

## **TecHealth**

Technology Center to Promote Healthy Lifestyles

### **FY 2015-2016 Annual Report**

**Director: Delia Smith West, PhD**

#### **I. CENTER TIMELINE**

The 2015-2016 fiscal year at the Technology Center to Promote Healthy Lifestyles (TecHealth) was marked by the selection of new, key personnel; the launch of the TecHealth website; the initiation of Tech Tuesday Talks-a monthly technology and health seminar; continuing work on existing research projects; the development of research proposals and submit them for funding; new publications on TecHealth generated research; and presentations at national conferences and meetings. The following is a list of some of the significant events on the TecHealth timeline for this fiscal year.

#### **July 2015**

- Michael Scribellito hired as the TecHealth Senior Software Applications Analyst.

#### **August 2015**

- Funding began for the 5-year grant awarded to Dr. West from the National Institutes of Health. "iReach3: Internet Assisted Obesity Treatment Enhanced by Financial Incentives," which will bring approximately \$1,818,001 to USC over the life of the project.
- Chelsea Larsen, summer TecHealth research assistant and former TecHealth intern, is accepted as a doctoral student in the Health Aspects of Physical Activity Program within the Exercise Department. Ms. Larsen receives Behavioral-Biomedical Interface Program (BBIP) predoctoral fellowship award. BBIP is partially funded by a National Institutes of Health T32 pre-doctoral research training grant and is awarded to select outstanding students as they begin their PhD studies. Dr. West will be Larsen's mentor during her doctoral program.
- Recruitment begins for "Gamecock HealthE U," a research pilot focused on cancer prevention and control behaviors and technology use among incoming college freshman at the University of South Carolina.

#### **November 2015**

- Research efforts begin on "Examining the Use of Social Media as a Response and Recovery Strategy During the #SCFlood of October 2015." Funded by the USC Office of Research, Dr. West serves as a collaborator on the project.
- TecHealth website goes live, <http://techealth.sc.edu/>. The website has had 1572 visitors as of June 15, 2016.
- Courtney Monroe, PhD, TecHealth postdoctoral fellow, begins recruitment for NETworks, a technology-based obesity treatment program examining the role of social support which is funded with the USC Aspire grant mechanism; a total of 36 residents of the Columbia area were enrolled in this research study and received weight management and health promotion intervention.

- TecHealth had a substantial presence at the national Obesity Society annual scientific sessions, with 3 poster presentations, which were presented by postdoctoral fellows (Coulon & Monroe) and masters student (Larsen), as well as by Dr. West. Dr. West was selected to deliver an oral presentation.
  - Larsen C, Magrady K, Monroe C, Brandt H, Sundstrom B, Turner-McGrievy G, Wilcox S, West DS. Technology usage of college students in a technology delivered behavioral weight gain prevention program: A pilot study. Poster presentation.
  - \*Monroe C, Turner-McGrievy G, Sundstrom B, Magrady K, Larsen C, Wilcox S, Brandt HM, West D. HealthE U: A pilot study of the effect of a technology-mediated behavioral weight gain prevention program on weight control practices of college students. Poster presentation.
  - Coulon SM, West DS. The relation of intra-individual cortisol variability with intervention adherence and weight loss among African-American women in a behavioral weight control program. Poster presentation.
  - West DS. Does the Addition of Online Individual Motivational Interviewing Chat Sessions Enhance Weight Loss Outcomes in a Group-Based Online Weight Control Program? Oral presentation.

### January 2016

- TecHealth presents the first *Tech Tuesday Talk*, a monthly seminar series hosted by TecHealth which brings together students, faculty, staff, state agencies and members of the business community to share ideas and learn about advances in health and technology. Attendance at the events has been robust with a diverse group of attendees. In the five months since its inception, over 120 people have requested to be added to the TecHealth e-mail list to be notified about upcoming talks. The Tech Tuesday Talk series is held during the fall and spring academic semesters and then goes on hiatus during the summer. The talks will resume in September 2016.
- Search Committee for Assistant Professor tenure-track faculty position within TecHealth convenes to review applicants.

### February 2016

- Briana Davis, MPH hired as Research Recruitment and Retention Coordinator, working predominantly on iReach3.

### March 2016

- Recruitment begins for iReach3. At the end of 5 years, over 200 overweight or obese South Carolinians will have received weight-loss treatment through the research study at no charge to the individual.
- Two candidates for the tenure-track Assistant Professor position in the TecHealth Center are interviewed on campus; four candidates were phone interviewed.
- Dr. West was invited to deliver the 2016 D.K. Stanley lecture at the University of Florida, Gainesville, FL

## May 2016

- Courtney Monroe, PhD, hired as tenure-track Assistant Professor in Health Promotion, Education and Behavior in the Arnold School and as a faculty member in TecHealth Center, filling a position that was posted within the Health Promotion, Education and Behavior department. Formerly a postdoctoral fellow with TecHealth, Dr. Monroe is an exercise physiologist whose research focus is on technology-based approaches to effectively promote and assess physical activity, as well as delivering effective behavioral weight control. Dr. Monroe will begin her new position in August 2016.

## June 2016

- Christine Pellegrini, PhD, was offered and accepted the tenure-track Assistant Professor TecHealth position. She will be in the Exercise Science Department in Arnold School, filling the first of the two junior faculty positions within the center allocated to Dr. West as part of her start-up. Prior to joining TecHealth and the Arnold School, Dr. Pellegrini was a Research Assistant Professor in the Department of Preventive Medicine at Northwestern University. She has research interest and experience in cost-effective technology-supported and patient-centered behavioral interventions; knee replacement utilization and weight loss among older, minority populations; and sedentary behavior's role in diabetes and chronic disease. Dr. Pellegrini will start her position at the Center in January 2017.
- TecHealth initiates a summer pilot program research grant program, providing direct award of programming time to a research project seeking to develop technology to promote a healthy lifestyle. The award is made on a competitive basis with internal and external review; programming for the Summer Sponsorship program is provided by the TecHealth software engineer, Mr. Scribellito. For the initial offering, 11 submissions were received. The inaugural 2016 award was presented to Arnold School doctoral student, Alicia Dahl for her proposal "Healthy Gestational Weight Gain". The sponsorship will allow Dahl to create a website providing overweight and obese women with healthy gestational weight gain recommendations and behavioral strategies.
- TecHealth Visiting Summer Scholar, Dr. Vicki DiLillo from Ohio Wesleyan University, consults with Dr. West on research design, health promotion and obesity prevention treatment; funding from her university supported her visit to USC to expand her knowledge in these key public health areas.
- Exercise Science applicant Melissa Stansbury, M.S. accepted for doctoral program in Health Aspects of Physical Activity in fall 2016 slated to work with Delia West, PhD, as mentor and focus her research activities on TecHealth related research questions.

## Additional Activities

Throughout the year, Dr. West continued her work as co-investigator on the \$1.8 million NIH Small Business Innovation Research Grant (SBIR), "Developing the Dietary Inflammatory Index for Clinical Application. Additionally, Dr. West began collaboration with researchers from across the Arnold School of Public Health on an NIH PO1 grant proposal, "Biobehavioral Risk Factors, and Racial Disparities in Colon Cancer." Dr. West will serve as Project Leader of an intervention study within this program project which will be submitted in September, 2016. The project is projected to bring approximately \$1,732,500 in new extramural funding to the University over the 5 years of the project.

During the year, Dr. West also collaborated with USC School of Medicine faculty to refine their lifestyle weight control program so that the clinical program was more effective in promoting behavior changes to promote effective weight control. These collaborators developed a proposal, “Online Comprehensive Weight Management Counseling Program for Primary Care Providers,” which would provide health care professionals with all the necessary components for an obesity reduction program. The proposal is currently being submitted for funding through several private foundations.

**II-D SUMMARY OF NON-STATE PARTNERSHIPS**

**iReach3 Internet Assisted Obesity Treatment Enhanced by Financial Incentives**

In collaboration with the University of Vermont, Dr. West is the Principal Investigator of this NIDDK funded “iReach3 Internet Assisted Obesity Treatment Enhanced by Financial Incentives,” which will bring in \$1,818,001 to USC over a five-year period. In addition to Dr. West, the project employs a project director, a postdoctoral scholar, recruitment-retention coordinator, behavioral interventionists and a software engineer. Over 200 South Carolinians will participate in the obesity treatment study, improving their health and thereby reducing the economic burden of obesity related medical expenses and lost productivity that would otherwise be incurred by these individuals.

**iReach2 Internet Assisted Obesity Treatment: Enhanced by Motivational Interviewing**

Dr. West is PI **in collaboration** with Jean Harvey, PhD-University of Vermont, Dept. of Nutrition and Food Sciences of this National Institutes of Health funded R01. This study contributed \$655,303 to the USC system since West’s arrival in 2013.

**III. ALUMNI DATA SURVEY**

Not applicable

**IV. CENTER PERSONNEL CHANGES**

<b><u>Name-Senior/Junior Personnel</u></b>	<b><u>Date Joined Center</u></b>	<b><u>Date Left Center</u></b>
<b>Michael Scribellito/Junior Personnel</b>	<b>7/15/15</b>	
<b>Briana Davis/Junior Personnel</b>	<b>2/1/16</b>	
<b>Alliyah Willard/Junior Personnel</b>	<b>2/1/16</b>	
<b>Sandra Coulon/Junior Personnel</b>	<b>7/1/2014</b>	<b>7/31/15</b>

**V. SUMMARY OF GRADUATE AND OTHER EDUCATION AND TRAINING**

- Courtney Monroe continues as a second-year post-doctoral fellow with TecHealth
- Monroe-research presentation to ASPH Exercise Science graduate student class
- Monroe-research seminar for ASPH faculty, staff and graduate students
- West-research presentation to two ASPH graduate student classes, Exercise Science

- West-workshops at the American Diabetics Association Meeting 2016
- West-workshop sponsored by The Academy of Nutrition and Dietetics (April 2016)
- West- mentoring doctoral student, Chelsea Larson, technology-enhanced weight loss intervention techniques and research methodology
- Monroe- Training in research processes for 5 undergraduate students assisting in TecHealth research projects
- Training in brand development for Alliyah Willard, current USC School of Visual Art and Design undergraduate
- West- will be primary mentor of Exercise Science doctoral student Melissa Stansbury beginning in Fall 2016

## **VI. A & F SUMMARY OF ECONOMIC DEVELOPMENT OUTCOMES**

### Significant Research Efforts and Achievements

The Center has been involved in 9 collaborative research projects during FY2015-2016. The projects range in stages of development from the initial identification of an area of interest for potential research to the final stage of publication and presentations. Some of these projects, such as “HealthE U” and “Gamecock HealthE U” were undertaken with the aim of providing the basis for submission for future large-scale funding. The following is a list of the current TecHealth research projects.

### ***Extramurally Funded Research***

#### **iReach 3-Internet Assisted Obesity Treatment Enhanced by Financial Incentives-NIH R01**

Status-Participant Recruitment and Intervention

Dual PIs: Delia West PhD-USC, Exercise Science and Jean Harvey, PhD-University of Vermont, Dept. of Nutrition and Food Sciences

#### **iReach2 Internet Assisted Obesity Treatment: Enhanced by Motivational Interviewing-NIH R01**

Status-Data Analysis and Publications

Dual PIs: Delia West PhD-USC, Exercise Science and Jean Harvey, PhD-University of Vermont, Dept. of Nutrition and Food Sciences

#### **Developing the Dietary Inflammatory Index for Clinical Application-NIH SBIR**

Status-Research and development of index

James Hébert, PhD-USC, CPCP, Director SC Statewide Cancer Prevention and Control Program

Michael Wirth, PhD-USC, Epidemiology and Biostatistics

Gabrielle Turner McGrievy, PhD-USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR

Delia West, PhD-USC, Exercise Science (Co-Investigator)

### ***Intramurally Funded Research***

#### **Using Technology to Enhance Social Support for Weight Loss-ASPIRE I, Track II-B grant**

Status-Data analysis and publications

Courtney Monroe, PhD-USC, Exercise Science

Delia West, PhD-USC, Exercise Science

**Examining the Use of Social Media as a Response and Recovery Strategy During the #SCFlood of October 2015-USC Office of Research**

*Status-data analysis*

Heather Brandt, PhD-USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Gabrielle Turner-McGrievy, PhD- USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Delia West, PhD-USC, Exercise Science  
Daniela B. Friedman, PhD-USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Danielle Gentile, PhD candidate (student), USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Tracey Thomas, DrPH candidate (student), USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR

***TecHealth Center Funded Research***

**HealthE U-Technology Center to Promote Healthy Lifestyles feasibility pilot, SmartState Center funded**

Status-data analysis and publications relevant to planned grant proposal submission

Heather Brandt, PhD-USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Courtney Monroe, PhD-USC, Exercise Science  
Beth Sundstrom, PhD- College of Charleston, Communications  
Gabrielle Turner-McGrievy, PhD - USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Delia West, PhD-USC, Exercise Science  
Sara Wilcox, PhD-USC, Exercise Science, Director Prevention Research Center

**Gamecock HealthE U-Technology Center to Promote Healthy Lifestyles pilot, SmartState Center Funded**

Status-data analysis and publications relevant to planned grant proposal submission

Heather Brandt, PhD-USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Courtney Monroe, PhD-USC, Exercise Science  
Beth Sundstrom, PhD- College of Charleston, Communications  
Gabrielle Turner-McGrievy, PhD - USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Delia West, PhD-USC, Exercise Science  
Sara Wilcox, PhD-USC, Exercise Science, Director Prevention Research Center

**“Healthy Motivations for Moms-to-Be”**

Status- doctoral dissertation proposed and being implemented

Alicia Dahl, MS, - USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Gabrielle Turner-McGrievy, PhD-USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Sara Wilcox, PhD-USC Exercise Science, Director Prevention Research Center  
Jihong Liu, PhD-USC Epidemiology and Biostatistics  
Rachel Davis, PhD-Exercise Science

***Research in Development prior to Submission for funding***

**Biobehavioral Risk Factors, and Racial Disparities in Colon Cancer**

James Hébert, PhD-USC, CPCP, Director SC Statewide Cancer Prevention and Control Program  
Gabrielle Turner-McGrievy, PhD - USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Delia West, PhD-USC, Exercise Science  
Swann Adams, PhD-USC, Epidemiology and Biostatistics, College of Nursing  
Cheryl Armstead PhD-USC Psychology  
Steven Blair, P.E.D-USC Exercise Science  
Heather Brandt, PhD-USC, HEALTH PROMOTION, EDUCATION AND BEHAVIOR  
Jim Burch, PhD-USC, Epidemiology and Biostatistics  
Brian Chen, MS-USC, Exercise Science

Trisha Felder, PhD-USC, Nursing  
James Hardin, PhD-USC, Epidemiology and Biostatistics  
Sue Heiney, PhD-USC, Nursing, Epidemiology and Biostatistics  
Lorne Hofseth, PhD-USC, Pharmacy  
Angela Murphy, PhD-USC, Medicine  
Scott Strayer, MD-USC, Medicine  
Nitin Shivappa, PhD-USC, Epidemiology and Biostatistics  
Susan Steck, PhD-USC, Epidemiology and Biostatistics  
Vicki Vance, PhD-USC, Biology  
Michael Wirth, PhD-USC, Epidemiology and Biostatistics  
FeiFei Xiao, PhD-USC Epidemiology and Biostatistics

### **Online Comprehensive Weight Management Counseling Program for Primary Care Providers**

Delia West, PhD-USC, Exercise Science  
Tracy Voss, MD, USC School of Medicine  
J. Elliot Turner, PharmD, BCPS, Palmetto Health  
TecHealth Center's Economic Impact on South Carolina

### **Economic Impact**

In direct financial contributions, \$1,818,001 will be added over a five year period to the University of South Carolina by the NIH grant, "iReach3-Internet Assisted Obesity Treatment Enhanced by Financial Incentives," starting with the 2016 fiscal year. Other extramural grants similarly garner additional funds for the state, and provide employment opportunities for new research staff. With the increased productivity derived from the addition of two new faculty members to the Center and the submission of pending grant proposals, the Center is well on the way to an increase in revenues for the state of South Carolina.

Due to the research carried out at TecHealth, the economic contribution of the Center extends far beyond direct revenues and job creation. Obesity reduction and prevention is the current research focus of TecHealth. Obesity contributes to many health problems including Type 2 diabetes, coronary heart disease and stroke, hypertension, arthritis and even some cancers. In 2013, 31.7% of South Carolina adults were obese, a rate predicted to roughly double to 62.9% by 2030 with a majority of the remaining population being overweight.

To underscore the economic implications for the state, a recent study from the Center for Social Dynamics and Policy in conjunction with the World Food Center of the University of California-Davis, estimates that medical costs, lost work productivity, disability payments and lost tax revenue result in a cost of \$92,235 over the lifetime of an obese individual when compared to a person maintaining a normal weight. Using the 2013 obesity rate, the cost to South Carolina is currently \$135,238,682,187. In 2030 with a predicted population growth to 5,148,569, the expected 62.9% obesity rate will mean \$298,698,426,619 in obesity related costs to South Carolina. Obesity is an economic as well as a health problem that South Carolina cannot afford to ignore.

Our obesity research directly improves the health of the participants enrolled in the studies and the healthy lifestyles information they receive gives them the tools to improve the health of their families and friends. Perhaps more importantly, the information derived from our research uncovers the best methods to deal with the obesity crisis facing our state. "iReach3" studies the effect of financial rewards in an online weight-loss program. "NETworks" explores how to leverage the role of social connections to produce success in weight reduction. "HealthE U" and "Gamecock HealthE U" look at the best

methods to reach our college students as they are becoming responsible for their own health decisions and establishing dietary and exercise patterns in an effort to prevent increasing obesity among youth and young adults.

The TecHealth research portfolio is crafted to address obesity across the life spectrum. “NETworks” and “iReach3” reach adults of all ages while HealthE U and Gamecock HealthE U target college students. Obesity sometimes begins even before birth with maternal obesity in the first trimester linked to future obesity for the child. TecHealth has given a Summer Sponsorship to enable a young researcher to develop a website targeted to obese pregnant women. Along with the typical medical issues related to obesity, in pregnancy excess adiposity increases the maternal risk of gestational diabetes and preeclampsia and puts the baby at risk for stillbirth and congenital anomalies.

### **Sharing our Research Activities**

Across Campus and the Columbia area: Our Tech Tuesday Talk Series initiated in Jan 2016 created a formal outlet for sharing update on research with colleagues and students on campus and interested community partners (business owners, medical personnel, area public health agency representatives, etc.). The response to this series has been robust and therefore the series will continue in the fall 2016 after a summer hiatus.

Within Health Care Community: Realizing the crucial need to share our research results with other partners to increase the impact it will have on our obese population, we are currently seeking funding for our “Online Comprehensive Weight Management Counseling Program for Primary Care Providers” program. Physicians are often on the front lines of obesity treatment and this project delivers a comprehensive weight-loss program employing the most effective methods for use by South Carolina physicians to treat their obese patients. This project is an outgrowth of direct consultation in weight management program improvement provided by Dr. West and Ms. Magradey to primary care providers within the Palmetto Health organization.

Within the Scientific Community: Center personnel also have shared research findings at the 2015 Obesity Society Meeting and the 2016 American College of Sports Medicine Meeting. These meetings attract not only researchers from South Carolina, but other researchers from across the country. In a similar manner, TecHealth articles in the Journal of Medical Internet Research and the American Journal of Preventive Medicine reach scientists in other South Carolina institutions as well as the broader academic community outside of the state.

In addition to collaborations within USC, currently, Dr. West is serving as co-investigator on a research project, “Developing the Dietary Inflammatory Index for Clinical Application” in collaboration with the Columbia based business, Connecting Health Innovations. TecHealth also collaborated with Beth Sundstrom, PhD at the College of Charleston on the research pilot, “TecHealth” and is still working with her on a federal grant proposal needed to expand upon the pilot to a larger study.

A detailed list of presentations and publications by TecHealth Center personnel is included below.

#### *Publications*

West DS, Monroe CM, Turner-McGrievy GM, Sundstrom B, Larsen C, Magradey K, Wilcox S, Brandt HM

A Technology-Mediated Behavioral Weight Gain Prevention Intervention for College Students:  
Controlled, Quasi-Experimental Study

J Med Internet Res 2016;18(6):e133

URL: <http://www.jmir.org/2016/6/e133>



DOI: 10.2196/jmir.5474  
PMID: 27296086

Monroe CM, Thompson DL, Bassett DR Jr., Fitzhugh EC, Raynor HA. Usability of mobile phones in physical activity related research: A systematic review. *American Journal of Health Education*. 2015;46(4):196- 206.  
<http://www.tandfonline.com/doi/full/10.1080/19325037.2015.1044141#.VdN7RPIVhBc>

Coulon SM, Monroe CM, West DS. A Systematic, Multi-domain Review of Mobile Smartphone Apps for Evidence-Based Stress Management”-*American Journal of Preventive Medicine*, published online 03/16/2016. DOI: <http://dx.doi.org/10.1016/j.amepre.2016.01.026>

### *Presentations*

“Motivational Interventions to Improve Long-term Behavioral Weight Control” at the 2016 D.K. Stanley lecture at the University of Florida, College of Health and Human Performance-Delia West

“Motivation Interviewing for Diabetes: A Workshop for Clinicians” workshop at the 2016 American Diabetes Association Clinical Meeting, Jacksonville, FL, May 2016-Delia West

HealthE-U: A pilot study of a technology based behavioral weight gain prevention program-poster presentation, 2015 Obesity Society Meeting & Arnold School of Public Health 40<sup>th</sup> Anniversary Poster Presentation-Chelsea Larsen

HealthE U: A pilot study of the effect of a technology-mediated behavioral weight gain prevention program on weight control practices of college students-poster presentation, 2015 Obesity Society Meeting & Arnold School of Public Health 40<sup>th</sup> Anniversary Poster Presentation-Courtney Monroe

“A Formative Evaluation of Freshman College Students' Preferences And Practices Regarding Technology-based Weight Control”-poster presentation, 2016 American College of Sports Medicine Meeting-Courtney Monroe

“TecHealth-A South Carolina SmartState Center”-poster presentation at the Arnold School of Public Health 40<sup>th</sup> Anniversary Poster Presentation-Delia West

## **VII. Summary of testimonial and anecdotal data (SC Centers of Economic Excellence Nuggets)**

“Thanks doesn’t seem like quite enough. I feel like I’m getting my life back on track and know I’ve added years of good health thanks to the NETworks program.”

*NETworks\* participant*

*\*NETworks is funded through TecHealth-Technology Center to Promote Healthy Lifestyles*