

Avoiding Another Germanwings

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USC Aviation Safety and Security





Aerospace Medical Association



- Extend awareness to aircrew, civil and military organizations
- Create understanding
- What are the contributing factors
- Prevent
 - » Expert Working Group Recommendations Letter to FAA
 - » Germanwings 9525 accident, Updated September 21, 2015



Resources

- The Perversion of Virtue, Thomas Joiner
- Why People Die by Suicide, Thomas Joiner
- Myths About Suicide, Thomas Joiner
- Night Falls Fast, Kay Redfield Jamison
- The Suicidal Mind, Edwin S. Schneidman
- Suicide as Psychache, Edwin S. Schneidman
- The Crime Classification Manual, Douglas, Burgess, Burgess and Ressler
- Paintings by Jeanine Anthony



- Air Mozambique LAM 470 November 29, **2013** Em190 Dep Maputo, Mozambique to Luanda, Angola . 33 fatalities
- Malaysian Air MH 370 March 8, **2014** B777 Dep Kuala Lumpur, Malaysia to Beijing, China. 239 fatalities
- Germanwings Flight 9525 March 24, **2015** A320 Dep Barcelona, Spain to Dusseldorf, Germany. 150 fatalities

26 September 1976 – 12 fatalities

A Russian pilot stole an Antonov 2, *crashed plane into divorced wife's apartment.*



22 August 1979 – 4 fatalities

A fired 23 year old male mechanic stole HS- 748 transport plane. *Crashed the plane into a residential area.*

9 December 1982 – 24 fatalities

The captain of Japan Airlines Flight 350 intentionally crashed the DC-8 into Tokyo Bay.

13 July 1994 – 1 fatality

A Russian Air Force engineer stole the aircraft to commit suicide. *Crashed when ran out of fuel.*

21 August 1994 – 44 fatalities

Royal Air Maroc ATR-42 airplane crashed in Atlas Mountains. Captain *disconnected the autopilot and directed the aircraft to the ground.* Findings challenged.



19 December 1997 – 104 fatalities

Silk Air Flight 185, a Boeing 737 en route from Jakarta to Singapore crashed following a rapid descent from cruising altitude. NTSB stated that the captain may have committed suicide *after switching off both flight recorders and put the aircraft into a dive*, possibly after first officer left the flight deck. Disputed.

11 October 1999 – 1 fatality

An Air Botswana captain who had been *grounded for medical reasons* took off in an ATR-42. He made several demands over the radio and finally stated he was going to crash the plane. The aircraft crashed into two parked ATR-42 aircraft on the platform at Gaborone Airport, Botswana.

31 October 1999 – 217 fatalities

Egypt Air Flight 990, a Boeing 767, entered a rapid descent 30 minutes after departure from New York-JFK Airport. The NTSB concluded that the accident was a “result of the relief first officer’s flight control inputs.” The suggestions of a deliberate act were heavily disputed by Egyptian authorities. *Performance and discipline problems. FO being removed from international flights. Chief pilot on board.*

Additional Related Cases



December 7, 1987 – 43 Fatalities

PSA 1771, LAX – SFO, BAE 146

Recently terminated employee killed manager, flight crew, self, and all passengers on-board.

Crashed near San Luis Obispo, California.

April 7, 1994 – 4 Injuries, 0 Fatalities

FedEx 705, KMEM – KSJC, DC-10

Deadheading pilot attempted takeover of plane with hammers and spear gun. Flight crew landed aircraft after desperate fight in cockpit. *Performance and discipline problems.*

Psychological Incapacitation



5 September 1996

British Airways BAC-11 en route from Birmingham UK to Milan, Italy the First Officer reported feeling unwell and “frightened of the altitude.” Aircraft diverted to Lyon. First Officer admitted taking *psychotropic medication and not reporting it* to aeromedical authorities.

23 January 2001

Galaxy Air Cargo, DC-3 departed night VFR from island runway. Captain had served 49 months in Federal penitentiary for cocaine distribution, the First Officer suffered episode of loss of consciousness. Toxicology showed *cocaine for Captain and anti-depressants for First Officer*.

28 January 2008

Air Canada B767 from Toronto to London Heathrow. Captain requested diversion to Shannon for medical emergency. *First Officer was belligerent and uncooperative*.

Pilot Incapacitation



July 2009

Mesaba Airlines. Saab 340 at cruise, *flight attendant was no longer coherent and performing unusual activities*. Captain instructed passenger to intervene.

27 March 2012

Jet Blue A320 departed JFK to Las Vegas. Captain talked about religion and made incoherent statements. *Captain stated “things just don’t matter,” “we need to take a leap of faith,” “We’re not going to Las Vegas.”* Captain abruptly left cockpit for lavatory. Off-duty Jet Blue Captain to cockpit. Captain aggressively tried to reenter. FO ordered that the Captain be retrained. Declared emergency and diverted.

18 January 2015

Condor Airways A320 at FL370 copilot was *incapacitated for psychiatric reasons*. Diverted to Faro, Portugal.

How Big is the Problem?



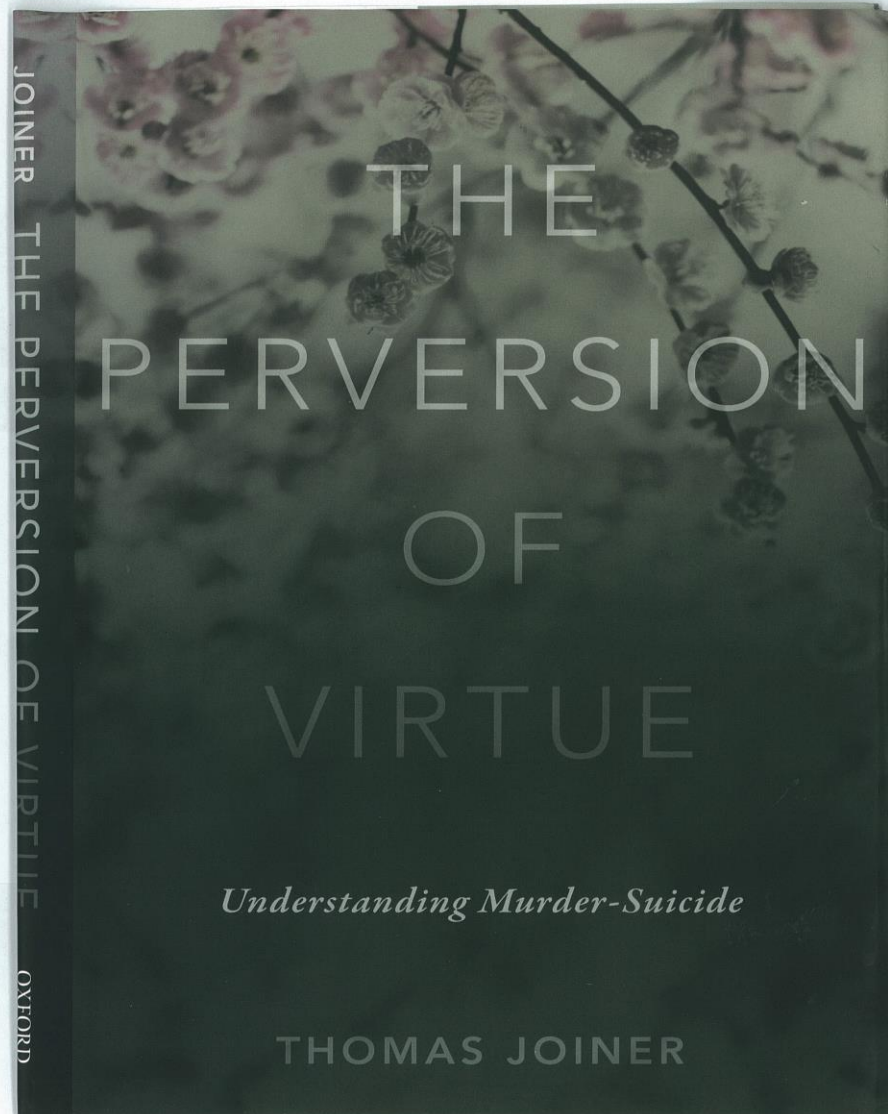
- Global survey 3,485 Airline Transport Pilots
- April – December 2015
- 1,837 responded
- 233 (12.6%) met depression threshold
- 75 (4.1%) reported having suicidal thoughts
- 140,000 ATP's - 4.1% = 5,600

» Wu, et al, *Environmental Health* (2016)

Global Survey



- 233 (12.6%) met depression threshold
- 16.2% if more than one alcoholic drink per day
- 36.4% if experiencing sexual harassment 4x or more in past week
- 42.9% if experiencing verbal harassment 4x or more in the past week





The Perversion of Virtue

Understanding Murder Suicide

Thomas Joiner, PhD

- Murder followed by a suicide
- Suicidal ideation is primary
- Dominated by thoughts of suicide
- Seeks to justify and blame others
- Justify on virtues of Justice, Glory, Mercy, Duty



Joiner on Murder-Suicide



- Not impulsive
- Not spur of the moment
- Suicide is primary
- The intention to take another life comes after suicide is settled upon

Understanding Murder-Suicide



- Approximately 30,000 suicides per year USA
- Murder suicide (ms/s) rate = 0.3%
- 1,574 fatalities, 787 m/s acts in US per year
- Globally 21,000 m/s fatalities per year



Higher among pilots

- Reviewed 65 cases of suicide and m/s
- 13 cases of pilot m/s
- 6 cases of commercial operations
- Rate of m/s to suicide was 17%
- Much higher than for general population (0.3%)

- Suicide and murder suicide events involving aircraft
- Kennedy, et al Aerosp Med Hum Perf 2016



- *The Perversion of Virtue* by Thomas Joiner
- The Psychology of Murder-Suicide
- Primacy of suicidal idea-intention
- Seeks to justify
- Perversion of virtue
- *“If I am to die, it is only right that they will die too.”*

Perversion of Virtue



- JUSTICE, GLORY, DUTY, MERCY
- JUSTICE
 - “Soon, I’ll be dead. But is it fair that I die while those who have wronged me go unpunished?”
- GLORY
 - “People will die because of me. It will be a day that will be remembered forever.” Eric Harris , Columbine High School



Murder Suicide Premeditated



- Andreas Lubitz, Germanwings co-pilot did online research on cockpit doors, suicide methods and medical treatments. Kept a diary “Decision Sunday BCN” fatal flight 2 days later.
- Charles Whitman’s psychiatrist notes four months prior to the University of Texas shootings “thinking of going up on the tower with a deer rifle and start shooting people.”

Perversion of Glory and Justice



- Seung-Hui Cho,
- Virginia Tech Massacre, April 16, 2007
- Sent dozens of photos, pages of writings and 25 minutes of video to NBC
- *"You forced me into a corner and gave me only one option,"*
- “savior of the oppressed, the downtrodden, the poor and the rejected”
- Receive glory from enacting justice
- Compared himself to Jesus Christ

Perversion of Glory



- Eric Harris , Columbine High School Shootings
 - “People will die because of me. It will be a day that will be remembered forever.”
 - 15 killed

Primacy of Suicidal Ideation



- Dylan Klebold, Colombine High School
 - *I don't fit in here thinking of suicide gives me hope, that I'll be in my place wherever I go after this life...that I'll finally not be at war with myself, the world, the universe – my mind...*
 - *Oooh god I want to die sooo bad...such a sad desolate lonely **unsalvageable** I feel I am...*
 - Dylan Klebold's Journal and Other Writings, transcribed and annotated by Peter Langham, PhD



A Look In-depth

Pilot Murder Suicide as a Crime

- Mass Murder – The unlawful killing of four or more victims by the same offender(s) acting in concert in a single continuous event which may last several minutes, hours or days.
- Much larger data base
- Identify shared characteristics
- Profile



Mass Murder

- Single continuous event
- Social manipulation and persuasion missing
- Sexual gratification element missing
- Suicide often part of the plan
- *Classic mass murderer is a mentally disordered individual whose problems have increased to the point that he acts out against groups of people who are unrelated to him or his problems..* Douglas, Crime Classification Manual, 3rd Edition, pag.114

The Three Selves



- Social Self
- Personal Self
- Private Self/ Secret Self
- Violent crime begins imagination
- Unusually rich fantasy life
- Wonderland 1998 Internet Child Porn
 - Four suicides followed public disclosure

Behavior as a Spectrum



- Any individual
- Spectrum of Behavior
- Not a single narrow band
- Attempt to keep apart
- Elements extend through social and personal
- Does not come “out of the blue”

Internet



- Old boundaries gone
- Previously repressed
- Feeling of secrecy and anonymity
- Allows fantasy to grow, share and affirm
- Something very wrong can appear to be OK, habituation

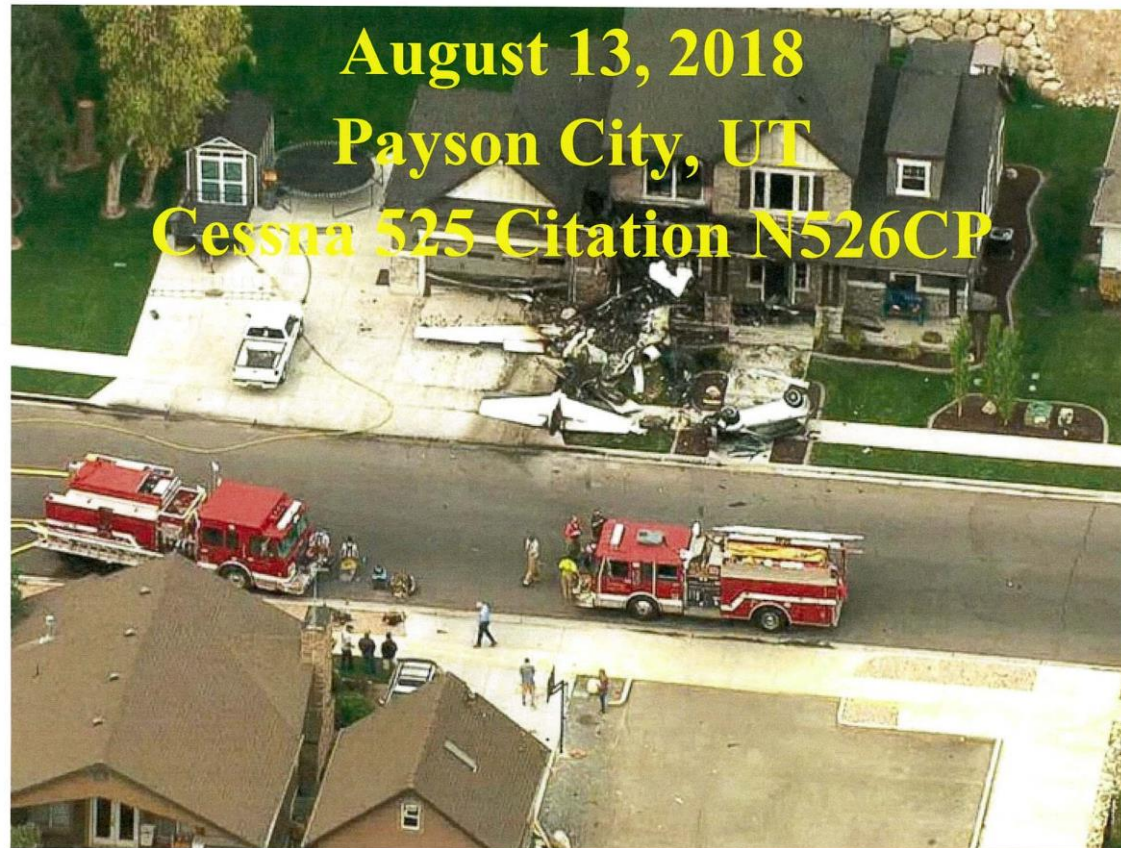


Differences with Murder *per se*



- Violence Policy Center study
- 378 m/s examined
- 6 months
- 288 victims were female (76%)
- Perpetrators were over 90% male
- In murder *per se*, 90% male, victims 76% male

Payson City, Utah, August 13, 2018. Pilot arrested for domestic violence. Released. Stole Cessna C525. Crashed into house, wife and children sleeping.



Anchorage, AK December 29, 2015. Police called,
husband incapacitated. Wife feared attempted suicide.
Took C172 and crashed into wife's office building.



Redding, CA, April 18, 2015. Pilot sent suicidal messages to friends and family.



Differences Murder and Murder-Suicide

- Unlike murder, only 15% of m/s have a blood alcohol level of more than 0.0%.
- But many have anti-anxiety and anti-depressant medications
- Most murders are motivated by anger and rage
- Murder absent suicide rarely involves a mood disorder.
- **Depression**, manic-depression, borderline personality disorder.



BEA Final Report

Accident on 24 March 2015
operated by Germanwings

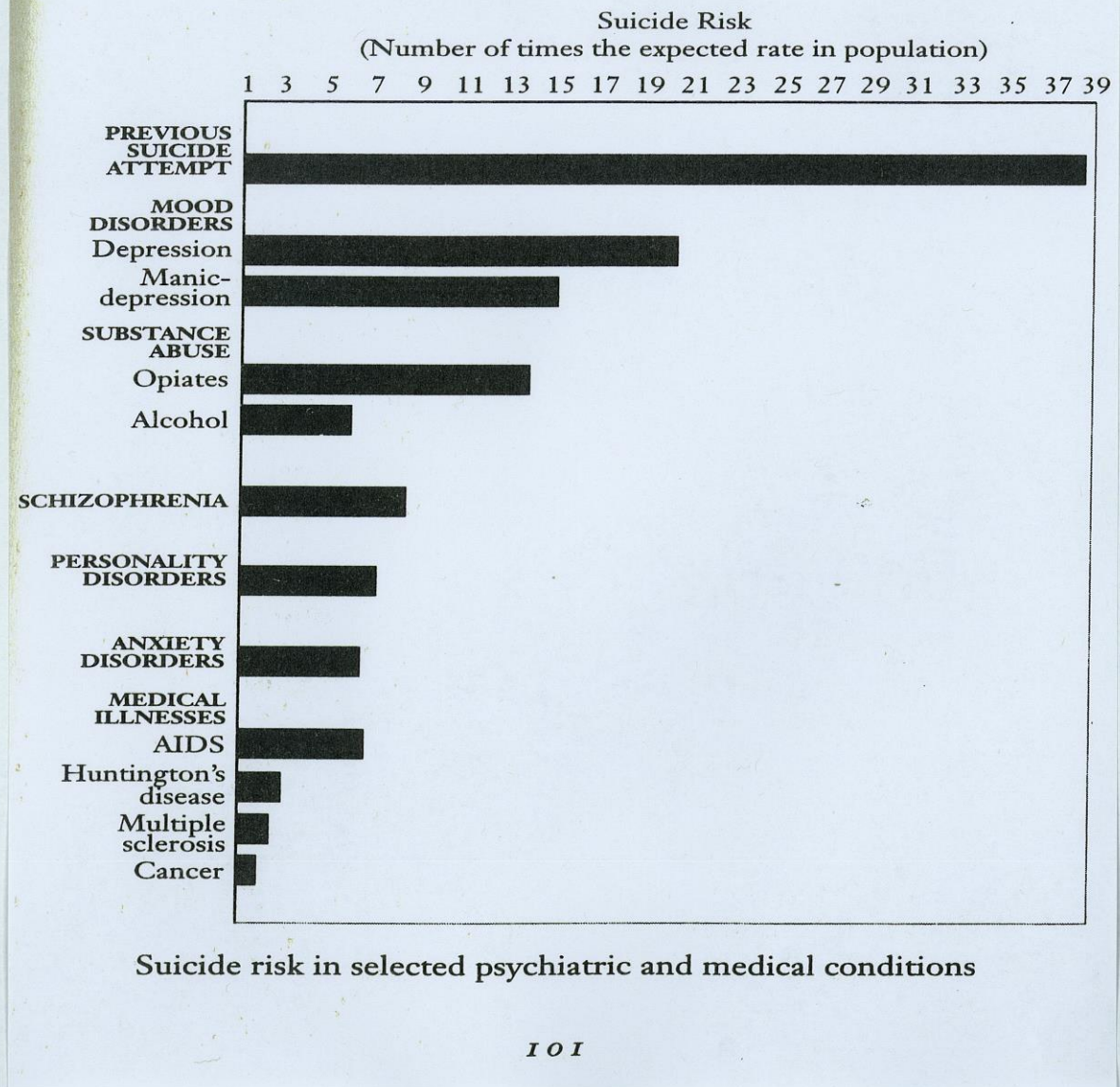
- 1.13.1 Medical history of the co-pilot
- In August 2008, the co-pilot started to suffer from a severe depressive episode without psychotic symptoms. During this depression, he had suicidal ideation, made several “no suicide pacts” with his treating psychiatrist and was hospitalized.

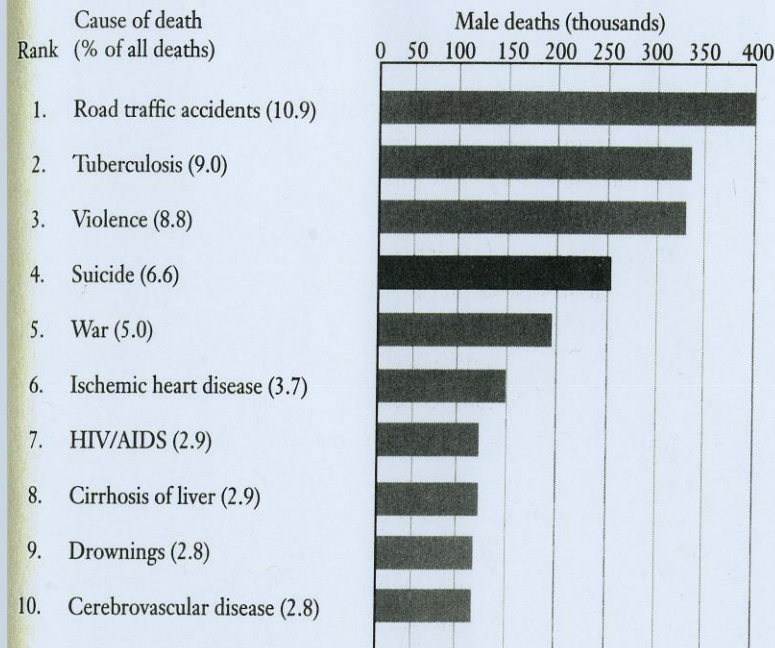
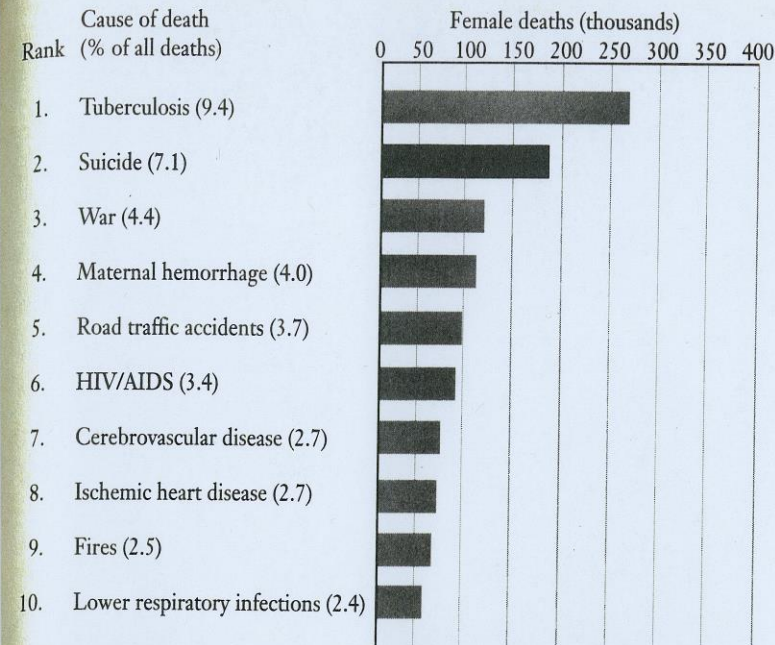
BEA Final Report Germanwings



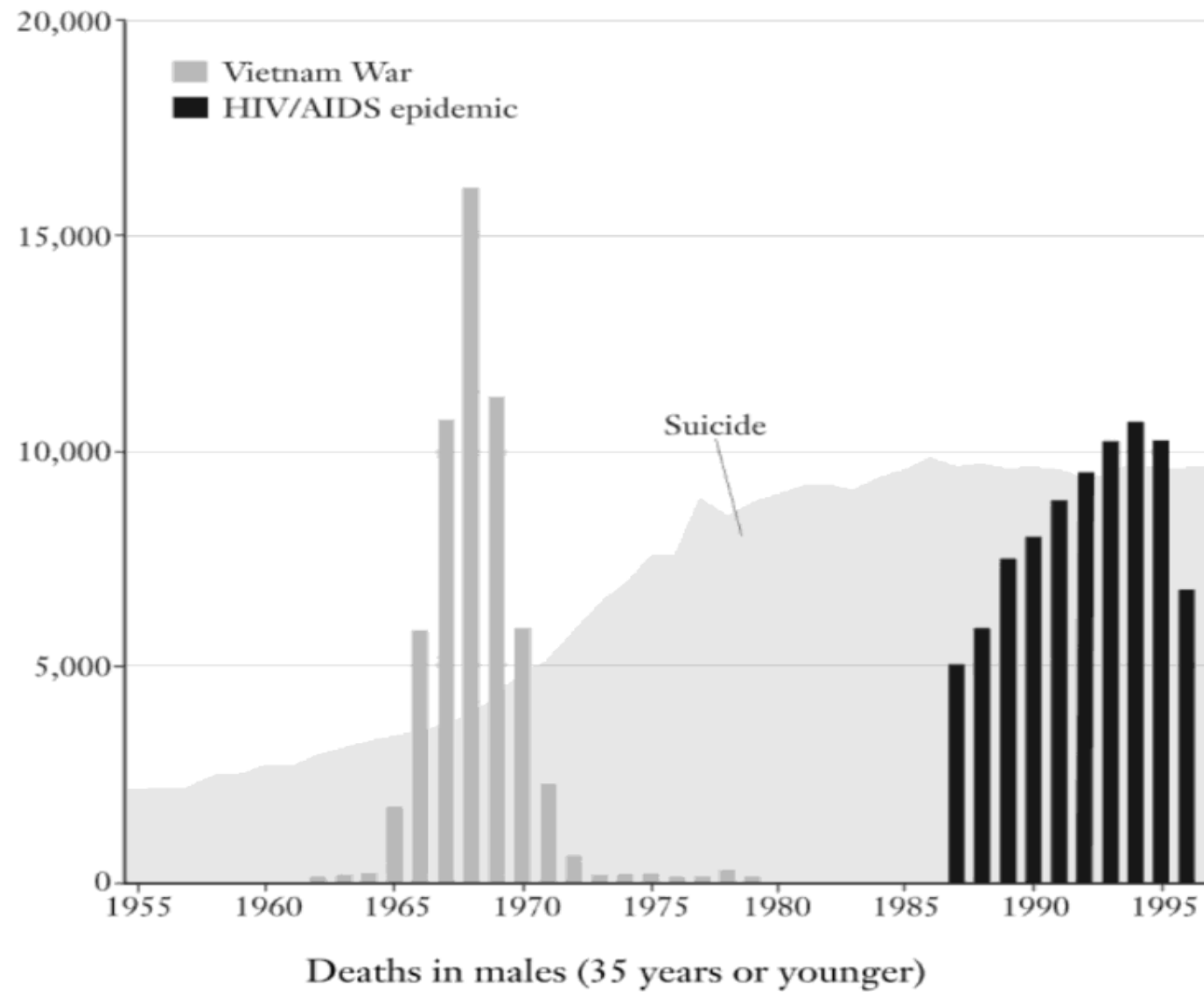
- In the two weeks prior to the mishap the co-pilot was treated by three separate private physicians and one treating psychiatrist. He was put on sick leave from work by each of the physicians and referred to a psychiatric hospital.
- Feared he was going blind. Consulted 41 different doctors.
- In the five weeks prior to the mishap he was provided prescriptions for five separate medications. Three of which were found in the toxicological post mortem.







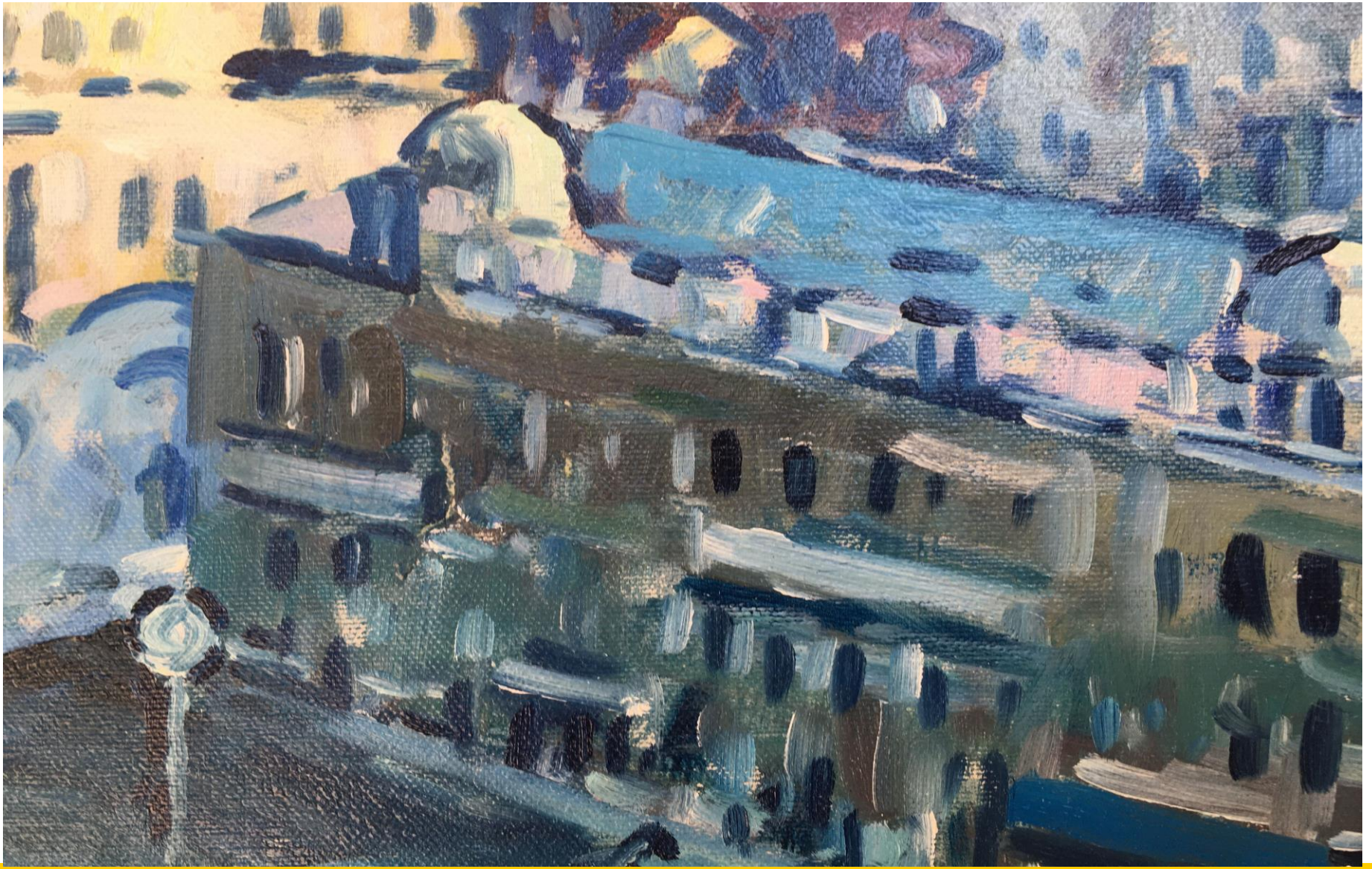
Leading causes of death in females and males, worldwide, ages 15-44



Mood disorders - precursors



- Estimated that 6-7% of US adults have major depressive disorder (16.2 million)
- Estimated that 2.8% have manic-depressive (6.8 million)
- World Health Organization estimates 300 million worldwide depressive disorders



Social Risk Factors



- Suicide rates in the US 1999
- Divorced 32.7 per 100,000
- Widowed 19.7 per 100,000
- Single 17.8 per 100,000
- Married 10.6 per 100,000

Depression markers



- Sleep issues
- Changes in appetite and weight
- Decreased energy or fatigue almost daily
- Difficulty concentrating and thinking clearly
- Psychomotor agitation or retardation
- Recurrent thoughts of death or suicide

Night Falls Fast

Kay Redfield Jamison



- Sleep loss is probably the strongest element in triggering a manic episode.

- Night Falls Fast, Jamison pg.201

What turns depression into suicidal ideation?



- Feelings of ineffectiveness
- Feelings of burdensomeness
- Habituation “high dive”
- Planfulness
- Lethality
- *“Men are four times more likely than women to die by suicide; women are approximately three times as likely as men to attempt suicide”*

Habituation



- Self-injury is the most powerful and dangerous way to acquire lethality. WPD 68
- Impulsivity is a well documented risk factor.
 - WPD 184-185

Habituation to at risk behavior



- Interviews of 29 street youth involved in prostitution showed that 76% had made at least one suicide attempt.

» Why People Die by Suicide, Joiner, pg 71



- *The need to belong is a fundamental human motive. When this is thwarted numerous negative effects on health, adjustment and well-being have been documented. It is interesting to note that the pain of thwarted belongingness may activate similar brain areas as physical pain.*

» *Why People Die by Suicide, Joiner, pg. 118*

Three variables frequently present in the month before suicide



- Feeling of burden on others
- Social withdrawal
- Help negation





Behavioral cues

- “depressed and suicidal people have trouble engaging in the back and forth dance of non-verbal communication, eye contact, head nodding, affirmation of the other..”
- “I was locked within myself..”
- Social isolation correlates with suicidal ideation

» *Why People Die by Suicide*, Joiner pg. 122

Behavioral



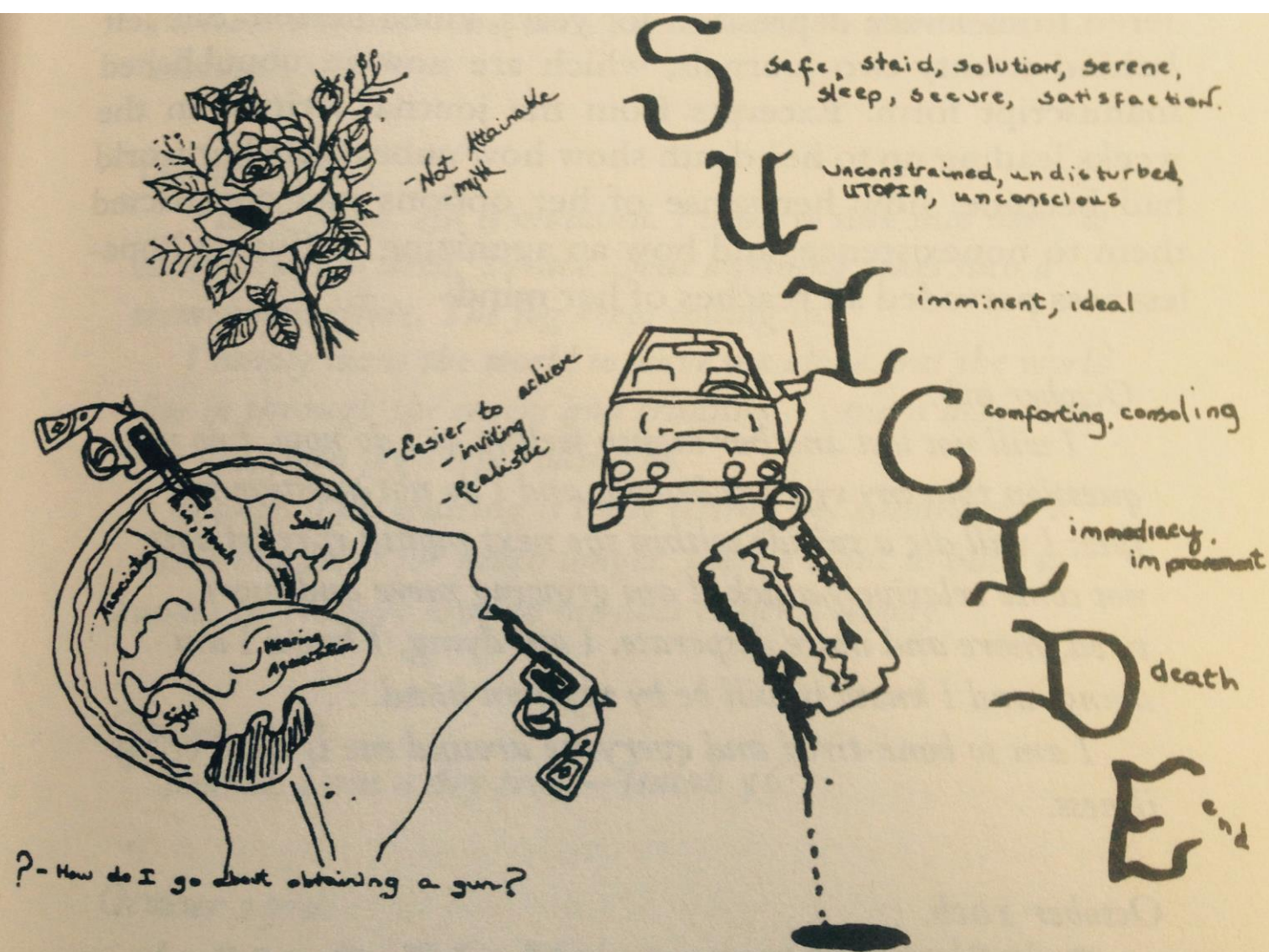
- Low social connection
- Lack of eye contact
- Disharmony of facial expression and gestures with appropriate response
- Depression shatters the capacity of the mind to think



Only..



- Cognitive deconstruction
- “the most dangerous word.. is the four letter word only”
- *"You forced me into a corner and gave me only one option,"* Seung Hui Cho
- Suicide is seen as the only solution
- Inappropriate words for death



Drawings by a nineteen-year-old college sophomore

The Physiology of Depression



- Serotonin neurochemical key role in mood, sleep and appetite
- Serotonin transporter controls availability of serotonin in the synapses
- Acts as a recycler
- Return to neuron after release into synapse
- Dysregulated serotonin systems attracting suicide research attention

Research Role of Genetics



- Suicide risk 1 in 10,000 general population
- Family history of suicide, 2-5 in 10,000
- Identical twins if one then 13-19 in 100 likelihood.
- In one English study – suicides were 3x more likely to have history of violent behavior

» *Night Falls Fast*, Kay Redfield Jamison 1999, Ch. 7

Warning signs



- Agitation
- Insomnia
- Nightmares
- Social withdrawal
- Weight loss

Aerospace Medical Association



- Extend awareness to aircrew, civil and military organizations
- Create understanding
- What are the contributing factors
- Prevent

» Expert Working Group Recommendations Letter to FAA



Awareness

- Murder/suicide is a global phenomenon
- Kills approximately 21,000
- Some studies show higher among pilots
- Suicidal ideation is primary
- Individual seeks to justify own death
- Perversion of four virtues
- Justice, Glory, Mercy, Duty



Understanding

- Suicide is planned
- Not spur of the moment
- Second highest cause of death females 18-45, fourth highest cause of death males
- Feeling lack of belonging
- Burdensomeness, deep sense of incompetence, helpless, hopeless
- Risk factors – Depression, bipolar, BPD

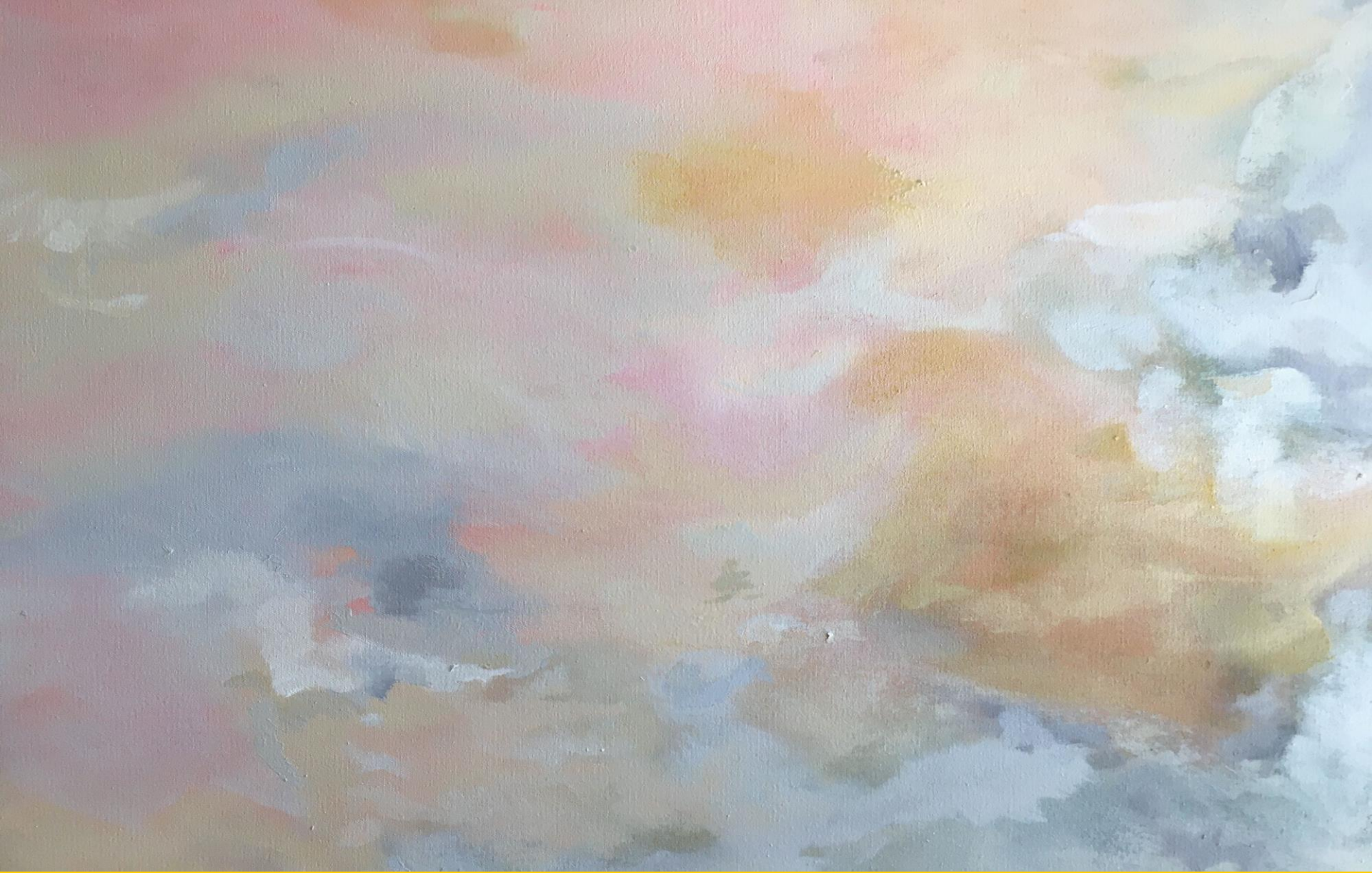


Prevention

- Pilot assistance programs
- Leadership create a harassment-free environment
- Spread knowledge, understanding and listen
- Study – 5 out of 6 murder-suicides occurred when left alone
- People are alone in suicide
- **Two persons in cockpit**

Challenge





Thank you

