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14. ABSTRACT The specific aims of the study are to: 1) examine body weight and fat changes associated with participation in a population-based intervention, 2) examine changes in fitness associated with participation in a population-based intervention, and 4) evaluate the maintenance of changes in body weight, body fat, and fitness after discontinuation of the promotion associated with the H.E.A.L.T.H. program. The study is a cluster (group) randomized trial in which clusters of Army National Guard units were randomly assigned to one of two treatment arms: 1) immediate access to the H.E.A.L.T.H. intervention or 2) delayed access to the H.E.A.L.T.H. intervention. The research design includes two years of baseline data, two years of the comparison of the two treatment arms, followed by two years of delivery of the H.E.A.L.T.H. intervention to the treatment arm that received a delayed intervention. Access to the H.E.A.L.T.H. intervention will be continued for one additional year for both treatment arms to evaluate utilization and efficacy after discontinuation of the H.E.A.L.T.H. promotion program. Data is collected from two sources: 1) the Unit Personnel System- Command Management System (UPS-CMS), and 2) the H.E.A.L.T.H. website. Data has been collected using routinely obtained annual Army Physical Fitness Tests (APFT). Participants are not required to sign voluntary consent forms due to their anonymity. The H.E.A.L.T.H. intervention will be available for all population Soldiers during periods designated by the research study design.					
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## **Introduction**

The Pennington Biomedical Research Center (PBRC) is delivering a program to the Louisiana Army National Guard (LANG) called Healthy Eating, Activity, and Lifestyle Training Headquarters (H.E.A.L.T.H.) (1). This program was designed to address weight management needs and non-compliance with the Army Weight Control Program (AWCP) (2) and the Army Physical Fitness Test (APFT) (3).

The H.E.A.L.T.H. program has two components: 1) an online program that includes personalized eating, fitness, and APFT tools to help Soldiers stay fit and meet AR600-9 and APFT standards, and 2) a promotion program designed to prompt awareness and regular usage of the website program. The H.E.A.L.T.H. program aims to empower Soldiers in healthy and safe lifestyle change to sustain healthy weight and performance on a year-round basis. The H.E.A.L.T.H. website was specifically designed to aid military personnel in achieving healthy management of body weight, healthy nutrition, physical fitness, and combat readiness.

The H.E.A.L.T.H. study is a cluster (group) randomized trial in which clusters of Louisiana Army National Guard (LANG) units will be randomly assigned to one of two treatment arms: 1) Intervention arm 1: Immediate access to the H.E.A.L.T.H. intervention or 2) Intervention arm 2: Delayed access to the H.E.A.L.T.H. intervention. The research design will include two years of baseline data (collected retroactively), two years of the comparison of the two treatment arms, followed by two years of delivery of the H.E.A.L.T.H. intervention to the treatment arm that received a delayed intervention. Access to the H.E.A.L.T.H. intervention will be continued for one additional year for both treatment arms to evaluate utilization and efficacy after discontinuation of the H.E.A.L.T.H. promotion program (See Appendix A for the Study Timeline).

Data will be collected from two sources: 1) Unit Personnel System/Command Management System (UPS/CMS), and 2) the H.E.A.L.T.H. website. The intervention will be delivered to the entire LANG population and all Soldiers in the LANG will be anonymous participants in the study. Data will also be collected using routinely obtained annual Army Physical Fitness Tests (APFT). Participants will not be required to sign voluntary consent forms due to their anonymity.

## **Body**

This project delivers an Internet-based intervention for assisting the LANG Soldiers' adherence to body weight and physical fitness standards described in AR 600-9 and FM 21-20. This Internet-based program, called H.E.A.L.T.H. (1), is integrated with a promotion program that uses the command structure and existing communication functions of the LANG to promote the use of the Internet-based intervention. This approach can be viewed as a population-based health promotion program that will be integrated into existing programs that are designed to assist overweight or unfit Soldiers, e.g., the Army Weight Control Program (AWCP) (2).

PBRC personnel work closely with a Louisiana Executive Advisory Committee (LEAC), as well as a National Executive Committee to guide this research project. During the first year of the project, the primary objectives were: 1) collection of baseline data from the Unit Personnel System/Command Management System (UPS/CMS) and the Army Physical Fitness Test (APFT) (3), i.e., height, weight, fatness estimates, and measures of fitness, 2) assess the unique health risk communication, weight management, and fitness needs of the Louisiana Army National Guard, 3) development of the randomized clusters of the H.E.A.L.T.H. intervention, 4) installation of measurement equipment (scales and stadiometers) in all LANG units, 5) launch of H.E.A.L.T.H. program to intervention arm 1, and 6) future planning of promotion campaigns and novel communication methods. These objectives were successfully completed during Year 1.

During Year 2, the objectives were: 1) collection of Year 2 APFT and height/weight data from LANG data resources, 2) continued promotion of the H.E.A.L.T.H. program to those units in intervention arm 1, 3) planning for inclusion of intervention arm 2 in Year 3 of the H.E.A.L.T.H. promotion program and 3) preliminary analysis of the initial data that was collected since the start of the H.E.A.L.T.H. intervention. These objectives were successfully completed during Year 2.

During Year 3 the objectives were: 1) collection of Year 3 APFT and height/weight data from LANG data resources, 2) launch of the promotion of the H.E.A.L.T.H. program to units within Intervention Arm 2 clusters, 3) planning for Year 4 of the study, and 4) preliminary analysis of data collected since the start of the H.E.A.L.T.H. intervention and presentation of these preliminary results at the December, 2013 annual executive meeting. These objectives were successfully completed during Year 3. Also in Year 3, a new addition to the scope of work for Army H.E.A.L.T.H., under this contract was added. Army H.E.A.L.T.H. was presented to the U.S. Army Surgeon General and it was agreed that the Army H.E.A.L.T.H. program would roll out under the Performance Triad program. The new addition to the current contract included development, roll out, and maintenance funding.

During Year 4, the study objectives were: 1) collection of Year 4 APFT and height/weight data from LANG data resources, 2) continued promotion of the H.E.A.L.T.H. program to units within Intervention Arms 1 and 2 clusters, 3) planning for Year 5 of the study, and 4) preliminary analysis of the data. These objectives were successfully completed during Year 4. In addition, preliminary analyses were presented at the *3<sup>rd</sup> International Soldiers' Physical Performance* conference (6) in an oral talk in Boston, MA, on August 18-21, 2014. Dr. Stewart also met with select executive members about preliminary results in lieu of an annual executive meeting this year. All progress and results on the study were found to be satisfactory. In addition, for the Performance Triad/Surgeon General side of this work, further development occurred for

the Performance Triad pilot, as well as maintenance. Calls and meetings were also held to discuss directions for this partner work/contract.

During Year 5, the study objectives were: 1) collection of final APFT and height/weight data from LANG data resources, 2) discontinuation of the promotion program for the H.E.A.L.T.H. website program and observation of usage by LANG members from all clusters in the study, 3) analysis and further dissemination of data, and 4) planning and preparation for publication of papers on the study. These objectives were successfully completed during Year 5. Further meetings were also held with the Performance Triad task force in an effort to continue the collaboration of the Triad effort, Army H.E.A.L.T.H. and the ARMYFIT program. Army H.E.A.L.T.H. continues to be disseminated under the Triad effort. These costs are currently being covered by the current contract.

During Year 6, the study objectives were: 1) website continued to be available to the traditional guardsmen of the Louisiana Army National Guard. 2) discontinuation of the promotion program for the H.E.A.L.T.H. website program. 3) continuation of the assessment of usage and 4) further dissemination of data during the observation period of the study. 4) begin specifications process for an iPhone platform app. The iPhone application was a direct request through several meetings for the Army H.E.A.L.T.H. program from various entities using the program, e.g. Performance Triad, ARMYFIT, with the idea that the application could potentially go through the Army review process and become an official application for the Army for the management of nutrition, fitness, sleep and mind/body health.

During Year 7, final analyses for the LANG study will be conducted and further dissemination of findings will occur. Final analyses will be done in anticipation of upcoming conferences, including the 4<sup>th</sup> International Soldiers' Physical Performance meeting in 2017. The extension without funds (EWOFF) for this project was awarded during this year and the Performance Triad pilot, Army H.E.A.L.T.H., will continue to be disseminated Army-wide and

qualitative data collected and provided to the Surgeon General’s task force. In this year, a plan for the Army H.E.A.L.T.H. program to be upgraded from the current desktop and mobile website form to a more user-friendly, iPhone app (requested by the Performance Triad users) will commence. This upgrade will help facilitate the dissemination of the Army H.E.A.L.T.H. program to those who want to utilize it on its own or part of other Army programs.

### **H.E.A.L.T.H. Website**

The H.E.A.L.T.H. website was launched (1Apr2010) and is currently being used by the LANG population. PBRC is continuing to make upgrades to the website in order to make it more user-friendly and accommodating to LANG Soldiers and their families, as well as add fresh content and tools to encourage use of the website for weight management purposes. Upgrades to the website will continue to be made throughout the project.

The H.E.A.L.T.H. website is now able to be accessed and utilized via web platform using Smartphone devices. The launch of the program on Smartphones enabled field managers to engage Soldiers more efficiently at events. At drill events, it has been noted that most Soldiers have Smartphones. As the Field Managers registered Soldiers for the H.E.A.L.T.H. program, the smartphone capability of the website allowed the Field Managers to reach more Soldiers in a shorter period of time. This capability also allowed for more convenient and “portable” day-to-day use of the program by Soldiers and their family members. Additionally, the smartphone application has been updated to a more sophisticated design, to resemble an application that would be downloaded from the typical application store. These updates have greatly contributed to Soldiers’ use of the website over the course of the study.

### **Data Collection & Analyses**

Data collection for Year 1 was completed November 2011. Data collection for Year 2 was collected in November, 2012, prior to the annual Executive Committee meeting. Data collection for Year 3 was collected in November, 2013 in preparation for the December



Executive meeting, 2013. Year 4 initial data collection was completed in August, 2014 and presented at the 3<sup>rd</sup> *International Soldiers' Physical Performance* conference (6) in August, 2014, Boston, MA. Final data was collected November, 2015 and is currently being cleaned and analyzed for dissemination/publication in the final years of the study, 2016-2017.

### **Promotion of the Use of the H.E.A.L.T.H. Website**

The promotion strategy for the H.E.A.L.T.H. program/website consisted of a 2 step program:

- Step 1: An awareness campaign that was designed to increase new registration in the intervention arm with a steady increase.
- Step 2: A reinforcement program designed to actively communicate new features of the H.E.A.L.T.H. website and tips for usage to existing users to foster continued long-term use of the H.E.A.L.T.H. website for weight loss and weight maintenance.

This 2- step promotion strategy was based on the enrollment outcomes of the H.E.A.L.T.H. pilot studies at Fort Bragg, NC (4) and the New England Reserve Command (94<sup>th</sup> RRC) (5). The unique design of this promotion program allowed both steps 1 and 2 to occur repetitively in Years 1 and 2, while also occurring simultaneously in years 3 and 4 with the inclusion of intervention arm 2 to the H.E.A.L.T.H. program.

Table 1 illustrates the website promotion schedule for distribution of materials to full time members and Traditional Guardsmen of the LANG. A typical day of promotion (during the week) required that Field Managers make calls, have in-person meetings, give talks to LANG full time personnel, interact with unit Family Readiness Groups (FRG), and attend Soldier Readiness Programs (SRP) when they occur. The interactions of the Field Managers in each of these instances was dependent upon available time and level of awareness by the Soldier, FRG member, speed at which the SRP moves, etc. At each opportunity, the Field Managers communicated the key point of the H.E.A.L.T.H. website and provided an overview of how the website can be used to help an individual achieve their diet/nutrition and exercise/fitness goals.

Further, with the use of portable computers and the Soldier’s Smartphones, Field Managers were able to register large amounts of Soldiers on site at these events.

The majority of the Field Managers’ interactions with the population occurred over drill weekends. This is the time period when the Field Managers had the greatest opportunity to communicate to a large portion of a unit’s Soldiers. During drill, the Field Managers were responsible for educating Traditional Guardsmen on the H.E.A.L.T.H. program and were the single point resource for issue resolution (i.e.: technical problems, application issues, etc.) to all Soldiers present. Similarly, the H.E.A.L.T.H. program has been able to develop a working relationship with the LANG Public Affairs Office (PAO), which has allowed for the targeted distribution of electronic newsletters and promotional materials. This tactic, used in combination with the in-person message distribution plan, has worked exceptionally well throughout the course of the study.

**Table 1: H.E.A.L.T.H. Promotion Schedule**

	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>	<b>Quarterly</b>
<b>Military Email</b>			<b>X</b>	
<b>Word of Mouth</b>	<b>X</b>			
<b>Newsletters</b>			<b>X</b>	
<b>Liaisons</b>		<b>X</b>	<b>X</b>	<b>X</b>
<b>Fliers</b>	<b>X</b>			
<b>Brochures</b>	<b>X</b>			
<b>Training</b>	<b>X</b>			<b>X</b>
<b>Contests</b>				<b>X</b>
<b>Promo Material</b>			<b>X</b>	

All active promotions of the website and H.E.A.L.T.H. program ended 1 November 2014. This date marked the transition of the study to a year-long observational period (to determine if Soldiers utilize the program in the absence of an active promotion program) as described in the study description and illustrated in the study timeline.

## **Secondary Project: Soldier Performance Triad-(Addition to the Current Contract)**

Army Medicine implemented a Performance Triad (Nutrition, Fitness & Sleep) pilot program at multiple military installations. The PBRC team has closely collaborated with the Performance Triad administration (TATRC and the Army Surgeon General's office) to launch the Army H.E.A.L.T.H. program as part of this pilot program. The official roll out was December 2013. The PBRC team is currently updating, adapting, and adding additional features to the Army H.E.A.L.T.H. website and mobile phone tool to be used with this program. In this regard, there has been significant progress made in updating the tool and databases as well as the mobile application for the Triad program. The official Triad program app was launched in July 2014 and Army H.E.A.L.T.H. was launched Army-wide as part of that effort. Dr. Stewart gave an oral presentation on the Army H.E.A.L.T.H. program at the Technology Workshop meeting hosted by the Office of the Army Surgeon General on May 18<sup>th</sup> – 19<sup>th</sup> 2015. The purpose of this workshop was to continue a working relationship by bringing experts together to review and analyze readiness and health data sets that are relevant for Commanders/Leaders. As this effort further develops, we will report all updates in future reports. It is important to note that this project is housed under the same contract (W81XWH-09-1-0616) as the Weight, Measurements and Standards for Soldiers project. This work continues in conjunction with the Office of the Army Surgeon General to continue to maintain the technology program for the Performance Triad administration. At this time, the current project has a no cost extension (NCE) in place through September 2017. The H.E.A.L.T.H. technology is being maintained for the Performance Triad program at this time and current collaboration has begun with ARMYFIT to possibly link the ARMYFIT platform to Army H.E.A.L.T.H.

## Key Research Accomplishments

- The Smartphone application was reconfigured to a more sophisticated and user friendly design.
- The H.E.A.L.T.H. website program was promoted to the LANG Soldiers at drill, pre-mobilization training, Family Day, SRP, State Family Workshops and YRT events.
- To date, 3,125 Soldiers and 317 civilians have enrolled in the H.E.A.L.T.H. program in the LANG population.
- The Army H.E.A.L.T.H. website was significantly updated for the Triad field test and Army-wide distribution as a part of the Performance Triad program.
- Dr. Tiffany Stewart, Principal Investigator, traveled to the *3<sup>rd</sup> International Soldiers' Physical Performance Conference*, August, 18-21, 2014, Boston, MA, to present preliminary project results on LANG H.E.A.L.T.H, as well as to provide a project update with select members of the executive committee.
- Dr. Tiffany Stewart, Principal Investigator, traveled to Aberdeen Proving Ground (September 2-5, 2014) for a meeting with the Army Surgeon General team to discuss the future of the Army H.E.A.L.T.H. technology as it relates to the Performance Triad application/program.
- Dr. Tiffany Stewart and project manager Michael Switzer traveled to Falls Church, VA (May 18<sup>th</sup> -19<sup>th</sup> 2015) to attend the FY 15 Technology Workshop to continue our relationship with the Army Surgeon General team on further development of weigh management technology for Soldiers. Dr. Stewart gave an oral brief on Army H.E.A.L.T.H. that has since resulted in a collaboration with ARMYFIT.
- Discussions are currently in progress to possibly develop a partnership of the Army H.E.A.L.T.H. platform with the ARMYFIT platform to best serve Soldiers' and Military families with weight management resources. More updates on the planning of this partnership to come.

## Reportable Outcomes

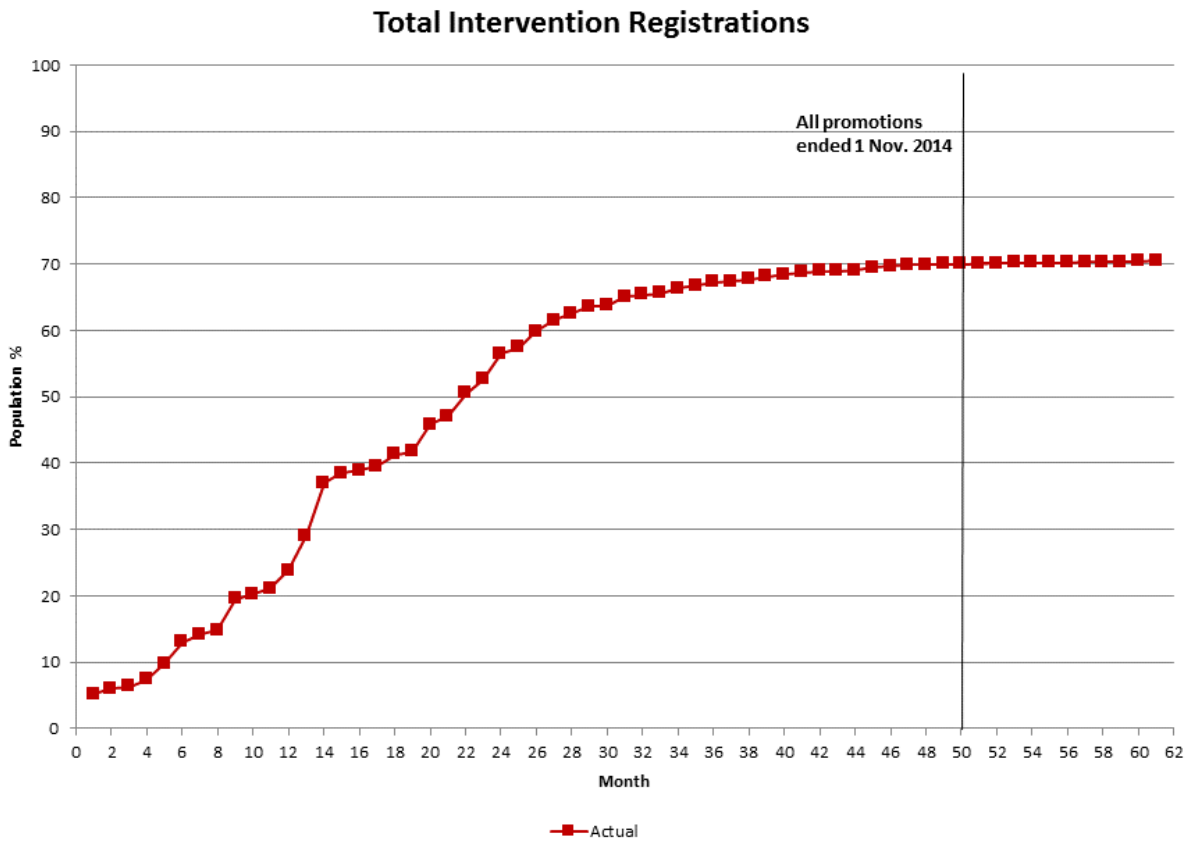
1. Stewart, T.M. Nutrition tracking devices: A Review. An invited presentation given at an invited work group session for the U.S. Army Surgeon General workgroup -the U.S. Military Telemedicine and Advanced Technology Research Center (TATRC), *Leveraging Technology to Create and Sustain Change*, Ft. Detrick, MD, May, 2013.
2. Stewart, T.M. Army H.E.A.L.T.H.: Exceeding the Standards. An invited presentation given at the *Soldier Medical Readiness Seminar*, June 21, 2014.
3. Teyhen, D.S., McClain, J., Stewart, T.M., Neal, D.N., Thorndike, F., Aldag, M., Edinborough, E., Levine, B., Ghanadian, J., Kinn, J., Parramore, D., Trabosh, V., Haught, A., & Kunkler, K. (2014). Leveraging technology: Creating & sustaining changes for health, *Telemedicine and e-Health*, 20, 9, 835-849. PMID: 24978152
4. Stewart, T.M. H.E.A.L.T.H. Update: Moving Beyond the Standards. An invited presentation given at the *U.S. Army Surgeon General's Task Force Update Meeting*, Washington, DC, May 2015.
5. Stewart, T.M. Army H.E.A.L.T.H. Intensive: An Overview. An invited presentation given at the CMD Monthly Commanders Update, Camp Beauregard, LA, October, 2015.

## Supporting Data

### Intervention Website Usage Data: Preliminary Report

The H.E.A.L.T.H. website has been available to the Soldiers and families of the LANG since April 1, 2010. To date, 3117 (90%) Soldiers and 315 (10%) civilians have registered on the H.E.A.L.T.H. website. Figure 1 illustrates the cumulative enrollment on the LANG H.E.A.L.T.H. website since its launch. The end of the active promotion period is indicated with a solid black line. Activity (new registrations) after this period is without that assistance of an active promotion. It is evident that the promotions program was useful in prompting website enrollment as after the promotion program ended, use of the website program stalled as expected.

**Figure 1: H.E.A.L.T.H. Website Enrollment**

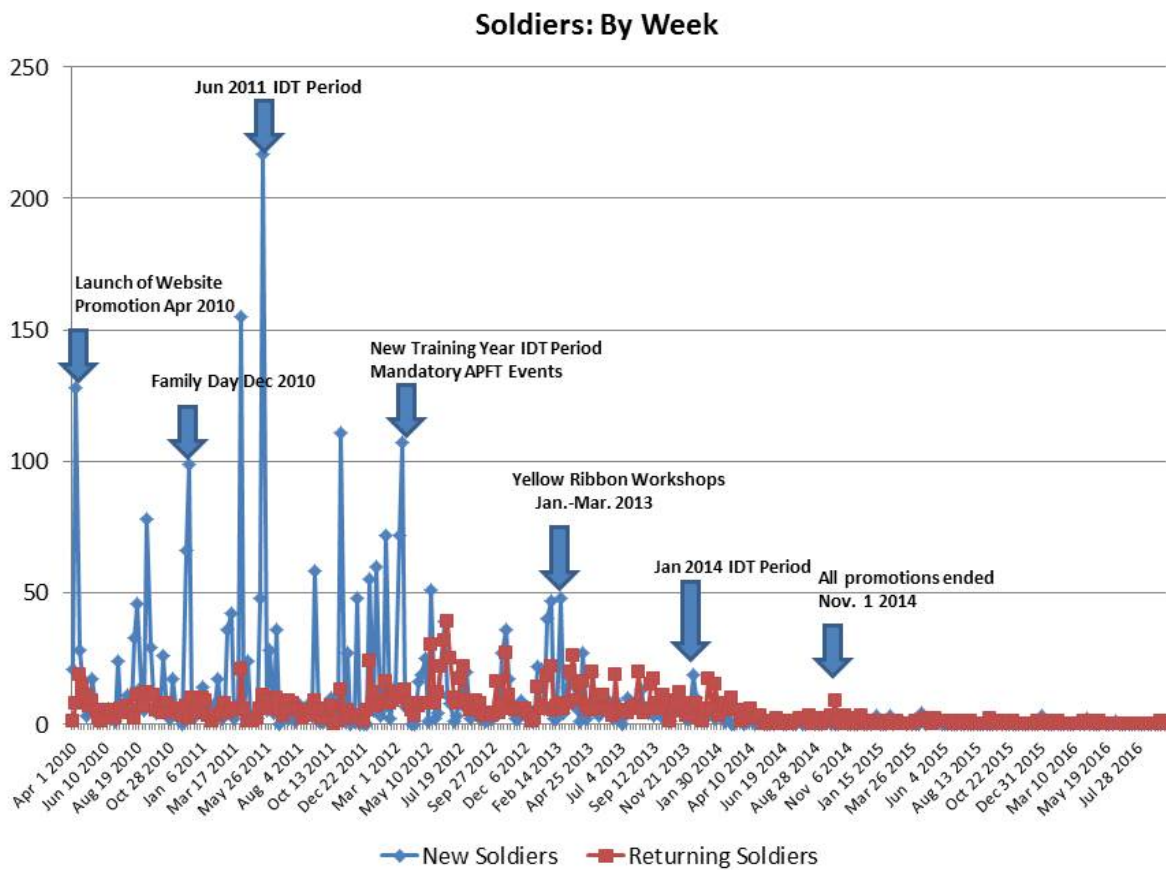


This study has been operationally affected as a result of missions to Afghanistan, including the deployment of the project manager, Michael Switzer. Mr. Switzer returned in September, 2014 to resume his position at PBRC on the LANG project. Further, project manager, Paul Mounts was retained on Active Duty in Sep 2013 upon return from his deployment and now serves in a part-time consultant role at PBRC. Despite these missions directly impacting the rate of registration in the H.E.A.L.T.H. program (possibly slowing the rate of registrations), we have made significant progress in enrollment of Soldiers and their families on the H.E.A.L.T.H. website, and we have continued to see increased enrollment. That said, as the population has been saturated with information about the program over time, we are beginning to see registration rates slow down. That trend is to be expected at this point and the majority of promotion efforts at this point in the project are focused on getting users to remain engaged with the program, e.g. use the program on a somewhat regular basis (minority of users), versus registering on the program and never returning (majority of users). This is similar to other trials of this nature in civilian technology programs for weight management. Also, enrollment and use in target groups (overweight) are more likely than non-target groups. In addition, users experience utilization fatigue over time and typically use the tool on a non-regular basis over time, particularly as environment saturation goes up and the promotion program and rewards wind down.

Figure 2 shows the association between promotion events and enrollment and return usage of the H.E.A.L.T.H. program. As seen in Figure 2, the largest increases in participant registration are associated with drill weekends. Over the years, the majority of new registrations as well as return users to the website have occurred during the events scheduled by PBRC Field Managers on a monthly scheduled, drill weekend. In addition to drill weekends, there has been increased registration during specific events such as an SRP (Soldier Readiness Processing)

event or YRT (Yellow Ribbon Training) events. These additional events have allowed for more face time for our Field Managers in presenting the website program both to the Active Guard and Reserve (AGR) unit staff and traditional Soldiers. That said, use of completely anonymous (no contact with counselors, no direct feedback from program via email, etc.), automated feedback based programs is expected to be somewhat low as compared with technology and/or clinic programs with higher rates of in person or email contact by counselors.

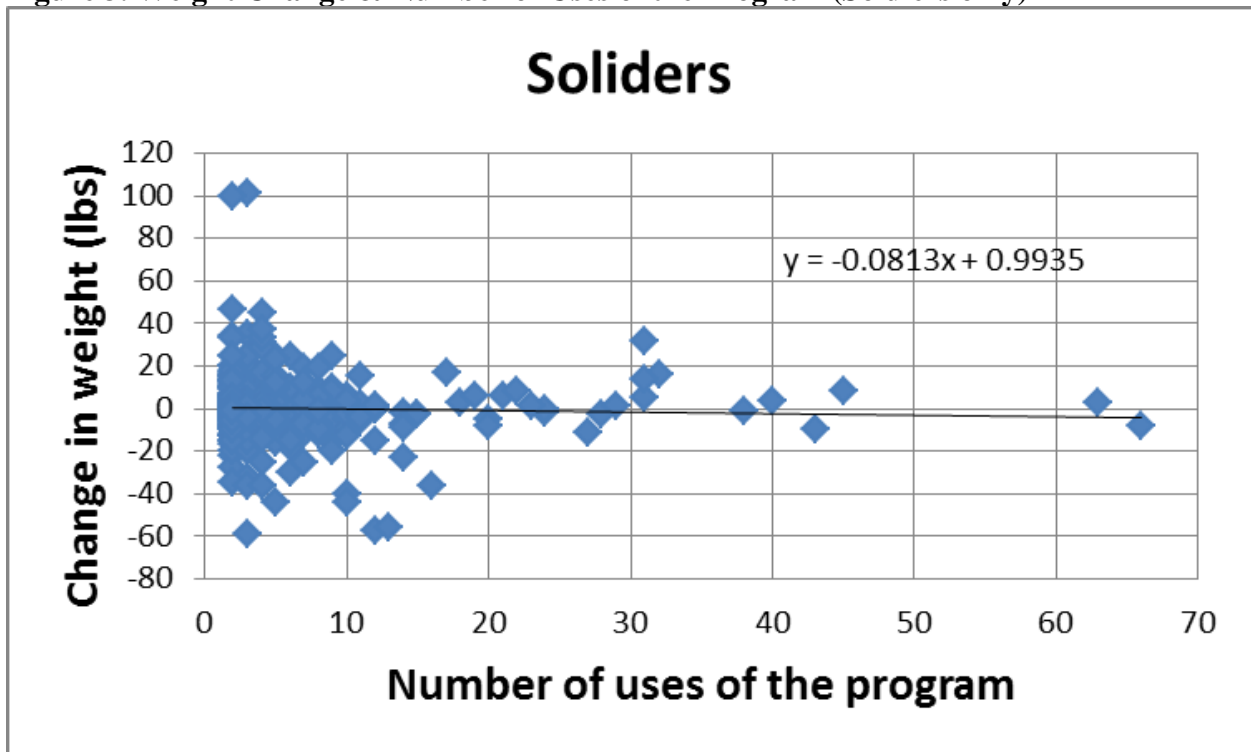
**Figure 2: H.E.A.L.T.H. Website Soldier Registrations by Week**





Figures 3 and 4 depict change in weight related to the number of days of use of the website program for Soldiers. Overall, there was a downward trend in weight with higher use of the program.

**Figure 3. Weight Change & Number of Uses of the Program (Soldiers only)**



**Figure 4. Weight Change (%) & Number of Uses of the Program (Soldiers only)**

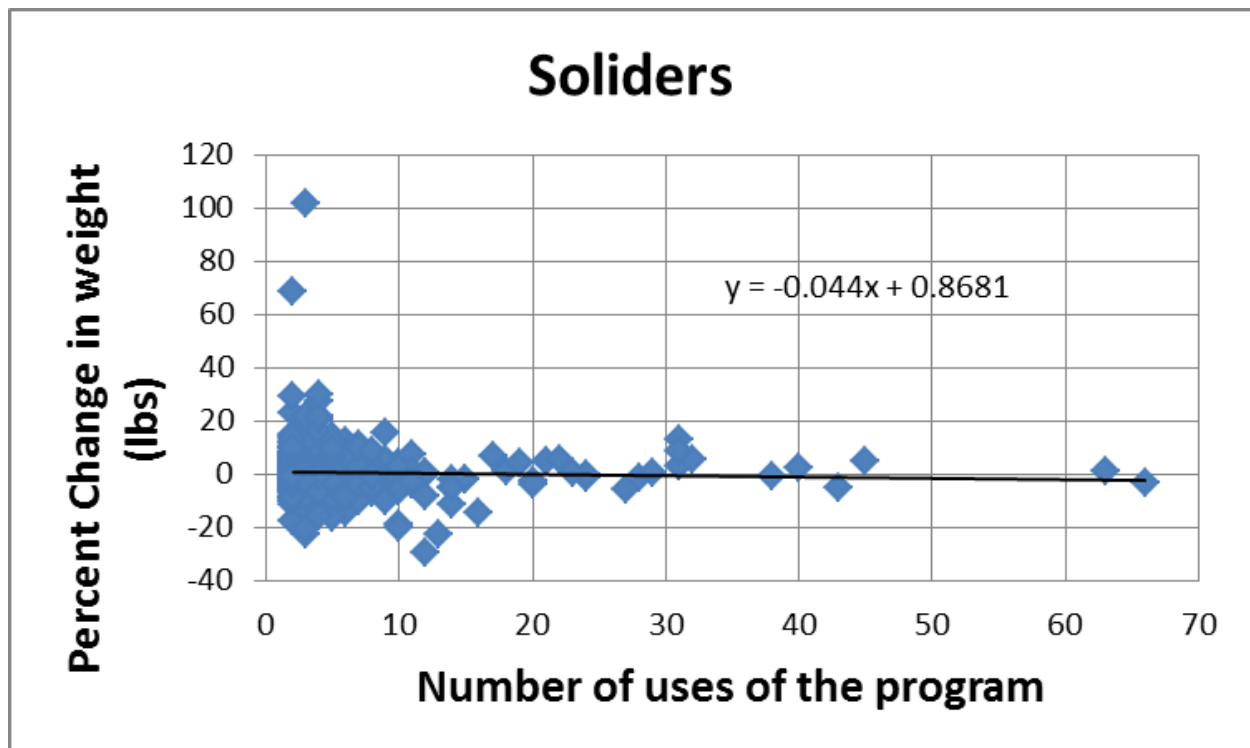


Table 1 describes the demographics of the participants from the website in the LANG study.

**Table 1. LANG Website User Demographic Data**

		Soldier		Civilian	
		n	Mean (sd)	n	Mean (sd)
Age	Male	2203	28.9 (8.7)	60	26.1 (6.5)
	Female	702	27.4 (7.7)	23	25.5(7.1)
BMI	Male	2181	27.7 (4.6)	60	26.7 (4.5)
	Female	693	25.8 (4.4)	23	23.0 (3.1)
		n	Percent	n	Percent
Race	Caucasian	1855	63.8%	49	59.0%
	African American	872	30.0%	30	36.1%
	Other	181	6.2%	4	4.8%
Years in Military	Less than 5	1305	44.9%		
	5 to 10	697	24.0%		
	More than 10	905	31.1%		

Table 2 and 3 depict preliminary data analyses for change in weight related to participants who met a 5 % weight loss goal based on weight records entered through the course of the study.

**Table 2. User Type (frequency) and Weight Loss: Target Population**

	Anytime weight loss to start weight	
	Met 5% weight loss goal? – Target	
	Yes	No
Low use (n = 227)	13 (5.7%) <sup>a</sup>	214
Medium use (n = 191)	33 (17.3%) <sup>b</sup>	158
High use (n = 45)	21 (46.7%) <sup>c</sup>	24
Total (n = 463)	67	396

Note: Low use= 2 weight records entered; medium use= 3–9 weight records entered; high use= ≥10 times; Target population: BMI>23.5

**Table 3. User Type & Weight Loss: All Users**

	Anytime to Start time		At the end of Study to Start	
	Met 5% weight loss goal?		Met 5% weight loss goal?	
	Yes	No	Yes	No
Low use (n = 285)	18 (6.3%) <sup>a</sup>	267	18 (6.3%) <sup>a</sup>	267
Medium use (n = 234)	35 (15.0%) <sup>b</sup>	199	30 (12.8%) <sup>b</sup>	204
High use (n = 54)	22 (40.74%) <sup>c</sup>	32	10 (18.5%) <sup>c</sup>	44
<b>Total (n = 573)</b>	75	498	58	515

Table 3: Low use= 2 weight records entered; medium use= 3–9 weight records entered; high use= ≥10 times

Besides the frequency of use, other variables that may affect weight change were also examined. These variables included initial weight deviation (starting weight-screening weight), gender, race, age, enlisted/officer status, smoking status and combat status. Tables 4 and 5 show preliminary linear model regression analyses on weight change(%) on both all users as well as the subgroup of medium and high users. These tables indicate that initial weight deviation has a significant impact on percent weight change; as initial weight deviation increases, so does weight change (%).

**Table 4. Regression on Weight change (%): (N = 573, all users)**

	Standard Beta	P - value	R <sup>2</sup>
Frequency of Use (# of weight entries)	-0.05	0.28	0.002
Initial Weight Deviation (weight – screening weight)	0.06	<.001	0.05
Gender, Race, Age, Enlisted, Smoker, combat status	-1.7, to 1.4	0.02 to 0.83	0.023

Note: Weight change (%) definition:  
 $100 * (\text{weight at last entry} - \text{start weight}) / \text{start weight}$

**Table 5. Regression on Weight change (%)**  
**(N = 288, medium and high users)**

	Standard Beta	P - value	<sup>2</sup> R
Frequency of Use (# of weight entries)	-0.05	0.46	0.002
Initial Weight Deviation (weight – screening weight)	0.09	<.001	0.08
Gender, Race, Age, Enlisted, Smoker, combat status	-2.2, to 2.8	0.06 to 0.87	0.06

Note: Weight change (%) definition:  
 $100 * (\text{weight at last entry} - \text{start weight}) / \text{start weight}$

## Key Lessons

Key Lessons to date indicate:

- Novel interventions are needed to promote healthy body weight/fatness, physical performance, and personnel readiness among military personnel.
- Soldiers will use mobile intervention for prevention of weight gain and/or weight management.
- An environmental promotion program is necessary to promote utilization of the website and mobile tools.
- Preliminary results suggest that sustained use of a mobile intervention may provide weight loss in Soldiers and Civilians and/or prevent unwanted weight gain.
- Implementation of a mobile program needs to receive support from the command structure and medical services to maximize impact in the military population.
- In three populations (Active Duty, Reserves, National Guard) it has been demonstrated that H.E.A.L.T.H. is a beneficial tool for those who use it on a regular basis.
- Preliminary analyses of the LANG population reveal:
  - Overall, the target population logged on more frequently.
  - The nutrition planner was the most utilized tool on the website.
  - Individuals who used the website more frequently over time lost more weight.
  - Overall, users were satisfied with the website.
  - Individuals continued to log on after promotion period but at a significantly lower rate

## Conclusions (Summary)

1. Overall Progress: Progress has been made in the development of new applications for the H.E.A.L.T.H. website and promotion of the website to Soldiers. The website will continue to be a dynamically updated program, incorporating cutting edge programming in nutrition and fitness, in order to keep the information on the site interesting, useful, current, and personalized for Soldiers and their families.

2. Data: Website data collection is ongoing and up to date and preliminary results are presented in other sections of this report.

3: Future Directions:

- a. Final analysis of data.
- b. Usage observation of the site over the next year of the study (Year 8)
- c. Website and Smartphone application upgrades will continue throughout the duration of the program. We will continue to improve the feature and tools of the website to increase usage and provide the participants with a path to weight loss/maintenance, and improved APFT results.
- d. The website and smartphone application will continue to be upgraded for the Performance Triad program, including plans for an iphone application to be developed, as well as other alterations made per new project funding and plans from the Army Surgeon General's office for the program.
- e. Given preliminary results of the present trial, an Army H.E.A.L.T.H. "Intensive" program is currently being piloted in another study (funded by a different contract) that includes the addition of fitness trackers, smart scales, remote monitoring technologies, remote one to one individual health coaching/counseling and behavioral prompting for weight management in Soldiers and family members. Preliminary

results of the present study are in line with other website based trials for weight management, e.g. more frequency of use, better results, less use with less behavioral prompting, and in general 5% or less weight loss for those who need to lose weight. Further analysis of data will examine weight gain prevention as well.

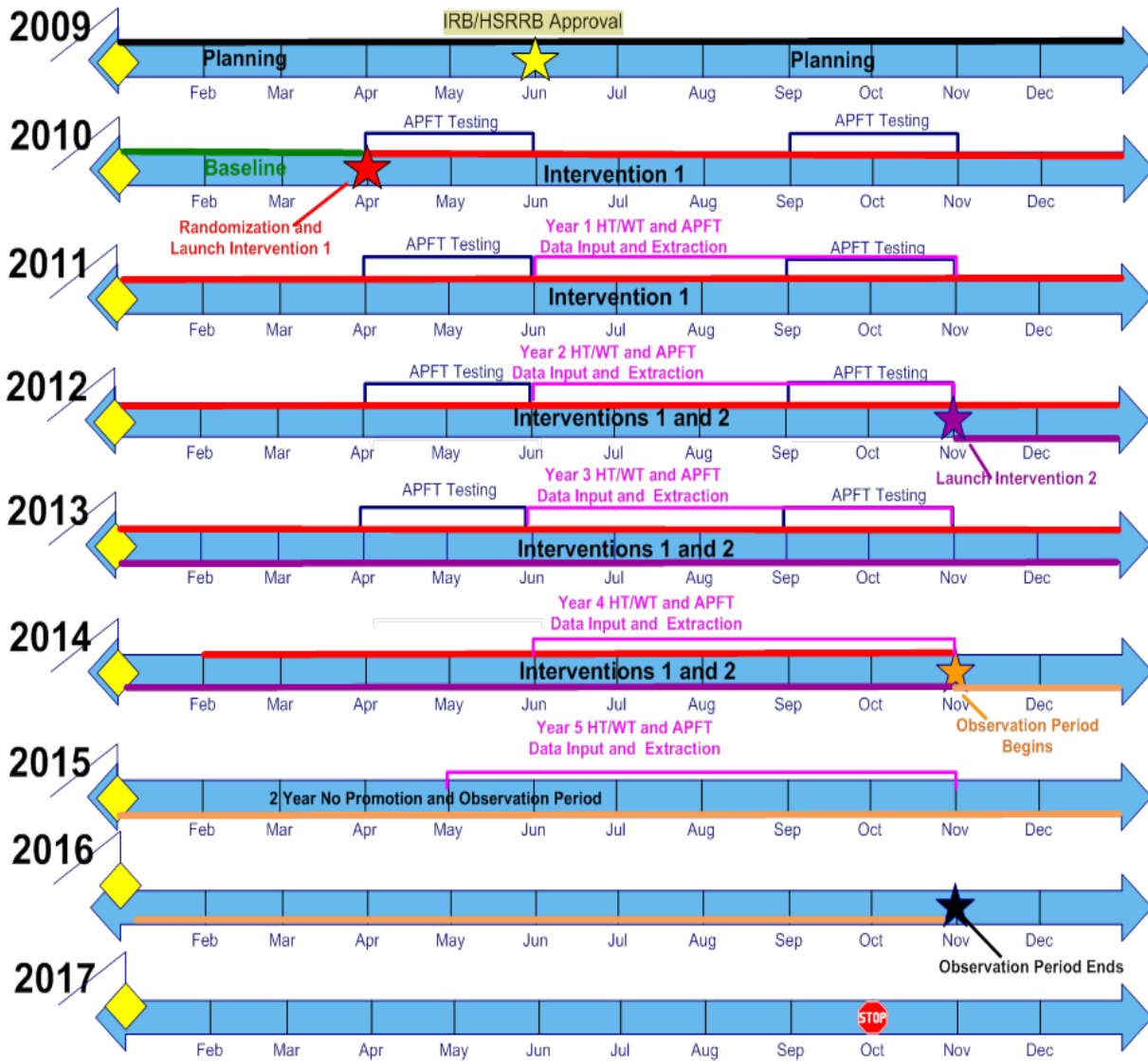
- f. It should be noted that this study has developed and examined a web-based, completely anonymous website portal program for Soldiers for the purposes of achieving/maintaining military standards. That said, other than mass marketing programs/promotion program to increase awareness of the program to potential users, due to the nature of the anonymous/no consent process, we were not able to employ behavioral prompting in this trial, e.g .individual emails, texts, messages to increase use or aid Soldiers in altering habits or reinforcing progress. Based on the literature, we believe that these things directly enhance the frequency of use of the program, thus, promoting improved results. Thus, we have taken these lessons and are currently deploying them in a pilot trial on an “intensive” version of the program used in the present study. Results from the pilot trial will also be utilized to further improve the application for the population in need, i.e. Soldiers, family members, and veterans.
- g. Plans and scope for the Army H.E.A.L.T.H. iphone application will be finalized with the aim to acquire additional funds to complete and maintain the application for the Army.

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# Appendix A Study Timeline



## Appendix B Summary of Travel

2-5 SEP 2014	Surgeon General Workgroup meeting: Performance Triad App 2.0	Tiffany Stewart	-Meeting to plan future of Performance Triad application and the role of Army H.E.A.L.T.H. in application
8 OCT 2014	Monthly Camp Beauregard Meeting	Michael Switzer	Monthly meeting with members of the LANG Executive Committee to discuss project status
5 NOV 2014	Monthly Camp Beauregard Meeting	Michael Switzer	Monthly meeting with members of the LANG Executive Committee to discuss project status
11 APR 2015	Annual Officer Association Conference	Michael Switzer	Meeting with LANG Junior and Senior Officers discussing project status and update
23 APR 2015	Annual Enlisted Association Conference	Michael Switzer	E9 SGM conference to discuss project status and future updates
26-27 APR 2015	Annual Enlisted Association Conference	Michael Switzer	Meeting with LANG Junior and Senior Enlisted Soldiers discussing project status and update
18-19 MAY 2015	Triad Technology Workshop	Tiffany Stewart Michael Switzer	Meeting with Department of Surgeon General Office and Triad to analyze readiness and health data sets for Commanders/Leaders
21 OCT 2015	CMD Monthly Commanders Update Brief	Tiffany Stewart Michael Switzer	Meeting with the Command Leadership of LANG to discuss project status and future directions

\*Note: Travel included for key events in the LANG H.E.A.L.T.H. and the Army H.E.A.L.T.H. project are listed in the table. This table does not include all daily visits to units for promotion purposes as it would be too cumbersome for the purposes of this report.