People with Diabetes
- South Carolina had the 8th highest prevalence of diabetes among adults in the nation in 2014. One in nine adults has diabetes.\(^1,2,3\)
- Approximately one in seven African-Americans has diabetes, compared to one in ten white adults.\(^1,2,3\)
- One in four over the age of 65 has diabetes in South Carolina. Additionally, one in six has prediabetes in this growing age group. Additionally, one in seven has prediabetes in this growing age group.\(^1,2,3\)
- One in five adults with an annual household income of less than $15,000 has diabetes.\(^1,2,3\)

Diabetes Death
- Diabetes is the 7th leading cause of death in South Carolina. In 2015, 1,346 people died from diabetes, or **three deaths per day**. The death rate from diabetes for African-Americans was two times higher as compared to whites.\(^2,3,4\)

Hospitalization and Charges for Diabetes
- In 2015, around 26,000 diabetes hospitalization and ER visits occurred in SC, with charges of more than $419 million.\(^5\)
- The cost of care for all South Carolinians with diabetes is estimated to exceed three billion dollars in 2015 and more than four billion dollars by 2020. Less than one quarter (23.7%) of this cost has been paid by private insurance. The public portion will exceed three billion dollars in 2020.\(^6\)

Diabetes Risk and Complications
- 4 out of 5 adults with diabetes in South Carolina are overweight or obese.\(^1,2,3\)
- 8 out of 10 adults with diabetes have hypertension.\(^1,2,3\)
- 2 out of 3 adults with diabetes have high cholesterol.\(^1,2,3\)
- Prevalent cases of end-stage renal disease attributable to diabetes in adults have increased by 32% in SC in the last 10 years.\(^7\)

- 4 out of 9 persons with diabetes have not taken a diabetes self-management class.\(^1,2,3\)

---

1. SC Behavioral Risk Factor Surveillance System (SC BRFSS)
2. Public Health Statistics and Information Services (PHSIS)
3. SC Department of Health and Environmental Control (SC DHEC)
4. Division of Biostatistics
5. SC Revenue and Fiscal Affairs (SC RFA)
February 21, 2017

To Governor Henry McMaster and the Members of the General Assembly:

On behalf of the Board of Directors of the Diabetes Initiative of South Carolina (DSC), I am pleased to present our twenty-second Annual Report (calendar year 2016). The report was requested in the Diabetes Initiative of South Carolina Act, Chapter 39, Section 44-39.

Diabetes is a major public health problem in South Carolina; however, the Diabetes Initiative of South Carolina (DSC) provides a realistic mechanism to address issues on a statewide basis. About one in seven African-Americans has diabetes, compared to one in ten white adults. One in four over the age of 65 years old has diabetes in South Carolina. In the same age group, one in six has prediabetes. One in five adults with a less than $15,000 annual household income has diabetes.

DSC has a wide variety of representation on the DSC board and the Center of Excellence, Surveillance Council, and Outreach Council. Different individuals throughout the state are on the DSC Board, such as representatives from academic medical centers, clinicians, certified diabetes educators, SC Hospital Association, SC DHEC, SC DHHS, and the SC Medical Association.

The DSC has developed several programs for the education of a variety of health professionals about diabetes and its complications. DSC has sponsored 22 Annual Diabetes Fall Symposia for Primary Health Care Professionals featuring education and all aspects of diabetes mellitus. This symposium is an annual 2-day statewide program that supplies a comprehensive diabetes management update to all primary care professionals and an opportunity for attendees to obtain CMEs, CEUs, and other continuing education credits at a low cost. DSC also sponsors a Diabetes Strategies for the Twenty-First Century Symposium, held annually in the winter. Additionally, the DSC sponsors a Diabetes Under the Dome Day, which is a day at the legislature providing screening for diabetes and educational input about diabetes for our state’s representatives and other professionals at the state house.

Thank you for your past support and I hope you will accept these achievements as part of your administration. We look forward to providing you the successes for 2017 in next year’s report.

Respectfully submitted on behalf of the DSC Board,

Kathie L. Hermayer, MD, MS, FACE
Board Chair, Diabetes Initiative of South Carolina

Enclosure
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For more information, please visit our website

[http://www.musc.edu/diabetes](http://www.musc.edu/diabetes)
EXECUTIVE SUMMARY
EXECUTIVE SUMMARY

- Diabetes affects 29.1 million people, which is approximately 9.3 percent of the U.S. population. There are about 21 million people diagnosed with diabetes and 8.1 million people undiagnosed with diabetes.¹
- In 2014, South Carolina ranked eighth in the nation in the prevalence of diabetes mellitus.²
- 4 out of 5 adults with diabetes in South Carolina are overweight or obese.²
- 8 out of 10 adults with diabetes have hypertension.²
- 2 out of 3 adults with diabetes have high cholesterol.²
- Cases of end stage renal disease due to diabetes have increased by 32% in the past 10 years.²
- 4 out of 9 persons with diabetes have not taken a diabetes self-management class.²

The purpose of the Diabetes Initiative of South Carolina (DSC) is to develop and incorporate a comprehensive statewide plan of community outreach programs, health professional education, and diabetes surveillance in South Carolina. The DSC is committed to lowering the severe complications and cost burden of diabetes in the state by providing the tools for management of the disease.

The partnerships, via the effort of three Councils (Outreach, Diabetes Center, and Surveillance), achieved much success during 2016.

The Outreach Council:
The mission of the outreach council is to oversee and direct efforts in patient education for primary care to include: promoting adherence to national standards of education, ongoing assessment of patient care, costs, and reimbursement issues for persons with diabetes in South Carolina. The Outreach Council provides an annual report for the DSC Board. The DSC continues to work closely with the SC DHEC to assess community needs and maintain an efficient and consolidated outreach effort. The Outreach Council supported efforts towards the national publication for primary care professionals and other subspecialists for the April 2016 Diabetes Symposium issue of the American Journal of the Medical Sciences, 2016, Volume 351, Number 4. Contents of this journal include educational lectures spanning 21 Annual Diabetes Fall Symposia for Primary Health Care Professionals featuring topics regarding many aspects of diabetes mellitus.

Outreach efforts have increased diabetes awareness and continue to motivate patients with diabetes to maintain their care. Over 220 children and youths with diabetes attended Camp Adam Fisher from June 11-18, 2016, where they learned the latest news about diabetes management from their peers and from volunteer health professionals. The DSC sponsored the Diabetes under the Dome Day at the Legislature on March 16, 2016. The purpose of this event is to increase awareness related to diabetes and associated risks and to screen the general assembly members and other legislative professionals for diabetes or prediabetes with a finger stick glucose, A1C, height, waist circumference, BMI, blood pressure and cholesterol/lipids. People who are identified with risks or prediabetes can reduce their chances of developing diabetes by increasing physical activity and losing a weight. Even a 5-10 pound weight loss reduces risks. The event was met with great success and overall 58 people were assessed.

A screening program was initiated to identify risks for diabetes in rural SC focused on Bamberg County and surrounding areas. Led by Dr. Carolyn Jenkins, DSC and the College of Nursing, with funding from Sanofi, the program used the American Diabetes Association Risk Test and screened about 800 persons for risk factors for diabetes, including A1C, blood pressure, lipids, BMI, and waist circumference. Results were discussed with participants, action plans developed, and (with permission), the data were shared with the participants’ primary care provider (PCP). If participants had no PCP, they were linked to health care providers in the area.
In collaboration with Regional Medical Center in Orangeburg, South Carolina Health and Human Services, UNC-CH, and rural physicians, MUSC is conducting a study to evaluate nurse phone-based care coordination compared to in-home community health worker care coordination for patients with diabetes who have uncontrolled A1C or BP levels. Enrollment is completed and follow-up is ongoing.

**The Diabetes Center Council:**
The mission of the Diabetes Center Council is to work with health care providers to improve care of persons with diabetes. The 22nd Annual Diabetes Fall Symposium for Health Care Professionals was held on September 22 & 23, 2016 at the North Charleston Convention Center. The total attendance for the Symposium was 229 participants. The Diabetes Strategies program took place on February 2 & 3, 2016 at the North Charleston Convention Center. The total attendance for the Strategies program was 86 participants.

**The Surveillance Council:**
The mission of the surveillance Council is to acquire, analyze and distribute epidemiologic information about diabetes. In June 2015, Dr. John Vena, MUSC Chair of Biostatistics and Epidemiology, became the new chairman for the DSC Surveillance Council. Dr. John Vena and co-chair, Dr. Kelly Hunt, will be analyzing the data for diabetes in SC in conjunction with other statewide organizations such as DHEC and the SC Hospital Association.

Dr. Kathie Hermayer and Dr. Kelly Hunt presented an overview of the Surveillance Council activities and findings at the Department of Medicine Grand Rounds at MUSC on May 3, 2016. The key data reviewed were on diabetes prevalence. Access limitations to prediabetes data were discussed, with suggestions of joining forces between DHEC, HSSC, and other organizations with access to data. Drs. Hermayer and Hunt met with leaders in bioinformatics in SC concerning the use of EMRs or available databases, either for development of a SC Diabetes Registry or identifying and tracking quality metrics for diabetes in the state.

A major accomplishment of the Surveillance Council for 2016 has been to increase collaborative networks of investigators and professionals focused on the assessment of diabetes in South Carolina. The Council is currently launching an upgrade to the DSC webpages, and will continue to review and implement strategies for improvement in 2017. The Surveillance Council is also in the process of outlining goals and objectives for the DSC Strategic Plan.

Diabetes is a vast problem in South Carolina; however, the DSC provides a realistic mechanism to address issues on a statewide basis. The DSC continues to assess progress and provide evidence of significant decreases in co-morbidities and mortality. The overarching goal of the DSC is to provide professional education, community outreach, and the development of new targeted initiatives which will lead to continuous improvements in the care of people at risk and with diabetes. These strategies will help reduce the morbidity, mortality, and costs of diabetes and its complications in South Carolina.

**References:**
2. SC Behavioral Risk Factor Surveillance System (SC BRFSS); Public Health Statistics and Information Services (PHSIS); SC Department of Health and Environmental Control (SC DHEC)
HISTORICAL BACKGROUND
In 1991, the Division of Diabetes Translation, Centers for Disease Control, Atlanta, Georgia, published updated trends in diabetes and in diabetic complications in the United States, between 1980 and 1989. Major trends included an increasing prevalence of diabetes and increasing hospitalization rates among diabetic individuals for the serious complications of amputations, end stage renal disease, myocardial infarctions and cardiovascular death. The prevalence of diabetes was doubled in blacks when compared with whites. There was an increase in all major cardiovascular complications among blacks with diabetes. Diabetes was the leading cause of blindness among adults, and women with diabetes were at an increase risk for adverse outcomes of pregnancy.

These issues were magnified in South Carolina, relative to most other states in the United States. Diabetes prevalence was estimated at 6.1%, 5th among 38 states surveyed. Diabetes as a contributor to mortality was increasing in incidence in South Carolina and diabetes accounted for approximately 11% of hospital admissions. Overall, 14% of hospital beds were occupied by people with diabetes. Longitudinal data in the decade of 1980-1990 revealed increases in the prevalence of excess weight, self-reported hypertension and high blood cholesterol in individuals known to have diabetes. Hospitalization rates for renal failure, amputation, and myocardial infarction were increasing and the mortality rate for diabetes as one of the listed causes of death in South Carolina was steadily rising, from 50.7/100,000 population in 1980 to 71.1/100,000 population in 1992.

Shortages of health care professionals involved in care for people with diabetes were recognized. In particular, there were inadequate numbers of primary care physicians, endocrinologists, nephrologists, certified diabetes educators, podiatrists, and pharmacists trained in the care of people with diabetes. Major physician health professional shortages were identified by the Office of Primary Care, S.C. DHEC in 50% of the 48 counties in South Carolina and 74% of the counties in the state were designated by the S.C. State Health and Human Services Commission as medically underserved.

Crude estimates of quality of care for people with diabetes were made. In one survey of type 2 diabetes patients in 1994, 24% had not seen a medical doctor in the past year for diabetes, only 34% reported that they checked blood glucose at least once a day, and a mere 28% had ever heard of HbA1c. Of these, only 18% had an A1C check in the past year. Approximately one quarter of the diabetes individuals reported eye examinations and less than half said they had a foot examination in the past year. It was found that diabetes education had been provided to less than 50% of individuals with diabetes.

Evidence was appearing from large scale collaborative clinical trials that the risks of morbidity and mortality from such cardiovascular complications as myocardial infarction and stroke could be substantially reduced by intensive management of lipid profiles and elevated blood pressure. In 1993, the seminal report from the Diabetes Control and Complications Trial (DCCT) established that intensive glycemic regulation in type 1 diabetes would substantially decrease the risks for the progression of retinopathy, nephropathy, and neuropathy. Simple, inexpensive low dose aspirin therapy produced modest risk reductions for myocardial infarction as a secondary prevention strategy. Microalbuminuria was recognized as a risk marker for cardiovascular events and for renal failure, and it was predicted that intervention trials with angiotensin converting enzyme inhibitors (ACEI) would be effective in delaying progression of these serious complications.

Thus, a serious public health problem of diabetes and its complications was recognized in South Carolina and in the United States. An undersupply of qualified health professionals was on hand to deal with the increasing demands of more intensive education and health care for people with diabetes. Ominous upward trends in mortality and morbidity statistics were present, and an increasing incidence of markers of future cardiovascular events (hypertension, cholesterol, overweight/obesity) was occurring. It was evident that an action plan was needed.
The Diabetes Initiative of South Carolina (DSC) was created by legislative action and signed into law by the Governor of South Carolina in July, 1994. The law established a Board of Directors with members appointed by the top officials of key organizations with an interest in diabetes and its complications. The Board has met quarterly since that time and annually submits this Report. It is referred for progress review by the Legislature and the Governor.

The Organization Chart of the Diabetes Initiative of South Carolina is shown below:

There are three Councils; the Center of Excellence, Outreach, and Surveillance Council. There is a Diabetes Center of Excellence, established in the original legislation, based at the Medical University of South Carolina. This Center is responsible for administering the many activities and programs of DSC and its Board and Councils. It is also responsible for developing and administering professional education programs for health professionals of all varieties in South Carolina, to improve their knowledge and abilities to care for people with diabetes in our state. The Outreach Council is responsible for community interface, with a broad goal of improving diabetes care and education directed at people affected by diabetes. The Surveillance Council is responsible for acquiring, analyzing and distributing epidemiologic information about diabetes including its prevalence costs, morbidity, and mortality. This Council works closely with the Division of Diabetes, Heart Disease, Obesity, and School Health of the SC Department of Health and Environmental Control, and regularly examines the scope and impact of diabetes in South Carolina. A DSC site has been established in the School of Medicine at USC, and provides a critical mechanism for liaison between the two schools and for oversight of programs and activities in the midlands and upstate regions of South Carolina.

We also regularly interact with the American Diabetes Association, the Carolinas Center for Medical Excellence, the Hypertension Initiative of South Carolina and the Area Health Education Consortium. Full reports from key components in the DSC structure are included in this Report.
In calendar year 2004, we completed a review of 5 years of progress, which concentrated on the first 3 goals of the 10 Year Strategic Plan. We recognized that the legislation had created a uniquely successful statewide collaborative effort. Programs were generally on target and were productive. Examples were community outreach, professional and patient education programs, and surveillance of trends in diabetes care. It was recognized, however, that prevalence of diabetes and obesity was increasing, and that comorbidities such as hypertension and altered blood lipids complicated overall management. Major extramural grant funding for community-based programs and clinical trials had been acquired at MUSC and at USC. Overall, progress with that unique combination of public and private resources (federal, state, regional and local support) had been exciting.

In 2011 the Diabetes Initiative of SC evaluated the 10 Year Strategic Plan for improving diabetes in South Carolina. Programs that have been operative for a sufficient time to see trends in morbidity, mortality, hospitalizations, emergency room visits, and health disparities among people with diabetes in South Carolina were assessed. After this analysis by the Board, Councils, and major partners, we published a monograph “The State of Diabetes in South Carolina: An Evaluation of the First Ten Year Strategic Plan of the Diabetes Initiative of South Carolina.” Areas of defined advances were described as well as issues which require further attention. Since diabetes mellitus is a chronic disease with very long-term complications, it is likely that another decade (or more) of work will be needed to be certain that promising trends are sustained and real.

In 2012 the Diabetes Initiative of SC began writing its second 10 Year Strategic Plan. It is hoped that the Plan will be completed by mid-2016.
BUDGET
AND
RESEARCH GENERATED IN PARTNERSHIP WITH DSC
DSC OPERATING BUDGET
FY 2015 – 2016

State Appropriation $ 289,088
Less Cuts 165,617
Total Budget $ 123,471

RESEARCH GENERATED IN PARTNERSHIP WITH DSC

We are pleased to report major partnership opportunities in diabetes research for fiscal year 2016.

1. Epidemiology of Diabetes Intervention and Complications (EDIC) is a follow-up study of the course of patients enrolled in the Diabetes Control and Complications Trial (DCCT) in Charleston. Along with patients from 27 other centers in United States and Canada, this is a study of vascular complications after long-term glycemic control in type 1 diabetes. PI: Louis M. Luttrell, MD, PhD

2. LEADER Trial: To assess the effect of treatment with liraglutide compared to placebo for at least 3.5 years and up to 5 years on the incidence of cardiovascular events in adults with type 2 diabetes who are at high risk for cardiovascular events. PI: Ali Rizvi, MD


4. LEADER: Liraglutide Effect and Action in Diabetes: Evaluation of Cardiovascular Outcome Results: A Long-term, Multi-centre, International, Randomized Double-blind, Placebo-controlled Trial to Determine Liraglutide Effects on Cardiovascular Events. PI: Kathie Hermayer, MD

5. Technology Intensified Diabetes Education Study in African Americans with Type 2 Diabetes Mellitus (TIDES). The major goals of this project are to test the efficacy of a technology-intensified diabetes education/skills training (TIDES) intervention in improving glycemic control in African Americans with poorly controlled type 2 diabetes and to identify effective strategies for improving metabolic control and reducing diabetes complications and mortality rates in African Americans with type 2 diabetes. Sponsor: NIH/NIDDK. PI: Leonard E. Egede, MD

6. Technology-Intensified Diabetes Education/Skills Intervention in AAs with DM-2 (TIDES). The major goals of this project are to study the effectiveness of telephone delivered diabetes knowledge/information and motivation/behavioral skills for improved glycemic control in patients with poorly controlled type 2 diabetes. Sponsor: NIH/NIDDK. PI: Leonard Egede, MD

7. Tablet-Aided Behavioral Intervention Effect on Self-Management Skills (TABLETS). The major goal of the proposed research is to conduct a randomized clinical trial to test the effectiveness of a telephone-delivered behavioral lifestyle intervention on improving self-management behaviors in rural populations at high risk of cardiovascular disease. Sponsor: NIH/NIDDK. PI: Cheryl Lynch, MD. Co-I: Leonard Egede, MD

8. Charleston Health Equity and Rural Outreach Innovation Center (HEROIC). Goal: The Charleston HEROIC is one of 19 nationally funded VA HSR&D Centers of Innovation (COIN). The VA HSR&D initiated the COIN program to promote innovative research, facilitate partnerships and collaboration across disciplines, and increase the impact of health services research on the health and health care of Veterans. HEROIC's mission is to improve access and equity in healthcare for all Veterans by eliminating geographic, racial/ethnic, and gender-based disparities. VA HSR&D Center Award. Center Director: Leonard Egede, MD
9. **Transforming Patient-Centered Medical Homes into Medical Communities for Underserved Rural Patients (TPCMH-MCURP)**
   The purpose of this study is to improve diabetes management from hospital to home. Research specific aims are to document the primary barriers and facilitators of diabetes management and transitional care in Bamberg County through formative research with local hospital staff (at Orangeburg Regional Hospital as local hospital closed), primary care and specialist providers, public health practitioners, and high risk diabetes patients and their families. PI: Carolyn Jenkins, DrPH, APRN-BC

10. **SC DHEC’s Division of Diabetes, Heart Disease, Obesity, and School Health**
    The division is within the Bureau of Community Health and Chronic Disease Prevention and the goals and activities are possible through funding from the Center of Disease Control and Prevention. In collaboration with multiple partners, contractors and community organizations, the division implements strategies that have targeted and statewide reach and impact on multiple population groups to achieve improved chronic disease outcomes. The division is charged to lead South Carolina’s healthy eating and active living policy, systems, and environmental approaches to reduce obesity and obesity-related chronic conditions; health systems interventions to improve the effective delivery and use of clinical and other preventive services; and community-clinical linkages to support heart disease and diabetes prevention and control. The Diabetes Initiative of South Carolina is a major clinical partner and many of their goals and objectives are complementary. PI: Rhonda L. Hill, PhD, MCHES

12. **Greenville Hospital System Employees with Uncontrolled Diabetes Mellitus, Disease Management Pilot with Wireless Meter and CDE Co-management**  PI: John Bruch, MD; Co-PI Michelle Stancil, RN, CDE

13. **The Role of Sphingolipids in the Development of Diabetic Nephropathy:**
    The goal of this project is to examine the association and predictive ability of sphingolipids in relationship to diabetic nephropathy in individuals with type 1 diabetes using the DCCT/EDIC study population. Co-PIs: Maria Lopes-Virella, MD, PhD and Rick Klein, PhD

14. **Monitoring and Managing Newly Healed Chronic Leg and Foot Ulcer Skin Temperature: A Cooling Intervention (MUSTCOOL) to Prevent Ulcer Recurrence:**
    The goal of this study is to test MUSTCOOL, a home-based self-monitoring and self-management ulcer prevention intervention for patients with newly healed chronic venous leg and diabetic foot ulcers. Most ulcers recur within 3 months of healing. During the six-month randomized clinic trial, skin temperature will be monitored daily, a maintenance dose of cooling gel pack or placebo will be applied three times weekly to the affected skin, and a bolus dose of cooling will be applied for 5 consecutive days if skin temperature becomes elevated. We will measure outcomes on the incidence of ulcer recurrence, pain, physical activity and quality of life. PI: Theresa Kelechi, PhD, RN, FAAN

15. **Novel Intervention Linking Public Housing with Primary Care to Prevent Diabetes**
    The goal of this R34 two-year planning project is to develop, implement, and evaluate a pilot translational, DPP intervention. We propose to partner with the City of Charleston Housing Authority and the Fetter Health Care Network (FHCN), a federally qualified health center (FQHC) primary care network to refine and pilot test a community-based, behavior focused DPP intervention to reduce obesity and diabetes risk in public housing residents who are already eligible for FHCN/FQHC services. This 2-year R34 project will use a randomized wait list control design to allocate participants to a translational community based DPP intervention or FHCN/FQHC usual care. PI: Gayenell Magwood, PhD, RN, FAAN

17. **Community-based Intervention under Nurse Guidance after Stroke (CINGS)-Wide Spectrum Investigation of Stroke Outcome Disparities on Multiple Levels (WISSDOM) Center**
    The researchers are developing a community-partnered approach (CBPR) for patients at highest risk for future stroke to design a system for a theoretical, multi-level, novel intervention to control the premier stroke risk factor, hypertension. PI: Gayenell Magwood, PhD, RN, FAAN
## SUMMARY OF RESEARCH GENERATED IN PARTNERSHIP WITH DSC

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### Comment

Yearly funding of programs in education, care, and clinical research focus on improving outcomes for people with diabetes in SC. Total funding is now at $49.9 million, and yearly funding is $8.7 million. This yearly extramural funding is more than 30.3 times our current state budget. Thus, the modest investment that the state has provided for the Diabetes Initiative of South Carolina’s core funding has paid very impressive dividends in attracting extramural support for 15 long-term projects which address a wide variety of issues relating to diabetes and its complications.
Diabetes Initiative of South Carolina
Outreach Council
January 1, 2016 – December 31, 2016
Annual Board Report

As defined by Section 44-39-50 amendment to 1976 Code of Laws for South Carolina, The Diabetes Outreach Council shall oversee and direct efforts in patient education and primary care including:
1. Promoting adherence to national standards of education and care.
2. Ongoing assessment of patient care, costs and reimbursement issues for persons with diabetes in South Carolina.
3. Preparing an annual report and budget proposal for submission to the Diabetes Initiative of South Carolina Board.

Ongoing Outreach Council Meetings and Activities
The Outreach Council of the Diabetes Initiative of South Carolina met 3 times in 2015.

Prominent Activities
• DSC website updates (www.musc.edu/diabetes).
• SC Guidelines for Diabetes Care, revised and updated.
• SC Inpatient Guidelines for Diabetes Care, revised and updated.
• Collaborative efforts with the American Diabetes Association (ADA), American College of Endocrinology (ACE), American Association of Diabetes Educators (AADE), Joint Commission on Accreditation of Healthcare Organizations (JACHO), Juvenile Diabetes Research Foundation (JDRF), and Agency for Healthcare Research and Quality (AHRQ).
• Updated information on how to become a Certified Diabetes Educator (CDE).
• Updated patient literature and web links provided by governmental websites.
• 14th Annual Chronic Disease Prevention Symposium, SC DHEC, March 11-12, 2016.

Programs and Activities of Outreach Council Partners to Address Diabetes
• South Carolina Vocational Rehabilitation Department received 421 new referrals, served 935 cases, and rehabilitated 201 people with diabetes disability.
• South Carolina Hospital Association continues to focus on improving diabetes control in hospitals in South Carolina. SC Inpatient Guidelines for Diabetes Care was revised and updated.
• Camp Adam Fisher, the Carolina’s largest overnight camp for children with diabetes, siblings/friends, was held at the Cooper 4-H Leadership Center on Lake Marion, June 11-18, 2016, and hosted 220 campers.
• Family Practice Diabetes Education (Group) – 1st & 3rd Tuesday of every month.
• Family Practice Diabetes Education (Individual) – 2nd & 4th Tuesday of every month
• Diabetes Advisory Committee (DAC), 3rd Wednesday of every month.
• 13th Annual Obesity Summit: “Going the Distance: Achieving HEALTH Equity Together,” Brookland Baptist Church, 10/24/16, 200+ participants.
• Midlands Chapter of Diabetes Educators, Villa Tronco Restaurant, 11/26/16, 20 participants.
Programs/Grants

1. **Transforming Patient-Centered Medical Homes into Medical Communities for Underserved Rural Patients**
   PI: Carolyn Jenkins, DrPH, APRN-BC
   2015 Funding: $79,000   Total funding: $150,000   Years: 2014-2016
   The purpose of this study is to improve diabetes management from hospital to home.

   Research specific aims are to:
   **Aim 1:** Formative development of research: Document the primary barriers and facilitators of diabetes management and transitional care in Bamberg County through formative research with local hospital staff (at Orangeburg Regional Hospital as local hospital closed), primary care and specialist providers, public health practitioners, and high risk diabetes patients and their families. Using focus groups (FG) (i.e., qualitative approach), the following research questions will be addressed:
   A. What are the individual, interpersonal, health system, and community barriers and facilitators to diabetes and associated disease management and discharge from hospital to home among Bamberg residents?
   B. What are the recommended intervening strategies for reducing unnecessary hospital re-admissions and associated costs, and improve self-management success among individuals in Bamberg County?

   **Aim 2:** Based on findings from the research literature and Aim 1, develop a medical home/community extender community health worker (CHW) intervention for high risk diabetes patients and their families that includes training in:
   - monitoring and tracking A1c and blood pressure
   - simple self-management coaching strategies
   - accessing/enhancing resources supporting medication management, discharge plan adherence, problem solving, and improved diet and physical activity.
   - addressing barriers and facilitators identified in Aim 1.

   **Aim 3:** To test the impact and feasibility of a 3 month medical home/community extender CHW intervention for reducing unnecessary hospital re-admissions and associated costs, improve self-management success among individuals in Bamberg County, and conduct cost analyses of the intervention through a 3-group randomized control trial (RCT) feasibility pilot including:
   a) CHW in-home intervention;
   b) equipoise telephonic care by an RN;
   c) usual care.

3. **Novel Intervention Linking Public Housing with Primary Care to Prevent Diabetes**
   PI: Gayenell Magwood, PhD, RN
   The goal of this R34 two-year planning project is to develop, implement, and evaluate a pilot translational, DPP intervention. We propose to partner with the City of Charleston Housing Authority and the Fetter Health Care Network (FHCN), a federally qualified health center (FQHC) primary care network to refine and pilot test a community-based, behavior focused DPP intervention to reduce obesity and diabetes risk in public housing residents who are already eligible for FHCN/FQHC services. This 2-year R34 project will use a randomized wait list control design to allocate participants to a translational community based DPP intervention or FHCN/FQHC usual care. PI: Gayenell Magwood
4. **Community-based Intervention under Nurse Guidance after Stroke (CINGS)-Wide Spectrum Investigation of Stroke Outcome Disparities on Multiple Levels (WISSDOM) Center**

PI: Gayenell Magwood, PhD, RN  
2015 Funding: $264,850  Total funding: $1,059,400  Years: 2015-2019

The researchers are developing a community-partnered approach (CBPR) for patients at highest risk for future stroke to design a system for a theoretical, multi-level, novel intervention to control the premier stroke risk factor, hypertension.
Professional Education Activities

The Diabetes Strategies for the 21st Century program is intended to assist professionals in meeting the CE requirements for a non-CDE to work as a primary instructor in an ADA recognized program. This course reviews state-of-the-art diabetes care from pathophysiology to current trends in diabetes management and principles of teaching and learning, and will supplement study for certification as a diabetes educator.

- February 2, 2016 - attendance 84
- February 3, 2016 – attendance 82

Diabetes Under the Dome focuses on raising awareness of diabetes and its complications in the state of South Carolina. Free measurements will be performed for blood glucose levels, A1c levels, lipids, weight, blood pressure, and BMI. Representatives from the Diabetes Initiative of South Carolina, Medical University of South Carolina, Ralph H. Johnson VA Medical Center, REACH U.S. Diabetes Coalitions, American Diabetes Association, and PhRMA were on hand to discuss diabetes and its complications with the SC legislators and statehouse staff.

- March 16, 2016 – 58 individuals were evaluated/educated
  - Volunteers included 2 people from the Diabetes Initiative of SC; 3 people from Presbyterian College of Pharmacy, 4 people from Fortis College, 1 person from MUSC, 3 people from Palmetto Health School of Pharmacy, 2 people from South University School of Pharmacy, and 1 person from industry
  - Press conference held at 9:30 am – Dr. Kathie Hermayer addressed the press
  - Pharma provided financial support for the testing supplies
  - 2014 DSC Annual Report distributed to the SC Governor and SC Legislators

22nd Annual Diabetes Fall Symposium for Primary Health Care Professionals is an annual 2-day state wide program that not only provides a comprehensive diabetes management update to all primary care professionals, but also an opportunity for professionals to obtain CME, CEUs, etc. at a low cost. Continuing education credits are provided for these health professionals who attend the Symposium: physicians, nurses, social workers, pharmacists, and registered dietitians. Outstanding local and national experts comprise the faculty, and interactive workshops provide exposure to and discussion of practical topics for attendees.

For the past 21 years, 30-35 individuals have submitted scientific posters each year for a very popular poster session. Attendance at these symposia has grown steadily over the years, from 121 in 1994 to 229 attendees in 2016. Close to 3000 health professionals have attended these Symposia.

- September 22 & 23, 2016, North Charleston Convention Center, North Charleston, SC.
- Attendees: Day 1 - 229; Day 2 - 199

Other Professional Education Activities

- Updated Diabetes Initiative of South Carolina Screening Forms:
  - Are You at Risk for Developing Diabetes?
  - Persons with Diabetes, What are Your Risks for Developing Complications or Problems?
- Updated South Carolina Adult Guidelines for Diabetes Care – 2016
- Developed South Carolina Adult Guidelines for Diabetes Care in the Hospital – 2016
- Drafted the DSC 10-year Strategic Plan
- Published 2nd Diabetes Symposium special edition of The American Journal of the Medical Sciences with 10 manuscripts on diabetes and its complications.
Certifications

Joint Commission Advanced Certification/MUSC Inpatient Diabetes Program
  • Certification dates 12/4/2015 – 12/4/2017

MUSC – ADA Outpatient Education Recognition Program (2 sites)
  • Recertified – 1/6/17 – 1/6/21

Regularly Scheduled Meetings

MUSC Hospital Diabetes Task Force
  • MUSC Hospital Diabetes Task Force
  • Hospital Quality Committee

Publications

The Surveillance Council under the direction of new leadership in 2016 updated its membership and activities that will lead to increased expertise and collaboration across the State. Through quarterly meetings and action plans the Surveillance Council has informed diabetes-related outcomes trends, management of diabetes, and encouraged the continued use of the DSC webpage as a source of information and data regarding diabetes in South Carolina. The surveillance activities for outcomes trends identified several key findings focused on diabetes prevalence and mortality. Over the past twenty years there has been an average 2.5% annual increase in diabetes prevalence among adults in SC (p<0.01). While a typical reduction in mortality rate of 2.2% has been observed during the same period, the increased number of people living with diabetes (from 5.0% in 1995 to 12.0% in 2014) has brought more need for diabetes care, particularly for severe in-hospital cases and cases with crisis at the emergency departments. SC continues to experience an epidemic of diabetes. Coupled with declining trends in mortality and increased hospitalization and emergency department visits, the state is experiencing historical morbidity and complications due to diabetes. The preliminary data on pre-diabetes suggests that the diabetes epidemic will be formidable suggesting that better surveillance and screening is tantamount.

The Surveillance Council facilitated scientific articles for the American Journal of Medical Sciences Symposium edition submitted by DSC members. The following articles were published in the April 2016 issue of the Journal:

- Walker RJ, Strom Williams J, Egede LE. Influence of Race, Ethnicity and Social Determinants of Health on Diabetes Outcomes.
- Shearer JE, Jenkins CH, Magwood GS, Pope CA. Contested Ownership of Disease and Ambulatory-Sensitive Emergency Department Visits for Type 2 Diabetes.

DHEC approved and distributed two diabetes fact sheets: Diabetes Impact in South Carolina, and Prediabetes in South Carolina and these were reviewed at the SC meeting in March 2016. Both of these fact sheets have been added to the DSC website and disseminated to DSC members. They were also used at the 2016 Diabetes Under the Dome Event. None-the-less, surveillance council members had concerns regarding the underestimates in the prevalence of pre-diabetes due to the data sources that relied on self-reported outcomes. The Council initiated efforts to assess other data options around the state for pre-diabetes, and explore ways to tie together the efforts of the Surveillance and Outreach Councils. The Council proposed that future activities asses if the Guidelines are having an impact on screening and prevalence for pre-diabetes and diabetes.

Dr. Kelly Hunt presented and overview of the Surveillance Council activities and findings at the Department of Medicine Grand Rounds at MUSC in May 2016. The key data reviewed were on diabetes prevalence. Access limitations to prediabetes data were discussed, with suggestions of joining forces between DHEC, HSSC, and other organizations with access to data. Drs. Hermayer and Hunt met with leaders in bioinformatics in SC concerning use of the EMR or available databases either for development of a SC Diabetes Registry or identifying and tracking quality metrics for diabetes in the state.

The following figure which was published by Heidari et al in the American Journal of the Medical Sciences in 2016 depicts the increasing prevalence of self-reported diabetes in South Carolina from 1995 to 2014 as well as persistent racial disparities in diabetes prevalence. In brief, in South Carolina the prevalence of diabetes increased from around 5% in the mid 90’s to 12% two decades later. Moreover, projections based on this data indicate that diabetes prevalence could reach 21% in South Carolina by 2035. In the mid 90’s in white males and females the prevalence is at or below 5%, but by two decades later it is over 10% in both while males and females. In African American males and females the prevalence starts out between 5
and 10% in men and women and by two decades later it is well over 15% in black women and close to 15% in black men.


The 22nd Annual Diabetes Fall Symposium occurred September 22-23, 2016 at the North Charleston Convention Center. The Council continued to coordinate the scientific poster session for the Diabetes Symposium. This event continues to increase in numbers and quality of research findings, and functions as a forum for describing diabetes research in South Carolina.

The annual DSC Diabetes Under the Dome event was held on Wednesday, March 16, 2016 at the SC Statehouse. Legislators and diabetes advocates gathered at the Statehouse to focus attention on diabetes awareness and the increasing number of South Carolinians diagnosed with diabetes. The DCS webpage continues to be a major resource for information and data regarding diabetes in South Carolina.

A major accomplishment of the Surveillance Council for 2016 has been to increase collaborative networks of investigators and professionals focused on the assessment of diabetes in South Carolina. The Council is currently launching an upgrade to the DSC Webpages, and will continue to review and implement strategies for improvement in 2017. The Surveillance Council is also in the process of outlining goals and objectives for the DSC Strategic Plan.
**Accomplishments**

The summary of the major accomplishments follows:

- Development and maintenance of a diverse group of investigators in South Carolina who focus their work on the study of diabetes
- Maintenance of DSC Webpage
- The Council has organized several reports and manuscripts focused on diabetes and prediabetes in South Carolina
- Production of trends reports
- Production and distribution of data slides which can be downloaded from the webpage including a presentation made at the Medical Grand Rounds at MUSC in May 2016.
- Coordination of the scientific poster session in conjunction with the 2016 Diabetes Symposium.
- Maintenance of a working committee to use statewide and clinical databases to estimate the prevalence of diabetes in South Carolina
- Co-Chairs: John Vena, PhD and Kelly Hunt, PhD from the Department of Public Health Sciences at MUSC, initiated review of the Council’s membership and facilitated the nomination and appointments of new members from across the State of South Carolina.

**Functions**

The Surveillance Council was established in 1995 to develop and implement a state-of-the-art system for the assessment of diabetes in South Carolina, and to provide a mechanism to evaluate interventions and control programs. The Council consists of diabetes care providers, epidemiologists, program specialists and researchers, and is staffed by data specialists at the South Carolina Department of Health and Environmental Control and the Medical University of South Carolina. The Council operates with formal quarterly meetings and communications via email, reports, and conference presentations. The Council has established the following objectives:

- Develop, implement and evaluate surveillance protocols and methodologies to assess diabetes awareness and knowledge, prevalence of diabetes, access to primary care, quality of diabetes self-management, and utilization of monitoring guidelines. This includes evaluation of patient and professional education programs. Specific efforts include:
  - Maintain a mechanism to analyze mortality, morbidity, hospitalization and survey data in production of reports to describe the burden of diabetes in South Carolina.
  - Analyze the effects of co-morbidities with diabetes.
  - Establish and maintain an ongoing evaluation of the role of insurance and managed care companies in control of diabetes.
  - Function as a central unit composed of multiple organizations and disciplines involved in the surveillance of diabetes in South Carolina.
  - Function as a data and information resource for DSC and DHEC and other organizations involved in diabetes control.
  - Develop and maintain an Internet Website for distribution of information regarding diabetes in South Carolina.
  - Establish a scientific forum to showcase diabetes research and projects in South Carolina.
  - Establish a methodology to estimate the prevalence of diabetes in South Carolina based on clinical data.
  - Establish a methodology to assess trends in diabetes-related outcomes and clinical practices.
The South Carolina Department of Health and Environmental Control (DHEC) is dedicated to the prevention of chronic disease disparities such as diabetes. The overarching diabetes efforts at DHEC are to prevent complications, disabilities, and burden associated with diabetes as well as to eliminate diabetes-related health disparities.

I. State and Federal Updates:
The Diabetes Advisory Council of South Carolina (DAC)
- DHEC provides support to the Diabetes Advisory Council of SC (DAC) related to diabetes prevention efforts across the state. The 2016 – 2021 Statewide Comprehensive Diabetes Prevention Plan was developed and launched with over 150 stakeholders. The DAC has an active involvement of 38 unique organizations from across the state with about 80 individuals representing those organizations.
- The Diabetes Advisory Council of South Carolina (DAC) is currently moving forward with implementation of the 2016 – 2021 Statewide Comprehensive Diabetes Prevention Plan for South Carolina. The Executive Committee and each of the workgroups have set an independent standing meeting time. Each workgroup has chosen to focus on the following:
  - Pillar 1: Developing a SC Provider Toolkit for screening, testing, referring for prediabetes
  - Pillar 2: Selecting counties of focus to identify organizations to become National DPPs
  - Pillar 3: Surveying current National DPP participants to assess perceived barriers to participating in a program
  - Pillar 4: Assessment of current employer and insurer coverage options in SC
- Rachel Kaplan, MPH, was hired as the Diabetes Prevention Coordinator with the Diabetes Advisory Council of SC. Rachel works with the DAC on statewide diabetes prevention efforts, primarily focusing on oversight, coordination, and implementation of the 2016-2021 Statewide Diabetes Prevention Plan for South Carolina. She graduated with a Bachelor of Arts in Human Services from Elon University in North Carolina, and received her Master’s in Public Health and a Certificate in Drug and Addiction Studies at the University of South Carolina. Rachel is very active with the North Carolina chapter of the American Diabetes Association and has been a Program Coordinator for the chapter’s summer camp over the past seven years.

II. Diabetes Surveillance Systems:
Goal: Monitor the statewide diabetes burden and identify gaps to assist with planning, decision-making, and evaluation.
- The leading causes of death by county have been updated and posted online on the DHEC website by county and by region. Ten leading causes of death by age groups have also been completed and posted online.
- The diabetes county fact sheets have been updated and are being formatted to share with the Division of Surveillance for review. The county chronic disease fact sheets are in the process of being updated and are 50% completed.
- A map of all stroke centers and telestroke centers have been developed to help identify areas of the state to explore for potential Get With the Guidelines (GWTG) stroke hospitals or telestroke facility among DHEC’s collaborators.
- A set of maps have been developed to overlay the National Diabetes Prevention Program (National DPP) sites. The base maps display prevalence of diabetes among Medicaid population or prevalence of prediabetes using three-year average rates among adults.
III. Health Systems Improvement:
Goal: To increase the number of health care providers engaged in professional education on recommended standards of care.

**Diabetes Self-Management Education (DSME) Programs**
- Through a partnership with DHEC, nine Federally Qualified Health Centers (FQHCs) have received American Association of Diabetes Educators (AADE) accreditation to increase the number of accredited diabetes self-management education (DSME) programs across the state. The 2016 SCaleDown related objective target was exceeded with nine Federally Qualified Health Centers receiving accreditation.
- The 1305 evaluation team has developed a DSME state map that designates the locations of accredited DSME sites across the state and areas of the state with Medicaid eligible populations with diabetes. This map will be used to determine where efforts to develop and sustain DSME practices should occur during the current grant year.
- On August 18, 2016 the Office of Program Evaluation presented during the CDC Evaluation Peer Learning conference call to discuss the evaluation efforts of DHEC’s DSME collaborations. The Office has also added new evaluation activities regarding DSME that include, geocoding healthcare providers within the top two counties that have the highest quartiles of Medicaid eligible adults with diabetes, developing an assessment to determined DSME Medicaid billing facilitators and barriers, and developing and implementing a rubric with FQHCs, medical practices, and rural health clinics to capture implementation status of DSME programs across the state. This rubric will provide information to guide technical assistance supporting the maintenance of DSME programs.

IV. Community Awareness and Outreach:
Goal: Increase diabetes knowledge and awareness across disparate and hard to reach communities.

**National Diabetes Prevention Program (National DPP)**
- DHEC staff (Central Office and Region) have assisted organizations in offering the NDPP in 8 diverse settings, which has assisted with recruiting, retention, and positive lifestyle changes among participants. Settings include medical practices, worksites, free clinics, senior centers, faith-based, etc.
- The Office of Program Evaluation Services created a map to assess the percent of Medicaid eligible adults with diabetes and location of DSME/T sites. The map is designed to determine if the adult Medicaid population has access to DSME/T programs in areas of highest need. Additionally, a second map is currently being developed to identify the health care providers located in the counties with the highest percent of Medicaid eligible adults.
- The SC WISEWOMAN (WW) Program's National DPP Referral and Coordination Guide has been developed. The WW Program Manager and the Lifestyle Intervention Coordinator held a train the trainer session September 2016 for the American Cancer Society's Regional Service Coordinators (RSCs) who will train and provide technical assistance for WW providers on the WISEWOMAN National DPP Referral and Coordination process. The RSCs will now train their respective WW providers and health coaches.
- As part of the 1422 program evaluation, National DPP participant surveys were collected through September 30th to assess facilitators and barriers to participating in the program. Surveys of the National DPP sites are also being conducted to assess facilitators and barriers to establishing, recruiting, and maintaining a National DPP.

V. General DHEC Diabetes Updates
- Ms. Jacqlyn Atkins, MPH, CHES began as the Health Systems Coordinator with the Division of Diabetes, Heart Disease, Obesity and School Health on November 17th. Jacqlyn has a BS in Psychology, an MPH and over seven years’ experience working in public and private health environments. Jacqlyn was previously the Director of the Office of Health Equity (OHE) and prior to that role she served as the Associate Director of Student Wellness at the University of SC. Jacqlyn is currently on the Executive Committee and the board respectfully for the Diabetes Advisory Council of SC and the Diabetes Initiative of SC. She is intricately involved
in the Morehouse Partnership for Diabetes Health Equity Learning Collaborative and the lead on the Million Hearts Pilot Project for Columbia, SC. Within the scope of her new position, Jacqlyn will provide technical assistance to health systems on quality improvement from a state level to include policies and procedures within practice work.

- Division personnel participated as panelists on two national webinars and one national best practice summit to share successful implementation of grant strategies and initiatives grantees and state health departments.
DIABETES INITIATIVE OF SOUTH CAROLINA
BOARD OF DIRECTORS AND COUNCIL MEMBERS
Diabetes Initiative of South Carolina

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Advisory Member:
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Professor Emeritus, MUSC
### Outreach Council

#### Members

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<tr>
<th>Name</th>
<th>Title/Role</th>
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<tbody>
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<td>Michelle Nichols, PhD, RN</td>
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22
Surveillance Council

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Teresa Robinson, MBA                           Division Fiscal Coordinator

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