are coded as incident cases. Denominators were all persons with incident cases and persons without diabetes.

Incidence rates were calculated by age group, gender, ethnicity, and obesity status. After analysis of incidence patterns, non-Hispanic—white and "Other"—primarily Asians—were combined

into a single group, and African Americans and Hispanics were combined into a single group. We fit a main effects model for age, gender, ethnicity and obesity status and developed the annual incidence rates reported in Table 1.

Table 1. Diabetes incidence rates used in Texas State Data Center projections by age, gender and ethnicity

	White and Other				Black and Hispanic			
Age	Male		Female		Male		Female	
	Not Obese	Obese	Not Obese	Obese	Not Obese	Obese	Not Obese	Obese
18-34	0.2%	0.4%	0.1%	0.3%	0.2%	0.5%	0.2%	0.4%
35-44	0.2%	1.1%	0.1%	1.0%	0.2%	1.5%	0.2%	1.3%
45-54	0.6%	5.5%	0.5%	4.7%	0.8%	7.5%	0.7%	6.5%
55-64	1.7%	3.4%	1.5%	2.9%	2.4%	4.6%	2.0%	4.0%
65+	1.6%	3.7%	1.4%	3.2%	2.2%	5.0%	1.9%	4.3%

Mortality rates used for the diabetes projection

We used different mortality rates for those with and without diabetes in this projection. After reviewing existing research and reports on this topic (Gu, Cowie and Harris 1998; Honeycutt et. al. 2003; and Tierney et. al. 2004), we decided to use the results from Gu, Cowie and Harris (1998) as our basis to determine the mortality differentials.

Using NHANES I (1971-1975) and its follow-up data (1992-1993), Gu, Cowie and Harris (1998) calculated deaths during the follow-up years and rates per 1,000 person-years for those with and without diabetes by race/ethnicity, sex and age groups. We used the mortality rate ratios between those with and without diabetes but made two adjustments. Assuming that the rate ratio has a positive relationship with years of age, we extrapolated the ratios between age 26 and age 64 to get a ratio for single years of age. This was done separately for the four sex-race/ethnic groups available in the Gu, Cowie and Harris (1998) report : Non-Hispanic Whites and Non-Hispanic Blacks of both sex groups. We also assumed that the ratios would be the same for Hispanics with Non-Hispanics Blacks, and for Other with Non-Hispanic Whites of the corresponding sex-age groups.

We then used these ratios to derive mortality rates from the SDC survival rates for Texas in 2007. These rates have been used in the SDC population projections and we used the 2007 survival rates to get our mortality rates for Non-Hispanic Whites, Non-Hispanic Blacks, Hispanics and Other by sex and single year of age. We then made the assumption that these mortality rates are the result of the mortality rates of those with and without diabetes weighted by their share in the population in 2007 (formula 1). And with the age-sex-race/ethnic diabetes prevalence rates we calculated from Texas BRFSS 2007, we thus got our mortality rates for the diabetic and non-diabetic population (formulas 2 and 3):

SDC Mortality Rate = Prevalence rate*Mortality Rate (Diabetes) + (1-Prevalence Rate)*Mortality rate (No Diabetes) (1)

Mortality Rate (Diabetes) = SDC Mortality Rate/(Prevalence rate+(1-Prevalence rate)/Rate ratio) (2)

Mortality Rate (No Diabetes) = SDC Mortality Rate /(Prevalence rate*(Rate ratio-1)+1) (3)

Mortality rates used in the analysis are reported in Table 2.

Table 2. Mortality rates per 1,000 by race, Hispanic Origin, gender and diabetes status

	White/Other				African American				Hispanic			
Age	Male		Female		Male		Female		Male		Female	
	Diabetes	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**
18	8.0	1.3	2.0	0.5	2.5	1.1	1.4	0.6	6.3	1.0	1.2	0.3
19	7.7	1.2	2.4	0.6	3.3	1.5	1.3	0.5	6.9	1.1	1.5	0.4
20	8.1	1.3	1.8	0.5	3.4	1.5	1.7	0.7	7.3	1.2	1.2	0.3
21	8.0	1.3	2.1	0.5	4.1	1.8	1.6	0.6	6.5	1.0	1.4	0.3
22	8.1	1.3	1.6	0.4	3.8	1.7	1.9	0.7	6.4	1.0	1.1	0.3
23	7.3	1.2	1.8	0.5	3.5	1.6	1.7	0.7	5.9	0.9	1.3	0.3
24	7.6	1.2	1.7	0.4	4.0	1.8	1.4	0.5	6.5	1.1	1.2	0.3
25	6.0	1.0	2.2	0.5	4.7	2.1	3.0	1.1	5.6	0.9	1.1	0.3
26	6.0	1.0	2.1	0.5	4.2	1.9	2.5	1.0	5.8	1.0	1.4	0.4
27	5.6	1.0	2.2	0.6	4.2	1.9	2.0	0.8	5.1	0.9	1.4	0.4
28	6.5	1.2	1.8	0.5	4.8	2.2	2.3	0.9	5.8	1.0	1.2	0.3
29	6.7	1.2	2.5	0.7	4.2	1.9	2.5	1.0	5.6	1.0	1.3	0.4

Table 2. Mortality rates per 1,000 by race, Hispanic Origin, gender and diabetes status

	White/Other				African American				Hispanic			
Age	Male		Female		Male		Female		Male		Female	
	Diabetes	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**
30	5.5	1.1	2.1	0.6	4.8	2.2	2.6	1.1	5.3	1.0	1.6	0.4
31	5.8	1.2	2.2	0.6	4.8	2.2	2.7	1.1	4.3	0.9	1.2	0.3
32	5.3	1.1	2.5	0.7	3.5	1.6	3.3	1.3	5.0	1.1	1.6	0.5
33	6.0	1.3	2.4	0.7	5.1	2.3	2.9	1.2	5.3	1.2	1.5	0.5
34	6.0	1.4	2.8	0.9	4.7	2.2	3.4	1.4	4.8	1.1	1.7	0.5
35	6.3	1.5	2.7	0.8	5.1	2.3	3.6	1.5	5.4	1.3	1.5	0.5
36	6.7	1.7	3.1	1.0	6.1	2.8	3.0	1.2	4.6	1.2	2.0	0.6
37	6.2	1.7	3.2	1.0	6.4	2.9	4.2	1.8	5.7	1.5	1.9	0.6
38	6.6	1.9	2.9	1.0	7.0	3.2	3.7	1.6	4.8	1.4	1.9	0.6
39	6.5	2.0	3.3	1.1	6.4	2.9	5.0	2.1	4.7	1.5	1.8	0.6
40	7.1	2.3	3.7	1.3	8.8	4.0	5.4	2.4	5.6	1.9	2.3	0.8
41	7.4	2.6	4.0	1.4	8.8	4.0	5.8	2.6	5.2	1.8	2.4	0.8

Table 2. Mortality rates per 1,000 by race, Hispanic Origin, gender and diabetes status

	White/Other				African American				Hispanic			
Age	Male		Female		Male		Female		Male		Female	
	Diabetes	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**
42	7.0	2.6	3.9	1.4	8.5	3.9	5.8	2.6	5.5	2.1	2.5	0.9
43	7.6	3.1	4.2	1.6	11.0	5.0	7.2	3.2	5.8	2.4	2.8	1.1
44	7.5	3.4	4.5	1.8	10.6	4.8	7.3	3.3	6.0	2.7	3.2	1.2
45	6.9	3.5	4.5	1.8	11.4	5.2	7.8	3.5	6.3	3.2	3.0	1.2
46	7.3	3.7	4.5	1.8	11.2	5.2	6.7	3.1	6.1	3.1	3.2	1.3
47	7.6	3.9	4.9	2.0	13.7	6.4	7.8	3.7	6.9	3.5	3.7	1.5
48	8.7	4.5	4.9	2.1	14.2	6.8	8.1	3.9	7.4	3.9	3.6	1.5
49	8.8	4.7	5.6	2.4	15.7	7.7	10.3	5.1	7.7	4.1	4.4	1.9
50	9.6	5.2	5.9	2.6	16.8	8.4	11.1	5.5	8.1	4.4	4.3	1.9
51	9.3	5.1	6.5	2.9	16.8	8.6	9.5	4.9	8.8	4.8	5.1	2.3
52	10.6	5.9	6.8	3.1	19.0	9.9	11.6	6.0	8.7	4.9	5.6	2.5
53	10.8	6.2	7.6	3.5	17.9	9.5	11.4	6.1	9.5	5.4	6.6	3.0

Table 2. Mortality rates per 1,000 by race, Hispanic Origin, gender and diabetes status

	White/Other				African American				Hispanic			
Age	Male		Female		Male		Female		Male		Female	
	Diabetes	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**
54	10.5	6.1	7.0	3.3	21.3	11.6	12.1	6.6	9.4	5.5	6.2	2.9
55	10.3	6.0	8.2	3.9	22.3	12.4	11.2	6.2	11.6	6.8	6.4	3.1
56	12.5	7.5	9.9	4.8	20.3	11.5	14.1	8.0	10.8	6.5	6.8	3.3
57	13.1	8.0	10.1	5.0	23.7	13.8	15.8	9.2	11.3	6.9	7.1	3.5
58	13.6	8.4	10.5	5.3	24.9	14.8	16.6	9.9	13.3	8.2	7.7	3.9
59	14.5	9.2	11.5	5.9	27.8	17.0	15.5	9.4	13.7	8.7	9.8	5.1
60	16.7	10.8	12.4	6.5	27.1	16.9	15.9	10.0	14.0	9.0	10.4	5.5
61	17.4	11.5	14.3	7.7	29.2	18.7	18.9	12.1	15.8	10.4	12.4	6.7
62	18.9	12.7	14.9	8.2	31.5	20.7	19.5	12.8	15.8	10.6	11.2	6.2
63	20.2	13.8	16.0	9.0	32.7	22.1	21.8	14.7	19.8	13.6	13.6	7.6
64	21.9	15.3	17.5	10.0	35.2	24.5	23.5	16.3	19.2	13.4	13.1	7.6
65	24.0	17.1	19.2	11.3	40.8	27.2	25.3	18.1	19.2	13.7	14.8	8.7

Table 2. Mortality rates per 1,000 by race, Hispanic Origin, gender and diabetes status

	White/Other				African American				Hispanic			
Age	Male		Female		Male		Female		Male		Female	
	Diabetes	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**
66	24.2	17.3	19.9	11.7	40.6	27.0	24.1	17.2	22.8	16.3	15.9	9.3
67	27.3	19.5	21.2	12.5	42.6	28.4	27.9	19.9	25.4	18.1	16.2	9.6
68	30.5	21.8	23.5	13.8	46.0	30.7	32.7	23.3	22.7	16.2	19.5	11.5
69	33.8	24.2	26.3	15.5	50.2	33.5	32.9	23.5	30.8	22.0	20.6	12.1
70	34.9	24.9	28.9	17.0	54.0	36.0	38.6	27.6	31.5	22.5	23.3	13.7
71	38.0	27.1	30.3	17.8	58.9	39.3	38.9	27.8	34.9	25.0	25.9	15.2
72	42.3	30.2	33.6	19.8	68.2	45.5	38.7	27.6	37.9	27.1	27.8	16.4
73	48.2	34.4	39.0	23.0	69.5	46.3	41.3	29.5	39.7	28.4	29.0	17.0
74	50.6	36.1	42.4	24.9	70.0	46.6	48.2	34.4	43.3	30.9	33.5	19.7
75	54.9	39.2	47.6	28.0	83.2	55.4	51.7	36.9	50.1	35.8	35.6	20.9
76	59.4	42.4	52.0	30.6	81.7	54.5	55.0	39.3	54.1	38.6	42.5	25.0
77	65.0	46.4	56.9	33.5	93.3	62.2	56.0	40.0	60.6	43.3	41.8	24.6

Table 2. Mortality rates per 1,000 by race, Hispanic Origin, gender and diabetes status

	White/Other				African American				Hispanic			
Age	Male		Female		Male		Female		Male		Female	
	Diabetes	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**	**Diabetes**	**No Diabetes**
78	71.6	51.1	61.9	36.4	99.1	66.0	62.4	44.6	60.8	43.4	49.5	29.1
79	78.7	56.2	67.4	39.7	109.3	72.8	66.7	47.6	68.6	49.0	51.4	30.2
80	83.1	59.3	76.6	45.0	113.3	75.5	72.6	51.8	78.0	55.7	60.8	35.8
81	93.5	66.8	79.9	47.0	110.4	73.6	87.9	62.8	77.9	55.6	58.8	34.6
82	101.9	72.8	91.6	53.9	123.6	82.4	81.7	58.3	82.7	59.1	63.6	37.4
83	115.6	82.6	103.5	60.9	121.7	81.2	92.0	65.7	92.3	65.9	85.4	50.2
84	124.9	89.2	114.4	67.3	139.3	92.9	101.3	72.3	99.4	71.0	81.7	48.1
85	185.3	132.4	197.6	116.3	189.1	126.0	155.5	111.1	152.7	109.1	151.9	89.3

County and regional projections

Once statewide projections were complete, we used the Texas State Data Center 2000-2004 projections of the population by age, gender, race, and Hispanic origin to allocate projected cases to counties and regions. In making this allocation, we first "weighted" the Hispanic denominators for the United States –born by the ratio of the prevalence rate for diabetes for native-born Hispanics compared to foreign-born Hispanics in the baseline data (Odds ratio for prevalent diabetes = 1.19 for U.S.-born). We used baseline distribution of immigrants/natives in the Hispanic population in each county from the Census 2000 results to assign weights. The net effect of the weighting was to raise the projected prevalence rates in counties like Bexar where the county Hispanic population is predominantly native-born, and lower it in counties like Harris and Dallas where the county Hispanic population has a larger representation of immigrants. The magnitude of the adjustment of the overall county rates was less than 2% for the counties that were most affected.

County	Diabetes 2010	Diabetes 2020	Diabetes 2030	Diabetes 2040	Change Rate 2010-2040
State of Texas	2,221,727	3,903,995	5,783,481	7,980,225	259%
Anderson County	5,638	9,295	12,061	13,494	139%
Andrews County	1,325	1,946	2,195	2,303	74%
Angelina County	7,681	11,853	15,157	18,184	137%
Aransas County	3,096	5,154	6,214	6,212	101%
Archer County	817	1,256	1,450	1,563	91%
Armstrong County	211	292	313	282	34%
Atascosa County	4,976	8,698	11,930	14,473	191%
Austin County	2,901	5,210	7,165	8,871	206%
Bailey County	713	1,040	1,199	1,276	79%
Bandera County	2,322	4,139	5,219	5,403	133%
Bastrop County	8,156	18,249	32,331	52,555	544%
Baylor County	464	664	712	619	33%
Bee County	3,340	4,943	5,972	6,454	93%
Bell County	21,132	35,516	49,407	59,598	182%
Bexar County	160,603	254,303	333,804	399,422	149%
Blanco County	1,108	2,035	2,682	2,922	164%
Borden County	87	128	131	122	41%
Bosque County	1,923	3,019	3,591	3,799	98%
Bowie County	9,166	14,174	17,882	19,899	117%
Brazoria County	26,714	50,708	76,419	105,195	294%
Brazos County	11,072	18,738	26,119	32,440	193%
Brewster County	1,075	1,574	1,841	1,979	84%
Briscoe County	206	285	304	296	43%
Brooks County	1,131	1,483	1,666	1,764	56%
Brown County	3,842	5,831	6,863	7,183	87%
Burleson County	1,983	3,278	4,057	4,237	114%
Burnet County	4,604	8,821	12,423	14,419	213%
Caldwell County	3,915	6,814	9,677	12,436	218%
Calhoun County	2,209	3,117	3,511	3,595	63%
Callahan County	1,307	1,959	2,187	2,170	66%
Cameron County	42,990	69,668	94,565	116,611	171%
Camp County	1,458	2,462	3,254	3,804	161%
Carson County	589	818	867	831	41%
Cass County	3,220	4,482	4,774	4,353	35%
Castro County	900	1,316	1,481	1,521	69%
Chambers County	2,939	5,617	8,431	11,941	306%
Cherokee County	4,736	7,399	9,186	10,290	117%
Childress County	710	955	1,049	1,084	53%
Clay County	1,085	1,615	1,805	1,681	55%
Cochran County	443	643	757	798	80%
Coke County	438	626	686	689	57%
Coleman County	957	1,313	1,448	1,402	46%
Collin County	62,432	168,052	341,622	606,480	871%
Collingsworth County	349	483	528	518	48%

County	Diabetes 2010	Diabetes 2020	Diabetes 2030	Diabetes 2040	Change Rate 2010-2040
Colorado County	2,531	4,009	5,040	5,579	120%
Comal County	10,852	22,011	32,844	40,840	276%
Comanche County	1,463	2,098	2,386	2,480	69%
Concho County	471	790	936	839	78%
Cooke County	3,704	6,307	8,162	9,330	152%
Coryell County	5,208	8,042	9,803	10,383	99%
Cottle County	223	299	318	309	39%
Crane County	453	707	831	854	88%
Crockett County	543	795	872	852	57%
Crosby County	821	1,167	1,314	1,408	71%
Culberson County	417	608	691	720	73%
Dallam County	591	914	1,076	1,108	87%
Dallas County	199,578	320,296	444,100	560,291	181%
Dawson County	1,642	2,248	2,465	2,456	50%
Deaf Smith County	1,900	2,737	3,284	3,538	86%
Delta County	536	799	899	861	61%
Denton County	51,140	131,003	263,008	461,977	803%
De Witt County	2,375	3,417	3,993	4,153	75%
Dickens County	349	556	721	749	115%
Dimmit County	1,326	1,795	2,044	2,088	57%
Donley County	457	736	875	858	88%
Duval County	1,757	2,326	2,588	2,624	49%
Eastland County	1,921	2,782	3,118	3,010	57%
Ector County	12,276	19,222	25,117	30,004	144%
Edwards County	286	398	432	431	51%
Ellis County	13,087	27,894	49,163	82,592	531%
El Paso County	79,057	118,613	152,108	179,599	127%
Erath County	2,660	4,093	5,126	6,055	128%
Falls County	1,923	2,613	2,877	3,023	57%
Fannin County	3,345	5,407	6,699	7,291	118%
Fayette County	2,648	4,372	5,608	6,339	139%
Fisher County	476	634	661	618	30%
Floyd County	856	1,287	1,522	1,660	94%
Foard County	178	246	261	247	38%
Fort Bend County	52,631	126,268	219,316	338,090	542%
Franklin County	1,043	1,608	1,836	1,753	68%
Freestone County	2,012	3,179	3,956	4,331	115%
Frio County	1,886	2,701	3,129	3,208	70%
Gaines County	1,366	2,068	2,484	2,712	99%
Galveston County	28,035	46,861	63,308	79,532	184%
Garza County	577	978	1,244	1,410	144%
Gillespie County	2,891	5,045	6,410	6,542	126%
Glasscock County	149	241	270	269	81%
Goliad County	924	1,344	1,506	1,465	58%
Gonzales County	2,202	3,320	4,111	4,623	110%

County	Diabetes 2010	Diabetes 2020	Diabetes 2030	Diabetes 2040	Change Rate 2010-2040
Gray County	2,037	2,736	2,964	2,897	42%
Grayson County	10,968	17,665	22,931	27,345	149%
Gregg County	10,960	17,189	23,206	30,972	183%
Grimes County	2,772	4,385	5,255	5,332	92%
Guadalupe County	11,575	22,751	34,907	48,721	321%
Hale County	3,500	4,975	5,709	5,832	67%
Hall County	413	583	706	772	87%
Hamilton County	875	1,285	1,402	1,311	50%
Hansford County	532	790	928	1,001	88%
Hardeman County	489	695	760	720	47%
Hardin County	4,572	7,220	8,658	9,268	103%
Harris County	340,886	583,537	865,388	1,187,469	248%
Harrison County	6,264	9,270	10,992	12,151	94%
Hartley County	510	696	721	678	33%
Haskell County	680	905	970	904	33%
Hays County	13,168	32,693	65,340	112,455	754%
Hemphill County	335	485	514	519	55%
Henderson County	8,519	14,163	18,167	20,900	145%
Hidalgo County	75,725	140,401	220,069	313,551	314%
Hill County	3,660	5,973	7,480	8,434	130%
Hockley County	2,281	3,309	3,989	4,242	86%
Hood County	5,424	10,199	14,563	18,926	249%
Hopkins County	3,271	5,123	6,222	6,572	101%
Houston County	2,695	3,938	4,499	4,714	75%
Howard County	3,563	5,309	6,111	5,932	66%
Hudspeth County	471	794	1,039	1,202	155%
Hunt County	7,708	13,088	18,494	25,271	228%
Hutchinson County	2,095	2,870	3,042	2,796	33%
Irion County	224	323	346	319	42%
Jack County	775	1,104	1,208	1,129	46%
Jackson County	1,524	2,204	2,489	2,524	66%
Jasper County	3,579	5,112	5,640	5,368	50%
Jeff Davis County	353	594	732	820	132%
Jefferson County	24,379	33,741	40,949	49,032	101%
Jim Hogg County	759	1,020	1,131	1,186	56%
Jim Wells County	4,881	6,911	7,996	8,322	70%
Johnson County	13,477	26,776	44,258	73,396	445%
Jones County	1,887	2,517	2,692	2,609	38%
Karnes County	1,660	2,408	2,860	3,013	82%
Kaufman County	9,230	20,758	38,213	67,837	635%
Kendall County	3,465	7,310	10,887	13,370	286%
Kenedy County	65	100	114	113	74%
Kent County	106	144	134	111	4%
Kerr County	5,640	9,003	10,909	10,866	93%
Kimble County	544	821	934	884	62%

County	Diabetes 2010	Diabetes 2020	Diabetes 2030	Diabetes 2040	Change Rate 2010-2040
King County	37	59	66	64	74%
Kinney County	458	589	641	649	42%
Kleberg County	3,530	4,992	5,958	6,264	77%
Knox County	466	639	702	714	53%
Lamar County	4,853	7,365	8,447	8,202	69%
Lamb County	1,643	2,359	2,882	3,157	92%
Lampasas County	2,251	4,404	6,517	8,473	276%
La Salle County	782	1,071	1,210	1,283	64%
Lavaca County	2,109	3,136	3,638	3,699	75%
Lee County	1,686	2,806	3,721	4,569	171%
Leon County	2,042	3,343	4,034	3,964	94%
Liberty County	7,327	13,080	18,523	24,582	236%
Limestone County	2,406	3,683	4,435	4,654	93%
Lipscomb County	314	461	518	498	58%
Live Oak County	1,447	2,055	2,260	2,143	48%
Llano County	2,343	3,386	3,769	3,789	62%
Loving County	9	15	15	12	25%
Lubbock County	21,309	30,983	37,563	41,228	93%
Lynn County	757	1,090	1,216	1,246	65%
McCulloch County	928	1,302	1,405	1,338	44%
McLennan County	19,520	29,386	38,872	49,117	152%
McMullen County	126	185	207	199	59%
Madison County	1,363	2,113	2,416	2,406	76%
Marion County	1,386	1,964	2,034	1,818	31%
Martin County	497	756	892	950	91%
Mason County	521	808	893	828	59%
Matagorda County	3,877	5,558	6,376	6,646	71%
Maverick County	5,836	8,777	10,854	12,236	110%
Medina County	4,726	7,791	9,927	11,083	134%
Menard County	338	509	556	484	43%
Midland County	11,485	18,211	23,854	28,867	151%
Milam County	2,756	4,292	5,212	5,721	108%
Mills County	548	757	786	707	29%
Mitchell County	1,071	1,556	1,750	1,734	62%
Montague County	2,042	3,088	3,465	3,309	62%
Montgomery County	37,800	89,356	160,763	259,418	586%
Moore County	1,842	2,900	3,636	4,074	121%
Morris County	1,455	2,037	2,235	2,176	50%
Motley County	165	221	222	197	19%
Nacogdoches County	5,494	8,736	11,129	13,147	139%
Navarro County	4,741	7,804	10,958	14,843	213%
Newton County	1,533	2,114	2,171	1,973	29%
Nolan County	1,613	2,220	2,419	2,404	49%
Nueces County	32,651	44,917	52,309	56,624	73%
Ochiltree County	832	1,310	1,648	1,891	127%

County	Diabetes 2010	Diabetes 2020	Diabetes 2030	Diabetes 2040	Change Rate 2010-2040
Oldham County	209	319	358	363	74%
Orange County	7,664	11,252	12,683	12,753	66%
Palo Pinto County	2,692	4,072	4,868	5,539	106%
Panola County	2,307	3,270	3,609	3,445	49%
Parker County	10,247	21,257	34,612	53,199	419%
Parmer County	1,009	1,528	1,804	1,951	93%
Pecos County	1,816	2,501	2,880	3,005	65%
Polk County	5,580	10,117	13,475	14,808	165%
Potter County	10,656	16,944	22,914	28,641	169%
Presidio County	982	1,376	1,632	1,850	88%
Rains County	1,319	2,601	3,626	4,012	204%
Randall County	9,647	15,902	20,797	24,687	156%
Reagan County	375	598	739	790	111%
Real County	422	640	706	665	58%
Red River County	1,534	2,091	2,226	2,166	41%
Reeves County	1,547	1,999	2,074	1,906	23%
Refugio County	1,009	1,392	1,530	1,540	53%
Roberts County	103	160	182	169	64%
Robertson County	1,830	2,657	3,005	3,056	67%
Rockwall County	6,824	19,824	43,295	87,308	1179%
Runnels County	1,199	1,650	1,793	1,752	46%
Rusk County	4,996	7,551	8,912	9,456	89%
Sabine County	1,332	1,891	1,984	1,785	34%
San Augustine County	1,130	1,638	1,779	1,742	54%
San Jacinto County	2,640	4,081	4,619	4,483	70%
San Patricio County	7,032	10,393	12,145	12,623	80%
San Saba County	646	926	1,075	1,140	77%
Schleicher County	368	527	598	633	72%
Scurry County	1,604	2,255	2,568	2,670	66%
Shackelford County	315	445	473	440	39%
Shelby County	2,615	3,924	4,703	5,015	92%
Sherman County	319	478	546	556	74%
Smith County	18,743	31,058	44,130	62,468	233%
Somervell County	765	1,441	2,066	2,638	245%
Starr County	6,699	10,820	14,601	17,985	168%
Stephens County	915	1,278	1,451	1,543	69%
Sterling County	161	242	276	271	68%
Stonewall County	190	253	270	245	29%
Sutton County	522	777	880	867	66%
Swisher County	847	1,190	1,376	1,469	73%
Tarrant County	144,686	271,035	434,284	658,438	355%
Taylor County	10,756	15,647	19,139	21,064	96%
Terrell County	167	232	235	220	32%
Terry County	1,359	1,916	2,172	2,315	70%
Throckmorton County	199	258	267	242	22%

County	Diabetes 2010	Diabetes 2020	Diabetes 2030	Diabetes 2040	Change Rate 2010-2040
Titus County	2,812	4,789	6,480	7,881	180%
Tom Green County	9,668	13,586	15,749	16,585	72%
Travis County	74,631	131,400	190,885	238,859	220%
Trinity County	1,745	2,665	3,068	2,998	72%
Tyler County	2,190	3,179	3,468	3,300	51%
Upshur County	3,668	5,727	6,979	7,910	116%
Upton County	421	601	663	659	57%
Uvalde County	2,923	4,129	4,845	5,194	78%
Val Verde County	5,435	8,047	9,728	10,703	97%
Van Zandt County	5,240	8,392	10,083	10,479	100%
Victoria County	8,644	12,607	15,237	16,986	96%
Walker County	5,310	7,714	9,055	9,252	74%
Waller County	3,758	6,785	10,272	14,581	288%
Ward County	1,242	1,705	1,886	1,940	56%
Washington County	3,278	5,120	6,313	6,670	103%
Webb County	23,821	40,914	60,442	81,627	243%
Wharton County	4,489	6,684	8,146	8,974	100%
Wheeler County	514	677	706	680	32%
Wichita County	10,303	13,649	15,061	15,279	48%
Wilbarger County	1,410	2,010	2,299	2,333	65%
Willacy County	2,390	3,327	3,920	4,182	75%
Williamson County	31,793	78,899	147,885	243,082	665%
Wilson County	4,540	9,137	13,774	18,297	303%
Winkler County	789	1,144	1,289	1,322	68%
Wise County	4,901	8,696	11,511	13,713	180%
Wood County	4,889	8,203	9,895	9,810	101%
Yoakum County	778	1,203	1,419	1,539	98%
Young County	1,732	2,421	2,753	2,877	66%
Zapata County	1,821	3,226	4,772	6,555	260%
Zavala County	1,470	2,092	2,471	2,613	78%

County	Percent Diabetes 2010	Percent Diabetes 2020	Percent Diabetes 2030	Percent Diabetes 2040
State of Texas	11.9	17.1	20.8	23.8
Anderson County	11.8	18.7	24.2	28.8
Andrews County	13.0	19.1	21.9	25.2
Angelina County	12.2	17.6	21.2	24.1
Aransas County	14.5	21.7	25.9	28.2
Archer County	10.9	16.0	18.8	21.4
Armstrong County	12.3	17.6	19.5	20.1
Atascosa County	14.2	20.3	24.3	27.6
Austin County	13.0	19.4	23.3	26.2
Bailey County	14.0	19.6	22.0	24.0
Bandera County	13.1	19.9	23.4	25.0
Bastrop County	11.8	16.8	19.9	22.3
Baylor County	13.9	20.5	24.1	25.8
Bee County	12.2	17.5	21.2	24.4
Bell County	10.7	16.3	21.0	24.9
Bexar County	13.5	19.0	22.6	25.7
Blanco County	13.0	19.8	23.5	25.3
Borden County	13.2	20.3	24.6	28.6
Bosque County	13.0	19.1	22.0	23.7
Bowie County	12.4	18.4	23.3	27.3
Brazoria County	11.6	17.2	21.0	24.1
Brazos County	8.2	12.5	16.4	20.3
Brewster County	14.1	20.0	23.4	26.7
Briscoe County	13.9	19.8	23.2	25.6
Brooks County	18.3	23.4	26.0	28.9
Brown County	12.5	18.5	22.2	25.3
Burleson County	13.6	20.0	23.4	25.4
Burnet County	13.0	20.0	24.2	26.6
Caldwell County	13.0	18.3	21.8	25.2
Calhoun County	13.9	19.4	22.7	25.4
Callahan County	12.1	17.8	20.5	22.6
Cameron County	15.1	20.6	23.8	27.1
Camp County	13.8	19.6	23.0	24.7
Carson County	11.6	17.2	20.0	22.7
Cass County	13.5	19.5	23.1	25.7
Castro County	14.2	20.1	23.4	26.7
Chambers County	11.1	16.1	19.2	22.1
Cherokee County	12.4	18.1	21.7	24.4
Childress County	11.5	15.9	18.3	20.5
Clay County	11.8	17.4	20.7	22.4
Cochran County	14.4	20.8	23.9	27.1
Coke County	13.7	20.0	23.5	26.8
Coleman County	13.5	19.3	22.4	24.5
Collin County	9.9	15.6	20.1	23.5
Collingsworth County	13.8	19.9	23.8	27.2

County	Percent Diabetes 2010	Percent Diabetes 2020	Percent Diabetes 2030	Percent Diabetes 2040
Colorado County	14.3	20.8	24.7	27.8
Comal County	12.6	19.1	22.9	25.1
Comanche County	13.3	19.1	22.6	25.4
Concho County	13.4	23.8	32.7	37.4
Cooke County	11.8	18.0	22.0	25.0
Coryell County	8.9	13.7	18.0	21.8
Cottle County	14.8	21.1	24.7	27.4
Crane County	13.9	20.6	24.5	27.5
Crockett County	15.9	22.8	26.3	29.0
Crosby County	14.9	20.6	23.6	27.1
Culberson County	16.6	23.1	27.2	31.2
Dallam County	12.0	17.7	21.3	24.3
Dallas County	11.5	16.8	20.8	24.0
Dawson County	13.8	19.2	21.8	24.1
Deaf Smith County	13.7	19.0	22.2	25.2
Delta County	12.4	18.5	22.4	25.7
Denton County	9.0	13.8	17.9	21.6
De Witt County	14.6	21.0	24.8	28.0
Dickens County	13.7	21.0	27.1	31.6
Dimmit County	17.1	22.9	26.6	29.9
Donley County	13.2	20.2	24.6	27.6
Duval County	17.5	23.2	26.3	29.2
Eastland County	12.9	18.7	21.8	24.0
Ector County	13.0	18.9	22.8	26.5
Edwards County	15.6	22.4	26.8	31.1
Ellis County	11.2	16.5	20.2	24.1
El Paso County	14.4	19.5	23.0	26.5
Erath County	9.1	13.3	16.0	18.7
Falls County	13.1	17.7	20.1	22.8
Fannin County	11.7	16.9	19.5	20.7
Fayette County	13.5	19.6	22.8	24.5
Fisher County	14.4	20.4	24.3	27.5
Floyd County	14.4	20.6	24.3	27.7
Foard County	13.8	19.8	23.8	26.8
Fort Bend County	12.4	19.1	23.2	26.1
Franklin County	12.9	19.3	23.1	24.5
Freestone County	12.7	18.3	21.1	22.7
Frio County	14.8	20.6	24.3	27.3
Gaines County	12.2	17.8	20.8	23.9
Galveston County	12.5	17.8	21.1	23.9
Garza County	13.9	22.1	28.0	33.0
Gillespie County	14.4	21.8	26.2	28.1
Glasscock County	12.6	19.2	23.3	26.2
Goliad County	15.5	22.1	25.7	27.7
Gonzales County	14.2	20.3	24.0	27.5

County	Percent Diabetes 2010	Percent Diabetes 2020	Percent Diabetes 2030	Percent Diabetes 2040
Gray County	12.0	17.0	20.1	22.4
Grayson County	11.5	17.0	20.4	23.2
Gregg County	12.2	17.4	20.5	22.7
Grimes County	13.3	19.4	22.7	24.6
Guadalupe County	12.6	18.1	21.7	24.9
Hale County	13.0	18.5	22.0	25.1
Hall County	14.3	20.2	24.6	28.5
Hamilton County	12.9	19.1	22.5	24.2
Hansford County	12.7	18.3	20.8	22.4
Hardeman County	13.1	19.1	22.7	25.6
Hardin County	11.4	16.9	20.3	23.3
Harris County	11.6	16.4	20.1	23.3
Harrison County	12.6	18.3	21.4	23.6
Hartley County	11.3	15.8	17.6	18.4
Haskell County	14.3	20.4	23.1	24.7
Hays County	9.6	14.6	19.0	23.1
Hemphill County	12.3	18.3	21.1	24.3
Henderson County	12.8	18.8	22.0	23.7
Hidalgo County	14.0	19.2	22.9	26.7
Hill County	13.0	18.8	21.9	24.0
Hockley County	12.9	18.8	22.7	26.5
Hood County	12.7	18.9	22.2	24.1
Hopkins County	12.3	18.2	21.6	23.8
Houston County	13.7	19.5	22.9	25.4
Howard County	13.6	21.0	25.9	29.2
Hudspeth County	15.7	22.2	27.9	33.3
Hunt County	11.0	15.9	19.1	21.5
Hutchinson County	12.2	18.2	21.6	24.0
Irion County	14.2	21.3	26.3	30.2
Jack County	11.0	15.9	18.6	20.0
Jackson County	13.7	19.9	23.5	26.7
Jasper County	12.8	18.7	22.1	24.5
Jeff Davis County	15.7	23.4	28.9	34.4
Jefferson County	12.6	17.1	19.5	21.2
Jim Hogg County	18.3	23.8	26.8	30.2
Jim Wells County	16.2	22.1	25.4	28.3
Johnson County	10.8	15.6	18.5	21.3
Jones County	11.5	16.0	18.2	19.8
Karnes County	12.9	18.8	22.9	26.1
Kaufman County	11.2	16.5	19.9	23.1
Kendall County	12.7	19.6	23.7	25.4
Kenedy County	18.3	24.9	29.2	33.7
Kent County	14.6	21.7	25.1	27.1
Kerr County	14.4	21.2	25.4	27.7
Kimble County	14.6	21.7	25.8	28.4

County	Percent Diabetes 2010	Percent Diabetes 2020	Percent Diabetes 2030	Percent Diabetes 2040
King County	11.7	18.1	23.3	26.4
Kinney County	17.2	23.3	26.7	29.4
Kleberg County	13.4	18.6	22.7	26.3
Knox County	14.2	20.1	23.4	26.3
Lamar County	12.4	18.5	22.2	24.6
Lamb County	14.5	20.4	24.2	27.7
Lampasas County	12.0	18.0	21.6	24.5
La Salle County	16.2	21.5	23.5	26.0
Lavaca County	13.7	20.0	23.7	26.2
Lee County	12.3	17.8	21.2	24.6
Leon County	14.3	21.2	25.2	27.3
Liberty County	11.4	16.7	19.9	22.4
Limestone County	13.2	19.2	22.9	25.0
Lipscomb County	12.9	19.2	23.0	25.2
Live Oak County	14.4	21.5	26.1	29.1
Llano County	14.5	19.8	21.2	20.7
Loving County	14.9	23.9	31.0	35.9
Lubbock County	10.9	15.7	19.2	22.5
Lynn County	14.4	20.6	23.9	27.1
McCulloch County	14.3	20.3	23.4	25.5
McLennan County	11.3	15.7	19.1	22.5
McMullen County	16.4	24.4	30.5	36.2
Madison County	11.9	17.4	19.8	20.9
Marion County	15.0	21.5	24.8	26.8
Martin County	13.4	19.0	21.9	24.5
Mason County	15.5	23.0	27.2	29.5
Matagorda County	13.4	19.1	22.6	25.6
Maverick County	16.0	21.5	24.4	27.2
Medina County	13.6	19.7	23.4	26.3
Menard County	15.8	23.6	27.0	28.0
Midland County	12.5	18.4	22.2	25.8
Milam County	13.7	19.6	22.9	25.6
Mills County	13.3	19.1	21.1	21.7
Mitchell County	12.9	18.8	22.4	25.2
Montague County	12.8	19.0	22.4	24.1
Montgomery County	10.8	16.4	20.1	22.9
Moore County	12.1	17.9	22.3	26.5
Morris County	14.0	20.0	23.6	26.4
Motley County	14.2	20.2	24.1	27.2
Nacogdoches County	10.9	16.1	19.4	21.9
Navarro County	12.3	17.4	20.6	23.4
Newton County	12.7	18.0	20.8	23.0
Nolan County	13.6	19.4	22.8	25.9
Nueces County	13.6	18.5	21.6	24.5
Ochiltree County	11.6	17.1	20.2	22.6

County	Percent Diabetes 2010	Percent Diabetes 2020	Percent Diabetes 2030	Percent Diabetes 2040
Oldham County	11.2	17.0	20.7	24.7
Orange County	11.8	17.7	21.3	24.1
Palo Pinto County	12.3	17.8	20.7	23.2
Panola County	12.9	18.8	22.1	24.4
Parker County	10.9	16.7	20.6	23.9
Parmer County	13.1	18.9	22.5	26.0
Pecos County	13.6	18.7	22.1	25.6
Polk County	13.4	20.1	24.1	26.3
Potter County	11.5	16.6	20.4	24.0
Presidio County	16.4	21.3	22.8	24.7
Rains County	13.2	20.3	24.8	27.1
Randall County	10.7	16.1	20.2	24.0
Reagan County	13.5	20.4	24.7	28.0
Real County	15.6	22.4	26.6	29.2
Red River County	13.5	18.9	21.4	23.0
Reeves County	16.7	23.8	28.2	31.7
Refugio County	16.0	22.4	25.3	27.9
Roberts County	13.1	20.4	23.9	24.8
Robertson County	14.2	19.9	22.8	24.8
Rockwall County	10.5	15.9	19.4	22.1
Runnels County	13.8	19.6	22.6	25.1
Rusk County	12.9	18.8	21.9	23.8
Sabine County	14.8	21.3	24.6	26.3
San Augustine County	15.1	21.8	25.1	27.8
San Jacinto County	13.3	19.3	22.5	24.4
San Patricio County	13.6	19.4	22.8	25.5
San Saba County	12.8	18.8	22.2	25.2
Schleicher County	15.1	21.8	25.3	29.3
Scurry County	12.5	18.0	21.6	25.1
Shackelford County	12.1	17.5	19.8	20.9
Shelby County	12.9	18.6	21.9	24.0
Sherman County	12.4	18.3	22.3	26.0
Smith County	12.3	17.2	19.9	22.1
Somervell County	11.2	16.5	19.4	21.4
Starr County	15.3	20.4	23.2	26.1
Stephens County	11.9	16.9	19.2	21.5
Sterling County	13.5	20.6	25.2	29.4
Stonewall County	13.9	20.0	23.4	25.5
Sutton County	15.4	22.2	25.7	27.8
Swisher County	12.9	18.0	20.9	23.7
Tarrant County	10.9	15.9	19.4	22.3
Taylor County	10.7	15.7	19.6	22.9
Terrell County	17.6	24.5	29.8	35.0
Terry County	13.6	19.1	22.1	25.3
Throckmorton County	13.1	18.7	21.5	23.1

County	Percent Diabetes 2010	Percent Diabetes 2020	Percent Diabetes 2030	Percent Diabetes 2040
Titus County	12.3	18.1	22.1	25.3
Tom Green County	12.3	17.7	21.5	25.1
Travis County	10.3	15.9	21.0	25.2
Trinity County	14.2	20.8	24.1	26.1
Tyler County	12.4	17.7	20.3	21.9
Upshur County	12.3	18.0	20.9	22.9
Upton County	14.7	21.3	24.2	27.0
Uvalde County	14.7	19.8	22.6	25.2
Val Verde County	15.3	21.2	24.6	27.8
Van Zandt County	12.4	18.2	21.3	23.0
Victoria County	13.1	18.4	21.8	24.9
Walker County	9.2	13.3	16.3	18.7
Waller County	11.1	15.7	18.8	21.8
Ward County	14.4	20.2	23.3	26.6
Washington County	12.6	18.6	22.5	24.9
Webb County	13.7	18.1	21.1	24.0
Wharton County	13.6	19.4	23.2	26.8
Wheeler County	12.9	18.3	21.4	24.1
Wichita County	10.8	15.4	18.6	21.3
Wilbarger County	12.5	18.2	22.1	25.6
Willacy County	15.5	20.8	23.8	26.8
Williamson County	10.3	15.8	19.7	22.8
Wilson County	13.1	19.3	23.0	25.6
Winkler County	13.8	19.9	23.2	26.3
Wise County	10.6	15.7	18.1	19.4
Wood County	14.0	21.3	25.5	27.8
Yoakum County	13.4	19.8	22.7	25.8
Young County	12.4	17.7	20.5	22.9
Zapata County	15.9	21.6	25.2	28.9
Zavala County	16.8	22.8	26.8	30.4