

Final Progress Report for Research Projects Funded by Health Research Grants

Instructions: Please complete all of the items as instructed. Do not delete instructions. Do not leave any items blank; responses must be provided for all items. If your response to an item is “None”, please specify “None” as your response. “Not applicable” is not an acceptable response for any of the items. There is no limit to the length of your response to any question. Responses should be single-spaced, no smaller than 12-point type. The report **must be completed using MS Word**. Submitted reports must be Word documents; they should not be converted to pdf format. Questions? Contact Health Research Program staff at 717-783-2548.

1. **Grantee Institution:** The Pennsylvania State University
2. **Reporting Period (start and end date of grant award period):** 1/1/2009 – 12/31/2012
3. **Grant Contact Person (First Name, M.I., Last Name, Degrees):** John Anthony, MPA
4. **Grant Contact Person’s Telephone Number:** 814-935-1081
5. **Grant SAP Number:** # 4100047645
6. **Project Number and Title of Research Project:** 33 - Embedded Rural Clinical Research Infrastructure: Utilization of Community-Based Nurses and Paramedics
7. **Start and End Date of Research Project:** 07/08/2009-6/30/2012
8. **Name of Principal Investigator for the Research Project:** Thomas Terndrup, MD
9. **Research Project Expenses.**

9(A) Please provide the total amount of health research grant funds spent on this project for the entire duration of the grant, including indirect costs and any interest earned that was spent:

\$122,357.54

9(B) Provide the last names (include first initial if multiple individuals with the same last name are listed) of **all** persons who worked on this research project and were supported with health research funds. Include position titles (Principal Investigator, Graduate Assistant, Post-doctoral Fellow, etc.), percent of effort on project and total health research funds expended for the position. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project	Cost
Gordon	Research Coordinator and Community Health Asst.	100%	42,359.87
Brown	Methodology Consultant	13.30%	9,953.20
Lindstrom	Sr. Research Associate	3.34% Yr 3	5,950.00
Cook	Home Safety Consultant	Contractor ~ 25%	10,000.00
Sipe	Community Health Asst.	Contractor ~ 25%	5,000.00
Fisher	Community Health Asst.	Contractor ~ 15%	4,500.00
Shoop,K	Community Health Asst.	Contractor ~ 25%	5,380.76
Corbin	Community Health Asst.	Contractor ~ 10%	1,750.00
Snook	Community Health Asst.	Contractor ~ 10%	1,250.00

9(C) Provide the names of **all** persons who worked on this research project, but who *were not* supported with health research funds. Include position titles (Research Assistant, Administrative Assistant, etc.) and percent of effort on project. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project
Terndrup	Professor/Chair Emerg. Med., Penn State College of Medicine (PI)	5% Yr 1, 3.5% Yr 2, 1.5% Yr 3
Corbin	Assoc Director of Penn State Cooperative Extension— (coPI)	5 % Yr 1, 2% Yr 2, 1% Yr 3
Adoff	Research Fellow Yr 1	< 1%
Mitchell	VP Marketing – Board Member	< 1%
Palm	Retired – Board Member	< 1%
Schooley	Retired – Board Member	< 1%
Shoop, P	EMS Chief – Board Member	< 1%
Weaver	VNA Staff – Board Member	< 1%
Gilbert	Instructor/Coordinator – Board Member	< 1%
Walker	Director County Extension – Board Member	< 1%
Alter	Professor – Board Member	< 1%
Barkdoll	Nursing Educator – Board Member	< 1%
Behr	Engineer – Board Member	< 1%
Hoffman	Nurse Administrator – Board Member	< 1%
Flaherty-Craig	Clinical Neuropsychologist – Board Member	< 1%

9(D) Provide a list of **all** scientific equipment purchased as part of this research grant, a short description of the value (benefit) derived by the institution from this equipment, and the cost of the equipment.

Type of Scientific Equipment	Value Derived	Cost
None		N/A

- 4 iPod Touch devices were purchased (by the Department of Emergency Medicine) and programmed with software tools purchased with CURE funds and for use by the CHA's:

HomeFast (home safety survey), miniCog (cognitive survey), demographic information (medications and co-morbid conditions).

10. Co-funding of Research Project during Health Research Grant Award Period. Did this research project receive funding from any other source during the project period when it was supported by the health research grant?

Yes X No _____

If yes, please indicate the source and amount of other funds:

Department of Emergency Medicine research start up funds purchased 4 iPod Touch devices - \$560

11. Leveraging of Additional Funds

11(A) As a result of the health research funds provided for this research project, were you able to apply for and/or obtain funding from other sources to continue or expand the research?

Yes X No _____

If yes, please list the applications submitted (column A), the funding agency (National Institutes of Health—NIH, or other source in column B), the month and year when the application was submitted (column C), and the amount of funds requested (column D). If you have received a notice that the grant will be funded, please indicate the amount of funds to be awarded (column E). If the grant was not funded, insert “not funded” in column E.

Do not include funding from your own institution or from CURE (tobacco settlement funds). Do not include grants submitted prior to the start date of the grant as shown in Question 2. If you list grants submitted within 1-6 months of the start date of this grant, add a statement below the table indicating how the data/results from this project were used to secure that grant.

A. Title of research project on grant application	B. Funding agency (check those that apply)	C. Month and Year Submitted	D. Amount of funds requested:	E. Amount of funds to be awarded:
Penn State Hershey Post-Discharge Congestive Heart Failure (CHF) Patient Home Visit Follow-Up Service	<input type="checkbox"/> NIH <input type="checkbox"/> Other federal (specify: _____) <input checked="" type="checkbox"/> Nonfederal source (Cardinal Healthcare Foundation)	12/2012	\$35,000	\$ TBA

Beacon Community Cooperative Agreement Program	<input type="checkbox"/> NIH <input checked="" type="checkbox"/> Other federal <u>HHS (Health IT)-ARRA</u> <input type="checkbox"/> Nonfederal source (specify:_)	2/2010	\$4,422,844	Not funded
Mifflin and Juniata Elderly Rural (MAJER) Health Network Planning Grant	<input type="checkbox"/> NIH <input checked="" type="checkbox"/> Other federal (specify: <u>HRSA</u>) <input type="checkbox"/> Nonfederal source (specify:_)	1/2010	\$85,000	Not funded

11(B) Are you planning to apply for additional funding in the future to continue or expand the research?

Yes X No _____

If yes, please describe your plans:

Additional funding opportunities will be explored in an effort to improve the ability to integrate emergency medical technicians, paramedics, and nurses into systems that provide direct service in the homes of patients discharged from a hospital or those in need of in-home support for primary care.

12. Future of Research Project. What are the future plans for this research project?

Using the lessons learned through our experience with the REACH Network in using EMS personnel and nurses outside of their traditional roles, the Department of Emergency Medicine at the Penn State College of Medicine will be using EMS personnel and nurses to support the health and safety of recently discharged patients. Skilled nursing, paramedical, and physician personnel will conduct post-hospital discharge home visits with congestive heart failure (CHF) patients. The follow-up home team will gather clinical information, conduct an environmental home scan and patient safety assessment; and refine the medication reconciliation process to ensure that patients are taking medications as instructed and following other post-discharge instructions. This is important in promoting adherence and avoiding unnecessary hospital readmission or drug interaction issues. In our rural region where patients can have difficulty getting access to care, this service will enable these patients to manage their health while remaining in their own homes, promote health, and create opportunities for early intervention to enhance safety and avoid hospital readmission.

13. New Investigator Training and Development. Did students participate in project supported internships or graduate or post-graduate training for at least one semester or one summer?

Yes No

If yes, how many students? Please specify in the tables below:

	Undergraduate	Masters	Pre-doc	Post-doc
Male			1	
Female	1			
Unknown				
Total	1		1	

	Undergraduate	Masters	Pre-doc	Post-doc
Hispanic				
Non-Hispanic	1		1	
Unknown				
Total	1		1	

	Undergraduate	Masters	Pre-doc	Post-doc
White	1		1	
Black				
Asian				
Other				
Unknown				
Total	1		1	

14. Recruitment of Out-of-State Researchers. Did you bring researchers into Pennsylvania to carry out this research project?

Yes No

If yes, please list the name and degree of each researcher and his/her previous affiliation:

Stephan Winn, PhD, from Flinders University South Australia from the Faculty of Health Science in the area of deafness and hearing impairment.

15. Impact on Research Capacity and Quality. Did the health research project enhance the quality and/or capacity of research at your institution?

Yes No

If yes, describe how improvements in infrastructure, the addition of new investigators, and other resources have led to more and better research.

The demonstrated proof of concept has enabled our institution to apply for other funds using a similar approach. The institution is also piloting a study using EMTs to follow up with

patients recently discharged from the emergency department as described in future plans. Since we clearly showed that EMTs and emergency Nurses can be adequately trained in human subjects research, following protocols, adopting new technologies (e.g. data collection into iPod Touch device), contributing as team members and being a successful part of clinical research, we have expanded into EMS research in the community of Pennsylvania paramedics focusing on airway safety and simulation (R18 grant from AHRQ, 3 year grant ending May 2015; Terndrup, PI). In addition, during this time frame and because of this success, we participated in several prehospital trials with EMS (IMMEDIATE and RAMPART, both of which had primary efficacy manuscripts published, JAMA and NEJM).

16. Collaboration, business and community involvement.

16(A) Did the health research funds lead to collaboration with research partners outside of your institution (e.g., entire university, entire hospital system)?

Yes No

If yes, please describe the collaborations:

Collaborations were developed with the members of the REACH advisory board, the Visiting Nurses Association, Lewistown Hospital, senior advocacy groups in the Lewistown area, and local emergency medical services personnel. As noted in question 15, several successful EMS trials were begun, some completed and others are in progress. (e.g. CARES registry, ProTECTiii trial).

16(B) Did the research project result in commercial development of any research products?

Yes No

If yes, please describe commercial development activities that resulted from the research project:

16(C) Did the research lead to new involvement with the community?

Yes No

If yes, please describe involvement with community groups that resulted from the research project:

Fame EMS, Lewistown, PA; Visiting Nurses Association (VNA) of Central PA; Lewistown Hospital, PRN (a healthcare staffing organization based in Lewistown), and The Learning Center in Lewistown, PA. Our community board included advocates for elder care in the Lewistown area, including hospital, primary care, nursing, Aging Association Agency, and other community health activists.

17. Progress in Achieving Research Goals, Objectives and Aims.

List the project goals, objectives and specific aims (as contained in the grant agreement). Summarize the progress made in achieving these goals, objectives and aims for the period that the project was funded (i.e., from project start date through end date). Indicate whether or not each goal/objective/aim was achieved; if something was not achieved, note the reasons why. Describe the methods used. If changes were made to the research goals/objectives/aims, methods, design or timeline since the original grant application was submitted, please describe the changes. Provide detailed results of the project. Include evidence of the data that was generated and analyzed, and provide tables, graphs, and figures of the data. List published abstracts, poster presentations and scientific meeting presentations at the end of the summary of progress; peer-reviewed publications should be listed under item 20.

This response should be a DETAILED report of the methods and findings. It is not sufficient to state that the work was completed. Insufficient information may result in an unfavorable performance review, which may jeopardize future funding. If research findings are pending publication you must still include enough detail for the expert peer reviewers to evaluate the progress during the course of the project.

Health research grants funded under the Tobacco Settlement Act will be evaluated via a performance review by an expert panel of researchers and clinicians who will assess project work using this Final Progress Report, all project Annual Reports and the project's strategic plan. After the final performance review of each project is complete, approximately 12-16 months after the end of the grant, this Final Progress Report, as well as the Final Performance Review Report containing the comments of the expert review panel, and the grantee's written response to the Final Performance Review Report, will be posted on the CURE Web site.

There is no limit to the length of your response. Responses must be single-spaced below, no smaller than 12-point type. If you cut and paste text from a publication, be sure symbols print properly, e.g., the Greek symbol for alpha (α) and beta (β) should not print as boxes (\square) and include the appropriate citation(s). DO NOT DELETE THESE INSTRUCTIONS.

Four long-term objectives are included in this project: (1) Establish an effective health research coordinator network (Rural Embedded Assessment Community Health [REACH] Network) in central PA, that will both represent the health needs of these communities and also facilitate community based translational research and educational programs aimed at improving the health of this population. Recruiting of healthcare staff from the communities themselves (i.e., employees of the communities) and working with county Cooperative Extension staff, allows immediate local representation and engagement, both from an assessment, intervention and ultimately from a prevention point of view; (2) Based on outcomes data supporting the effectiveness of the two important initial measures (i.e., fall reduction and influenza immunization rates among community based elders), the rural community engaged research program will facilitate further network growth and additional observation and interventional studies beyond the home – extending to farms and rural communities; (3) We have chosen health

professionals of the community as research staff, one being more traditional (nurses) and the other less so (emergency medical technicians), who are embedded within the communities themselves (cost and effectiveness will be tracked compared to a hypothetical, centralized model); (4) By providing research training using distance learning techniques (i.e., the good clinical practice of research and coordination, in conjunction with elder cognitive behavioral assessment), we will enhance immediate employment opportunities and alternative research career pathways for nurse and EMT staff. This program could become a national model for strengthening rural and small town America's research and health education infrastructure at modest cost and provide significantly enhanced employment opportunities at the local level. The REACH Network could have a significant positive impact on enabling adaptive aging in place and delivering more cost effective health care to rural populations across the United States.

The specific aims of this project are to:

1. Establish an effective health research coordinator network (the REACH network) in central PA that will both represent the unmet health needs of these communities and facilitate community based translational research and educational programs aimed at improving the health of this population.
2. This study will test the hypothesis that using the REACH network to provide in-home interventions to make the home safer will reduce the risk of falls and fall-related injuries compared to a control group not receiving the intervention. Likewise, the availability on in-home influenza vaccinations will translate to a higher percentage of immunized elders, compared with elders not offered in-home vaccination.
3. Determine the effectiveness of using health professionals embedded in their rural communities as research coordinators. Traditional health professionals (nurses) and EMT's will be trained in the conduct of clinical research. The effectiveness of this approach will be tracked and compared to a hypothetical, centralized model.
4. Determine whether the use of distance learning techniques for training in the good clinical practice of research has enhanced immediate employment opportunities or alternative career pathways for the trainees. This program could become a national model for strengthening rural and small town America's research and health education infrastructure at modest cost and provide significantly enhanced employment opportunities at the local level.

Progress

Specific Aim 1: Establish an effective health research coordinator network (the REACH network) in central PA that will both represent the unmet health needs of these communities and facilitate community based translational research and educational programs aimed at improving the health of this population.

The REACH project was successful in forming ties with community groups and getting their input into community needs, culture, and resources. First, we established a community advisory board that included members from the local hospital, a local physician, emergency medical services, home health care, a science teacher, and a cooperative extension director/educator (see

Table 1). The community advisory board helped the research team become more knowledgeable in understanding the local context and dynamics that could impact the study, as well as understanding how the community context helps inform and improve research. The representatives on this committee have been extremely valuable in providing suggestions, opening doors to local organizations, providing names of older adults who could benefit from the project, and giving their perspective about which strategies would work best in their community.

Ellen Weaver, MS, RN	Regional Director, Visiting Nurses Association of Pennsylvania, Centre Home Care
David Schooley, DO	Retired Department of Health, Public Health Physician, Medical Director for Community Health
Tom Walker	Director, Penn State Learning Center
Kathie Graham	Director, Mifflin/Juniata Area Agency on Aging
Maureen Hoffman	Coordinator, Waver and Options Program with Area on Aging
Phyllis Palm, RN, BS, FACHE	Retired Senior Vice President of Operations, Lewistown Hospital
Patrick Shoop	EMS Chief of FAME Ambulance Service, Lewistown
Phyllis Mitchell	VP Marketing, Lewistown Hospital

A scientific advisory committee was also convened that included an interdisciplinary team of researchers and extension professionals who brought a wealth of career knowledge that includes community outreach education, family and consumer science, emergency medicine, nursing, clinical neuropsychology, evaluation research methods, agricultural, environmental and regional economics, landscape arts and architecture, and architectural engineering (see Table 2).

Thomas Terndrup, MD	Chair, Department of Emergency Medicine, Penn State College of Medicine
Marilyn Corbin, PhD	Associate Director of Cooperative Extension State Program Leader for Children, Youth, and Families
Theodore Alter, PhD	Professor of Agricultural, Environmental & Regional Economics, Penn State Co-Director, Center for Economic and Community Development
Louis Brown, PhD	Research Associate, Penn State Research Prevention Center
Claire Flaherty-Craig, PhD	Associate Professor of Neurology, Penn State Hershey
Richard Behr, PhD	Professor of Architectural Engineering, Penn State Director, Penn State Smart Spaced Center for Aging in Place
Carranda Barkdoll, MSN, RN, CRNP	Campus Coordinator for Nursing Programs Penn State Mont Alto
Kirk Gilbert, PhD	Science Instructor and Rural Health Educator Penn State Learning Center

The Community Advisory Board and the Scientific Advisory Committee met monthly with the other participants in the REACH Network either face to face in Lewistown or by videoconference for the first year of the study, and quarterly in the second year. These meetings were an exemplary model of community-based participatory research. The Community Advisory Board and the Scientific Advisory Committee worked in tandem to design the study methodology, taking into account the sensitivities and preferences of community members. This was critical to the success of the network.

A number of observations can be made about our experience in engaging the community in research. First, it is important that all stakeholders, community and university-based, perceive benefit in taking part in the study. Each participant needs to see a substantial benefit from engagement to overcome the time and other costs of involvement in a participatory action research project. Effective communication of the benefits of involvement is critical for community engagement efforts to be successful. We have noted the following benefits to participating in the REACH Network:

- Benefits to participant and community: awareness of previously-unconsidered home safety issues and the importance of annual flu immunization; understanding of the research process and advantages of different research methodological designs
- Benefit to participating community organization: strengthens organization's ties to the community and helps the organization more effectively pursue its mission of improving rural healthcare delivery based on the input provided by the community and university stakeholders
- Benefit to university: awareness of local contextual factors and dynamics that impact the study and service delivery; establishment of research infrastructure that can be tapped into for other community-based research initiatives.
- Benefit to community health assistant: meaningful contribution to their community and involvement in the research process.

The second observation is the importance of involving and cultivating ownership among multiple stakeholders in the process of community collaboration. Open communication and regular feedback opportunities empowered participants and community health assistants to inform the direction of the REACH Network, thereby developing ownership of the process and responsibility for its success; rather than simply forming, organizing, and administering Network operations.

In order to assess the network's level of community engagement, a collaboration survey was developed and provided to all members of the network in April 2010. The survey aimed to assess members' involvement, effectiveness of leadership and communication, network participation, community support and barriers. A total of 17 network members completed the survey. A report was generated that identified the strengths and weaknesses of the collaboration and ways in which the community engagement strategies could be improved. The findings of this survey were ultimately used to generate a first-person report of the REACH Network that was published in the *American Journal of Community Psychology* (Brown, 2012).

In the REACH Network, all levels of participation in the project proved critical to its success. Penn State University researchers needed participation from Penn State Cooperative Extension to engage local health service providers. Participation from local health service providers enabled the engagement of locally embedded community health assistants, who were then able to connect with elders interested in the health services made possible by the REACH Network. All partners maintained a distinct perspective, deriving unique benefits from their involvement. However, all parties were united by a mutually-beneficial agenda that was collaboratively developed. Development of a shared agenda relied on a collaborative decision making process that fostered trust through mutual respect for each partners' autonomy and value as critical to the success of the larger partnership.

Specific Aim 2: Test the hypothesis that using the REACH network to provide in-home interventions to make the home safer will reduce the risk of falls and fall-related injuries compared to a control group not receiving the intervention, and the availability of in-home influenza vaccinations will translate to a higher percentage of immunized elders, compared with elders not offered in-home vaccination.

The REACH Network utilized the services of six research-trained Community Health Assistants (CHAs) during the reporting period, including two local emergency medical technicians (EMTs), three local nurses, and the research coordinator, Leigh Gordon Brown. After successful completion of CITI training (100% pass rate on first attempt using distance learning), the CHAs began recruiting participants. Recruitment was done predominantly by word of mouth, at local churches, visits to senior centers, discussions with family, friends and neighbors, etc. Recruitment was aided by the use of informational brochures and articles in local media. A cross-over design was employed, with half of the participants in the first half of the study receiving home assessments and half surveys regarding influenza status; during the second half of the study, the cohorts were switched with those receiving home assessments in the first half receiving surveys of influenza status and vice versa.

A baseline questionnaire was administered to each participant that collected information regarding the participant's fall and flu shot history, medical conditions, current medications, lifestyle factors and demographics. Initial home visits for the fall prevention group included the HomeFast safety assessment, a brief neurocognitive screening (Mini-Cog) and the Timed Get Up and Go test that measures mobility. The HomeFast safety assessment survey was made into an application for the iPod Touch device that not only collected data on home safety but also collected pertinent information such as participant's name and date of assessment. A home safety recommendation brochure was also designed. Based on the results of each participant's HomeFast survey, a personalized brochure was created to give participants tips and recommendations on how to make their homes safer. Participants in the immunization phase of the study received the Seasonal Influenza Vaccine Survey.

A total of six CHAs (2 EMTs, 3 nurses, and the study coordinator) were active during over the course of the study. A total of 230 elders were contacted and informed about the study; of these, 170 consented to participate. Of these 170, baseline questionnaires were completed by 165. A total of 116 individuals received in-home safety assessments using the HomeFast tool, and 86 have completed follow-up questionnaires regarding the incidence of falls since the initial

intervention. Influenza vaccination status surveys were completed by 80 participants. In addition, 116 timed Get-Up-And-Go fall risk assessments were completed, and 94 neurocognitive assessments were performed. Thirty-three individuals withdrew from the study for various reasons. Of the 170 consented participants, 60 were male and 110 were female, with an average age of 80.15 years.

According to the home visits, the most common fall risks found in the home were lack of non-slip floor surfaces, no slip resistant mats and/or strips in the bath/shower recess, lack of sturdy grab rails in the shower/beside the bath, loose throw rugs (not securely fixed to the floor) and not being able to easily switch on a light from their bed (Table 3).

Table 3. Incidence of Fall Risks Identified in HomeFast Survey

Home Fast Question #	Hazard	Incidence
3	Floor Surfaces Not Non-slip	43
4	Loose Rugs Not Securely Fixed to the Floor	27
13	No Accessible/Sturdy Grab Rails in Shower/Beside Bath	21
12	Cannot Walk In/Out of Shower Recess Easily & Safely	18
19	No Accessible/Sturdy Grab Rail Extending Full Length of Outdoor Steps/Stairs	15
24	Not Wearing Well Fitting Slippers or Shoes	15
11	Cannot Get In/Out of Bath Easily & Safely	13
14	No Slip Resistant Mats/Strips in Bath/Bathroom/Shower Recess	13
7	Lights Not Bright Enough for Person to See Clearly	12
18	No Accessible/Sturdy Grab Rails Extending Full Length of Indoor Steps/Stairs	12
8	Cannot Switch Light on Easily from Bed	11
9	Outside Sidewalks/Steps/Entrances Not Well Lit at Night	10
16	Cannot Easily Reach Kitchen Items without Climbing/Bending/Upsetting Balance	10
20	Cannot Easily & Safely Go Up/Down Steps/Stairs Inside or Outside of House	10
25	Cannot Care for Pets without Bending or Being at Risk of Falling	10
1	Inside Pathways Not Free from Clutter, Obstructions	7
15	Toilet is Not Close to Bedroom	7
21	Edges of Steps/Stairs Inside or Outside House Not Easily Identified	7
23	Sidewalks around House Not in Good Repair, Free of Clutter	6
10	Cannot Get On/Off Toilet Easily & Safely	5
22	Cannot Use Entrance Door(s) Safely & Easily	5
6	Cannot Get Up from Lounge Chair Easily	4
5	Cannot Get In/Out of Bed Easily & Safely	2
17	Cannot Carry Meals Easily & Safely from Kitchen to Dining Area	2
2	Floors & Floor Coverings Not in Good Condition	1

Overall, 22 of the 170 participants (12.9%) experienced a fall at some time during the course of the study. However, our home intervention did not appear to lead to a decrease in the incidence of falls. The group receiving the home safety survey followed by a list of recommendations for reducing home fall risk (n = 60; average age 80.33 years; range 66-95 years) experienced 20 falls (33%) in the succeeding 12 months, while the control group that did not receive the HomeFast survey or get recommendations about home fall risks (n = 45; average age 80.4) experienced 9 falls (20%) during the same 12 months.

The average time of the Timed Get Up and Go test (which measures mobility) was 14.5 seconds. In this test, the person is asked to stand up from a standard chair and walk a distance of 10 feet, turn around and walk back to the chair and sit down again. The individual uses his/her usual footwear and can use any assistive walking device they normally use, such as a cane. The person is seated with his/her back to the chair, their arms resting on the arm rests, and any walking aid they may use should be in hand. Timing, using either a wristwatch with a second hand or a stop watch, begins when the individual starts to rise from the chair and ends when he/she is once again seated in the chair. The normal time to completion for a healthy individual is 7-10 seconds, and a measure >20 seconds is indicative of impaired mobility. While our population was clearly not freely mobile, only 13 of 116 participants (11.2%) were truly impaired. Interestingly, score on the Timed Get Up and Go test was higher (18.74 seconds) in participants who experienced falls.

The Mini-Cog test was conducted to test for Alzheimer's and dementia. It is a simple and relatively quick screening tool carried out that can identify early mental decline. It takes about 3 minutes to administer and is often used in office visits and emergency rooms as a screening tool to identify those who require further investigation into their clinical presentation. The Mini-Cog consists of a three item recall and a clock drawing test. The person is asked to repeat three unrelated words, such as penny, apple, table. The person is then asked to draw a clock showing a specific time. The patient is then asked to recall the three words. Among the participants who completed the Mini-Cog, 17 of 94 participants (18%) exhibited some degree of cognitive impairment. Of the 22 patients who experienced a fall, 3 (13.6%) also exhibited cognitive impairment.

A total of 41 participants completed flu surveys. 85% of participants reported receiving an influenza vaccination and 91% of those reported receiving the vaccination from their primary doctor. 39% reported having influenza at some time in their lives.

Specific Aim 3: Determine the effectiveness of using health professionals embedded in their rural communities as research coordinators.

Community Health Assistants (CHAs) were community-embedded nurses and EMTs that were familiar with, and residents of, the community (Mifflin and Juniata counties) and thus were able to gain the trust of community members. By engaging local community members and organizations, the CHAs were well-placed to deliver in-home assessments of home safety regarding fall prevention, influenza immunization status, and neurocognitive status in rural elderly citizens living in their own homes. These CHAs were key to the study because their connection to the community was critical in ensuring commitment to the process and project. Developing strong collaborative relationships during project implementation was vitally important because the credibility and trust that accompanies strong relationships is vital to program success and sustainability.

Open communication and regular feedback opportunities empowered participants and CHAs to inform the direction of the REACH Network, thereby developing ownership of the process and responsibility for its success; rather than simply forming, organizing, and administering Network operations. Once CHAs established trust with the participants and the utility of the Network's

initiatives became apparent to participants, these individuals then came to serve as proponents and advocates for the Network. This allowed for increasing participation from within the participants' social network. When developing community initiatives, embracing the expertise, experience, wisdom, and assets of all individuals in the process is important to fostering success, long-term commitment, and sustainability in the community.

Specific Aim 4: Determine whether the use of distance learning techniques for training in the good clinical practice of research has enhanced immediate employment opportunities or alternative career pathways for the trainees.

All CHAs received instruction from the Smart Spaces Center for health aging in place regarding home fall hazards, and were trained in the delivery of the HomeFast safety survey. CHAs were also instructed in the use of the iPod Touch device to collect study data and administer surveys. Dr. Claire Flaherty-Craig provided training in cognitive behavioral assessment and the administration of the Mini-Cog test. Finally, all CHAs received training in the Good Conduct of Patient Research through the online Collaborative Institutional Training Initiative (CITI) course. While all CHAs reported that participation in the project was rewarding and provided them with insight regarding the design and conduct of clinical research studies, at the close of the study this enrichment did not immediately lead to enhanced employment opportunities for the nurses or EMTs.

Dissemination of Research Findings

At present, one publication has resulted from the REACH Network study (Brown, 2012). Depending on a final analysis of the data, additional manuscripts may be submitted for publication. The work has also been presented at the Center for Integrated Health Delivery Systems annual meeting held in State College, PA on March 29, 2010, at the Academy Health Annual Research meeting in Boston on June 28, 2010, and at the Healthy Homes National Conference in Denver, CO in June 2011.

The REACH Network and the participatory nature of the research study were described in two articles: "Helping Elders Stay Well in Their Homes" appeared in *Right Here* magazine published by Lewistown Hospital, and "REACH Network—Projects Reaching Out to the Elderly" appeared in Penn State's *Outreach* magazine.

Publication

Louis D. Brown, Theodore R. Alter, Leigh Gordon Brown, Marilyn A. Corbin, Claire Flaherty-Craig, Lindsay G. McPhail, Pauline Nevel, Kimbra Shoop, Glenn Sterner III, Thomas E. Terndrup, M. Ellen Weaver. Rural Embedded Assistants for Community Health (REACH) Network: First-Person Accounts in a Community–University Partnership. *American Journal of Community Psychology*. Published online May 1, 2012.

<http://www.springerlink.com/content/616441v89735v16u/fulltext.pdf>.

18. Extent of Clinical Activities Initiated and Completed. Items 18(A) and 18(B) should be completed for all research projects. If the project was restricted to secondary analysis of clinical data or data analysis of clinical research, then responses to 18(A) and 18(B) should be “No.”

18(A) Did you initiate a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

Yes

No

18(B) Did you complete a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

Yes

No

If “Yes” to either 18(A) or 18(B), items 18(C) – (F) must also be completed. (Do NOT complete 18(C-F) if 18(A) and 18(B) are both “No.”)

18(C) How many hospital and health care professionals were involved in the research project?

_____ Number of hospital and health care professionals involved in the research project

18(D) How many subjects were included in the study compared to targeted goals?

400 Number of subjects originally targeted to be included in the study

170 Number of subjects enrolled in the study

Note: Studies that fall dramatically short on recruitment are encouraged to provide the details of their recruitment efforts in Item 17, Progress in Achieving Research Goals, Objectives and Aims. For example, the number of eligible subjects approached, the number that refused to participate and the reasons for refusal. Without this information it is difficult to discern whether eligibility criteria were too restrictive or the study simply did not appeal to subjects.

18(E) How many subjects were enrolled in the study by gender, ethnicity and race?

Gender:

60 Males

110 Females

_____ Unknown

Ethnicity:

_____ Latinos or Hispanics

170 Not Latinos or Hispanics

_____ Unknown

Race:

- American Indian or Alaska Native
 Asian
 Blacks or African American
 Native Hawaiian or Other Pacific Islander
 170 White
 Other, specify: _____
 Unknown

18(F) Where was the research study conducted? (List the county where the research study was conducted. If the treatment, prevention and diagnostic tests were offered in more than one county, list all of the counties where the research study was conducted.)

The REACH Network was based at Penn State Hershey in Dauphin County, but participants were recruited from Mifflin and Juniata Counties.

19. Human Embryonic Stem Cell Research. Item 19(A) should be completed for all research projects. If the research project involved human embryonic stem cells, items 19(B) and 19(C) must also be completed.

19(A) Did this project involve, in any capacity, human embryonic stem cells?

- Yes
 No

19(B) Were these stem cell lines NIH-approved lines that were derived outside of Pennsylvania?

- Yes
 No

19(C) Please describe how this project involved human embryonic stem cells:

20. Articles Submitted to Peer-Reviewed Publications.

20(A) Identify all publications that resulted from the research performed during the funding period and that have been submitted to peer-reviewed publications. Do not list journal abstracts or presentations at professional meetings; abstract and meeting presentations should be listed at the end of item 17. **Include only those publications that acknowledge the Pennsylvania Department of Health as a funding source** (as required in the grant agreement). List the title of the journal article, the authors, the name of the peer-reviewed publication, the month and year when it was submitted, and the status of publication (submitted for publication, accepted for publication or published.). Submit an electronic copy of each publication or paper submitted for publication, listed in the table, in a PDF version 5.0.5 (or greater) format, 1,200 dpi. Filenames for each publication should include

the number of the research project, the last name of the PI, the number of the publication and an abbreviated research project title. For example, if you submit two publications for PI Smith for the “Cognition and MRI in Older Adults” research project (Project 1), and two publications for PI Zhang for the “Lung Cancer” research project (Project 3), the filenames should be:

- Project 1 – Smith – Publication 1 – Cognition and MRI
- Project 1 – Smith – Publication 2 – Cognition and MRI
- Project 3 – Zhang – Publication 1 – Lung Cancer
- Project 3 – Zhang – Publication 2 – Lung Cancer

If the publication is not available electronically, provide 5 paper copies of the publication.

Note: The grant agreement requires that recipients acknowledge the Pennsylvania Department of Health funding in all publications. Please ensure that all publications listed acknowledge the Department of Health funding. If a publication does not acknowledge the funding from the Commonwealth, do not list the publication.

Title of Journal Article:	Authors:	Name of Peer-reviewed Publication:	Month and Year Submitted:	Publication Status (check appropriate box below):
1. Rural Embedded Assistants for Community Health (REACH) Network: Accounts in a community-university partnership	Louis Brown, Theodore Alter, Leigh Gordon Brown, Marilyn Corbin, Claire Flaherty-Craig, Lindsay McPhail, Pauline Nevel, Kimbra Shoop, Glenn Sterner, Thomas Terndrup, and M. Ellen Weaver	American Journal of Community Psychology (2013) 51:206-216	01/2012	<input type="checkbox"/> Submitted <input type="checkbox"/> Accepted <input checked="" type="checkbox"/> Published

20(B) Based on this project, are you planning to submit articles to peer-reviewed publications in the future?

Yes X No _____

If yes, please describe your plans:

If data permit, a journal manuscript based on outcome measurements will be submitted for publication.

21. Changes in Outcome, Impact and Effectiveness Attributable to the Research Project.

Describe the outcome, impact, and effectiveness of the research project by summarizing its impact on the incidence of disease, death from disease, stage of disease at time of diagnosis, or other relevant measures of outcome, impact or effectiveness of the research project. If there were no changes, insert “None”; do not use “Not applicable.” Responses must be

single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.

While this highly innovative project was unable to achieve and maintain targeted enrollment expectations, we were clearly able to demonstrate the feasibility of this approach. Further strengthening of the CHAs by a more vigorous coordinator and oversight may have allowed full enrollment and interpretation. As a result, we are unable to draw final conclusions about our primary endpoint- fall reductions in elder citizens in their homes. We attribute this to the fact that the REACH network only enrolled 170 subjects rather than the target number (400). Had we been able to recruit the 8 nurses and 8 EMTs as originally planned, we believe that we would have been able to recruit the target number of participants. We were pleased, however, that the 5 CHAs, were able to recruit an average of 34 participants each, somewhat greater than the 25 participants per CHA that we originally estimated.

22. Major Discoveries, New Drugs, and New Approaches for Prevention Diagnosis and Treatment. Describe major discoveries, new drugs, and new approaches for prevention, diagnosis and treatment that are attributable to the completed research project. If there were no major discoveries, drugs or approaches, insert “None”; do not use “Not applicable.” Responses must be single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.

None

23. Inventions, Patents and Commercial Development Opportunities.

23(A) Were any inventions, which may be patentable or otherwise protectable under Title 35 of the United States Code, conceived or first actually reduced to practice in the performance of work under this health research grant? Yes _____ No X

If “Yes” to 23(A), complete items a – g below for each invention. (Do NOT complete items a - g if 23(A) is “No.”)

- a. Title of Invention:
- b. Name of Inventor(s):
- c. Technical Description of Invention (describe nature, purpose, operation and physical, chemical, biological or electrical characteristics of the invention):
- d. Was a patent filed for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?
Yes _____ No _____

If yes, indicate date patent was filed:

e. Was a patent issued for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?

Yes _____ No _____

If yes, indicate number of patent, title and date issued:

Patent number:

Title of patent:

Date issued:

f. Were any licenses granted for the patent obtained as a result of work performed under this health research grant? Yes _____ No _____

If yes, how many licenses were granted? _____

g. Were any commercial development activities taken to develop the invention into a commercial product or service for manufacture or sale? Yes _____ No _____

If yes, describe the commercial development activities:

23(B) Based on the results of this project, are you planning to file for any licenses or patents, or undertake any commercial development opportunities in the future?

Yes _____ No X _____

If yes, please describe your plans:

24. Key Investigator Qualifications. Briefly describe the education, research interests and experience and professional commitments of the Principal Investigator and all other key investigators. In place of narrative you may insert the NIH biosketch form here; however, please limit each biosketch to 1-2 pages. *For Nonformula grants only – include information for only those key investigators whose biosketches were not included in the original grant application.*

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME <p style="text-align: center;">Terndrup, Thomas E.</p>	POSITION TITLE <p style="text-align: center;">Professor, Department of Emergency Medicine Associate Dean for Clinical Research</p>		
eRA COMMONS USER NAME <p style="text-align: center;">tterndrup</p>			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Juniata College, Pennsylvania	BS	1977	Biology and Chemistry
Penn State University, Pennsylvania	MD	1981	Medicine
Columbia University Affiliated Residency, NJ	N/A	1987	Emergency Medicine
SUNY Health Science Center	Fellow	1988	Pediatric EM
Dartmouth School of Medicine, Physiology	Post-Doc.	1992-98	Neurophysiology

A. Personal Statement.

I am very pleased to be the submitting this biosketch following completion of local CURE funding for the REACH network. We have explored a very innovative set of strategies to include outreach activities and research in rural communities aimed to benefit senior rural citizens at high risk for non-inclusion because of their location and the absence of research personnel in their locale. These studies involved a significant contribution from Penn State University faculty and staff, contributed by in-kind contributions and personal efforts. The contributions of many community volunteers and the creation of Community Health Assistants has been successful, but continuing support has been absent despite several applications to state and federal agencies. While the scientific findings will be limited because of the severe funding constraints, we will contribute to the evolving literature on this important topic going forward.

B. Positions and Honors.

Professional Experience:

1982-1985	Medical Director , Emergency Department Lee County Hospital, United States Public Health Service;
1988-1992	Assistant Professor ; Department of Emergency Medicine and Pediatrics; State University of New York Health Science Center, Syracuse, New York (SUNY)
1993-1998	Associate Professor ; Departments of Emergency Medicine, Physiology and Pediatrics; SUNY.
1992-1998	Postdoctoral Fellow ; Department of Physiology, Dartmouth School of Medicine
1998-2000	Professor , Departments of Emergency Medicine and Pediatrics; SUNY.
2001-2006	Professor and Chair , Department of Emergency Medicine, University of Alabama at Birmingham
2000-2006, 2003	Director , Center for Emergency Care & Disaster Preparedness, University of Alabama at Birmingham
	Member, Bioterrorism Education Study Section, Agency for Health Care Research and Policy
2006-present	Professor and Chair , Department of Emergency Medicine, and Associate Dean for Clinical Research , Milton S. Hershey Medical Center, Penn State University College of Medicine

Honors:

- 1977 *Phi Beta Kappa and Magna Cum laude*, Juniata College
- 1988 Best Resident Paper, Scientific Assembly of American College of Emergency Physicians
- 1991 Outstanding Scientific Paper, National Association of EMS Physicians Annual Meeting
- 1993 American Epilepsy Foundation and Career Development Award, American College of Emergency Physicians
- 1994 Visiting Professor, Department of Clinical Sciences, Cornell Veterinary School of Medicine.
- 1995-2000 National American Heart Association Faculty, Pediatric Resuscitation Subcommittee
- 1995-1997 Visiting Scientist in Physiology, Department of Physiology, Dartmouth Medical School.
- 1996 & 1997 Outstanding Consultant. *Annals of Emergency Medicine*.
- 1997-2000 Editorial Consultant, *Currents*, American Heart Association.
- 1998-2000 Education Working Group Chair, national Emergency Cardiovascular Care Committee, AHA
- 2000-2004 Publications Chair, Public Access to Defibrillation clinical trial, University of Washington and NHLBI
- 2000-2006 Senior Scientist, Center for Outcomes Evaluation and Research, UAB
- 2001-2012 Senior Scientist & External Advisor, Center for Emerging Infections & Emergency Preparedness, UAB
- 2004-2006 Steering Committee, Resuscitation Outcomes Consortium, NHLBI

C. Selected Peer-Reviewed Publications (Selected from 65 peer-reviewed publications)

Most relevant to the current application

1. The Public Access Defibrillation Trial Investigators (Hallstrom A, Ornato, et al (**Terndrup TE**)). Public access defibrillation and survival after out-of-hospital cardiac arrest. *NEJM* 2004;351:637-646.
2. Morrison LJ, Nichol G, Rea TD, et al (**Terndrup TE**) for the ROC Investigators. Rationale, Development and Implementation of the Resuscitation Outcomes Consortium Epistry – Cardiac Arrest. *Resuscitation* 2008;78:161-169.
3. Aufderheide TP, Kudenchuk PJ, Hedges JR, et al (**Terndrup**) for the ROC Investigators. Resuscitation Outcomes Consortium (ROC) PRIMED cardiac arrest trial methods Part 1: Rationale and methodology for the Impedance Threshold Device (ITD) Protocol. *Resuscitation* 2008;78:179-185.
4. Newgard C, Rudser K, Hedges JR, et al (**Terndrup**) for the ROC Investigators. A Critical Assessment of the Out-of-Hospital Trauma Triage Guidelines for Physiologic Abnormality. *J Trauma* 2010;68:452-462.
5. Stiell IG, Nichol G, Leroux BG, et al (**Terndrup**) for the ROC Investigators. Early versus later rhythm analysis in patients with out-of hospital cardiac arrest. *N Engl J Med* 2011;365:787-97.

Additional recent publications of importance to the field (in chronological order)

6. Zehner WJ, Scott JM, Iannolo PM, Ungaro A, **Terndrup TE**. A randomized, double-blind comparison of single dose terbutaline versus albuterol during pre-hospital treatment of respiratory distress. *Acad Emerg Med* 1995;2:686-691.
7. **Terndrup TE**, Knuth SL, Gdovin MJ, Darnell R, Bartlett D. Respiratory motor nerve activities during experimental seizures in cats. *J Appl Physiol* 1996;80:924-930.
8. Leaming JM, **Terndrup TE**, Ognibene S. Glottal area patency during cortical seizures. *Acad Emerg Med* 1999;6:682-687.
9. **Terndrup TE**, Darnall R, Knuth SL, Bartlett D. Effects of experimental cortical seizures on respiratory motor nerve activities in piglets. *J Appl Physiol* 1999;86:2052-2058.
10. Ornato JP, McBurnie MA, Nichol G, et al (**Terndrup TE**). The public access defibrillation (PAD) trial: Study design and rationale. *Resuscitation* 2003;56:135-147.
11. Peberdy MA, Van Ottingham L, Groh WJ, et al (**Terndrup TE**). Adverse events associated with lay

- emergency response programs: The Public Access Defibrillation trial experience. *Resuscitation*, 70, 59-65.
12. Brown TB, Dias JA, Saini D, Shah RC, Cofield SS, Kaslow RA, Waterbor JW **Terndrup TE**. Relationship between knowledge of cardiopulmonary resuscitation guidelines and performance. *Resuscitation* 2006;69:253-61.
 13. Dias J, Brown TB, Saini D, Shah R, Cofield S, Waterbor J, Funkhouser E, **Terndrup TE**. Simplified dispatch-assisted CPR instructions outperform standard protocol. *Resuscitation* 2007;72:108-114.
 14. Kanter RK, Andrade J, Boeing N, et al (**Terndrup**). Developing Consensus on Appropriate Standards of Disaster Care for Children. *Disaster Med Public Health Preparedness*. 2009;3:27–32.
 15. **Terndrup TE**, Leaming JM, Adams J, Adoff S. A hospital based coalition formed to improve regional surge capacity. *W J Emerg Med*. 2011 (in press).

D. Research Support.

GM076659-04 Terndrup (local PI) 9/30/2009-8/31/2013
 Protocolized Care for Early Septic Shock. Funded by the NHLBI.
 Role: coPI. Multicenter clinical trial of early recognition and treatment of sepsis.

HFPEP07002-01-01 Terndrup (PI) 2006-2012.
 Role: PI for hospital preparedness programs for Penn State.
 Funded by ASPR and Pa Department of Health.

Improving Patient Safety Through Simulation Research (1R18 HS021456-01)
 Terndrup (PI). July 2012 to June 2015.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Marilyn A. Corbin	POSITION TITLE Associate Director and State Program Leader, Children, Youth and Families		
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Southwestern College, Winfield, KS	BS	1970	Business Administration
Kansas State University, Manhattan, KS	MS	1972	Clothing, Textiles and Interior Design
Kansas State University, Manhattan, KS	PhD	1983	Family Life Education

Please refer to the application instructions in order to complete sections A, B, and C of the Biographical Sketch.

POSITIONS

- 1972 – 1974 Clothing & Textile Specialist-Consumer Education, Texas Agricultural Extension Service, Texas A & M University
- 1975 - 1978 Clothing and Textile Extension Home Economist, Kansas Cooperative Extension Service, Kansas State University
- 1979 – 1983 Extension Specialist-Clothing, Instructor, Kansas Cooperative Extension Service, Kansas State University
- 1983 – 1987 Extension Specialist-Clothing, Assistant Professor, Kansas Cooperative Extension Service, Kansas State University
- 1987 – 1993 Assistant Director, Extension Home Economics, Associate Professor, Kansas Cooperative Extension Service, Kansas State University
- 1989 - 1992 Acting Director/Acting Associate Director, Kansas Cooperative Extension Service, Kansas State University
- 1997 – 1998 Professor, Assistant to the Director, Cooperative Extension Service, College of Agriculture and Life Sciences, North Carolina State University, Raleigh, NC.
- 1993 – 1997 Professor, Assistant Director/Department Head, Family & Consumer Sciences, Cooperative Extension Service, College of Agriculture and Life Sciences, North Carolina State University, Raleigh, NC.
- 1998 – Present Professor, Associate Director of Cooperative Extension, and State Program Leader for Children, Youth and Families, The Pennsylvania State University, Cooperative Extension, University Park, PA.

HONORS

- Epsilon Sigma Phi, Distinguished Service Award, State, 1991
- USDA Honor Award for Emergency Response to Hurricane Fran, 1997
- National Extension Association of Family & Consumer Sciences, 2nd place award for Educational Curriculum Package: Women and Heart Disease: A Rural Women's Health

Initiative: A Resource Kit, 2002

- Vice-President's Award for Outreach Leadership, Penn State University, 2002
- University Continuing Education Association - 2003 Exemplary Program Award – Honorable Mention for 2002 Rural Women's Health Conference – Linking Mental, Behavioral, and Physical Health: Quality of Life Issues Outcomes, and Strategies for Health Promotion
- Pennsylvania Cancer Control Consortium – 2003 Certificate of Commendation - For bold leadership in the development of the first-ever Comprehensive Cancer Control Plan for the Commonwealth of PA to reduce the burden of cancer for all citizens
- Pennsylvania Health Educators Institute, 2004 Media Health Promotion Award for Creating Health program
- National Diversity Award for 2005, Cooperative States Research, Education and Extension Service, USDA
- National Extension Association of Family & Consumer Sciences
Distinguished Service Award, 2006
Florence Hall Award, 1st Place, Eastern Region, and 1st Place National, 2007

PEER REVIEWED PUBLICATIONS

- Bankston, J., K. Castania, M. Corbin, B. G. Mathewson, and J. Vasquez. (1998). Benefits of Diversity and Pluralism in the Extension System. Cornell Cooperative Extension.
- Corbin, M., et al. (1998). How Communities Can Respond to the Needs of Families Who are Seeking to Become Self-Sufficient. North Carolina Cooperative Extension Service.
- Corbin, M. (1998). Trends and emerging issues related to welfare reform. *The Forum for Family and Consumer Issues*. 3.2:22
(<http://www.ces.ncsu.edu/depts/fcs/pub/1998/welfare.html>)
- Mincemoyer, C. and Corbin, M., (2001). Computer-Mediated Needs Assessment to Identify 4-H Curriculum Needs. *Journal of Extension*. 39:5; 5 pp.
- Corbin, M. (2002). Penn State Outreach Program Builds Health Awareness. *Journal of Family and Consumer Sciences*. 94:4; pp. 68-69.
- Corbin, M. Kiernan, N.E., Koble, M., Watson, Jack, & Jackson, D. (2004). Using the logic model to plan extension and outreach program development and scholarship. *Journal of Higher Education Outreach and Engagement*. 10:1; pp. 61-70.
- Corbin, M., Kiernan, N.E., & Gettings, M.A. (2007). Preventing Diabetes: You Have the Power to Take Action. *Journal of Extension*, 45(5).
(<http://www.joe.org/joe/2007october/a5.shtml>)
- Corbin, M., Trainer, J., & Fang-Liu, C., & Gueldner, S. (2008). A Model for Community Outreach: Cooperative Extension Osteoporosis Prevention and Screening Programs. In Gueldner, S., Grabo, T., Newman, E., & Cooper, D. (Ed.). *Osteoporosis: Clinical Guidelines for Prevention, Diagnosis, and Management* (pp. 187-199). New York: Springer Publishing Company.

RESEARCH SUPPORT

- United States Department of Agriculture, 2008, Diabetes Detection and Prevention, Role: PI, Award: \$77,406
- PA Department of Health, 2008, Childhood Lead Poisoning, Role: PI, Award: \$314,000
- PA Department of Health, 2008, Diabetes Education, Role: PI, Award: \$667,913
- PA Department of Health, 2006-2010, Partners for Healthy Choices, Role: PI, Award: \$120,000