

2. BACKGROUND

2.A. Objectives and Overall Environment for T32 Training Program

The University of Alabama at Birmingham (UAB) Health Services, Outcomes, & Effectiveness Research (HSOER) Training Program (T32) is a collaborative effort of the UAB Center for Outcomes and Effectiveness Research and Education (COERE) and the UAB Lister Hill Center for Health Policy (LHC) (see Appendix 1 for all acronyms). We are in our 10th year of funding with a National Research Service Award (NRSA) Institutional Training Grant (T32) in Health Services Research (HSR). Our program name reflects the growth of our program and recognizes the program enhancements that occurred with the receipt of three time-limited awards, an AHRQ ARRA supported T32 in Comparative Effectiveness Research (CER) and a companion ARHQ K12 grant in CER, and more recently, an AHRQ K12 in Patient Centered Outcomes Research (PCOR). In competing for renewal of our T32, **our overall goal, as reflected in our aims below, is to continue to strengthen and expand our combined predoctoral and postdoctoral HSOER training capacity through targeted enhancements to the existing organization and infrastructure by building upon the momentum of CER/PCOR T32 and K12 programs amidst the vibrant intellectual milieu for HSOER at UAB.** Our research and training base is drawn from across 5 UAB Schools (Medicine, Public Health, Health Professions, Nursing, and the College of Arts and Sciences), including 37 Primary Mentors and 24 Associate Mentors and Mentors-in-Training. Because of the collective expertise of these faculty and the strength of the training infrastructure we have built over the last 10 years through the research training partnerships described below, UAB is uniquely positioned to train the next generation of HSOER investigators. T32 training will be supported by our extensive research base in three broad domains highly relevant to AHRQ priority areas: 1) Healthcare efficiency and disparities; 2) Healthcare quality measurement and improvement; and 3) Comparisons of effectiveness and safety of prevention, diagnosis, and treatment options (CER).

In addition to the strength of our faculty, our training capacity is greatly enhanced by UAB's unique University-Wide Interdisciplinary Research Centers (UWIRCs), many of which are NIH-funded Centers of Excellence. Forged through the experience gained in nearly 10 years as a T32 program in HSR and over two years as a T32 program and K12 program in CER, training will continue to be facilitated by the long-standing partnership between the COERE and the LHC with the added strength of newer partnerships forged over the last 5 years with our AHRQ Center for Education and Research on Therapeutics (CERTs), the UAB Minority Health Disparities Research Centers (MHRC; an NIH Center of Excellence) and the UAB NIH-supported Center for Clinical and Translational Sciences (CCTS; a Clinical and Translational Science Awardee [CTSA]). In addition, strong training partnerships have continued to be developed with other UWIRC's such as the Center for Aids Research (CFAR), Center for Aging (CFA) and NIH-funded Nutrition and Obesity Research Center (NORC).

Building on these strong academic partnerships, the T32 works in synergy with other HSOER training resources in which our T32 leaders are directly involved, including the National VA Quality Scholars Fellowship Program; the AHRQ-funded UAB CER/PCOR programs; the AHRQ-funded UAB Deep South Arthritis and Musculoskeletal CERTs; and the UAB COERE. Together, these training resources constitute an umbrella program, the **UAB-VA Deep South Health Services, Outcomes, and Effectiveness Research Training Program (HSOERTP)**, which has common approaches to the mentoring, career development activities, biweekly seminars, evaluation plan and infrastructure for 10-20 trainees in any given year, including our 6 current HSOER T32 trainees, providing a critical mass of trainees in a truly interdisciplinary environment

The cornerstone of our program is the mentored research experience, with an emphasis on core competencies and academic enrichment (career development). We have had excellent success in promoting the independent HSOER research careers of predoctoral and postdoctoral trainees in HSOER with 83% of our 18 former trainees that were supported by this T32 remaining involved in research and/or academic positions with 12 currently in faculty positions (see Tables 12A, 12B and Section 6.B. of the Progress Report). Our academic component involves four MSPH tracks for postdoctoral trainees and, for predoctoral trainees, the PhD in Health Services Administration's Health Services Research track; the DrPH in Outcomes Research and the PhD in Comparative Effectiveness in Epidemiology. Each trainee identifies a mentoring panel of 2-3 mentors, and with their help identifies a major research focus, designs and completes a research project relevant to HSOER, and submits the results for peer-reviewed publication and dissemination. Because of the strong mentorship component of training, these projects serve as the foundation for future K or related career development awards. We draw from a large pool of senior and mid-level mentorship talent. Our program will also continue its innovative and successful approach to "training the mentors", in which senior faculty mentors involve more junior faculty in co-mentoring with them, thus teaching how to mentor by example.

Our T32 program was first funded in 2003 with just 2 slots and successfully renewed in 2007 with 2 predoctoral and 3 postdoctoral trainees. Thus far, 18 trainees (13 physicians) representing 15 Divisions/Departments have completed training through this T32 program, and currently we are supporting 3 predoctoral and 3 postdoctoral trainees from 5 different Divisions/Departments. Notably, 100% of our HSOER T32 trainees have completed the program and 33% of our trainees have been from under-represented minorities (URMs). Between them, **our T32 graduates have published 130 peer-reviewed papers; 12 are faculty at academic medical centers, and 1 has returned to her surgical residency; 3 of our predoctoral graduates have completed their dissertations with the fourth scheduled to defend in 2013.**

For this 5-year renewal period, we propose to maintain a "steady state" of 9 trainees (3 pre- and 6 post-doctoral) in Year 1, adding one additional predoctoral slot in Year 2 to attain a goal of 4 predoctoral and 6 postdoctoral trainees by 2014. Pre-doctoral slots will continue to be competed among qualified students in the PhD program in Health Services Administration-Health Services Research and DrPH program in Health Care Organization and Policy as well as qualified HSOER candidates from other highly related PhD programs such as Epidemiology and Medical Sociology. Postdoctoral training slots will continue to be competed among eligible internal and external doctoral-level HSOER qualified candidates.

By drawing on the strengths of the current program, the success of the ARRA-funded T32 in CER and the wealth of resources available to program trainees through the interdisciplinary culture at UAB, the renewal of our T32 will allow us to accomplish the following **specific aims** for our training program:

- 1) Provide a talented cadre of predoctoral and postdoctoral trainees with high quality **training and individual and team mentoring**, promoting the methodological skills and other core competencies required for success as independent HSOER investigators. **We will continue to leverage past institutional and federal investments in our successful mentoring programs supported by 37 Primary and 24 Associate Mentors and Mentors-in-Training with active HSOER research programs.**
- 2) Provide an intensive **didactic curriculum and multi-disciplinary training experiences focused on HSOER to assure that T32 trainees have the knowledge and experience to advance in their careers and build on the strengths of the current program's research and training environment, which is at the forefront of evidence-based and implementation research.**
 - a. Allow postdoctoral trainees without such prior training to choose from 4 MSPH tracks (Section 3.C.1).
 - b. To enrich hands-on training, trainees will choose a rotation from 10 short rotations involving key HSOER stakeholders and long-standing non-UAB collaborators (Section 3.C.4).
 - c. Continue to expand the HSOER experience for HSOER trainees by strengthening interdisciplinary collaborations with the Research Education Component of the UAB CCTS and with our partner UAB UWIRCs through combined training activities (e.g. seminars, programs).
- 3) **Continue to engage all levels of faculty for continued growth of our highly successful mentor training and mentorship review programs, concepts pioneered by the COERE and facilitated through the umbrella UAB-VA Deep South HSOERTP.**
- 4) **Develop an Alumni Council of former T32 and K12 trainees to partner with our External Advisory Committee (EAC), established as part of our CER T32, to provide independent assessment bodies to evaluate the success of the program and trainees.**
- 5) **Engage a Stakeholder Advisory Panel of patient advocates and representatives of patient-led organizations, healthcare payers, consumer organizations, and academic experts to:**
 - a. Advise our mentors and trainees on the training experience, including the research curriculum, to assure that trainees are gaining skills in how to engage stakeholders, and
 - b. Work with newly created Dissemination Advisor to assist trainees with dissemination of relevant research findings beyond academic venues.

2.B. Organization, Participating Departments/Programs, and UAB Commitment to HSOER

The program is facilitated by UAB's unusually collaborative atmosphere and dedication to accomplishing interdisciplinary research, training, and service objectives as exemplified in its 28 UWIRCs supported for over 30 years by an annual UAB investment of over \$5 million dollars of HHS indirect funds. Briefly, UWIRCs must span several schools and departments, and bring together multidisciplinary investigators to serve as incubators for research ideas and proposals, facilitating the conduct of research; the supporting UWIRCs spur the kind of research that is central to HSOER. Several UWIRCs that are most centrally involved in this application are briefly described below, discussed in the Resources section and provide Letters of Support. The Directors of the COERE, **Kenneth Saag**, MD, MSc (T32 Program Director and Director of the UAB CERTs), **Michael Morrissey**, PhD (T32 Co-Director and Director of the LHC) and **Monika Safford**, MD (T32 Co-Director and Assistant Dean of CME) have led and grown this T32 program, in partnership (primarily) with the Departments

of Medicine (19 Mentors), Health Care Organization and Policy (3 Mentors), Epidemiology (4 Mentors), Health Services Administration (2 Mentors), and the School of Nursing (3 mentors). The Department of Medicine, which physically houses the training program, has annual extramural research funding of more than \$101 million. The Departments of Health Care Organization and Policy, Epidemiology and Health Services Administration also have exceptional national reputations with significant extramurally supported research. Thus, UAB's T32 program is anchored within a dynamic interdisciplinary environment with 37 Primary Mentors from 18 Divisions/ Departments across campus (see Tables 1 and 2). Each has an active and successful track record of HSOER research and mentoring. Table 2 includes a brief description of our Primary Mentors' and the HSOER Domains their research addresses.

2.B.1 UAB Center for Outcomes and Effectiveness Research and Education (COERE)

The COERE (**K. Saag, MD, MSc**, Director; **M. Morrissey, PhD** Co-Director; **M. Safford, MD** Associate Director) is a multidisciplinary UWIRC with a mission to maintain and continuously enhance a successful program of research on improving the quality and outcomes of health care in Alabama and across the nation. Nested within the COERE is the AHRQ-funded Deep South Arthritis and Musculoskeletal CERTs, one of only six nationally (see section 2.D.1). Since being formalized as a UWIRC in 1998, COERE leaders have been instrumental in attracting over \$498M in extramural grant support for interdisciplinary research and training in HSOER at UAB. Through its work in statistical and methodological innovations in quality measurement and improvement, community engagement research, and conduct of trials and observational studies in real-world populations, COERE has become a national resource. The COERE's scientific strengths are focused in CER/PCOR including: patient safety in the use of therapeutics, health care economics, systematic literature review/guideline development, and translating research into practice. In these areas, COERE scientists apply methodological expertise in epidemiology, pharmacoepidemiology, health economics, economic evaluation and modeling (decision analytic modeling, cost-effectiveness and cost-benefit analysis), biostatistics, health informatics and the behavioral sciences. A growing strength is the COERE's expertise in the use of large administrative data-bases. In collaboration with the Department of Epidemiology and the LHC, we established a university-wide resource for Medicare and Medicaid claims data, called the Pharmacoepidemiology and Economics Research (PEER) Group. Since 2008, we have acquired over 130 million claims of Medicare and Medicaid data from over 54 million beneficiaries. Housed at the UAB School of Public Health, the unit has addressed questions on the economic and disease burden of osteoporosis, the longitudinal comparative effectiveness and safety of biologic medicines and recently expanded into the area of cardiovascular diseases (see Table A below for representative projects and publications).

The COERE hosts focused Work Groups in methodological areas of expertise and interest (e.g. community engagement; healthcare organizations and systems) and certain disease focused areas of interest (e.g. diabetes and diabetes prevention, musculoskeletal disorders, HIV-AIDS, and cardiovascular disease). Within and across these focus areas are the cross-cutting themes of relevance to AHRQ in healthcare efficiency and disparities, healthcare quality measurement and improvement, and CER/PCOR. To help foster research in these areas, COERE supports intramural pilot projects as part of the CCTS/Council of Center Directors Translational Research Pilot Grant Program. In 2010, COERE supported a pilot project by **H. Wang, MD** (T32 Mentor) that successfully led to a NINR-funded R01 that is examining risk factors for sepsis in the community. The COERE sponsors monthly Works-In-Progress seminars, monthly epidemiology book reviews, monthly outcomes research breakfast discussion groups, frequent visits by outside speakers, bi-monthly biostatistics rounds, and an annual intermediate methods workshop co-sponsored with other UAB Centers (see Section 3.C.9 for descriptions of these and other activities). COERE also broadcasts the monthly AHRQ DeCIDE network methods seminars and other relevant national webinars. These activities are designed to promote outcomes and effectiveness research and education at UAB, and to encourage the cross-fertilization of ideas.

2.B.2. UAB Lister Hill Center for Health Policy (LHC).

The LHC (**M. Morrissey, PhD**, Director) was established in 1987 through an endowment from the U.S. Congress honoring the former Alabama Senator Lister Hill and has a university-wide mission to facilitate the conduct of health policy research, to disseminate the findings of trans-disciplinary research beyond the usual channels of academic publication, and to sponsor the Lister Hill Policy Fellows Program (see Section 2.C.3). To help fulfill its mission, LHC supports an intramural grants program, funding 2 or 3 seed projects per year and sponsors a monthly Seminar Series that invites 10 nationally known researchers each year to present work in progress. LHC also sponsors two Research Methods Workshops a year. These half-day sessions provide state of the art research techniques to practicing health services researchers. The LHC initiated its

Scholars program in 1990. Currently there are 58 scholars located in eight UAB schools, representing 25 disciplines, and including most of the T32 faculty mentors. The LHC provides guidance in understanding and projecting the impact of effective intervention strategies on health care policy and identifying the most efficient methods for implementing such strategies. LHC is actively involved in health economics at the national and international levels. It has previously hosted the Annual Health Economics Conference and is a founding member of the Southeastern Health Economics Study Group (SHESG). In addition, since 1990 LHC has disseminated the results of the research of its scholars through a monthly abstract mailed to over 3,000 Congressional offices, state health officers, Medicaid commissioners, southeastern legislative offices, and others. These abstracts, written for a policy audience, are on the Center's website: www.healthpolicy.uab.edu.

2.B.3. UAB Minority Health and Health Disparities Research Center (MHRC)

The NCMH supported UAB MHRC (**M. Fouad, MD**, PI/Director; T32 Internal Advisor and Mentor) is a comprehensive educational, research, and community-outreach center focused on eliminating the health inequalities experienced by racial and ethnic minorities locally, regionally, and nationally. The MHRC, refunded in 2012 for another 5 years, accomplishes its mission by fostering partnerships with academic schools and centers, historically black colleges and universities, state agencies, community organizations, and grassroots groups. It serves as an infrastructure that supports interdisciplinary research on minority health and health disparities. As a UWIRC, the MHRC is supported by ten UAB schools and has 220 faculty members, 18% of which are African-American and 16% Latino. Such university-wide participation facilitates MHRC's involvement in interdisciplinary activities and ensures the accomplishment of its purpose to serve as an infrastructure that supports university-wide interdisciplinary research on health disparities.

2.B.4. Other Collaborating UAB Centers and Programs (see Letters of Support)

Center for Clinical and Translational Science (CCTS) (**R. Kimberly, MD, PI**; T32 Internal Advisor) – The CCTS was funded by the NCR in 2008 in response to the NIH request for applications for CTAs. The vision of the UAB CCTS is to transform the institutional environment by building productive and efficient interdisciplinary research teams through educational ingenuity, regulatory reorganization, resource coordination, and methodological innovation. Its mission is to develop a transformative infrastructure that spans the spectrum from preclinical research to bench-to bedside translation to community implementation. Many HSOER T32 leaders and mentors hold leadership roles with the CCTS. For example, **K. Saag** leads the CCTS KL2 program and **E. Berner, EdD** (T32 Associate Director and Mentor) Co-Directs the Biomedical Informatics core.

UAB Center for Aids Research (CFAR) (**M. Saag, MD**, Director; T32 Internal Advisor and Mentor) – One of the seven original Centers established by NIAID in 1988, the CFAR has benefited for over 20 years from institutional leadership that has played an instrumental role in leading HIV/AIDS research efforts on a global scale since its inception (see Table A). CFAR has a long tradition of training and research partnerships with the UAB HSOER T32 program and the COERE. This includes an NIH ARRA-funded Infectious Diseases T32 with a CER focus and co-sponsorship of recent COERE/CFAR postdoctoral fellow **A. Willig, PhD** who is now transitioning to faculty with the Division of Infectious Diseases. Two key components of the CFAR relevant to this T32 are 1) its membership in the CFAR Network of Integrated Clinical Systems (CNICS) project, the first electronic medical records-based resource network that integrates clinical data from the large and diverse population of HIV-infected persons in the modern HAART era who are receiving care at one of the US-funded CFAR sites and 2) the UAB 1917 Clinic, which provides comprehensive and compassionate health care for HIV infected people which provide the foundation for the UAB 1917 Clinic Cohort, a prospective cohort study established in 1992. Both the CNICS and the 1917 Cohort are available to trainees to use as part of their research (see letters of support). Of note, we have recently developed a short term rotation with the CNICS that provides trainees a structured opportunity to work directly with CNICS data (see Section 3.C.4)

UAB Center for Aging (CFA) (**R. Allman, MD**, Director; T32 Internal Advisor and Mentor) – The UAB CFA UWIRC promotes the health and well-being of older persons by conducting and promoting age-related research, training students and faculty to conduct research, disseminating their knowledge, and supporting community outreach and clinical programs. Established in 1976, the CFA encourages and coordinates the activities of the multiple disciplines represented by the many UAB schools to fulfill its mission. Collaborative research is conducted in the areas of immobility, urinary incontinence, Alzheimer's disease, atherosclerosis, musculoskeletal disease, and age-related cancer. CFA faculty have extramural support for research in these and other areas totaling over \$60 million. Trainees and mentors interested in age-related research can utilize CFA provided enrichment and training activities including the Deep South Resource Center for Minority Aging

Research (RCMAR) (see Section 2.C.2 and 2.D.1) and the Faculty Scholars Program, a 160-hour training program that provides participants with geriatric knowledge, curriculum guidance and mentorship.

UAB Nutrition and Obesity Research Center (NORC) (D. Allison, PhD, Director; T32 Internal Advisor) – The UAB NORC is an NIH and intramurally funded UAB UWIRC established to foster a multidisciplinary approach to basic, clinical, and translational research with an emphasis on understanding the metabolic factors, environmental influences, and associated genetic traits underlying nutrition and obesity-related health problems. The NORC comprises 110 investigators from 30 academic units, with many extramural grants for nutrition/obesity research. The NORC provides training opportunities in obesity research through NIH-funded Predoctoral and Postdoctoral Fellowships. These opportunities cover virtually all aspects of obesity research ranging from molecular biology to epidemiology. This disease focus makes it distinct from the HSOER T32 but there are opportunities for cross-collaborative training if a trainee is interested in HSOER related obesity work. M. Safford (T32 Co-Director) is part of the NORC mentor pool (See Table 3).

2.C. HSOER Relationship to Other UAB Research Training Activities

Table 3 lists all active federally supported training grants that our Primary Mentors participate with and were active as of August 2012. In total, they support 45 postdoctoral and 52 predoctoral trainees at UAB, but only the HSOER T32 and time limited CER T32, both directed by **K. Saag**, exclusively support HSOER trainees. Four of these grants are directed by individuals who have been selected to serve as mentors and/or advisors for this training program. We now describe how our T32 program leadership has synergy with a variety of related training activities that enhance the research training environment for HSOER T32 trainees.

2.C.1 Umbrella UAB-VA Deep South HSOER Training Program) (K. Saag, PD; M. Safford, co-PD)

In 2006, the T32 and the VA Quality Scholars Fellowship programs were brought together, along with the COERE postdoctoral fellows (below), under an umbrella program named the UAB-VA Health Services Research Training Program (HSRTP) to create synergies and cohesiveness for both the trainees and participating faculty mentors (see Figure 1 for organizational chart). With the successful receipt of an ARRA-funded AHRQ T32 and K12 in CER in 2010 and the PCOR K12 in PCOR and in recognition of the special relevance of eliminating racial/ethnic disparities particularly in our region of the country, we expanded the scope of training to include CER and PCOR domains and renamed the program the UAB-VA Deep South HSOER Training Program. In addition to having compatible training goals, these programs share the same leadership, build on each other's infrastructure, and partner in research activities. Beyond bringing cohesiveness to the HSOER training at UAB and the Birmingham VA, the Deep South HSOERTP provides more visibility and allows for economies of scale in mentoring oversight, career development, trainee recruitment, and evaluation activities. This T32 is the primary HSOER training mechanism at UAB and the focus of this application. Now, we briefly describe the other sources of HSOER trainees.

T32 and K12 in CER, and K12 in PCOR (K. Saag, PI) - In July 2010, UAB was awarded two one-time training grants in CER from AHRQ under the American Recovery and Reinvestment Act (ARRA) of 2009: 1) a 3-Year K12 grant supporting four scholars and 2) a 3-Year T32 supporting two cohorts of two fellows each. Both grants will end June 2013. In August 2012, UAB was awarded a PCOR K12 from AHRQ, a 2-year grant supporting 1 cohort of three scholars. The additional experience gained and expanded infrastructure created by these one-time training grants have directly benefited the continued growth of the HSOER T32 through expansion of the curriculum to include more CER and PCOR domains and methodology and the identification of a larger pool of high quality candidates and mentors.

National VA Quality Scholars Fellowship Training Program (VAQS) (C. Estrada, PI; T32 Associate Director; P. Patrician, PhD, Senior Nurse Scholar; T32 Content Leader) - The 2-year, VA-funded fellowship targets post-residency physicians and nurses with the purpose of training clinicians to become champions for change and leaders in quality improvement (implementation) research.¹ The program is coordinated by the Dartmouth Institute for Health Policy & Clinical Practice. At Birmingham, 4 scholars are currently enrolled several of whom will obtain an MSPH in Outcomes Research. This year the Birmingham VA was awarded a training position for a Chief Resident in Quality and Patient Safety, which will lead quality and safety education. Most scholars go on to careers in quality improvement or academic research careers. Notably, three of the current Scholars are African-American women with a research on health disparities research, quality of HIV care, and teamwork.

UAB COERE and Other Institutionally Supported Postdoctoral Fellowships - These fellowships are leveraged with intramural support from the COERE and other UWIRCs and then supplemented by research support from mentors' extramural grants. In addition to being mentored by the HSOER Training Program leadership, institutionally supported fellows attend courses in the MSPH in Outcomes Research that are tailored to the trainee's skills and interests. Since 2001, we have had 10 such fellows with 30% from URMs. This includes **Maria Pisu, PhD**, a health economist, who is currently an extramurally-funded T32 Mentor. Recent fellows include **Nicole Wright, PhD** (Epidemiology) and **Iris Navarro, MD, MSPH** (Rheumatology). Both are recent or soon to be additions to the UAB academic faculty. The ability to co-support an occasional fellow with intramural funds confirms institutional commitment as well as our large pool of potential candidates in HSOER.

2.C.2. Health Disparities Research Training Program (HDRTP) (M. Fouad, Director)

Our current health disparities training programs are certificate-type enrichment programs, and serve as career enhancement rather than career development programs. This 1-2 year program for junior faculty and postdoctoral scholars pulls together the training components of four other grants—the Alabama Collaboration for Cardiovascular Equality (ACCE) Partnership, the Morehouse School of Medicine/Tuskegee University/UAB Comprehensive Cancer Center Partnership, the Project EXPORT/RESPECT MHRC, and the Deep South RCMAR (see section 2.D.1)—into one infrastructure to maximize effectiveness and resources. Current disparities scholars attend lectures weekly for a year, and work with a mentor to develop a grant in disparities research. Along with UAB, 5 other institutions currently participate in the HDRTP: Morehouse School of Medicine, Tuskegee University, University of Alabama, Tulane University, & Creighton University. The extant training programs and research support assures that a network of senior health disparities researchers is available at UAB to serve as program faculty and mentors for the HSOER T32. To date, the HDRTP has trained 100 fellows and junior faculty with 46% obtaining extramural funding in disparities. The HDRTP has integrated these training resources under the UAB MHRC. Current HSOER T32 postdoctoral trainees, **Megan Ruiter, PhD** and **Karen Albright, DO, MPH** are in this enrichment program and many of the postdoctoral scholars exposed to this short enrichment program are natural candidates for participation in the HSOER T32.

2.C.3. Lister Hill Center (LHC) Health Policy Fellowships Program. (M. Morrissey, Director)

This program, initiated in 1992, includes current UAB masters or doctoral students who are successful in a campus-wide competition. They spend six months in a national health policy setting, typically in Washington, DC or Atlanta, GA. Fellows have served in the CDC, HRSA's Office of Rural Health Policy, the IOM, and the World Bank, among other placements. Three have worked with AHRQ. Current HSOER T32 predoctoral trainee **Monica Aswani, MPH** recently completed her fellowship as the Patient Safety Fellow at the Johns Hopkins Quality and Safety Research Group with Peter Pronovost as her primary mentor. She conducted research addressing healthcare quality and patient safety involving methods to reduce diagnostic errors, hospital readmissions, and central-line associated bloodstream infections. This research led to 4 publications.

2.D. Research Base for HSOER T32

Research at UAB is well supported by extramural funding and is dramatically stimulated by a rich culture of interdisciplinary collaboration supported through the network of UWIRCs described in Section 2.B. As one of the top research universities in the country, UAB received \$503 million in 2011 in grants and contracts. It is also noteworthy that the Department of Medicine, in which the T32 Director (**K. Saag**) and T32 Co-Director (**M. Safford**) have their primary appointments, has consistently ranked among the top 10 departments of medicine (DOM) in NIH funding. This also includes UAB's robust track record of past and active projects in all areas of health disparities research under the leadership of **M. Fouad** and supported by 15 years of uninterrupted funding of a minority health research center. Table 4 highlights \$133M in active and pending grant and contract support of the 37 Primary Mentors for the training program. It is noteworthy that each Primary Mentor has active or pending research support providing research opportunities for trainees. Some of the 189 active federally supported research centers and research projects by UAB faculty are presented below and in Table A. As evident, UAB has the critical mass of faculty and mentors with funded projects, diverse expertise, and ample research experience to promote rigorous training in the three HSOER domains highlighted above and continue to serve as a key component of the research and mentor base of the T32.

2.D.1. Federally Funded Research Centers Supporting HSOER at UAB

Deep South Arthritis and Musculoskeletal Center for Education and Research on Therapeutics (CERTs) (K. Saag, PI, J. Curtis, MD, MSPH, MS Co-PI; T32 Content Leader) - In 1999, UAB received the first of four awards from the AHRQ to develop the UAB CERTs. The CERTs was renewed in 2002, 2006 and again in 2011 as a \$4.1 million cooperative agreement. The UAB CERTs is now one of only 6 national CERTs. The

UAB CERTs has successfully identified, funded and conducted more than 50 projects investigating and disseminating knowledge about safe and effective use of therapeutics related to musculoskeletal disease, much of which is relevant to HSOER. CERTs scientific seminars are regularly conducted with university-wide participation. For example, in February 2012, the CERTs, in collaboration with six UAB centers and schools, facilitated its fifth annual Methods half-day symposium entitled, “New Design and Analytical Methods in Patient Centered Outcomes and Comparative Effectiveness Research”.

Deep South Comprehensive Research Center of Excellence P60 (M. Fouad, PI)- Built on the success of the P-60 Project EXPORT (RESPECT), the overarching goal of this NIH/NCMHD-funded center was to establish a comprehensive minority and health disparities research infrastructure to generate new knowledge on minority health and on health disparities in chronic diseases. The UAB MHRC established by the grant places emphasis on understanding the mechanisms underlying health disparities to develop and to test interventions to reduce and ultimately eliminate these disparities (see Section 2.B.3). We will build on this successful base in disparities research to expand HSOER and to leverage this infrastructure for training of our T32 trainees.

Center of Excellence in Comparative Effectiveness Research for Eliminating Disparities (CERED) (M. Fouad PI, K. Saag, Co-PI) - Funded by NIMHD as an administrative supplement to the P60 Deep South Comprehensive Research Center of Excellence that helps support the MHRC (see Section 2.A.2 and Resources), the CERED expanded the infrastructure created by the P60 to include comparative effectiveness research, training, and dissemination. The goals are to: 1) conduct research on the comparative effectiveness of health care delivery strategies within health disparities populations; 2) conduct CER on the impact of different treatments in the reduction of health disparities, including the development of innovative research methods for evaluating effectiveness in health disparity populations; 3) establish effective dissemination strategies to ensure that health disparity populations and the health care providers and systems that serve them are aware of and capable of utilizing the results of CER; 4) promote linkages to patient data registries and networks that can partner with our UAB CERED in health disparity-relevant CER and dissemination; and 5) promote participation of health disparity populations in CER studies. Of note, this CERED mechanism does not offer trainee slots, but does sponsor HDRTP trainees in the form of funds for pilot projects.

Deep South Resource Center for Minority Aging Research (RCMAR) P30 (R. Allman, PI; M. Fouad Co-PI)- The Deep South RCMAR is NIA-funded and provides a research infrastructure for the following objectives: 1) mentored research careers; 2) enhance cultural diversity of the individuals conducting health research on older persons; 3) conduct research on and disseminate strategies for recruiting and retaining African American older adults in research; 4) facilitate innovative strategies to support enduring research careers in minority health and encourage the recruitment of established researchers to undertake research on minority aging health; 5) improve the research methods and tools necessary to conduct rigorous and comparable research on diverse populations; 6) advance scientific knowledge to decrease health disparities; and 7) disseminate research results addressing the resolution of health disparities through the improvement of minority health, particularly for older African Americans. The Deep South RCMAR is built upon the unique strengths of four partner institutions (Morehouse School of Medicine, Tuskegee University, University of Alabama, and UAB). The RCMAR provides an infrastructure for training and mentoring programs, funds 3 pilot projects per year, and nurtures community relations. This enrichment program is a natural segue for talented postdoctoral scholars, who receive this exposure to health disparities, to next seek a K award.

2.D.2. Examples of UAB Research Projects in HSOER Constituting the Training Base

UAB mentors in this application have a robust track record of past and active projects, diverse expertise, and ample research projects to promote rigorous training in HSOER. Table 4 provides all current and pending grant support of our 37 Primary Mentors. Table A provides examples of the many past and present HSOER focused UAB projects and representative publications from our Primary and Associate Mentors organized by three broad domains relevant to AHRQ priority areas and the focus of our training program: 1) Healthcare Efficiency and Disparities; 2) Healthcare quality measurement and improvement; and 3) Comparisons of effectiveness and safety of prevention, diagnosis, and treatment options (CER).

Table A. Research Base of UAB Mentors, by AHRQ Priority Areas and HSOER Domains Emphasis Area* (note many projects span several emphasis areas)

Clinical or Methods Topic (UAB investigators) ^{publications or in progress (IP)}	Partners, Data Sources (Funding)	AHRQ Priority Areas/HSOER Domains*
Healthcare Efficiency and Disparities Focus		
Obesity prevention program in a low resource school (Baskin) ²	Birmingham city schools public school (MetLife)	1, 2, 3
Factors associated with retention of African-American women in a community walking program (Baskin, Fouad, Scarinci) ³	DSN WALK program (NCI)	1, 2, 3
Parental support of children's physical activity (Baskin) ⁴	Parents of elementary school kids in NY and AL (NMCHD)	1, 2, 3
Diabetes prevention for Latinas (Cherrington) ⁵⁻⁸	ENCOURAGE (RWJ)	1
Linking community health workers with primary care for indigent minorities with an Internet dashboard (Cherrington, Safford) ^{IP}	ENCOURGAE (ADA)	1, 2
Internet-delivered intervention to improve diabetes care for rural residents (Estrada, Safford) ⁹	UAB CME Network (NIDDK)	1, 3
Increasing minority participation in clinical trials (Fouad) ^{10-13,IP}	CanCORS, PLCO (NHLBI, NCI)	1, 3
Effects of comorbidity in breast and prostate cancers (Fouad) ^{14, 15}	Birmingham metro area, Medicare (CDC)	1, 3
Community-based interventions to eliminate breast and cervical cancer disparities (Fouad) ¹⁶⁻²⁰	African American women, Medicare, REACH (CDC)	1, 2
Utilization of Community Health Workers/Advisors to reduce cancer disparities (Fouad) ^{6, 21, 22,IP}	African American women, REACH (CDC)	1, 2
Complex patient health intervention to eliminate disparities (Fouad, Scarinci) ²³	Medicare AL REACH	1, 2
Perceived discrimination in healthcare (Halanych) ²⁴	Birmingham African American Community members (RWJ, NHLBI)	1, 2
Radio dramas to prevent diabetes and to improve diabetes outcomes in African Americans and Latinos in Alabama (Kohler) ²⁵	BodyLove Program (Jefferson County, NIH)	1, 2
Development and validation of an instrument to assess perceived social influence on health behaviors (Kohler, Fouad) ²⁶	Adult African Americans (NIH)	1, 2
Multimedia community intervention on medication adherence in hypertensive adults (Martin, Kohler, Pisu) ²⁷	HARP trial, Alabama Black Belt (NHLBI)	1, 3
Unrecognized MI and cardioprotective medication use (Leviton, Safford, Muntner) ²⁸	REGARDS (AHRQ)	1, 3
Risk. benefits of estrogen and estrogen plus progestin on the risk of fracture, cardiovascular disease, dementia, and malignancy (Lewis, Safford) ²⁹⁻³²	WHI (NIH; Wyeth Pharmaceuticals)	1, 3
Social services for HIV to improve care for African American women (Moneyham) ³³	Rural African American women in Alabama (NIH)	1, 2
Disparities in stroke risk factors and outcomes (Howard G, Safford) ³⁴⁻³⁶	REGARDS (NINDS)	1
Cost-effectiveness of a diabetes group RCT in AL Black Belt (Pisu, Safford) ^{IP}	ENCOURAGE (NIDDK)	1, 2, 3
Health professional shortage areas and cardiovascular disease treatment and mortality (Safford, Brown) ^{37, 38}	REGARDS (NHLBI)	1
Disparities in anticoagulation for a fib (Safford, Howard G, Howard, V) ³⁹	REGARDS (NINDS)	1
Bisphosphonate use and outcomes of treatment in men (Safford) ⁴⁰	Veterans Affairs (AHRQ)	1, 3
RCT comparing two approaches to Improving chronic pain management among rural physicians (Safford) ^{IP}	UAB CME Network (Pfizer)	1, 3
Comparing two approaches to improving diabetes self-care among rural minorities in the South (Safford, Cherrington, Halanych, Martin) ⁴¹⁻⁴³	ENCOURAGE (Peers for Progress)	1
Peer support and messaging to increase mammography, HPV testing, cervical cancer screening and prevention in Latinas (Scarinci) ^{22, 44}	Rural African American women, Latina immigrants (NIH)	1, 2,
Healthcare Quality Measurement and Improvement Focus		
Hospital care risks in older adults (Ahmed, Allman, Brown) ⁴⁵⁻⁴⁷	Veterans Affairs (NIA, VA Career Award)	2, 3
IVR-supported care transition intervention, "e-coach" RCT of complex patients with CHF or COPD (Berner) ^{IP}	UAB Health System (AHRQ)	2, 3
Cost of GIOP system management intervention (Beukelman, Kilgore, Pisu) ⁴⁸	Aetna (AHRQ)	2, 3
National JIA treatment recommendations (Beukelman) ⁴⁹	(ACR, NIH)	2, 3
Osteoporosis medication adherence and fractures (Curtis, Saag K, Delzell) ^{IP}	Medicare (Pharmaceutical)	2, 3
NSAIDs safety (Curtis, Saag K) ^{50,51}	UnitedHealthcare data (AHRQ)	2
Osteoporosis prevention group randomize trials (Curtis, Saag K, Kilgore) ^{52-55,IP}	QIOs, Medicare (AHRQ)	2
Change in stated clinical practice (Gilbert, Richman) ⁵⁶	Dental Practice-Based Research Network (NIH)	2

Effectiveness of peri-operative beta-blocker in reducing cardiac events (Hawn, Richman) ⁵⁷	VA (VA HSRD)	2, 3
Outcomes for surgical pay-for-performance measures (Hawn) ⁵⁸	VA (VA)	2
Decision Support For Safer Surgery (Hawn) ^{IP}	Michigan Surgical Quality Collaborative (AHRQ, SBIR)	2
Physician patient relationships and trust care process (Hearld) ^{59, 60}	Health Professions' Area Resource File (RWJ)	2
Evidence implementation systematic review (Hearld) ⁶¹	(IOM)	2, 3
Improving access to care for rural veterans (Kertesz) ⁶²	Alabama Rural Veterans Health Initiative (VA)	1, 2
Improving quality of primary care for homeless patients (Kertesz) ^{IP}	VA (VA)	1, 2, 3
Guidelines for chronic nonmalignant pain in the homeless (Kertesz) ⁶³	National Health Care for the Homeless Guideline (VA)	1, 2, 3
Incentives for home health care and hospice (Kilgore, Morrisey, Locher) ⁶⁴	Medicare (NIA)	2
Cost of skeletal fractures (Kilgore, Morrisey) ⁶⁵	Medicare and Medicaid (Pharmaceutical)	2
Insurance coverage relation to ambulatory ER and hospital utilization (Kilgore, Morrisey, Menachemi) ⁶⁶	Alabama CHIP (Alabama ALL Kids)	2
Nutritional support and patient centered outcomes (Locher) ^{67-70,IP}	Alacare, Barnes Jewish Hosp (NIA, HRSA)	2
Nutritional interventions for care transitions (Locher) ⁷¹	Alacare, HomeCare Plus (NIH)	2
Health care delivery treatment and coordination of care delays (Locher) ⁷²	UAB Head and Neck Cancer Registry (UAB)	2
Practice variations, predictors, outcomes, prophylactic gastrostomy tube placement in head and neck cancer patients (Locher and Kilgore) ⁷³	SEER-Medicare Data (ACS)	2
Cost of RCTs research (Locher, Kilgore) ⁷⁴	Medicare (ACS; Amgen)	2,,3
Cost and quality of care in asthmatic children (Menachemi, Morrisey, Kilgore) ⁷⁵	AL CHIP (AL ALL Kids)	2
Real-world effectiveness of HIV treatment (Mugavero, Saag, M) ^{76,IP}	ART-CC cohort andACTG (NIH, UK Med Res Council)	2, 3
HIV medications treatment recommendations (Mugavero, Willig, Saag M) ⁷⁷⁻⁸³	UnitedHealth, CNICS (NIH)	2, 3
Workload intensity, nursing environment and adverse events (Patrician) ⁸⁴⁻⁸⁷	Military Hospitals (TriService Nursing)	2, 3
GIOP quality improvement group randomized trials (Saag K, Curtis) ⁸⁸⁻⁹³	Aetna (NIAMS)	2,
National arthritis treatment recommendations (Saag K, Curtis) ⁹⁴	(ACR)	3
National arthritis (OA, RA) quality indicators (Saag K) ⁹⁵	(AF)	3
National Gout quality indicators (Saag K) ⁹⁶	(AHRQ)	2, 3
Costs and benefits of HIV treatment CD4 count (Saag M, Pisu, Mugavero) ⁹⁷	HIV/AIDS Longitudinal Outcome Metrics, (NIH)	2
Managed care access barriers (Weech-Maldonado) ⁹⁸	FL Medicaid's PSOs, Medicaid (FL Agency forHCA)	1, 2
Comparisons of Effectiveness and Safety of Prevention, Diagnosis, and Treatment Options focus		
Life-space assessment to determine mobility in older adults (Allman) ^{46, 99}	Aging adults (NIA)	3
Heart failure, ARBs compared to ACE inhibitors (Allman) ¹⁰⁰	Alabama Heart Failure Project (NIH)	3
Risk assessment of biologics in musculoskeletal disorders (Curtis, Saag K) ¹⁰¹	UnitedHealthcare data (FDA/CBER)	3
Bisphosphonates comparative anti-fracture efficacy (Curtis, Saag K) ¹⁰²	REALITY, MEDSTAT (Pharmaceutical)	3
Comparative safety of biologic products in RA (Curtis, Saag K) ^{103-105,IP}	UnitedHealthcare data (AHRQ, FDA/CBER)	3
Biologic use in RA and osteoporosis (Curtis, Delzell, Morrisey, Warriner, Kilgore, Curtis, Saag K) ^{65, 106-127}	Medicare and Medicaid (AHRQ, Pharmaceutical)	3
Arthritis therapeutics adherence in large databases (Curtis and Delzell) ^{110,IP}	Aetna (Pharmaceutical)	3
Data mining to determine NSAIDS AEs (Curtis, Delzell) ¹²⁸	MCBS (AHRQ)	3
Improving data from cancer clinical trials (Demark-Wahnefried) ¹²⁹	CYCORE (NCI)	3
Home based diet and exercise program for older, overweight cancer survivors(Demark-Wahnefried) ¹³⁰	RENEW (NIH, VA HSRD)	1, 3
Lung cancer treatment and outcomes (Fouad) ¹³¹	CanCORS, HMOs, State cancer registries, VA (NCI)	3
Prostate, lung, colorectal and ovarian cancer screening and outcomes (Fouad) ^{15, 132-134}	PLCO, population-based cohorts (NCI)	3
Effectiveness of pre-operative antibiotics and surgical site infections (Hawn) ⁵⁸	VA NSQIP data (VA, AHRQ)	3
Effectiveness of the Surgical Care Improvement Program (SCIP), surgical site infection rates (Hawn) ⁵⁷	Veterans Affairs (HSRD)	3
Comparative Effectiveness of Mesh and Suture Repair for Hernia (Hawn) ¹³⁵⁻¹³⁷	VA (VA, HSRD)	3
Duration of post-operative VTE prophylaxis and VTE prevention (Hawn) ¹³⁸	VA (VA, HSRD)	3

Attributable Risk of Smoking on Surgical Complications (Hawn) ¹³⁹⁻¹⁴¹	VA (HSRD)	3
Antiplatelet management in patients with cardiac stents undergoing invasive procedures (Hawn) ^{IP}	VA and Medicare (VA HSRD)	3
Prediction models for ECG screening (Levitan, Safford, Kilgore, Muntner) ¹⁴²	REGARDS (NIH)	3
Comparing intensive lifestyle intervention and usual care to improve outcomes in type 2 diabetes patients (Lewis, Safford) ¹⁴³	Look Ahead study (NIDDK)	3
Pharmacogenetics of warfarin safety and use (Limdi) ^{144, 145}	The International Warfarin Pharmacogenetics Consortium (NHLBI CDC)	3
Leisure time physical activity and hospitalization (Martin, Allman) ¹⁴⁶	Study of Aging (NIA)	2, 3
Health information technology adoption, EHR examination (Menachemi) ¹⁴⁷	AHA, HIMSS, Leapfrog (UAB)	2, 3
SMS text messaging on healthcare outcomes (Menachemi) ¹⁴⁸	(UAB)	2, 3
Patient-reported medication adherence and health outcomes (Muntner) ^{149, 150}	Ochsner Health System, Humana (NIA)	3
Methods to permit the conduct of large simple trials (Saag K, Warriner, Delzell, Curtis) ¹⁵¹	Medicare, DARTnet, CMTP (NCRR ARRA)	3
Vertebroplasty post-procedure related fractures (Saag K, Curtis) ^{155, 152}	BC/BS (FDA/CDRH)	3
New approaches to longitudinal data in arthritis therapeutics (Saag K, Curtis, Delzell) ^{153-158, IP}	Medicare, Tenn Care, Kaiser, (AHRQ)	3
HIV clinical trial, "real world" observational cohort study (Saag M) ^{159, IP}	1917 Clinic Cohort (NIH, AHRQ)	3
Non-evidence based antibiotic use post dental procedure & infection (Safford) ¹⁶⁰	VA (VA)	3
National arthritis treatment recommendations update (Singh) ¹⁶¹	(ACR)	2, 3
Rheumatic therapies meta-analyses, systematic reviews (Singh) ¹⁶²⁻¹⁷⁶	Cochrane (NIH)	3
Incident cognitive impairment in Stroke Belt residents (Wadley, V. Howard) ¹⁷⁷	REGARDS (NIH)	3
HIV effectiveness versus efficacy of treatment (Willig, Saag M., Mugavero) ^{178, IP}	1917 Clinic Cohort (NIH, CNICS)	3

*HSOER emphasis areas - 1) Healthcare efficiency and disparities, 2) Healthcare quality measurement and improvement, 3) Comparisons of effectiveness and safety of prevention, diagnosis, and treatment options (CER)

See Appendix 1 for all acronyms listed in this table

IP = Project in progress

2.E. Continued Need for AHRQ HSOER Training Program at UAB

Since its initial funding in 2003, the AHRQ-funded T32 program has provided an organized approach to HSOER training activities and brought considerable visibility to HSOER at UAB. With the programs renewal in 2008, we were able to create synergies with other training activities such as the VA Quality Scholars program. The program also provided the training infrastructure to expand training opportunities. This includes the AHRQ ARRA-funded CER T32 and K12, the NIH ARRA-funded Infectious Diseases CER T32 and the AHRQ-funded PCOR K12. With the ARRA-funded T32 training being time limited, non-renewable, and ending in June 2013, the HSOER T32 Training Program is essential to the continuance and growth of HSOER training at UAB. Through a renewal of the HSOER T32, we will be well positioned to respond to the groundswell of enthusiasm for HSOER at UAB.

2.E.1. Need for Institutional HSOER Postdoctoral Training Program at UAB

The postdoctoral component of the T32 attracts new investigator talent to HSOER research, to UAB, and to the "Deep South." The need to train doctoral level trainees for HSOER research is fundamental to educating researchers in domains relevant to AHRQ priority areas 1) Healthcare efficiency and disparities; 2) Healthcare quality measurement and improvement; and 3) Comparisons of effectiveness and safety of prevention, diagnosis, and treatment options (CER). Given the strengths of our faculty in precisely these research areas, we believe that we offer an ideal environment for training the next generation of HSOER researchers. The T32 program also promotes recruitment and retention of talented HSOER faculty that enjoy the opportunity to mentor full-time trainees in a collaborative interdisciplinary research environment. Thus, many UAB high quality faculty candidates that might otherwise leave the region, or worse, never pursue a career in HSOER were recruited and/or retained in the near past (see Table E of the Progress Report for examples of recruited faculty). Our program is further enhanced by the September 2012 arrival of internationally known health services researcher **C. Seth Landefeld, MD** as new Chair of Medicine at UAB (see letter of support).

2.E.2. Need for Institutional HSOER Predoctoral Training Program at UAB

Overall the T32 predoctoral program has provided an opportunity to steer highly qualified doctoral candidates into a career path they might not otherwise have considered. T32 predoctoral trainees have been a focus of the training program since its inception with the addition of a HSR specialization to the PhD Program in Health

Services Administration (HSA). The HSR specialization was a direct result of the funding of our T32 and was integrated under the guidance of **N. Weissman, PhD** (T32 Senior Advisor). The predoctoral programs were redesigned and expanded with the oversight of **M. Morrissey, PhD** as its director. The integration of the core courses from the MSPH in Health Outcomes into the HSR specialization also allowed us to identify promising doctoral candidates from the new DrPH program in Health Outcomes within the Department of Health Care Organization and Policy, SOPH, that take similar coursework. The PhD in Comparative Effectiveness in Epidemiology was added in 2011 and closer linkages with the PhDs in Medical Sociology and Health Behavior are underway. Each of these degree programs have much to offer the health services research field and the T32 program provides a mechanism to make their faculties and students aware of the research opportunities in HSOER. We provide additional information about the doctoral programs in Section 3.C.2.

3. PROGRAM PLAN for HSOER T32

We are proposing continuation of our interdisciplinary *UAB Health Services & Outcomes Research Training Program (T32)* as a combined pre and postdoctoral research training program focused on three broad domains relevant to AHRQ priority areas: 1) Healthcare Efficiency and Disparities; 2) Healthcare quality measurement and improvement; and 3) Comparisons of effectiveness and safety of prevention, diagnosis, and treatment options (CER). We will build on the program's current structure and the many collaborating programs described. We also propose to incorporate components of our successful CER T32 and CER K12 that end June 2013 and the recently awarded AHRQ-funded PCOR K12. In recognition of these added areas of emphasis, we created the new name of *UAB Health Services, Outcomes, & Effectiveness Research (HSOER) Training Program (T32)*. We are a growing program beginning our 10th year of funding after starting with only 2 trainees in 2003 and reaching a peak of 11 trainees (3 pre and 8 post) in 2010 (HSR and CER T32s combined). We have demonstrated the capacity to create an integrated interdisciplinary training environment for young researchers, and to successfully equip them with the core competencies needed to become successful independent researchers with 100% of HSOER T32 trainees completing the T32 program and 83% remaining in research or training positions to date. As part of our ongoing assessment activities, we have updated our formal mentoring plan (Section 3.C.5) and evaluation system (Section 3.D.) and propose other initiatives to strengthen mentoring and training.

The academic components of the program, which provide the clinical research methods core competencies, will continue to require completion of their respective doctoral program (for predocs) and for postdocs, either the completion of one of our approved MSPH tracks (for those without prior comparable masters-level training) or selected core courses offered through our MSPH tracks (for postdocs in need of additional competencies). The program will draw from a pool of primary mentors with extensive background in HSOER (see 3.B). As part of the mentored research experience, each trainee will identify a research focus, participate as a collaborator in their mentor's research projects and publications and design and complete an appropriate independent research project, submitting the results for peer-reviewed publication. In addition, depending on career plans, trainees will be expected to conceptualize and outline a plan to submit a research grant (R03, R21, or R01) or continued research career development award (e.g. K Award or F-32). We will also continue our innovative approach to training junior mentors, the *Associate Mentors/Mentors in Training* component (see section 3.C.7).

The overall T32 training goals will not change substantially from those of the current funding cycle (2008-2013); however, specific **enhancements are proposed in this application**, and include:

- Enriched program focus highlighting three key HSOER domain areas aligned with AHRQ mission
- Expansion of predoctoral program (DrPH in Health Outcomes, PhD in Epidemiology, and other qualified doctoral programs)
- Increased program coordination and synergism with the UAB HDRTP and CCTS Training Component;
- Enhanced senior leadership in HSOER
- Addition of independent assessment/advisory bodies: Alumni Council and External Advisory Committee
- Addition of Stakeholder Advisory Panel and Dissemination Advisor
- Addition of Short Term Rotations opportunities for HSOER T32 trainees

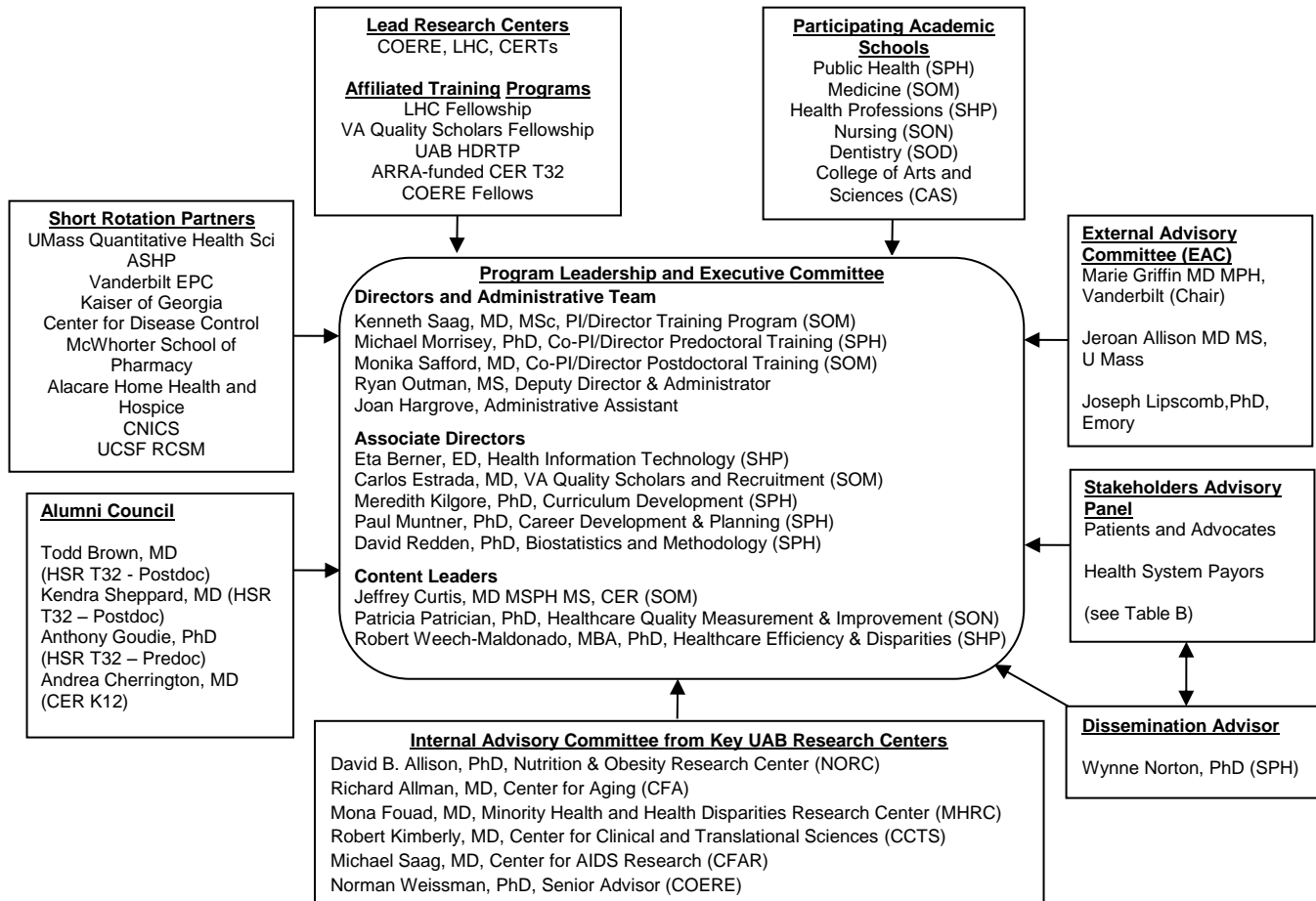
3.A. Program Administration (Training Program and Environment) for HSOER T32

We will utilize the same successful infra-structure in existence for our current umbrella UAB-VA HSOERTP, with the continued expansion of the mentoring pool and added advisory support from an External Advisory Committee, Alumni Council, and Stakeholder Advisory Panel. See **Figure 1** for organization structure.

As PI/Program Director, **K. Saag** (See 3.A.1) is responsible for the overall direction of the training program. He will work closely with the Co-Directors, **M. Morrissey** and **M. Safford**, to coordinate the research infrastructure

and academic components of the training program and to assure the quality of the mentoring relationships and plans of the trainees. The program directors, associate directors and content leaders will make up the **Executive Committee (EC)**. The EC will be responsible for the overall quality and scientific integrity of the training program and for assuring the relevance and quality of the academic, career development, and mentoring components of the program to create an integrated training experience. The COERE, which serves as the coordinating center for the umbrella UAB-VA Deep South HSOER Training Program, has served and will continue to serve as the coordinating center for this T32 training program.

Figure 1. UAB T32 in HSOER Training Program Organization Chart



3.A.1. Program Directors

Kenneth Saag, MD, MSc has devoted the majority of his over 20-year career efforts to outcomes and epidemiologic research. During and immediately after his rheumatology fellowship, he earned a Master's of Science Degree in Epidemiology from the University of Iowa. In 1998, Dr. Saag was recruited to UAB as an Associate Professor of Medicine with a joint appointment in Epidemiology. In 1999, Dr. Saag received the first of four awards from the AHRQ as the principal investigator and director of the CERTs. The CERTs was renewed in 2002, 2006, and again in 2011 as a \$4.1 million cooperative agreement. The UAB CERTs is one of only 6 current national CERTs, and the only one focused on musculoskeletal disorders. Under the directorship of Dr. Saag, the UAB CERTs has successfully identified, funded and conducted more than 50 projects investigating and disseminating knowledge about safe and effective use of therapeutics. Dr. Saag is the PI of a NIAMS-funded P50 Center of Research Translation (CORT) in Gout that began September 2012. Since 2009, Dr. Saag has been Director of the UAB COERE. Along with the CERTs and the training grants, a K24 awarded in 2005 and renewed in in 2009 provides 50% effort for mentoring, and Dr. Saag has support from NIAMS by R01, R21, P50 and P60 grants. Dr. Saag has mentored 35 junior faculty and postdoctoral fellows and has published (or in press) 190 original reports and nearly 100 reviews, chapters, or editorials.

Monika Safford, MD, Co-PI and Director of Postdoctoral Training is Professor of Medicine with an active program in health disparities research which has supported numerous trainee projects. Her extramurally funded research program tops \$17 million since 1998, and she has 185 peer reviewed reports that have contributed to the scientific evidence base. Her current extramurally funded program includes an NHLBI-

funded and recently renewed R01 (an ancillary study to the REasons for Geographic And Racial Differences in Stroke study) and a community-based trial program testing peer-delivered interventions to improve diabetes outcomes. She has fostered the career of dozens of students and residents, and has mentored 27 postdoctoral fellows and junior faculty, counting among her mentees the current Director of Outcomes Research at Novartis (Dr. Kristofer Kahler), academically appointed scientists with independent research programs (Cherrington, Durant, Halanych, Helmer, Kertesz, Salanitro) and students who have decided to build research careers in part due to their mentorship experiences with her (Shih, Sewell, Chen). She holds an NHLBI-funded K24 providing 25% effort for mentoring. In 2009, she was appointed Assistant Dean for Continuing Medical Education (CME) which includes a CME Network of over 1200 primary care physicians in AL, MS and surrounding states, offering opportunities for dissemination and conduct of research on physician behaviors and practice patterns.

Michael Morrissey, PhD, Co-PI and Director of Predoctoral Training is an economist and Professor of Health Care Organization and Policy and Director of the LHC. He has faculty appointments in the Departments of Economics, Sociology, and Health Services Administration and senior scientist appointments in the UAB COERE, the CFA, and the Injury Control Research Center, among others. Dr. Morrissey has served on 11 dissertation committees and mentored 13 trainees in the past 10 years. He is the author of five books and over 150 articles on issues of health economics, health insurance, and managed care. His current research focuses on the health and economic burden of osteoporosis among Medicare and Medicaid recipients (Amgen) and the effects of the Children's Health Insurance Program on low income children's use of services and health outcomes. He served for 10 years on the board of the International Health Economics Association and is Treasurer of the American Society of Health Economists. Dr. Morrissey serves on the editorial board of *Health Services Outcomes and Research Methodology*. He has served on study sections for AHCPH (now AHRQ), NIH, HCFA, the VA, and NIAAA. Dr. Morrissey is a fellow of the Employee Benefits Research Organization, and the first recipient of the John Thompson Prize in Health Services Research awarded by the Association of University Programs in Health Administration.

3.A.2. Program Organization

In addition to the Program Directors, we have selected five Associate Directors and three Content Leaders that will be part of the expanded Training Program Executive Committee (EC) that meets twice monthly to advise the T32 directors (see Figure 1). We have also identified a diverse group of internal and external advisors and stakeholders that will provide their expertise on all aspects of training activities including recruitment, curriculum and didactic activities, program evaluation and stakeholder engagement (See letters of support).

Associate Directors – Five Associate Directors will help oversee important administrative and scientific aspects of the training program. **M. Kilgore, PhD RN** (Professor and Director, MSPH Outcomes Research Track) will continue to serve as academic adviser to all T32 trainees and advise the program on curriculum development. **C. Estrada, MD**, Professor and Director of the VAQS Program and the Division of General Internal Medicine will continue to lead Recruitment and Retention Efforts for the T32 Program and will be responsible for developing and monitoring a recruitment strategy that targets both internal and external talent, addresses minority recruitment and aid in the triage of applicants to T32 versus VAQS. **E. Berner, EdD**, Professor and founding Director of the Center for Health Informatics for Patient Safety/Quality within the UAB Department of Health Services Administration and national Co-Chair of the CTSA Informatics Key Function Committee, a member of the TEP for the AHRQ Clinical Decision Support Initiative, will continue her T32 leadership role and advising the program in the integration of training in the use of health informatics in their research. With the inclusion of non-clinician postdoctoral trainees and the expansion to additional doctoral programs, we have added **P. Muntner, PhD** (Professor and Director, PhD Program in Epidemiology) to advise trainees on Career Development and Planning. He will also work with Program directors to oversee the enrichment of the epidemiology curriculum that is not based on classroom coursework (e.g. HSOER Fellows Meetings). **D. Redden, PhD** (Associate Professor of Biostatistics and Director of CCTS, CORT and CERTs Methods Cores), an established biostatistician and a skilled methodologist, will be joining our leadership team serving as lead advisor to our trainees for statistical design and analysis. These individuals are all COERE Senior Scientists and LHC Senior Scholars and serve in other institutional leadership positions. Each has an established record as a successful independent investigator in HSOER and is nationally recognized as research leaders and mentors.

Content Leaders - We have also expanded the role of our senior UAB HSOER leadership in the form of nationally recognized Content Leaders for the 3 priority areas of HSOER and AHRQ previously identified (Section 2): 2) **CER - J. Curtis, MD, MSPH, MS**, Co-Director of the UAB CERTs and UAB Pharmacoeconomics and Economics Research (PEER) Unit and Deputy Director for a collaborative project between the FDA, AHRQ, and a number of academic centers studying the safety of biologic agents using multiple, pooled national data; 3) **Healthcare Quality Measurement and Improvement - P. Patricia, PhD**, Senior Nurse Scholar, VAQS Program and Member of the American Association of Colleges of Nursing's Strategic Advisory Group for Quality and Safety in Education for Nurses (QSEN) program; 4) **Healthcare Efficiencies and Disparities - R. Weech-Maldonado, MBA, PhD** Co-Leader of the Research Program for the UAB MHRC and PI of AHRQ, NIMHD, Commonwealth Fund, and DHHS Office of Minority Health funded research that developed and tested patient-centered measures of culture competence and assessed hospital adherence to Cultural and Linguistic Appropriateness Services standards. These content leaders will advise trainees and mentors on their research projects and lead seminars and training sessions as part of the fellows meetings and affiliated forums (see Section 3.C.9).

Internal Advisory Committee (IAC) – **N. Weissman, PhD** emeritus co-director of the UAB NRSA T32 and COERE, will continue in his role as a Senior Advisor to the program and will be joined on the Internal Advisory Committee by five UWIRC Center Directors (see letters of support) (**D. Allison, PhD**, NORC; **R. Allman, MD**, CFA; **M. Fouad, MD**, MHRC; **R. Kimberly, MD**, CCTS; and **M. Saag, MD**, CFAR). The EC will meet with the Internal Advisory Committee twice yearly (once in combination with the EAC).

Alumni Council - As result of our growing pool of training program alumni, an Alumni Council is proposed as an enhancement to the current program. This committee will be made up of alumni representing each level of training (pre, post and K12) supported by the umbrella UAB-VA HSOERTP. Of note, each member has received a post-T32 career development award. Through twice a year meetings with trainees and with the EC, the Council will provide an assessment of trainee progress and provide a non-threatening forum for trainees to discuss their concerns with their progress in the program and with mentoring relationships. Figure 1 and Section 3.D. provide additional information about the Alumni Council and its members.

External Advisory Committee (EAC) - To guide our program we will continue to charge an external advisory committee, initially established as part of our CER T32 and K12. The committee has met previously (see Appendix 2) and will continue to meet annually by teleconference (or onsite, as we have in the past, if funds are available) to provide ad hoc consultation to our leadership, mentors, and trainees. The EAC comprises distinguished external experts in HSOER and mentoring. We will have three academic advisors (see their Letters of Support) that include: Marie Griffin, MD, MPH, (Chair Advisory Committee) - a Professor of Preventive Medicine at Vanderbilt University, Jeroan Allison, MD, MS, Professor and Vice Chair of the Department of Quantitative Health Sciences at the University of Massachusetts Medical School, and Joseph Lipscomb, PhD, Professor of Public Health at Emory University.

Table B. Stakeholder Advisory Panel in Support of UAB HSOER T32

Patients and Advocacy Groups	
1917 HIV Outpatient Clinic Patient Advisory Board	National Consumers League
The Kirklin Clinic at UAB (ambulatory clinic)	National Osteoporosis Foundation
Deep South Continuing Medical Education Network	National Council on Patient Information and Education
Southern Association of Diabetes Educators	Outcome Measures in Rheumatology (OMERACT) Patient Perspectives
American Society of Health-System Pharmacists	StopAfib.org, a Division of the American Foundation for Women's Health,
Arthritis Foundation	
Healthcare Delivery Organizations and Payers	
Blue Cross/Blue Shield of Alabama	Aetna
Alacare Home Health and Hospice	Kaiser Permanente Georgia
Alabama Quality Assurance Foundation	Centers for Disease Control and Prevention

Stakeholders Advisory Panel and Dissemination Advisor – Guidance to the trainees and training program will be further enriched by participation from a council of patients, patient advocates, and health system payer representatives (see Table B and letters of support) that will provide advice on engaging stakeholders and assist with implementation of the trainees research. For the latter, the Stakeholder Advisory Panel will work closely with the training program's new addition of a Dissemination Advisor, **W. Norton, PhD**, who was an inaugural fellow of the NIMH and VA-funded Implementation Research Institute and is Editor-in-Chief of the Dissemination and Implementation in Health e-Newsletter, that is supported in part by the National Cancer

Institute (NCI) and VA QUERI. The Panel will meet annually and on a per project ad hoc basis. Trainees will meet with the Dissemination Advisor as part of direct coursework (see section 3.C.1) or an annual one-on-one meeting and as their project nears completion.

3.B. Program Faculty for HSOER T32

3.B.1. Primary Key Mentors

We have identified a cadre of 37 experienced investigators that bring a unique and diverse skill set to mentoring and who have conducted funded research in one or more of the HSOER domains, forming the primary base for our trainee's research training experiences (see Tables 2, 4, and A). Many of our mentors have experience with mentoring both predocs and postdoc. Over the past 10 years, they have successfully mentored 144 predoctoral and 177 postdoctoral trainees in HSOER (see Tables 5A and 5B and Table 6A and 6B for their respective publications). Of note, our HSOER T32 trainees have a combined 130 publications (115 for postdocs and 15 for predocs) with 82% of postdocs with first author publications.

3.B.2. Associate Mentors and Mentors in Training (MITs)

UAB places considerable emphasis on training the next generation of mentors, a concept we pioneered with this T32 and expanded and improved with the ARRA-funded T32 and K12 in CER. In **Appendix 3A** we list a cohort of 24 Associate Mentors /MITs in HSOER, most of whom are products of successful UAB mentoring including 3 alumni of our HSOER T32 and 8 current or recent HSOER KL2/K12 Scholars and who are now Assistant or early-stage Associate professors. These junior faculty have been successful in HSOER disciplines and many have been recognized by receipt of career development awards and independent funding from different federal and non-profit agencies. They represent the next generation of HSOER mentors at UAB, and they are instrumental in helping to mentor the T32 trainees through their participation in seminars, conferences, and special venues such as the K Club (see Section 3.C.9). Many of these junior faculty already have remarkable early careers. Two of our T32 alumni are highlighted as particularly rapidly rising stars in their respective disciplines. During completion of his surgical fellowship, **Stephan Gray, MD, MSPH** ('05-'07, Primary HSOER Mentor: **M. Hawn, MD**) published 15 papers (6 first author) in surgical outcomes and was appointed Assistant Professor, UAB Department of Surgery in July 2012. **Todd Brown, MD, MSPH** ('06-'08 Primary HSOER Mentor: **M. Safford, MD**), Assistant Professor in the Division of Cardiology, has a very successful career in quality of care in cardiovascular disorders with 24 publications (9 first author) and upon completing his T32, subsequently received a UAB CCTS KL2 award to continue his work.

3.B.3. Co-mentors with Special Areas of Relevant Expertise

Beyond our designated HSOER primary mentors, we identify 35 other UAB faculty members who bring special areas of expertise to our HSOER T32 program; they will participate as secondary co-mentors with our trainees or provide contributions to our curricula and special expertise in our areas of HSOER as shown in **Appendix 3B**. While these faculty may not be actively funded in HSOER or directly engaged in HSOER primarily mentoring currently, their complementary areas of expertise related to HSOER include biostatistics, behavioral sciences, health-related quality of life, health informatics, information technology, medical decision making, and pharmacoconomics. Beyond each trainee's primary and secondary mentors, technical expertise in epidemiology and biostatistics is widely available through the coordinated infrastructure from our T32s and K12s, HDRTP, COERE, MHRC and CERTs. These experts have agreed to be available to advise trainees on matters of study design, statistical analysis, and data management. As mentioned above, biostatistical support for T32 training will be overseen by **D. Redden, PhD**, who has expertise working with large databases, performing group randomized trials, and mentoring junior faculty and trainees. Additional biostatistical support will be provided by **E. Funkhouser, PhD**, and **J. Richman, MD, PhD**, both of whom attend the T32 HSOER Fellows Meetings to provide immediate statistical advice to trainees during and after their presentations.

3.C. Proposed Training for HSOER T32

We are requesting funding for 10 trainee slots by Program Year 12 (2014). In Program Year 11 (2013-2104) we are requesting 3 predoctoral and 6 postdoctoral. In Program Year 12 we are requesting the addition of a 4th predoctoral slot for a **steady-state of 4 predoctoral and 6 postdoctoral slots by 2014 for the remaining Program Years of this 5-year renewal period**. With our current year's award we were approved for 6 slots (3 pre and 3 post) on this T32 (all are filled). Based on our recent experience of 8 postdoctoral (4 HSOER T32 and 4 CER T32) and 3 predoctoral (HSOER T32) AHRQ supported trainees in 2011-2012, we are very confident that the program can easily sustain this number and that, based on past successes in recruitment and proposed enhancements, we will attract many additional and diverse trainees. The postdoctoral positions will be for 2

years and are budgeted at NRSA Levels 3-5 based on our typical recruitment experience. The predoctoral positions will be for 3 years, the minimum required for a PhD.

In compliance with the NRSA guidelines, trainees are expected to work full-time (minimum 40 hrs per week) on their training activities. This includes their academic work and participating in their mentors' relevant research projects, with the goal of progressing toward their own independent research idea and proposal. Typically, trainees will spend half of their time on coursework as an average over the years, with over 50% time spent on coursework during the first year and progressively less subsequently. **Research activities will be a key part of training as soon as a trainee enters the program.** Predoctoral trainees will enter the program having completed Masters' coursework and/or competency exams. Postdoctoral trainees are expected to either already have training equivalent to some of the proposed coursework (e.g., biostatistics and epidemiology) or to acquire competencies at a faster pace than predoctoral trainees. Thus, the research component will be more intense during the first year for postdoctoral trainees, but all trainees will immediately engage in hands-on research under the supervision of their mentors.

Research by trainees must be related to the program focus areas and related themes of HSOER. Trainees will develop their own area of interest related to these themes; however, given the limited resources available for primary data collection, trainees will often use secondary data sources or primary data collection through their mentor's research grants. Training infrastructure will come primarily from COERE, LHC, MHRC, and CCTS; however, other UAB Centers and participating units also will provide infrastructure depending on the research focus and resources available to the primary mentor (see Section 3.C.6).

The T32 program provides a common set of core competencies (see section 3.C.3.) along with didactic and other educational experiences, a mentoring pool and a mentoring support/evaluation system. Academic educational and research experiences will be tailored to each individual trainee based on her or his background, goals, and interests. As seen in **Tables 5B, 9B and 12B** some of our trainees may enter the program with advanced degrees in epidemiology, other public health disciplines, or related qualifications, allowing them to focus their further training more intensively on their HSOER mentored research activities.

In addition to mentored research and the scheduled courses described in Section 3.C.1., trainees are strongly encouraged to participate in COERE and LHC enrichment activities and, depending on their research focus and interests, those available through other collaborating programs and centers (e.g. CERTs, MHRC, CCTS, CFA). These enrichment activities are considered part of the matrix of training resources (see Section 3.C.9.). **Whether degree or non-degree seeking, all didactic experience will be tailored to the trainee's background and specific areas of interest in HSOER.**

3.C.1. Core Curriculum Postdoctoral Trainees

A comprehensive list of core courses for our postdoctoral trainees will vary somewhat given the heterogeneity of our trainees. Trainees will be encouraged to enroll in courses to address specific training goals and core competencies tailored to their background, experience, career objectives and interests. In addition, trainees may opt to pursue a MSPH or doctoral degree. The choice of MSPH, DrPH, or other HSOER relevant courses (for those with existing MPH/MSPH) will depend on the trainee's background and training goals. For example, trainees with an MD or equivalent may opt to pursue a MSPH in Outcomes Research concentrating in clinical decision-making or a MSPH in Pharmacoepi/CER. Other trainees that enter the program with advanced degrees in epidemiology, other public health disciplines, or with related qualifications, may opt to focus on select HSOER courses most appropriate to fill in gaps in their training, instead of a specific degree track. Two courses expected to be taken by nearly all of the trainees is Patient-Based/Centered Outcomes Research instructed by **J. Locher, PhD** (T32 Mentor) and Dissemination and Implementation in Health instructed by **W. Norton, PhD** (T32 Dissemination Advisor) (see Appendix 4A and 4B for course syllabuses). Several existing programs and associated courses at UAB, supported by our extensive research base, provide established training opportunities in our three broad HSOER domains relevant to AHRQ that we defined in **Table A**.

Currently, UAB School of Public Health has four MSPH programs with a relevance to HSOER: 1) Outcomes Research (Directed by **M. Kilgore, RN, PhD**, T32 Associate Director); 2) Pharmacoepidemiology/CER; 3) Clinical Research; and 4) Applied Epidemiology (see Appendix 4C). These programs combine didactic research instruction and applied research experience in each discipline in order to prepare students for further study toward a PhD or for research positions. The Outcomes Research MSPH program, in particular, have been very successful in terms of productivity from HSOER trainees. Of 40 fairly recent graduates, 85%

presented original work at academic conferences, 60% published papers in peer-reviewed journals during their training, and more than 50% have gone on to faculty positions or are currently completing training. All MSPH students complete a research project/thesis and take core courses in biostatistics and epidemiology and complete a minimum of 15 hours of methodologic and specialty area courses. Students are strongly encouraged to enroll in other core public health courses. Individual MSPH programs require additional courses specific to the area of study. Please refer to Appendix 4D for the individual program's curriculum information.

3.C.2. Core Curriculum Predoctoral Trainees

Although the length and type of study depends on the student, those appointed as T32 predoctoral trainees will be provided at most 3 years support. For all predoctoral trainees, PhD requirements are successful completion of required coursework, comprehensive examinations, and an approved dissertation. Successful aspects of the Doctoral programs described below include their University-wide draw in faculty, the high ratio of faculty to doctoral students, the close personal working relationships fostered by this ratio, the emphasis on mentorship and joint student-faculty research, the high degree of student involvement in publishing and presentations at national meetings, and student success in winning honors and awards. Upon completion of their program of study, students are expected to be capable of: 1) Conducting and managing empirical and conceptual research, 2) Demonstrating high levels of expertise in their focus area in HSOER, 3) Meeting the requirements for a faculty position in an academic department, 4) Performing well in a high-level research or policy-making role in a non-academic organization such as a corporation, non-profit institution, or a government agency, and 5) Effectively communicating ideas both orally and in writing.

Below we provide descriptions of the two doctoral programs (Health Services Administration and Health Care Organization and Policy) that have historically provided T32 predoctoral trainees. We also provide a description of the Epidemiology PhD program that includes HSOER T32 qualified candidates and is directed by **P. Muntner, PhD** (T32 Associate Director). The T32 predoctoral candidate pool is further supplemented by qualified candidates from other UAB doctoral programs where our diverse mentor pool teach and mentor. Of special note is the PhD program in Medical Sociology, which current T32 predoctoral trainee **Sarah Ballard, MS** is enrolled and current T32 postdoctoral trainee **David Buys, PhD** and **J. Locher, PhD** (Mentor) are program graduates.

PhD program in Health Services Administration (HSA)-Health Services Research (HSR) Track – The PhD in HSA-HSR prepares students for faculty and other research positions in health care. T32 trainees from the PhD in HSA-HSR program will be required to elect their specialization courses and electives from core courses offered in the MSPH in Outcomes Research (see Section 3.C.1.) unless otherwise approved by the EC, academic advisor, and primary mentor. Of the total credit hour requirement for the PhD in the HSR track, 24 specialization hours are filled by the MSPH in Outcomes Research core courses (see Appendix 4D for curriculum description). Four former T32 predoctoral trainees completed this program including **Anthony Goudie, PhD**, Assistant Professor of Pediatrics and KL2 Scholar at the University of Arkansas for Medical Sciences and a member of our Alumni Council (see Letter of Support). Of the 5 2012 applicants accepted into the HSA-HSR PhD program, 4 were eligible for the HSOER T32.

DrPH Program in Health Care Organization and Policy-Outcomes Research Track (**N. Menachemi, PhD, Director and T32 Mentor**) – The purpose of the DrPH program, a new addition since our last T32 competitive renewal, is to provide education and training at an advanced level that allows graduates to pursue careers as practicing public health professionals. A minimum of 42 credit hours beyond the MPH are required to complete the degree (see Appendix 4D for curriculum description). The DrPH in HCOP-Outcomes Research augments the Outcomes MSPH courses (see Section 3.C.2 and Appendix 4C) with doctoral level rigor. These augmentations were implemented as part of our CER T32 and K12 and will be maintained and updated moving forward. Additional methods courses and a DrPH practicum providing real world outcomes research experience are required. Current T32 predoctoral fellows **Gabriel Tajeu, MSPH** and **Monica Aswani, MSPH** are enrolled in this program. Of the ten 2012 applicants accepted into the DrPH program, four were eligible for the HSOER T32 including **Ms. Aswani**.

PhD Program in Epidemiology (**P. Muntner, PhD, Director**) – The PhD program in epidemiology emphasizes epidemiologic study design and data analysis. The program is designed to prepare exceptionally qualified individuals for a career of research and teaching. A minimum of 60 credit hours must be earned to receive the

PhD in Epidemiology degree (see Appendix 4D for curriculum description). Of the 13 2012 applicants accepted into the PhD program, ten were eligible for the HSOER T32.

3.C.3. Core Competencies

Attainment of a set of competencies in HSOER will guide the tailoring of each trainee’s career development plan. For this purpose, we have defined the core competencies relevant to HSOER that will guide the program (see Appendix 4E). Trainees will work with their mentors and the program leadership to develop a personal pathway to acquire a full skill set in these core competencies. Trainees will meet these objectives in different ways, depending in part on their academic background and prior didactic experiences. All T32 trainees will attend and actively participate in coursework and various seminar series focused on core competencies of HSOER. This includes a seminar series that will be an initiative of the recently awarded AHRQ-funded PCOR K12 and devoted to PCOR focused themes and research which are also relevant to HSOER domains. Each seminar will outline the learning objectives for the session and attendees will complete an evaluation form at the end of the session to confirm uptake of the learning objectives and to receive their core competency “credit.” The importance of core competencies will be highlighted by having the trainees and mentors provide objectives and milestones related to their independent research and didactic course plan for meeting this program requirement on their annual mentoring contract (see Appendix 5A). This contract will help in the overall evaluation of their progress. A trainee’s independent project will provide experience for many core competencies including study design, analytic plans and interpretation of results. Trainees will further develop expertise by effectively communicating and disseminating their findings at national meetings and through peer reviewed journals. Competency in these areas will be reported on their semi-annual progress reports and reviewed by the EC. As described in Section 3.D. and Table D, satisfaction of these core competencies will be evaluated at a minimum of twice a year by the T32 EC in collaboration with the trainee and their mentors.

In summary, HSOER T32 trainees will be exposed to each of the HSOER core competencies through coursework, didactic seminars, mentored research training, and short term rotations during their time in the program. Trainees and their mentors (with guidance from the EC) will tailor each trainee’s career development plan to develop a personal pathway to acquire experience and expertise in a subset of core competencies essential to the trainee’s research and career.

3.C.4. Short term rotations

We propose 10 short rotations as training experiences, from which T32 trainees will select at least one to complement their other training. The nature and timing of the rotations is varied to allow for different data and methodological training that trainees may wish to experience and to represent many of the major stakeholders in HSOER. While some of these rotations will occur contiguously over a 2 to 3 month period, it may be more advisable to complete offsite rotations in a less contiguous fashion and over a more protracted time period. If is further anticipated that the projects resulting from certain rotations may require follow-up that extends beyond the initial on-site experience and can be completed using distance technology (internet, teleconference, and videoconferencing capacity that exists both at UAB and remotely). Each rotation will be designed to fulfill at least two of the overall learning objectives and core competencies offered by each site, based on the trainee’s previous knowledge, experience, specific interests, and goals for HSOER training (see Appendix 5B for a sample rotation contract). Table C provides a listing of the rotations and their respective learning objectives and core competencies covered. A brief description of each site is provided in the Resources section of the application and Appendix 6 includes letters of support from each of the external rotation sites.

Table C. UAB HSOER Short Term Rotations Designations and Objectives

Rotation (Supervisor(s))	Learning Objectives/Core Competencies Covered
Local (within Birmingham area)	
Alacare Home Health and Hospice (Steven Waits, RN, BSN and Tina Reed, RN)	1) Understand the strengths and limitations of home health care data for conducting HSOER; 2) Examine impact of new care plans on patient care and staff workload; 3) Develop effective models for translating research findings and national guidelines
CFAR Network of Integrated Clinical Systems (CNICS) (Michael Mugavero, MD, MPH)	1) Learn how the CNICS’ integrated system of clinical, behavioral and biological data is used to answer research questions; 2) Learn benefits of CNICS data versus other cohorts and other medical records; 3) Understand how to successfully retrieve and critically evaluate CNICS data; 4) Design a study to be completed within CNICS
Samford University McWhorter School of Pharmacy (Maisha Freeman PharmD)	1) Understand how to successfully retrieve and critically evaluate primary pharmaceutical literature, 2) Understand criterion for distinguishing between agents within broad pharmacologic classes.
UAB PEER Unit (Meredith Kilgore,	1) Develop study design specifications and translate these into data development and data

PhD and Jeffrey Curtis, MD, MSPH, MS)	analysis work plans; 2) Understand problems and limitations of large administrative databases and methods to minimize these problems; 3) Specify and implement methods to validate claims-based algorithms, conditions, procedures or other attributes of interest; and 4) Analyze data for a particular project and present results.
Regional (with 2-3 hour drive)	
Centers for Disease Control and Prevention (CDC), (Gloria Beckles, MD, MSc).	1) Learn methods to assess health, economic burdens and HRQL; 2) Design a study to evaluate the impact of health policies related to illnesses and risk factors; 3) Analyze large national survey data sets using appropriate methods
Kaiser Permanente of Georgia, (Douglas Roblin PhD).	1) Understand the strengths and limitations of managed care organization (MCO) data for conducting HSOER; 2) Understand and apply methods for correcting for selection effects inherent in MCO data; 3) Develop effective models for translating research findings into practice (evidence implementation research).
Vanderbilt University Evidence-based Practice Center (Melissa McPheeters, PhD)	1) Develop and refine research questions and analytic frameworks; 2) Conduct literature review; 3) Develop and test data abstraction forms; 4) Learn methods of abstracting data into evidence tables; 5) Develop summary tables and prepare evidence synthesis reports.
Remote (over 3 hours away by car)	
American Society of Health-System Pharmacists (ASHP) Research and Education Foundation (Daniel Coubaugh, PharmD)	1) Design educational programs to communicate HSOER-relevant information in ways aligned with their readiness to adopt them; 2) Conduct needs assessments of members of ASHP; 3) Develop HSOER-related reviews for the American Journal of Health-System Pharmacy.
University of California – San Francisco (UCSF), Research Center for Symptom Management (RCSM) (Christine Ritchie, MD, MSPH, FACP)	Learning objectives: 1) obtain advanced psychometric and analytic skills in symptom assessment 2) Use these skills to develop or adapt an existing scale or tool for independent research project
University of Massachusetts, Worcester Dept of Quantitative Health Sciences (John Ware Jr. PhD)	1) Obtain advanced skills in risk adjustment; 2) apply risk adjustment methods to statistical models; 3) obtain experience in patient reported outcomes measurement using of IRT and CAT.

3.C.5. Direct Mentoring Activities for T32 Trainees in HSOER

Selection of mentoring team. Immediately upon arrival into the program, the trainee meets with one of the Directors (**K. Saag, M. Safford, M. Morrisey**) to finalize the selection of a primary mentor, and identify an Associate and content mentors when applicable. A minimum of two mentors is required. The Directors will review with the trainee the lists of available mentors. The trainee meets with potential mentors about their current research and how the trainee may gain experience in the area that he/she is targeting while working with the potential mentor(s). Although trainees will not be expected to have already selected a full mentoring team at program entry, their interest in working with any particular mentor(s) will be heavily considered in the selection process. The selection of the final mentoring team is reviewed by the EC. Final approval is by the Program Director and consent of the mentor(s).

Mentoring plan - Within two weeks of beginning the program, trainees receive a group orientation to the mentoring plan and the program's expectations (see Appendix 7A for orientation materials). The mentoring process is discussed, as well as all the training program enrichment activities and resources. Once the mentoring team is established they begin meeting weekly with and develop a formal written mentoring plan. Copies of the written mentoring plan outline and of the guided timeline that we developed are attached (Appendix 7A and 7B). The timeline is geared toward the 2-year postdoctoral trainee. Predocs are also required to develop a mentoring plan and are instructed to use the timeline because it is applicable to their first 2 years as well. Predocs target defending their dissertations in their 3rd year.

Evaluation of the mentored research experience is an ongoing activity between the trainee and mentor (Section 3.D.). In the first 3-4 months, meetings between the trainee and their mentor(s) are expected to occur weekly. A minimum frequency of twice monthly meetings is expected once the mentoring plan is in place. Additionally, most mentors have an "open-door" policy, in which trainees may informally and spontaneously discuss progress, problems, or issues with the mentor without an appointment. This policy is facilitated by the geographic proximity of trainees to their mentors at UAB. In some cases the initially-assigned mentor(s) may be changed after the trainee has begun to articulate their training goals or if the initial match is not working out. In addition, trainees will meet twice a year with a member on the newly established Alumni Council to provide an unbiased assessment of progress. A progress report from trainees is required twice a year, submitted to the T32 Deputy Director, who shares it with the trainee's mentor(s), Program Leadership (EC), Alumni Council members, and Internal and External Advisors (if needed). Feedback is provided to the trainee and the mentor(s) from the Program Directors.

As part of the trainee and mentor developing a common frame of reference, trainees are asked to familiarize themselves with their mentor(s)' research projects and grants early in the training experience. Throughout training, trainees will attend project meetings, and participate in conference calls and analytic workgroups related to their mentors' research projects, as appropriate. This serves to assist in communication about research methods and to stimulate the trainee's ideas about their own research. Trainees may also be asked to review other investigator's related research proposals and/or participate in the writing of new proposals where the literature review and methods would be beneficial to their training.

Mentored research project - The primary focus of our predoctoral training is completion of the doctoral program including dissertation. For T32 predoctoral trainees students, the dissertation must be performed under the supervision of the primary T32 mentor and must focus on important topics relevant to HSOER and related themes in the AHRQ priority domains. The student's selected primary mentor will serve as co-chair with one of the trainee's doctoral program faculty, and at least one member of the Program's EC will serve as on the student's dissertation committee in order to stay closely advised of the student's dissertation progress.

At the beginning of Year 1 postdoctoral trainees will discuss with their mentor(s) the direction for the trainee's own research project, and identify data resources and/or data collection needs. When appropriate secondary data sources are not available, trainees will be guided in the design of a pilot project to refine study questions and collect primary data for their full proposals. As an enhancement to the current program, we implemented a process where new trainees presented their research topic within their first three months in the program. The mentor(s) will work with the Program Director(s) to identify research facilities and support, and recommend additional mentor(s) be added for specific areas of expertise. Another recent enhancement to the current program is the implementation of a formal process whereby trainees will be required to meet with a biostatistician to discuss study design and analysis plan in Year 1 prior to independent project initiation. By Year 2, postdoctoral trainees are expected to have begun analyzing preliminary data or conducting exploratory analyses. During their training, postdoctoral trainees may also participate on other research projects in their area of interest. Given the relatively long time from inception of a project to reporting of results, this approach provides real world experience in research expands the trainee's exposure to all phases of HSOER research (from grant preparation to presentation of data).

Predoctoral and Postdoctoral trainees will present their research idea at least once a year to the T32 HSOER Fellows Meeting for feedback. Predoctoral trainees will practice their dissertation proposal (if applicable) and their dissertation defense in the Fellows Meeting venue. The trainees and their mentoring teams will work with the Program Director(s) to problem solve any concerns and identify potentials for dissemination and implementation of the results. It is expected that from their mentored research projects, predoctoral trainees will have a minimum of 1 publication during their training and postdoctoral trainees will produce 2-3 manuscripts. This is consistent with the average production of past trainees (1.2 and 2.2, respectively).

3.C.6. Relevant Cohorts and Databases Available to T32 Trainees at UAB

In order to nurture trainees as independent researchers, the training program makes available significant research resources, linkages, and infrastructure of the COERE, LHC, MHRC, other UWIRCs, and collaborating Divisions and Departments . This includes many data sets that may be used by trainees. Many are project and investigator specific; others are either public use or available for purchase. Examples of the former, which can be made available to trainees with permission from the PI and through data sharing agreements with the responsible agency, include, REGARDS (funded by NINDS) and REGARDS MI (NHLBI), or CARDIA (NHLBI). Descriptions of each of these databases along with additional training resources and infrastructure through collaborating centers and partners are provided in the Resources section. Examples of public datasets that we have used and available to the trainees include the Medicare 5% sample and (50 state) Medicaid (MAX) data, the Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (all years), the American Hospital Association Annual Survey of Hospitals (1980 to present) and the Physician Area Resource File. Data use agreements for these data typically make them available to a trainee when working with a LHC scholar or COERE scientist. Other data resources may be identified through the COERE's and LHC's collaborations with other UAB centers (e.g., CERTs, MHRC, Arthritis and Musculoskeletal, Aging, AIDS Research, Cancer Center) and health care industry partners (e.g. VA, Kaiser-Permanente Georgia, Aetna, Alabama Quality Assurance Foundation, and Blue Cross/Blue Shield of Alabama) (see letters of support).

3.C.7. Mentor Training

A mentor monitoring and feedback program is already established as part of the UAB/VA HSR/CER Training program. To facilitate optimal mentoring, the Program has developed a mentoring manual (see **Appendix 7C**). Furthermore, the UAB Department of Medicine has a *Junior Faculty Mentoring Program and Research Training and Career Development Core Committee*. At the beginning of each academic year, new mentors are sought from among experienced as well as more junior research faculty members. Based on the needs and desires of the mentor and mentee, committee activities include regular meetings to discuss research grants and papers, funding opportunities, summary statements from grant applications, and other educational and career issues. Mentoring skills of faculty (Associate Mentors/ MITs in particular) will also be enhanced by the CCTS mentoring initiative. This initiative has developed a mentoring “tool box,” which provides both mentors and mentees at UAB with access to guidance and tools such as mentoring contracts (see **Appendix 5A**). This initiative further enhances mentoring for trainees and is built based on principles contained in national resource materials such as “A Guide to Training and Mentoring in the Intramural Research Program at NIH” ([/www1.od.nih.gov/oir/sourcebook/ethic-conduct/mentor-guide.htm](http://www1.od.nih.gov/oir/sourcebook/ethic-conduct/mentor-guide.htm)) and the National Academy of Science’s monograph, “Advisor, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering” (National Academy Press, 1997; <http://www.nap.edu/readingroom/books/mentor/>). Mentors are also encouraged to participate in regional and national mentoring workshops. Many of our Associate Mentors and MITs have K or other career development awards providing protected time to expand their skill set and do direct mentoring. The T32 training program assists with this by integrating them into the T32 programming including the HSOER Fellows Meetings and their inclusion on mentoring teams of the T32 trainees where they participate in all mentoring activities including completion of the mentoring contract.

3.C.8. Dissemination of T32 Trainees Findings to the Public

We will use state-of-the-art and emerging approaches in education, behavior change, and patient activation strategies to disseminate research findings from the trainees’ projects. We will use and test both established and novel behavioral strategies to achieve this goal. For planned and future projects, Dissemination Advisor **W. Norton, PhD**, program leadership, trainees’ mentors and the Stakeholder Advisory Panel will 1) advise trainees on theories and methods aimed at changing patients’ communication behaviors during medical interactions; 2) advise on optimal communications instructional strategy, presentation format, and medium; 3) assist with evaluations of interventions; and 4) link trainees as needed with other UAB and non-UAB dissemination and implementation stakeholders. Part of the training will include the learning how to disseminate their products and research findings both regionally and nationally to patients, providers, pharmacists, health systems, insurers and policy makers. Most trainees will also be expected to take **W. Norton’s** Dissemination and Implementation in Health course.

Beyond presenting scientific results in peer reviewed publications (2-3 anticipated) and at national meetings, trainees will also communicate their findings to the public and medical community through: 1) regional and national websites; 2) Press Releases (e.g. past participant in the National Consumer League, a stakeholder in this application, press conference on NSAID safety held at the National Press Club); 3) our partnership with the American Society of Health System Pharmacists (ASHP). ASHP will help disseminate therapeutic findings to the pharmacy community and other health professionals, including physicians and nurses; 4) extensive partnerships with local, regional, and national organizations and stakeholders of patient advocacy organizations, quality improvement organizations, and payers (see Letters of Support and Table B); and 5) through collaborations with the UAB CME office and the Deep South CME Network (**M. Safford**, T32 Co-Director and Assistant Dean for CME).

3.C.9. UAB Forums for HSOER T32 Skills Development and Cross Fertilization

At UAB, there is a rich diversity of training and education available, including didactic teaching, within or outside of degree-seeking programs, role-modeling, hands-on instruction, and conferences in the research programs relevant to HSOER. Regardless of the didactic curricula choices by each candidate, the UAB T32 Trainees will share a common core curriculum. Their curriculum further will be enriched by the short courses and work-in-progress seminars provided by the CERTs, COERE, LHC and CCTS training and education component and other seminars detailed below. Furthermore, communication of scientific findings to others is critical to success in HSOER research, and trainees give regular presentations at these UAB research meetings. Also, there are a variety of similar forums sponsored by other UWIRC centers depending on the focus of the trainee’s research. A list of past presentations from these forums is provided in **Appendix 8A**.

T32 HSOER Fellows Meetings - To encourage networking and to promote learning and problem solving in collaboration with one another, trainees will attend our twice monthly HSOER T32 fellows meeting. This has been a very popular conference focused on career development activities. The venue also provides trainees an opportunity to present their works-in-progress and practice their presentations for regional and national meetings. With the successful receipt of the CER T32, we expanded it to incorporate CER-specific material. The recently awarded PCOR K12 has led us to further expand the curriculum to include PCOR-specific materials and change its name to *T32 in HSOER Fellows Meeting* reflecting the full scope of activities.

Seminars and Weekly Conferences from CERTs, COERE, MHRC, CCTS, T32 in HSR/CER, HDRTP and Lister Hill Center with Relevance to HSOER - UAB provides diverse research experience for trainees and numerous venues in which to present and review research findings. Educational opportunities relevant to HSOER include: 1) *Combined Work-In-Progress* series alternating each week between *CERTs, COERE, LHC and CCTS*; 2) *MHRC Health Disparities Seminar Series* (quarterly); 3) *Pharmacoepidemiology Book Review Series* (monthly)- discussion of current topics and book chapters in epidemiology biostatistics, systematic review of the literature and other HSOER relevant topics; 4) *Half-day Intermediate Methods Workshops* (annual); 5) *HDRTP Health Disparities Videoconference series* (twice monthly); 6) *CCTS Clinical Translation Science Forum* (monthly); 7) *The Department of Medicine's Research Development Group Clinical Research Seminar* (monthly); 8) *Department of Epidemiology Seminars* (weekly); 9) *CCTS Nascent Research Panel* (bimonthly); and 10) *Biostatistics Seminars* (twice-monthly).

UAB Clinical and Translational Science (CTS) Training Program - A CTS Training Program provides 6 months of research training, through 50 hours of lectures and interactive sessions aimed at postdoctoral fellows and junior faculty. Didactic instruction includes lectures within the following modules: Clinical Trials, Epidemiology, Biostatistics, Ethics, Clinical Genetics Research, Behavioral Research, Outcomes Research, Dissemination of Results, Grant Writing and Funding Opportunities. A 20-hour survey course, *Vocabulary of Clinical and Translational Science*, includes fundamental information on hypothesis generation and testing, informatics, biostatistics, epidemiology and population research, clinical trials, ethics, overviews of translational and outcomes research, accessing information, the IRB and oversight of research, and critical review of literature.

CCTS Professional Skills Training Program (PSTP) - This program provides practical assistance in the development of four areas relevant to HSOER T32 Fellows and is now encouraged of all trainees in response to program feedback (see **Appendix 8B** for 2011-12 schedule): 1) Scientific manuscripts-includes introductory material on types of scientific writing, where to submit articles, the elements of a journal article, and how to respond to critiques and correspond with editors, 2) Scientific presentations-includes visual design, presentation organization, verbal and nonverbal communication strategies, and tips on audience interaction, 3) Research plans for grant applications-includes introductory material on developing and writing specific aims, background and significance, preliminary studies, research design and methods, and abstracts, 4) Revisions to pink sheets-includes identifying common mistakes in grant writing, draft review and revision, the NIH- review process, and responding to pink sheets.

K Club –T32 fellows will meet quarterly in an informal setting with peers and K-level junior faculty who have or are pursuing K-awards to receive informal presentations on topics relevant to career development. Past topics have included project management, negotiation skills, and research ethics.

National Meeting Attendance – T32 Trainees will attend the annual Annual AHRQ sponsored National Research Services Award (NRSA) Trainees Research Conference. Trainees will also often attend national meetings focused on their area of research. For many trainees these include specialty meetings but also include more HSOER methodologically focused meetings such as the ISPE (containing short courses in pharmacoepidemiology), the Society for General Internal Medicine, and AcademyHealth. Through participation at both internal and external venues, trainees present their data to colleagues, meet other investigators involved in similar research, and learn about their areas of research from outside experts in the field.

Additional Summer Symposia and Short Courses - Past HSOER trainees have participated in several summer programs that provide skills of great relevance to their career development. Multiple UAB faculty mentors have personal experience with each program as part of their own training. Thus, they will be able to guide trainees to

select those activities most optimal for their career development as options for those desiring more didactic instruction and programs (see Appendix 8C for a listing of possible options)

In summary, UAB and its Schools, Departments, Divisions, and UWIRCs, in conjunction with targeted HSOER-didactic opportunities external to UAB, provide an outstanding setting for the career development of trainees in HSOER. Based on institutional commitment, resources and its past successful record in research and mentoring, a T32 in HSOER will continue to provide capacity to help develop the next generation investigators.

3.D. Training Program Evaluation for HSOER T32

We will build on the work of leadership in our K12/T32 HSR/CERTP, HDRTP and CCTS Education and Training Component to update and improve the systematic/formal prospective evaluation process implemented during the last funding period. The evaluation process will include: 1) An annual mentoring plan/contract drafted collaboratively by the trainee and their Primary Mentor that will provide the milestones for the trainee's progress. The contract has been updated to now include consultation with a biostatistician and plan for achieving core competencies (see **Appendix 5A**), 2) Semi-annual progress reports to the program Steering Committee that will report on progress related to the milestones from the mentoring plan/contract updated to now be completed online using [surveymonkey.com](https://www.surveymonkey.com)[®], 3) A 6-month online confidential evaluation of the mentor(s) by the trainee and of the trainee by the mentor updated to now be completed online using [surveymonkey.com](https://www.surveymonkey.com)[®], 4) An interview and feedback session with a Program Director every 6 months with an interview guide and feedback form for the Program Director to use to provide feedback to the mentor(s) and Trainee (see Appendix 9A), 5) the addition of a twice a year meeting with a member of the Alumni Council to review progress and provide feedback on the training program; 6) the addition of a rotation contract that may be used for the T32 EC and PD to plan the short-term rotations. The plan will include milestones and learning objectives specific to the Rotation (see **Appendix 5B**); 7) Annual Alumni Survey updated to now be completed online using [surveymonkey.com](https://www.surveymonkey.com)[®] (see Appendix 9B).

For a description of the indicators that will be obtained from each of the above components, see **Table D**, which illustrate the data sources, related indicators, and objectives of our proposed evaluation tools. This data collection and feedback system provides prospective data regarding quality of the mentoring and the trainee's productivity to the EC, IAC, and Alumni Council for assessing the program's and trainee's progress. We will use a combination of our EC with input from the EAC as a mechanism for reviewing trainee's progress. The EC with help from the COERE and T32 Deputy Director will be responsible for collating and summarizing evaluation data collected for the program in an ongoing fashion and sharing this data with the EAC at its annual review meeting (see Appendix 2 for 2012 EAC report). The EAC will provide an independent annual review of the program by reviewing scholar progress and available data from the program's evaluation process. The EAC will make recommendations to the EC regarding areas for improvement. The EAC will be led by Marie Griffin, MD, MPH, who is a current T32 PI and has an extensive background in Health Services Research and mentoring (see letters of support). In addition to the EAC, the newly established Alumni Council (see 3.A.2.) will serve in an ombudsman capacity providing an independent assessment of trainee progress, quality of the training and mentoring trainees were receiving, and a non-biased forum for trainees to discuss their views about the program.

Much of the focus of the evaluation is on immediate and short-term outcomes such as trainees' professional productivity (abstracts, publications); participation (attendance/presentations to enrichment forums); satisfaction with program; meeting of milestones on development and conduct of research projects; completion of didactic work; obtainment of core competencies; and successful transition to an academic faculty position and independent funding. Trainees also are followed for 10 years for long-term outcomes such as progress towards academic career goals, which will be assessed through their CVs and an annual Alumni Survey. The plan incorporates both formative and summative evaluations. Formative activities allow program leadership to prospectively assess a trainee's progress and satisfaction with the program to provide a feedback loop for problem discovery and improving the program. The EC will develop and implement evaluation as proposed in the evaluation matrix (**Table D**).

Table D. UAB HSOER T32 Evaluation Plan Matrix

Data Sources (Inputs)	Indicators (Outputs)	Objective	Feedback	Timeline (Frequency)
Recruitment reports	-% accepted who matriculate -% minority applied, accepted and matriculated	-Assess program desirability -Increase minority recruitment	To PI/PD and EC	Yearly
Mentoring Plan	-Training goals -Mentor and mentee expectations -Productivity (Expected) -Research project identification -Research project completion	Baseline for assessment of individual Scholar's progress and success of mentoring	To mentor-mentee team by EC	Annual (at the beginning of each training year)
Trainee Progress Reports	-# of Mentoring contacts -Progress on research -Abstracts and Publications -Participation in career development activities	Ongoing feedback on -Trainee engagement/progress -Effectiveness of mentoring -Obtainment of core competencies	To mentor-mentee team by EC	Twice a year
Trainee Assessments of Program	-Quality of mentoring -Barriers to success -Trainee satisfaction w/ mentor -Trainee satisfaction w/ program	-Identify strengths and weaknesses -identify early need for intervention -Assess Trainee meetings in an ongoing fashion	To EC from mentee and Alumni Council	Twice a year
Mentor's Evaluation of Trainee	-Trainee progress to goals/productivity -Quality of mentor's relationships -Areas of strength -Areas for improvement	Provide ongoing advice from mentor to mentee	To Trainee (each meeting) from mentors	Ongoing with bi-annual reports to SC and AC
Exit Interview of Trainee	-Satisfaction with overall program and with mentored research experience; -Self-assessment of degree to which program helped Trainee meet goals	Identify areas for improvement, i.e., barriers to success, patterns in program weakness	To EC from trainees	When Trainee exits program
Advisory Committees	-Aggregate achievements of trainees -Aggregate evaluations by trainees	Assess overall program performance	To EC from EAC, IAC, and Alumni Council	Annual
Alumni Survey and CV	-Current position/career satisfaction -Relevance of T32 to current work -Independent research funding -Publications	Long-term evaluation of program	To EC from Trainee To AHRQ in progress reports	Annual (for 10 years)

3.E. Trainee Candidates for HSOER T32

3.E.1. Recruitment Plans

Tables 7A and 7B provide the respective pool of predoctoral and postdoctoral candidates for this T32. Specifically, they highlight the potential applicants from Divisions/Departments that have historically provided most of our trainees. On average for the past five years, these programs enroll 12.6 eligible predoctoral trainees and 20.8 eligible postdoctoral trainees annually, of which 3.8 and 2.4 respectively are URM applicants. These internal candidates are further supplemented by our local and national recruitment efforts. Under the direction of T32 Associate Director **C. Estrada** and following the successful approach we have used for this T32 and the CER T32, we will post announcements for T32 positions on the UAB Postdoctoral website; on the COERE, LHC, MHRC, and SON public websites; mail/email flyers to UAB clinical academic department heads, residency program directors, and center directors; and use word-of-mouth publicity. Internally identified candidates will be supplemented by additional candidates through national advertisements on the AcademyHealth's training program website and other similar venues. We will also work with members of our Stakeholder Advisory Panel to announce requests for applications. When applicable, these recruitment efforts will be combined with the VAQS program and applicants will be triaged to the applicable program. We will select the best candidates from within the large UAB system and from outside. As documented in **Table 8A and 8B**, we have been successful in identifying more qualified candidates than slots available. In 2012, 18 of the applicants accepted into the T32 affiliated doctoral programs were eligible for the one open T32 predoctoral slot and we received applications from 15 qualified candidates representing 13 Divisions/Departments for our one open postdoctoral slot. When possible, other funding sources have been used to retain qualified candidates. In particular, funds allocated to several of our UWIRC centers (COERE, CERTs, CFAR) have been leveraged to provide partial or full support for our most promising postdoctoral fellows. This includes **Melissa Mannion, MD**, a pediatrician and a candidate from the 2012 applicant pool. Tables 5B and 6B highlight trainees supported by these funds with a '#'.

3.E.2. Trainee Selection Process

A rich pool of potential T32 Fellows creates wonderful opportunities to identify highly promising trainees who will reap the most benefit from the program. The selection process places heavy emphasis on commitment by the candidate to an academic career in HSOER and by the mentor to the success of the trainee. Upon notice of anticipated award we will initiate our recruitment and selection process, like the one we have used for selecting prior T32 Fellows, informing potential applicants, mentors, and program directors (predoctoral) of the anticipated availability of T32 awards and inviting applicants to submit a 2-page Letter of Intent briefly listing their project title, their mentors (at least two will be required), their career development plan (coursework, degree programs (if relevant), proposed short rotation, and a brief description of their proposed research. Letters of Intent will be reviewed by the EC and all applicants deemed qualified will be invited to interview with at least 2 members of the EC to assess both their career commitment and their mentorship plans. The interviews will be scored with respect to career development plan and the quality of the mentorship relationships. The selection process typically takes a maximum of 2 months after notice of award. In subsequent years, selection will be completed prior to submission of the annual progress report to AHRQ.

3.F. Institutional Environment and Commitment to T32 Training

UAB is a multidisciplinary research institution with 6 graduate schools in the health-related professions (Medicine, Nursing, Public Health, Health Professions, Dentistry, Optometry) and almost 100 research centers, which are the institutional infrastructure of its collaborative research enterprise. Research at UAB is well supported both by traditional extramural funding and is dramatically stimulated by a rich culture of interdisciplinary collaboration supported through a network of UWIRCs (see Section 2.B and Resources). The DOM faculty plays leading roles in federally-sponsored training such as the CCTS and 17 T32 training grants and 3 K12s. Letters of support from the University President and Provost, Deans of 5 UAB Schools (Medicine, Public Health, Health Professions, Nursing, College of Arts and Sciences), the Chair of the Council of Center Directors (representing 28 UWIRCs), and 4 Doctoral Program Directors provide unequivocal evidence of support for the competitive renewal of the T32 training program and guarantee adequate space, facilities and protected time for trainees and mentors. As part of UAB's commitment to all issues related to postdoctoral education and training, it created the UAB Council of Postdoctoral Education. The goals of the Council are to improve the environment for postdoctoral training and to facilitate the retention and recruitment of high quality postdoctoral scholars at UAB. Finally, **UAB ranks first among public universities nationwide in "Best Places to Work for Postdocs," according to the 2012 Postdocs Rankings published by The Scientist.**

4. RECRUITMENT AND RETENTION PLAN TO ENHANCE HSOER T32 DIVERSITY

Increasing the participation of under-represented minorities (URMs) in health services and outcomes research is a personal commitment of our program's leadership. Our AHRQ-funded T32s in HSR and CER have had success in recruiting a very diverse group of trainees at both the predoctoral and postdoctoral level. Table 10 provides information on the 14 URMs (4 active) that have trained under the umbrella UAB-VA HSOERTP during the past five years. They represent both predocs and postdocs and 8 disciplines. **To date, 33% of our AHRQ-funded HSOER T32 trainees have been from URMs** (6 African-Americans, 1 Hispanic, and 1 Asian-Pacific Islander) and all have completed or remain involved in the training program. Of the 7 URMs that have completed the program, 5 are currently in faculty or continued academic training positions. For the past 5 years, 4 URMs predocs have each received 36 months of support and 2 URMs postdocs have each received 24 months of support. Aided by our internal and external collaborations, we will assure substantial diversity as we move forward with career development for this T32. UAB's institutional stance on equity and diversity and its position as one of the major research institutions in the Southeast are important foundations for diversity recruiting and retention efforts. **Appendix 10** provides a detailed description of the UAB commitment to diversity and to persons with disability. Also of importance, **M. Fouad, MD**, an Internal Advisor and T32 Mentor and the PI of the MHRC, chaired the SOM Diversity Task Force, which recommended the establishment of the current SOM Office of Diversity. She also participates in interviewing and recruiting new minority faculty.