U.S. Army Public Health Center

Public Health Information Paper

PHIP No. 12-07-0922

Evaluation of Fort Campbell Army Wellness Center Injury Prevention Pilot Program

General Medical: 500A

September 2022

APHC

ACKNOWLEDGMENTS

Numerous collaborators at APHC and Fort Campbell, Kentucky (FCKY), supported this project. At APHC, collaboration occurred across Directorates, with the following four sections involved: Injury Prevention Branch (Clinical Public Health and Epidemiology (CPHE) Directorate); Public Health Assessment Division (Health Promotion and Wellness (HPW) Directorate); Army Wellness Center (AWC) Operations Division (HPW Directorate); and Health Promotion Operations Division (HPW Directorate). Collaborators at FCKY included the FCKY Commander's Ready and Resilient Council (CR2C), the FCKY AWC, and the 101st Airborne (ABN) Division.

The authors would like to specifically acknowledge the following APHC and FCKY staff, whose contributions were necessary to evaluate this unique project and partnership:

Mr. John Resta, whose conversations with the 101st ABN Commander initiated the project.

Mr. Todd Hoover, who oversaw initial coordination.

Dr. Omar Rivera, who co-authored the project plan and maintained communication and coordination with the FCKY Community Ready and Resilient Integrator (CR2I) and FCKY AWC.

Dr. Theresa Jackson Santo, who provided oversight and guidance for interpretation of results.

Dr. Patricia Erickson who managed, analyzed, and interpreted data for injury and fitness outcomes.

Ms. Catherine Rappole, who collected roster and medical data, and prepared data for analysis.

Ms. Tiffany Simms, the FCKY CR2I, who maintained essential communication and coordination between the FCKY CR2C, FCKY AWC, and 101st ABN Division.

Ms. Jheri Godfrey, who oversaw recruitment of 3rd Brigade (3BDE) Soldiers to the FCKY AWC and AWC assessments, and offered recommendations for implementation of future similar projects.

MAJ Kimberley Maxwell, the 3BDE Surgeon who created the unit orders, coordinated with 3BDE staff, and obtained the data necessary to identify Soldiers meeting the criteria for referral to the FCKY AWC.

MAJ Jodi Krippel, 3BDE, ensured that required roster information was communicated.

Ms. Mimi Eng, who assisted with preparation of this final documentation of evaluation results.

REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From – To)*
10 August 2022	Final	September 2018 – March 2021

Evaluation of the Fort Campbell Army Wellness Center Injury Prevention Pilot Program (PHIP No. 12-07-0922)	**5a. CONTRACT NUMBER** n/a **5b. GRANT NUMBER** n/a **5c. PROGRAM ELEMENT NUMBER** n/a
6. AUTHOR(S) Michelle Canham-Chervak, Stephanie Gomez, Christina Via, Anna Schuh-Renner, Bonnie Taylor, Michael Jarka, Bruce H. Jones	**5d. PROJECT NUMBER** S.0057864 **5e. TASK NUMBER** n/a **5f. WORK UNIT NUMBER** n/a
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Public Health Center, Aberdeen Proving Ground, Maryland 21010	**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Public Health Center, Aberdeen Proving Ground, Maryland 21010	**10. SPONSOR/MONITOR'S ACRONYM(S)** **11. SPONSOR/MONITOR'S REPORT NUMBER(S)**

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for Public Release/Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

This information paper documents a U.S. Army Public Health Center (APHC) pilot program with Soldiers in the 101st Airborne (ABN) Division at Fort Campbell, Kentucky (FCKY). The objective was to test a program to reduce modifiable risk factors for musculoskeletal (MSK) injuries and the incidence of MSK injuries by leveraging existing on-site health promotion services available at the FCKY Army Wellness Center (AWC). Data-driven referral guidelines were developed, focusing on two factors routinely associated with higher injury risk in military populations: low aerobic fitness and high or low body fat. The 3rd Brigade (3BDE), 101st ABN Division identified and referred Soldiers meeting the recommended 2-mile run time criteria of ≥15:30 minutes (males) or ≥19:00 minutes (females). Referrals occurred February 2019 through August 2019, the pilot was discontinued in December 2019 due to unit operational tempo, and AWC and injury metrics were assessed after 9 months (May 2020). Results indicated that approximately 14% of 3BDE Soldiers (*n*=534) met the 2-mile run time criteria and were not currently injured or on profile. Of the 324 Soldiers ultimately eligible for the pilot, 19.1% (*n*=62) visited the AWC for the first time; eight other eligible Soldiers were walk-ins. Given the small total number of referrals (*n*=70), improvements in body mass index, 2-mile run time, VO_2 max, or injury rates were not observed within 9 months of implementation. Referral criteria development continued following execution of this project, and further revisions are planned to develop criteria using Army Combat Readiness Test run time results. Injuries continue to be a leading barrier to Soldier medical readiness, and AWCs offer services to modify low aerobic fitness and body composition, leading risk factors for Soldier injury. Execution of a pilot in a larger Soldier population using revised guidelines, and implementation of recommendations from this pilot, is warranted.

15. SUBJECT TERMS:

Army, injuries, injury prevention, health promotion, Army Wellness Center, evaluation

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18.** NUMBER OF PAGES	**19a. NAME OF RESPONSIBLE PERSON**
			Unclassified		Dr. Michelle Chervak, Chief, Injury Prevention Branch
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			**19b. TELEPHONE NUMBER** *(include area code)*
Unclassified	Unclassified	Unclassified			410-436-4312

TABLE OF CONTENTS

Evaluation of Fort Campbell Army Wellness Center
Injury Prevention Pilot Program
PHIP No. 12-07-0922

1. INTRODUCTION

This information paper documents a U.S. Army Public Health Center (APHC) pilot program with Soldiers in the 101st Airborne (ABN) Division at Fort Campbell, Kentucky (FCKY). It was the first program to engage operational units in the utilization of injury risk criteria for identification of Soldiers who would benefit from Army Wellness Center (AWC) services aimed at reducing musculoskeletal (MSK) injury risk factors and the incidence of MSK injuries. The program linked injury prevention science, public health program evaluation, and existing on-site FCKY health promotion assets and infrastructure. Results were intended to inform the Army Enterprise on how injuries and injury risk factors affecting Soldier readiness could be addressed upstream of an injury event by leveraging available health promotion resources.

2. BACKGROUND

MSK injuries affect a large percentage of Active Duty (AD) Soldiers and negatively impact Soldier readiness. In 2019, 55% of AD Soldiers experienced an injury, accounting for over 10 million limited duty days (APHC, 2020). Considering FCKY specifically, a 2016 survey of the 101st ABN Division indicated that 35% of male Soldiers and 42% of female Soldiers experienced an injury in a 1-year period (APHC, 2018).

AWCs (called Armed Forces Wellness Centers (AFWC) at Joint Bases) are readiness platforms that provide healthy behavior change through evidenced-based health education/health coaching and advanced fitness testing technology for Soldiers, Family members, Retirees, and Department of the Army Civilians. The AWC/AFWC services have been shown to positively influence health behaviors and outcomes (Rivera et al., 2018).

This pilot program was requested by the Commanding General of FCKY's 101st ABN Division in May 2018, with an effort to prevent Soldier MSK injuries and was directed by a tasker from the U.S. Army Medical Command to APHC (#16248). The goal was to leverage existing health promotion assets and infrastructure located on FCKY to impact readiness positively through assessments of injury risk factors and injury reduction. The pilot program was conducted from September 2018 through March 2021.

3. PROJECT EXECUTION

The APHC Public Health Review Board approved this project (#18-666) as public health practice in September 2018. A Memorandum of Agreement between the APHC and 101st ABN Division was finalized in January 2019.

The APHC first created referral guidelines that would be used to identify Soldiers at high risk for MSK injury and would most likely benefit from referral to AWC services. The APHC Injury Prevention Branch conducted sensitivity and specificity analyses on survey data collected from an airborne division (*n*=6,496). The analyses focused on two modifiable factors routinely associated with higher injury risk in military populations: low aerobic fitness and high or low body fat (Jones et al., 2017; Jones, Hauschild, and Canham-Chervak, 2018). Actionable guidelines were developed to allow leaders to identify and refer Soldiers who would benefit from

AWC services aimed at improving aerobic fitness and body composition (APHC, 2021b). Analyses included the following data elements: Soldier height, weight, sex, injury prevalence, and Army Physical Fitness Test (APFT) run time. Due to physiological differences between sexes, analyses were conducted separately for men and women. The guidelines were then validated using survey data collected from an infantry division (*n*=10,984). The resulting MSK injury referral guidelines identified Soldiers with an APFT 2-mile run time greater than 15:30 minutes (males) or greater than 19:00 minutes (females) as being at higher risk for MSK injury (APHC, 2021b). For the pilot, since AWCs offer prevention, not treatment services, a second criteria for AWC referral was that the Soldier could not be on an injury profile.

The APHC worked with the FCKY Commander's Ready and Resilient Integrator (CR2I) to communicate the referral guidelines to 101st ABN Division commanders. Based on training schedules, the 3rd Brigade (3BDE) was selected for participation. The CR2I then worked with the 3BDE Training Office to draft a Tasking Order directing—

- All Battalion (BN) training officers or delegates to ensure that all 2018 fall/winter APFTs were completed and event data were uploaded into the Data Training Management System (DTMS) by 20 December 2018, and
- All BN training officers or delegates to provide rosters of Soldiers by name who met the AWC referral guidelines to the 3BDE Surgeon's Office.

The 3BDE Surgeon's Office used e-Profile to review the rosters and identify Soldiers who were on an injury profile. Soldiers currently on profile, given ongoing injury treatment and rehabilitation, were not eligible for AWC referral. Rosters were then provided to FCKY AWC health educators, who were responsible for contacting all eligible Soldiers to schedule AWC appointments. Participation was voluntary, but encouraged by leadership. The AWC enrollment period was 19 February to 31 August 2019. Unit rosters indicating those who met referral guidelines (run time and profile criteria) were shared with APHC to define participant, eligible non-participant, and non-eligible non-participant groups for injury rate comparisons.

Upon visiting the FCKY AWC, health educators provided primary prevention services to address known MSK injury risk factors, including low estimated VO_2 maximum (ARIEM, 1984), high or low body mass index, low physical activity level, and inadequate sleep. It was anticipated that Soldiers who met the referral guidelines and utilized AWC services would experience improvements in MSK injury risk factors and decreases in the incidence of MSK injuries.

Rosters were obtained monthly from 3BDE. If a Soldier was within the 3BDE during the enrollment period (February to August 2019), they were included in the analyses.

Ongoing pilot coordination with 3BDE, 101st ABN Division ended in December 2019. They were unable to support continuation of the pilot due to tight schedules in all units.

To assess the extent to which participants experienced improvements in MSK injury risk factors, average body mass index, average APFT 2-mile run time, and VO_2 max were assessed at participants' initial and first follow-up AWC visits. Due to small sample sizes and low follow-up rates, comparative analyses could not be computed.

To assess changes in injury incidence, three timeframes of interest were considered: Pre-implementation (01 May 2018–31 January 2019), program enrollment (19 February 2019–31 August 2019), and post-implementation (01 September 2019–31 May 2020). MSK injury rates (# MSK injuries/person-months) for pre-implementation and post-implementation

timeframes were compared using a repeated measure Poisson regression (p<0.05 indicating statistical significance). Data on injuries were from the Defense Medical Surveillance System maintained by the Defense Health Agency (DHA) Armed Forces Health Surveillance Division.

4. FINDINGS

An evaluation summary is available in Appendix B. Key findings for each evaluation question were as follows:

1) *To what extent did 101st Soldiers referred for AWC services as part of this project meet injury risk criteria?*
   - About 1 in 7 Soldiers (14.0%, *n*=534) were referred for AWC services because they met the 2-mile run time criteria for MSK injury risk and were not currently injured/on profile.

2) *To what extent did 101st Soldiers who met injury risk criteria utilize AWC services?*
   - Nearly 1 in 5 Soldiers (19.1%, *n*=62) who met injury risk criteria completed an initial AWC visit. Additionally, 8 walk-in Soldiers met injury risk criteria at the initial AWC visit.

3) *Did the percentage of FCKY AWC clients who initially met injury risk criteria increase?*
   - The percentage of FCKY AWC clients who initially met injury risk criteria increased between fiscal year (FY) 2019 quarters (Q) 1 and 2 when AWC referrals began. The percentage of FCKY AWC clients who initially met injury risk criteria remained constant between FY19Q2 and FY19Q4, when AWC referrals continued for the pilot. Due to small sample sizes, results should be interpreted with caution.

4) *To what extent did 101st Soldiers who met injury risk criteria and utilized AWC services experience improvements in MSK injury risk factors?*
   - Of the 70 Soldiers who utilized AWC services for MSK injury risk factors, a small proportion (11-49%; varied by AWC service type) followed-up with the AWC. Due to small sample sizes, comparative analyses could not be conducted to determine improvements.
   - Given the limited data, notable improvements in body mass index, APFT 2-mile run time, and VO_2 maximum were not observed between referred Soldiers' initial AWC visit and their first follow-up. Due to small sample sizes, results should be interpreted with caution.

5) *To what extent did 101st Soldiers who met injury risk criteria and utilized AWC services experience a change in MSK injury incidence?*
   - The difference in participants' pre- and post-implementation injury rates was not statistically significant. The small sample size limited the pilot study's ability to detect a potential significant difference in injury rates.

6) *How did MSK injury incidence compare between 101st Soldiers who met injury risk criteria and utilized AWC services, and 101st Soldiers who met injury risk criteria but did not utilize AWC services?*
   - Post-implementation injury rates (September 2019–May 2020)
     - Participants: 11.9 injuries/100 Soldier-months
     - Eligible non-participants: 13.6 injuries/100 Soldier-months
     - Non-eligible non-participants: 12.6 injuries/100 Soldier-months

- Differences in injury rates among participants and non-participants were not statistically significant. Due to small sample sizes, results should be interpreted with caution.

5. CONCLUSIONS

Due to low participation rates in the FCKY 101st ABN Injury Prevention Pilot, the effects of AWC referral on MSK injury could not be determined.

Referral body composition and run time guideline development continued following execution of this project and are documented in an APHC technical report (APHC, 2021b). Development of criteria using Army Combat Readiness Test (ACFT) run times is planned, in which longer run times have been associated with higher injury risk (APHC, 2021a). Development of revised criteria will occur after the ACFT becomes the test of record (1 October 2022) and sufficient data are available.

Injuries continue to be a leading barrier to Soldier medical readiness, and AWCs/AFWCs offer services to modify low aerobic fitness and body composition, which are leading risk factors for Soldier injury. Execution of a pilot in a larger Soldier population using revised guidelines, and implementation of the recommendations listed above is warranted.

6. RECOMMENDATIONS

The lessons learned from the pilot informed the following recommendations to consider during future implementation of a similar program:

6.1. Planning Phase

- Identify more than one brigade for implementation to obtain sample sizes needed for measurement of desired outcomes and address potential fluctuations in population size, particularly in units that can deploy.
- Select brigades with high likelihood of availability and few anticipated leadership changes.
- Obtain additional outcomes data such as MSK profiles and ACFT performance, when possible.
- Confirm current contact information for Soldiers.
- Keep Brigade Surgeon as primary point of contact for referral list.

6.2 Implementation Phase

- Encourage leadership emphasis with planned communications reiterating command support.
- Plan additional AWC staffing for initial contact, and establish a master roster.
- Consider AWC group assessments with extra equipment on stand-by.
- Lessen time for AWC fitness assessments by pre-programming exercise prescriptions with available data.
- Require VO_2 maximum test for referred Soldiers who visit the AWC; educate on link between aerobic fitness and injury risk.

APPENDIX A

REFERENCES

U.S. Army Public Health Center (APHC). 2018. Technical Report No. S.0048216-16, *Epidemiological Investigation of the Rehabilitation Physical Readiness Training Program Baseline Survey,* by R Brooks, T Grier, E Dinkeloo, Z Solomon, and BH Jones. Aberdeen Proving Ground, Maryland.

APHC. 2020. *2020 Health of the Force Report*. https://phc.amedd.army.mil/topics/campaigns/hof

APHC. 2021a. The Army Combat Fitness Test: Shifting Training Culture, Optimizing Performance, and Identifying Injury Risk. *In: 2021 Health of the Force Report*. https://phc.amedd.army.mil/topics/campaigns/hof

APHC. 2021b. PHIP No. 22-02-0221, *Establishing Army Wellness Center Referral Guidelines for Injury Prevention Based on Aerobic Fitness and Body Composition,* by A Schuh-Renne, BH Jones, L Rivera, and M Canham-Chervak. Aberdeen Proving Ground, Maryland.

U.S. Army Medical Research and Development Command (ARIEM). 1984. Technical Report No. T3/85, *Relationship between the Army Two Mile Run Test and Maximal Oxygen Uptake,* by R Mello, M Murphy, and J Vogel. Fort Detrick, Maryland.

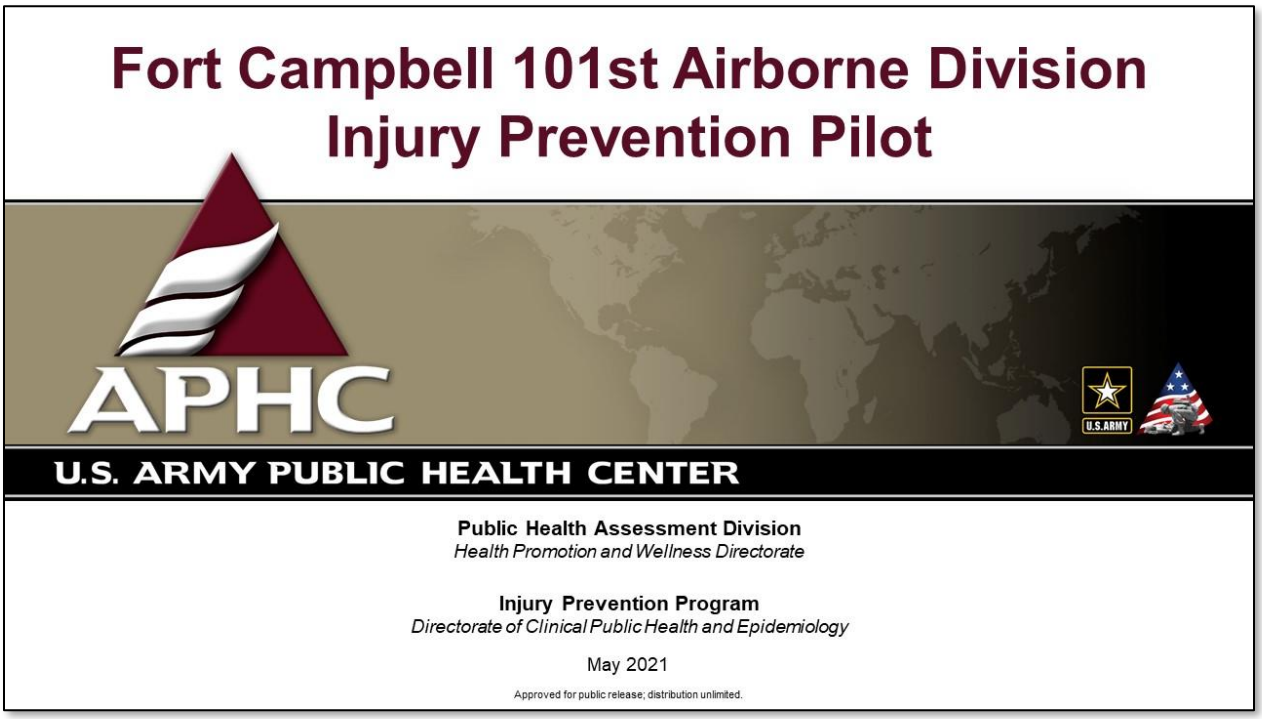
Jones BH, K Hauret, S Dye, V Hauschild, S Rossi, M Richardson, and K Friedl. 2017. “Impact of physical fitness and body composition on injury risk among active young adults: A study of Army trainees.” *J Sci Med Sport* 20(Suppl 4):S17-22. doi: 10.1016/j.jsams.2017.09.015

Jones BH, VD Hauschild, and M Canham-Chervak. 2018. “Musculoskeletal training injury prevention in the U.S. Army: Evolution of the science and the public health approach.” *J Sci Med Sport* 21(11):1139-1146. doi: 10.1016/j.jsams.2018.02.011

Rivera L, J Ford, M Hartzell, and T Hoover. 2018. “An evaluation of Army Wellness Center clients’ health-related outcomes.” *Am J Health Promot* 32(7):1526-1536. doi: 10.1177/0890117117753184

APPENDIX B

BRIEFING SLIDES



Disclaimer and Disclosure

Disclaimer: The views expressed in this presentation are those of the author(s) and do not necessarily reflect the official policy of the Department of Defense, Department of the Army, U.S. Army Medical Department or the U.S. Government.

Disclosure: The study presented within this presentation was supported in part by appointments to the Postgraduate Research Participation Program at the U.S. Army Public Health Center administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and APHC.

Purpose and Outline

Purpose: To provide a summary of the Fort Campbell, Kentucky (FCKY) 101st Airborne (ABN) Division Injury Prevention Pilot to the FCKY Army Wellness Center (AWC) and Commander's Ready and Resilient Council (CR2C).

Outline:

- Bottom Line Up Front (BLUF).
- Background.
- Overview of Pilot.
- Methods.
- Results.
- Summary.
- Recommendations.

Bottom Line Up Front

- Due to low participation rates in the FCKY 101st ABN Injury Prevention Pilot, **the effects of AWC referral on musculoskeletal injury could not be determined.**
- The lessons learned from the pilot informed the following recommendations that Fort Campbell **should consider for future injury prevention support**:
  - Identify more than one brigade with high likelihood of availability and no leadership changes.
  - Confirm current contact information for Soldiers.
  - Keep brigade surgeon as primary point of contact for referral list.
  - Encourage leadership emphasis with planned communications reiterating command support.
  - Plan additional Army Wellness Center staffing for initial contact, and establish a master roster.
  - Consider group assessments with extra equipment on stand-by.
  - Lessen time for fitness assessments by pre-programming exercise prescriptions with available data.
  - Require VO_2 maximum test for referred Soldiers; educate on link between aerobic fitness and injury risk.

Background

Why are musculoskeletal (MSK) injuries important to the Army?

- Among Active Duty Soldiers:
  - In 2017, **56%** of Soldiers had a new injury [1]
    - **71%** of all injuries were cumulative micro-traumatic MSK "overuse" injuries [1]
  - From JAN-JUN 2019, MSK injuries were responsible for **59%** of temporary profile days [2]
  - Each year, MSK injuries result in over **10 million** limited duty days (LDD) [3]

Preventing MSK injuries is a priority to promote and maintain Soldier readiness.

[1-3] See References

Background

What are the leading modifiable risk factors associated with MSK injuries?

Low Aerobic Fitness + Poor Body Composition = Increased MSK Injury Risk

Aerobic Fitness

- Slow 2-mile run time
- Low VO_2 maximum

Greater VO_2 maximum is associated with faster 2-mile run time [4] (r = -0.91)

Body Composition

- Low or high body mass index

MSK Injury Risk

- Increased risk of a training-related MSK injury [5]

Background

How does the Army address risk for MSK injuries?

- Utilization of AWC services is associated with improvements in MSK injury and other health- and readiness-related outcomes to include: [6]
  - **Body mass index**
  - **Cardiorespiratory fitness (indexed as VO_2 maximum)**
  - **2-mile run time**
  - Body fat percentage
  - Blood pressure
  - Perceived stress

AWC ARMY WELLNESS CENTER

The AWCs are health promotion assets that help Soldiers address the modifiable MSK risk factors that impact Soldier readiness.

Project Origin

- Fort Campbell, Kentucky (FCKY) 101st ABN requested injury prevention support from the U.S. Army Medical Command (MEDCOM).
  - 101st ABN injuries in past 12 months: 35% (males), 42% (females)
- U.S. Army Public Health Center (APHC) was tasked to execute an injury prevention pilot with the 101st ABN in collaboration with the FCKY AWC.

Overview of Injury Prevention Pilot

Pilot Objectives

1. Identify 101st Soldiers who meet MSK injury risk criteria.
2. Encourage Soldiers who meet criteria to engage in AWC primary prevention services to address injury risk factors.
3. Evaluate pilot processes and outcomes.

Pilot Goal

- To reduce risk factors for MSK injuries, the incidence of MSK injuries, and unit-level MSK profiles among 101st Soldiers by leveraging existing health promotion assets and infrastructure located at FCKY.

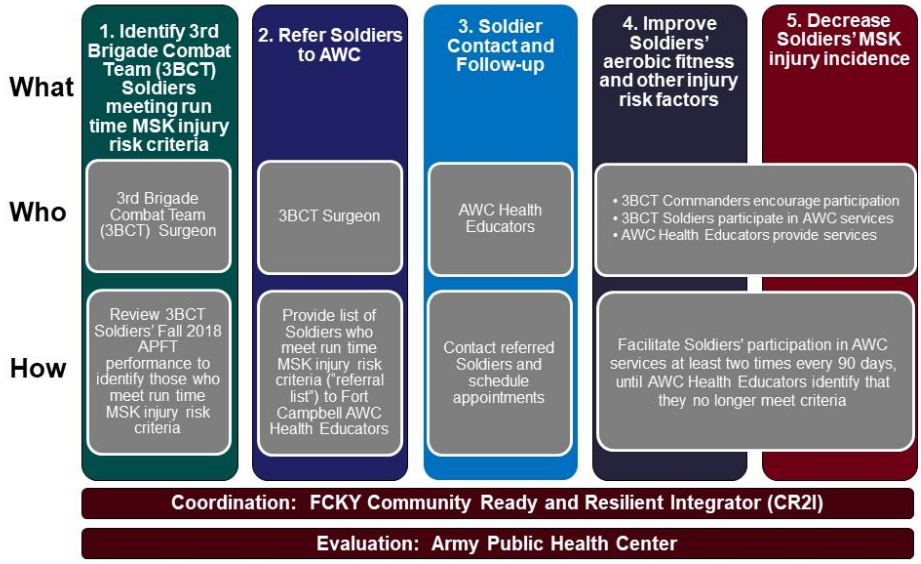
Evaluation Questions

1. To what extent do 101st Soldiers referred for AWC services as part of this project meet injury risk criteria?
2. To what extent do 101st Soldiers who meet injury risk criteria utilize AWC services?
3. Does the percentage of FCKY AWC clients who initially meet injury risk criteria increase?
4. To what extent do 101st Soldiers who meet injury risk criteria and utilize AWC services experience improvements in MSK injury risk factors?
5. To what extent do 101st Soldiers who meet injury risk criteria and utilize AWC services experience a change in MSK injury incidence?
6. How does MSK injury incidence and Army Physical Fitness Test (APFT) performance compare between 101st Soldiers who meet injury risk criteria and utilize AWC services and 101st Soldiers who meet injury risk criteria but do not utilize AWC services?

U.S. Army Public Health Center | Approved for public release; distribution unlimited. | 12

U.S. Army Public Health Center | Approved for public release; distribution unlimited. | 13

Overview: Injury Prevention Pilot



Step 1: Soldier Identification

MSK Injury Risk Criteria Creation

- APHC identified MSK injury risk criteria based on injury incidence, APFT run-time, height, and weight survey data from a sample (n = 6,496) of 101st ABN Soldiers.

Criteria applied per feedback from 3BCT:

1. 2-mile run time	Males	Females
	> 15:30 minutes	> 19:00 minutes
2. Not currently injured or on profile		

MSK Injury Risk Criteria Communication

- APHC worked with and communicated criteria to the FCKY CR2I and 3BCT Surgeon.

Identification of Eligible Soldiers

- 3BCT Surgeon used APFT data uploaded into the Defense Training Management System (DTMS) and e-Profile to identify Soldiers who met the 2-mile run time criteria and were not injured or on profile.

Step 2: Soldier Referral to AWC

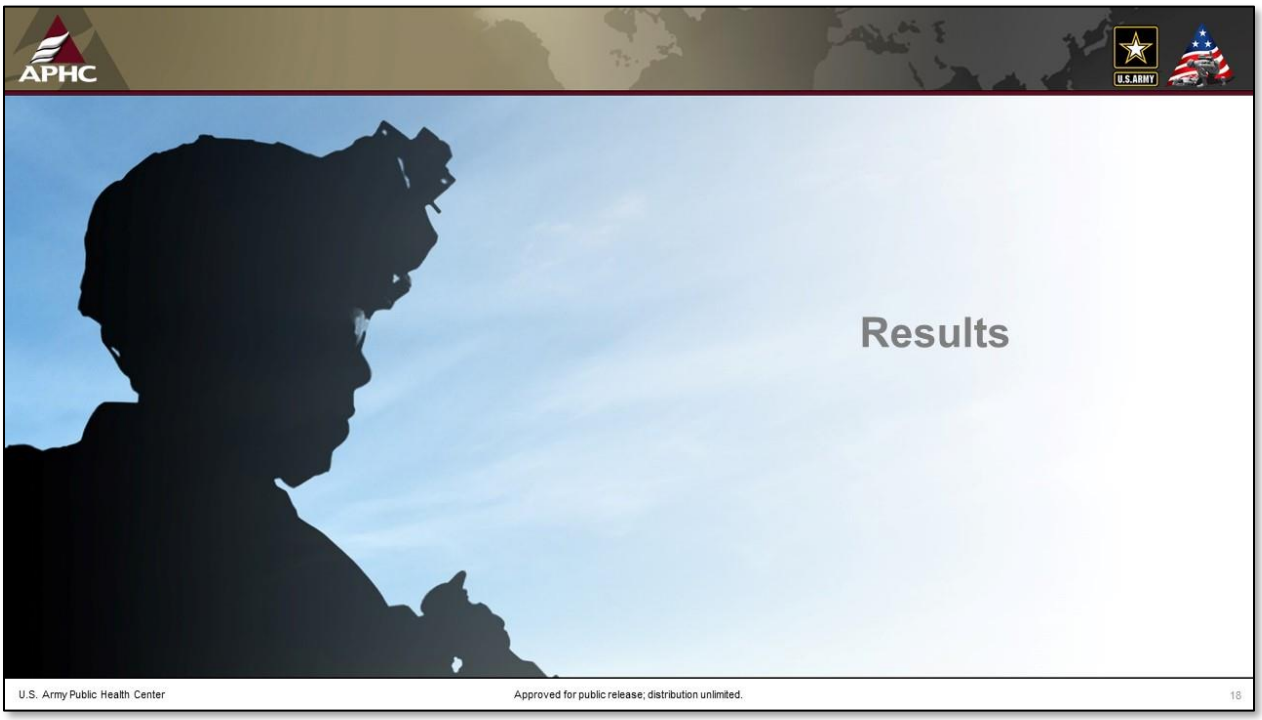
3BCT Surgeon provided referral list of Soldiers who met 2-mile run time criteria and injury/profile criteria to FCKY AWC Health Educators

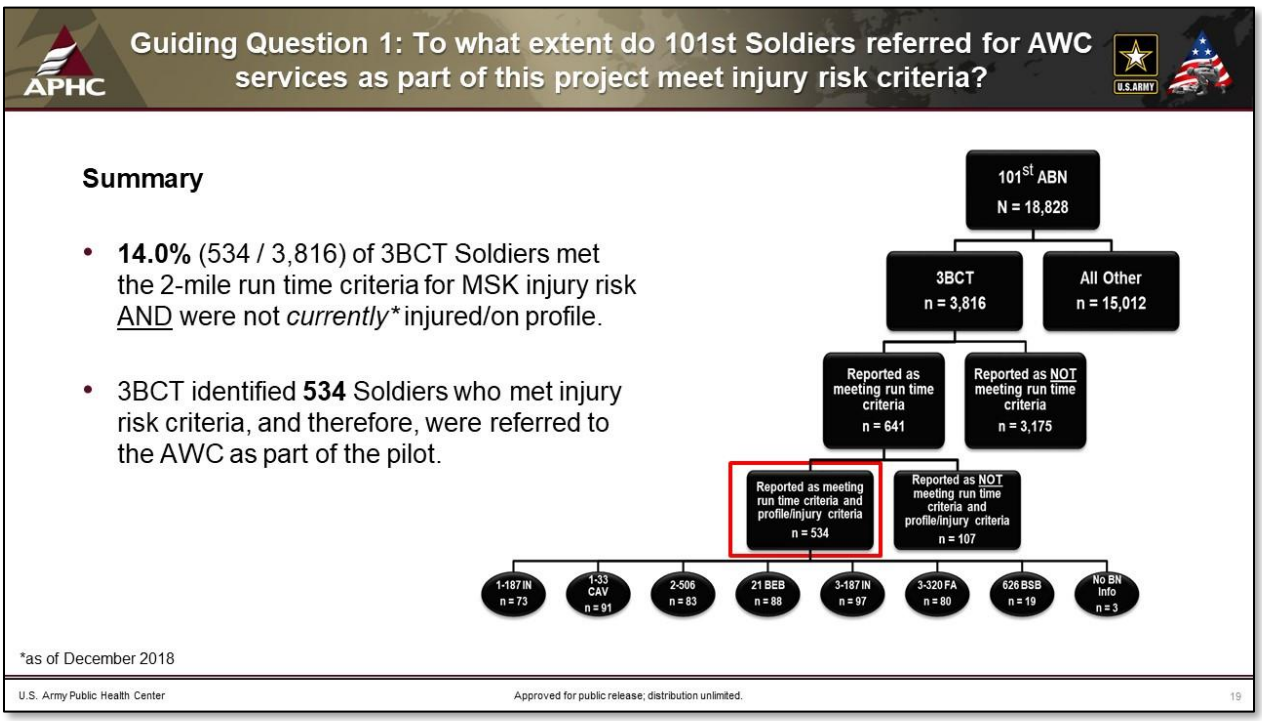
Step 3: Soldier Contact and Follow-up

- AWC Staff contacted Soldiers from 01 FEB 2019 through 31 AUG 2019
- FCKY AWC Director and Health Educators contacted all eligible Soldiers and tracked their status, as follows:

1. **Participated:** Clients who participated in an initial visit.
2. **Did not respond to contact:** Clients who did not answer or return phone calls.
3. **Unable to contact:** Clients with invalid contact information (i.e., wrong phone number).
4. **Declined:** Clients who were contacted and declined/refused to participate.
5. **No longer met criteria:** Clients who went on profile, became a Reservist, or no longer met 2-mile run time criteria.
6. **Permanent Change of Station (PCS):** Clients who experienced a PCS and were assigned to a new location.
7. **Expiration – Term of Service (ETS):** Clients whose current contract expired and were free to leave the military.
8. **No-show:** Clients who scheduled an appointment to participate but did not show-up and did not reschedule.

	n	%
Referred Soldiers	**534**	**100%**
Participated	**74**	**14%**
	n	**%**
Did not respond to contact	169	32%
Unable to contact	119	22%
Declined to participate	65	12%
No longer met criteria	43	8%
PCS	29	5%
ETS	19	4%
No-show for appointment	16	3%

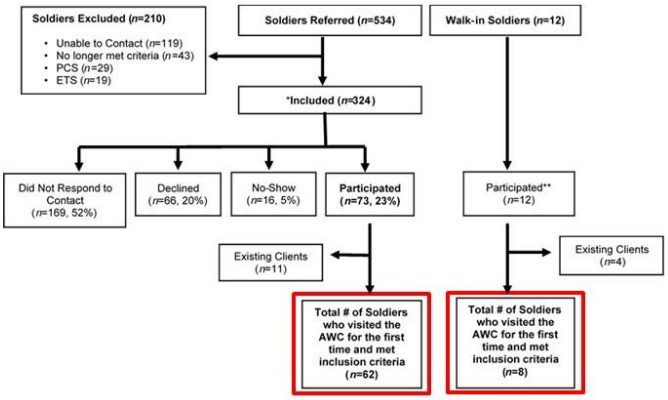

APHC
U.S.ARMY
Results
U.S. Army Public Health Center
Approved for public release; distribution unlimited.
18


APHC
Guiding Question 1: To what extent do 101st Soldiers referred for AWC services as part of this project meet injury risk criteria?
U.S.ARMY
Summary
• 14.0% (534 / 3,816) of 3BCT Soldiers met the 2-mile run time criteria for MSK injury risk AND were not currently* injured/on profile.
• 3BCT identified 534 Soldiers who met injury risk criteria, and therefore, were referred to the AWC as part of the pilot.
101st ABN N = 18,828
3BCT n = 3,816
All Other n = 15,012
Reported as meeting run time criteria n = 641
Reported as NOT meeting run time criteria n = 3,175
Reported as meeting run time criteria and profile/injury criteria n = 534
Reported as NOT meeting run time criteria and profile/injury criteria n = 107
1-187 IN n = 73
1-33 CAV n = 91
2-506 n = 83
21 BEB n = 88
3-187 IN n = 97
3-320 FA n = 80
626 BSB n = 19
No BN Info n = 3
*as of December 2018
U.S. Army Public Health Center
Approved for public release; distribution unlimited.
19

Guiding Question 2: To what extent do 101st Soldiers who meet injury risk criteria utilize AWC services?

Summary

- **19.1%** (*n* = 62) of Soldiers included in the pilot met injury risk criteria ***and*** visited the AWC for the first time.
- Of walk-in Soldiers, **8** Soldiers also met injury risk criteria and visited the AWC for the first time.
- A total of **70 Soldiers met injury risk criteria and visited the AWC for the first time.**

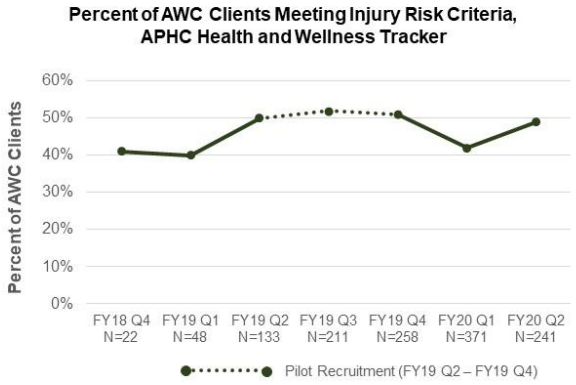


*as of 31 August 2019
**no unit information available

Guiding Question 3: Does the percentage of FCKY AWC clients who initially meet injury risk criteria increase?

Summary

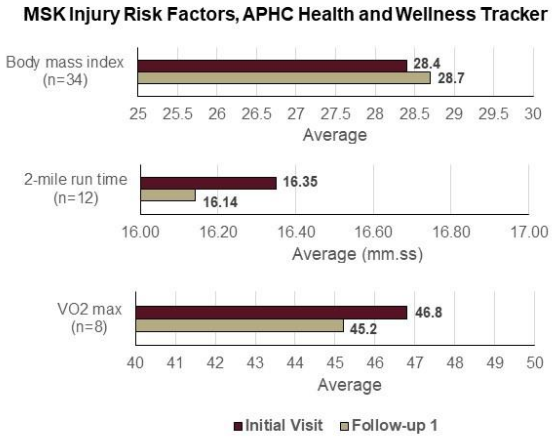
- The percentage of FCKY AWC clients who initially met injury risk criteria **increased between FY19Q1 and FY19Q2** when AWC referrals began.
- The percentage of FCKY AWC clients who initially met injury risk criteria **remained constant between FY19Q2 and FY19Q4** when AWC referrals continued for the pilot.



Guiding Question 4: To what extent do 101st Soldiers who meet injury risk criteria and utilize AWC services experience improvements in MSK injury risk factors?

Summary

- Of the **70 Soldiers** who utilized AWC services for MSK injury risk factors, **a small proportion (11-49%) followed-up with the AWC**.
- Due to small sample sizes, **comparative analyses could not be computed to determine improvements.**
- Given the limited data, **notable improvements in body mass index, 2-mile run time*, and VO_2 maximum were not observed** between referred Soldiers' initial AWC visit and their first follow-up.

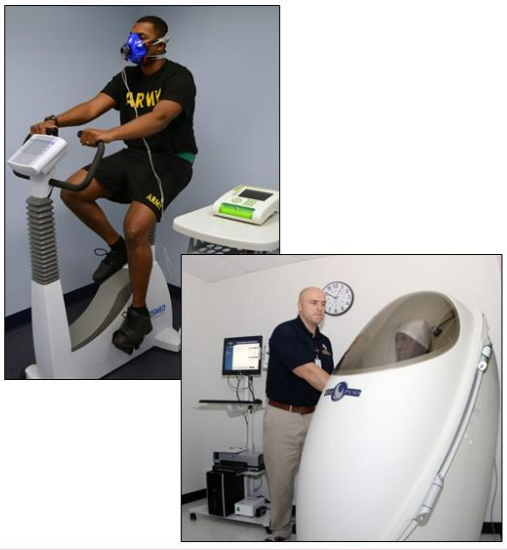


*from the Army Physical Fitness Test (APFT)

Guiding Question 5: To what extent do 101st Soldiers who meet injury risk criteria and utilize AWC services experience a change in MSK injury incidence?

Summary

- Participation injury rates:
  - Pre-implementation: 15.8 injuries/100 Soldier-month*
  - Post-implementation: 11.9 injuries/100 Soldier-month
- **Difference in rates pre- and post- implementation were not statistically significant.****

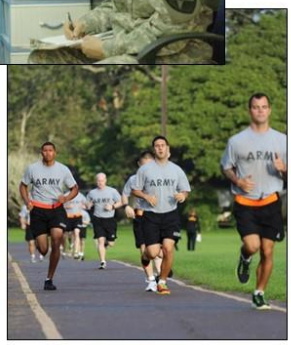


*Negative binomial model: p=0.12, rate ratio=1.33 (0.93, 1.90)
**Due to small sample sizes, results should be interpreted with caution.

Guiding Question 6: How does MSK injury incidence compare between 101st Soldiers who meet injury risk criteria and utilize AWC services and 101st Soldiers who meet injury risk criteria but do not utilize AWC services?

Summary

- **Post-implementation injury rates (SEP 2019 – MAY 2020)**
  - Participants: 11.9 injuries/100 Soldier-month
  - Eligible non-participants: 13.6 injuries/100 Soldier-month*
  - Non-eligible non-participants: 12.6 injuries/100 Soldier-month
- **Difference in rates among participants and non-participants were not statistically significant.****



*Negative binomial models controlling for gender, rank:
p=0.40, rate ratio=1.18 (0.80, 1.75)
p=0.94, rate ratio=0.98 (0.66, 1.47)

**Due to small sample sizes, results should be interpreted with caution.

Pilot Summary

Due to low participation rates, the team was unable to determine the effects of AWC referral on MSK injury. The key findings for each guiding question include the following:

Evaluation Question	Key Findings
1. To what extent do 101st Soldiers referred for AWC services as part of this project meet injury risk criteria?	About 1 in 7 Soldiers (14.0%, n=534) referred for AWC services as part of this project **met the 2-mile run time criteria for MSK injury risk and were not currently injured/on profile.**
2. To what extent do 101st Soldiers who meet injury risk criteria utilize AWC services?	Nearly 1 in 5 Soldiers (19.1%, n=62) included in the pilot **met injury risk criteria and visited the AWC for the first time.** Additionally, **8 walk-in Soldiers met injury risk criteria and visited the AWC for the first time.**
3. Does the percentage of FCKY AWC clients who initially meet injury risk criteria increase?	Yes, the percentage of FCKY AWC clients who initially met injury risk criteria **increased between FY19Q1 and FY19Q2** when AWC referrals began. The percentage of FCKY AWC clients who initially met injury risk criteria **remained constant between FY19Q2 and FY19Q4** when AWC referrals continued for the pilot.*
4. To what extent do 101st Soldiers who meet injury risk criteria and utilize AWC services experience improvements in MSK injury risk factors?	**Notable improvements in body mass index, 2-mile run time, and VO_2 maximum were not observed** between Soldiers' initial AWC visit and their first follow-up.*
5. To what extent do 101st Soldiers who meet injury risk criteria and utilize AWC services experience a change in MSK injury incidence?	The 101st Soldiers who meet injury risk criteria and utilize AWC services **did not experience a change in MSK injury incidence.** Differences in participant injury rates, pre- and post-implementation were not observed.*
6. How does MSK injury incidence compare between 101st Soldiers who meet injury risk criteria and utilize AWC services and 101st Soldiers who meet injury risk criteria but do not utilize AWC services?	**Differences in MSK injury incidence were not observed** between 101st Soldiers who meet injury risk criteria and utilize AWC services and 101st Soldiers who meet injury risk criteria but do not utilize AWC services.*

*Due to small sample sizes, results should be interpreted with caution.

Recommendations based on Lessons Learned

Planning phase

- Identify more than one brigade for implementation.
- Select brigades with high likelihood of availability and no leadership changes.
- Have unit confirm current contact information for Soldiers.
- Keep brigade surgeon as primary POC for referral list.

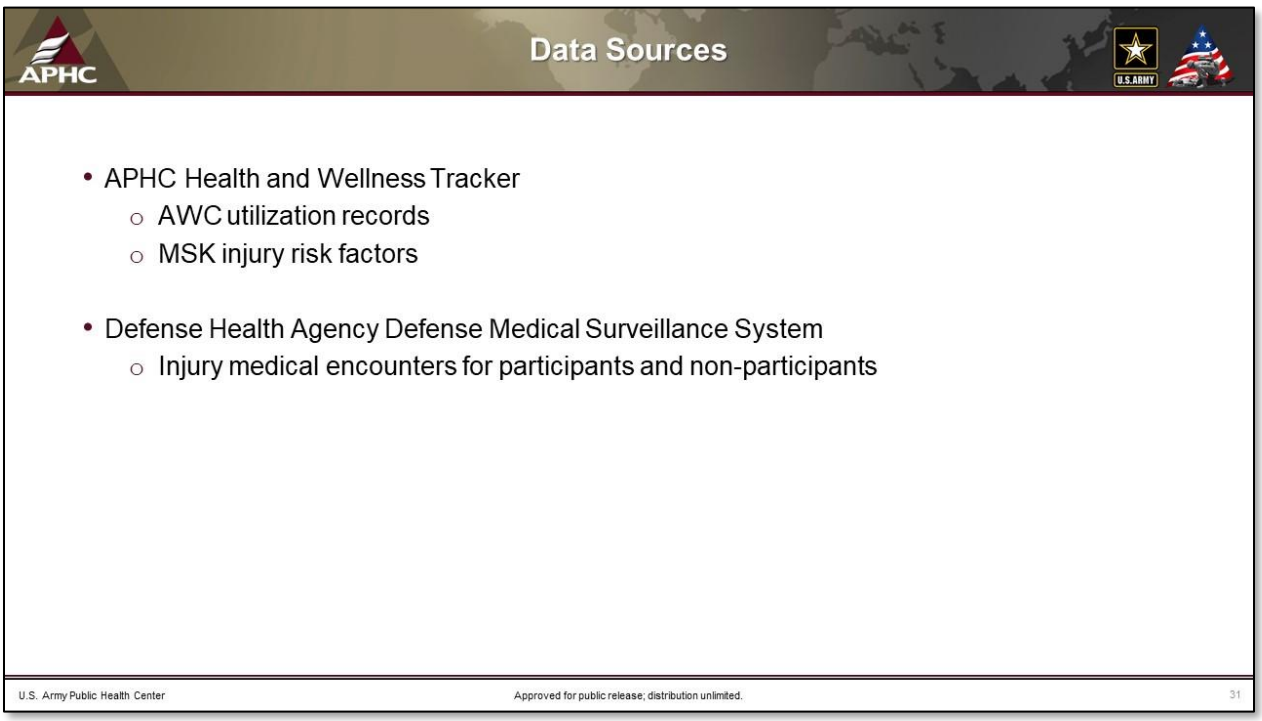
Implementation phase

- Encourage leadership emphasis with planned communications reiterating command support.
- Plan additional AWC staffing for initial contact, and establish a master roster.
- Consider group assessments (BN or CO) with extra equipment on stand-by.
- Lessen time required for fitness assessments by pre-programming exercise prescriptions with available data.
- Require VO_2 maximum test for referred Soldiers; educate on link between aerobic fitness and injury risk.

References

1. U.S. Army Public Health Center. 2019. *Health of the Force*. https://phc.amedd.army.mil./topics/campaign/hof
2. Jones, B, H Todd, M Chervak, O Rivera, and L Mitvalsky. 2019. *Increasing Readiness through injury prevention*. Presentation at the Warrior's Corner, Association of the United States Army Annual Meeting. Washington, D.C.
3. Ruscio, BA, BH Jones, SH Bullock, BR Burnham, M Canham-Chervak, CP Rennix, TS Wells, and JW Smith. 2010. A process to identify military injury prevention priorities based on injury type and limited duty days. *American Journal of Preventive Medicine* 38(1 Suppl):S19-S33.
4. U.S. Army Research Institute of Environmental Medicine. 1984. Technical Report No. T3/85, *Relationship between the Army two mile run test and maximal oxygen uptake*. Prepared by Mello, RP, MM Murphy, and JA Vogel. U.S. Army Medical Research and Development Command, Fort Detrick, Maryland.
5. Jones, BH, KG Hauret, SK Dye, VD Hauschild, SP Rossi, MD Richardson, and KE Friedl. 2017. Impact of physical fitness and body composition on injury risk among active young adults: A study of Army trainees. *Journal of Science and Medicine in Sport* 20(Suppl 4):S17-S22.
6. Rivera, LO, JD Ford, MM Hartzell, and TA Hoover. 2018. An Evaluation of Army Wellness Center Clients' Health-Related Outcomes. *American Journal of Health Promotion* 32(7):1526-1536.


APHC
U.S.ARMY
Backup Slides
U.S. Army Public Health Center
Approved for public release; distribution unlimited.
30


APHC
Data Sources
U.S.ARMY
• APHC Health and Wellness Tracker
o AWC utilization records
o MSK injury risk factors
• Defense Health Agency Defense Medical Surveillance System
o Injury medical encounters for participants and non-participants
U.S. Army Public Health Center
Approved for public release; distribution unlimited.
31

Challenges with Contact and Follow-up

- AWC Health Educators contacted eligible Soldiers, but Soldiers were not always sure about whether leadership was supportive of participation
- Recruitment paused MAR – APR 2019
  - Soldiers attended Joint Readiness Training Center (JRTC)
- Incorrect contact information
  - AWC Health Educators were unable to contact 119 (22%) of the 534 referred Soldiers
- Deployments hindered follow-up assessments at the AWC
  - Multiple BNs deployed beginning SEP 2019

Data Limitations

Outcomes unable to assess:

- Unit-level decreases in the proportion of Soldiers with a MSK profile and the proportion with a MSK injury-related Medical Readiness Category 3 (MRC3) status
  - Office of the Surgeon General (OTSG) Medical Readiness Assessment Tool (unit-level MRC status, profiles) not available beyond April 2019
- APFT performance differences between 101st Soldiers who meet injury risk criteria and utilize AWC services and 101st Soldiers who meet injury risk criteria but do not utilize AWC services
  - Complete DTMS data not available