CLEARINGHOUSE
FOR MILITARY FAMILY READINESS

Zero Suicide Systems Approach Pilot Project

Evaluation Report

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PennState

Note: This report is an evaluation report of the Zero Suicide Systems Approach Pilot Project. It was last updated on October 1, 2020. Additional evaluation data are forthcoming that may affect evaluation results.

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Zero Suicide Systems Approach Pilot Project Highlights

The United States Air Force spearheaded the creation of the Zero Suicide Systems Approach (ZSSA) pilot, and it was the first Service branch to pilot test a Zero Suicide Framework. This pilot is a partnership between the Air Force Medical Readiness Agency (AFMRA) and the Clearinghouse for Military Family Readiness at Penn State (Clearinghouse). The ZSSA is a pilot test of the Zero Suicide Framework, which creates a healthcare, system-wide approach to suicide prevention by utilizing a framework that intends to close gaps in patient care through seven distinct components.

1. **Lead** a system-wide culture change committed to reducing suicides.
2. **Train** a competent, confident, and caring workforce.
3. **Identify** individuals with suicide risk via comprehensive screening and assessment.
4. **Engage** all individuals who are at risk of dying by suicide using a suicide care management plan.
5. **Treat** suicidal thoughts and behaviors using evidence-based treatments.
6. **Transition** individuals through care with warm hand-offs and supportive contacts.
7. **Improve** policies and procedures through continuous quality improvement.

The ZSSA framework aims to improve care and outcomes for individuals who are at risk for dying by suicide in the Air Force's healthcare system. It represents a commitment to patient safety— the most fundamental responsibility of a medical team's job— and also to the safety and support of clinical staff, who do the demanding work of treating and supporting suicidal patients (Zero Suicide Institute, 2018). This framework was pilot tested at five Air Force Military Treatment Facilities (MTFs), and they include the following:

Throughout the implementation of the ZSSA Pilot Project, AFMRA and the Clearinghouse have worked to make deliberate and demonstrable progress towards the goal of eliminating suicides within the Air Force. Although many additional efforts have taken place (see activities completed section of this report), broad level progress includes the following:

Lead. Implementation teams were formed at each installation with suicide prevention champions from disciplines across the MTF. Waivers to Air Force Instructions (AFI) were granted for pilot sites, which demonstrates leadership support for pilot testing evidence-informed protocols and processes.

Train. Over 4,000 MTF staff members were trained at five pilot sites on screening for suicide using the Columbia Suicide Screener. In addition, all mental health and behavioral health staff were trained in assessing suicide using the Columbia Suicide Assessment, Assessing and Managing Suicide Risk (AMSR), Safety Planning, Reducing Access to Lethal Means, and Cognitive Behavioral Therapy for Suicidal Patients (CBT-SP).

Identify. At the five ZSSA pilot bases, every patient should be screened for suicide risk at every clinical encounter. This screening should follow the implementation of new suicide-risk screening protocols. All Air Force Mental Health Clinics are now using the Columbia Suicide Screener and the Columbia Suicide Assessment.

Engage. When risk is identified, patients are engaged in appropriate pathways to care by using clinic- and base-specific triage points. This includes enrollment in the Suicide Risk Management Pathway (SRMP) and enrollment in suicide-specific case management services.

Treat. New Mental Health Documentation templates were pilot tested and rolled-out. These templates streamline the required documentation process and prioritize treatment. The Air Force has trained all mental health providers at each pilot base in Cognitive Behavioral Therapy for Suicidal Patients. Refined and improved Safety Planning interventions are being used in Mental and Behavioral Health across pilot bases.

Improve. The Air Force is using data-driven continuous quality improvement to advance patient outcomes and provide the best care for those at risk for suicide. At our five pilot bases, decreases in suicide deaths have occurred.

As of December 2019, suicide attempts, suicide deaths, and psychiatric inpatient hospitalizations are lower at the five ZSSA pilot bases than at comparison bases. **Further analysis shows that over the course of this project (2015 – 2019), participation in the pilot program was associated with a statistically significant decrease of suicide death rates**. These results have been achieved during a time when Air Force suicides, in general, have been increasing (Losey, 2020; Svan, 2020). Thus, there is preliminary evidence that ZSSA may be having a positive impact on suicide-related outcomes. In comparison, no other recent efforts, noted to date, used to reduce military suicides have made a difference. Additional details of project results can be found in the results section of this report and are organized into fidelity data, suicide death data, data regarding suicide attempts, and data regarding psychiatric inpatient hospitalizations.

The results and efforts of the ZSSA Pilot Project point to multiple successes, several challenges, and many lessons learned. Taking each of these items into account, the Clearinghouse puts forth the following options and recommendations.

Option One. Not recommended. The first option states that the Air Force do nothing with the information learned from this ZSSA Pilot Project and continue to conduct medical operations in the same way. Although this is an option, the Clearinghouse does not recommend this choice. Rather, the lessons learned from the ZSSA Pilot Project should be utilized to continue to advance the care of Airmen who are at risk for suicide and their families.

Option Two. Recommended only if DHA buy-in is achieved. The second option is that AFMRA utilizes the results of the ZSSA Pilot Project to implement ZSSA across the entire Air Force. This would require a great investment of resources. However, if the effort was shared by the entire Air Force medical team (i.e., not just the AFRMA Mental Health Branch), implementing ZSSA at all 76 Air Force MTFs would require less time and resources for a single branch or wing then it did to conduct the ZSSA Pilot Project. Practical lessons learned from Centerstone Behavioral Health and the Institute for Family Medicine indicate that a system-wide adoption may be more successful than only implementing the program at several bases. If the Air Force chooses this option, training, policy, procedures, and practices could be championed across all AFMRA sections and support could be spread across the Air Force in such a way that true culture change may occur. Note, it appears that DHA will likely have direct operational control of many medical resources in the near future. This recommendation may not be feasible unless the DHA is supportive and buys into this system's approach.

Option Three. Recommended. This option would involve the use of sustainable and feasible promising practices from the ZSSA Pilot Project across all Air Force MTFs. These promising practices include employing the Mental Health Documentation template, the Columbia Suicide Screener, and the Columbia Suicide Assessment, which have already been implemented in Mental Health Clinics across the Air Force. This third selection appears to be the most feasible and sustainable option given that much is still unknown about what is within AFMRA's scope versus within the scope of DHA. If this option is chosen, the Clearinghouse recommends the following:

Recommended Practice One: Universal Screening
The Air Force should adopt universal screening using the Columbia Suicide Screener at every clinical encounter across all MTF clinics. This is an essential tenant of any Zero Suicide effort, has been demonstrated to reduce suicide rates, and appears to have been successful in the ZSSA Pilot Project.

Recommended Practice Two: Suicide Risk Management Pathway
The Air Force should adopt the use of the SRMP, including the suicide-specific case management positions, where possible. This pathway provides clear directions for providers and patients on what to expect and what steps to take regarding the care and management of patients at risk for suicide.

Recommended Practice Three: Brief-Safety Planning
The Air Force should adopt the use of the Brief Safety Planning Tool (BSP-T) that can be utilized within Primary Care Clinics, and all specialty clinics, when a low- or intermediate-risk of suicide is identified in a patient.

Recommended Practice Four: Prioritize Treatment

Irrespective of any other recommendations, the Air Force should actively promote a shift from hospitalization towards out-patient care for the majority of patients who are suicidal. Initial qualitative interviews and data on the use of CBT-SP within clinics indicate that the Air Force still has a culture that prioritizes hospitalizing suicidal patients over providing them with evidence-based treatments within the Mental Health Clinic. Evidence is clear that hospitalization does not reduce suicidality and may even make it worse.

Recommended Practice Five: Build a System for Continuous Quality Improvement

The Air Force should invest a substantial amount of time and resources into building a system for continuous quality improvement. Continuous quality improvement has been the most difficult component of the ZSSA Pilot Project due to the lack of ability to get data out of the Air Force's EHR. A successful electronic records system would enable AFMRA leadership to inquire about a topic and receive data-driven information in a reasonable time period. For example, in a successful system, AFMRA would be able to ask an analytic team for the percentage of individuals who are being screened for suicide risk within primary care clinics. If that data were pulled in a reasonable time period, AFMRA leadership could then make timely, data-informed decisions about how to improve the screening of individuals (e.g., additional training, reminding clinics of the policy, changing the way results are documented). Thus, a successful system for continuous quality improvement would provide AFMRA with the ability to make data-informed decisions on many facets of medical care – not just suicide prevention. Without timely analytics, AFMRA is forced to make and implement policy without real-time data.

Zero Suicide Background

Zero Suicide is an international initiative that involves creating a healthcare system-wide approach to suicide prevention by utilizing a framework that intends to close gaps in patient care (Covington, 2018). The Zero Suicide framework utilizes a specific set of evidence-based tools and strategies to close these gaps and reduce deaths by suicide. Practitioners of Zero Suicide deem suicide deaths among those selected in a healthcare system to be preventable, and zero suicides should be the goal of healthcare systems. The approach aims to continually improve the quality of care to end death by suicide. Many governmental and private organizations have adopted the Zero Suicide model: The Henry Ford Health System, The National Action Alliance for Suicide Prevention (NAASP), The National Suicide Prevention Lifeline (NSPL), and The Substance Abuse and Mental Health Services Administration (SAMHSA). These healthcare systems that have adopted a Zero Suicide model have seen dramatic reductions in suicide rates, and several have attained and sustained zero deaths by suicide for multiple years (Aronson, Hawkey, Brawley, & Perkins, 2016).

The Zero Suicide effort begins with an organization's leadership and "equips institutions with training, access to evidence-based treatments and supports and care pathways that have demonstrated exceptional results in healthcare systems" (Covington, 2018, p. 4). The Zero Suicide framework consists of seven core components that the National Action Alliance's Clinical Care and Intervention Task Force (2012) identified as being essential elements of suicide care for health and behavioral healthcare systems to adopt. These core components (Zero Suicide Institute, 2018) include the following:

1. **Lead** a system-wide culture change committed to reducing suicides;
2. **Train** a competent, confident, and caring workforce;
3. **Identify** individuals with suicide risk via comprehensive screening and assessment;
4. **Engage** all individuals who are at risk of dying by suicide using a suicide care management plan;
5. **Treat** suicidal thoughts and behaviors using evidence-based treatments;
6. **Transition** individuals through care with warm hand-offs and supportive contacts; and
7. **Improve** policies and procedures through continuous quality improvement.

Zero Suicide implementation requires commitment from leadership, training and active participation from all staff, and a data-driven approach to improving care. For systems "dedicated to improving patient care and outcomes, the Zero Suicide framework presents both an aspirational challenge and a way forward" (Zero Suicide Institute, 2018, p. 1).

The Air Force's Zero Suicide Systems Approach Pilot Project

The U.S. Air Force has historically been a leader in suicide prevention for our country's military and civilian populations. In response to increased suicide rates between the years 1990 – 1994, the U.S. Air Force began implementing a comprehensive suicide prevention program that integrated involvement from both community agencies and healthcare clinics (Knox et al., 2010). The focus of this initial program was to increase awareness of risk factors for suicide and offer locations and supports that are available resources for those in need. In addition, this effort also focused on reducing the stigma of seeking mental health services within the Air Force. These initial efforts led to the official forming of the Air Force Suicide Prevention Program (AFSPP) in

1997 (Knox et al., 2010). The founding of the program began a shift in the Air Force perspective from seeing suicide as solely a medical problem to viewing it as a larger service-wide, community problem. As rates of suicide in the Air Force reduced significantly, other military and civilian communities began modeling much of their work after the Air Force's efforts (Knox et al., 2010). In fact, the AFSPP has been recognized as a critical forerunner of Zero Suicide initiatives throughout the world (National Action Alliance's Clinical Care and Intervention Task Force, 2012).

Despite a substantial investment of time, talent, and funds in prevention efforts, suicide attempts and completions in the Air Force have increased during the past several years (Franklin, 2016; Smolenski et al., 2014). As a result of the increase in suicide deaths and attempts, in 2016, the Air Force Medical Readiness Agency (AFMRA; previously the Air Force's Medical Operations Agency [AFMOA]) began looking for innovative and data-driven ways to further reduce suicidality (i.e., suicide deaths, suicide attempts, and suicide-related hospitalizations) among Airmen. While the Air Force was utilizing methods that had been found to reduce suicide rates, such as suicide screening, safety planning, and lethal means restriction, the Air Force was looking for ways to enhance evidence-based practices and further formulate the most comprehensive approach to suicide prevention.

With this in mind, in 2016, AFMRA partnered with the Clearinghouse for Military Family Readiness at Penn State (Clearinghouse) to begin implementing and evaluating a Zero Suicide pilot project in the Air Force – the first ever implementation of a Zero Suicide approach in a military setting. This became known as the Zero Suicide Systems Approach (ZSSA) Pilot Project.

The ZSSA Pilot Project utilizes an evidence-informed framework to pilot test implementing, sustaining, evaluating, and improving suicide prevention components within the healthcare setting of five Air Force bases that serve 80,000 Airmen. The primary goal of this pilot was to test the utility, feasibility, and sustainability of Zero Suicide within the Air Force. Initial funding for the pilot project was provided by the Department of Defense's (DoD) Suicide Prevention Office (DSPO), and the majority of funding over the life of the project was provided by AFMRA. In addition, the AFMRA and Clearinghouse teams partnered with the Education Development Center (EDC) to provide training and consultation throughout the life of the ZSSA. Figure 1 provides an overview of the ZSSA Pilot Project structure.

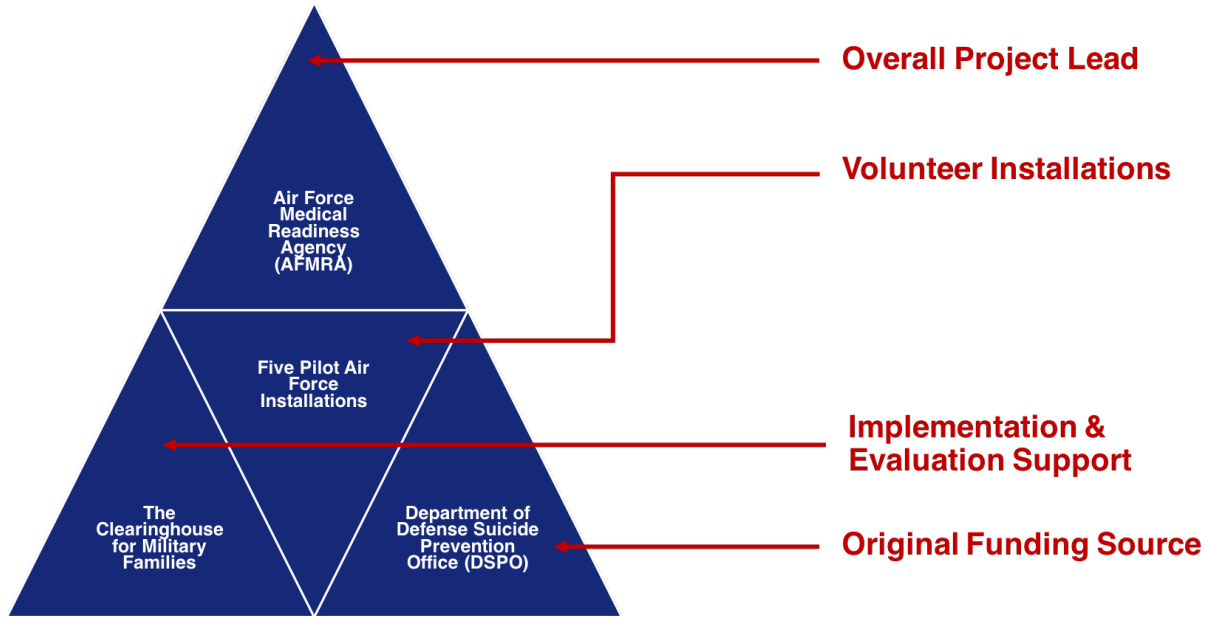

Figure 1. Overview of the Structure of the ZSSA Pilot Project.

Activities Completed

Initially, the Clearinghouse and AFMRA investigated model Zero Suicide initiatives and the evidence behind each component (e.g., screening instruments, treatments targeting suicidality). In addition, the Clearinghouse conducted a qualitative review of suicide prevention strategies at three Air Force Military Treatment Facilities (MTF). A list of these initial research reports can be found in Appendix A. Armed with these research findings, the Clearinghouse and AFMRA began to plan for implementation of the ZSSA Pilot Project.

Air Combat Command (ACC) was the Air Force's major command (MAJCOM) with the highest population, as well as the highest rates of suicide. For this reason, the MAJCOM was asked to participate in the project and, ultimately, volunteered five pilot bases for participation. These were Davis-Monthan Air Force Base, Holloman Air Force Base (now part of the Air Education and Training Command [AETC]), Langley Air Force Base, Nellis Air Force Base, and Tyndall Air Force Base. In order to design an appropriate Zero Suicide approach, the Clearinghouse conducted a qualitative review at these five bases. This qualitative review examined the current state of suicide prevention practices with each MTF, a gap analysis of suicide prevention practices, and openness and readiness for change of each base (Aronson, Hamel, Hawkey, & Perkins, 2017). The results (see Table 1 for results highlights) of this qualitative review were eye-opening and formed the foundation for the project's implementation and evaluation.

Table 1

Highlighted Findings from the Qualitative Review of Pilot Bases (Aronson, Hamel, Hawkey, & Perkins, 2017)

Element	Highlighted Findings
Lead	• The majority of Mental Health Flight Commanders and providers reported significant concerns regarding the need for the Air Force to change its perspective on and culture surrounding mental health and suicide. ○ Currently, a culture of blame exists -- there is a perception that individuals' careers will be or have been destroyed or damaged when an Airman under their care dies by suicide. • Leaders are concerned that the Zero Suicide Approach will be an unfunded mandate that would not be sustained or supported sufficiently (i.e., concern for time and resources). • Leaders stated there is pressure to complete most medical visits with patients rapidly and efficiently, and this pressure creates a barrier to conducting suicide screenings and to reviewing safety plans. • Most leaders reported that their clinics were understaffed with providers and non-providers. Some locations had only one psychologist and few, if any, Behavioral Health Optimization Program (BHOP, now Primary Care Behavioral Health [PCBH]) providers. • Mental health staff were concerned that the Zero Suicide Approach would be difficult to implement in the absence of a robust electronic health record system. • The Zero Suicide Approach Pilot Project is often negatively associated with a zero-tolerance policy, which is perceived as punitive.
Train	• Training on the screening, assessment, and clinical care of patients at risk for suicide is inadequate. The only training mentioned was the annual Air Force suicide training, which was considered low in quality and utility. • Staff indicated support for formalized protocols and increased training for screening, assessment, and treatment of patients with suicidal ideation.
Identify	• Although Mental Health, Flight Medicine, Pediatrics, and Family Care screen for suicide risk, other specialty clinics do not appear to be screening for suicide risk. • The Suicide Status Form was used at all locations; however, mental health professionals do not view it as useful. • Medical providers do not know what next steps to initiate when suicide risk is identified. • The BHOP program is not fully functioning at all five installations. • Providers and non-providers were excited about the possibility that screening would occur across the healthcare system.
Engage	• There is rapid action when a patient on the High Interest List (HIL) does not show up for an appointment. Command is typically notified within 30 minutes of an Airman missing an appointment; however, little to no engagement occurs between scheduled sessions. • There was a general consensus that, with formalized training, technicians could be better utilized in engaging with patients. • BHOP is seen as a positive resource that can be utilized by primary care and other clinics to provide suicide assessment, patient engagement, and care transition services for patients presenting with suicidal ideation in a non-mental health setting.
Treat	• Hospitalizing patients who expressed suicidal ideation was the main treatment response.

	• Providers were fearful of treating patients at risk for suicide due to concerns about being blamed if the provider was the last person to actually see the patient before the patient attempted or completed suicide. • No providers reported that they treat suicidality directly. Few providers could name an evidence-based or evidence-informed treatment of suicidality. • At some bases, mental health providers are embedded directly within units. However, little is known about their patient contacts or services provided. • There was a general consensus that, with formalized training, technicians could be better utilized in the treatment of patients.
Transition	• There is currently little to no contact in between appointments for any patients regardless of their status on the HIL. • Air Force staff are knowledgeable about alternative resources, on their bases and in their local geographic areas, that are available for patients who present with suicidal ideation in their clinics.
Improve	• Little discretionary time is allotted to ongoing continuous quality improvement of standardized procedures for suicide care. • Standardized reviews take place following a suicide death; yet, most medical staff are not debriefed, and there is little discussion of the suicide death outside of the formalized review process. • The review process for a suicide event is considered punitive and is perceived by many staff as an opportunity to assign blame for the event.

Armed with the information from this Qualitative Review, the ZSSA Pilot Project team (i.e., AFRMA and the Clearinghouse) began formulating a multifaceted plan for implementing a ZSSA Pilot Project at these five installations. The planning was an iterative process that initially took place between the Clearinghouse and AFMRA. As plans began to formalize, the project team worked with ACC MAJCOM representatives and points of contact (POC) from each base to assure that the planning process was inclusive and that buy-in was achieved. Thus, the project worked with each pilot base to formulate base-specific ZSSA implementation teams. These teams became the foundation for base-level change throughout the life of the project.

A broad-level overview of the activities completed throughout the life of the ZSSA Pilot Project is included below. The activities begin with those activities that were completed during the planning phases. They are then arranged first by ZSSA core component. Note, some activities fit into the mission of multiple components (i.e., Safety Planning includes training, engaging with patients, and treating patients using safety planning as an intervention); however, for the sake of clarity, the Clearinghouse has chosen primary components for these items to be organized into. Within each component, activities are then chronologically organized based on when they began. See Appendix A for a full list of products (i.e., reports, literature reviews, and trainings) completed as part of the ZSSA Pilot Project. These completed products can be requested by contacting a member of the Clearinghouse ZSSA Team at zerosuicide@psu.edu.

Activities Completed During the Initial Planning Phase

- Review of model programs and matrix of common elements and examination of fit within the Air Force
- Review of screening risk instruments and best practices in screening
- Review of approaches to engagement with mental health patients
- Review of suicide risk among lesbian, gay, bisexual, and transgender (LGBT) individuals in the military
- Review of treatment and patient outcome measures

- Review of economic and intangible costs of suicide
- Review of quality assurance and provider accountability
- Rapid site visits and rapid review of screening/assessment in the Air Force
- Conduct site visits to model organizations utilizing Zero Suicide
- Utilize reviews for project planning
- Site visits to five pilot MTFs to meet with leadership and conduct a qualitative review

Lead a system-wide culture change committed to reducing suicides

- Leveraged DSPO and AFRMA leader's support for the ZSSA Pilot
- Initiated weekly (later changes to bi-weekly) telephone conference calls (TCONs) between the Clearinghouse, AFMRA, and ACC MAJCOM representatives
- Formed partnership with Centerstone Behavioral Health and the Institute for Family Health for the purposes of expert guidance
- Created implementation teams at each pilot site with suicide prevention champions from disciplines across the MTF
- Began monthly implementation support TCONs with pilot sites that continued throughout the life of the ZSSA Pilot Project
- Gained waiver to Air Force Instructions (AFI) granted for pilot sites, which demonstrates leadership support for pilot testing evidence-based protocols and processes
- Developed briefing PowerPoint slides that were utilized by base implementation teams to keep their local leadership engaged in the project
- Created ZSSA marketing materials
- Held a plethora of meetings (i.e., briefings, trainings, updates) with pilot sites' MTF Leadership (i.e. Medical Group Commanders, MTF Executive Teams, Flight Commanders from across the MTF, and mental health leaders)

Train a competent, confident, and caring workforce

- Held Zero Suicide Academy in San Antonio, Texas, for leadership and implementation teams
    - Using the ZSSA Framework, participants learned how evidence-based practices would be implemented at their MTF to improve care and safety for individuals at risk
    - Zero Suicide faculty, coordinated by the EDC, provided interactive presentations and small group sessions
    - Leadership collaborated with participants to develop organization-specific action plans
- Began monthly Communities of Practice that provided an opportunity for bases to come together and learn from each other and from experts in the field of suicide prevention
- Provided in-person training to behavioral and mental health providers at four of the five pilot bases on AMSR
- Offered in-person trainings to over 4,000 MTF staff in screening for suicide risk using the Columbia Suicide Screener
- Supplied virtual training to all mental and behavioral health providers at five pilot sites in Counseling and Accesses to Lethal Means (CALM)
- Presented in-person trainings to all mental and behavioral health providers at five pilot bases in assessing for suicide risk using the Columbia Suicide Assessment

- Gave in-person trainings to all mental and behavioral health providers at five pilot bases in safety planning and reducing access to lethal means using the pilot's updated suicide safety plan
- Delivered additional rounds of in-person training to five pilot bases to assure the following:
    - All MTF staff were trained in screening for suicide risk using the Columbia Suicide Screener
    - All behavioral and mental health staff were trained in screening for suicide risk using the Columbia Suicide Screener, assessing suicide risk using the Columbia Suicide Assessment, safety planning, and reducing access to lethal means
- Held webinar trainings to provide additional access to all trainings
- Developed computer-based trainings to assure sustainability of training new staff and retraining existing staff in screening for suicide risk using the Columbia Suicide Screener, assessing suicide risk using the Columbia Suicide Assessment and safety planning, and reducing access to lethal means
- Trained AFMRA and the Clearinghouse ZSSA Team in Cognitive Behavioral Therapy for Suicide Prevention (CBT-SP), and this training was used to help guide Air Force-specific modifications on future training
- Supplied in-person training at each of the five pilot sites to train mental and behavioral staff in CBT-SP that is customized for the Air Force utilizing the expertise of the Center for Deployment Psychology
- Presented multiple ZSSA trainings as new POCs and new implementation team members joined at each pilot site

Identify individuals with suicide risk via comprehensive screening and assessment

- Developed ZSSA Screening Protocol using the Columbia Suicide Screener
- Implemented use of the ZSSA Screening Protocol and Columbia Suicide tool within each clinic at all five pilot sites
    - Screening takes place at every clinical encounter
    - The Columbia Suicide Screener replaced the use of the Patient Health Questionnaire – 9 (PHQ-9), which measures depression and not suicide
- Developed ZSSA Assessment Protocol using the Columbia Suicide Assessment
    - The Columbia Suicide Assessment replaced the Suicide Status Form (SSF), which was not designed as a suicide-risk assessment instrument
- Implemented use of the Columbia Suicide Assessment Tool and ZSSA Assessment Protocol within the MTF at each pilot site

Engage all individuals at risk for suicide using a suicide-care management plan

- Conducted time-motion study at two installations to determine appropriate staffing for care coordinators and case managers
- Created and implemented Safety Planning and Lethal Means Reduction Protocols and tools
- Hired case manager positions at each pilot base and at several non-pilot bases
    - Case management duties developed
    - Case management protocols developed and implemented
    - Case management case-load tracking tools developed and implemented
    - Bi-weekly case management TCONs began and were continued throughout the life of the pilot project

Treat suicidal thoughts and behaviors using evidence-base treatments

- Modified the Mental Health Documentation template in order to streamline documentation and prioritize treatment
- Standardized documentation procedures established for documenting use of the safety planning tool (i.e., via HAIMS upload to record) in Mental Health and Primary Care Behavioral Health
- Researched evidence-based treatments for their potential to be sustainable across pilot sites and Air Force-wide
- Implemented CBT-SP as the treatment to be used with suicidal patients

Transition individuals through care with warm hand-offs and supportive contacts

- Developed and implemented triage-steps to assure patients receive appropriate, gap-free care when identified as being at risk for suicide
- Developed and implemented the Suicide Risk Management Pathway (SRMP) Protocol that outlines the following for suicidal patients:
    - Enrollment onto the SRMP
    - Treatment, care coordination, and contact to be received
    - Discharge from the SRMP

Improve policies and procedures through continuous quality improvement

- Created a ZSSA Pilot Project evaluation and data-collection plan
- Streamlined Mental Health Documentation template
- Modified the safety plan utilized within the ZSSA Pilot and aligned it with evidence-based practices
- Teamed with a Tri-Service Workforce (TSWF) Group to modify CERNER, the Air Force's new electronic health record, in an attempt to make data more usable
- Worked with base-level staff to modify current electronic health records to allow for easier documentation of Columbia Suicide Screener results
- Created multiple data-tracking sheets in an attempt to collect fidelity data at each installation
- Obtained access to fidelity data through AFMRA and the Clearinghouse cooperating with Air Force Analytics (Note: this data lagged, resulting in missing last quarter of fidelity data within this report)

Results

Data collected throughout the project indicate that suicide attempts, suicide deaths, and psychiatric inpatient hospitalizations are all lower at the five ZSSA pilot bases compared with non-ZSSA ACC bases (i.e., comparison bases used so that the population, operational tempo, and mission are similar to pilot bases). Further, the lower rates of suicide deaths at pilot bases is statistically significant. These results have been achieved during a time when Air Force suicides, in general, have been increasing (Losey, 2020; Svan, 2020). Thus, there is evidence that ZSSA may be having a positive impact on suicide-related outcomes. In comparison, no other recent efforts, noted to date, used to reduce military suicides have made a difference. Overall project results are broken down into

Key Takeaway: Participation in the ZSSA Pilot was associated with a statistically significant decrease of suicide death rates.

fidelity data, suicide death data, data regarding suicide attempts, and data regarding suicide-related hospitalizations.

Various data indicate positive changes from individual trainings (e.g., screening, assessment, safety planning, CBT-SP). This includes positive changes in self-efficacy, confidence in using protocols and tools, and the likelihood of protocol and tool utilization. These results are located within individual training reports. See Appendix A for a full list of reports and products.

Fidelity

Note: The project team is awaiting additional fidelity data from Air Force Analytics. In addition, in-person qualitative interviews were being conducted at pilot bases to determine fidelity to the ZSSA model within each clinic at every base. However, interviews were only able to be completed at two of the five ZSSA pilot bases prior to COVID-19 travel restrictions being put into place.

Overall, fidelity to the ZSSA Pilot Project model is measured by examining the percentages of individuals who received the Columbia Suicide Screener out of the total number of individuals seen in medical appointments. From this point, fidelity data further examine the care that individuals received once identified as being at risk for suicide. For example, an individual who is considered to be at high risk would have more points of interaction along the Suicide Risk Management Pathway than an individual who is considered to be at medium or low risk.

Initial data, provided by the Air Force Medical Analytic team, are shown in Figure 2. These data show that an average of just 13.30% of 2017 monthly Primary Care and Flight Medicine medical encounters at the five ZSSA pilot bases were given the Columbia Suicide Screener as required per the ZSSA Pilot Project Model. These numbers increase slightly to 22.85% in 2018 and 23.59% in 2019. Based on the complexity of pulling accurate and complete data from the EHR system, and base self-reports and base-gathered data indicating higher fidelity (see below), the Clearinghouse and AFMRA have reason to believe that the Analytics-pulled numbers may be inaccurate. AFMRA continues to work with their analytic team, now part of the Defense Health Agency (DHA), to improve these data pull methods and overall accuracy.

Note: Data from other medical clinics could not be examined by the AFMRA analytic team due to limitations of the Air Force's electronic health record system.

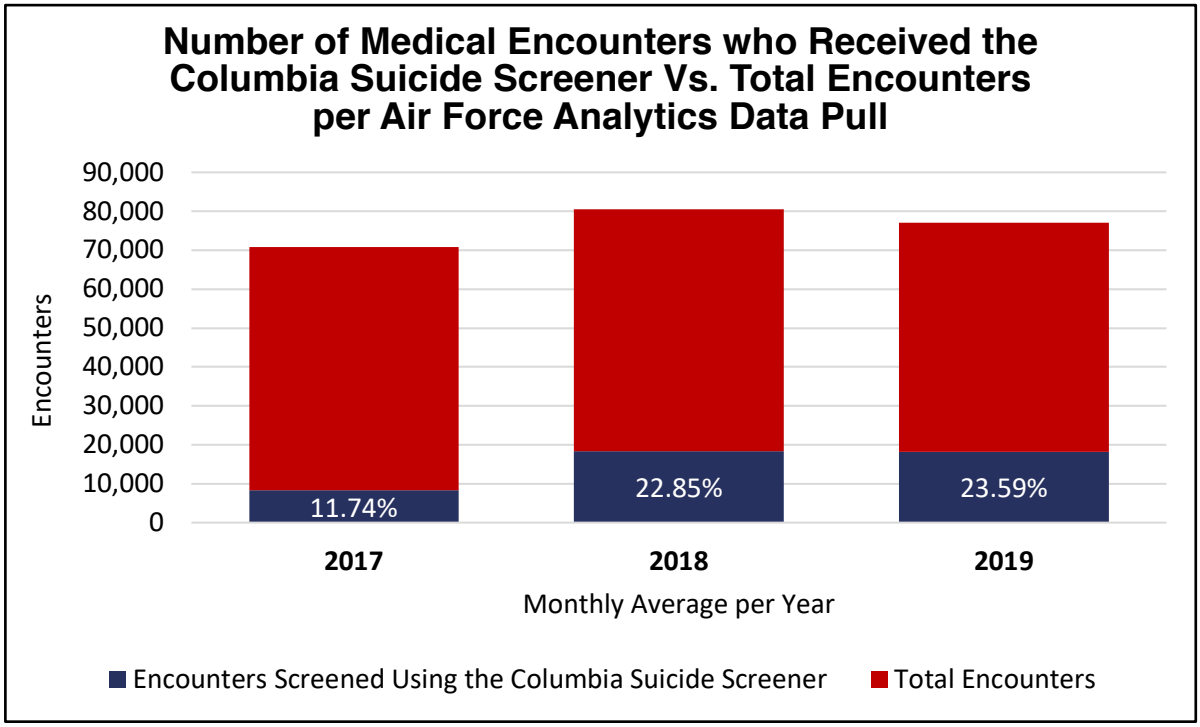

Figure 2. Monthly Average Number of Medical Encounters who Received the Columbia Suicide Screener Vs. Total Encounters at five ZSSA Pilot Sites based on Air Force Analytics data pulls. 2019 data is not yet complete.

Given difficulties pulling timely, accurate data from the Analytics systems, each ZSSA pilot base was also asked to conduct its own fidelity checks by reviewing random samples of patient health records from each medical clinic through randomized chart sampling. This was done on a volunteer basis, and several bases were not able to collect the data. However, results from two bases suggest a high level of fidelity to the screening components of the ZSSA Pilot Model. Fidelity data collected by one ZSSA pilot base's case manager suggest that fidelity to screening as outlined in the ZSSA Pilot Model ranged from between 81.82% - 85.86% depending on the month of random charts being reviewed. At the second base that has provided these data, fidelity to the screening components of the ZSSA Pilot Model was 80.96%. These higher rates of fidelity to the screening portion of the ZSSA Pilot Model are in line with the following: (1) ZSSA pilot bases reported estimates of fidelity in screening using the Columbia Suicide Screener across clinics and (2) initial, yet incomplete, results from the 2019 – 2020 qualitative interviews conducted by Clearinghouse staff with personnel from each clinic at two ZSSA pilot bases indicate high fidelity to the ZSSA Pilot Model.

Suicide Deaths

Suicide death data are provided by the AFMRA to the Clearinghouse. These data are examined and tracked by AFMRA as part of the Department of Defense's Suicide Event Report (DoDSER) process. The DoDSER system "standardizes suicide surveillance efforts across the military services and tracks the total suicide deaths, manner of death, and other variables" (Defense Suicide Prevention Office, n.d.).

The DoDSER data show that overall deaths by suicide at the five ZSSA pilot bases have decreased over the course of this project (see Figure 3 for comparison with control bases). In June of 2015 (i.e., when this project was being discussed), suicide death rates at the five ZSSA pilot bases was 0.08 per 2,0000 active duty enrollment population. By December of 2019, this rate had decreased to 0.01; which is currently lower than non-pilot comparison bases. Figure 3, created by AFMRA's Dr. Hla Yin Myint, highlights a brief spike in suicide deaths occurred at pilot bases in June of 2019. During this spike in suicide deaths, AFMRA and the Clearinghouse focused additional efforts, working with pilot bases to increase fidelity to the ZSSA model (e.g., additional trainings, additional TCONs, request to track fidelity at each base). Suicide death rates once again declined at the ZSSA pilot bases following these continuous quality improvement efforts. Figures 4-8 show individual pilot base's rates of suicide deaths during the course of the ZSSA Pilot.

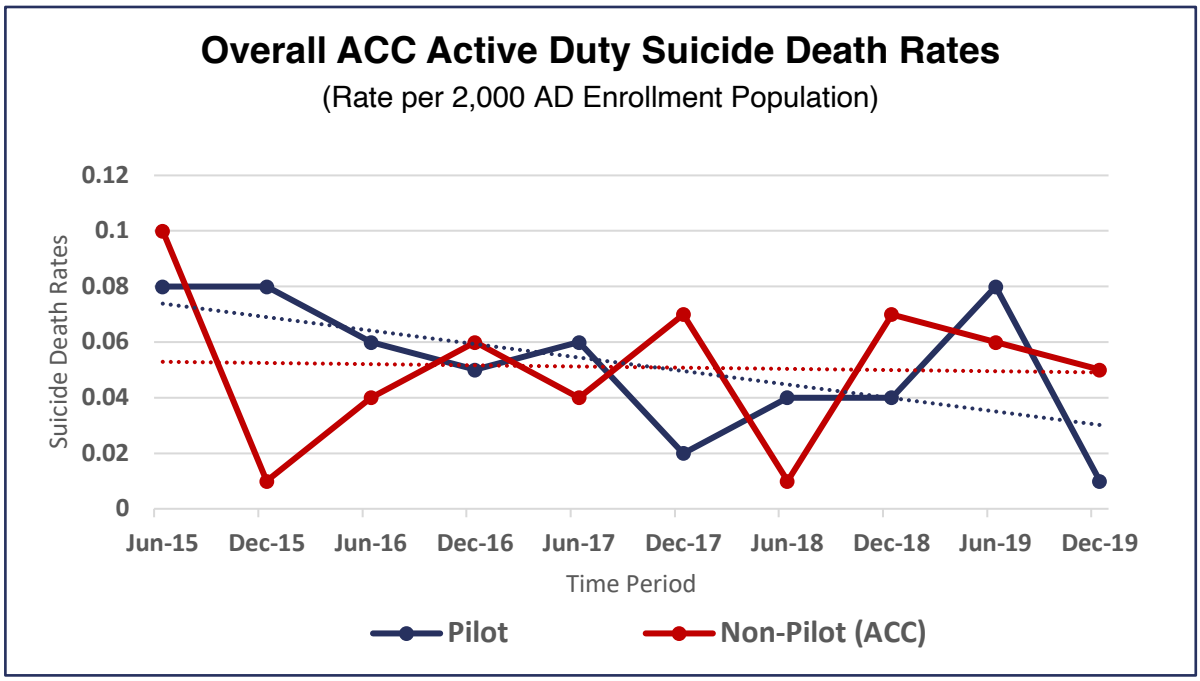

Figure 3. Active Suicide Death Rates at Pilot Bases during the Course of the ZSSA Pilot Project.

In order to further examine the suicide death data, we conducted a non-experimental, longitudinal cohort study of the five pilot bases and seven control bases from 2015 - 2019. Given the repeated measure nature of the data, the generalized estimating equation (GEE) method incorporating the effect of temporal autocorrelation was employed. Utilizing GEE, we compare the counts of suicide attempts and deaths over time between sites with the pilot program with those without. The outcome variables are the numbers of suicide attempts, deaths, and combined incidents. The assignment of bases (pilot vs. control), time point, and the interaction of these two, are the only variables in the model. Since the outcomes are count variables, Poisson models are applied. The population at each time, for each base, is added into the model as exposure. Thus, focusing on the interaction of time and the intervention, the GEE model can differentiate the temporal trends in pilot bases and control bases. The model can be expressed as:

$$ln(y_{ij}) = \beta_0 + \beta_1 Time_i + \beta_2 Trt_j + \beta_3 Time_i * Trt_j + ln\,(Pop_{ij})$$

In this model, *i* stands for time point *i*, *j* is the Air Force base *j*, y_{ij} is the event number of outcome of interest (the number of suicide death/attempt/combined) at time *i*, Trt_j=1 if base *j* is a pilot base, Trt_j=0 otherwise, and $ln\ (Pop_{ij})$, the log of population at time *i* in site *j*, acts as an offset. Additionally, to test the sensitivity of the models to different time units, the analysis is conducted on data aggregated at quarter-level and semi-annual-level.

Basic data descriptive, histograms, and plots (see Appendix B) indicate that all (2015-2019) counts of average suicide deaths, attempts, and combined events in pilot bases were greater than that in control bases. This is very likely the result of unequal baseline of suicide events determining which bases were chosen for the pilot since mild overdispersion (the variance is larger than the mean) only appears in the pilot site group. Overall, there is no extreme excessive zero-value counts in the model. Poisson models are sufficient for the analysis given no severe overdispersion was found. To confirm this, we ran both Poisson and negative models and did get identical estimates, supporting our decision to choose Poisson models. Generally, no obvious temporal trend can be observed in suicide attempt rates and combined suicide event rates. However, the plots in quarterly and half-yearly data imply that the suicide rates dropped over time in pilot sites.

Since no evident curvilinear pattern was observed in the plots, time is treated as continuous linear variable in the GEE models. Counts of suicide attempts/deaths/combined events are the outcome variable, and time (Time), treatment (Trt), and interaction between time and treatment (Trt*Time) are the independent variables. Tables 2-4 present the statistically significant estimates for these models using monthly, quarterly, and semi-annually data respectively. In addition, models without the interaction term are also estimated to examine the effect of time and treatment separately when the interaction term is non-significant. The results are included in these tables as well. For non-significant estimates, only QIC and QICu values indicating model performance are reported.

Tables 2-4 show no significant estimates found for suicide attempts and combined events models. However, we can see that the interaction between treatment and time is statistically significant in the model for suicide deaths. This model also has lower QIC and QICu than the model without the interaction term, indicating this model performs better than the latter one. The statistically significant interaction between treatment and time (-0.0136 in monthly data) shows that suicide death rates at pilot bases decreased quicker than that in control bases over time, indicating that the ZSSA Pilot is effective. This finding lends the support to our impression in visual inspection. To compare the estimated difference in death incident rates at the end of the time period, we set the last month as month 0, and the first month as the -59th month. Therefore, the incident rate (IR) for pilot bases is *exp(-.5101)=0.6* times the incident rate for non-pilot bases holding the other variables constant at the time of the 60th month. The analyses using quarterly and semi-annual data (Table 3-4) illustrate similar results to Table 2. All these results consistently indicate that participating in the pilot program was associated with decreased suicide death rates over time. These findings are statistically significant.

These results provide evidence, albeit limited, that the pilot program appears to be effective in preventing suicide deaths. The non-experimental nature of this analysis means some limitations exist. For example, the effect on the outcomes from factors not included in the model cannot be completely ruled out. Thus, if possible, adding site demographic characteristics, measures of leadership attitudes, or level of working stress as control variables could improve future assessments on the efficacy of this pilot program.

Suicide death rates and trends at each individual pilot base are highlighted below in Figures 4-8. ***Davis-Monthan.*** At Davis-Monthan Air Force Base, deaths by suicide have decreased over the life of the ZSSA Pilot Project. While suicide deaths have ranged from 0.07 in June of 2015 to 0.00 in June 2019 and in December of 2019, the trend line shows a general decrease. Figure 4 shows that the goal of zero deaths by suicide has been achieved and sustained for a brief period of time.

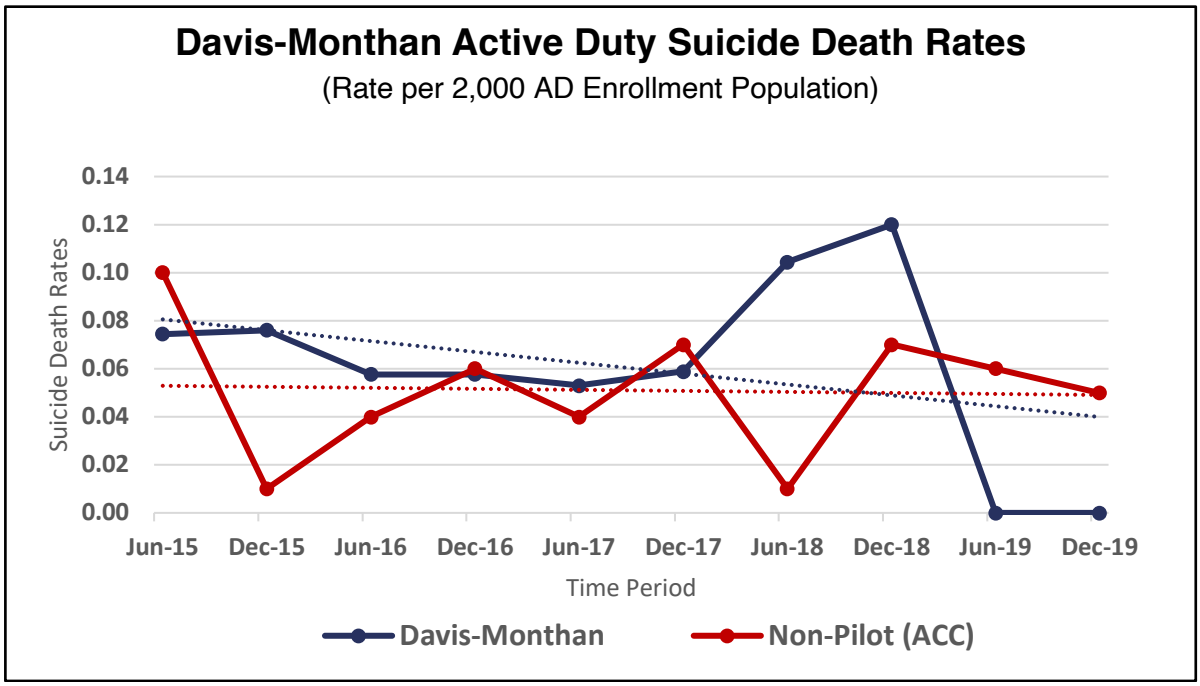

Figure 4. Davis-Monthan Air Force Base Active Duty Suicide Death Rates during the Course of the ZSSA Pilot Project.

Holloman. Suicide deaths at Holloman Air Force Base (see Figure 5) have changed more frequently. In fact, zero deaths by suicide was achieved and sustained for an entire year (December of 2017 – December of 2018). Suicide death rates increased from December of 2018 through June of 2019, after which additional emphasis was placed on fidelity to the ZSSA model. Although decreases in suicide deaths cannot be contributed solely to these additional efforts, deaths by suicide did decrease over the life of the project. By December of 2019 rates were at zero.

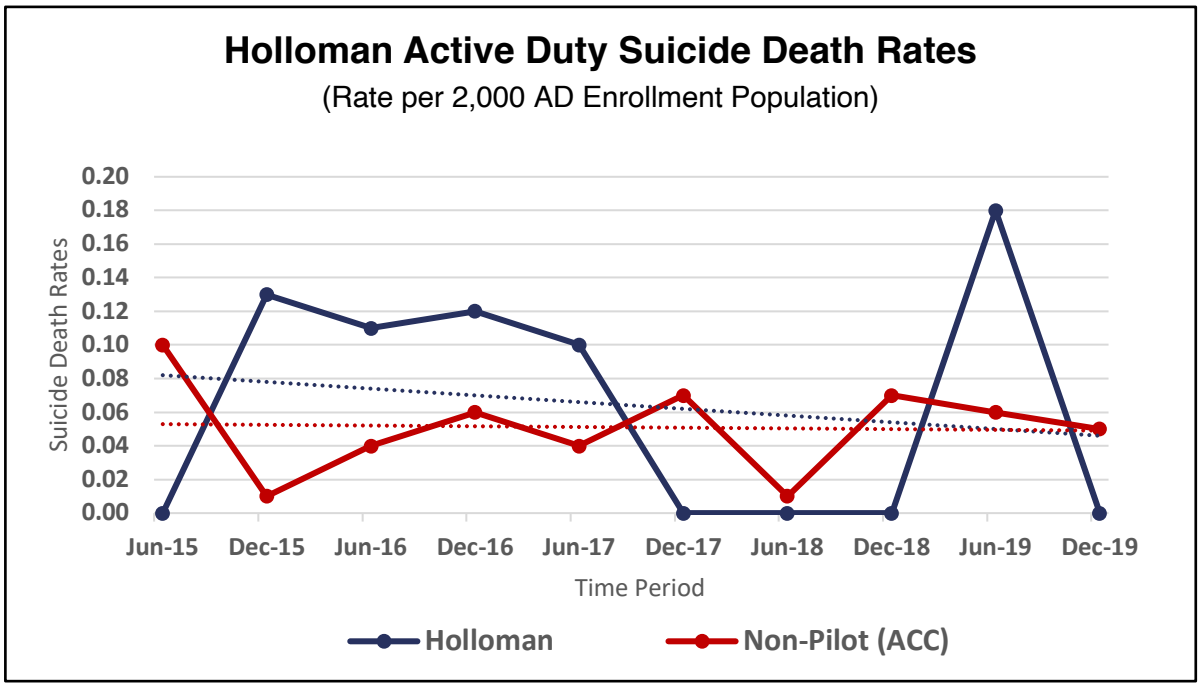

Figure 5. Holloman Air Force Base Active Duty Suicide Death Rates during the Course of the ZSSA Pilot Project.

Langley. The trend line in Figure 6 shows a steady decrease in suicide deaths at Langley Air Force Base over the course of the ZSSA Pilot Project. Although these rates have fluctuated over time, they have decreased from 0.04 per 2,000 active duty enrollment population in June of 2015 to 0.00 in December of 2019. As highlighted in Figure 6, the goal of zero suicide-related deaths at Langley Air Force Base was achieved and sustained multiple times (i.e., June 2016 – December 2016, briefly in December of 2017, and again from June of 2019 – December of 2019).

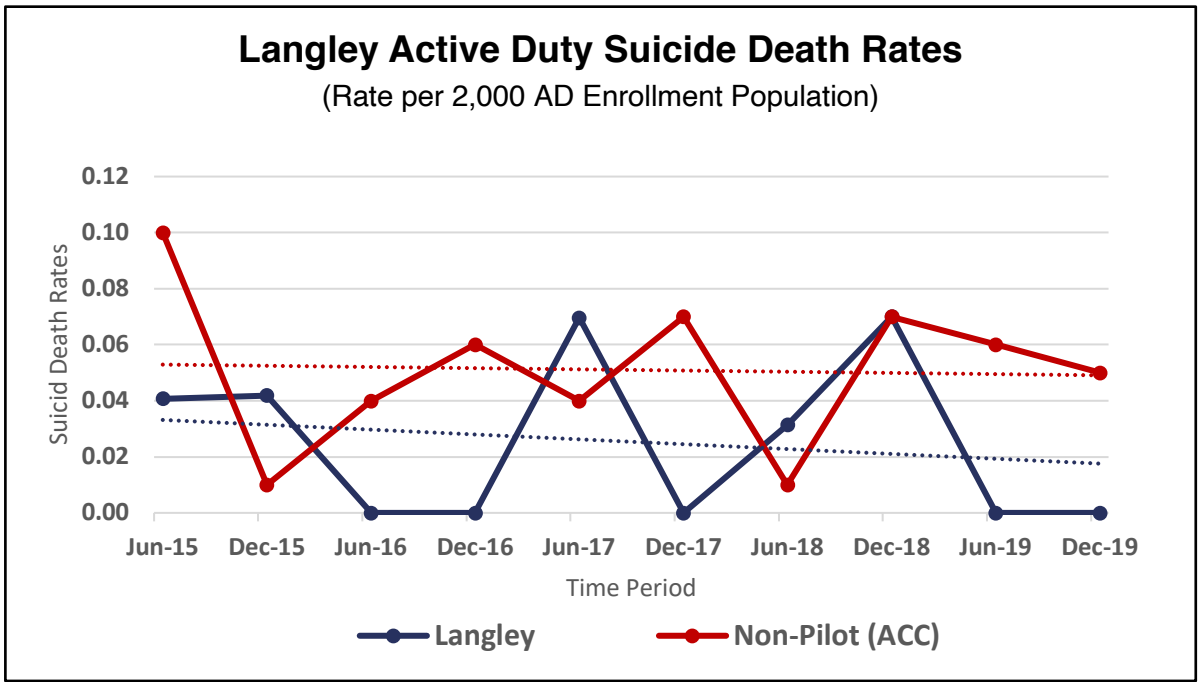

Figure 6. Langley Air Force Base Active Duty Suicide Death Rates during the Course of the ZSSA Pilot Project.

Nellis. Rates of suicide-related deaths at Nellis Air Force Base have recently increased. However, overall rates over the course of the ZSSA Pilot Project decreased (see Figure 7) from 0.11 per active duty enrollment population in June of 2015 to 0.06 by December of 2019. Figure 7 shows the overall trend line of suicide deaths at Nellis decreasing over the life of the ZSSA Pilot Project.

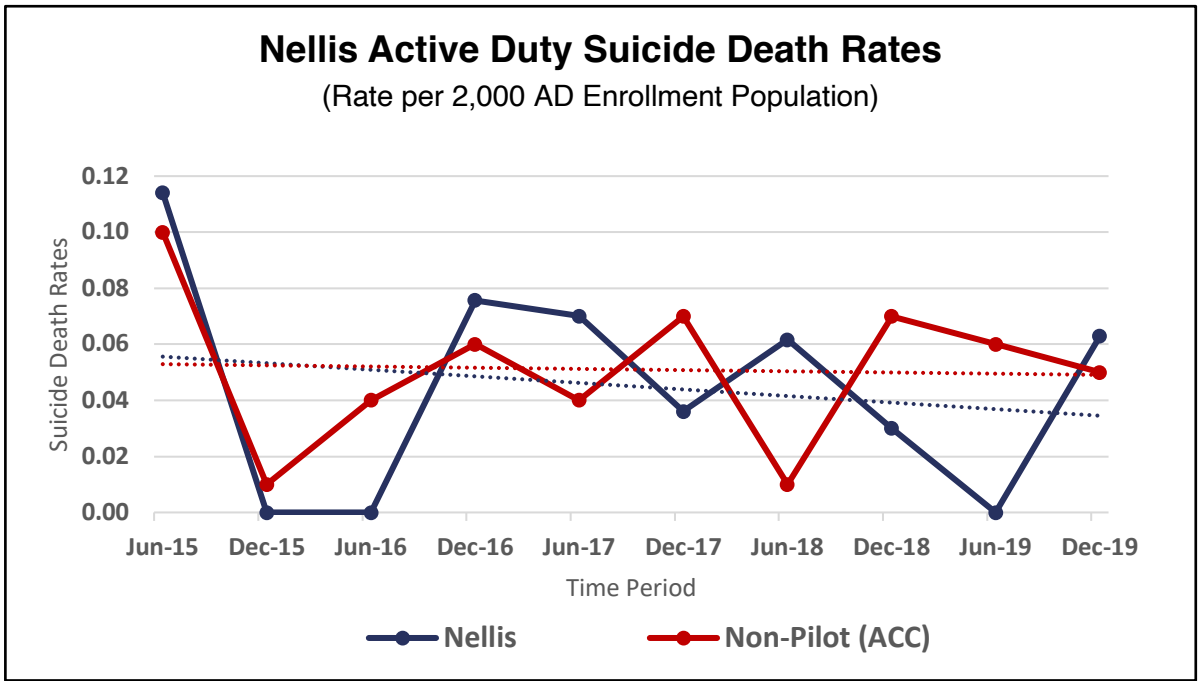

Figure 7. Nellis Air Force Base Active Duty Suicide Death Rates during the Course of the ZSSA Pilot Project.

Tyndall. Tyndall Air Force Base has had the most sustained success in reducing suicide deaths during the ZSSA Pilot Project. Figure 8 shows that Tyndall Air Force Base first achieved the goal of zero suicide-related deaths in December of 2016 and maintained zero deaths by suicide through December of 2018. Suicide death rates spiked between December of 2018 and June of 2019. During this time Tyndall Air Force Base and the Northwest Florida region suffered major damage and evacuation from Hurricane Michael, which was a category 5 hurricane (Reeves, 2019). During this evacuation period, families were displaced, and many active duty Airmen experienced drastic changes to their operational tempo and work duty assignments (J. Sigler, personal communication, May 29, 2019). Despite this tragic event, Tyndall Air Force Base remained strong, the base was quickly rebuilt, and deaths by suicide continued to show a downward trend over the course of the Pilot Project. Deaths by suicide were once again at zero by the end of the pilot project.

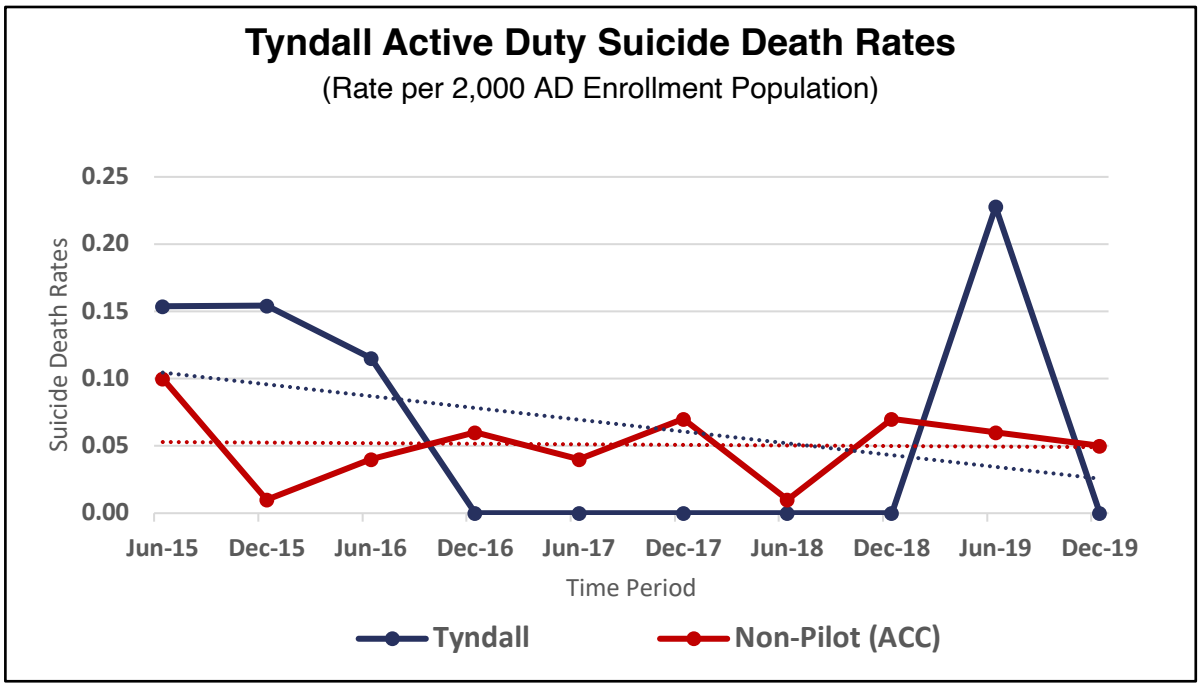

Figure 8. Tyndall Air Force Base Active Duty Suicide Death Rates during the Course of the ZSSA Pilot Project.

Suicide Attempts

Suicide attempt data was also provided to the Clearinghouse by AFMRA. Like suicide deaths, these data are examined by the Air Force and tracked as part of the DoDSER process. Unlike deaths by suicide, the suicide attempt rates at ZSSA pilot bases have not decreased to the same level. The overall trend line for both the ZSSA pilot bases and the non-ZSSA comparison bases shows an increase in suicide attempt rates. This is highlighted in Figure 9, created by AFMRA's Dr. Hla Yin Myint. Rates at the ZSSA pilot bases appear to be increasing at a slower rate than the non-ZSSA comparison bases. Looking at specific numbers, the average rate of suicide attempts at the five ZSSA pilot bases was 0.21 per 2,000 active duty enrollment population as of June 2015. This number fluctuated during the life of the pilot and ended with a slight decrease to 0.18 by December of 2019.

Key Takeaway: Suicide attempts are increasing. However, the rates of attempted suicide at the ZSSA pilot bases are increasing at a slower rate than comparison bases.

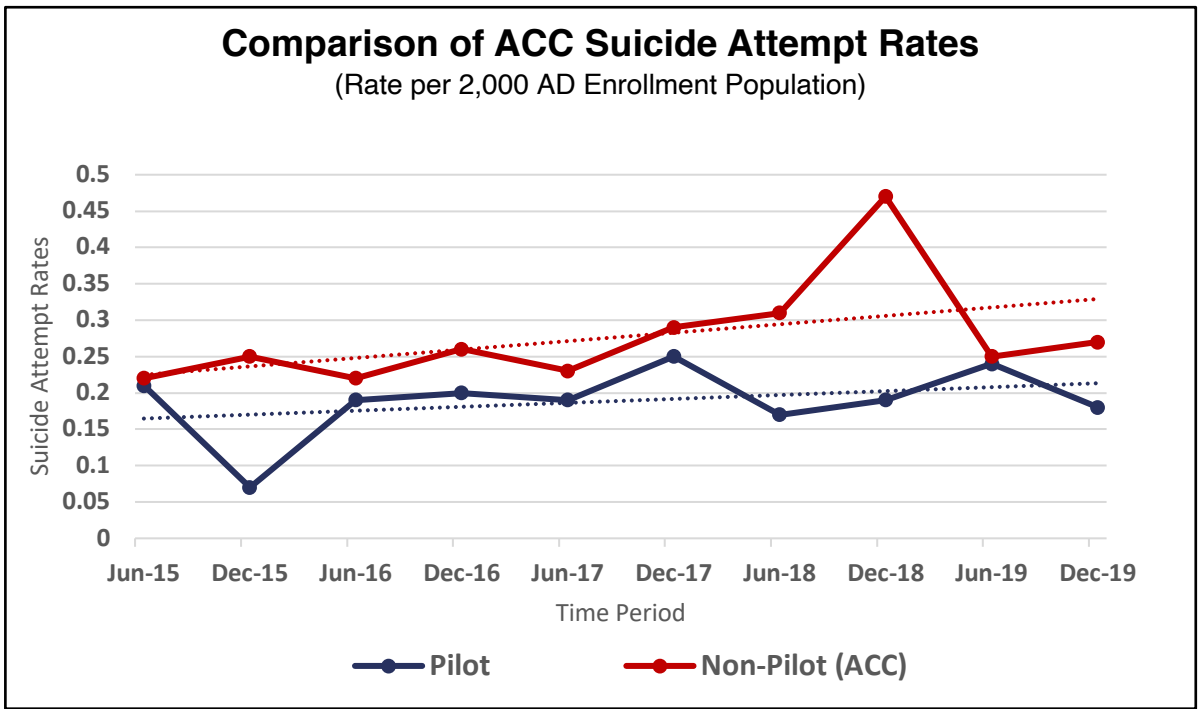

Figure 9. Comparison of Suicide Attempt Rates Across the Five ZSSA Pilot Bases.

Inpatient Psychiatric Hospitalizations

Key Takeaway: During the course of the ZSSA Pilot Project, rates of inpatient psychiatric hospitalizations have decreased at pilot bases from 2.55 in June of 2016 to 1.75 per 2,000 active duty enrollment population by December of 2019. During this same time, rates at non-pilot bases have increased slightly.

Data on inpatient psychiatric hospitalizations was also provided to the Clearinghouse by AFMRA. While this data is not tracked using the DoDSER process, it is pulled by the Air Force Analytics team. When the ZSSA Pilot Project began, the rates of active duty inpatient psychiatric hospitalization were slightly higher at the five pilot bases, when compared to non-pilot ACC bases. Figure 10, created by AFMRA's Dr. Hla Yin Myint, shows that over time rates of inpatient psychiatric hospitalizations have increased at non-ZSSA pilot sites, while rates at ZSSA pilot bases have decreased. As of December 30, 2019, the end of the project, the average psychiatric hospitalization admission rate at a ZSSA pilot site was 1.75 Airmen per 2,000 active duty enrollment population. At non-ZSSA ACC bases, this number was 2.48 Airmen per 2,00 active duty enrollment population. In examining the trend line for each group of bases, you can see a reduction of psychiatric hospitalization admission at pilot ZSSA bases compared to a steady rate at the non-ZSSA bases.

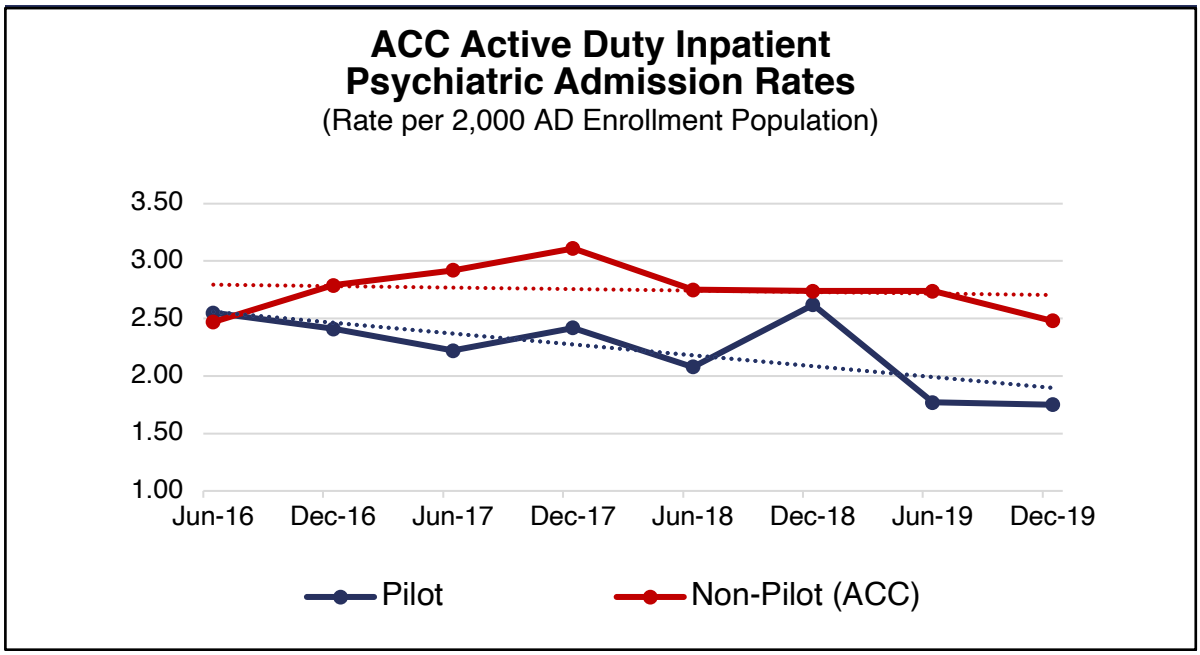

Figure 10. Active Duty Inpatient Psychiatric Admission Rates during the Course of the ZSSA Pilot Project.

Note: Active duty inpatient psychiatric hospitalizations are not examined by the Air Force according to diagnosis. As a result, only total rates and numbers are known. The Air Force has been unable to examine the numbers and percentages of these inpatient psychiatric hospitalizations that are directly attributed to suicidality.

Limitations

There are multiple limitations in this draft report: (1) incomplete data collection (i.e., qualitative interviews not yet complete, incomplete fidelity data from Air Force Analytics), (2) possibly inaccurate data (i.e., AFMRA is working with the Air Force's Medical Analytic Team to confirm accuracy), and (3) unconfirmed data (i.e., self-reported by bases). It is the goal of the Clearinghouse ZSSA Pilot Project Team to minimize these limitations as soon as possible in an updated draft of this report.

Challenges

As with any multifaceted project implemented in real-word settings, the ZSSA Pilot Project had multiple changes and challenges throughout the implementation process. Some of these changes were positive, such as being able to utilize data to practice continuous quality improvement and assist the medical staff at the five pilot bases. Other changes were difficult to navigate, such as active duty travel being denied that resulted in a planned workshop training not being held. These challenges are organized below according to ZSSA component.

Lead

Leadership support is crucial in creating a leadership-driven, safety-oriented culture committed to dramatically reducing suicide among people under care. Early in the pilot, progress was made in securing DSPO and AFMRA leadership support. In addition, MAJCOM support and MTF Medical Group Commander support were given to the ZSSA Pilot Project early during the pilot implementation. Though upper-level leadership buy-in and backing were in place, it was determined by the Clearinghouse and AFMRA that the pilot needed to gain additional leadership support to be successful. That support needed to come from non-mental health clinical leadership personnel. It was often difficult since the pilot bases were volunteers and therefore had no specific directive to enforce pilot activities. In response to this challenge, the project team continually worked to engage with MTF leadership during site visits to the pilot bases. In addition, data-driven quarterly reports on MTF-specific pilot participation and patient outcomes were provided to each pilot site to provide an update on progress and to generate motivation and leadership engagement in the pilot.

AFMRA provided pilot oversight and developed policies related to the ZSSA Pilot Project. However, the AFMRA ZSSA Pilot Project team consisted of only individuals from within the Mental Health Branch. Due to AFMRA's compartmentalized organization, it proved difficult to create a systematized uniform procedure for a project that was designed to be implemented MTF-wide as opposed to being clinic-specific. Getting all of the clinics to coordinate project implementation designed to impact all medical and mental health services was a daunting task. AFMRA intended to bring all AFMRA leadership together to hold a ZSSA Academy/workshop. The intention of this academy was to educate all Air Force policy makers, from across all disciplines, on the goals and intentions of the ZSSA Pilot Project. The hope was to have additional time to gain project buy-in and to show how other disciplines could incorporate ZSSA Pilot protocols into their policies and procedures. This would enable all AFRMA leadership to work towards the goals of the ZSSA Pilot Project rather than the project being championed only by the AFMRA Mental Health Branch. Due to budgetary constraints, and travel not being approved by the Air Force, this workshop was not held. To address this issue, the project team established communication pathways with multi-

disciplinary Air Force Medical Service representatives within AFMRA. These communication pathways facilitated frequent and increased collaboration, engagement, and timely problem-solving.

The frequent changing of high-level and mid-level leadership was a continual challenge encountered throughout the pilot. The turnover of leadership and Air Force personnel were most often due to a Permanent Change of Station (PCS). This turnover affected many elements of the pilot program from ZSSA pilot base-level to AFMRA-level leadership and from championing to knowledge retention. To minimize the impact of leadership and personnel turnover, continuous support and materials were provided to pilot site POCs to encourage implementation team and POC engagement with the Medical Group Commander and other executive staff. The project team provided an orientation to educate and bring new leadership and POCs up to date on the ZSSA Pilot Project.

Operational efficiency and institutional memory posed challenges to leadership on where to focus financial and personnel resources and how to sustain those resources. In regards to personnel resources, most ZSSA pilot bases were found to be undermanned. This required that schedules be changed to incorporate new training, which required providers and staff to step away from patient care in order to be trained prior to implementing clinical practice changes. This issue was addressed by converting ZSSA Pilot Project training components into webinars and/or computer-based trainings. See the Training section below for additional information. Another way this was addressed was by securing suicide prevention-specific case management positions at each of the five pilot bases. These case managers followed up on suicidal patient engagement tasks without burdening other staff, freeing time for providers to deliver more patient care.

Training

Training is essential in the development of a competent, confident, and caring workforce. ZSSA Pilot Project training began with the Zero Suicide Academy for leadership and implementation teams. AMSR training, assessment, screening, and safety planning training were provided for all mental and behavioral health providers across the five ZSSA pilot bases. Screening training was provided to medical staff at all five ZSSA pilot bases. Training on such a large scale (i.e., mental and behavioral health and MTF-wide) presented its own set of challenges. These included the initial cost and time burden of training recipients. The regular PCS schedule of active duty medical staff complicated training needs, which further affected the cost and time burden of training recipients. As a result, ensuring fidelity to the training model became challenging. These issues were addressed by converting ZSSA Pilot Project training components into standardized computer-based trainings and webinar-based trainings that fit into predetermined training cycles for staff. Although some in-person training components continue to be offered upon request, all ZSSA Training Components can now be delivered electronically. These trainings were also integrated into in-processing training for new providers and staff at each of the five ZSSA pilot bases.

Identify

Systematically identifying and assessing suicide risk among patients receiving care were accomplished by launching MTF-wide screening with the Columbia Suicide Screener. As

screening was intended to be conducted across all primary and specialty care clinics at each pilot base, pilot site differences were found in the availability of resources (e.g., Emergency Department and behavioral staff in Primary Care) at each base that affected the screening and assessment triage steps. In order to combat this challenge, AFMRA and the Clearinghouse created triage actions for the Columbia Suicide Screener and Columbia Suicide Assessment that included required action steps and action steps that could be customized to each base and clinic. As implementation of MTF-wide screening continued, issues of reliability and incompatibility across multiple electronic health record systems were found. In response, local implementation teams engaged with individual clinics to track specific screening administration and documentation procedures. When possible, implementation teams instructed the clinics to utilize TSWF screening forms, which allowed for the possibility of data-mineable documentation for AF Analytics to track screening results and triage actions associated with screening results.

Engage

Ensuring every individual has a suicide care management plan, or pathway to care, that is timely and adequate to meet his or her needs is essential to engagement with patients. This includes collaborative safety planning and reducing access to lethal means. Sustaining appropriate implementation was identified as the primary challenge within the engagement component of the ZSSA Pilot Project. To meet this challenge, a standardized, full-safety planning tool for use with high-risk patients and a brief-safety planning tool for use with low- or intermediate-risk patients were implemented at pilot bases. Based on the success of the ZSSA Pilot, these tools were later implemented within Mental Health Clinics across the Air Force. A standardized protocol for elevated, suicide-risk, patientcare coordination, called the SRMP, was also developed. The SRMP serves as an MTF-wide patient management and communication strategy for coordinating care, closely monitoring the improvement and exacerbation of symptoms, and ensuring timely delivery of treatment. The SRMP institutes a standardized set of procedures that intend to provide the highest level of patient safety possible through enhanced patient follow-up in regularly scheduled appointments in the Mental Health Clinic and follow-up contact in between appointments. The added suicide-specific case manager position assisted by providing continuous contact and support to patients on the SRMP. Still, staff turnover in these contract case manager positions was a challenge, as some positions were vacant for long periods of time, making it difficult to fully implement SRMP protocols.

Treat

To treat those at risk for suicide, an effective evidence-based treatment was needed to directly target suicidality. Challenges of implementing such a treatment included the delivery of training and retraining and ongoing fidelity monitoring. In addition to standardized safety planning (see section above for additional details), providers at each of the pilot sites were trained in CBT-SP. CBT-SP is an evidence-based, manualized cognitive behavioral treatment for those with suicidal ideation, including acute suicidal ideation and behaviors. Ensuring and monitoring providers' fidelity in CBT-SP was not fully addressed before the end of the ZSSA Pilot Project.

The initial qualitative review that took place at all pilot bases revealed dissatisfaction with the Documentation template required to be used by mental health staff. This feedback indicated that the documentation was repetitive and time consuming. As a result, the ZSSA team at AFMRA

and the Clearinghouse worked with mental health staff to revise and streamline the Mental Health Documentation template. The team worked with multiple Air Force Agencies to ensure that the new template met all legal and ethical requirements. In addition, the new template was built to incorporate all ZSSA components (e.g. screening, assessment, safety planning) into the new Mental Health Documentation template. Although base-level staff were involved in the change process, they were also resistant to change. The AFMRA and Clearinghouse teams worked through this resistance by delivering a series of webinars and providing documentation guides for mental health staff.

Transition

To provide continuous contact and support to patients at risk of suicide, especially in transitions between different clinics, communication across all medical and mental health service providers was increased. However, inter-clinic communication among medical and mental health service providers was not consistent at any of the five ZSSA pilot bases. The challenge was to open communication pathways that were not being utilized and then maintain that communication. Pilot site teams recruited representatives from all patient-care clinics to maintain communication pathways. The POCs utilized flight- and squadron-level leadership to motivate staff to participate in local implementation teams. Inter-clinic TCONs between PCBH, mental health, and other patient-care providers were used to discuss patient-care decisions. The establishment of a suicide-specific case manager assisted in providing continuous contact and support to patients with suicide risk. Transition plans to non-military, off-base, care providers were not initially well developed for dependents. Where possible, case managers now coordinate the transition of care to off-base providers for Airmen, dependents, and retirees.

Improve

Retrieving fidelity data has been the single-largest challenge of the ZSSA Pilot Project. A data-driven quality improvement approach needed to be put in place to inform continuous system adjustments to improve patient outcomes and better care for those at risk for suicide. Initially, the Air Force's Electronic Health Records (EHRs) were found to be accessible but not mineable. In addition, EHR systems differ across medical clinics. As AFMRA worked with their Analytics Team to get access to these data, they were met with multiple challenges. These obstacles included the lack of Analytics Team time to pull the requested data and staff pulling data incorrectly. In addition, midway through the ZSSA Pilot Project, the DHA took ownership of the database, and AFMRA had to start working with a new team to get the requested data. To this date, AFMRA continues to work with DHA Analytics to obtain system-wide fidelity data through 2019.

Accessing other data sources was explored with little success. The team initially created fidelity tracking sheets that were to be used by base-level staff to track fidelity to the ZSSA Pilot Project model. However, it was decided that 100% chart review was not feasible due to the high level of workload this would have generated. Thus, a random sampling check, similar to the peer review process, was implemented. However, even this was met with difficulty due to mental health staff at each pilot base not having the available time to conduct these reviews. As a result, some chart review fidelity data were not gathered. The PSU team is also conducting qualitative interviews with staff from all clinics to ascertain project feedback. This feedback includes information on fidelity to the ZSSA Pilot Project Model.

Note: As part of a new grant from the Military Suicide Research Consortium (MSRC), the Clearinghouse has a Business Associate Agreement with the Air Force, which will allow for a Clearinghouse staff member to have access to the Air Force's EHR. This will hopefully allow for the Clearinghouse to conduct record reviews and further determine fidelity to the ZSSA Pilot Project model.

Lessons Learned

There have been several lessons learned throughout the ZSSA Pilot Project that appear to be crucial to the success, sustainability, and feasibility of ZSSA. The Clearinghouse asks that these lessons learned be considered when formalizing any decisions regarding the broader use of ZSSA in the Air Force. These lessons are included below and are organized according to ZSSA Pilot Project component.

Lead a system-wide culture change committed to reducing suicides

- From the beginning, the ZSSA pilot had leadership support at the AFMRA. Though upper-level leadership support was important, attaining additional mid-level mental health and medical health leadership support was crucial. The combination of explicit support from both upper and mid-level leadership appears to be an important aspect of promoting provider and staff participation MTF-wide as they learn and utilize a new system for identifying and treating patients at risk for suicide.
- Due to the high level of personnel turnover continually found in the Air Force, efforts are required to minimize the impact that turnover has on leadership and personnel support, championing, and knowledge retention. This challenge can be met by providing orientations, continuous support, and resource materials that can educate and keep new leadership and staff up to date on ZSSA.
- Active and engaged leadership in ZSSA is critical. In the absence of active and engaged leadership, the likelihood of ZSSA being successfully implemented is unlikely.
- The adoption of clinical innovations is complex, challenging, and time consuming. Not surprisingly, the success of clinical innovations requires a model of leadership that leaves no question in any stakeholder's mind that the innovation is needed, must happen, will be done with high quality, and will make life better for all stakeholders (e.g., patients, staff, providers, non-providers, families).
- Because clinical innovation is complex, challenging, and time consuming, its successful implementation requires culture change, clear expectations of each stakeholder's role, stakeholder enthusiasm, and a willingness to work through real-world implementation.
- Given the increasing role DHA is playing in the management of Service branch healthcare systems, developing a strong collaborative partnership with DHA is very important. Without support from DHA, it is difficult to imagine how a larger roll-out of ZSSA across the Air Force could take place. Understanding how suicide prevention is being prioritized (if at all) at DHA is a critical step in making decisions about the future of ZSSA.

Train a competent, confident, and caring workforce

- Most providers have not had education or training in the identification and treatment of individuals at risk for suicide.

- Clinic staffing should be taken into consideration before new training takes place. To incorporate new training, provider and staff clinical schedules must be temporarily changed, which could result in reduced time for clinical encounters. The new trainings would need to be streamlined before a large-scale roll-out could occur.
- Although staff were trained in CBT-SP, full implementation of the treatment was not achieved. Staff need additional support and consultation if they are expected to utilize the CBT-SP training.

Identify individuals with suicide risk via comprehensive screening and assessment

- The Columbia Suicide Screener has proven to be easy to utilize across all MTF clinics and career fields.
- Initial resistance to changes (use of the screening protocol at every clinical encounter across the MTF) subsides as staff become accustomed to using the screening tools and see success in their own clinics.
- Systematic MTF-wide screening at every clinical encounter appears to be, perhaps, the most useful and sustainable aspect of the ZSSA Pilot Project.

Engage all individuals at-risk for suicide using a suicide care management plan

- Engagement sustainability can be attained with the use of standardized tools including the full- and brief-safety planning tools and a standardized protocol for elevated suicide risk patient care (i.e., SRMP).
- The manning of a suicide prevention-specific case manager position is critical in providing continuous contact and support to patients on the SRMP.

Treat suicidal thoughts and behaviors using evidence-based treatments

- Many providers believe that the best treatment, even the only treatment, for suicide risk is hospitalization. Unnecessary hospitalizations are costly and, usually, not helpful for those at risk for suicide. Direct treatment of suicidality is the safest course of action.
- The Clearinghouse's experience in working with the Air Force on ZSSA has demonstrated that providers are fearful of treating patients who are at risk for suicide. Many providers have expressed the idea that "you don't want to be the last person to have had eyes on someone who kills himself or herself."
- To ensure providers are equipped to treat patients identified at risk for suicide the following should be considered:
    - A cultural shift needs to occur in which post-suicide death reviews are not seen as punitive but as an opportunity to learn and grow;
    - A cultural shift needs to occur such that evidence-based treatment is prioritized over hospitalization;
    - Clinicians must be trained in evidence-based interventions and protocols;
    - Clinicians must be given the support and resources required to implement use of the tools and treatments in which they are trained.

Transition individuals through care with warm hand-offs and supportive contacts

- The use of the SRMP has been a crucial step in assuring that patients do not fall into gaps in the Air Force's healthcare system.
    - Educating providers and patients on each step of care provided during the SRMP assists in managing expectations and assuring that each care component is delivered when needed.

- The utilization of a suicide prevention-specific case manager greatly increases the ease of patient transitions and the amount of contact they receive from their care team.

Improve policies and procedures through continuous quality improvement

- Healthcare systems are dynamic, fast paced, and ever changing. The most successful Zero Suicide implementations have occurred within healthcare systems that have robust electronic health records that are designed to address suicide risk in patients irrespective of where patients receive treatment in the system.
- Process data are critical because they identify where implementation is going well and where it needs additional support. Obtaining access to Air Force data was one of the challenges in the ZSSA pilot. Different clinics within MTFs use different databases, and most databases were not searchable. This was a significant barrier in the Clearinghouse's ability to develop, monitor, and respond to quality implementation metrics. Putting data in the hands of decision makers (e.g., clinic directors, MTF leadership) assists in the daily oversight of implementation, and the benefits of using data to achieve high-quality ZSSA implementation are sizeable predictors of success.
    - Improvements need to be made in the management of Air Force EHR data in order to allow AFMRA to make timely, data-informed decisions and conduct continuous quality improvement to their policies and procedures.
- Highly related to access to data, continuous quality improvement is the engine that drives improvements to the dissemination and implementation of clinical innovations. Situations change, patients change, rules and regulations change, so continuous quality improvement keeps entities ready for improvement and better positioned to address changes as they happen. Continuous quality improvement also acknowledges that processes, procedures, and practices should adapt to changing environmental conditions – whether those changes occur in a clinic or across an MTF. Healthcare outcomes are better in systems that take continuous quality improvement seriously. Not surprisingly, a commitment to continuous quality improvement requires strong leadership, a culture that values quality and improvement, a willingness to admit to errors and problems, and the collection and use of both process and outcome data.

Next Steps

The formal processes of piloting ZSSA have concluded at four of the five pilot bases. Although each base continues to implement ZSSA protocols and procedures, the Clearinghouse is no longer actively involved in monthly telephone support calls or training of staff. However, the Clearinghouse continues to work with case managers to monitor fidelity and provide case management support. In addition, the Clearinghouse continues to work with individual base POCs as questions or concerns arise.

The Clearinghouse and AFMRA teams do continue to work with Davis-Monthan in the full capacity described within this report. In fact, Davis-Monthan will continue pilot testing the ZSSA Model for the next several years thanks to new funding from the MSRC. In addition to the support they are currently receiving, Davis-Monthan will receive two full-time staff members to support and monitor the implementation of ZSSA. One staff member will become Davis-Monthan's MTF Zero Suicide Implementation Coach and will assist with all aspects of the project. The second, a data analyst hired by the Clearinghouse, will work solely on analyzing ZSSA-related data, which includes conducting record reviews to ascertain fidelity to the ZSSA Pilot model.

In addition to the work described above for MSRC, the immediate next steps for the ZSSA Pilot Project include the following:

- Continue to support all pilot bases as needed
- Continue full implementation support at Davis-Monthan
- Finalize qualitative interviews at the three remaining ZSSA pilot bases once COVID-19 travel restrictions have been lifted
- Work with AFMRA and Air Force Analytics to verify the accuracy of system-level fidelity data and obtain the final 2019 quarter of fidelity data
- If possible, work with Air Force Analytics to add site demographic characteristics, measures of leadership attitudes, and/or level of working stress as control variables to improve/refine assessments of the pilot program's effectiveness
- Work with case managers at five pilot sites to receive additional base-level fidelity data.
- Update this project report with additional data
- Review (and modify as needed) all computer-based training modules to ensure ZSSA trainings are accurate and current
- Develop and deliver a ZSSA Toolkit to AFMRA. The Toolkit will encompass all components of the ZSSA Pilot Model including all tools, protocols, and policies created over the life of the ZSSA Pilot Project

Conclusion and Recommendations

Results from the ZSSA Pilot Project indicate that the project was successful at reducing suicide deaths. Although different at each point in time, trend lines continue to show suicide deaths declining at each pilot base. Further, suicide deaths, suicide attempts, and psychiatric inpatient hospitalizations are lower at the five ZSSA pilot bases than at comparison bases. These data suggest that the ZSSA Pilot Project may be effective in reducing suicide-related outcomes at the five ZSSA pilot bases.

The adoption of ZSSA practices and the reduction of suicide-related outcomes required a large investment of time and resources. The formal launch of the ZSSA Pilot Project began over 3 years ago. During this time, the Air Force has invested a significant amount of financial resources and personnel time in an effort to make this project successful. In addition, the Clearinghouse has supplied a great deal of time in support of the five pilot bases through training, problem-solving, and supporting implementation. The resources spent on the ZSSA Pilot Project provided a strong return on investment given the lessons that have been learned, the change in Air Force practices that have been successful (i.e., screening and assessment has already been changed for all of Air Force Mental Health), and the lives that have been saved.

Utilizing the results of the ZSSA Pilot Project combined with experience and knowledge gained over the last 3 years of implementing the ZSSA Pilot Project, AFMRA has three distinct options to choose from related to Zero Suicide:

Option 1: *Do nothing with the learned information from this ZSSA Pilot Project.*
Option 2: *Roll out ZSSA Air Force-wide.*
Option 3: *Utilize sustainable promising practices from the ZSSA Pilot Project to modify protocols and policies across the Air Force.*

Option One. Not recommended. The first option states that the Air Force do nothing with the information learned from this ZSSA Pilot Project and continue to conduct medical operations in the same way. Although this is an option, the Clearinghouse does not recommend this choice. Rather, the lessons learned from the ZSSA Pilot Project should be utilized to continue to advance the care of Airmen who are at risk for suicide and their families.

Option Two. Recommended only if DHA buy-in is achieved. The second option is that AFMRA utilizes the results of the ZSSA Pilot Project to implement ZSSA across the entire Air Force. This would require a great investment of resources. However, if the effort was shared by the entire Air Force medical team (i.e., not just the AFRMA Mental Health Branch), implementing ZSSA at all 76 Air Force MTFs would require less time and resources for a single branch or wing then it did to conduct the ZSSA Pilot Project. Practical lessons learned from Centerstone Behavioral Health and the Institute for Family Medicine indicate that a system-wide adoption may be more successful than only implementing the program at several bases. If the Air Force chooses this option, training, policy, procedures, and practices could be championed across all AFMRA sections, and support could be spread across the Air Force in such a way that true culture change may occur. Note, it appears that DHA will likely have direct operational control of many medical resources in the near future. This recommendation may not be feasible unless the DHA is supportive and buys into this system's approach.

Option Three. Recommended. This option would involve the use of sustainable and feasible promising-practices from the ZSSA Pilot Project across all Air Force MTFs. These promising practices include employing the Mental Health Documentation template, the Columbia Suicide Screener, and the Columbia Suicide Assessment, which have already been implemented in Mental Health Clinics across the Air Force. This third selection appears to be the most feasible and sustainable option given that much is still unknown about what is within AFMRA's scope versus within the scope of DHA. If this option is chosen, the Clearinghouse recommends the following.

Recommended Practice One: Universal Screening
The Air Force should adopt universal screening using the Columbia Suicide Screener at every clinical encounter across all MTF clinics. This is an essential tenant of any Zero Suicide effort, has been demonstrated to reduce suicide rates, and appears to have been successful in the ZSSA Pilot Project.

Recommended Practice Two: Suicide Risk Management Pathway
The Air Force should adopt the use of the SRMP, including the suicide-specific case management positions, where possible. This pathway provides clear directions for providers and patients on what to expect and what steps to take regarding the care and management of patients at risk for suicide.

Recommended Practice Three: Brief-Safety Planning
The Air Force should adopt the use of the Brief Safety Planning (BSP) Tool that can be utilized within Primary Care Clinics (and all specialty clinics) when a low- or intermediate-risk of suicide is identified in a patient.

Recommended Practice Four: Prioritize Treatment

The Air Force should actively promote a shift from hospitalization towards out-patient care for the majority of patients who are suicidal. Initial qualitative interviews and data on the use of CBT-SP within clinics indicate that the Air Force still has a culture that prioritizes hospitalizing suicidal patients over providing them with evidence-based treatments within the Mental Health Clinic. Evidence is clear that hospitalization does not reduce suicidality and may even make it worse.

Recommended Practice Five: Build a System for Continuous Quality Improvement

The Air Force should invest a significant amount of time and resources into building a system for continuous quality improvement. Continuous quality improvement has been the most difficult component of the ZSSA Pilot Project due to the lack of ability to get data out of the Air Force's EHR. A successful electronic records system would enable AFMRA leadership to inquire about a topic and receive data-driven information in a reasonable time period. For example, in a successful system, AFMRA would be able to ask an analytic team for the percentage of individuals who are being screened for suicide risk within primary care clinics. If that data were pulled in a reasonable time period, AFMRA leadership could then make timely, data-informed decisions about how to improve the screening of individuals (e.g., additional training, reminding clinics of the policy, changing the way results are documented). Thus, a successful system for continuous quality improvement would provide AFMRA with the ability to make data-informed decisions on many facets of medical care – not just suicide prevention. Without this option, AFMRA is left making policy without real-time data.

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Appendix A: Products Completed as part of the ZSSA Pilot Project

Any of these products can be requested by contacting the Clearinghouse ZSSA Team at zerosuicide@psu.edu.

Computer-Based Training Modules

- *Assessing for Suicide Risk using the Columbia Suicide Assessment*
- *Counseling on Access to Lethal Means: Air Force Specific*
- *Safety Planning and Lethal Means Reduction*
- *Screening for Suicide Risk using the Columbia Suicide Screener*

In-person Trainings

- *Assessing for Suicide Risk using the Columbia Suicide Assessment*
- *Case Management Training*
- *Cognitive Behavioral Therapy for Suicidal Patients* (Note: training owned by the Center for Deployment Psychology)
- *Safety Planning and Lethal Means Reduction*
- *Screening for Suicide Risk using the Columbia Suicide Screener*
- *Zero Suicide Systems Approach Pilot Project Orientation*

Literature Reviews

- *Approaches to Engagement with Mental Health Patients and Evidence of Effect*
- *Electronic Health Record Systems and Clinical Record Keeping*
- *Inpatient Psychiatric Care: Staffing Ratios*
- *Mental Health Access to Care Metrics*
- *Peer Support Groups for Suicide Prevention: A Systematic Literature Review*
- *Quality Assurance and Provider Accountability*
- *Review of Suicide Risk Instruments*
- *Suicide Risk Among Lesbian, Gay, Bisexual, and Transgender (LGBT) Individuals in the Military*
- *Suicide Risk Screening and Assessment in Air Force Mental Health Clinics: A Rapid Review*
- *The Economic and Intangible Costs of Suicide*

Operating Procedures

- Updates to the *Air Force Guide for Suicide Risk Assessment, Management, and Treatment*
- Waivers to AFI 44-172

Other

- *Air Force Mental Health Clinical Documentation Template*
- Case Management Tracking Forms
    - *Mental Health Case Management Caseload Tracker*
    - *Patient Contact Tracker*
    - *ZSSA Risk Management Continuum Data Tracker*
- Cross-walk of BHDP and TSWF data capabilities
- ZSSA Data Collection Plans
- ZSSA Data Collection Tracking Forms

Protocols

- *Suicide Assessment Protocol*
- *Suicide Risk Case Management Protocol*
- *Suicide Risk Management Continuum Protocol*
- *Suicide Risk Management Pathway Protocol*
- *Suicide Safety Planning and Lethal Means Reduction Protocol*
- *Suicide Screening Protocol*

Reports and Evaluation Findings

- *Air Force Mental Health Time-Motion Study: Clinic-Level Operational Findings from Mental Health Clinics at Tinker and Nellis Air Force Bases*
- *Cognitive Behavioral Therapy for Suicide Prevention - Suicide Prevention Training Survey Results*
- *Qualitative Review of Mental Health Clinics' Suicide Prevention and Interventions: Initial Review of Model Programs*
- *Qualitative Review: Suicide Prevention Practices at Five Zero Suicide System Approach Pilot Sites*
- Results from the Assessing and Managing Suicide Risk training
- Zero Suicide Academy Evaluation Report
- ZSSA Safety Planning and Lethal Means Reduction: Training Evaluation Report
- *ZSSA Screening and Assessment Training: Report of Participant Feedback*

Webinars

- *Assessing for Suicide Risk using the Columbia Suicide Assessment*
- *Case Management Training*
- *Safety Planning and Lethal Means Reduction*
- *Screening for Suicide Risk using the Columbia Suicide Screener*
- Training on the Air Force's Mental Health Clinical Documentation Template
- *Zero Suicide Systems Approach Pilot Project Orientation*

Appendix B: Basic Data Descriptive, Histograms, and Plots

Table B-1

Basic Data Descriptive.

		Pilot (n=5)			Control (n=7)		
		Mean	Variance	Min-Max	Mean	Variance	Min-Max
Monthly	Attempts	0.5833	0.9195	0-6	0.3810	0.4130	0-3
	Deaths	0.1333	0.1494	0-2	0.0786	0.0726	0-1
	Both	0.7167	1.2606	0-8	0.4595	0.5258	0-3
Quarterly	Attempts	1.7500	3.7449	0-9	1.1429	1.3895	0-5
	Deaths	0.4000	0.4444	0-3	0.2357	0.2102	0-2
	Both	2.1500	4.9167	0-10	1.3786	1.6039	0-6
Half-yearly	Attempts	3.5000	8.9489	0-12	2.2857	3.2215	0-7
	Deaths	0.8000	0.6531	0-3	0.4714	0.4267	0-3
	Both	4.3000	10.9490	0-13	2.7571	3.2300	0-7

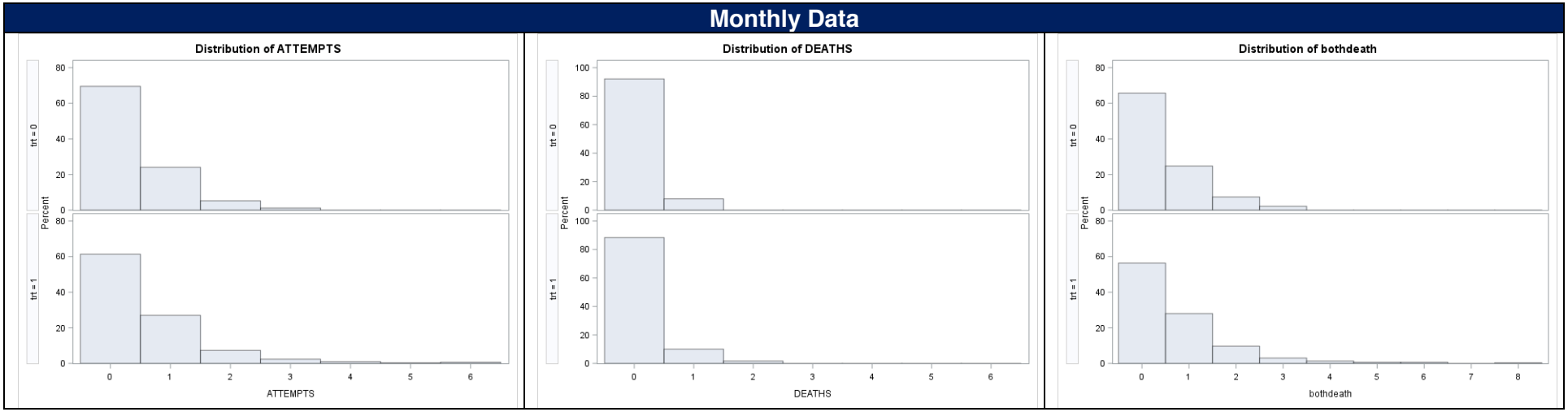

Figure B-1. Histograms of Monthly Suicide Attempt and Death Counts.

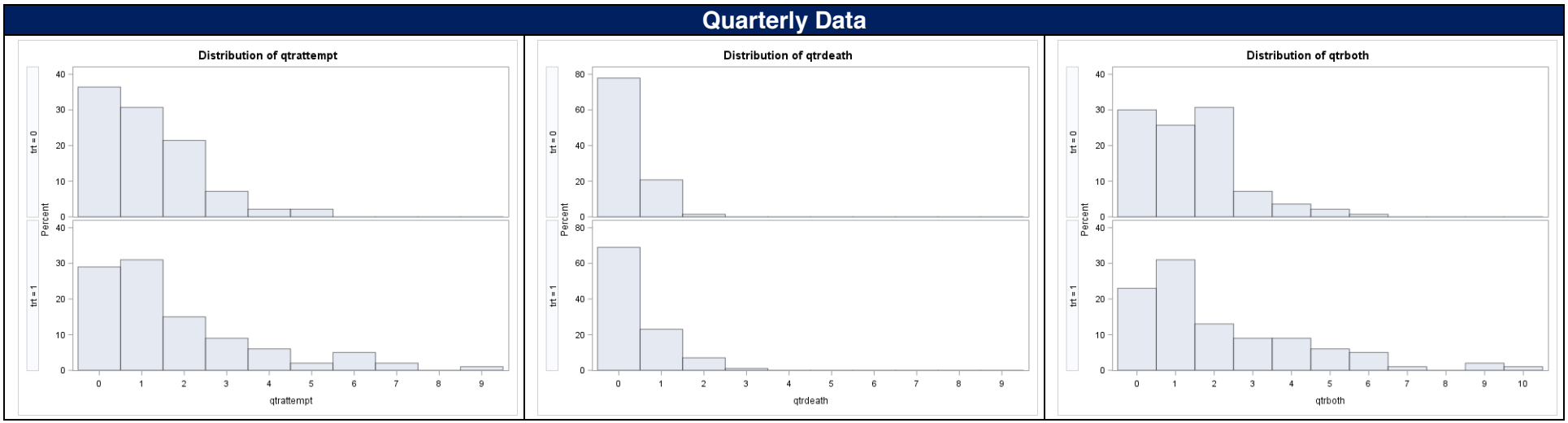

Figure B-1. Histograms of Quarterly Suicide Attempt and Death Counts.

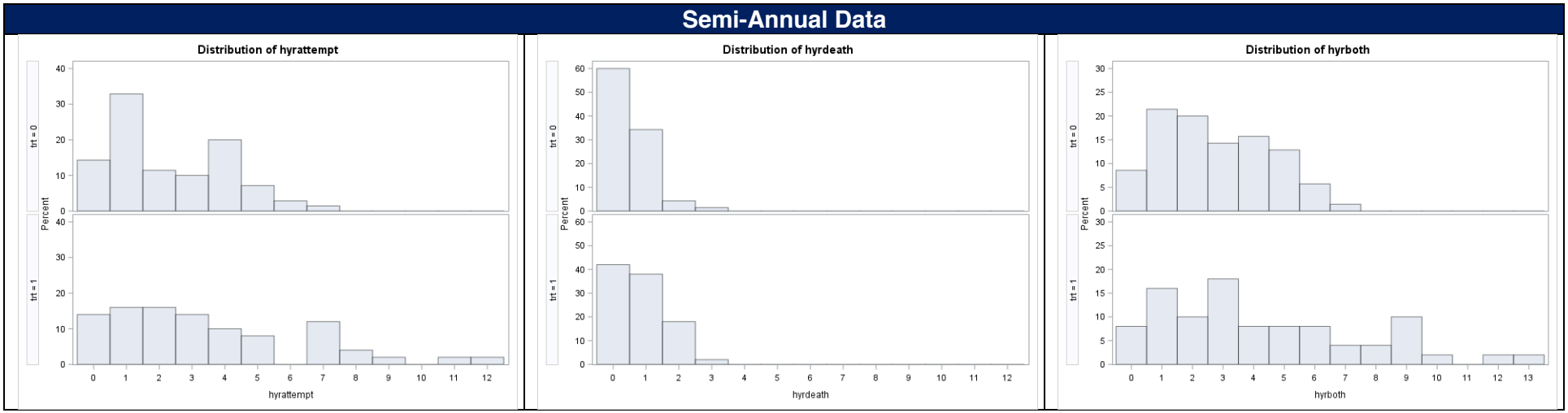

Figure B-1. Histograms of Semi-Annual Suicide Attempt and Death Counts.

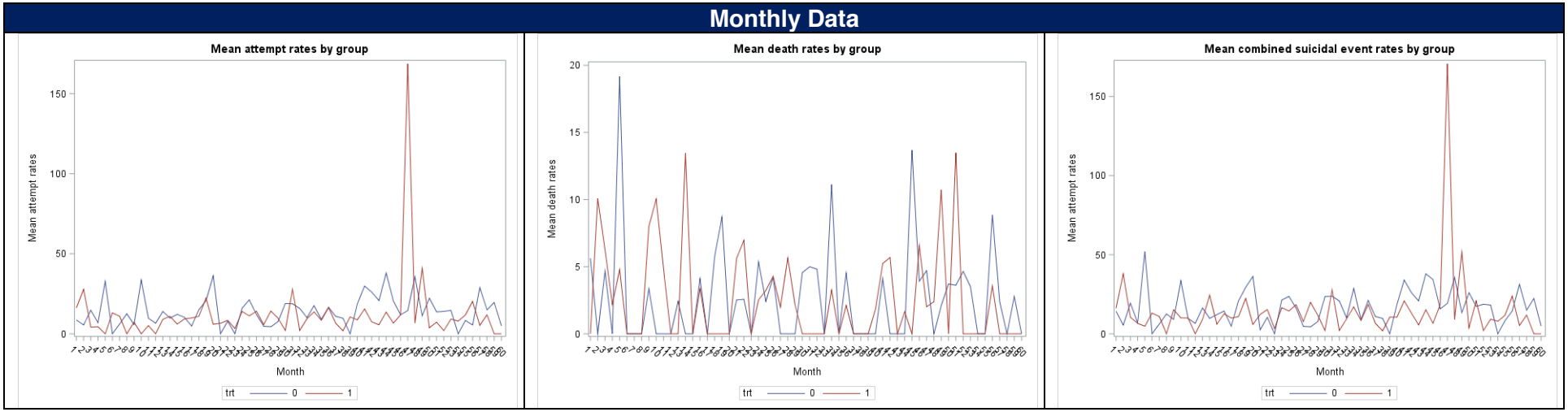

Figure B-1. Plots of Monthly Suicide Attempt and Death Rates by Intervention.

Note: Although there was an extreme high spike in suicide attempt rates (resulting in high combined events rates also) in November of 2018, there is no evidence that it is an outlier, as Tyndall Air Force Base did have a hurricane and forced evacuation. This resulted in the base population decreasing significantly.

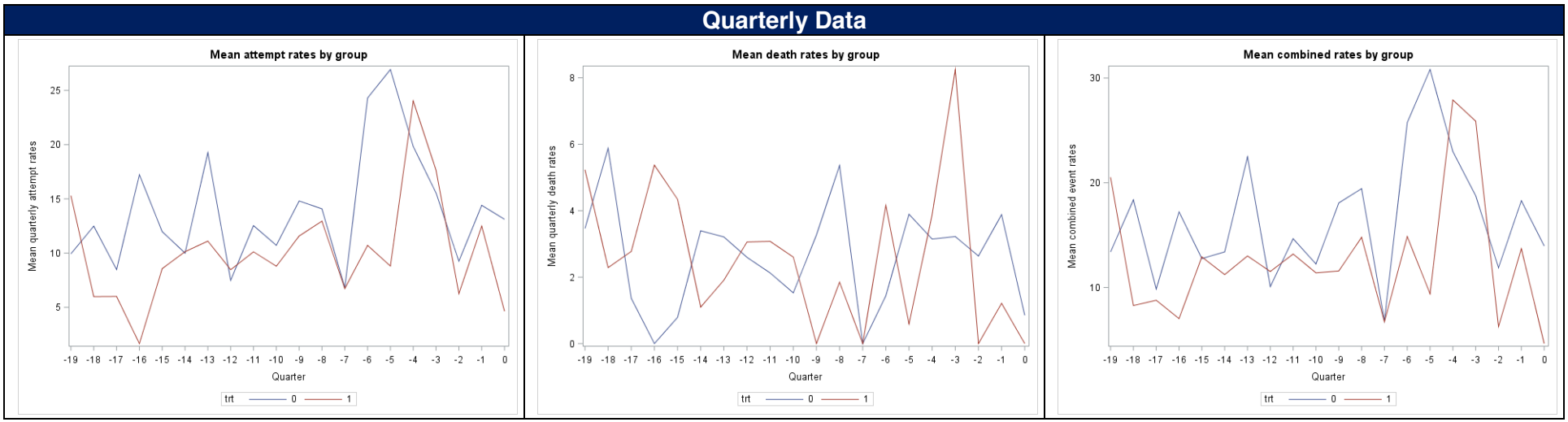

Figure B-1. Plots of Quarterly Suicide Attempt and Death Rates by Intervention.

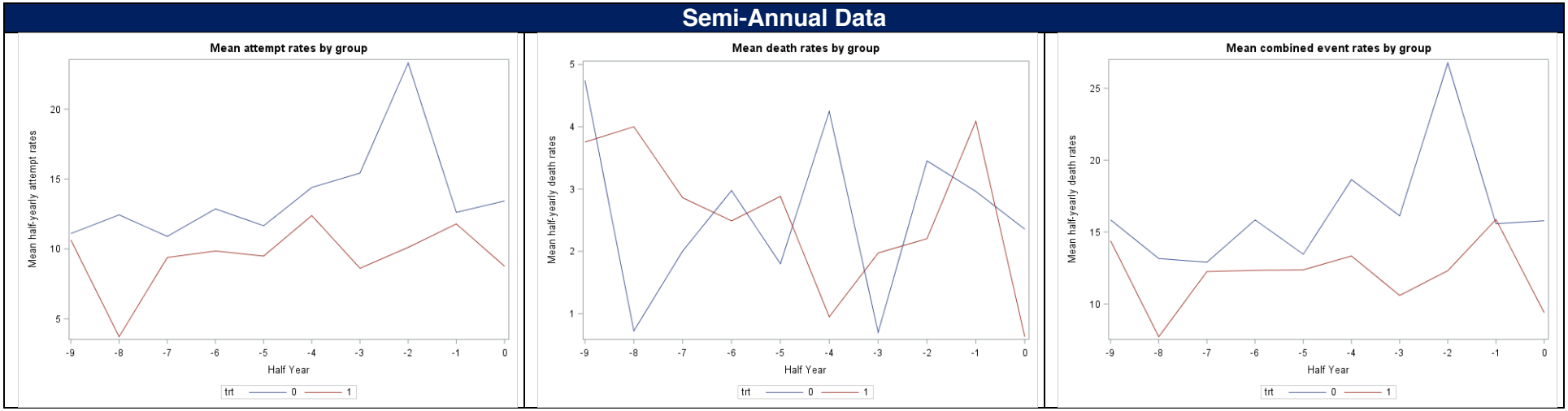

Figure B-1. Plots of Semi-Annual Suicide Attempt and Death Rates by Intervention.