



**Cross Disciplinary Project**

# **The Biology of suicidal Behavior**

2018-2019

**Presented to:** International Arab Baccalaureate

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  - Imbalance of Neurotransmitters
  - Imbalance of Hormones
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# Introduction



**More deaths due to suicide than to malaria,  
breast cancer, or war and homicide!**

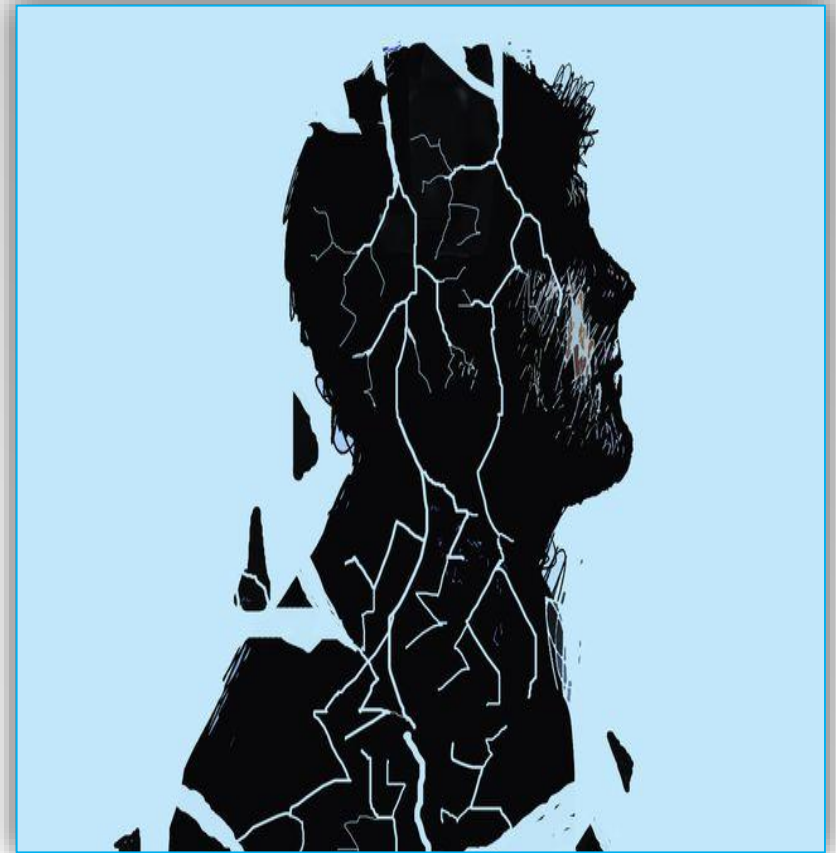


# Suicide

**An act with a fatal outcome**

**A conclusion of escape**

**Deliberate killing of oneself**

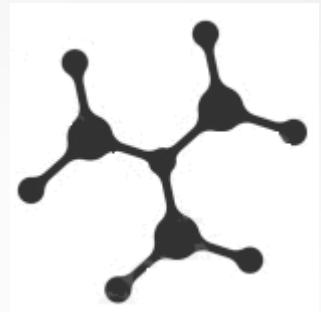


# What relationship exists between the chemical imbalance of the body and suicide?



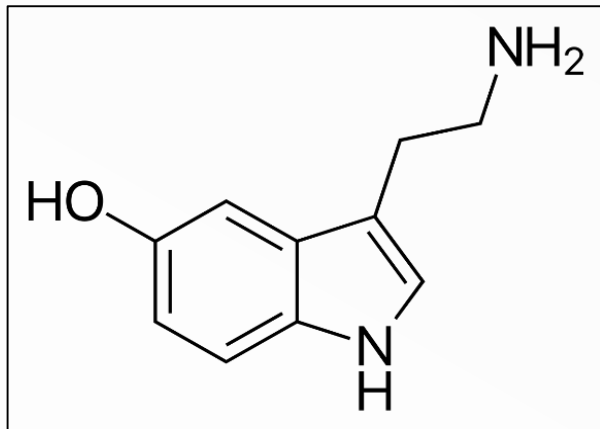
# Scientific Part of Suicide

- ❖ **Imbalance of Neurotransmitters**
- ❖ **Imbalance of Hormones**



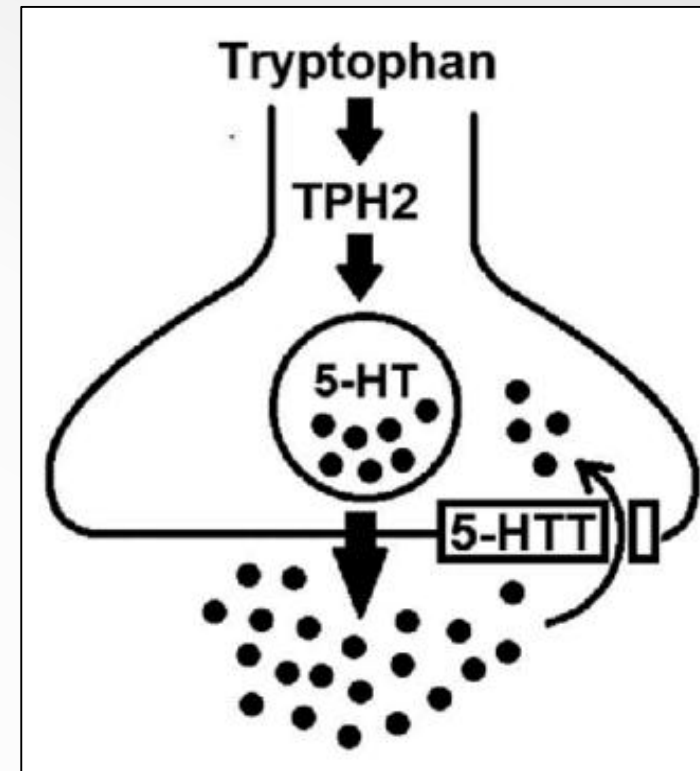
# Imbalance in neurotransmitters- Serotonin

Serotonin impacts all your body, from your emotions to your motor skills



Serotonin molecule

## Mode of action of serotonin

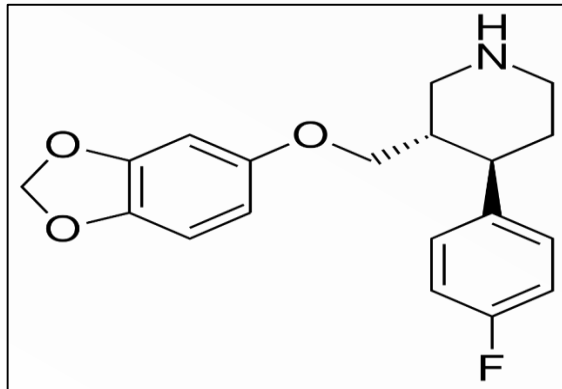




# Imbalance in neurotransmitters- Serotonin

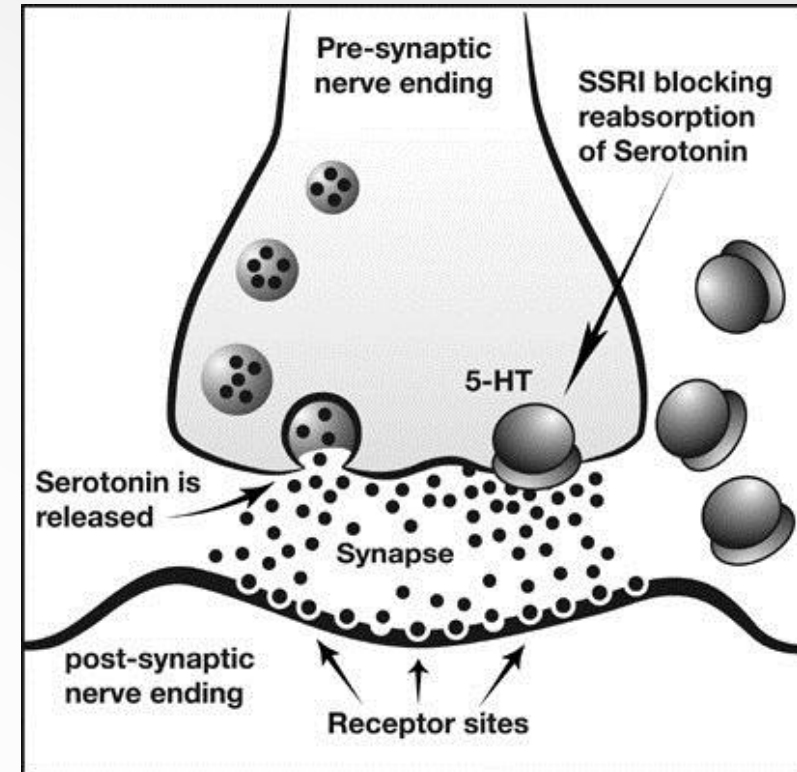
→Low Levels Treatment:

Doctors prescribe a Selective Serotonin Reuptake Inhibitor (SSRI) to treat depression



Paroxetine molecule

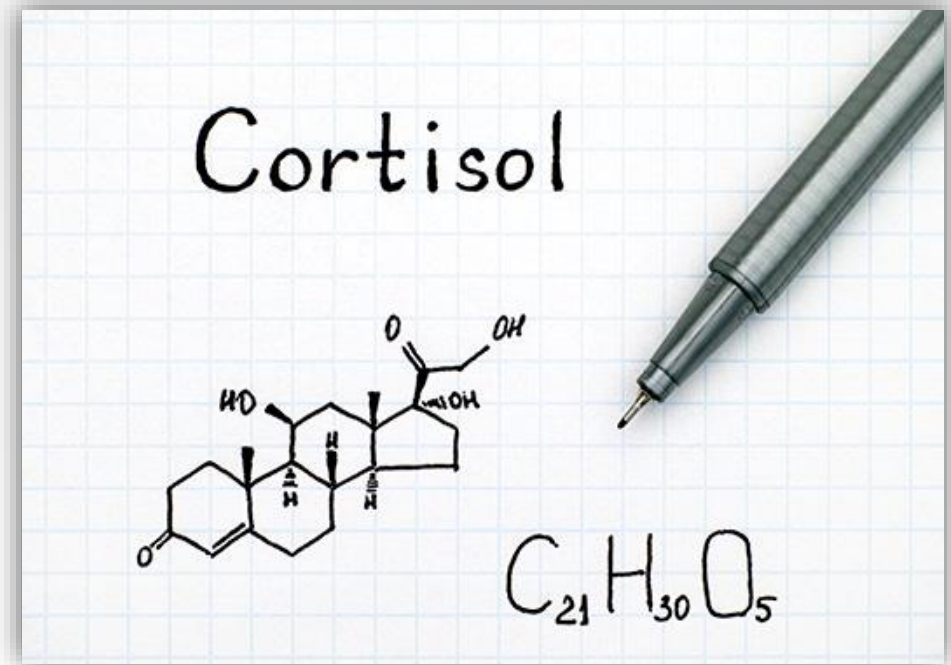
SSRIs activity at the level of the synapse



# Imbalance of Hormones- Cortisol

## 1- Normal case of stress:

Cortisol levels drop, your heart rate and blood pressure return to baseline levels, and other systems resume their regular activities



# Imbalance of Hormones- Cortisol

## 2- Constant feeling of stress:

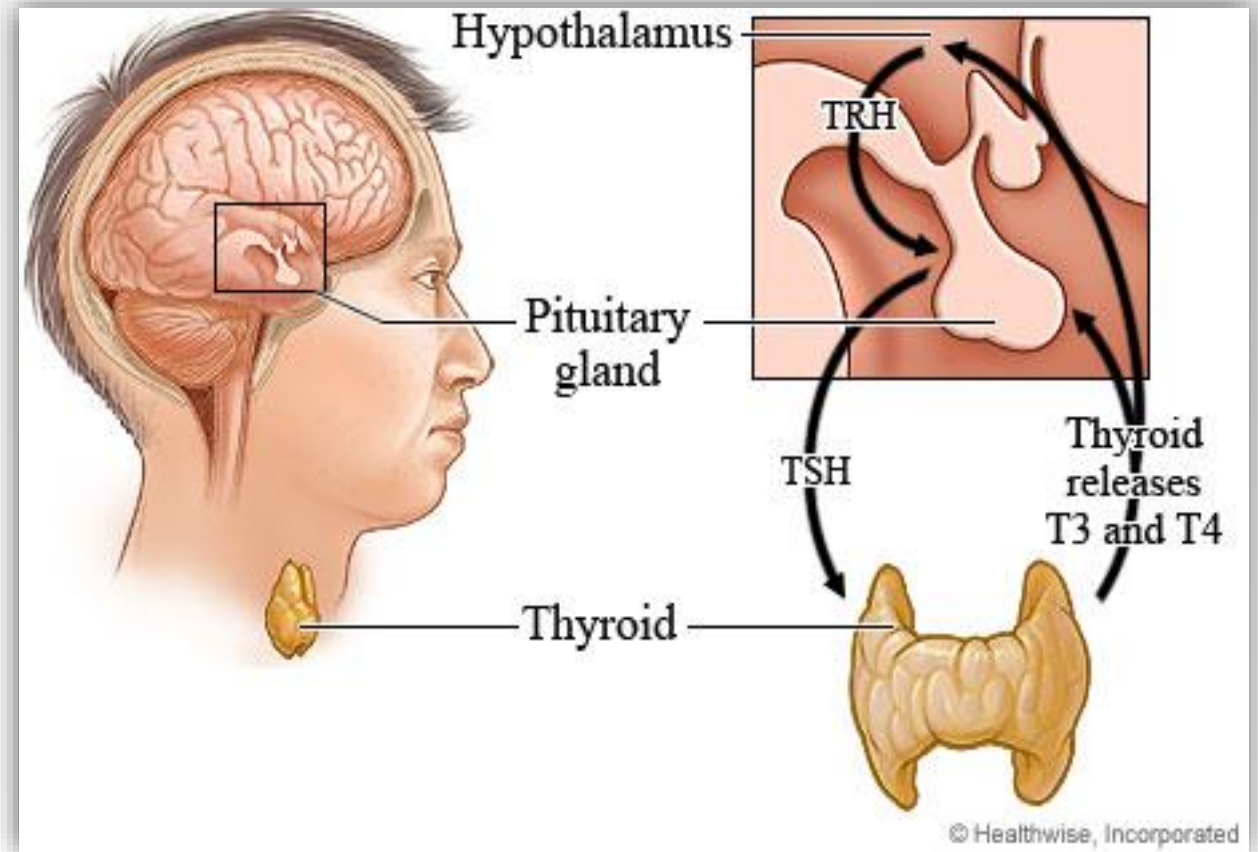
Fight-or-flight reaction stays turned on and cortisol levels are always high.

The overexposure to cortisol and other stress hormones that follow can disrupt almost all your body processes.



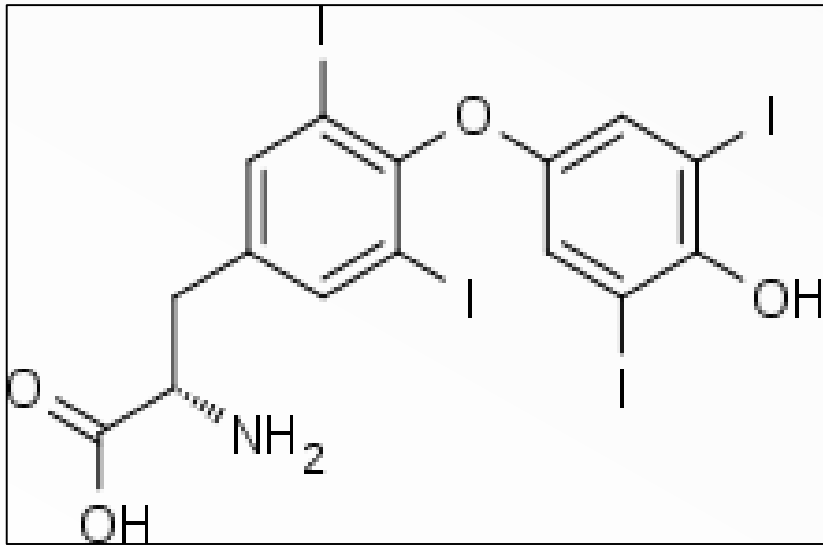
# Imbalance of Hormones- Thyroid hormones

## Production of Thyroid hormones

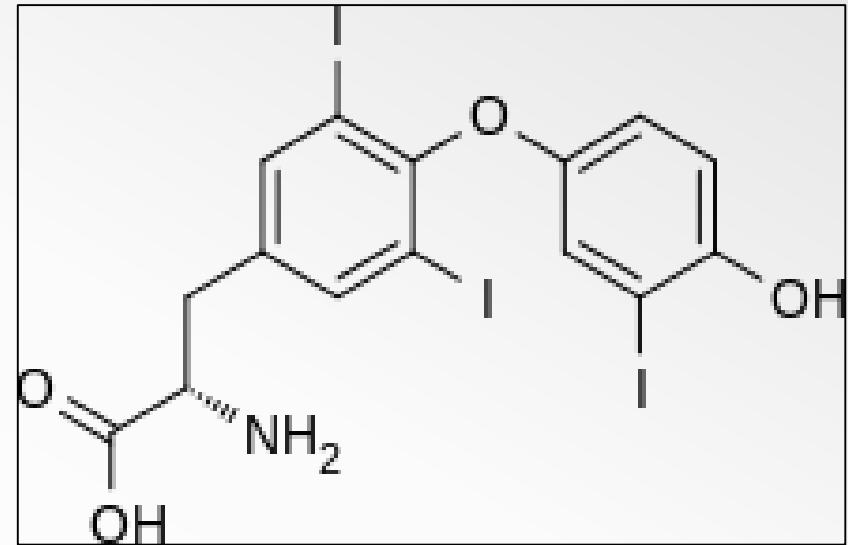


# Imbalance of Hormones- Thyroid hormones

Thyroxine (T4)



Triiodothyronine (T3)



# Imbalance of Hormones- Thyroid hormones

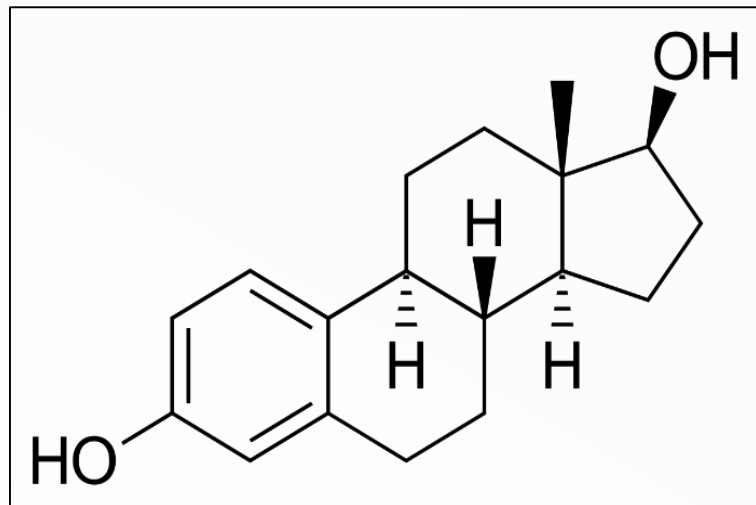
- The relation between thyroid function and depression has long been recognized.
- To test the concentration of thyroid hormones, the doctor prescribes a test to check the concentration of TSH, free T3, free T4 and thyroid antibodies.
- Thyroid hormones have been used as an adjunct to antidepressant therapy to accelerate clinical response to antidepressants and to potentiate clinical response in non-responders to antidepressants.

# Imbalance of Hormones- Female hormones

- The suicidal attempt ranks significantly related to the serum progesterone concentration and the luteal phase.
- Hormonal contraception increases the risk of suicide and suicide attempts (Skovlund et al., 2016; Schaffir et al., 2016; Bertolote et al., 2003).
- The perimenopause causes mood swings
- Women can experience mood disorders associated with their menstrual cycle (PMDD) → Relationship between female sex hormones and mood.

# Imbalance of Hormones- Female hormones

Estrogen molecule

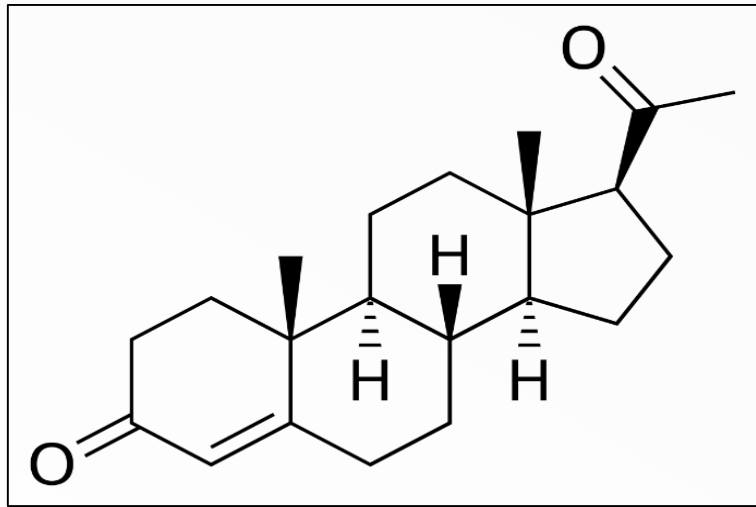


- Estrogen helps give serotonin a boost. When it drops considerably women can feel very depressed, and may even have consistent thoughts of suicide and death.
- Estrogen is also responsible for raising endorphin levels, and increasing the neurotransmitter GABA, which has a calming effect.



# Imbalance of Hormones- Female hormones

Progesterone molecule



Progesterone plays a role in balancing estrogen. During menopause, its concentration fluctuates, resulting in depression. When progesterone levels are normal, they act as an antidepressant.

# Imbalance of Hormones- Female hormones

Testing can uncover imbalances which can then be directly addressed:

- The DUTCH test (Dried Urine Test for Comprehensive Hormones)
- DHEAS test (Dehydroepiandrosterone sulfate)
- Estradiol test
- Progesterone test

# Imbalance of Hormones- Treatment

Those who think they may be experiencing hormonal imbalances may be prescribed hormone replacement therapy (HRT) or an alternative therapy to address imbalances and put them on the road to a more joyful life.



# Imbalance of Hormones- Treatment

Janet, a Real life case of hormone imbalance



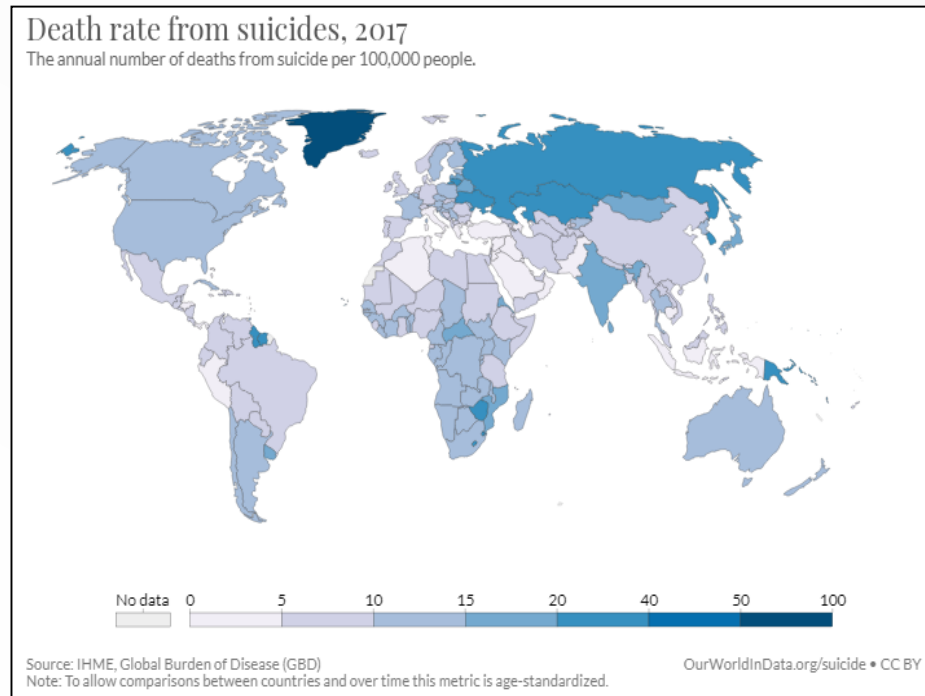
# Suicide Statistics

- ❖ Suicide across the world
- ❖ Suicide rates by age and income level
- ❖ Suicide rate by gender
- ❖ Suicide rates in Lebanon:
  - By age
  - By gender

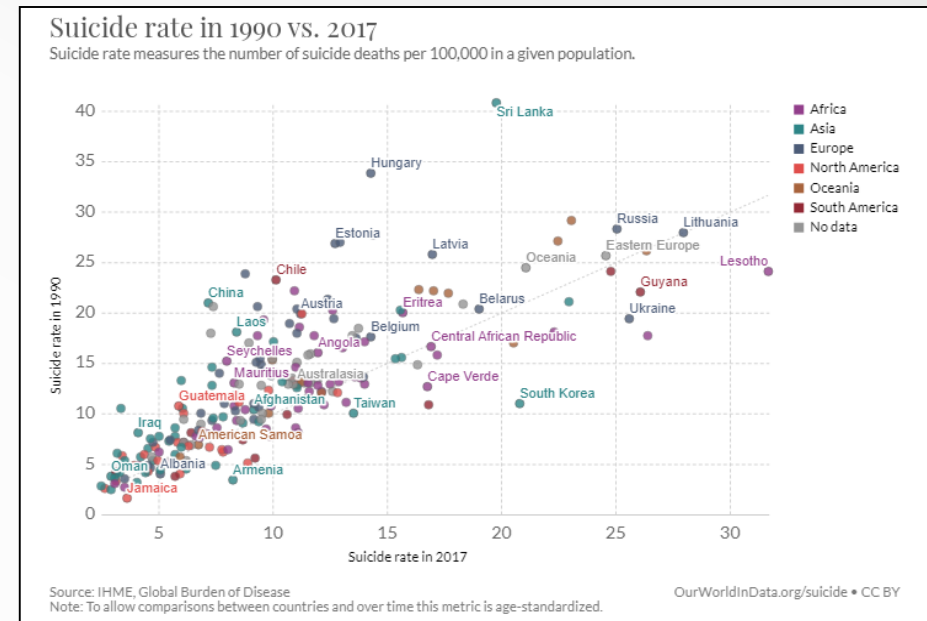


# Statistics across the world

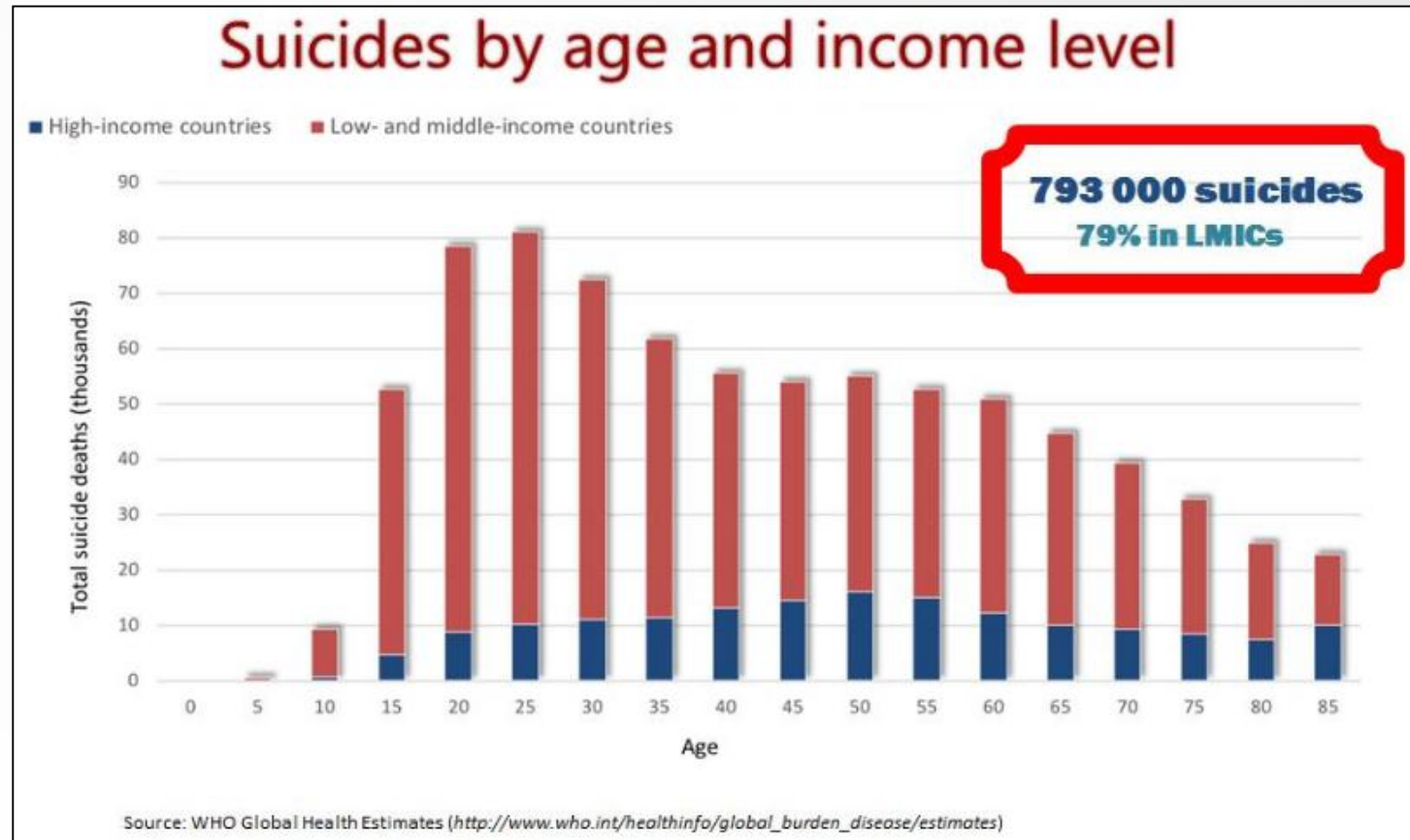
Globally, 10 people per 100,000 died from suicide in 2017. In the map we show the differences in suicide rates across the world.



## How have suicide rates changed?

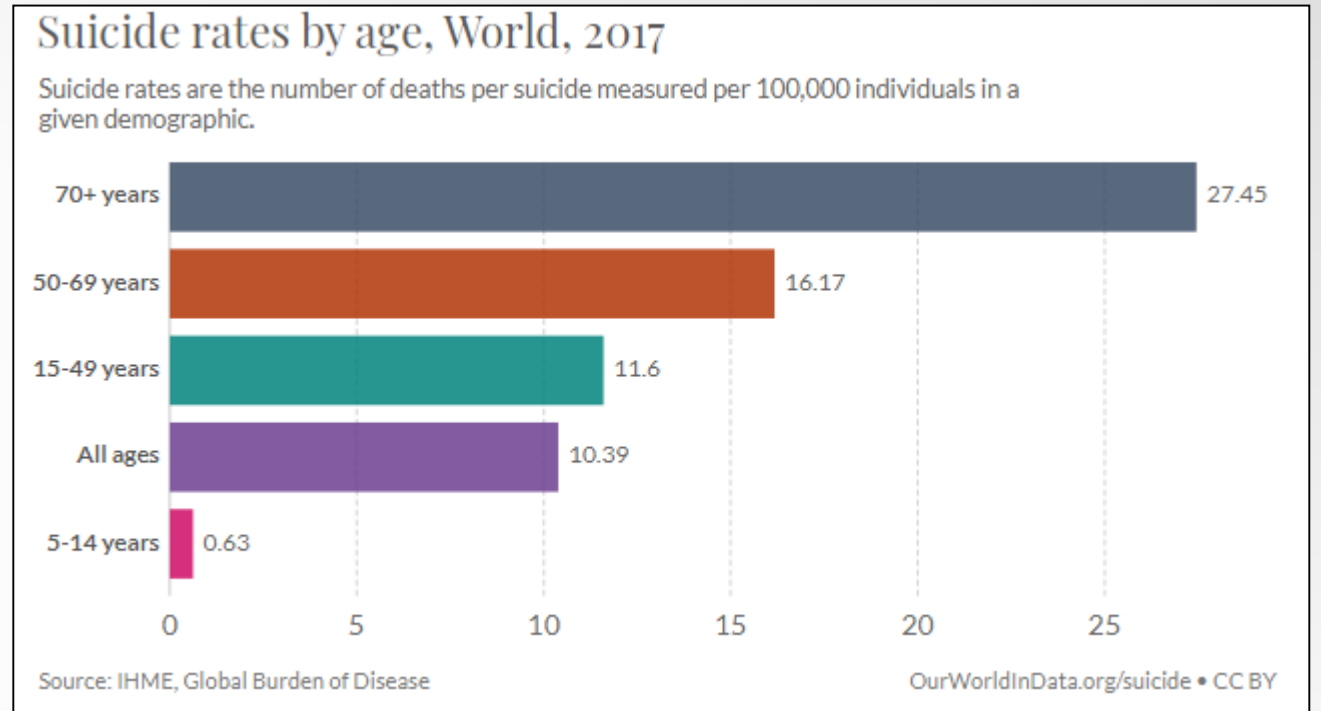


# Suicide rates by age and income level (2016)



# Suicide rates by age

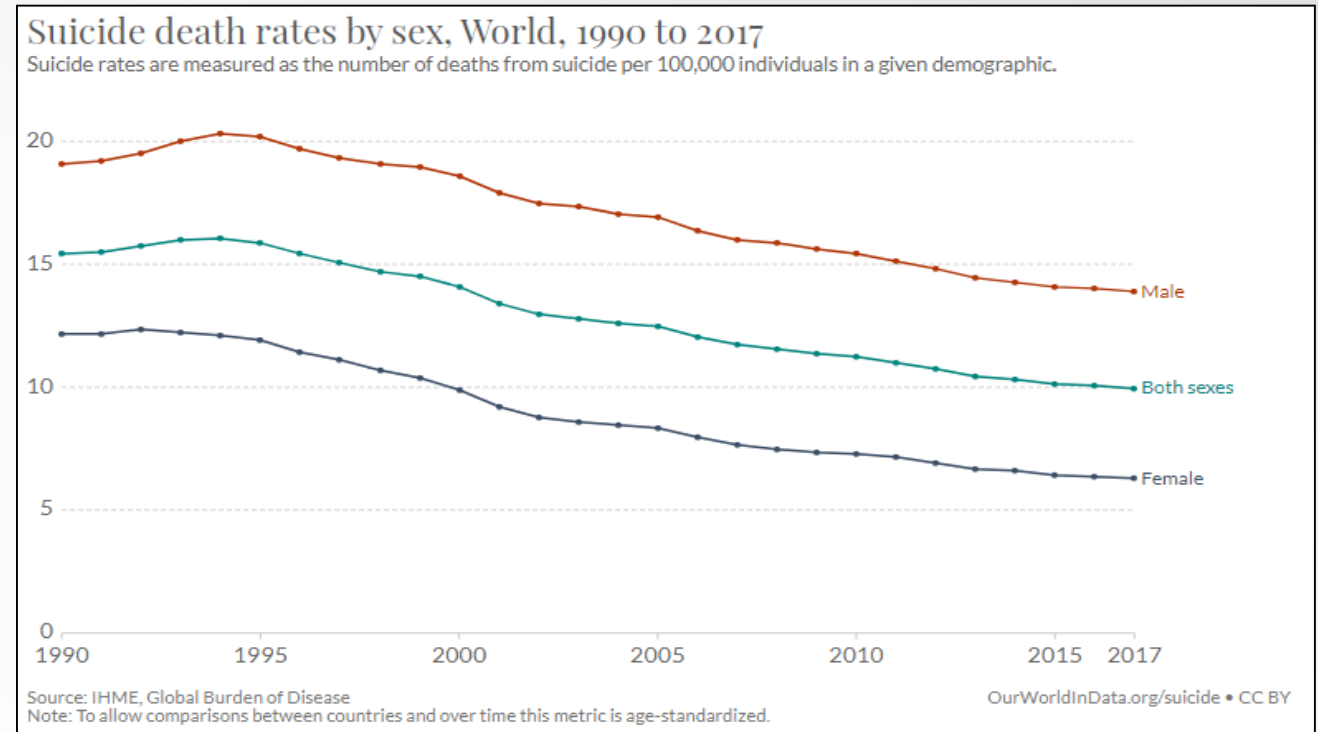
Suicide is one of the leading causes of death in young people. But this does not necessarily mean suicide is more likely to occur in young people than old. It's largely a reflection of the fact that older populations also die from many other causes.





# Suicide rates by gender

Suicide rates in men are just over twice as high as for women.

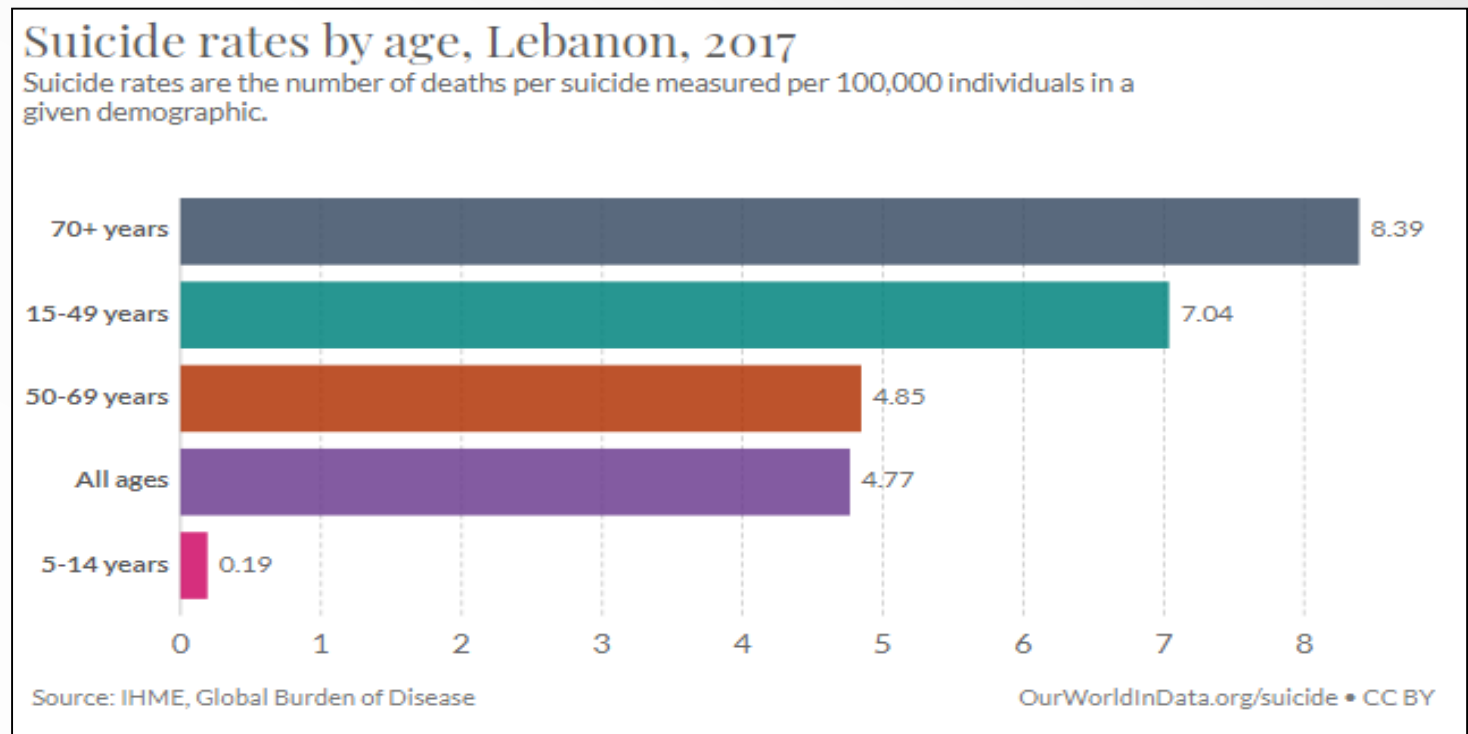


# Suicide rates in Lebanon

In Lebanon, on average, every 3 days one person dies of suicide and on average, every six hours, one person attempts suicide.

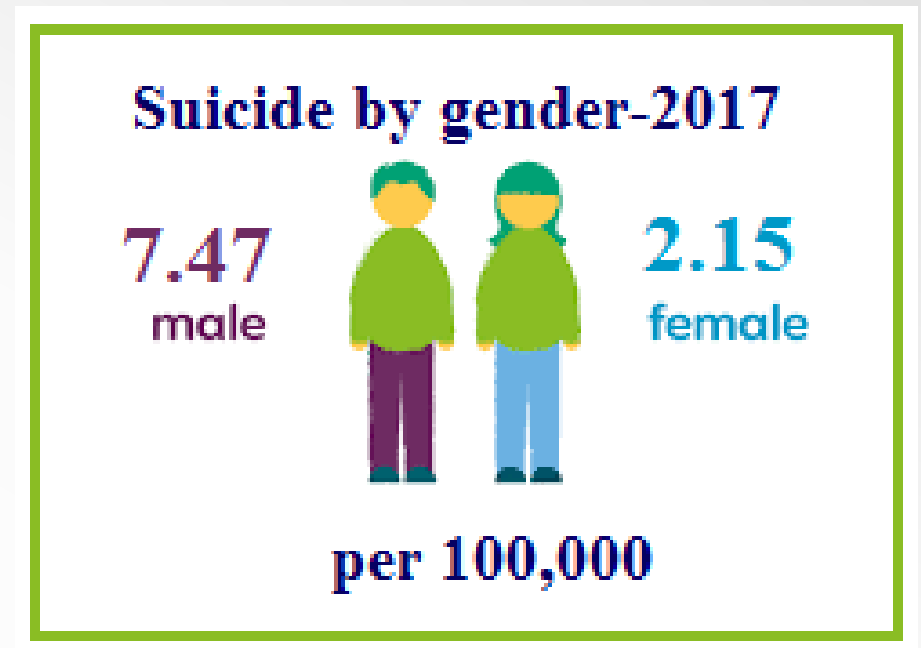
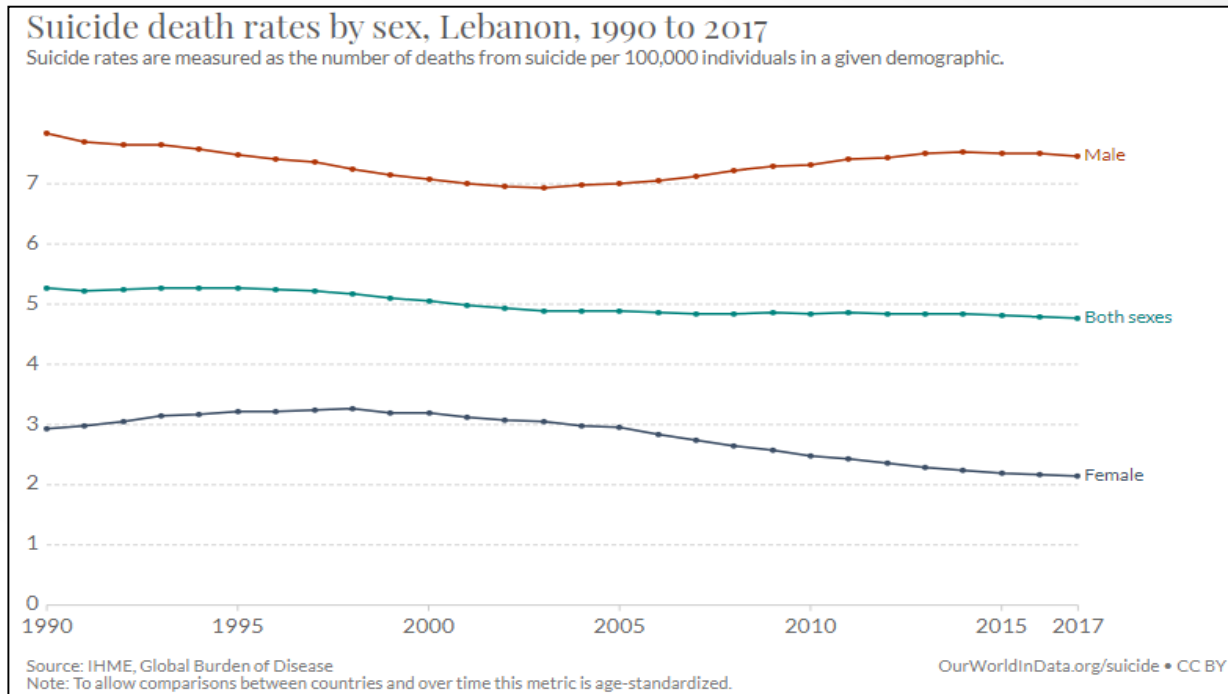
→ They are not representative of the actual suicide rates as prevailing religious, legal, and social issues.

Suicide rates by age



# Suicide rates in Lebanon

## Suicide rates by gender



# Suicide methods



# Suicide methods

**Firearms** are one of the most common suicide methods globally.



# Suicide methods

**Hanging**



**Poisoning**



# Suicide methods

**Drowning**



**Cutting**



**Jumping**



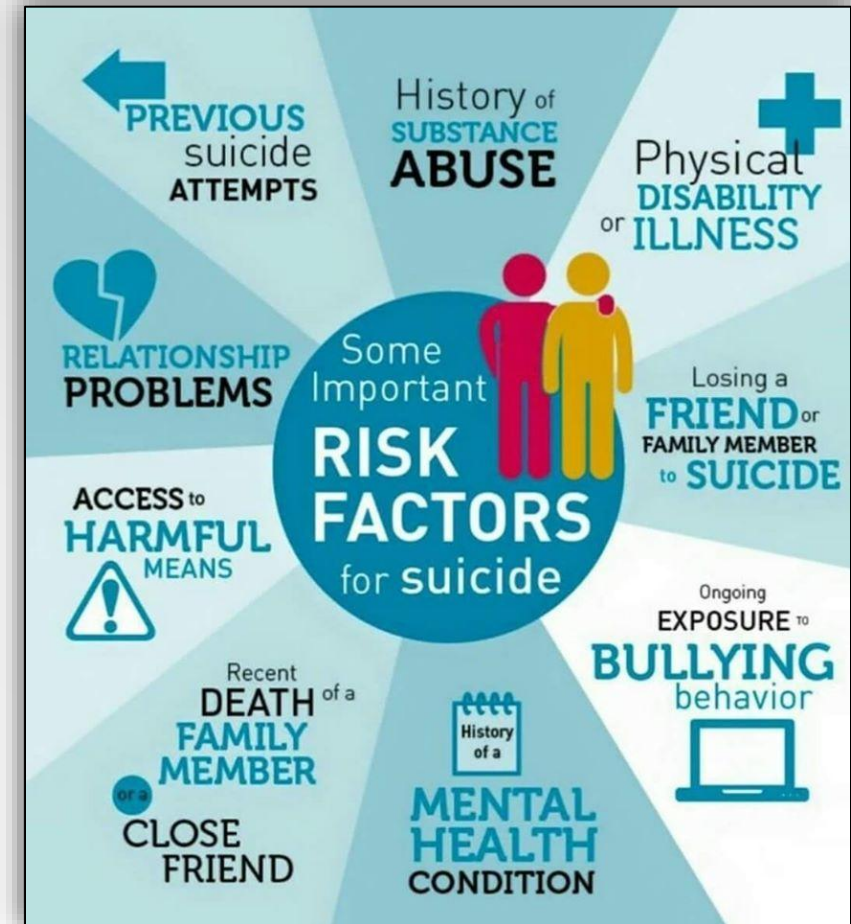
# **Risk Factors, Warning Signs and Prevention**





# Risk Factors

- Life challenges can cause some people to have suicidal thoughts.
- This can lead people to begin contemplating a “way out” from the negative thoughts and feelings.



# Warning Signs

Almost everyone who has committed suicide will have shown some signs or warnings.



# Prevention

The best way to prevent suicide is to recognize the warning signs of suicide, take them seriously and act upon them.



## SUICIDE PREVENTION ADVICE

# WAIT!

- W** **Watch out** for signs of distress and changes in behaviour
- A** **Ask** "are you having suicidal thoughts?"
- I** **It will pass** – assure your loved one that, with help, their suicidal feelings will pass with time
- T** **Talk to others** – encourage your loved one to seek help from a GP or health professional



# Reduction of Suicide Attempts and Suicidal Deaths

- Increasing public awareness
- Campaigning to reduce stigma
- Guidelines for the mass media
- Improving the quality of people's lives thereby reducing stress
- Regulation of over the counter medication, sale of pesticides and guns....



# Breaking Down The Stigma

Some research suggests that higher suicide rates may be linked to greater stigma toward mental illness.

→ It's time for a change. We have to reexamine and overhaul how we think, speak, and act on the topic of suicide.

- Raise your voice
- Reach out and show your support
- Investigate ways to spread education in schools, universities, workplaces and in social environments
- Examine your thought processes
- Use your social networks to discuss suicide and mental illness openly



**TALKING ABOUT  
SUICIDE**

**Stop the silence and stigma of  
suicide!**

# Lebanon's First National Emotional Support and Suicide Prevention Helpline

## *Embrace Lifeline*

Non-profit organization  
which works to raise  
awareness around mental  
health in Lebanon

Embrace's suicide hotline:  
**1564**  
embrace

Mental illness isn't  
a **taboo** subject.



1 in 4 of the people you know may be  
silently suffering.

[www.embracefund.org](http://www.embracefund.org)

**Share this**  
**You might save a life**



Emotional  
Support



Suicide Risk  
Assessment



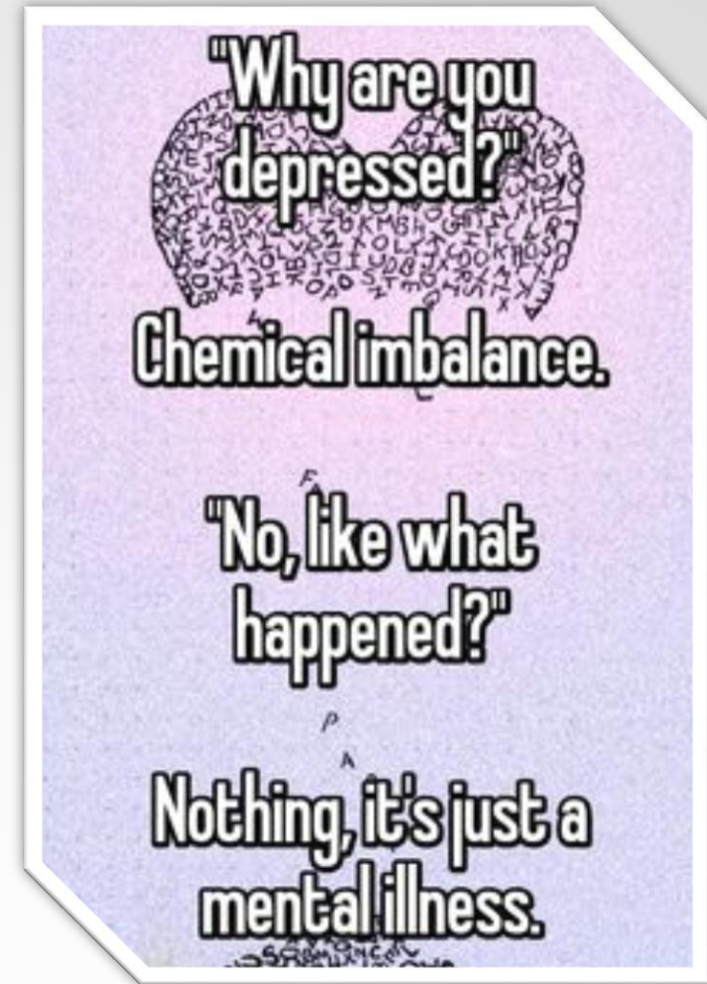
Orientation to  
Community  
Service

# Conclusion



Talk to your friend. Your friend may not realize that he or she is suffering from depression. Listen to your friend and make sure your friend knows that you care. Help your friend understand that no matter how overwhelming problems seem, help is available.

## **Why Suicide?**





# Beyond IQ Game



# Description

It's a box containing 50 cards with 25 myth or fact cards and 25 questions cards with answers about suicide.



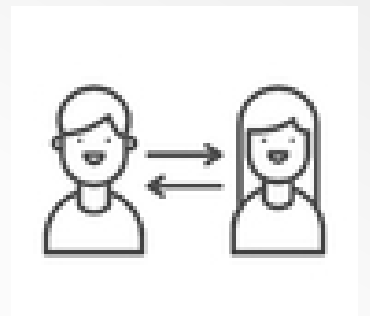
# Instructions:

- This game is played by two teams. One team pick a card and ask the question written/ or read the sentence written on it, and the second group must answer the question correctly/ or guess if the sentence written is a fact or myth, in order to win . They have two trials to answer correctly: they will get 5 points, if they answer correctly from the first time, and 2 points from the second time. The group who reaches 100 points will be the winner.
- Age: 14+



# Social and Educational Importance

- Raising awareness of suicide amongst young people
- Enhance emotional intelligence
- Develop social emotional skills and emotional self-regulation



**Thank You**



# References



- <http://mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress/art-20046037#:~:text=Cortisol%2C%20the%20primary%20stress%20hormone,flight-or-flight%20situation.>
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