

# Kentucky Diabetes Report

January 10

# 2013

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Report to the LRC on diabetes-related efforts in the Department for Medicaid Services, the Department for Public Health and the Office of Health Policy within the Cabinet for Health and Family Services, and Department for Employee Insurance within the Personnel Cabinet.

**KRS 211.752**

**Report to the LRC  
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## Report to the LRC KRS 211.752

### Executive Summary

#### Executive Summary: Kentucky Diabetes Report

This report is a result of a law enacted by the legislature and signed by Governor Steve Beshear in 2011. The statute requires that in odd numbered years, three agencies in the Cabinet for Health and Family Services; the Department for Public Health, the Department for Medicaid Services and the Office of Health Policy; and the Personnel Cabinet collaborate in developing a report on the impact of diabetes on the Commonwealth as well as proposing recommendations for how to address this epidemic.

The data in this report will demonstrate that diabetes is a common, serious and costly disease for Kentuckians. Consider the following highlights from the data on diabetes in Kentucky:

- The prevalence of diabetes has more than tripled since 1995 when an estimated 3.5% of adults had diabetes, compared to 10% in 2010, an increase of 158%. The current rate of diabetes nationally is 6.9%.
- Research by the CDC has shown that approximately 27% of people with diabetes have not been tested and diagnosed. For Kentucky, this would mean that in addition to the 370,000 patients diagnosed with diabetes, another 137,000 have undiagnosed diabetes, for a total of 507,000 adults living with diabetes.
- 233,000 Kentucky adults have been diagnosed with prediabetes and will progress to a diagnosis of diabetes if they do not receive proper medical care and take actions to halt the progress of the disease.
- Ten percent (10%) or 22,039 members of the Kentucky Employees Health Plan (2010) have diabetes.
- Medicaid members experience a very high rate of diabetes at 18% or 82,048 adults.
- In parts of eastern Kentucky, the rate of diabetes among Medicaid adults exceeds 20%.
- Nearly 1% or 3,874 Medicaid members younger than 19 years of age have diabetes.
- Nearly 30% of women who already have diabetes (not gestational diabetes) and become pregnant will be hospitalized prior to delivery.
- Over 60% of pregnant women with pre-existing diabetes (not gestational diabetes) will deliver by Cesarean section compared to 36% of pregnant women without diabetes.
- Hospitalizations for diabetes resulted in charges of \$183,000,000 in 2011.
- Emergency Department visits for diabetes resulted in charges of \$23,709,718 in 2011.

There is however also good news about diabetes. Diabetes is controllable, meaning that the serious complications of the disease such as blindness, kidney failure, lower extremity amputation and cardiovascular disease do not have to occur or can be significantly reduced if the disease is diagnosed early and managed well by the health care team and the patient. Following known standards of care in treatment with diet, physical activity and medications can bring blood sugar, cholesterol and blood pressure levels to near normal. The great challenge of diabetes is developing ways to bridge the gap

between what is KNOWN about how to treat the disease, what actually happens in healthcare practice and what patients do to manage their own health.

It is imperative that Kentucky prepare for an increasing burden of diabetes. The recommendations in this report represent a first step towards addressing the challenges of diabetes. Changes must occur in multiple parts of the health care system, community settings, and in personal behaviors in order to impact the diabetes epidemic. Many federal agencies have been active in responding to the diabetes epidemic, including the Department of Health and Human Services (HHS), the Centers for Disease Control and Prevention (CDC) and the National Institute of Diabetes and Digestive and Kidney Diseases. These agencies, along with non-government entities such as the American Diabetes Association, have amassed an impressive amount of evidence as to “what works” in diabetes control. Now is the time for Kentucky to take advantage of this information and take steps to support changes to improve diabetes care and prevention.

Opportunities for change include:

- Supporting expansion of a proven program for diabetes prevention called the Diabetes Prevention Program (DPP). This program is offered through 2 YMCA’s in Kentucky, Greater Louisville and Central Kentucky (Lexington). This program can be expanded to more YMCA organizations in Kentucky and to organizations other than YMCAs.
- Expand the availability of Diabetes Self-Management Education opportunities across a wide variety of possible providers ranging from local health departments, hospitals, primary care clinics, large employers, community centers and faith-based organizations.
- Support implementation of two strategic plans. The state Diabetes Plan and “Unbridled Health-A Plan for Coordinated Chronic Disease Prevention and Health Promotion.” Both plans were developed via large coalitions and stakeholders groups. These plans already contain the kind of initiatives that will help address prevention, as well as, dramatically improve diabetes care and diabetes outcomes.
- Implement pilot projects with the Kentucky Employee Health Plan (KEHP) such as integrating the DPP into the KEHP disease management and the HumanaVitality wellness program; and incentivizing KEHP plan members with diabetes to participate in Diabetes Self-Management Education (DSME).
- Work with KEHP and the Medicaid Managed Care Organizations to improve prediabetes testing and referral to an expanded group of providers of the DPP.
- Support policies that will move health care providers toward the use of electronic health records (EHR) AND connecting those EHR’s to the Kentucky Health Information Exchange (KHIE).
- Support policies to have laboratories operating in Kentucky submit the results of the key diabetes blood sugar test called A1C to the Kentucky Health Information Exchange.
- Require unique record identifiers on administrative claims data collected by the Office of Health Policy to allow Kentucky to better understand patterns of hospitalization and emergency department visits.
- Support expansion of the Kentucky Behavioral Risk Factor Survey (BRFS) to better understand the health disparities facing the Commonwealth.
- Take advantage of the opportunity for expansion of the access to care provision of the Affordable Care Act such as the Health Benefit Exchange and Medicaid eligibility expansion so that more uninsured people with diabetes are able to receive appropriate medical care and avoid costly, unnecessary hospitalizations or emergency department visits.

# Introduction

## Purpose of the Report

This report is a requirement of KRS 211.752. The statute requires that in odd numbered years, three agencies under the Cabinet for Health and Family Services; the Department for Public Health, the Department of Medicaid Services and the Office of Health Policy; and the Personnel Cabinet collaborate in developing a report on the impact of diabetes on the Commonwealth as well as proposing a plan and recommendations for how to address the epidemic. (See **Attachment A** for a copy of the legislation.)

This report will describe the scope of the diabetes epidemic in Kentucky, the cost and complications of diabetes, and how four agencies in Kentucky State government address diabetes in populations which they serve. In addition, we will also present recommendations on how to improve the health of Kentucky residents with, or at risk for, developing diabetes.

## Report Development

The Secretary of the Cabinet for Health and Family Services assigned oversight of the development of the report to the Department for Public Health (DPH). A committee with representatives from each of the entities named in the legislation was assembled to review the legislation and develop the report. This group met over a period of several months to share data about diabetes in the populations each entity serves, discuss how diabetes was addressed by each entity and develop a plan for future efforts. (See **Attachment B** for a list of the participants.)

Because Kentucky is one of the first states to pass this kind of legislation, it is envisioned that Kentucky's process and experience will be a potential model for other states pursuing or implementing related legislation. The National Association of Chronic Disease Directors (NACDD) is working with other states to assist them through this process. A representative from the NACDD, Ms. Marti Macchi, was invited to address the Kentucky group by teleconference to offer background/information from the national perspective and share experience from other states implementing similar legislation. She continued to participate with the group as the work progressed.

The group found the opportunity to collaborate in this way very beneficial. It has led to the generation of new ideas and renewed energy/excitement around diabetes prevention and control in Kentucky. We are pleased to offer the following report for your review and look forward to your feedback and future collaborative opportunities.

## Overview of Diabetes Impact

Diabetes is one of the leading causes of death and disability in the US. It was the 6<sup>th</sup> leading cause of death by disease in the U.S. and Kentucky<sup>1,2</sup>. Besides leading to premature death, both type 1 and type 2 diabetes are associated with long-term complications that threaten quality of life. Estimates from the 2010 Kentucky Behavioral Risk Factor Survey tell us that up to 370,000 adults in Kentucky have been diagnosed with diabetes while an additional 233,000 adults have prediabetes. Approximately 30,000 adults are newly diagnosed with the disease each year. Of those adults with diabetes, 10% are uninsured and 37% of those uninsured have incomes under \$15,000 per year. An additional 38% of adults with diabetes have incomes between \$15,000 and \$25,000 per year. Twenty-three percent of

Kentuckians with diabetes also smoke tobacco which greatly increases their risk of developing cardiovascular or nerve complications<sup>3</sup>.

Diabetes is the leading cause of adult blindness, end-stage kidney disease and non-traumatic lower-extremity amputations. People with diabetes are 2-4 times more likely to have coronary heart disease and stroke than people without diabetes. In addition, poorly controlled diabetes can complicate pregnancy resulting in preterm birth, preeclampsia, intrauterine growth restriction, congenital anomalies or intrauterine death. Many of these complications and deaths from diabetes can be prevented, delayed or significantly reduced with proven interventions. People with diabetes, along with their support network and their health care providers, can take steps to control the disease and lower the risk of complications by following the medical standards of care identified by the American Diabetes Association. Following good self-management habits such as eating a diabetes healthy diet, taking medications as directed and checking blood sugars as directed by their physician empower the patient to directly participate in their health outcomes.

### **What is Diabetes?**

Diabetes is a common chronic disease in which the amount of sugar (glucose) in a person's blood is too high. Either the body does not produce insulin or is not able to make use of the insulin it produces. Insulin is a hormone that is needed to convert sugar, starches and other food into energy needed by every cell in the body for daily life. When the amount of sugar circulating in the blood is too high, it causes damage to many parts of the body including the eyes, heart, blood vessels, kidneys and nerves. This damage makes diabetes the leading cause of adult blindness, end-stage kidney disease and amputations of the foot and/or leg. People with diabetes are also at greatly increased risk for heart disease and stroke. In addition, diabetes can cause serious complications during pregnancy resulting in more preterm births, more Cesarean sections due to larger babies, life threatening conditions such as preeclampsia, birth defects and increased risk of type 2 diabetes for both the mother and the child once she/he reaches adulthood.

### **What is Prediabetes?**

Prediabetes is a condition in which an individual's blood glucose or A1C levels (a blood test that provides an average of the patient's blood glucose levels over the last 12 weeks) are higher than normal, but not high enough to be classified as diabetes. People with prediabetes are at increased risk for developing type 2 diabetes, heart disease and stroke. Evidence has shown that people with prediabetes who lose weight and increase their physical activity can prevent or delay the development of type 2 diabetes and may even return blood sugar levels to normal.

### **How are Diabetes and Prediabetes Diagnosed?**

Appropriate blood testing for diabetes among those at risk for the disease is vital to ensure patients that those with elevated blood sugar levels or high A1C are identified as early as possible. Early diagnosis and appropriate treatment/management provides the best opportunity to prevent diabetes and its complications. Testing involves a simple blood test performed in a health care facility.

## Types of Diabetes

The major types of diabetes are:

- **Type 1** diabetes (previously known as “juvenile diabetes”) develops when the body does not produce insulin, which controls blood sugar (glucose) levels. To survive, people with type 1 diabetes must have insulin delivered by injections or an insulin pump. This form of diabetes usually strikes children and young adults, although disease onset can occur at any age. In adults, type 1 diabetes accounts of approximately 5% of all diagnosed cases of diabetes. **There is no known way to prevent type 1 diabetes.**
- **Type 2** diabetes usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. In adults, type 2 diabetes accounts for about 90-95% of all diagnosed cases of diabetes. Risk factors for type 2 diabetes include: older age, obesity, family history of diabetes, personal history of gestational diabetes, impaired glucose metabolism, physical inactivity and race/ethnicity. African Americans, Hispanic/Latino Americans, American Indians, some Asian Americans and Native Hawaiians or other Pacific Islanders are at particularly high risk for development of type 2 diabetes and its complications. Type 2 diabetes in children and adolescents, although still rare, is being diagnosed more frequently among African Americans, Hispanic/Latino Americans, American Indians and Asian/Pacific Islanders. Type 2 diabetes may be preventable through modest lifestyle changes.
- **Gestational Diabetes** is a form of glucose intolerance diagnosed during pregnancy. It occurs more frequently among African Americans, Hispanic/Latino Americans, and American Indians. It is also more common among obese women and women with family history of diabetes or gestational diabetes. During pregnancy, gestational diabetes requires treatment to optimize maternal blood glucose levels to lessen the risk of complications in the infant and mother. Women who have had gestational diabetes have a 35% - 60% chance of developing diabetes in the next 10-20 years.

## How is Diabetes Managed?

Diabetes can affect many parts of the body and can lead to serious complications such as blindness, kidney damage, and lower-limb amputations. Working together, people with diabetes, their support network and their health care providers can reduce the occurrence of these and other diabetes complications by controlling the levels of blood glucose, blood pressure and blood lipids, and by receiving other preventive care practices in a timely manner.

Managing diabetes is a complicated endeavor. Diabetes is managed by a combination of appropriate clinical care from a health care provider who understands diabetes care, combined with individual responsibility of the person with diabetes for taking medications as directed, making changes to their food choices and developing a regular pattern of physical activity in order to control blood sugar. Controlling blood sugar to near normal levels is vital to prevent the development of complications of diabetes such as kidney disease, cardiovascular disease, nerve damage to the feet and other debilitating conditions.

There are specific medical guidelines for the management of diabetes<sup>4</sup>. Healthcare professionals caring for a person with diabetes should:

- Measure blood pressure at every visit
- Check feet for sores at every visit and provide a thorough foot exam at least once a year
- Order an A1C test at least twice a year to determine what the patient's level of glucose control has been for the past 12 weeks
- Assess kidney function through urine and renal function blood tests at least once a year
- Test blood lipids (fats)—total cholesterol; LDL or low-density lipoprotein (“bad” cholesterol); HDL or high-density lipoprotein (“good” cholesterol); and triglycerides at least once a year

A person with diabetes should work with their health care provider(s) to schedule:

- A dental checkup twice a year
- A dilated eye exam once a year
- An annual flu shot
- A pneumonia shot (according to age guidelines)

The person with diabetes must become knowledgeable about how food choices, physical activity, illnesses and medications impact blood sugar individually and in myriad combinations. Diabetes Self-Management Education (DSME) in group classes are a proven way for a person with diabetes to learn the many things they need to know to help them manage their condition. The *Guide to Community Preventive Services*, a resource for evidence-based recommendations and findings about what works in public health, recommends DSME as an effective and cost efficient way for persons with diabetes to learn to improve blood sugar control, improve quality of life and prevent complications<sup>5</sup>. The Guide is produced by the Community Preventive Services Task Force, an independent group established by the Department of Health and Human Services to examine the evidence and produce findings and recommendations about effective and ineffective programs, services, and policies<sup>5</sup>.

Studies in the US and abroad have found that improved blood glucose control benefits people with either type 1 or type 2 diabetes. In general, every percentage point drop in A1C blood test results can reduce the risk of microvascular complications (eye, kidney, and nerve diseases) by 40%. In persons with type 1 diabetes, intensive insulin therapy has long-term beneficial effects on the risk of cardiovascular disease. Blood pressure control reduces the risk of cardiovascular disease (heart disease or stroke) among people with diabetes by 33% - 50% and the risk for microvascular complications (eye, kidney, and nerve diseases) by approximately 33%. Improved control of LDL cholesterol can reduce cardiovascular complications by 20%-50%. Detecting and treating diabetes-related eye disease can reduce the development of severe vision loss by an estimated 50%-60%. Comprehensive foot care programs can reduce amputation rates by 45%-85%. Detecting and treating early diabetic kidney disease by lowering blood pressure can reduce the decline in kidney function by 30% - 70%.

Data on how well Kentuckians with diabetes fare in meeting clinical and self-care measures is noted in Table 1. Kentucky actually exceeds the national rate in 5 key measures: percentage of people with diabetes who receive two or more A1C tests in a year, rates of flu and pneumonia vaccinations, rate of self-foot exams, and self-blood sugar monitoring (highlighted below). One area of opportunity for improvement will be increasing the percentage of people who have participated in diabetes self-management education (DSME).



<b>Table 1: Reported Rate of Diabetes Care Practices Among Adults with Diabetes, Kentucky and US (BRFSS 3 year averages from CDC Division of Diabetes Translation)</b>		
<b>Preventive Care Practice</b>	<b>KY 2010</b>	<b>US 2010</b>
<b>Received a Professional Foot Exam</b>	<b>67.5%</b>	<b>67.5%</b>
<b>Annual Dilated Eye Exam</b>	<b>61.5%</b>	<b>62.8%</b>
<b>Received 2 or more A1C's Past Year</b>	<b>74.5%</b>	<b>68.5%</b>
<b>Received a Flu Shot Past Year</b>	<b>57.8%</b>	<b>50.1%</b>
<b>EVER Received a Pneumonia Shot</b>	<b>59.5%</b>	<b>42.5%</b>
<b>Performs Daily Self Foot Exam</b>	<b>70.7%</b>	<b>61.1%</b>
<b>Daily Self Blood Glucose Monitoring</b>	<b>67.9%</b>	<b>63.6%</b>
<b>EVER had Self-Management Education</b>	<b>51.7%</b>	<b><u>57.4%</u></b>

### **Prevention of Type 2 Diabetes**

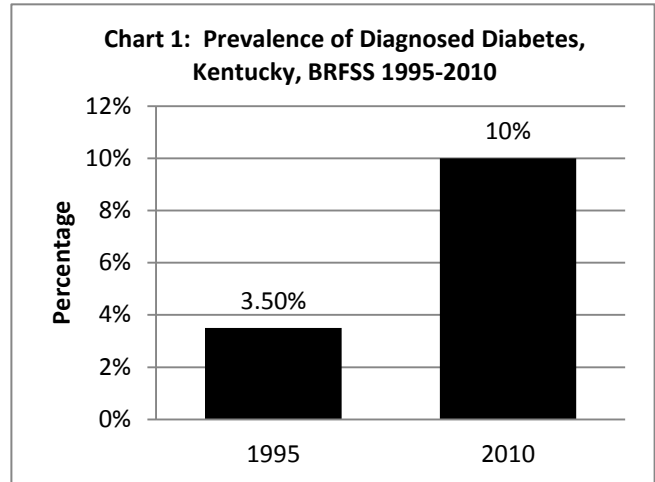
The Diabetes Prevention Program (DPP), a large prevention study of people at high risk for developing diabetes, demonstrated that lifestyle intervention to lose weight and increase physical activity reduced the development of type 2 diabetes by 58% during a three year period. The reduction was even greater, 71%, among adults aged 60 years and older. Interventions to prevent or delay type 2 diabetes in individuals with prediabetes can be feasible and cost-effective. Research has found that lifestyle interventions are more cost-effective than medications. Kentucky has applied for funding for an Innovation Grant from the Center for Medicare Services (CMS), forming a collaboration with state universities, YMCAs, Kentucky Chamber of Commerce, state healthcare providers and the Kentucky Diabetes Network (KDN). The grant requests funding for the coalition to develop a network of Diabetes Prevention Programs (DPP) programs throughout the Commonwealth. At the time of the report, a funding announcement is pending.

### **The Scope of Diabetes in Kentucky**

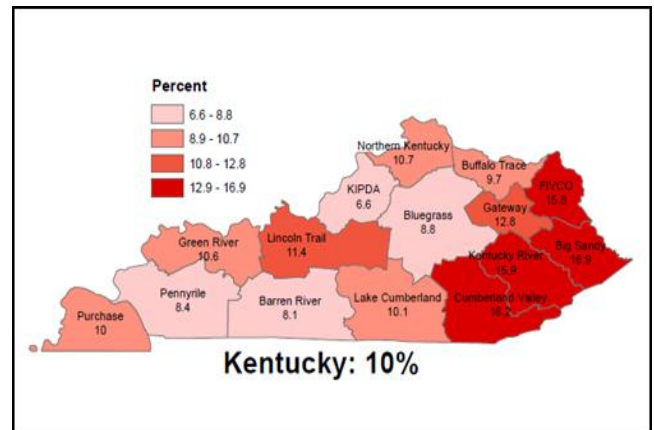
This section of the report provides data on the scope of diabetes in the Commonwealth overall, and within the population covered by the Kentucky Employee Health Plan and the Medicaid program. When possible, we have provided data for youth and for women with either gestational diabetes or with pre-existing diabetes at the time of pregnancy.

## Statewide Prevalence of Diabetes and Prediabetes in Kentucky Adults

- In 1995, approximately 3.5% of Kentucky adults (120,000 adults) had been diagnosed with diabetes. By 2010, the prevalence rate for diabetes had increased to **10% or approximately 370,000 adults** (See Chart 1).
- Based on national trends – we can be confident that approximately 95% of these adults have type 2 diabetes and 5% have type 1 diabetes. (2011 CDC National Diabetes Fact Sheet)
- An additional **233,000 Kentucky adults** have been diagnosed with prediabetes and are at high risk of progression to diabetes.
- Men and women in Kentucky experience similar rates of diabetes; however, African Americans have a higher prevalence (13.1%) than do Whites (10.0%) which is consistent with national data.
- Diabetes is more common among those with lower incomes and/or lower levels of education. Almost 20% of Kentuckians earning \$15,000 or less per year have diabetes compared to 11% earning between \$25K and \$35K, and 6.6% of those earning \$50K or more annually.
- Diabetes is also more prevalent as people age. Therefore with an aging population, Kentucky (like the rest of the nation) can expect to continue seeing high rates of diabetes. Five and a half percent (5.5%) of adults age 35-44 have diabetes compared to 11.1% of those aged 45-54, 17.8% of those 55 -64 and 20.1% of those aged 65 and older.
- Diabetes is more prevalent in Eastern Kentucky (see Figure 1) than in other areas of the state. However, it is important to note that diabetes is common across all of Kentucky.

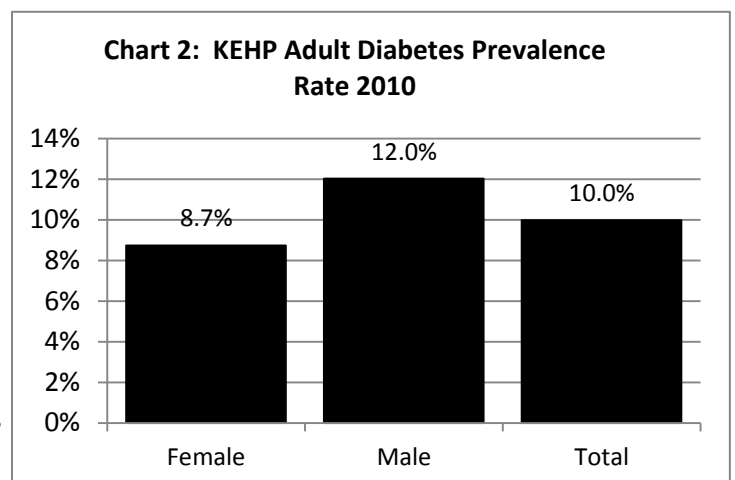


**Figure 1: 2010 Behavioral Risk Factor Surveillance System Kentucky Diabetes Prevalence by ADD**



## Prevalence of Diabetes Among Adult Kentucky Employee Health Plan (KEHP) Members

- In 2010, among the 220,794 adults covered by the KEHP, 10% (22,039) have been diagnosed with diabetes based on claims filed with that diagnosis.
- Diabetes rates are somewhat higher among male (12%) KEHP members than for females (8.7%) (See Chart 2).
- Just as with statewide data, diabetes prevalence increases with age among KEHP

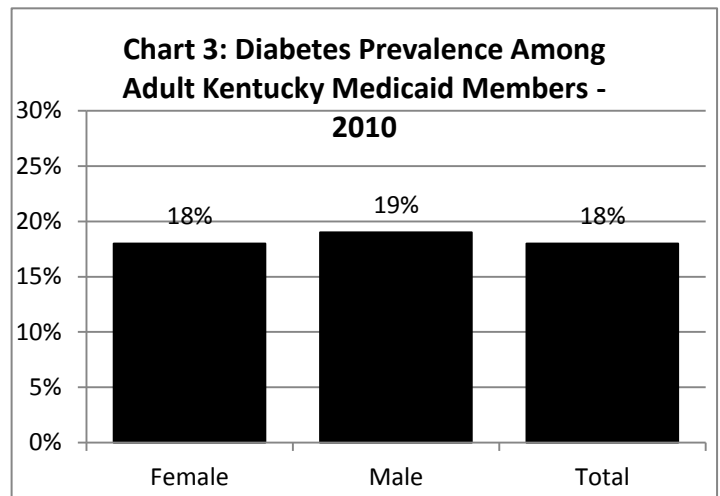


members. Of those aged 35-44, 5.7% have diabetes, compared to 16.3% of those ages 55-64 and 21.3% of those age 65 and older.

- Unlike the statewide data reported above, KEHP members in rural and urban parts of the state show similar rates of diabetes. Of KEHP, 10.1% members in rural areas have been diagnosed with diabetes compared to 9.5% of members in urban areas.

### Prevalence of Diabetes Among Adult Kentucky Medicaid Members

- Eighteen percent of the adult Medicaid population have been diagnosed with diabetes, a rate twice as high as the Kentucky rate of 10%, and almost triple the national rate of 6.9%
- Men and women have similar rates of diabetes in the Medicaid population.



- Table 2 shows the diabetes prevalence rate for adult Medicaid members in each Area Development District of Kentucky. As was seen in the statewide distribution of diabetes, we see that ADDs in Eastern Kentucky have the highest diabetes prevalence rates, yet rates are quite high across all ADDs.

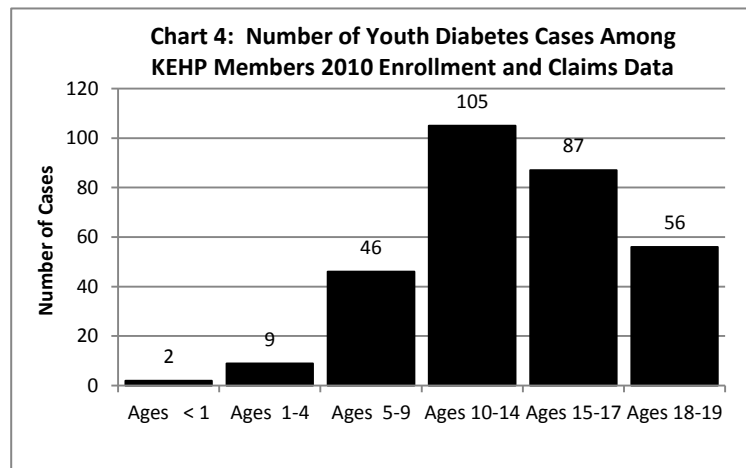
Area Development District	Female	Male
Barren River	19.63%	20.38%
Big Sandy	21.43%	19.69%
Bluegrass	17.22%	18.22%
Buffalo Trace	19.43%	17.81%
Cumberland Valley	21.79%	20.18%
FIVCO	20.09%	17.95%
Gateway	18.47%	17.30%
Green River	18.48%	19.69%
KIPDA	14.37%	16.44%
Kentucky River	23.43%	20.68%
Lake Cumberland	19.49%	19.14%
Lincoln Trail	16.35%	16.07%
Northern Kentucky	15.19%	16.45%
Pennyrile	17.79%	18.33%
Purchase	16.78%	16.74%
<b>Grand Total</b>	<b>18.23%</b>	<b>18.50%</b>

## Diabetes in Kentucky Youth (Ages 19 and younger)

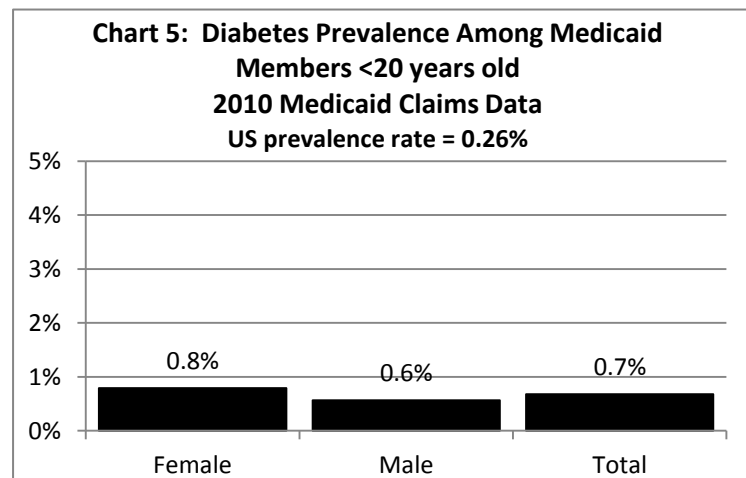
There is no reliable source of data on the prevalence of either type 1 or type 2 diabetes among youth in Kentucky overall. The data from Medicaid and KEHP presented in this section represent a significant segment of the Kentucky youth population, but leave out youth covered by other insurers. Another gap in this data is the inability to separate patients with type 1 and type 2 diabetes diagnoses, which is important due to the known increase in type 2 diabetes in youth. Efforts to distinguish cases of type 1 from type 2 diabetes using claims data were not successful due to a high rate of inconsistent coding on the claims data. For example, a large number of youth and adult claims data showed that in some instances the person was coded as having type 1 diabetes on one visit but type 2 diabetes on a different visit – this is not clinically possible and therefore clearly an error in coding. Research by CDC shows that type 2 diabetes remains fairly rare among youth with a prevalence rate of only 0.26%, although prevalence is increasing more among African American, Hispanic/Latino American and American Indian youth compared to white youth. In addition, CDC sponsored research has shown that among youth aged 12 to 19 years, the overall prevalence rate of prediabetes may be as high as 23%.

If Kentucky youth experienced diabetes prevalence rates of 0.26% similar to the rest of the nation, we would predict approximately 2,660 cases of either type 1 or type 2 diabetes. Data presented in this section shows that the rate of diabetes among youth in Kentucky is higher than expected with over 3,800 cases identified among Kentucky youth aged 19 and younger in the Medicaid and KEHP populations combined.

- Among KEHP covered youth, 0.40% (305) have a diagnosis of diabetes (See Chart 4).



- Of youth covered by Medicaid, 0.7% (3,874) have been diagnosed with diabetes. This data suggest that Kentucky youth experience diabetes at a higher rate than the nation overall (See Chart 5). Unfortunately, it is not possible to differentiate between type 1 and type 2 diabetes with the available claims data.



- Table 3 shows the number and percentage of Medicaid members aged 19 and younger that have a diagnosis of diabetes.
- As seen with adult data, ADD's in Eastern Kentucky have higher prevalence rates than other parts of the state, yet rates statewide remain uniformly high. The national prevalence rate of diabetes in youth is 0.26%

<b>Table 3: Prevalence of Diabetes among Medicaid Members 19 and Younger</b>				
<b>Area Development District</b>	<b>Girls</b>		<b>Boys</b>	
	<b>Count</b>	<b>Percent</b>	<b>Count</b>	<b>Percent</b>
<b>Barren River</b>	<b>148</b>	<b>0.78%</b>	<b>120</b>	<b>0.60%</b>
<b>Big Sandy</b>	<b>137</b>	<b>1.01%</b>	<b>102</b>	<b>0.70%</b>
<b>Bluegrass</b>	<b>325</b>	<b>0.76%</b>	<b>250</b>	<b>0.56%</b>
<b>Buffalo Trace</b>	<b>35</b>	<b>0.77%</b>	<b>30</b>	<b>0.63%</b>
<b>Cumberland Valley</b>	<b>251</b>	<b>1.10%</b>	<b>200</b>	<b>0.84%</b>
<b>FIVCO</b>	<b>93</b>	<b>0.93%</b>	<b>62</b>	<b>0.59%</b>
<b>Gateway</b>	<b>52</b>	<b>0.80%</b>	<b>35</b>	<b>0.50%</b>
<b>Green River</b>	<b>109</b>	<b>0.76%</b>	<b>85</b>	<b>0.57%</b>
<b>KIPDA</b>	<b>317</b>	<b>0.59%</b>	<b>195</b>	<b>0.35%</b>
<b>Kentucky River</b>	<b>150</b>	<b>1.40%</b>	<b>107</b>	<b>0.91%</b>
<b>Lake Cumberland</b>	<b>157</b>	<b>0.93%</b>	<b>126</b>	<b>0.72%</b>
<b>Lincoln Trail</b>	<b>104</b>	<b>0.63%</b>	<b>73</b>	<b>0.42%</b>
<b>Northern Kentucky</b>	<b>149</b>	<b>0.67%</b>	<b>130</b>	<b>0.55%</b>
<b>Pennyrile</b>	<b>108</b>	<b>0.78%</b>	<b>90</b>	<b>0.61%</b>
<b>Purchase</b>	<b>77</b>	<b>0.66%</b>	<b>56</b>	<b>0.47%</b>
<b>Grand Total</b>	<b>2212</b>	<b>0.79%</b>	<b>1662</b>	<b>0.57%</b>

### **Diabetes in Pregnancy**

Diabetes is a complication during pregnancy. Gestational diabetes is the more familiar complication of pregnancy, but increasingly, pregnancies occur in women with pre-existing type 1 or type 2 diabetes. Women with gestational diabetes or pre-existing diabetes are at increased risk for preeclampsia or Cesarean section. In addition to these complications, women with pre-existing diabetes are at increased risk for preterm birth, miscarriage or stillbirth.

Babies born to women with diabetes are at increased risk of high birth weight which can result in nerve damage to the shoulder during a vaginal delivery or Cesarean section, birth defects of the brain, spine or heart, low blood sugar after birth and are at increased lifetime risk of being obese or overweight as adults and of developing type 2 diabetes.

One important source of data on the impact of diabetes on pregnancies in Kentucky is from hospitalizations of pregnant women. Table 4 below shows hospitalizations for women with both gestational and pre-existing diabetes. These hospital stays are shown for both stays in which the woman delivered and also for hospitalizations which did not result in a delivery – stays during which a complication of pregnancy had to be managed in the hospital setting.

While only 1.43% of all pregnancy-related hospitalizations were for women with pre-existing diabetes, almost 28% of all non-delivery hospital stays in 2010 and 30% in 2011 were for women with pre-existing diabetes. By contrast, 5.7% of all maternal stays were for women with gestational diabetes, while 6.6% of non-delivery stays are for gestational diabetes.

The difference in delivery stays is also striking. For all delivery stays, 63% are for vaginal deliveries. However, only 37% of stays for women with pre-existing diabetes result in vaginal deliveries compared to 53% vaginal deliveries for stays with gestational diabetes.

<b>Table 4: Number and percentage of delivery and non-delivery maternal inpatient hospital discharges associated with diabetes and pregnancy, Kentucky: 2010 - 2011</b>								
	<b>2010</b>				<b>2011</b>			
	<b>Pre-existing diabetes complicating pregnancy</b>	<b>Gestational Diabetes</b>	<b>Maternal Stays without Diabetes</b>	<b>All Maternal Stays</b>	<b>Pre-existing diabetes complicating pregnancy</b>	<b>Gestational Diabetes</b>	<b>Maternal Stays without Diabetes</b>	<b>All Maternal Stays</b>
<b>Total Stays</b>	<b>832</b>	<b>3,306</b>	<b>54,105</b>	<b>58,243</b>	<b>915</b>	<b>3,274</b>	<b>53,720</b>	<b>57,909</b>
<b>(% of all maternal stays)</b>	<b>1.43%</b>	<b>5.68%</b>	<b>92.90%</b>	<b>100.00%</b>	<b>1.58%</b>	<b>5.65%</b>	<b>92.77%</b>	<b>100.00%</b>
<b>Non-Delivery Stays</b>	<b>231</b>	<b>207</b>	<b>7,155</b>	<b>7,593</b>	<b>275</b>	<b>277</b>	<b>6,857</b>	<b>7,409</b>
<b>(% of total stays for each column)</b>	<b>27.76%</b>	<b>6.26%</b>	<b>13.22%</b>	<b>13.04%</b>	<b>30.05%</b>	<b>8.46%</b>	<b>12.76%</b>	<b>12.79%</b>
<b>Stays with Delivery</b>	<b>601</b>	<b>3,099</b>	<b>46,950</b>	<b>50,650</b>	<b>640</b>	<b>2,997</b>	<b>46,863</b>	<b>50,500</b>
<b>(% of total stays for each column)</b>	<b>72.24%</b>	<b>93.74%</b>	<b>86.78%</b>	<b>86.96%</b>	<b>69.95%</b>	<b>91.54%</b>	<b>87.24%</b>	<b>87.21%</b>
<b>Vaginal (% of stays WITH delivery)</b>	<b>222</b> <b>36.94%</b>	<b>1,644</b> <b>53.04%</b>	<b>30,111</b> <b>94.16%</b>	<b>31,977</b> <b>63.13%</b>	<b>240</b> <b>0.76%</b>	<b>1,530</b> <b>4.84%</b>	<b>29,869</b> <b>94.41%</b>	<b>31,639</b> <b>62.65%</b>
<b>C-Section (% of stays WITH delivery)</b>	<b>379</b> <b>63.06%</b>	<b>1,455</b> <b>46.95%</b>	<b>16,839</b> <b>35.87%</b>	<b>18,673</b> <b>36.87%</b>	<b>400</b> <b>62.50%</b>	<b>1,467</b> <b>48.95%</b>	<b>16,994</b> <b>36.26%</b>	<b>18,861</b> <b>37.35%</b>
<b>Office of Health Policy, Inpatient Hospital Discharge Claims, calendar year, 2010 and 2011</b>								

KEHP reported data on the costs of pre-existing and gestational diabetes pregnancies compared to all pregnancies for their population. The highest costs are associated with pregnancy complicated by gestational diabetes at \$10,057, compared to \$7,535 for pre-existing diabetes. The average cost for all pregnancies is \$5,250 (See Table 5).

<b>Table 5: KEHP 2010 – Pregnancies with Pre-existing Diabetes and Gestational Diabetes</b>			
<b>Pregnancy Complication</b>	<b>Total Paid</b>	<b>Patient Count</b>	<b>Average Total Paid/Patient</b>
<b>Pre-existing Diabetes</b>	<b>\$391,810</b>	<b>52</b>	<b>\$7,535</b>
<b>Gestational Diabetes</b>	<b>\$3,811,780</b>	<b>379</b>	<b>\$10,057</b>
<b>All Pregnancy</b>	<b>\$31,203,604</b>	<b>5,943</b>	<b>\$5,250</b>
<b>Source: KEHP's enrollment and claims data aggregated by Thompson Reuters</b>			

## **The Financial Impact of Diabetes and its Complications**

### **Estimated Costs of Diabetes**

In November of 2010, the UnitedHealth Center for Health Reform & Modernization published a working paper entitled “The United States of Diabetes: Challenges and Opportunities in the Decade Ahead”. The report analyzed claims data from 10 million commercially-insured members and estimates that diabetes accounts for 7% of all health care spending for that population. Those with diabetes were shown to have an average annual cost of \$11,700, compared to \$4,400 for members without diabetes. Those members with diabetes who also had diabetes specific complications had average yearly costs of \$20,700. Medicare members with diabetes have costs 33% higher than those without diabetes, and those with diabetes complications have costs three times higher than those without complications.

The American Diabetes Association estimates that the largest component of medical care costs attributed to diabetes (50%) are for inpatient hospital care. Given that inpatient hospital care is such a large component of diabetes costs, examining Kentucky’s data on diabetes hospitalization costs and patterns is an important component of understanding the impact of this disease on individuals, families and the Commonwealth overall. This data also serves as a reflection of how well diabetes is, or is not, managed by healthcare providers and patients. The Agency on Healthcare Research and Quality (AHRQ) notes that diabetes hospitalizations “provide insight into the community health care system or services outside the hospital setting. Patients with diabetes may be hospitalized for diabetic complications if their conditions are not adequately monitored or if they do not receive the patient education needed for appropriate self-management.” (*Prevention Quality Indicators Overview*. AHRQ Quality Indicators. July 2004. Agency for Healthcare Research and Quality, Rockville, MD). In other words, if a person with diabetes is admitted to the hospital, it can be seen as a reflection of lack of access to care, a failure to provide appropriate care in the physician’s office, an inability of the patient to adhere to their plan of care, or a combination of all three.

### **Hospitalization Costs Due To Diabetes**

Kentucky’s inpatient hospital discharge data and emergency department utilization data are collected by the Office of Health Policy (OHP) within the Cabinet for Health and Family Services. This data is routinely referred to as “hospital discharge data” and “ED data”. This data provides a wealth of information on

the diagnoses of those hospitalized or treated in an ED and the financial charges associated with each episode of hospitalization or ED visit. Collected pursuant to KRS 216.2920 to 216.2929, the data is standardized administrative information routinely submitted by Kentucky hospitals to bill for their services and is also referred to as “administrative claims data.” OHP began collecting inpatient hospital discharge data in 2000 and added ED utilization data in 2008.

Kentucky statutes governing data submission do not allow the state to include individual identification information which would allow for determination of multiple hospitalizations or emergency department visits by one person. This means that this data show the number of hospital discharges or emergency department visits that occur during a year, not the actual number of people who are hospitalized and discharged or who visit an ED. The data cannot tell us how many individuals may be hospitalized more than once or have multiple ED visits, information which would be very useful in planning how to best respond to how diabetes costs (and indeed all hospitalization and ED costs) are incurred.

Another limitation of this data is a result of the nature of the cost information. The cost information reported is for the initial charges for each hospital discharge or ED visit. The actual reimbursement is not reported to the state as part of the administrative claims data. The actual amount reimbursed by various payer sources is based on agreement between the payer and the hospital and is typically far less than the amount charged.

An inpatient hospital discharge record includes all information from admission to discharge. An ED record includes visits to an ED that do not result in an inpatient admission. ED records also include data of patients that are held for an observation stay but not admitted as an inpatient to a hospital. This report includes hospital discharge and ED visit data for both 2010 and 2011.

Table 6 shows the number of hospital discharges in which diabetes was coded as the principal diagnosis. The data is reported by the (ADD) in which the person resides – not the ADD where the hospital is located. In the calendar years 2010 and 2011, there were **8,240 and 8,529 inpatient hospital discharges, respectively, from Kentucky hospitals for Kentucky residents** for which the principal diagnosis was diabetes (not including gestational diabetes which is reported separately). The total charges associated with these inpatient hospital discharges were **\$169,577,708 in 2010 and \$183,800,101 in 2011.**



<b>Table 6: Inpatient Hospital Discharges with Diabetes coded as the Primary Diagnosis Code</b>					
<b>Patient Residence Area Development District (ADD)</b>	<b>2010</b>		<b>2011</b>		<b>2 year average charge</b>
	<b>Discharges</b>	<b>Total Charges</b>	<b>Discharges</b>	<b>Total Charges</b>	
<b>01 – PURCHASE</b>	389	\$5,507,081	429	\$6,505,512	\$14,685
<b>02 – PENNYRILE</b>	407	\$6,456,538	366	\$5,466,846	\$15,425
<b>03 - GREEN RIVER</b>	318	\$4,894,112	322	\$5,346,257	\$16,001
<b>04 - BARREN RIVER</b>	410	\$7,698,850	466	\$9,165,460	\$19,251
<b>05 - LINCOLN TRAIL</b>	469	\$6,488,975	541	\$8,755,582	\$15,094
<b>06 – KIPDA</b>	1,838	\$46,634,620	1,749	\$45,009,630	\$25,549
<b>07 - NORTHERN KY</b>	672	\$13,801,022	825	\$20,864,213	\$23,156
<b>08 - BUFFALO TRACE</b>	89	\$1,748,390	121	\$1,979,907	\$17,754
<b>09 – GATEWAY</b>	157	\$2,958,981	181	\$3,462,756	\$18,999
<b>10 – FIVCO</b>	287	\$6,000,561	330	\$8,044,021	\$22,763
<b>11 - BIG SANDY</b>	450	\$12,307,554	397	\$12,367,160	\$29,132
<b>12 - KY RIVER</b>	565	\$10,977,636	506	\$11,080,933	\$20,596
<b>13 - CUMBERLAND VALLEY</b>	597	\$11,964,928	666	\$13,473,228	\$20,141
<b>14 - LAKE CUMBERLAND</b>	352	\$5,247,217	403	\$5,998,463	\$14,895
<b>15 – BLUEGRASS</b>	1,240	\$26,891,242	1,227	\$26,280,133	\$21,553
<b>Statewide</b>	<b>8,240</b>	<b>\$169,577,708</b>	<b>8,529</b>	<b>\$183,800,101</b>	<b>\$21,073</b>

Source: Office of Health Policy, Inpatient Hospital Discharge Claims, calendar year 2010 and 2011

### **Specific Diabetes Complications as Principal Diagnosis for Inpatient Hospital Discharges**

Hospitalizations for diabetes may occur due to a variety of common complications of the disease. All of the complications discussed in this section of the report are identified from the principal diagnosis code assigned by the physician during the hospital stay. The principal diagnosis is defined in the Uniform Hospital Discharge Data Set (UHDDS) as "that condition established after study to be chiefly responsible for occasioning the admission of the patient to the hospital for care". Table 7 below shows discharge data for specific diabetes complications. The data show the number of discharges for 2010 and 2011 combined the average length of stay (ALOS), the average charge for each type of complication and the total charges.

- The most frequent diabetes complication associated with inpatient hospital discharge data is Diabetic Ketoacidosis or DKA which accounts for almost one third of all diabetes primary hospitalizations. DKA is a life-threatening complication in which ketones (fatty acids) build up in the

blood due to a lack of insulin. Between 2010 and 2011, 32.4% (5,438) of all diabetes-primary cause hospitalizations were a result of DKA, with an ALOS of 3.11 days, an average charge of \$15,211 and total billed charges of \$82,719,731.

- The second most frequent diabetes complication causing hospitalization was “Diabetes with Hypoglycemic Manifestations,” which accounted for 26.6% (4,462) of all cases. The ALOS for this group was 5.89 days, with an average charge of \$25,042 and total billed charges of \$111,736,073.
- Diabetes with peripheral circulatory disorders resulted in the longest ALOS of 9.29 days, an average charge of \$47,623 and total billed charges of \$59,385,531. Peripheral circulatory disorders contribute significantly to the development of lower extremity infections and can result in amputations.
- Kidney disease leading to kidney failure requiring dialysis and transplant is a common complication of diabetes. Hospitalizations with renal (kidney) complications of diabetes account for a relatively small (2.4%) percentage of cases. However, this group has the second longest ALOS at 6.71 days, and also reflects the highest average charge of \$48,728 with total billed charges of \$19,832,096.

<b>ICD-9-CM Diagnosis Code</b>	<b>Total Discharges</b>	<b>Percent of Discharges</b>	<b>ALOS</b>	<b>Avg. Charge</b>	<b>Total Charges</b>
<b>(250.0) Without mention of complication</b>	<b>2,364</b>	<b>14.1%</b>	<b>2.89</b>	<b>\$10,075</b>	<b>\$23,816,613</b>
<b>(250.1) Ketoacidosis (DKA)</b>	<b>5,438</b>	<b>32.4%</b>	<b>3.11</b>	<b>\$15,211</b>	<b>\$82,719,731</b>
<b>(250.2) Hyperosmolarity</b>	<b>484</b>	<b>2.9%</b>	<b>3.79</b>	<b>\$17,173</b>	<b>\$8,311,680</b>
<b>(250.3) With other coma</b>	<b>80</b>	<b>0.5%</b>	<b>5.64</b>	<b>\$34,534</b>	<b>\$2,762,732</b>
<b>(250.4) With Renal Manifestations</b>	<b>407</b>	<b>2.4%</b>	<b>6.71</b>	<b>\$48,728</b>	<b>\$19,832,096</b>
<b>(250.5) With Ophthalmic manifestations</b>	<b>30</b>	<b>0.2%</b>	<b>3.37</b>	<b>\$13,746</b>	<b>\$412,382</b>
<b>(250.6) With Neurological Manifestations</b>	<b>2,035</b>	<b>12.1%</b>	<b>5.22</b>	<b>\$20,778</b>	<b>\$42,283,576</b>
<b>(250.7) With Peripheral Circulatory Disorders</b>	<b>1,247</b>	<b>7.4%</b>	<b>9.29</b>	<b>\$47,623</b>	<b>\$59,385,531</b>
<b>(250.8) With Hypoglycemic Manifestations</b>	<b>4,462</b>	<b>26.6%</b>	<b>5.89</b>	<b>\$25,042</b>	<b>\$111,736,073</b>
<b>(250.9) Unspecified Complications</b>	<b>222</b>	<b>1.3%</b>	<b>3.18</b>	<b>\$9,538</b>	<b>\$2,117,394</b>
<b>Grand Total</b>	<b>16,769</b>	<b>100.0%</b>	<b>4.65</b>	<b>\$21,073</b>	<b>\$353,377,809</b>

Source: Office of Health Policy, Inpatient Hospital Discharge claims, calendar year, 2010 and 2011

## Emergency Department (ED) Visits Due to Diabetes

Table 8 below shows the number and cost of ED for each ADD. It is important to recall ED data covers only visits which DO NOT result in hospitalization. ED visits for diabetes produced billed charges of approximately \$21 million in both 2010 and 2011. It is notable that there is a wide variation in the average charge for ED visits between different ADD's. The highest average charges are seen in the Big Sandy and Kentucky River ADD's, areas known to have among the highest rates of diabetes in the state. However, since these are average charges, the disparity in costs suggests that those with diabetes may experience more costly complications of the disease or may make more frequent use of the services at an ED.

<b>Table 8: Emergency Department Encounters with Diabetes coded as the Principal Diagnosis</b>					
<b>Patient Residence ADD</b>	<b>2010</b>		<b>2011</b>		<b>2 year</b>
	<b>ED Visits</b>	<b>Total Charges</b>	<b>ED Visits</b>	<b>Total Charges</b>	<b>Average Charges</b>
<b>01 - PURCHASE</b>	<b>378</b>	<b>\$801,033</b>	<b>430</b>	<b>\$987,061</b>	<b>\$2,212.99</b>
<b>02 - PENNYRILE</b>	<b>606</b>	<b>\$979,777</b>	<b>571</b>	<b>\$1,183,315</b>	<b>\$1,837.80</b>
<b>03 - GREEN RIVER</b>	<b>469</b>	<b>\$1,041,827</b>	<b>504</b>	<b>\$1,411,196</b>	<b>\$2,521.09</b>
<b>04 - BARREN RIVER</b>	<b>454</b>	<b>\$881,932</b>	<b>549</b>	<b>\$1,007,324</b>	<b>\$1,883.61</b>
<b>05 - LINCOLN TRAIL</b>	<b>515</b>	<b>\$722,952</b>	<b>455</b>	<b>\$756,424</b>	<b>\$1,525.13</b>
<b>06 - KIPDA</b>	<b>2,041</b>	<b>\$4,984,611</b>	<b>2,058</b>	<b>\$5,542,729</b>	<b>\$2,568.27</b>
<b>07 - NORTHERN KY</b>	<b>779</b>	<b>\$1,414,659</b>	<b>741</b>	<b>\$1,557,383</b>	<b>\$1,955.29</b>
<b>08 - BUFFALO TRACE</b>	<b>90</b>	<b>\$293,211</b>	<b>90</b>	<b>\$171,556</b>	<b>\$2,582.04</b>
<b>09 - GATEWAY</b>	<b>288</b>	<b>\$564,210</b>	<b>305</b>	<b>\$573,527</b>	<b>\$1,918.61</b>
<b>10 - FIVCO</b>	<b>466</b>	<b>\$1,055,824</b>	<b>461</b>	<b>\$1,135,257</b>	<b>\$2,363.63</b>
<b>11 - BIG SANDY</b>	<b>502</b>	<b>\$1,319,732</b>	<b>441</b>	<b>\$1,505,546</b>	<b>\$2,996.05</b>
<b>12 - KY RIVER</b>	<b>263</b>	<b>\$707,399</b>	<b>378</b>	<b>\$1,174,513</b>	<b>\$2,935.90</b>
<b>13 - CUMBERLAND VALLEY</b>	<b>1,480</b>	<b>\$1,849,761</b>	<b>902</b>	<b>\$1,957,616</b>	<b>\$1,598.40</b>
<b>14 - LAKE CUMBERLAND</b>	<b>523</b>	<b>\$844,896</b>	<b>544</b>	<b>\$900,963</b>	<b>\$1,636.23</b>
<b>15 - BLUEGRASS</b>	<b>1,657</b>	<b>\$3,355,304</b>	<b>1,826</b>	<b>\$3,845,308</b>	<b>\$2,067.36</b>
<b>Statewide</b>	<b>10,511</b>	<b>\$20,817,129</b>	<b>10,255</b>	<b>\$23,709,718</b>	<b>\$2,144.22</b>
<b>Source: Office of Health Policy, Emergency Department claims, calendar year, 2010 and 2011</b>					

## KEHP Costs Associated with Diabetes

The 22,000 KEHP members with diabetes incur significant costs for their medical care. Table 9 below shows costs for care provided in instances where diabetes was coded as the principal diagnosis. Of the over \$13.5 million in costs shown, 95% are attributed to adults with diabetes. An additional \$724,460 of costs is incurred by care of youth with diabetes. It is important to note that the costs reported in this table do not include costs that may be related to diabetes yet not directly coded as diabetes related. For example, conditions like hypertension, heart disease, kidney disease, influenza and others are made worse by diabetes and may in turn make diabetes more difficult (and more expensive) to manage/control.

<b>Table 9: KEHP 2010 – Total Plan Paid for Diabetes and Complications</b>			
<b>Diabetes and complications</b>	<b>Total Members</b>	<b>Adult Members</b>	<b>Youth Members</b>
Diabetes mellitus without complication	\$7,845,976	\$7,351,655	\$494,321
Diabetes with other specified manifestations (hypoglycemic)	\$1,567,472	\$1,562,476	\$187,235
Diabetes with neurological manifestations	\$847,787	\$846,858	\$23,465
Diabetes with ophthalmic manifestations	\$648,565	\$647,395	\$9,321
Diabetes with ketoacidosis	\$643,343	\$608,462	\$4,996
Diabetes with peripheral circulatory disorders	\$608,907	\$456,108	\$1,175
Diabetes with unspecified complications	\$466,698	\$445,274	\$1,169
Gestational Diabetes	\$454,596	\$443,232	\$1,088
Diabetes with renal manifestations	\$320,647	\$320,333	\$929
Diabetes with hyperosmolarity	\$93,547	\$92,371	\$446
Diabetes with other coma	\$28,573	\$27,485	\$314
<b>Total</b>	<b>\$13,526,110</b>	<b>\$12,801,650</b>	<b>\$724,460</b>
<i>Source: KEHP's enrollment and claims data aggregated by Thomson Reuters</i>			
*This table refers to total medical claims (IP, OP and Physician claims) for diabetes diagnosis based on primary diagnosis code			
** Adult members include members over age 19.			

Table 10 below shows the cost of hospitalizations for diabetes among those covered by KEHP. This insurance claims data allow the costs to be broken down into charges from the hospital as well as charges from the physician or other health care professional involved in the patients care. Similar to the table provided for statewide hospitalizations, these are broken down by the specific diabetes diagnosis code used by the physician/facility. In addition the last two rows of Table 10 show the costs associated with diabetes as the primary cause of the hospitalization and when diabetes is a secondary cause of the hospitalization. The pattern is similar to what was seen with statewide data – the highest costs associated with crises of either very high blood sugar in type 1 diabetes (ketoacidosis), or very low blood sugar (hypoglycemia) with the primary cause hospitalizations totaling a little more that \$2 million for 2010 while the total costs for diabetes as a secondary diagnosis is more than 10 times higher at slightly more than \$27 Million.

<b>Diagnosis Description</b>	<b>Total Paid</b>	<b>Hospital Claims</b>	<b>Professional/ Physician Claims</b>
Diabetes mellitus without complication	\$276,965	\$119,150	\$157,815
Diabetes with ketoacidosis	\$554,109	\$501,353	\$52,756
Diabetes with hyperosmolarity	\$85,029	\$82,328	\$2,701
Diabetes with other coma	\$20,228	\$19,923	\$306
Diabetes with renal manifestations	\$47,254	\$44,786	\$2,467
Diabetes with ophthalmic manifestations	\$501	\$0	\$501
Diabetes with neurological manifestations	\$346,771	\$334,483	\$12,288
Diabetes with peripheral circulatory disorders	\$350,749	\$340,060	\$10,688
Diabetes with other specified hypoglycemic manifestations	\$664,383	\$634,942	\$29,440
Diabetes with unspecified complications	\$27,669	\$18,132	\$9,537
<b>Total Hospital Claims with Diabetes as Primary Diagnosis</b>	<b>\$2,373,656</b>	<b>\$2,095,156</b>	<b>\$278,500</b>
<b>Total Hospital Claims with Diabetes as Any listed Diagnosis</b>	<b>\$27,022,448</b>	<b>\$23,560,919</b>	<b>\$3,461,529</b>

Source: KEHP's enrollment and claims data aggregated by Thompson Reuters  
 \*Hospital Claims refers to medical facility claims  
 \*\*Professional Claims refers to physician claims  
 \*\*\*Adult members include member over age 19

### **Diabetes Mortality**

In 2009, Kentuckians faced the third highest rate of death due to diabetes in the nation. In that year alone, 1334 Kentuckians died as a result of diabetes with an age adjusted rate of 28.8 per 100,000 residents as compared to the national rate of 20.9. The Kentucky mortality rate for men is 33.8 per 100,000 compared to the national rate of only 25.0. The rate for Kentucky women is 25.0 per 100,000, compared to a national rate of 17.7.

Rates are dramatically higher for African Americans compared to whites. The age adjusted mortality rate for African American men is 59.5 per 100,000 and for African American women, 51.9. By contrast, the age adjusted rate for white men is 32.3 per 100,000 and for white women, 23.4 per 100,000. Mortality rates are also substantially higher in eastern Kentucky ADD's as seen in Table 11 below. The Big Sandy ADD has a mortality rate of 45.3 per 100,000, followed closely by Kentucky River at 44.5 per 100,000, contrasted with rates of 17.4 in Gateway and 22.6 in Pennyryle.

<b>Table 11: Kentucky Diabetes Mortality Rates 2009</b>			
<b>Area Development District</b>	<b>Death Count</b>	<b>Crude Mortality Rate</b>	<b>Age Adjusted Mortality Rate</b>
<b>KENTUCKY</b>	<b>1,334</b>	<b>30.92</b>	<b>28.77</b>
<b>PURCHASE</b>	<b>64</b>	<b>32.62</b>	<b>24.67</b>
<b>PENNYRILE</b>	<b>58</b>	<b>25.92</b>	<b>22.56</b>
<b>GREEN RIVER</b>	<b>90</b>	<b>42.58</b>	<b>35.74</b>
<b>BARREN RIVER</b>	<b>72</b>	<b>25.82</b>	<b>24.76</b>
<b>LINCOLN TRAIL</b>	<b>75</b>	<b>28.97</b>	<b>29.07</b>
<b>KIPDA</b>	<b>256</b>	<b>27.23</b>	<b>25.15</b>
<b>NORTHERN KENTUCKY</b>	<b>137</b>	<b>31.39</b>	<b>34.04</b>
<b>BUFFALO TRACE</b>	<b>24</b>	<b>42.34</b>	<b>37.23</b>
<b>GATEWAY</b>	<b>15</b>	<b>18.52</b>	<b>17.44</b>
<b>FIVCO</b>	<b>51</b>	<b>36.70</b>	<b>29.13</b>
<b>BIG SANDY</b>	<b>74</b>	<b>47.01</b>	<b>45.26</b>
<b>KENTUCKY RIVER</b>	<b>53</b>	<b>45.68</b>	<b>44.51</b>
<b>CUMBERLAND VALLEY</b>	<b>93</b>	<b>38.34</b>	<b>35.70</b>
<b>LAKE CUMBERLAND</b>	<b>91</b>	<b>44.75</b>	<b>36.00</b>
<b>BLUEGRASS</b>	<b>181</b>	<b>23.43</b>	<b>23.89</b>
<b>Source: KDPH Office of Vital Statistics</b>			

### **Comparing the Burden of Diabetes with other Common Chronic Conditions**

The statute which defines the content of this report requires a comparison of the financial burden or impact of diabetes to that of other common chronic conditions. This section of the report looks at the relationship between diabetes and other common chronic conditions, the prevalence of other chronic disease among Kentuckians and the cost of those chronic diseases. There is a particular focus on cardiovascular diseases in comparison to diabetes, both because cardiovascular disease has a very high prevalence in Kentucky, but also because of the strong relationship between diabetes and cardiovascular diseases.

### **Diabetes in Combination with other Common Chronic Diseases**

It is always important to remember that diabetes does not exist in a vacuum – people with diabetes often have additional chronic illnesses that impact their ability to self-manage their diabetes and which provide additional diabetes management challenges to their doctor. For example, 58% of people with diabetes also have arthritis. Symptoms of their arthritis may limit their capacity to use physical activity as a method of improving their blood sugar control. Eighteen percent of those with diabetes also have asthma. Inhaled corticosteroids used to control asthma attacks can make blood sugar control more

difficult. People with diabetes also have higher rates of high blood pressure (81%) and high cholesterol levels (73%) than those without diabetes.

Recent research makes a clear link between diabetes and colon cancer<sup>6</sup>. Those with diabetes have a 30% higher death rate from colon cancer than those without diabetes. In addition diabetes makes cancer treatment more challenging due to the adverse effects of cancer treatment such as anorexia, nausea and weight loss. In addition, acute diabetes complications such as severe hyperglycemia may delay cancer treatment.

The combination of diabetes with high blood pressure and high cholesterol are directly tied to increased rates of cardiovascular diseases such as heart attacks and stroke. In fact 65% of those with diabetes will die of cardiovascular complications of the disease. Table 12 below illustrates the relationship between diabetes and cardiovascular conditions resulting in hospitalization. In approximately 39% to 50% of hospitalizations for which hypertension, ischemic heart disease, congestive heart disease or cerebrovascular disease is the coded as the primary reason for hospitalization, diabetes was coded as a secondary cause of the hospital stay. These diabetes related cases incur charges of nearly \$900 million.

<b>Table 12: Hospitalization Due to Cardiovascular Diseases For those With and Without Diabetes</b>					
<b>Cardiovascular Complication</b>	<b>With Diabetes</b>		<b>Without Diabetes</b>		<b>Proportion of Discharges with Diabetes</b>
	<b>Number of Discharges</b>	<b>Total Charges</b>	<b>Number of Discharges</b>	<b>Total Charges</b>	
<b>Hypertensive Disease</b>	<b>1,590</b>	<b>\$34,321,298</b>	<b>2,499</b>	<b>\$50,693,300</b>	<b>39%</b>
<b>Ischemic Heart Disease</b>	<b>10,749</b>	<b>\$495,833,089</b>	<b>17,095</b>	<b>\$743,042,682</b>	<b>39%</b>
<b>Congestive Heart Failure</b>	<b>8,688</b>	<b>\$222,902,175</b>	<b>8,783</b>	<b>\$215,999,952</b>	<b>50%</b>
<b>Cerebrovascular Disease</b>	<b>4,883</b>	<b>\$141,083,968</b>	<b>9,366</b>	<b>\$270,396,929</b>	<b>34%</b>
<b>Grand Total</b>	<b>25,910</b>	<b>\$894,140,530</b>	<b>37,743</b>	<b>\$1,280,132,863</b>	<b>41%</b>
<b>Source: Office of Health Policy, inpatient hospital claims, calendar year, 2010</b>					

## **Diabetes Prevalence, Mortality and Hospitalization Costs Compared to Other Common Chronic Diseases**

Table 13 below shows the prevalence rate of common chronic diseases for Kentucky including a comparison to national prevalence rates, as well as, the mortality rate for each disease. In every case except youth asthma, Kentucky prevalence rates are higher than the national average and mortality rates are among the highest in the nation. As with the hospitalization data, it is important to recognize that diabetes does not exist in isolation from other conditions even though deaths are reported as being due to a particular cause. Diabetes and other conditions such as COPD or coronary heart disease,

congestive heart failure and asthma negatively impact each other even though only one underlying cause of death is indicated on the death certificate. Diabetes is considered by many diabetes advocates to be under reported as the underlying cause of death, particularly deaths coded as being due to cardiovascular diseases.

<b>Chronic Disease</b>	<b>2010 Kentucky Prevalence Rate</b>	<b>2010 National Prevalence Rate</b>	<b>2009 Mortality Rate and National Ranking if available</b>
<b>Diabetes- Adult (BRFSS)</b>	<b>10.0%</b>	<b>9.5%</b>	<b>28.8 per 10,000 11<sup>th</sup> highest</b>
<b>Arthritis (BRFSS)</b>	<b>31.9%</b>	<b>24.4%</b>	<b>NA</b>
<b>Asthma– Adult (BRFSS)</b>	<b>10.5%</b>	<b>9.1%</b>	<b>.95 per 10,000</b>
<b>Asthma-Youth) (YRBSS)</b>	<b>10.9%</b>	<b>11.9%</b>	<b>Average 2 deaths each year</b>
<b>COPD (BRFSS 2011)</b>	<b>9.9%</b>	<b>6.1%</b>	<b>60.0 per 100,000 3<sup>rd</sup> highest</b>
<b>Coronary Heart Disease (BRFSS)</b>	<b>6.1%</b>	<b>4.1%</b>	<b>155.0 per 100,000 18<sup>th</sup> highest</b>
<b>Congestive Heart Disease</b>	<b>No data available</b>	<b>No data available</b>	<b>24.0 per 100,000 10<sup>th</sup> highest</b>
<b>Hypertension (BRFSS)</b>	<b>38.0%</b>	<b>30.8%</b>	<b>7.3 per 10,000 26<sup>th</sup> highest</b>

Note: BRFSS – Behavioral Risk Factor Surveillance System; YRBSS – Youth Behavioral Risk Factor Surveillance System

Diabetes and other chronic disease often result in costly hospitalizations. Table 14 below shows the number of hospitalizations due to diabetes and other chronic diseases, the average charge for those hospital stays and the total charges by disease. The three medical conditions that result in the most expensive hospitalizations are for three cardiovascular conditions strongly related to diabetes: ischemic heart disease, congestive heart failure and hypertension. Diabetes has the fourth highest average cost for individual hospitalizations at \$20,580.

<b>Chronic Disease Indicated as Principal Diagnosis</b>	<b>2010</b>		
	<b>Cases</b>	<b>Avg Charges</b>	<b>Total Charges</b>
<b>Diabetes</b>	<b>8,240</b>	<b>\$20,580</b>	<b>\$169,577,708</b>
<b>Asthma - Adult</b>	<b>4,437</b>	<b>\$13,909</b>	<b>\$61,713,388</b>
<b>Asthma- Childhood</b>	<b>2,359</b>	<b>\$9,899</b>	<b>\$23,352,170</b>
<b>COPD</b>	<b>20,775</b>	<b>\$16,568</b>	<b>\$344,199,605</b>
<b>Ischemic Heart Disease</b>	<b>27,844</b>	<b>\$44,493</b>	<b>\$1,238,875,771</b>
<b>Congestive Heart Failure</b>	<b>17,471</b>	<b>\$25,122</b>	<b>\$438,902,127</b>
<b>Hypertension</b>	<b>4,089</b>	<b>\$20,791</b>	<b>\$85,014,598</b>

Source: Office of Health Policy, Inpatient Hospital Discharge claims, calendar year, 2010



### Medicaid Costs for Diabetes and other Common Chronic Diseases

Looking at Medicaid claims data in Table 15, we see that diabetes carries the highest costs per adult member at \$2,796 for FY2010, with the annual cost for those under age 20 being slightly less at \$2,106. Similar to what was seen in the statewide hospitalization data, congestive heart failure and coronary heart disease are the next two highest cost chronic conditions for adult Medicaid members.

<b>Table 15: Medicaid Members Comparison of Overall and Per Member Costs for Diabetes and other Common Chronic Diseases - FY2010</b>			
<b>Chronic Condition</b>	<b>Number of Members Diagnosed</b>	<b>Total Paid Claims</b>	<b>Cost per Member</b>
Diabetes-20 and Over	82,048	\$229,439,358	\$2,796
Diabetes Less than 20	3,874	\$8,159,692	\$2,106
Congestive Heart Failure	16,592	\$37,092,152	\$2,236
Coronary Heart Disease	34,470	\$54,339,355	\$1,576
COPD and Allied Conditions	77,592	\$78,834,723	\$1,016
Hypertension	94,260	\$51,651,022	\$548
Asthma - 20 and Over	19,801	\$8,837,365	\$446
Asthma - Less than 20	40,876	\$16,446,984	\$402

### Kentucky Employee Health Plan Costs for Diabetes and Other Chronic Diseases

Table 16 below compares the costs of diabetes and other chronic diseases for patients covered by the KEHP. For this group, diabetes is in fact not the most expensive chronic condition covered by the plan. Instead, coronary heart disease, congestive heart failure, bariatric treatment of obesity and osteoarthritis are the higher cost conditions compared to diabetes.

<b>Table 16 KHEP Members Comparison of Overall and Per Member Costs for Diabetes and other Common Chronic Diseases - FY2010</b>			
<b>Chronic Condition</b>	<b>Number of Patients</b>	<b>Total Costs</b>	<b>Cost per patient</b>
Coronary Artery Disease	8,976	\$44,992,890.93	\$5,012.58
Congestive Heart Failure	1,397	\$4,755,099.02	\$3,403.79
Overweight/Obesity	3,013	\$9,400,795.44	\$3,120.08
Osteoarthritis	23,322	\$47,737,800.18	\$2,046.90
Chronic Back	52,852	\$49,541,688.77	\$937.37
(COPD)	4,724	\$3,487,549.18	\$738.26
Diabetes	24,757	\$13,497,521.10	\$545.20
Asthma	10,095	\$3,372,835.88	\$334.11
Hypertension	51,134	\$11,928,829.94	\$233.29

## Current Diabetes Efforts

The Department for Public Health, Department of Medicaid Services, and the Kentucky Employees Health Plan support a number of interventions related to diabetes. Each is described below.

### 1. Department for Public Health – Kentucky Diabetes Prevention and Control Program (KDPCP)

The Kentucky Department for Public Health has had a diabetes program for over 30 years. Beginning in the early 80's, the Kentucky General Assembly committed funds to support a statewide public health diabetes program. In addition, Kentucky Diabetes Prevention and Control Program (KDPCP) became the recipient of a grant from the CDC to support diabetes control efforts in the state. The program has evolved greatly over its 30 year history due to changes in science, the health care system and funding.

Today, the KDPCP is a population-based public health initiative whose mission is to reduce the sickness, disability and death associated with diabetes and its complications and to prevent new cases of type 2 diabetes. The key strategies of the program focus on education and support of persons with, and at risk for, diabetes to help them effectively manage their condition; education/support for health care providers caring for those with and at risk for diabetes; and mobilization of communities to identify and address problems related to diabetes in their communities.

This work is accomplished through a network of state, regional, and local partners that expand the reach of diabetes prevention and control efforts across the state. Staff at DPH in Frankfort provides leadership for the program, as well as, technical assistance, training, monitoring, data collection, etc. In concert with the state staff, a variety of partners are involved in implementing the program. Two of the major partners include the local health departments and local and state coalitions.

The local health departments have been a major partner in this effort since the program's inception providing critical infrastructure to the program. The most recent program design was created by a large group of state and local, public and private stakeholders. Because funding was not sufficient to support a comprehensive program in every local health department statewide, the program infrastructure was designed to support three tiers/levels of funding and services. This funding structure allowed KDPCP to distribute funds to all local health departments in the state and have some level of diabetes prevention and control effort statewide. Sites designated as level one provide lower levels of service, while sites designated as level three provide more comprehensive services. The ten sites designated as level three also provide critical support to the program as a whole. In addition to providing services in their areas, they assist the state staff with projects and activities that benefits the program as a whole (e.g. training of new staff, curriculum development, strategic planning, etc.).

In addition to the local health departments, another major partner is the Kentucky Diabetes Network (KDN). The KDN is a coalition of over 300 members representing health plans, health care professionals and organizations, academics, businesses, public health workers and many others involved in addressing diabetes in the state. This coalition has been active for thirteen years. KDN is an incorporated, 501c-3 organization and is run by a Board of Directors. It has six workgroups (Primary Prevention, Public Awareness, Patient Education, Professional Education, Advocacy, and

Public Relations). The KDN has received attention from other states and the CDC as a model for building and sustaining partnerships. For example, Kentucky was chosen by the CDC as one of six states to have staff and KDN partners interviewed on film regarding strategic planning and partnership efforts for use in on-line training modules being developed by CDC. The KDPCP was asked to submit an entry regarding successful efforts related to local and state coalitions for a pending “CDC Compendium” publication highlighting successful state diabetes prevention and control efforts.

Collectively, the local health departments, the KDN, and many others work together to support the programs many activities. Key efforts of the program are described below and outcomes are listed for each of these efforts on pages 27-29.

- **Community Mobilization:** Create/maintain active partnerships at the state and local levels to jointly pursue issues related to diabetes in communities, among health care providers, persons with diabetes and those at risk for diabetes. This is often accomplished by forming and maintaining local diabetes coalitions to address local needs. The KDPCP has had great success in mobilizing partnerships to identify and address diabetes-related issues. Today, Kentucky has over forty local diabetes coalitions which have been in place for over fifteen years and a robust state level coalition – the KDN.
- **Public Awareness/Education:** Promote education campaigns and messages that improve awareness of diabetes prevention and control to the general public. This is accomplished in various ways including media, presentations to local groups, the distribution of educational materials, etc.
- **Diabetes Self-Management Education and Support:** Provide a variety of educational programs/classes in communities to educate and support people with, or at risk for, diabetes. Classes include information, tools and resources to assist persons with diabetes to better manage their disease. Classes are also geared to educate people at risk for diabetes about ways to prevent or delay its onset. In addition, a variety of ongoing management and support services are provided (support groups, community events, additional education programs, etc.)
- **Professional Education and Health System Quality Improvement:** Provide access to current continuing education for health care professionals, as well as, information and tools to assist providers in serving people with, and at risk for, diabetes. Participate with other groups in activities aimed at improving the quality of diabetes care.
- **Surveillance and Evaluation:** Monitor data to assess the impact of diabetes, plan appropriate interventions and evaluate program efforts. Share data about the impact of diabetes in Kentucky with the public via media, publications, presentations, websites, etc.
- **Disease Management:** Six Diabetes Centers of Excellence (DCOE) sites, supported by the legislature and the CHFS Cabinet Secretary in 2007, assist persons with diabetes to better manage their disease through a unique partnership involving the patient, their primary care provider, the local health department, and community resources. A total of six sites located in local health departments helped manage over thirty counties. The primary target was Medicaid recipients. There was ongoing discussion between DPH and Medicaid for some time regarding

expansion of the DCOE to additional sites; however, financial constraints at the local level have hindered expansion of this program.

Another important effort to note is the Diabetes Research Board. KRS 211.736 created the Kentucky Diabetes Research Board which was attached administratively to the Cabinet for Health and Family Services for the purpose of administrative support. This support was provided by staff of the KDPCP. The Board was responsible for a Diabetes Trust Fund which allocated funds (\$200,000 in state General Funds annually beginning in FY 2007) for diabetes-related research to the University of Kentucky and the University of Louisville. Unfortunately, the funding for the trust was discontinued in 2009 as a result of funding reductions to DPH and the local health departments. Nevertheless, this small amount of funding produced some significant results (See **Attachment E**).

**Funding:**

The KDPCP receives CDC funds which are used to support state-level diabetes personnel and operating costs, fund local diabetes coalitions, support epidemiological and evaluation efforts, and support special projects. CDC’s current focus for these funds centers around 3 core interventions:

- Intervention #1: Improve quality of clinical care for populations with greatest diabetes burden and risk to improve control of A1C, blood pressure, cholesterol and to promote tobacco cessation.
- Intervention #2: Increase access to sustainable self-management education and support services for populations with greatest diabetes burden and risk to improve control of A1C, blood pressure, cholesterol, and to promote tobacco cessation.
- Intervention #3: Increase use of lifestyle change programs that have achieved CDC recognition (or pending recognition) to prevent or delay onset of type 2 diabetes among people at high risk.

State funds support diabetes prevention and control efforts statewide – primarily through the local health departments. Table 17 below describes the history of state funding for the KDPCP from 2005-2012.

**Table 17: Diabetes State Funding Summary 05-12**

State Funds	FY 05	FY 06	FY 07	FY 08	FY 09	FY10	FY11	FY12
Diabetes Program	\$1,400,000	\$2,300,000	\$2,300,000	\$2,300,000	\$2,300,000	\$1,900,000	\$1,900,000	\$1,900,000
Diabetes Centers of Excellence	n/a	n/a	\$750,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
Diabetes Research Board	n/a	\$200,000	\$200,000	\$200,000	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$1,400,000</b>	<b>\$2,500,000</b>	<b>\$3,250,000</b>	<b>\$4,000,000</b>	<b>\$3,800,000</b>	<b>\$3,400,000</b>	<b>\$3,400,000</b>	<b>\$3,400,000</b>

Program funding was essentially level for many years. The program received an increase of funds in FY 06. The addition of the DCOE's provided additional funding in 2007. Budget reductions to the DPH resulted in a reduction in funds in FY 10 through FY 12.

In FY 13, funds for diabetes activities in local health departments were part of a Core Public Health Service Block Funding. These funds may be spent on a variety of public health activities as dictated by local need. A review of local health department's budgets shows that many are funding diabetes activities.

Maintaining diabetes prevention and control efforts has become increasingly difficult in a time of declining resources. The addition of new/enhanced programming is even more challenging. Programming in the area of prevention of diabetes is needed, and has been included to the degree possible; however, no new funding exists to scale up such an effort.

### **Reach and Benefits of KDPCP Activities:**

The following describes the reach and effectiveness of program interventions:

#### **Community Mobilization:**

- Coalitions
  - Existence of more than 45 active coalitions, some sustained for more than 15 years
  - Participation by a diverse group of organizations and individuals from the community (~800)
  - Provided more than 188.4 million public awareness message exposures during last 4 years (09-12)
  - 35 coalitions (including KDN) completed Coalition Effectiveness Inventories and developed improvement plans in FY 11
  - Increased access to diabetes medications and supplies via patient assistance programs; behavior change and social support programs; places and organized programs for physical activity; healthy food choices in public places; screenings for prediabetes, diabetes, foot problems, eye disease and kidney disease; and an increased number participants in diabetes self-management education
  - The driving force behind maintaining or increasing public health state funding for diabetes since 1999.
  - Contributing force for numerous local or organizational health related policy changes
- Resources Generated
  - Mobilization of \$1,597,961 cash and in-kind resources in partnership efforts during last four years (09-12)

#### **Public Awareness/Education:**

- 94.5 Million Exposures to Diabetes Messages (2011)
- 5,307 Public Awareness Activities Implemented (2011)
- Participation of more than 350 Partners (2011)

#### **Diabetes Self-Management Education and Support:**

- Education
  - 89,638 Participants in Educational Programs (FY 11)
  - 1,975 Group Patient Educational Classes (FY 11)

- Access to DSME/Education - KDPCP has identified DSME as a key service that needs to be available for Kentuckians across our state regardless of ability to pay. Since 2004, we have worked with LHDs and other partners to expand the number of professionals trained to provide DSME and expand the number of classes available at no cost to those with diabetes. These efforts have resulted in:
  - 174% increase in the number of LHDs offering 1 or more set of comprehensive DSME classes (19 to 52)
  - 213% increase in the number of comprehensive DSME classes provided (246 to 770).
  - 126% increase in the number of diabetes control behavior change activities provided (735 to 1662). This includes comprehensive and non-comprehensive DSME, support groups with education, weight loss programs and Stanford CDSMP.
  - 41% increase in the number of behavior change activities for prevention of type 2 (4,939 to 12,737). This includes Power of Prevention and healthy nutrition classes as well as weight loss and physical activity programs.
- Numbers Receiving DSME
  - 55% increase in the number participants for diabetes control behavior change activities (e.g., comprehensive diabetes self-management education, topical education, support groups with education, weight loss programs, etc.)
  - 61 % increase in the number of participants for prevention of type 2 behavior change activities (e.g., healthy nutrition classes, physical activity programs, diabetes prevention classes, weight loss programs, etc.)

**Professional Education and Health System Quality Improvement:**

- 51 Professional Educational Programs (FY 11)
- 1,690 participants

**Disease Management**

- Disease Management/Diabetes Centers of Excellence (DCOE)
  - The gold standard for improved diabetes management is to examine the change in the average blood sugar level. DCOE participants showed improvement in this measure, particularly for those whose blood sugar levels were very elevated at the time of their enrollment.
    - Participants with elevated A1C levels had an average baseline of 9.1% which declined to 8.3% on follow-up testing, a decrease of 0.8%
    - Participants with very high baseline A1C levels of 11 or higher had an average decrease of 3.3%.
    - 40% of patients who reported not taking their medication as directed showed improvement in medication compliance.
    - 50% of those with high A1C levels reported improved compliance with testing their blood sugar as directed by their physician.

**Awards/Accomplishments**

- KDN won the Public Policy Award from the National Association of Diabetes Educators in 2006 for its work to educate policy makers about the importance of diabetes prevention and control efforts.

- KDPCP won the National Kidney Foundation of Kentucky’s Partnership Award in 2008 for its work with implementing the Kidney Early Evaluation Program (KEEP) screenings around the state.
- NDEP Frankie Award for Use of Media to Promote the NDEP, 2011
- Submitted 2 entries (one about coalitions and one about the DCOE) for a CDC Compendium publication re: successful DPCP Efforts – 2012

**2. Department for Medicaid Services (DMS)**

In November 2011, the Kentucky Department for Medicaid Services began the transition from a largely fee-for-service environment to a largely managed care environment. The purpose of this transition was two-fold:

- To contain costs and make more efficient use of limited resources; and
- To promote and improve care coordination of Medicaid patients. Managed care organizations, working with their member’s primary care provider would promote a holistic approach to care coordination, encompassing both the physical and behavioral health needs of the member.

Members with diabetes enrolled in managed care organizations (MCOs) and in disease and/or case/care management as of October 2012:

<b>Table 18</b>	
<b>CoventryCares of Kentucky</b>	<b>10,118</b>
<b>Kentucky Spirit Health Plan</b>	<b>553</b>
<b>WellCare of Kentucky</b>	<b>33 members in case management 6,933 members in disease management.</b>
<b>Passport Health Plan</b>	<b>5,208 members enrolled in case/care management or disease management</b>

- To assess the need for targeted interventions available through case/care management and disease management, the MCOs are required by their contracts to conduct health screening questionnaires for all new members within 90 days of enrollment. These screenings help the MCOs determine which members need to be offered enrollment in disease or case/care management. All these programs are opt-in.
- The total population remaining in fee-for-service (FFS) is approximately 47,000, and includes those in long-term care facilities and in waiver programs. Of the FFS population not in long-term care facilities, approximately 4,500 have diabetes. The Department for Medicaid Services continues to provide Medicaid members with health information related to chronic diseases.

The Department also provides updates to providers on diabetes through website communication.

### **Funding**

In SFY 2010, the Department for Medicaid Services spent approximately \$237 million (\$166 federal/\$71 state) for diabetes related services.

### **Effectiveness**

Medicaid managed care was implemented 01/10/2011 and is, therefore, still in the process of identifying needs and developing programs to serve the Medicaid population. Preliminary analysis indicates that MCOs in Kentucky are increasing the number of A1C tests throughout the state. **Specifically, one MCO reported an increase in A1C test of over 65% from 03/01/2012 to 12/31/2012 and another MCO reported an increase of over 50% for the test form 01/01/2012 to 12/31/2012.**

### **3. Personnel Cabinet - Kentucky Employees' Health Plan**

The Kentucky Employees' Health Plan (KEHP) is a self-funded program providing health insurance benefits to the employees and retirees of the Commonwealth of Kentucky, local school boards, and various cities and county governmental agencies. KEHP currently offers health insurance coverage to approximately 285,000 employees, retirees and their dependents.

KEHP partners with Humana as its third party administrator for all medical claims and ActiveHealth Management to oversee disease management and utilization review. ActiveHealth Management uses comprehensive claims-based identification to identify diabetic chronic disease states in children and adults.

ActiveHealth's major goals of the program for adults with diabetes are to ensure members understand the fundamental nature of diabetes and that diabetes is a risk factor for heart and vascular disease and can lead to heart attack, stroke and kidney disease. Accordingly, ActiveHealth evaluates and manages to significant targets in LDL cholesterol, HDL cholesterol, triglycerides, blood pressure, urine albumin/protein, creatinine level and A1C levels.

Other goals of the program are to ensure members understand the key clinical issues, self-management issues and monitoring issues which include the control of diabetes and evaluations for complications through regular eye, dental and foot exams. Members are evaluated and educated on important co-existent health and self-management issues: smoking, obesity, flu and pneumonia vaccination, exercise and diet. If a member volunteers, the member's family history will be reviewed to determine if there is an early history of heart disease – which is an additional risk factor – and is followed by education for aggressive risk reduction.

ActiveHealth's major goals of the program for children with diabetes are to educate the member/caregiver on the fundamental nature of diabetes (type 1 and type 2) and diabetes self-management.



ActiveHealth works to ensure that health care providers are aware of the need for certain standards of care for those with diabetes. When communicating with the provider, these are referred to as “care considerations”. ActiveHealth generates a confidential communication to the member and/or physician regarding important clinical information identified for the member and directed at improving health outcomes. A care consideration will include the identified issue and the potential adverse event, as well as, the literature citation that is the basis for the care consideration.

### **Funding**

The KEHP receives funds from the state General Fund to support the KEHP, a self-funded group health plan. These funds by way of employer portion of premium contributions are for the overall support of the KEHP including claims and administration. The KEHP trust fund may only use KEHP funds for claims and administration of the KEHP. Disease management funds are a part of Humana’s overall administrative fees. There are no funds specifically earmarked by the General Assembly for disease management or administration of the KEHP. For context, less than 5% of the plan’s expenses are for the administration of the KEHP.

### **Effectiveness**

The KEHP has a robust disease management program in place. KEHP provides disease and care management programs managed by ActiveHealth Management and Humana. The Informed Care Management (ICM) program provides disease management to members who have one or more of over 30 identified chronic conditions, including diabetes. Among the top conditions being addressed by the ICM program are hypertension, diabetes, chronic back/neck pain, GERD, and obesity. In 2010, 126,249 KEHP members had at least one of the identified conditions and were targeted for outreach. As part of the ICM program, Care Considerations is a program which relays confidential communication to the member and/or physician regarding important clinical information that is identified for the patient and directed at improving health outcomes. Over 70,000 care considerations were sent in 2010.

ActiveHealth has identified over 21,000 members with diabetes or with a high risk factor for diabetes. Over 4000 of those members are engaged with an ActiveHealth nurse, and over 1500 receive educational materials. 68% of the total population at risk is highly engaged with a nurse at Active Health.

ActiveHealth’s Informed Care Management program resulted in a total savings of \$12.71 PMPM (per member per month) by each identified program; however, the savings specific to the diabetes program is rolled into the total savings and isn’t identified separately.

## **4. Office of Health Policy**

The Office of Health Policy (OHP) is responsible for collecting and analyzing statewide claims data. Through its data collection and analysis, the office identifies opportunities for preparing and distributing relevant information to the public and other governmental entities about health, health care, and public policy. OHP collects administrative claims data in the form of copies of billing records from hospitals and ambulatory facilities. This administrative data includes many elements such as procedure codes, diagnosis codes, facility charges and patient demographic information. OHP collects administrative claims data related to inpatient hospital discharges, emergency

department utilization (including observation stays), outpatient surgery, mammograms, and other outpatient procedures such as MRI, CAT scan or procedures identified by specific CPT© codes.

OHP makes the data it collects available on its web site including information on charges for health-care services as well as information describing quality and outcome measures. The web site may be found at: <http://www.chfs.ky.gov/ohp/healthdata/>. The quality indicator reports presented on the web site were created using Quality Indicator software called MONAHRQ which was developed by the Agency for Health Care Research and Quality and the Department for Health and Human Services. The Quality Indicators provide a measure of quality for specific medical conditions and surgical procedures performed in a hospital setting, hospital utilization, maps of avoidable hospital stays and county rates of hospital use. This data is a valuable source of information for the public, as well as, other governmental entities.

OHP also prepares analysis of the data in response to requests from other entities. Generally about 100 reports are produced annually, with approximately one half of those requests originating from the Department for Public Health. While OHP does not operate any programs, they are a provider of data, reports, and analysis to entities such as the Department for Public Health and policymakers in support of their programs.

### **Funding**

OHP does not receive funding from the Kentucky General Assembly for specific programs or activities aimed at reaching those with diabetes. Included within the operating budget is \$200,000 allocated for the collection of administrative claims data.

### **Effectiveness**

OHP collaborates with the Department for Public Health by providing data analysis of hospitalization and Emergency Department visit data, and provides technical support for reports. They also utilize MONAHRQ to create an interactive web site which provides information about quality of care at the hospital level, health care utilization at the hospital level, preventable hospitalizations at the county level, and rate of conditions and procedures at the county level.

## **Coordinated Efforts**

In addition to the activities of the DPH, DMS and KEHP do individually to address diabetes, these organizations collaborate on diabetes-related activities. Examples of these activities are listed below.

### **Diabetes State Plan**

The state diabetes plan was initiated as part of KDPCP's work under the CDC grant. Kentucky Diabetes Prevention and Control Program (KDPCP) brought together a large group of stakeholders to develop a diabetes state plan for Kentucky. Department for Medicaid Services (DMS), Office of Health Policy (OHP), and the Kentucky Employee Health Plan administered by the Personnel Cabinet (Personnel/KEHP) were all represented in that planning process. In the midst of the planning process, two further mandates for state plan development related to diabetes occurred. First, Kentucky received funding from CDC to develop a Coordinated Chronic Disease Prevention and Health Promotion plan

(described above), and Senate Bill 63/KRS 211.752 was enacted requiring development of this diabetes plan between DPH, DMS, OHP, and Personnel/KEHP. The Diabetes State Plan strategic planning efforts will align with these mandates (See **Attachment C** for a copy of the draft Diabetes State Plan).

### **Coordinated Chronic Prevention and Health Promotion State Plan**

DPH recently led an effort to develop a Coordinated Chronic Disease Prevention and Health Promotion State Plan to achieve measurable improvements across the top five leading chronic disease related causes of death and disability (e.g. heart disease, cancer, stroke, diabetes and arthritis) and their associated risk factors. A steering committee composed of internal and external partners was created to give input and guide the process. In November 2011, a stakeholders meeting with over 160 partners was conducted to tap into and channel the enthusiasm and expertise of such a diverse group. Members of organizations responsible for this legislative report participated. The plan developed through this stakeholder driven process includes initiatives consistent with current statewide efforts and those noted in this document (See **Attachment D** for a summary of the “Call to Action” included in this Chronic Disease Plan).

### **Data from OHP**

The DPH utilizes burden/impact reports, fact sheets, presentations, grant applications; all organizations utilize data from the work of OHP.

### **CMS Healthcare Innovation Grant**

Very recently, the DPH, OHP, DMS, KEHP and other partners within the Cabinet, developed and submitted a planning grant application to the Centers for Medicare and Medicaid Services (CMS) for a Healthcare Innovation Grant. The grant proposes the development of a plan to implement the Diabetes Prevention Program (DPP) across the Commonwealth. The primary stakeholders in the plan are Kentucky Employees Health Plan, Medicaid Managed Care and Kentucky private insurers. At the time of this report, the application is under review.

### **KEHP and HumanaVitality<sup>SM</sup>**

The Personnel Cabinet, Kentucky Employees’ Health Plan (KEHP), and the Cabinet for Health and Family Service, Department of Public Health (DPH) have partnered in pursuit of promoting and improving access to a new wellness program. The Personnel Cabinet and DPH are exploring implementing DPH diabetes education and management programs into KEHP disease management and HumanaVitality<sup>SM</sup>. This would provide both local and face-to-face diabetes education and management to members in hopes to enhance the KEHP diabetes disease management services already provided.

More specifically, the Kentucky Employees’ Health Plan (KEHP) launched HumanaVitality<sup>SM</sup> in January 2012. HumanaVitality<sup>SM</sup> is a comprehensive wellness program that integrates rewards with health, providing the tools and support to help (KEHP) members live healthier lives. Based on research, HumanaVitality<sup>SM</sup>-engaged individuals have significantly lower medical claims compared to all other members and non-members. The more a person engages with the program, the more opportunities to earn incentives and get healthier.

The partnership between the Personnel Cabinet and DPH will expand access for KEHP members to receive a Vitality Check as part of the HumanaVitality<sup>SM</sup> wellness program. The Vitality Check is a blood screening and biometric assessment that measures body mass index (BMI), blood pressure, blood glucose and total cholesterol. Local health departments are sites for this biometric screening. The Vitality Check provides an assessment of an individual's basic health and offers valuable insight into health risks. The measurements chosen for this assessment have been shown through medical research to give participants an easy method to determine current health risks. A determination of high blood glucose has a direct correlation to the detection of diabetes whereas obesity, high cholesterol and a high blood pressure have an indirect correlation to prediabetes and diabetes. The more KEHP members who have the Vitality Check, the more early diagnosis of prediabetes and diabetes will occur. Once diagnosed with prediabetes or diabetes, the member's primary care doctor and KEHP's disease management programs can assist managing the condition.

While it's important for individuals to manage their own health, HumanaVitality<sup>SM</sup> also recognizes the gravity of certain illnesses and health conditions as being best managed under a disease management program.

### **Disease Management Programs**

Diabetes Centers of Excellence (DCOE) is a disease management program targeting Medicaid participants with diabetes who are 18 years or older and are not pregnant. The DCOE's assist persons with diabetes to better manage their disease through a unique partnership involving the patient, their primary care provider, the local health department and community resources. Medicaid and DPH collaborated on the project development.

In 2009, Medicaid and DPH collaborated to bring a DCOE-like disease management services to a particular population of about 400 Medicaid clients with diabetes that had been receiving disease management services from another vendor. When the contract with this vendor was discontinued, Medicaid asked DPH to provide services for these patients. The patients were located in a 10 county area of Kentucky. While these 10 counties did not completely coincide with the DCOE sites, the services were able to be provided to these patients via the DCOE sites and 2 additional local health departments.

### **MCO's Utilizing KDPCP Materials**

KDPCP produces and updates diabetes-related educational materials. A number of organizations outside of public health request and utilize these materials in their education and disease management programs. Passport Health Plan has been utilizing "Diabetes Basics" within their disease management program for several years. CoventryCares is currently utilizing KDPCP's "Nutrition Basics" with their members.

### **Diabetes Self-Management Education (DSME)**

A primary focus of the KDPCP has been to increase access to DSME in Kentucky. The classes provided by the local health departments are open to anyone with diabetes in the community – Medicaid recipients, staff, and community members.

## Joint Benchmarks

Currently, joint benchmarks do not exist across the entities mentioned in this report. The committee felt that utilizing the Healthcare Effectiveness Data and Information Set (HEDIS) measures would be an appropriate choice since these are well known, standard measures for assessing diabetes care and will be reported by the Medicaid MCO's and the KEHP. HEDIS is a tool used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service. The diabetes measures assess whether patients receive guideline-recommended care and achieve control levels for their blood sugar, cholesterol and blood pressure. The diabetes measures are listed below.

### HEDIS Measures

The percentage of adults 18-75 years of age with diabetes (type 1 and 2) who had each of the following:

- A1C testing
- A1C poor control (>9.0%)
- A1C control (<8.0%)
- A1C control (<7.0%) for a selected population
- LDL-C screening
- LDL-C control (<100 mg/dl)
- Medical attention for nephropathy
- BP control (<130/80 mm Hg)
- BP Control (<140/90 mm Hg)

Setting of joint benchmarks will take further work by the entities. To begin this process, KDPCP and OHP have been working with the Kentuckiana Health Collaborative (KHC). The KHC is dedicated to improving health status and healthcare in Greater Louisville and Southern Indiana and is convened by the UAW/Ford Community Health Initiative. The group is comprised of representatives that have a major stake in improving the healthcare system such as healthcare providers, health plans, hospitals, employers, government, labor unions, non-profit advocacy groups including Greater Louisville Medical Society, and other healthcare-related stakeholders. The mission of the KHC is to mobilize the community to improve health and well-being by coordinating action-oriented efforts. This group has for several years been creating "Consolidated Measurement Reports." Clinicians in Greater Louisville, including Southern Indiana, receive annual reports from KHC with feedback on the quality of care their patients received in select clinical areas of focus. Since 2007, KHC has partnered with statewide organizations to expand the reports outside of Greater Louisville into the remainder of Kentucky. Anthem Blue Cross Blue Shield, Humana Health Plan of Kentucky, Passport Health Plan and Kentucky Medicaid have provided data derived from their annual HEDIS submissions to create and distribute private consolidated measurement reports to providers. Statewide reports were not available in 2011; however, it is expected that the 2012 report will be available. These reports include benchmarks as well as averages from National Medicaid, National Commercial Average and Kentucky. This could be a very useful tool in providing and reporting data.

## Recommendations/Action Plan

### Goals and Action Items

The following goals and action items were identified by the committee as activities that would be most practical in improving outcomes for people with diabetes. They are based on accepted standards of practice and scientific evidence of what works to improve outcomes for those with diabetes and are consistent with diabetes and other chronic disease state planning efforts.

#### **Goal #1 - Support existing state health promotion plans, coalitions and partnerships related to diabetes and chronic disease prevention and control.**

##### **Rationale:**

KDPH works with many statewide coalitions/partnerships including the Kentucky Diabetes Network, Smoke-Free Kentucky, Heart Disease and Stroke Task Force, Partnership for a Fit Kentucky and the Unbridled Health Leadership Team. There are also many local coalitions addressing diabetes, tobacco use, physical activity, asthma and other conditions. The work of these coalitions will continue to be supported by the Cabinet for Health and Family Services through the Department for Public Health so that capacity for change is increased at the state level. These public-private partnerships with multi-sector representatives such as universities, schools, transportation, providers, pharmacists, local health departments, foundations, businesses, and other organizations create a collective voice and leverage resources available to each of the partners.

KDPH is currently working with the Kentucky Diabetes Network to finalize the development of the Kentucky Diabetes Plan and also working with the Unbridled Health Leadership Team to finalize “Unbridled Health-A Plan for Coordinated Chronic Disease Prevention and Health Promotion”. The development of the coordinated plan is a requirement of the Centers for Disease Control and Prevention in order to address chronic diseases such as diabetes, coronary heart disease, arthritis and lung diseases which share common risk factors such as smoking obesity, low levels of physical activity and poor nutrition and consists of overarching goals and objectives. Development of the state Diabetes Plan will provide more detailed goals, objectives and activities specific to the management and care of the patient with diabetes and prevention of progression from prediabetes to diabetes.

##### **Potential Action Items:**

- A. Provide financial support for implementation of the Kentucky Diabetes State Plan

The Kentucky Diabetes State Plan was developed in the fall of 2010 and spring of 2011, drawing on a large number of partners who met in groups to identify what might be done to improve diabetes care in Kentucky, and what efforts needed to occur for diabetes prevention. The working group developed interventions and strategies targeting changes in: health care system delivery of clinical care and patient education; promoting linkages between clinical care and community resources; policy and environmental changes to support diabetes prevention and management; and identifying improvements in data collection to address disparities and improve our ability to evaluate the impact of diabetes on the Commonwealth. Please note that this plan remains in “draft” form awaiting the completion of the Coordinated Chronic Disease Plan and this report to ensure maximum consistency in plans and goals (See **Attachment C** for a summary of the plan).

- B. Provide financial support for implementation of the Coordinated Chronic Disease Prevention and Health Promotion State Plan-***Unbridled Health***

The Coordinated Chronic Disease Prevention and Health Promotion State Plan provides a framework of common goals, initiatives and action items to reduce the significant chronic disease burden in our state. The framework includes policy, systems and environmental changes that support making the healthy choice the easy choice; expanded access to health screenings and self-management programs; creating strong community-clinical linkages and networks; and using data that acts as a catalyst for change (See **Attachment D** for the Unbridled Health –Kentucky’s Call to Action, a two page synopsis of strategic activities).

**Goal #2 - Increase the availability and utilization of evidence based lifestyle change programs such as the National Diabetes Prevention Program (DPP).**

**Rationale:**

The Diabetes Prevention Program is a 16 week lifestyle change program which teaches participants ways to make modest behavior changes in their daily diet and physical activity levels to produce weight loss of 5% to 7% of their body weight. This program is proven to prevent the development of diabetes in those at risk, or to at least significantly delay the onset of diabetes.

The inaugural partners of the National Diabetes Prevention Program were the Y (also known as YMCA of the USA) and UnitedHealth Group (UHG). These partner organizations were instrumental in starting up the national program and continue to expand the reach of evidence based lifestyle programs. Participants work with a lifestyle coach in a group setting to receive a 1-year lifestyle change program that includes 16 core sessions (usually 1 per week) and 6 post-core sessions (1 per month). The National Diabetes Prevention Program encourages collaboration among federal agencies, community-based organizations, employers, insurers, health care professionals, academia, and other stakeholders to prevent or delay the onset of type 2 diabetes among people with prediabetes in the United States.

The YMCA of Greater Louisville was one of the original partners in the groundbreaking research that proved the effectiveness of DPP. Currently in Kentucky, only the YMCA of Greater Louisville and the YMCA of Central Kentucky (Lexington) offer this program. Working to expand the availability of this program through YMCA’s and other organizations, businesses, hospitals, public health, etc. would give Kentuckians with prediabetes the opportunity to prevent or delay the development of diabetes. The CDC supports a DPP curriculum that can be used by public and private community groups.

**Potential Action Items:**

Provide financial support to:

- A. Expand DPP programming in Kentucky and engage state, county and local government agencies to provide access to DPP as a covered benefit for employees.
  - 1) Implement a KEHP Pilot project integrating the DPP into the KEHP disease management program and the HumanaVitality wellness program.
- B. Work with health care providers to implement systems for referral of people with prediabetes or multiple risk factors for type 2 diabetes to DPP.

- C. Coordinate implementation of health communication and marketing campaigns or coalition initiatives that raise awareness of prediabetes risk factors and the locations and enrollment information for DPP programs.
- D. Provide outreach and information to employer groups about DPP and encourage offering DPP as a covered employee benefit.

**Goal #3 - Increase the availability and utilization of sustainable evidence based diabetes and chronic disease self-management education and other health education or behavior change initiatives to improve control of A1C, blood pressure, and cholesterol and to promote tobacco cessation.**

**Rationale:**

Much of the sickness and death associated with diabetes can be prevented by appropriate clinical management and patient self-management practices. Controlling blood sugar, blood pressure, and cholesterol (the ABC's), plus stopping the use of tobacco products are critical to prevention of diabetes complications (blindness, kidney disease, nerve damage and heart disease). Comprehensive diabetes self-management education (DSME), as well as disease management/case management programs, have been shown to improve outcomes for people with diabetes.

**Potential Action Items:**

- A. Support KEHP pilot projects:
  - 1) Incentivize KEHP members with diabetes to participate in an evidence based DSME program.
  - 2) Collaborate with the Department for Public Health on diabetes disease management. KEHP members would be afforded the opportunity to not only work with disease management and case managers, but could also receive diabetes training or other diabetes management programs at local health departments.
  - 3) Explore integration of wellness into KEHP plan design, shifting from voluntary to mandatory participation. Possibilities include requiring the completion of an annual health assessment (HA) and/or a biometric screening both which are available through the KEHP's current wellness program, HumanaVitality.
- B. Provide financial support to:
  - 1) Expand availability of evidence based DSME programs to improve behavioral and/or clinical outcomes for people with diabetes (ADA Recognized or AADE accredited DSME programs)
    - a. Increase the number of nationally recognized diabetes education programs
    - b. Increase the number of Certified diabetes educators
  - 2) Expand availability of the Stanford Diabetes Self-Management Program and the Stanford Chronic Disease Self-Management support (CDSMP) program which are proven to improve ABC's control.
  - 3) Increase utilization of tobacco cessation services (e.g. quitlines) for adult tobacco users with diabetes.

**Goal #4 - Assure a sustainable diabetes prevention and control infrastructure and workforce.**

**Rationale:**

The extent of diabetes and prediabetes in Kentucky require a continued, well-staffed state program to coordinate diabetes efforts through local health departments, maintain connections to experts at the



CDC and maintain and expand existing local and statewide diabetes coalitions and other community-based organizations to address this serious chronic disease.

Health Care Reform and associated quality standards will increase the demand for qualified diabetes educators and evidence based diabetes prevention and control interventions.

**Potential Action Items:**

- A. Maintain and allocate new state General Funds for diabetes in the biennium budget. State diabetes funding will support:
  - 1) Continued updating and distribution of the DSME Curriculum which meets national standards for program recognition/accreditation.
  - 2) Training LHD and staff from other entities in the delivery of DSME classes
  - 3) Workshops for health care professional to improve knowledge of diabetes diagnosis, treatment and management.
    - a. Professional education/licensure/training
    - b. DSME
  - 4) Coordination of the expansion of the DPP program across Kentucky
  - 5) Develop/sustain a communication hub of diabetes information
  - 6) The Diabetes Research Board
  - 7) Public health infrastructure
- B. Increase the number of Certified Diabetes Educators (CDE's) and licensed diabetes educators in Kentucky
- C. Work with the "Diabetes Educator Licensure Board" to implement the new licensure requirement
- D. Work with diabetes stakeholders to define roles for health professionals, allied health professionals, community health workers, and others in promoting standard diabetes education management.

**Goal #5 - Improve diabetes and chronic disease surveillance systems needed to determine the extent and impact of diabetes on the Commonwealth.**

**Rationale:**

The ongoing, systematic monitoring and improvement of data collection on diabetes and other chronic diseases is vital for public health planning. Kentucky lacks adequate surveillance data on our African American population, in particular. Our administrative claims data on hospitalizations and emergency department visits lacks a unique patient identifier to allow us to understand certain quality of care issues.

Since 2009 Kentucky has received more than \$9 million to advance the use of an electronic health information exchange and support eligible healthcare providers across the state in achieving stage 1 meaningful use of certified technology. The system affords healthcare providers the functionality to support preventive health and disease management through alerts, messaging and other tools. The focus of Kentucky Health Information Exchange (KHIE) is on improving the health, quality and safety of healthcare for Kentucky's residents and visitors through the provision of a statewide, interoperable health information exchange. The Centers for Medicaid/Medicare Services have developed quality guidelines for disease management that providers may choose to demonstrate meaningful use of electronic technology and therefore receive incentive payments for adopting electronic medical record (EMR). These quality guidelines include diabetes management. This gives Kentucky an excellent

opportunity to use its established health information exchange to understand the scope and breadth of the disease as well as providing a tool for improving diabetes care through provider alerts and surveillance.

The continued development of the Kentucky Health Information Exchange offers the possibility to develop a depository of A1C results which would provide a more accurate understanding of how many people in Kentucky have diabetes and how well the disease is managed.

**Potential Action Items:**

Provide financial support to:

- A. Improve the specificity of the administrative claims data by establishing a policy to include unique patient identifiers on each administrative claims record. Without a unique patient identifier on each record, it is not possible to determine if a patient has multiple hospitalizations or ED visits in a given time period. A patient identifier would allow for complete analysis of the number of patients that are treated for specific diseases or conditions rather than the number of services provided. This is particularly beneficial with issues related to Public Health. The unique identifier would not provide the actual identity of a patient, but rather would provide a means to improve our understanding of patterns of hospital and ED use.
- B. Improve Behavioral Risk Factor Survey data on populations in Kentucky that experience health disparities. One target would be to improve data collection for African Americans as this population experiences drastically higher mortality rates due to diabetes than does the rest of the Kentucky population.
- C. Support Medicaid and KEHP in the collection and reporting of HEDIS data as part of the KHC project described below. This HEDIS data forms the basis for the Joint benchmarking required by as part of this report.
  - a. Support statewide coverage of the Kentucky Health Collaborative Consolidated Measurement Reports. KHC works with health insurers to use HEDIS data to create and distribute reports to clinicians illustrating the quality of care their patients received in select clinical areas of focus including diabetes. Since 2007, KHC has partnered with statewide organizations including Anthem Blue Cross Blue Shield, Humana Health Plan of Kentucky, Passport Health Plan, and Kentucky Medicaid. The Medicaid Managed Care Organizations have indicated a willingness to participate in this project. No statewide reports were available in 2011 during the transition to MCO's.
- D. Investigate expanded use of the Kentucky Health Information Exchange by laboratories reporting data as an A1C registry similar to that used by New York City. This would provide information on the level of diabetes control in our population of persons with diabetes in Kentucky. In addition, it may expand our knowledge of how many people have diagnosed diabetes in Kentucky, including how many youth have diabetes.

**Goal #6 - Review promising practices with the implementation of health care reform**

**Rationale:**

Accountable care organizations (ACO)s are networks of physicians and other providers that are held accountable for the cost and quality of the full continuum of care delivered to a group of patients. The organization agrees to take on the responsibility for providing care for a particular population which achieving specified quality objectives and constraining costs. In 2011, the National Committee for

Quality Assurance issued a list of proposed ACO capabilities, which form the basis of a voluntary ACO accreditation program.

**Potential Action Item**

KEHP pilot project –analyze the viability for KEHP members to participate in partnership with Humana in an Accountable Care Organization (ACO). The pilot project would focus on a segment of Louisville-based KEHP members. Accountable Care Organization (ACO) is a specific group of participating providers responsible for the total health care needs and expenditure of a designated population of participants who are assigned to a specific group of participating providers. The ACO design is built on participating providers accepting local accountability for a defined population of patients; payment reform based on shared savings and performance measures, which may include quality, process, outcomes and patient satisfaction metrics. While the ACO would not be specific to diabetes, the quality of care and outcomes of KEHP members with diabetes who are part of the pilot project would be studied.

**Goal # 7 - Support Policies that improve outcomes for persons with and at risk for diabetes and other chronic diseases.**

**Rationale:**

Systems and policy change is a cost effective way for states to improve a population’s health. There is strong evidence that Comprehensive Smoke Free Laws improve health by reducing heart attacks, respiratory problems such as asthma attacks and lung cancer which in effect reduces the overall social and financial burden to individuals, families, communities and states. Access to healthcare for the low-income/uninsured can reduce overall costs through preventive services and early interventions. Reimbursement for diabetes education classes by Certified Diabetes Educators can ensure that people can learn how to manage their diabetes and prevent complications. Electronic Medical Records and information sharing through KHIE can help ensure continuity and coordination of care and provide opportunities to engage patients in their own care.

**Potential Action Items:**

- A. Support passage of the statewide comprehensive smoke-free law.
- B. Take advantage of the opportunity for expansion of the access to care provision of the Affordable Care Act such as the Health Benefit Exchange and Medicaid expansion so that more uninsured people with diabetes are able to receive appropriate medical care and avoid costly, unnecessary hospitalizations or emergency department visits.
- C. Support policies to expand usage of Electronic Medical Records by all health care providers and link those systems to the KHIE.
- D. Support policies for Medicaid, KEHP, and other insurers to provide reimbursement for evidence based diabetes education classes.

## Budget

**Goal #1** **\$2,400,000**  
**Support existing state health promotion plans, coalitions and partnerships related to diabetes and chronic disease prevention and control.**

- A. Funding will support implementation efforts related to the Diabetes State Plan including education, training, coalition building, and systems change efforts.  
Diabetes State Plan \$50,000
  
- B. Coordinated Chronic Disease State Plan: This includes supporting the local communities and coalitions to implement evidence based interventions, conduct training, data collection, and development and maintenance of a web based chronic disease resource directory which would be available to providers and the public. Small grants for partners in local communities will be a key feature of these plans.  
Unbridled Health-  
Chronic Disease Prevention and Health Promotion Plan \$2,350,000

**Goal #2** **\$1,150,000**  
**Increase the availability and utilization of evidence based lifestyle change programs such as the National Diabetes Prevention Program (DPP).**

- A. Expand DPP programming in Kentucky and engage state, county and local government agencies to provide access to DPP as a covered benefit for employees.  
KEHP Pilot Project \$1,000,000
  
- B. Work with health care providers to implement systems for referral of people with prediabetes or multiple risk factors for type 2 diabetes to DPP. \$50,000
  
- C. Coordinated implementation of health communication and marketing campaigns. \$50,000
  
- D. Provide outreach and information to employer groups about DPP and encourage offering DPP as a covered employee benefit. \$50,000

**Goal #3** **\$125,000**  
**Increase the availability and utilization of sustainable evidence based diabetes and chronic disease self-management education and other health education or behavior change initiatives to improve control of A1C, blood pressure and cholesterol and to promote tobacco cessation.**

- A. Support KEHP pilot projects such as incentivizing KHEP members with diabetes to participate in an evidence based DSME program; integration of wellness into KEHP plan design by shifting from voluntary to mandatory participation; and/or collaborating with KDPH for disease management and diabetes education and will be covered in existing budget and funding of Goal 1 and 4. \$100,000

- B. Expand availability of and utilization of evidence based programs to improve behavioral and/or clinical outcomes for people with diabetes. \$25,000

**Goal #4 \$3,300,000**

**Assure a sustainable diabetes prevention and control infrastructure and workforce.**

- A. Maintain state General Funds for diabetes and designate those funds in the budget. This budget will cover all potential action items under Goal 4 including the three action items below.
  - Legislative funding of the Kentucky Diabetes Research Board \$3,100,000
  - Legislative funding of the Kentucky Diabetes Research Board \$200,000
- B. Increase the number of Certified Diabetes Educators (CDE's) and licensed diabetes educators in Kentucky. Included above
- C. Work with the "Diabetes Educator Licensure Board" to implement the new licensure requirement Included above
- D. Work with diabetes stakeholders to define roles for health professionals, allied health professionals, community health workers, and others in educating patients about diabetes management. Included above

**Goal #5 \$69,000**

**Improve diabetes and chronic disease surveillance systems needed to determine the extent and impact of diabetes on the commonwealth.**

- A. Establish a policy to include unique patient identifiers on each administrative claims record. The Office of Health Policy would develop this initiative working with the Kentucky Hospital Association. No funding required
- B. Improve Behavioral Risk Factor Surveillance System (BRFSS) data on populations in Kentucky that experience health disparities. One target would be to improve data collection for African Americans as this population experiences drastically higher mortality rates due to diabetes than does the rest of the Kentucky population. Each BRFSS call encounter costs \$35 per land line completion and \$75 per cell phone completion. Many households only have cell phones now.
  - Adding 800 BRFSS calls to targeted population (land line) \$24,000
  - Adding 200 BRFSS calls to targeted population (cell line) \$15,000
- C. Support statewide coverage of the Kentucky Health Collaborative (KHC) Consolidated Measurement Reports. KHC works with health insurers to use HEDIS data to create and distribute reports to clinicians illustrating the quality of care their patients received in select clinical areas of focus including diabetes. The inclusion of Medicaid, KEHP and Medicaid Managed Care Organizations would allow for comparative reporting across payers.
  - Expansion of data collection, analysis, and reporting \$10,000
- D. Investigate expanded use of the Kentucky Health Information Exchange by laboratories reporting data as an A1C registry similar to that used by New York City. This would provide

information on the level of diabetes control in our population of persons with diabetes in Kentucky. In addition, it may expand our knowledge of how many people have diagnosed diabetes in Kentucky, including how many youth have diabetes  
Estimated cost for changes to software \$20,000

**Goal #6**

**No funding required**

**Review promising practices with the implementation of health care reform**

The KEHP pilot project with an Accountable Care Organization (ACO) which will be initiated in the Louisville area with current providers has zero estimated cost by the Personnel Cabinet.

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**The following goals are issues the Cabinet and Legislature needs to consider for the improved health of all Kentuckians. However, direct funding for these items are outside the funding of this report.**

**Goal #7**

**Support Policies that improve outcomes for persons with and at risk for diabetes and other chronic diseases.**

- A. Protecting people in public places from the dangers of second-hand smoke is critical for the health of all Kentuckians. This law would be especially important for diabetics with their fragile medical state.
- B. Support the expansion of Medicaid eligibility and the Health Benefit Exchange as important policies that would allow access to preventive care and early diagnosis of diabetes to the approximately 360,000 Kentuckians currently without insurance.
- C. Support policies to expand usage of Electronic Medical Records by all health providers.
- D. Support policies for Medicaid, KEHP, and other insurers to provide reimbursement for evidence based diabetes education classes such as those included in the present Medicaid Preventive Services package and be required by Medicaid Managed Care Organizations.

**Total**

**\$7,044,000**

## References

1. Centers for Disease Control and Prevention. National Diabetes Fact Sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.
2. The Centers for Disease Control and Prevention (CDC), National Center for Health Statistics, Division of Vital Statistics, National Vital Statistics Report Volume 60, Number 3, December 2011, Table 19. Available at [http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60\\_03.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf).
3. Kentucky Department for Public Health. 2010 Kentucky Behavioral Risk Factor Survey.
4. American Diabetes Association. Standards of Medical Care in Diabetes – 2012; Diabetes Care January 2012 vol. 35 no. Supplement 1 S11-S63.
5. Guide to Community Preventive Services. Diabetes prevention and control. [www.thecommunityguide.org/diabetes/index.html](http://www.thecommunityguide.org/diabetes/index.html). Last updated: 1/10/2013.
6. Am J Gastroenterology, 2011; 106:1911–1921; Yuhara, et al. Is Diabetes Mellitus an Independent Risk Factor for Colon Cancer and Rectal Cancer?

# **Attachment A**

## **Legislation**



## **KRS 211.751-753**

### **211.751 Goals, benchmarks, and plans to reduce incidence of diabetes, improve care, and control complications.**

The Department for Medicaid Services, the Department for Public Health, the Office of Health Policy, and the Personnel Cabinet shall collaborate to identify goals and benchmarks while also developing individual entity plans to reduce the incidence of diabetes in Kentucky, improve diabetes care, and control complications associated with diabetes.

**Effective:** June 8, 2011

**History:** Created 2011 Ky. Acts ch. 83, sec. 1, effective June 8, 2011.

### **211.752 Annual reports to Legislative Research Commission.**

The Department for Medicaid Services, the Department for Public Health, the Office of Health Policy, and the Personnel Cabinet shall submit a report to the Legislative Research Commission by January 10 of each odd-numbered year on the following:

(1) The financial impact and reach diabetes of all types is having on the entity, the Commonwealth, and localities. Items included in this assessment shall include the number of lives with diabetes impacted or covered by the entity, the number of lives with diabetes and family members impacted by prevention and diabetes control programs implemented by the entity, the financial toll or impact diabetes and its complications places on the program, and the financial toll or impact diabetes and its complications places on the program in comparison to other chronic diseases and conditions;

(2) An assessment of the benefits of implemented programs and activities aimed at controlling diabetes and preventing the disease. This assessment shall also document the amount and source for any funding directed to the agency or entity from the Kentucky General Assembly for programs and activities aimed at reaching those with diabetes;

(3) A description of the level of coordination existing between the entities on activities, programmatic activities, and messaging on managing, treating, or preventing all forms of diabetes and its complications;

(4) The development or revision of detailed action plans for battling diabetes with a range of actionable items for consideration by the General Assembly. The plans shall identify proposed action steps to reduce the impact of diabetes, prediabetes, and related diabetes complications. The plan shall also identify expected outcomes of the action steps proposed in the following biennium while also establishing benchmarks for controlling and preventing relevant forms of diabetes; and

(5) The development of a detailed budget blueprint identifying needs, costs, and resources required to implement the plan identified in subsection (4) of this section. This blueprint shall include a budget range for all options presented in the plan identified in subsection (4) of this section for consideration by the General Assembly.

**Effective:** June 8, 2011

**History:** Created 2011 Ky. Acts ch. 83, sec. 2, effective June 8, 2011.

### **211.753 Use of agencies' existing diabetes information, data, initiatives, and programs to implement KRS 211.751 and 211.752.**

The requirements of KRS 211.751 and 211.752 shall be limited to the diabetes information, data, initiatives, and programs within each agency prior to June 8, 2011, unless there is unobligated funding for diabetes in each agency that may be used for new research, data collection, reporting, or other requirements of KRS 211.751 and 211.752.

**Effective:** June 8, 2011

**History:** Created 2011 Ky. Acts ch. 83, sec. 3, effective June 8, 2011.

# **Attachment B**

## **Committee Members**

## **Committee Members**

The following people participated in the preparation of this report.

### **Cabinet for Health and Family Services**

#### **Department for Public Health**

Stephanie Mayfield Gibson, MD, FCAP, Commissioner

Steve Davis, MD, former Acting Commissioner

Connie Gayle White, MD, MS, FACOG, Deputy Commissioner

Charles Kendell, Chief of Staff, Office of the Commissioner

Gary Kupchinsky, Assistant Director, Division of Prevention and Quality Improvement

Sue Thomas-Cox, RN, Manager, Chronic Disease Prevention Branch

Theresa A. Renn, RN, CDE, Program Director, Kentucky Diabetes Prevention and Control Program

Teresa A. Wood, PhD, Epidemiologist, Kentucky Diabetes Prevention and Control Program

### **Office of Health Policy**

Chandra Venettozzi, Health Data Administrator

Allison Lile, Senior Health Policy Specialist

### **Department for Medicaid Services**

Barbara Epperson, Data Analyst

Mary Coleman, RN, Nurse Consultant Inspector

### **Personnel Cabinet**

#### **Department of Employee Insurance**

#### **Kentucky Employees Health Plan**

Joe Cowles, Commissioner

Donna Cordier, Commissioner's Office

Fred Nelson, former Commissioner

### **National Association of Chronic Disease Directors**

Marti Macchi, MEd, MPH

Senior Consultant for Diabetes

# **Attachment C**

## **Diabetes State Plan**

## Kentucky Diabetes State Plan Framework March 2012

This strategic map was developed by a broad base of diabetes stakeholders with a vision for a Kentucky free of the devastation of diabetes.

<b>Mission</b>	Collectively work to prevent diabetes and its complications and reduce diabetes-related health disparities.												
<b>Target Population</b>	All Kentuckians with and at risk for diabetes with particular attention to populations with demonstrated disparities and at greatest risk for diabetes and its complications.												
<b>Goal</b>	<b>Prevent or Delay Diabetes</b>		<b>Improve Health and Quality of Life for Individuals with Diabetes</b>						<b>Reduce Health Disparities</b>				
<b>Long Term Desired Results or Outcomes</b>	Slow the Rise in Estimated Diabetes Incidence (# of new cases)		↓ ER Visits by People with Diabetes	↓ Rate of Hospitalizations for Lower Ext. Amputations ↑ # of Counties with LEA Adm. Rates Below National Average	↓ Hospitalization Rates for Ischemic Heart Disease and/or Stroke in Combination with Diabetes	↓ the % of People with Diabetes Who Have Been Told They Have Diabetic Retinopathy	↓ Rate of Hospitalization for Long Term Comps (ESRD, Blindness, LEA, Heart Disease/Stroke) ↓ # of KY Counties with Long Term D/M Comp. Adm. Rates > Nat. Avg.	↓ Hospitalization Rate for Short Term Diabetes Complications (Diabetic Ketoacidosis, Hyperosmolar Hyperglycemic State, Hypoglycemia)	↓ Age Adjusted Hospitalization Rate for Diabetes (Primary Dx) ↓ Age Adjusted Rate of Hospitalization for Uncontrolled Diabetes Complications	↓ Adverse Outcomes of Pregnancy Complicated by Diabetes	↓ Disparities ER visits & for Age-Adjusted Hospitalization Rates for Diabetes (Primary Dx), for Short & Long Term Comps, and Uncontrolled Diabetes & LEAs		
<b>Intermediate Desired Results or Impact</b>	↑ Reg. Phys. Activity Esp. for People with Prediabetes ↑ CDC Recognized Diabetes Prevention Lifestyle Modification Programs ↑ PCPs with NCQA Recognition		↑ A1C Testing & Improved Glycemic Control ↑ Blood Pressure Checks ↓ Tobacco Use			↑ Annual Urinary Microalb. Assessment ↑ Annual Lipid Assessment ↑ DSMT/E Programs with AADE or ADA Recognition		↑ Annual Dilated Eye Exams ↑ Daily Self-Blood Glucose Monitoring ↑ PCPs with NCQA Recognition		↑ Glycemic Control ↑ Daily Self-Blood Glucose Monitoring			
<b>Short Term Desired Results</b>	↑ Access to Safe Environments for Physical Activity ↑ Screening for Prediabetes in High Risk Individuals ↑ Worksites with Policies to Support Healthy Lifestyle ↑ # Employers & Health Plans that Offer Reimbursement for DPP ↑ Referral to CDC DPP for Lifestyle Modification ↑ Enrollment CDC DPP for Lifestyle Modification		↑ Screening for Diabetes in Undiagnosed Population ↑ CDEs & Licensed Diabetes Educators ↑ Enrollment in DSME/T ↑ Referral for DSME/T ↑ Access to DSMT/E			↑ Referral to Quitline by Diabetes Educators ↑ Access to Educ./Training for Specific Complications ↑ OBGYN Referral to CDE/Diabetes Ed./Gestational Ed. Program ↑ PCPs and Specialty Providers Adopting EMRs & Demo. Meaningful Use ↑ PCPs and Specialty Providers Participating in KHIE Effort		↑ Screening in High Risk Populations ↑ Access to Specialists for Diabetes Care ↑ Utilization Quitline Tobacco Cessation Strategies ↑ Surveillance of Impact & Outcomes Measures ↑ PCPs Who have Adopted Pt. Centered Medical Home Model		↑ Programs to Address Workforce Competency for Reaching Disparate Populations ↑ Access DSME/T in Disparate Pop. Service Areas ↑ Access Meds & Supplies for Uninsured ↑ Enrollment Disparate Population for DSME/T ↑ PCP Attendance D/M CME Offerings ↑ PCPs Using Evid-Based Dx & Tx Guidelines ↑ PCP Use of EMRs			
<b>Interventions and Strategies for Change</b>	<p>Interventions and strategies are targeted to achieve <b>changes in health systems in clinical and self-management services; policies; physical and social environment; and individual behavior</b> related to the short term, intermediate and long term results outlined in this document. They draw primarily from evidence-based or promising practices; strive to be culturally and linguistically appropriate; and seek to build a stronger connection between <b>clinical and community linkages</b>. They are also targeted to support <b>surveillance systems, research and evaluation</b> to inform, prioritize, deliver, and monitor the health of populations.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> <p><b>Health System Changes Re: Clinical &amp; Self-Management Services</b>                      Promote Evidence-based Clinical Screening for Diabetes/Prediabetes, Esp. Disparate Populations                      Promote Access/Utilization Self-management Ed. &amp; Lifestyle Mod. Programs, Esp. Dispar. Popul.                      Promote Evidence-based Clinical Care Practices for Diabetes Prevention/Management                      Support Initiatives to ↓ Out of Pocket Costs Clinical Preventive &amp; Self-management Services                      Promote Use of Electronic Medical/Health Records &amp; Connection to KHIE                      Support Certification/Recognition Programs Designed to ↑ Quality                      Promote Adoption of Models that Support Delivery of Consistent Coord. Comprehensive Care                      Support Medication Reviews &amp; Reconciliation by Health Care Professionals                      Promote Skill Bldg. Efforts to ↑ Understanding Health Info/Services &amp; Informed Decision Making                      Promote Health Communication Campaigns that Contribute to ↑ Quality Clinical Care Re: ABCs                      *With emphasis for disparate populations</p> </td> <td style="width: 33%; vertical-align: top;"> <p><b>Cultivate Clinical &amp; Community Linkages</b>                      Mobilize Partnerships to Identify &amp; Solve Diabetes Issues                      Maintain/Expand/Promote Web-based Diabetes Resource Directory                      Promote Provider Awareness of Self-management/ Lifestyle Mod. Programs                      Develop/Implement Communication Plans to Promote Stakeholder Connections                      Promote Various Assessments to Identify &amp; Address Health Needs &amp; Barriers</p> </td> <td style="width: 33%; vertical-align: top;"> <p><b>Policy &amp; Physical/Social Environmental Changes</b>                      Promote Tobacco Prevention and Control Policies                      Promote Efforts to Educate/Inform State/Local Policy Makers*                      Advocate for Policies in Health Care Org. that Contribute ↑ Quality                      Support Adoption Activity &amp; Nutrition Policies in Various Settings                      Promote Worksite Wellness Programs/Policies to Businesses                      Support Efforts that Promote Access to Safe Environ. for Activity                      Support Efforts to Improve Social Determinants of Health/Soc. Envir.</p> </td> </tr> </table>										<p><b>Health System Changes Re: Clinical &amp; Self-Management Services</b>                      Promote Evidence-based Clinical Screening for Diabetes/Prediabetes, Esp. Disparate Populations                      Promote Access/Utilization Self-management Ed. &amp; Lifestyle Mod. Programs, Esp. Dispar. Popul.                      Promote Evidence-based Clinical Care Practices for Diabetes Prevention/Management                      Support Initiatives to ↓ Out of Pocket Costs Clinical Preventive &amp; Self-management Services                      Promote Use of Electronic Medical/Health Records &amp; Connection to KHIE                      Support Certification/Recognition Programs Designed to ↑ Quality                      Promote Adoption of Models that Support Delivery of Consistent Coord. Comprehensive Care                      Support Medication Reviews &amp; Reconciliation by Health Care Professionals                      Promote Skill Bldg. Efforts to ↑ Understanding Health Info/Services &amp; Informed Decision Making                      Promote Health Communication Campaigns that Contribute to ↑ Quality Clinical Care Re: ABCs                      *With emphasis for disparate populations</p>	<p><b>Cultivate Clinical &amp; Community Linkages</b>                      Mobilize Partnerships to Identify &amp; Solve Diabetes Issues                      Maintain/Expand/Promote Web-based Diabetes Resource Directory                      Promote Provider Awareness of Self-management/ Lifestyle Mod. Programs                      Develop/Implement Communication Plans to Promote Stakeholder Connections                      Promote Various Assessments to Identify &amp; Address Health Needs &amp; Barriers</p>	<p><b>Policy &amp; Physical/Social Environmental Changes</b>                      Promote Tobacco Prevention and Control Policies                      Promote Efforts to Educate/Inform State/Local Policy Makers*                      Advocate for Policies in Health Care Org. that Contribute ↑ Quality                      Support Adoption Activity &amp; Nutrition Policies in Various Settings                      Promote Worksite Wellness Programs/Policies to Businesses                      Support Efforts that Promote Access to Safe Environ. for Activity                      Support Efforts to Improve Social Determinants of Health/Soc. Envir.</p>
<p><b>Health System Changes Re: Clinical &amp; Self-Management Services</b>                      Promote Evidence-based Clinical Screening for Diabetes/Prediabetes, Esp. Disparate Populations                      Promote Access/Utilization Self-management Ed. &amp; Lifestyle Mod. Programs, Esp. Dispar. Popul.                      Promote Evidence-based Clinical Care Practices for Diabetes Prevention/Management                      Support Initiatives to ↓ Out of Pocket Costs Clinical Preventive &amp; Self-management Services                      Promote Use of Electronic Medical/Health Records &amp; Connection to KHIE                      Support Certification/Recognition Programs Designed to ↑ Quality                      Promote Adoption of Models that Support Delivery of Consistent Coord. Comprehensive Care                      Support Medication Reviews &amp; Reconciliation by Health Care Professionals                      Promote Skill Bldg. Efforts to ↑ Understanding Health Info/Services &amp; Informed Decision Making                      Promote Health Communication Campaigns that Contribute to ↑ Quality Clinical Care Re: ABCs                      *With emphasis for disparate populations</p>	<p><b>Cultivate Clinical &amp; Community Linkages</b>                      Mobilize Partnerships to Identify &amp; Solve Diabetes Issues                      Maintain/Expand/Promote Web-based Diabetes Resource Directory                      Promote Provider Awareness of Self-management/ Lifestyle Mod. Programs                      Develop/Implement Communication Plans to Promote Stakeholder Connections                      Promote Various Assessments to Identify &amp; Address Health Needs &amp; Barriers</p>	<p><b>Policy &amp; Physical/Social Environmental Changes</b>                      Promote Tobacco Prevention and Control Policies                      Promote Efforts to Educate/Inform State/Local Policy Makers*                      Advocate for Policies in Health Care Org. that Contribute ↑ Quality                      Support Adoption Activity &amp; Nutrition Policies in Various Settings                      Promote Worksite Wellness Programs/Policies to Businesses                      Support Efforts that Promote Access to Safe Environ. for Activity                      Support Efforts to Improve Social Determinants of Health/Soc. Envir.</p>											
<b>Settings for Action</b>	1. Health Care Delivery Systems 2. Public & Private Health Insurance Organizations 3. Communities & the Built Environment 4. State and Local Government Agencies		5. Faith-Based Organizations 6. Academic Organizations (Researchers & Professional Educators) 7. Schools 8. Worksites or Employers				9. Media Organizations 10. Philanthropic Organizations 11. Non-Profit Organizations 12. Organizations Representing Disparate Populations						

# **Attachment D**

**Coordinated Chronic Disease Plan**

**Call to Action**

## Kentucky's Call to Action

Nearly every Kentuckian has a family member, friend, or co-worker who has been affected by a chronic disease. Kentucky's Coordinated Chronic Disease Prevention and Health Promotion State Plan can change this through a united effort and shared vision to improve the health and quality of life for all Kentuckians.

Collaboration ensures that the whole is greater than the sum of its parts. Where do you fit in? You are a key part of the team, and here are some examples of ways you can begin to make a difference:



If you are a school or university:

- Make your entire campus a tobacco-free environment.
- Provide healthy foods in vending machines and cafeterias.
- Include health promotion messages in health classes.
- Include comprehensive school physical activity programs.
- Adopt comprehensive school and staff wellness policies.



If you are a community-based organization:

- Support policy, environmental, and systems changes for chronic disease prevention and control.
- Collaborate to provide community prevention programs.
- Provide chronic disease prevention awareness information and screening programs for clients.



If you are a hospital:

- Collaborate to sponsor community screening and education programs.
- Implement comprehensive tobacco-free policies at your facility.
- Seek or maintain accreditation/certification to ensure quality (Heart, Stroke, Cancer, Baby Friendly or other).
- Collaborate to sponsor patient navigation and survivorship programs.



If you are an employer:

- Implement comprehensive tobacco-free policies at your facility.
- Use incentives and implement programs (paid time off for screenings, worksite wellness programs) to reduce barriers and encourage regular screenings.
- Provide healthy food options in vending machines and cafeterias.
- Adopt comprehensive worksite wellness policies and programs.



**If you are a local health department:**

- Support policy, environmental and systems changes for chronic disease prevention and control.
- Provide navigation services for clients.
- Collaborate in community prevention and health promotion campaigns.
- Consider the benefits of public health accreditation.
- Adopt comprehensive worksite wellness policies



**If you are a faith-based organization:**

- Encourage members to get preventive screening tests.
- Provide space for physical activity programs.
- Learn how to provide healthy potluck and meeting meals.
- Provide chronic disease prevention and health promotion information to members.



**If you are a legislator:**

- Sponsor or support legislation and funding that promotes chronic disease prevention and control.
- Raise constituents' awareness about chronic disease prevention and control programs in your district and help establish new programs as needed.
- Ensure that all Kentuckians have access to health care, screenings and early detection services.



**If you are a health care provider:**

- Provide culturally relevant counseling, information, and referrals for screening tests.
- Adhere to guidelines and best practices for prevention, treatment and supportive care.
- Refer patients to smoking cessation, physical activity, nutrition, breastfeeding, self-management and mental health programs.



**If you are a Kentuckian:**

- Stop using tobacco products or never start.
- Support comprehensive tobacco-free environment policies.
- Increase your daily physical activity.
- Eat more fruits and vegetables and maintain a healthy weight.
- Know when to be screened and do it on schedule.
- Take an active role in your health care decisions.



# Attachment E

## Diabetes Research Board Accomplishments

## Kentucky Diabetes Research Board Accomplishments

Title and Principal Investigator	Publications and Presentations
Assessment of renal effects of relaxin treatment in OVE26 diabetic mice. - David W. Powell, Ph.D.	Merchant, M.L., Cummins, T.D., Wilkey, D.W., Salyer, S.A., Powell, D.W., Klein, J.B., and Lederer, E.D. (2008) Proteomic analysis of renal calculi matrix proteins suggests an importance for inflammatory processes within calcium stone accretion. <i>Am J Physiol Renal Physiol.</i> 295, F1254-1258.
	Burg, J.S., Powell D.W., Chai, R., Hughes, A.L., Bard, M., Link, A.J., and Espenshade, P.J. (2008) Insig Regulates HMG-CoA Reductase by Controlling Enzyme Phosphorylation in Fission Yeast. <i>Cell Metabolism</i> 8, 522-531.
	Uriarte, S.M, Powell, D.W, Luerman, G.C, Merchant, M.L, Cummins, T.D, Jog, N.R, Ward, R.A, McLeish, K.R. (2008) Comparison of proteins expressed on secretory vesicle membranes and plasma membranes of human neutrophils. <i>J Immunol.</i> 15, 5575-558.
	Powell, D.W., Bertram, C.C., Cummins, T.D., Barati, M., Zheng, S., Epstein, P.N., and Klein, J.B. (2009) Renal Tubulointerstitial Fibrosis in OVE26 Type 1 Diabetic Mice. <i>Nephron –Experimental Nephrology</i> 111, e11-e19.
	Beck, L.H., Jr., Bonegio, R.G.B., Lambeau, G., Powell, D.W., Cummins, T.D., Klein, J.B., and Salant, D.J. (2009) Identification of the Phospholipase A2 Receptor as the Target Antigen in Idiopathic Membranous Nephropathy. <i>New England Journal of Medicine</i> 361, 11-21.
	Dean, W.L., Lee, M.J., Cummins, T.D. and Powell, D.W. (2009) Characterization of Platelet Microparticle Size Classes. <i>Thrombosis and Haemostasis</i> 102, 711-718.
	Cummins, T.D., Barati, M.T., Coventry, S.C., Salyer, S.A., Klein, J.B., and Powell, D.W. (2010) Quantitative mass spectrometry of diabetic kidney tubules identifies GRAP as a novel regulator of TGF- $\beta$ signaling. <i>Biochim Biophys Acta.</i> 1804, 653-662.
	Merchant, M.L., Powell, D.W., Wilkey, D.W., Cummins, T.D., Bertram, C.C., McAfee, K.J., Fleischer, C., Klein, E., and Klein, J.B. (2010) Microfiltration isolation of human urinary exosomes for characterization by MS. <i>Proteomics Clin. Appl.</i> 4, 84–96.
	Tezel, G., Yang, X., Lou, C., Cai, J., Kain, A.D., Powell, D.W., Kuehn, M.H., and Pierce, W.M. (2010) Hemoglobin Expression and Regulation in Glaucoma: Insights into Retinal Ganglion Cell Oxygenation. <i>Invest Ophthalmol Vis Sci.</i> 51, 907-919.
	Luo, C., Yang, X., Kain, A.D., Powell, D.W., Kuehn, M.H., and Tezel, G. (2010) Glaucomatous tissue stress and the regulation of immune response through glial Toll-like receptor signaling. <i>Invest Ophthalmol Vis Sci.</i> 11, 5697-707.
	Tezel, G., Yang, X., Luo, C., Kain, A.D., Powell, D.W., Kuehn, M.H., and Kaplan, H.J. (2010) Oxidative stress and the regulation of complement activation in human glaucoma. <i>Invest Ophthalmol Vis Sci.</i> 51, 5071-5082.
	Luerman, G.C., Powell, D.W., Uriarte, S.M., Cummins, T.D., Merchant, M.L., Ward, R.A., McLeish, K.R. (2011) Identification of phosphoproteins associated with human neutrophil granules following chemotactic peptide stimulation. <i>Mol Cell Proteomics.</i> 10

Title and Principal Investigator	Publications and Presentations
CONTINUED: Assessment of renal effects of relaxin treatment in OVE26 diabetic mice. - David W. Powell, Ph.D.	Gerbasi, R.V., Preall, J.B., Golden, D.E., Powell, D.W., Cummins, T.D., Sontheimer, E.J. (2011) Blanks, a Nuclear siRNA/dsRNA Binding Complex Component, is Required for Drosophila Spermiogenesis. Proc Natl Acad Sci U S A. 108, 3204-3209.
	Farley, A.R., Powell, D.W., Weaver, C.M., Jennings, J.L., and Link, A.J. (2011) Assessing the components of the eIF3 complex and their phosphorylation status. Journal of Proteome Research. Epub ahead of print
	Stewart, E.V., Nwosu, C.C., Tong, Z., Roguev. A., Cummins, T.D., Kim, D., Hayles, J., Park, H., Hoe, K., Powell, D.W., Krogan, N.J., and Espenshade, P.J. (2011) Yeast SREBP cleavage activation requires the golgi Dsc E3 ligase complex. Molecular Cell. In press
Telomeres in Obesity and Diabetes - Dennis C. Bruemmer, M.D.	<b>Manuscripts:</b>
	Findeisen HM, Kevin Pearson, Gizard F, Zhao Y, Cohn D, Heywood EB, Jones KL, de Cabo R, Bruemmer D. Oxidative Stress accumulates in Adipose Tissue during Aging and inhibits Adipogenesis. PLoS One (in press).
	<b>Presentations:</b>
	2010 Obesity 2010, 28th Annual Scientific Meeting San Diego, Satellite Symposium: Obesity and Related Diseases: Insight and Progress, "Adipose Tissue Telomere Attrition and Senescence in Aging" 2011 University of Washington, Diabetes and Obesity Center of Excellence (Seattle, WA), "Telomerase in Obesity, Diabetes, and Atherosclerosis."
Beta-catenin as a potential new target to prevent and/or treat type 1 diabetes - Dr. Pascale Alard, Ph.D	<b>Presentations:</b>
	S. Atay, M. Villard, M. Martin, S. A. Parnell, M. M. Kosiewicz, P. Alard. Investigation of the high expression of nuclear beta-catenin in bone marrow-derived dendritic cells from diabetes-prone mice. Research!Louisville October 20-24, 2008, Louisville, Kentucky.
	S. Atay, M. Villard, M. Martin, S. Parnell, M. M. Kosiewicz , P. Alard. Relationship between the high expression of nuclear beta-catenin in dendritic cells from NOD mice and the pro-inflammatory phenotype of these cells. American Association of Immunologists 96th Annual Meeting, Seattle Washington, May 2009.
	P. Alard, A. Holmberg, S. A. Parnell, M. Villard, M. Martin, and M. M. Kosiewicz. Accumulation of nuclear beta-catenin in dendritic cells from NOD mice leads to induction of IFNgamma-producing T cells implicated in diabetes progression. Research! Louisville, October 12-16, 2009, Louisville, Kentucky.
	M. Villard, A. Holmberg, S. A. Parnell, M. Martin, M. M. Kosiewicz, and P. Alard. Accumulation of nuclear beta-catenin in dendritic cells from NOD mice leads to induction of IFNgamma-producing T cells implicated in diabetes progression. Federation of Clinical Immunologic Societies Boston, Massachusetts, June 2010.

Title and Principal Investigator	Publications and Presentations
CONTINUED Beta-catenin as a potential new target to prevent and/or treat type 1 diabetes - Dr. Pascale Alard, Ph.D	<b>Publications:</b> A. Zirnheld, M. Villard, S. A. Parnell, M. Martin, A. Holmberg, M. Kahn, M. M. Kosiewicz and P. Alard. beta-catenin activity regulates IL-12 production in NOD DC and subsequent induction of IFN $\gamma$ -producing T cells. (in preparation).
Adiponectin Receptor Fragment as a New Biomarker for Type 2 Diabetes - Saeed A. Jortani, PhD	<b>Publications:</b> Pugia, MJ, Franke DHD, Barnes SL, Zerchera A, Brocka D, Foltz M, Valdes Jr. R, Jortani SA. Adiponectin Receptor-1 C-Terminal Fragment (CTF) in Plasma: Putative Biomarker for Diabetes. Clinical Proteomics 2009;5:156-62. <b>Presentations:</b> Jortani S.A. Gender difference in adiponectin (obesity and diabetes). Epigenetics conference. Advancing Womens Health Group at U of L. December 2008. Update on the Marker: Siemens company (our collaborator) who owns the patent on the discovery of CTF has decided to license it to a pharmaceutical company to develop it as a drug. We are told that they will not pursue the diagnostic approach.
Academic-Community Coalition for a School-based Obesity Prevention/Treatment Program - Jay Perman,	<b>Presentations:</b> The American College of Preventive Medicine (ACPM) conference on February 18, 2010 in Washington, D.C. The University of Kentucky Center for Clinical and Translational Science (UK CCTS) Annual Meeting in Lexington, Kentucky on March 23, 2010. The Academy Health Annual Research Meeting on June 28, 2010, in Boston, Massachusetts. The American Public Health Association (APHA) Annual Meeting on November 9, 2010 in Denver, Colorado. The Appalachian Health Summit: Focus On Obesity on Thursday, April 21, 2011 in Lexington, Kentucky. Southern Society for Pediatric Research Regional Meeting on Thursday, February 9, 2012 in New Orleans, Louisiana.
A novel mechanism by which type 2 diabetes promotes restenosis - Zhenheng Guo, PhD	<b>Presentations:</b> “Smooth Muscle Cell Specific Expression of Calcium Independent Phospholipase A2 $\beta$ Exacerbates Neointimal Formation in a Murine Carotid Artery Ligation Model “ Shu Liu, Zhongwen Xie, Qingwei Zhao, Huan Pang, Lindsay Kavanagh, Ming C. Gong, and Zhenheng Guo “Identification of a cAMP-response Element in RGS2 Promoter as a Key cis-regulatory Element for RGS2 Transcriptional Regulation by Angiotensin II in Cultured VSMC” Zhongwen Xie, Dexiang Liu, Shu Liu, John Turk, and Zhenheng Guo

Title and Principal Investigator	Publications and Presentations
Engineering pancreatic islets for the treatment of type 1 diabetes - Haval Shirwan, PhD	<b>Publications:</b>
	Lu, P., Rha, G., Melikishvili, M., Wu, G., Adkins, B. C., Fried, M. G. and Chi, Y.-I. (2008) Structural basis of natural promoter recognition by a unique nuclear receptor HNF4a: Diabetes gene product. J. Biol. Chem. 283: 33685-97.
	Rha G., Wu, G., Shoelson, S. E. and Chi, Y.-I. (2009) Multiple binding modes between HNF4alpha and the LXXLL motifs of PGC-1alpha lead to full activation. J. Biol. Chem. 284, 35165-76.
	Rha, G., Wu, G. and Chi, Y.-I. (2011) Probing the effect of MODY mutations near the coactivator binding pocket of HNF4alpha. Biosci. Rep. in press
	Rha, G., Popa, G., Tucker, C. L., Özcan, S. and Chi, Y.-I (2011) MED25 is a mediator component of HNF4alpha-driven transcription leading to glucose-stimulated insulin secretion in pancreatic beta-cells. Mol. Cell. Biol. under revision
	Recent funding activities: Active
	'Structural and functional studies of HNF1alpha and HNF4alpha' American Diabetes Association (ADA) Career Development Award (7-08-CD-03), 07/01/08 - 06/30/13 (role: PI)
	'Inhibition of ATGL-mediated lipolysis by G0S2' NIH/NIDDK (1R01DK089178-01), 07/01/10 - 06/30/15 (role: co-PI)
	<b>Pending</b>
	'Molecule mechanism of HNF4alpha in beta-cells' NIH/NIDDK (1R01DK093461-01), 12/01/11 - 11-30/16 (role: PI)
	Recent oral presentations (including the ones planned during my visit to Korea in May and the upcoming ADA meeting in June):
	'Molecular Structures of RNA/DNA/Proteins: A hammerhead ribozyme and the nuclear receptor HNF4alpha as examples' Department of Molecular Therapeutics, Scripps Florida, September 13, 2010
	'Molecular mechanism of HNF4alpha: Diabetes gene product' Department of Life Sciences, Sogang University, Seoul, Korea, May 19, 2011
	'Molecular mechanism of HNF4alpha: Diabetes gene product' School of Life Sciences and Biotechnology, Korea University, Seoul, Korea, May 20, 2011
	'Molecular mechanism of HNF4alpha: Diabetes gene product' Department of Molecular Cell Biology, Sungkyunkwan University School of Medicine, Suwon, Korea, May 24, 2011
'Molecular mechanism of HNF4alpha: Diabetes gene product' American Diabetes Association Annual Meeting, San Diego, CA (abstract submitted), June 24-28, 2011	

Title and Principal Investigator	Publications and Presentations
Engineering pancreatic islets for the treatment of type 1 diabetes - Haval Shirwan, PhD	<p><b>Publications:</b></p> <p>"Pancreatic Islets Engineered with SA-FasL Protein Establish Robust Localized Tolerance by Inducing Regulatory T Cells in Mice 11-7-11 Esma S. Yolcu, Hong Zhao, Laura Bandura-Morgan, Chantale Lacelle, Kyle B. Woodward, Nadir Askenasy, and Haval Shirwan"</p> <p><b>Funding:</b></p> <p>Received a 3-year funding from American Diabetes Association to continue the project initially funded by KDRB. The initial funds from KDRB was important to our ability to compete for the ADA funding.</p>
Developing Health Sciences Students To Be Health Navigators For Diabetes Prevention And Care - Geza Bruckner, PhD	<p>We have not published any of the findings to date but plan on doing so when we complete our current Student Health Navigator activities in collaboration with Homeplace; designed to assess the best use of SHNs as Health Care extenders - completed by the end of June. These current SHN activities evolved from lessons learned through our funded grant from KDRF. Although our recently submitted NIH grant "Utilizing Student Health Navigators to Expand the Health Care Capacity of Family Health Care Advisors (Community Navigators) in Rural Areas - NCMHD Health Disparities Research on Minority and Underserved Populations (R01) RFA-MD-10-003" was not funded, we plan to resubmit. We are also working on submitting a USDA grant by May 18th titled "Impact of Student Health Navigators/Community Advisors/Extension Agents on Promoting Changes in Health Behaviors of Pre and Adolescent Children in Appalachian Communities", again this grant application would not have materialized without the foundation work to develop SHN through the funding we received from KDRF. Let me know if more is needed. Our heartfelt thanks to the KDRF for the monetary support provided that has kick started our efforts to provide SHN services to rural underserved areas.</p>
Expanding T regulatory cells as a means of establishing mixed chimerism for the prevention and treatment of type 1 diabetes - Esma S. Yolcu, PhD	<p><b>Publications:</b></p> <p>Pancreatic Islets Engineered with SA-FasL Protein Establish Robust Localized Tolerance by Inducing Regulatory T Cells in Mice 11-7-11 Esma S. Yolcu, Hong Zhao, Laura Bandura-Morgan, Chantale Lacelle, Kyle B Woodward, Nadir Askenasy, and Haval Shirwan</p>