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"Zero Suicide" – A model for reducing suicide in United States behavioral healthcare

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Abstract

Suicide is a serious public health concern in the US, especially for those served in outpatient behavioral health. Over the past decade, there has been a dramatic increase in US suicide rates, and a significant proportion of those dying by or attempting suicide were treated in outpatient behavioral healthcare within the prior year. In response, the US Action Alliance released the National Strategy for Suicide Prevention in 2012, a key tenet of which is the "Zero Suicide" (ZS) model. ZS provides resources for administrators and providers to create a systematic approach to quality improvement for suicide prevention in healthcare systems via seven essential elements (Lead, Train, Identify, Engage, Treat, Transition, Improve). In this paper, we describe the ZS model, as well as our operationalization of the model in an NIMH-funded study in ~170 free-standing New York State outpatient behavioral health clinics, serving >80,000 patients. This study is the largest implementation and evaluation of the ZS approach ever conducted in outpatient behavioral health. Evaluation of ZS implementation in "real-world" clinical settings will provide crucial insight regarding broader dissemination and inform how to best adopt empirically-supported care for suicidal patients in outpatient behavioral health, thereby reducing tragic and preventable loss of life.

Keywords

Zero Suicide; implementation; clinical best practices; outpatient behavioral health

Worldwide, someone dies by suicide every 40 seconds. More than 800,000 people die by suicide annually, and for every death there are an additional 10-25 attempts (World Health

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Organization [WHO], 2017). In the United States, suicide is the 10th leading cause of death, and suicide rates are 22% higher than global averages (Center for Disease Control and Prevention [CDCP], 2017). U.S. suicide rates increased a staggering 25% over the past decade while other leading causes of death declined (CDCP, 2016). In 2016 alone, nearly 45,000 Americans died by suicide and one million made attempts (CDCP, 2017). Given the scope of this public health issue, the need for prevention has been repeatedly affirmed (U.S. Department of Health & Human Services [U.S. DHHS], 2011; 2012).

In response to this enormous public health issue, the National Action Alliance for Suicide Prevention (NAASP) was established in 2010. The National Action Alliance is a public-private partnership advancing the National Strategy for Suicide Prevention, a report published in 2012 by the U.S. Surgeon General and partnerships with the United States Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, the Suicide Prevention Resource Center, and a task force consisting of national and international suicidology experts (U.S. DHHS, 2012). While the National Strategy for Suicide Prevention advocates a comprehensive approach to suicide prevention involving community, school, primary care, emergency departments, inpatient units, and outpatient behavioral health settings, the National Action Alliance has identified healthcare systems as particularly critical venues for suicide prevention because suicidal patients often receive services in the period leading up to their attempt or death, providing an opportunity for identification and connection to treatment (U.S. HHS, 2012).

Unfortunately, suicidal patients often “fall through the cracks,” due in part to a fragmented American healthcare system (SPRC, 2017). Unlike in Norway, healthcare is not typically provided or overseen by the government in the United States (except for persons with significant disabilities or those living in poverty and requiring government assistance), and the majority of healthcare facilities are independent and privately-run. The majority of individuals pay for their health insurance premiums out-of-pocket, either through state-specific or federal insurance marketplaces or through group plans administered by private insurance companies that are offered and subsidized by their employers. While the Affordable Care Act of 2010 mandated that all Americans must carry health insurance, millions of individuals still struggle to access adequate, affordable healthcare (American College of Emergency Physicians, 2017). Further, idiosyncratic variations exist in insurance coverage, and different often-unaffiliated facilities are responsible for the care of physical, behavioral, and substance-related concerns; as a result, poor continuity of care and communication among providers is common (U.S. DHHS, 2011).

Even those receiving care often do not receive what is required to prevent or resolve suicidal crises. Between 20-80% of all persons dying by suicide in the U.S. accessed care in the year prior to their death (Ahmedani et al., 2014; Luoma, Martin, & Pearson, 2002), and nearly half within 30 days (Ilgen et al., 2012; a finding that has been replicated in other nations; Isometsa et al., 1995). While many reasons exist why people receiving services still die by suicide, three potential causes were identified by the National Strategy for Suicide Prevention: 1) detection of suicide risk is inadequate; 2) evidence-based, suicide-specific interventions are not deployed; and 3) intensity of care is not increased during high risk periods (U.S. DHHS, 2012). While great strides have been made in the past ten years in

identifying “best practices” for suicide prevention (Brown et al., 2005; Fowler et al., 2012; Jobes et al., 2005; Michel et al., 2017; Michel & Gysin-Maillart, 2015; Linehan et al., 2006; Luxton et al., 2013; Pisani et al., 2016; Posner et al., 2011), a striking gap remains between the development of these innovations and what services the majority of suicidal individuals in the U.S. actually receive. Experts in suicide prevention have long recommended universal screening with validated measures at regular intervals across varied settings to better identify those who may be at-risk for suicide, but the majority of individuals seen in healthcare settings do not receive any screening, let alone frequent screenings using standardized metrics (Posner et al., 2011). The field has also moved away from prediction of who will engage in suicidal behaviors, and shifted to a prevention-oriented approach in which those who are identified as being at elevated risk receive comprehensive suicide risk assessments that weigh distal and proximal risk and protective factors to identify potential fluctuations in suicide risk over time and inform subsequent treatment planning and interventions (Jobes et al., 2005; Pisani et al., 2016). However, the majority of clinicians are not trained in this orientation, many systems rely on risk status for triage, and even those patients who are effectively identified as being at high risk often do not receive specialty or more intensive mental health care.

Beyond best practices in assessment, research has also shown that better understanding of the suicidal state and suicide-specific interventions have shown significant promise in resolving suicidal urges, whereas treating underlying diagnoses alone does not typically resolve suicidal ideation and behaviors (Brown et al., 2005, Linehan et al., 2006; Michel & Gysin-Maillart, 2015). Unfortunately, despite the development of evidence-based, suicide-specific treatments and clinician guidelines (AESHI Working Group, 2018), the majority of clinicians working with suicidal individuals do not have sufficient training in how to provide these interventions or build strong, collaborative relationships with suicidal patients (Brown et al., 2005, Linehan et al., 2006; Michel & Gysin-Maillart, 2015; Michel & Jobes, 2010). In response to these gaps between science and practice, the National Action Alliance sought to provide recommendations for improving suicide care in healthcare systems, especially in regard to adequate procedures for detection of suicide risk, use of evidence-based, suicide-specific interventions, and greater intensity of care, monitoring, and patient engagement during their highest risk periods (U.S. DHHS, 2012). A key method of disseminating best practices in suicide care was the “Zero Suicide” Initiative (ZS; Suicide Prevention Resource Center, 2017; zerosuicide.sprc.org).

The “Zero Suicide” Initiative

ZS is a key component of the National Strategy for Suicide Prevention and priority of the National Action Alliance that aims to bridge gaps in practice. ZS is a strategic framework for creating a systematic approach to suicide prevention and quality improvement in the healthcare system with the aspirational goal of "zero suicides.” The foundational belief of ZS is that suicide deaths for individuals receiving care within health and behavioral health systems are preventable.[1] The few healthcare systems that have implemented and evaluated ZS-like approaches demonstrated notable reductions in suicide deaths (Centerstone, 2016; Hampton, 2010). It must be noted these studies were correlational and preliminary; it is extremely challenging to prove that a reduction of suicides is causally related to a specific

suicide prevention effort, and only large-scale, controlled evaluations of ZS procedures will establish their effectiveness. However, reductions of greater than 70% in the year after unveiling ZS interventions are certainly promising. The ZS model provides guidance on how to best implement "best practices" in "real-world" settings. ZS is comprised of seven essential elements for an effective, coordinated system for suicide care; four of these elements focus on how the patient should be treated and the remaining three relate to implementation factors (see Table 1).

The first implementation element, *Lead*, emphasizes the need to engage leadership and administration to create a culture change about suicide prevention. The onus is placed on leadership to put policies in place that foster a transparent, blame-free environment where suicide prevention is a systems issue and not the personal responsibility of individual staff members. This shifts emphasis away from liability or fear toward a safety-focused team approach, wherein identification and improvement of barriers to optimal care are everyone's responsibility. The second implementation element, *Train*, highlights the importance of developing a competent suicide prevention workforce. The ZS model stresses that every member of the workforce (not only mental health professionals) should receive training on the signs of suicide risk and how to interact with suicidal individuals effectively, with different staff roles requiring different competencies. Lastly, the final implementation element, *Improve*, emphasizes the need for data-driven quality improvement. Before implementing new procedures, organizations assess their current clinical practices, attitudes, and training to determine needs and knowledge/practice gaps. Leadership then develops an implementation plan based on identified needs, and employs systemic data collection to evaluate efforts, continually assess progress and model fidelity, encourage accountability, and inform revisions.

In addition to implementation elements, the ZS model also recommends four clinical elements. The *Identify* element provides guidelines for evidence-based screening and assessment of suicide risk for all patients at intake and regular intervals. The *Engage* element ensures pathways to care for patients at elevated risk, and recommends the creation of a personalized Suicide Care Management Plan that includes frequent reassessment, specialized treatment, and greater intensity of clinical contact. The *Treat* element stresses the importance of using evidence-based, suicide-specific interventions, including brief interventions to maintain immediate safety (such as safety planning and means reduction counseling[2]), and longer-term interventions to directly target suicidal thoughts and behaviors. Lastly, the *Transition* element highlights continuity of care and close monitoring

[1]The authors recognize that the name of the "Zero Suicide" Initiative is somewhat controversial. The initial intent of the National Action Alliance and Suicide Prevention Resource Center in selecting such a moniker was to inspire hope and optimism, and convey the belief that suicide deaths *could* be prevented within healthcare systems. This goal is clearly aspirational and limited to the prevention of suicide within healthcare systems only. Some have raised the concern that the name "Zero Suicide" could foster misconceptions amongst the public or policy makers, who may inaccurately perceive that aspirational goal as being readily attainable, and thus set expectations unrealistically high. Others have suggested that the title could convey the perception that all suicide deaths (not just those occurring outside in healthcare systems) should have been prevented, which could increase guilt and stigma for survivors who have lost loved ones. While these concerns are valid, the "Zero Suicide" Initiative has already been widely disseminated across the United States and internationally (see zerosuicide.org and zerosuicide.sprc.org for more information on the history of ZS). As such, the authors continue to use the ZS name in this manuscript.

[2]The Zero Suicide Academy considers safety planning and means reduction counseling to be engagement strategies used as part of a Suicide Care Management Plan. However, the co-developers of the Safety Planning Intervention (Stanley and Brown, co-authors on this manuscript), considered these brief interventions used to improve engagement and maintain safety throughout treatment.

of suicidal individuals, both between clinical contacts and during care transitions (e.g., hospital or ED discharge, etc.). For more detail, see: http://zerosuicide.sprc.org/toolkit.

A Large-Scale Implementation of Zero Suicide in Outpatient Behavioral Health

While emergency departments (ED) and inpatient units have historically been settings associated with crisis care, outpatient behavioral health is increasingly recognized as a critical venue for improved suicide care. In the United States, outpatient behavioral health clinics are typically freestanding entities that focus on mental health or substance abuse treatment. While these clinics may be in the same healthcare system as primary care or hospital providers, many are independent public or private organizations. While individuals may receive inpatient or residential treatment for particularly severe presentations or times of acute crisis, the majority of care for mental disorders is provided in outpatient behavioral health settings. Suicide rates in these settings are 100 times higher than those of the general population (Brown et al., 2000). At any time, ≈15% of outpatient behavioral health patients endorse suicidal ideation in the past week (Trivedi et al., 2013), 55% report lifetime suicidal ideation, and more than 25% made a suicide attempt (Harkavy-Friedman, 1993). These high rates are particularly alarming since outpatients experiencing suicidal ideation or attempt are more likely to eventually die by suicide (Wenzel et al., 2011). Given that behavioral health patients are seen over a longer period of time than inpatient or ED patients, the opportunities to intervene are greater; thus, improving prevention practices in outpatient behavioral health holds promise for reducing suicide.

As the ZS model is being promoted nationally, the National Institute of Mental Health (NIMH) funded grants evaluating the effectiveness of ZS interventions. Herein, we describe our implementation of the ZS model in New York State (NYS) behavioral healthcare clinics, the largest implementation and evaluation of the ZS model ever conducted. This implementation is a continuous quality improvement project undertaken by the NYS Office of Mental Health Bureau of Evidence Based Services and Implementation Science, with funding from the NIMH to test and evaluate implementation strategies (NIMH grant #: R01-MH112139; PI: Stanley).

NYS as a test system for outpatient ZS implementation

NYS is a strong location for testing implementation efforts, because the state's size, regional and population diversity, and established administrative databases allow for a large-scale, generalizable evaluation of ZS. While the suicide rate is relatively low, NYS ranks 5th in the nation for number of deaths (CDCP, 2017) given the population density. The suicide rate is also markedly variable across the state – while rates of suicide death are lower than the national average in the populous New York City metropolitan region, almost 50% of counties in NYS have suicide rates higher than the national average, especially in rural northern and western upstate regions. Rates among outpatient behavioral health patients climb even higher (58/100,000 in some counties; NYS Office of Mental Health, 2015). Nearly 45% of those dying by suicide in NYS were seen within a month of their death in an outpatient behavioral health clinic (NYS Office of Mental Health, 2016). The quality of care

in New York is also representative of outpatient care across the United States, in that most clinicians have little or no specialized training in suicide-specific interventions, few clinics have established systematic protocols for identifying, treating, and monitoring patients at elevated suicide risk, and no universal system for documenting and sharing information is in place across treatment settings (NYS Office of Suicide Prevention, 2016). Thus, we have aimed to address all of these deficits through our implementation of the ZS model.

Participating clinics

As of April 1, 2017, 177 licensed freestanding or state-operated mental health clinics were participating in this project. Clinics represent 90 provider agencies, over 3500 clinicians, and serve approximately 86,000 Medicaid-enrolled patients each year (see Table 2 for patient characteristics). Clinics elected to participate through a statewide continuous quality improvement project led by the NYS Office of Mental Health Bureau of Evidence Based Services and Implementation Science program and receive a small Medicaid claims-rate incentive (~4%).

AIM-SP clinical procedures

All participating clinics agreed to implement our operationalization of the ZS clinical procedures, called the *Assess, Intervene, and Monitor for Suicide Prevention (AIM-SP;* Stanley, 2017) program of suicide-safer care (see Figure 1). AIM-SP strives to provide a basic level of care for all patients, including universal screening and comprehensive risk assessment on a regular basis for all patients, and engagement of high-risk patients on a Suicide-Safer Care Pathway (SSCP) with specialized care and increased contact.

Assessment for all patients—All patients are screened for suicide risk at intake, quarterly treatment plan review, and as clinically-indicated (i.e., whenever there is an abrupt change in clinical status or if the clinician is concerned) using the highly-validated *Columbia Suicide Severity Rating Scale (C-SSRS*; Posner et al., 2011). At intake, the C-SSRS asks about both lifetime and recent suicidal thoughts and behaviors; subsequent timeframes are since the last administration. Patients also receive a comprehensive suicide risk assessment at intake, after positive screens, or as clinically-indicated, providing broader case conceptualization and creating an individualized profile of chronic/distal and acute/proximal risk and protective factors. Risk assessment is completed in the same session as a positive screen or shortly thereafter.

Intervention and monitoring for patients on the SSCP—If a patient is deemed to be high-risk during assessment, they are placed on the SSCP, a package of enhanced outpatient care that involves frequent reassessment and monitoring, greater intensity of clinical contact, and specialized interventions. Patients are placed on the SSCP if they endorse suicidal intent, plan, or behavior within the past 90 days (i.e., a “Yes” response to any of questions 4-6 on the C-SSRS screener); patients may also be placed on or removed from the SSCP based on clinical judgment. SSCP designation is clearly denoted in the medical record.

Before the patient leaves the initial clinical interaction, clinicians must determine which actions must be taken immediately to keep the patient safe until the next session. This

includes administering the 6-step *Stanley-Brown Safety Planning Intervention* (which includes provision of crisis information and means reduction counseling), and may involve including friends or family, if appropriate. Clinicians also provide psychoeducation about the nature of suicide risk, and brief the patient regarding the requirements of treatment on the SSCP and the rationale for these interventions. In subsequent sessions, clinicians construct a treatment plan that directly addresses suicidal thoughts and behavior. If clinicians are trained in suicide-specific interventions, these approaches are recommended; alternatively, clinicians can utilize their existing orientation and skillset to directly target modifiable risk factors and enhance protective factors, as informed by comprehensive suicide risk assessment. Clinicians maintain at least weekly sessions with all patients on the SSCP, re-screen patients at each session, and revise the safety plan as needed.

If patients miss scheduled appointments, clinicians make outreach contact to ensure safety and maintain continuity of care. This contact likely consists of a phone call, but could take the form of text messaging, emails, or home visits based on clinic policy. When making outreach contact, the purpose is to show concern over the patient's absence, assess mood state and current suicide risk, review the safety plan and crisis resources, problem-solve barriers to using the safety plan and attending treatment, and re-engage by scheduling an appointment as soon as possible. When patients on the SSCP have an ED visit or hospitalization, they are prioritized to receive an appointment within 72 hours of discharge (a particularly high-risk period for suicide). Clinicians strive for contact with other treatment providers to ensure "warm handoffs" and continuity of care during care transitions. Patients are eligible to exit the SSCP after 90 days free from suicidal intent, plan, behavior, ED visits, or inpatient hospitalizations or should the clinician determine that the level of care is no longer indicated.

Intervention and monitoring for patients not on the SSCP—Only patients at high risk are *required* to receive SSCP interventions; however, many patients at lower risk may benefit from certain SSCP interventions, and clinicians should use their judgment to select interventions as indicated. At minimum, patients not on the SSCP must be re-screened *at least* quarterly at treatment plan review, and any positive screen triggers comprehensive suicide risk assessment and SSCP determination. All patients, regardless of risk status, should be provided with crisis information during intake and at quarterly treatment review, including clinic off-hour/crisis numbers, local crisis support services (e.g., mobile crisis, ED, 911), and the National Suicide Prevention Lifeline (1-800-LIFELINE).

Training procedures

Agencies were assigned to one of two levels of implementation support, either *Basic* (BI) or *Enhanced* (EI) implementation. In the BI condition, large-group (~300 participants) webinars for clinic leadership are held monthly to assist with implementation of AIM-SP interventions, data reporting requirements, and training. In addition, all clinical staff in participating clinics (approx. 3,500) were required to take four hours of online distance-learning training on risk assessment, safety planning, the suicide-safer care pathway, and adaptations for children. EI procedures included all BI activities, but also included selection and utilization of site champions (i.e., clinic supervisors provided with advanced clinical

training to serve as on-site resources for staff) and attendance at monthly small-group (approx. 10-15 people) learning collaborative meetings that addressed barriers and facilitators for implementing the ZS model. The additional resources required to implement the EI interventions were supported by the grant.

Evaluation procedures

During the *Preparation* phase, all measures and materials were prepared, clinics were enrolled, baseline data were collected, site champions were selected, clinical training of staff was initiated, and leadership and site champions began attending large-group webinars (BI) or small-group learning collaboratives (EI). The study employed an effectiveness-implementation Type 1 design (Curran et al., 2012) and cluster randomization (agencies) with stratification by geographic region and agency size (high vs. low annual patient census) to assign agencies to either BI or EI conditions.

During the *Implementation* phase, AIM-SP clinical procedures were implemented for all newly-enrolled patients, then extended to all patients at quarterly treatment plan review after six months. Clinic leadership and site champions continued to attend webinars (BI) or learning collaboratives (EI), data reporting began, and quality improvement information and technical support were provided. The data collection protocol tracks individual patient- and aggregate clinic-level data on the receipt of the AIM-SP clinical components as well as proximal outcomes (treatment attendance, emergency care, and hospitalization). Distal outcomes (suicide deaths/attempts) were obtained via statewide mandated reporting of all suicide attempts and deaths to the New York State Integrated Mandated Reporting System (NIMRS; NYS Office of Mental Health, 2016) and NYS Medicaid data. The 12 months after implementation is the *Maintenance* phase, during which clinics sustain performance without grant-funded technical, clinical, or implementation support, and the *Follow-up* phase is 12 months after maintenance concludes, used to assemble suicide data and query the National Death Index for deaths occurring outside NYS.

The implementation phase began in October 2017, so data are not yet available. The primary planned analyses include comparison of the effectiveness of EI and BI conditions in reducing suicidal behaviors (attempts and deaths), psychiatric hospitalizations, and ED visits. We will also conduct a historical control comparison analysis to compare outcomes within agencies before and after AIM-SP implementation, and a matched-cohort comparison analysis to compare outcomes between agencies who are and are not participating in the project. Further, we will use mixed qualitative-quantitative approaches to compare EI and BI conditions on implementation and sustainability of the ZS model, evaluating agency- and provider-level predisposing, enabling, and reinforcing factors affecting implementation success, as well as rates and quality of ZS components (process/impact evaluation) during implementation, maintenance, and follow-up periods.

Conclusions

Suicide is an enormous public health concern, and ZS has been promoted as a way to reduce suicides for those receiving services. Our study is the largest implementation and evaluation of the ZS approach in outpatient clinics ever conducted. Results from this study will provide

crucial insight regarding how to best adopt and disseminate empirically-supported suicide-safe care, thereby reducing preventable loss of life.

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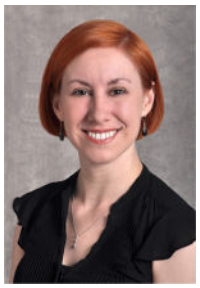
Biographies



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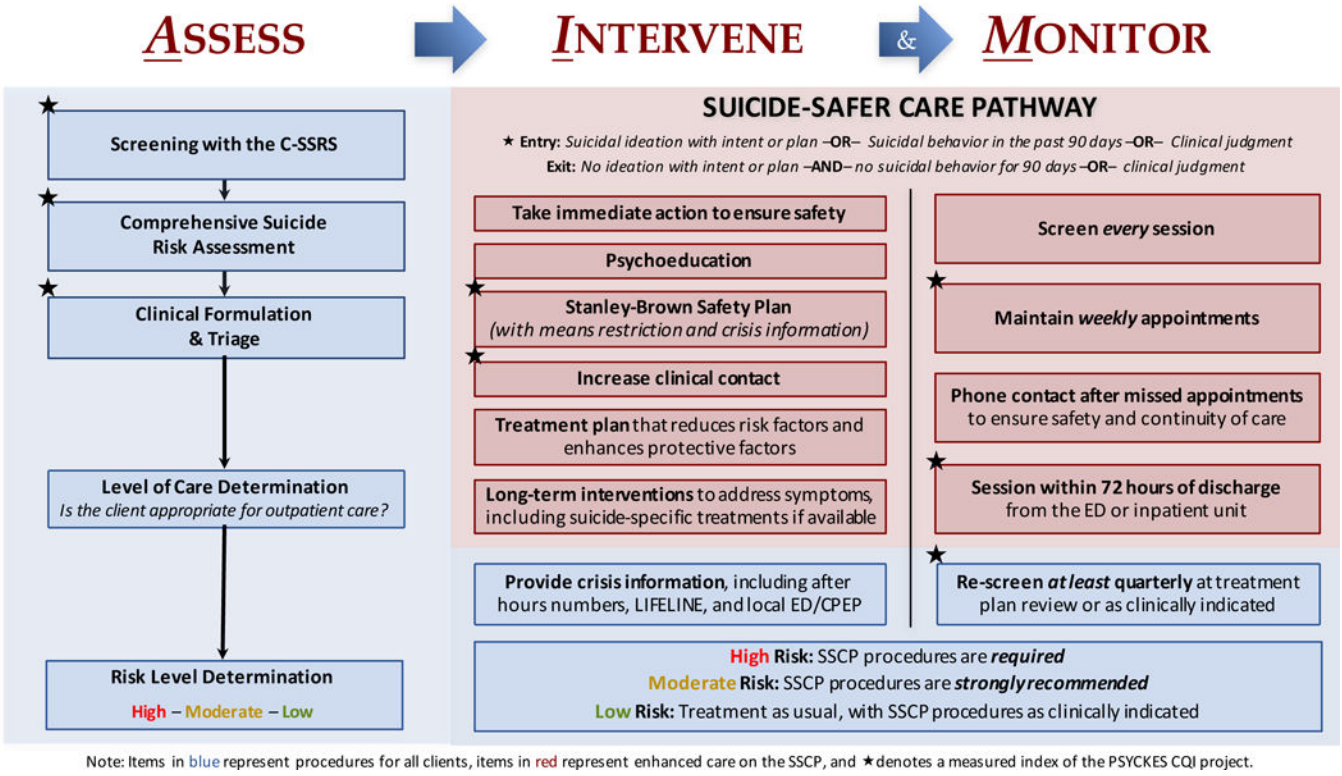

Figure 1.

Clinical procedures of the Assess, Intervene, and Monitor for Suicide Prevention (AIM-SP) program of suicide-safer care, an operationalization of the Zero Suicide model for outpatient behavioral health clinics.

Table 1

ZS Elements and their descriptions

Element	Description
Implementation Elements	
LEAD	Create organizational culture change about suicide prevention
TRAIN	Develop a suicide prevention competent workforce
IMPROVE	Data-driven quality improvement
Clinical Elements	
IDENTIFY	Screening and assessment of suicide risk
ENGAGE	Ensuring pathways to care
TREAT	Using effective evidence-based best practices
TRANSITION	Continuing contact and follow-up

Table 2

Characteristics of Medicaid enrolled patients served in New York State participating clinics

Characteristics	Percentage *N*=73,732
Age	
Youth (<18)	29.6%
Adults (18+)	70.4%
Gender[1]	
Male	46.2%
Female	53.8%
Race and Ethnicity[2]	
Caucasian or White	51.0%
African-American or Black	23.3%
Hispanic or Latin	10.5%
Asian or Asian-American	2.1%
Other/Unknown	13.1%
Region[3]	
Rural	44.0%
Urban	56.0%
Primary Diagnoses[4]	
Depressive disorder	25.4%
Schizophrenia-spectrum disorder	16.0%
Externalizing disorder (ADHD or Conduct)	13.2%
Anxiety disorder	9.9%
Bipolar disorder	9.5%
Personality disorder	0.5%
Other[5]	25.5%
Comorbid substance treatment[5]	10.5%

Notes: This analysis includes Medicaid enrolled individuals, with one or more service at a participating mental health clinic (177 clinics, 90 provider agencies participating as of April 1, 2017) between November 1st, 2015 and November 1st, 2016 (*N*=86,080), excluding individuals over 64 years or without continuous Medicaid eligibility during the year of observation (*n*=73,732). All data is derived from Medicaid claims and encounters.

[1] Information on transgender and non-binary gender-identified individuals was not available from Medicaid databases.

[2] Information on race and ethnicity (i.e., White vs. Black Hispanic) was not available separately from Medicaid databases.

[3] A county was defined as urban if its population density was greater than 1,000 people per square mile according to the 2010 Census.

[4] Determined using the most prevalent diagnosis assigned to the individual in Medicaid claims during the year of observation.

[5] Includes all diagnoses with <0.5%.

[6] Includes those with any substance use service during the year.