

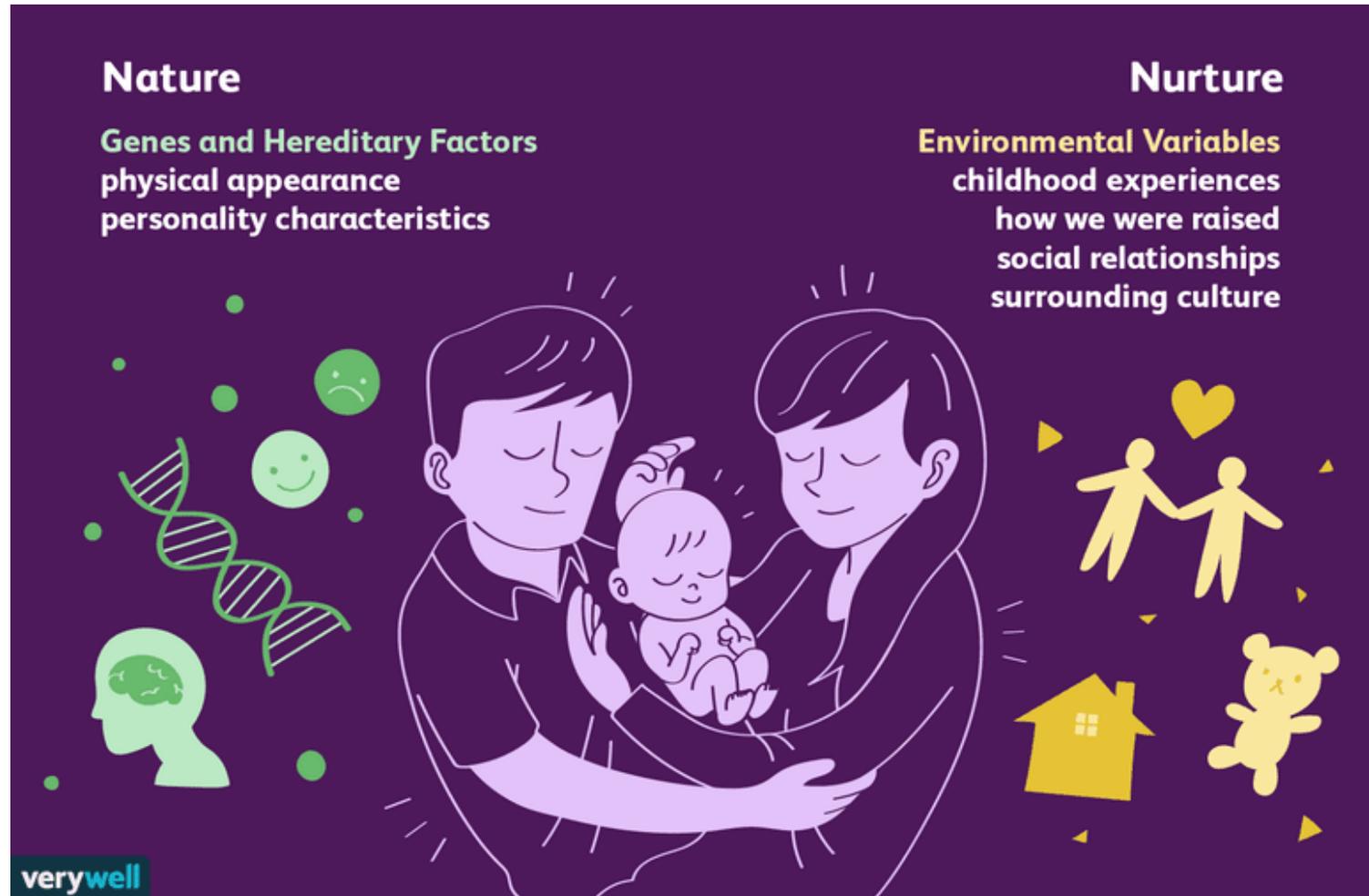


THE BRAIN, MENTAL HEALTH, AND ADDICTION

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NATURE VS. NURTURE



NATURE AND NURTURE

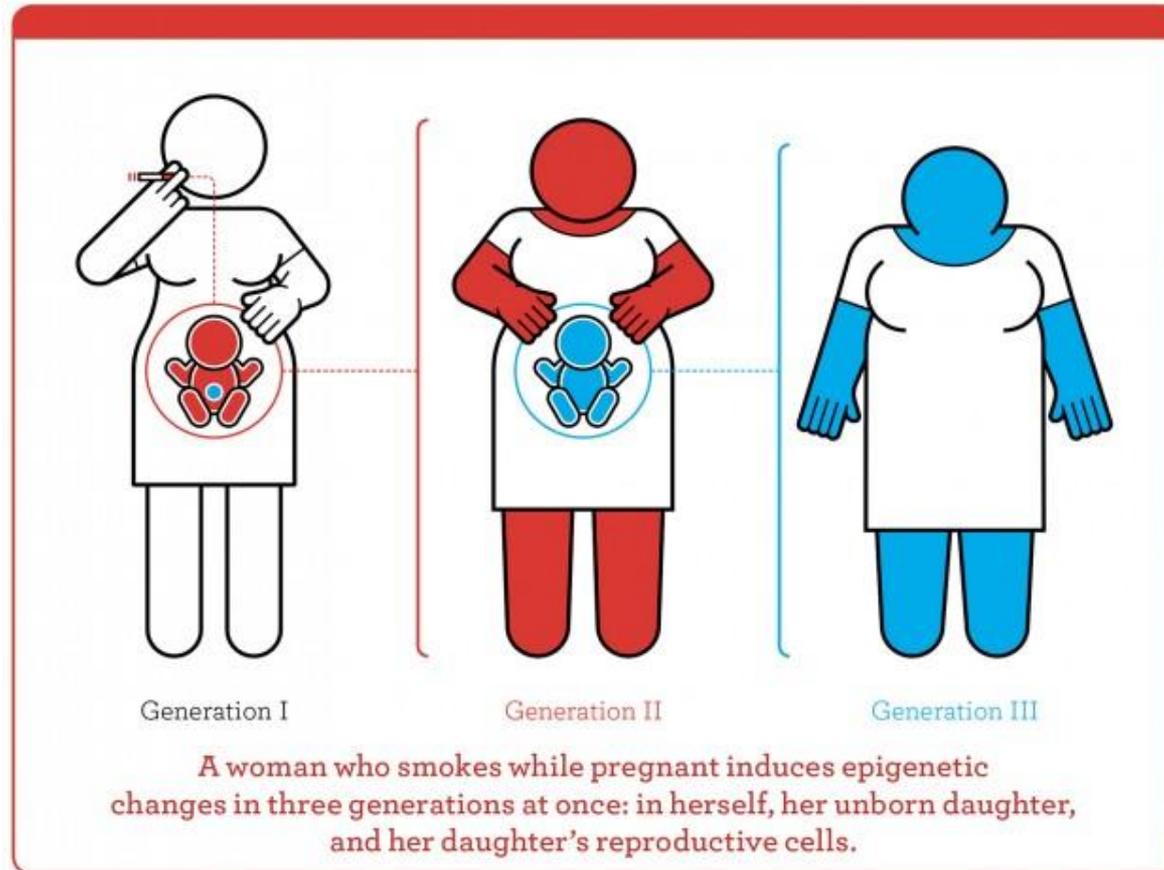


Twin, sibling, and adoptee studies validate that there is a genetic component to mental health and addiction. Many conditions show a strong hereditary component.

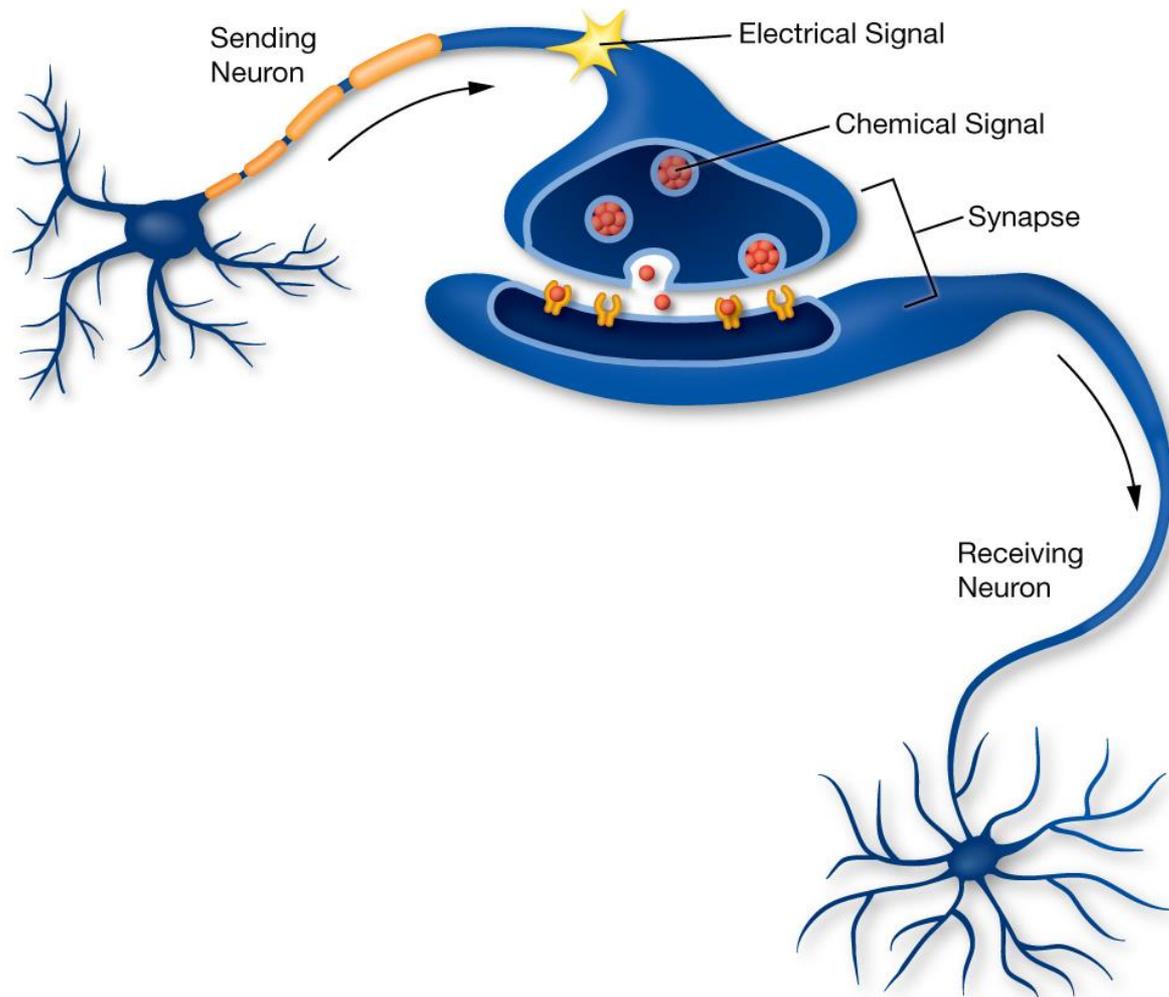
A British team also found that pregnant women who have a major emotional loss in the early months of pregnancy give birth to babies with a higher risk of schizophrenia.

The studies, published in the Archives of General Psychiatry, add to a growing understanding of how genetics and environmental distress sometimes act together to produce mental illness.

EPIGENETICS

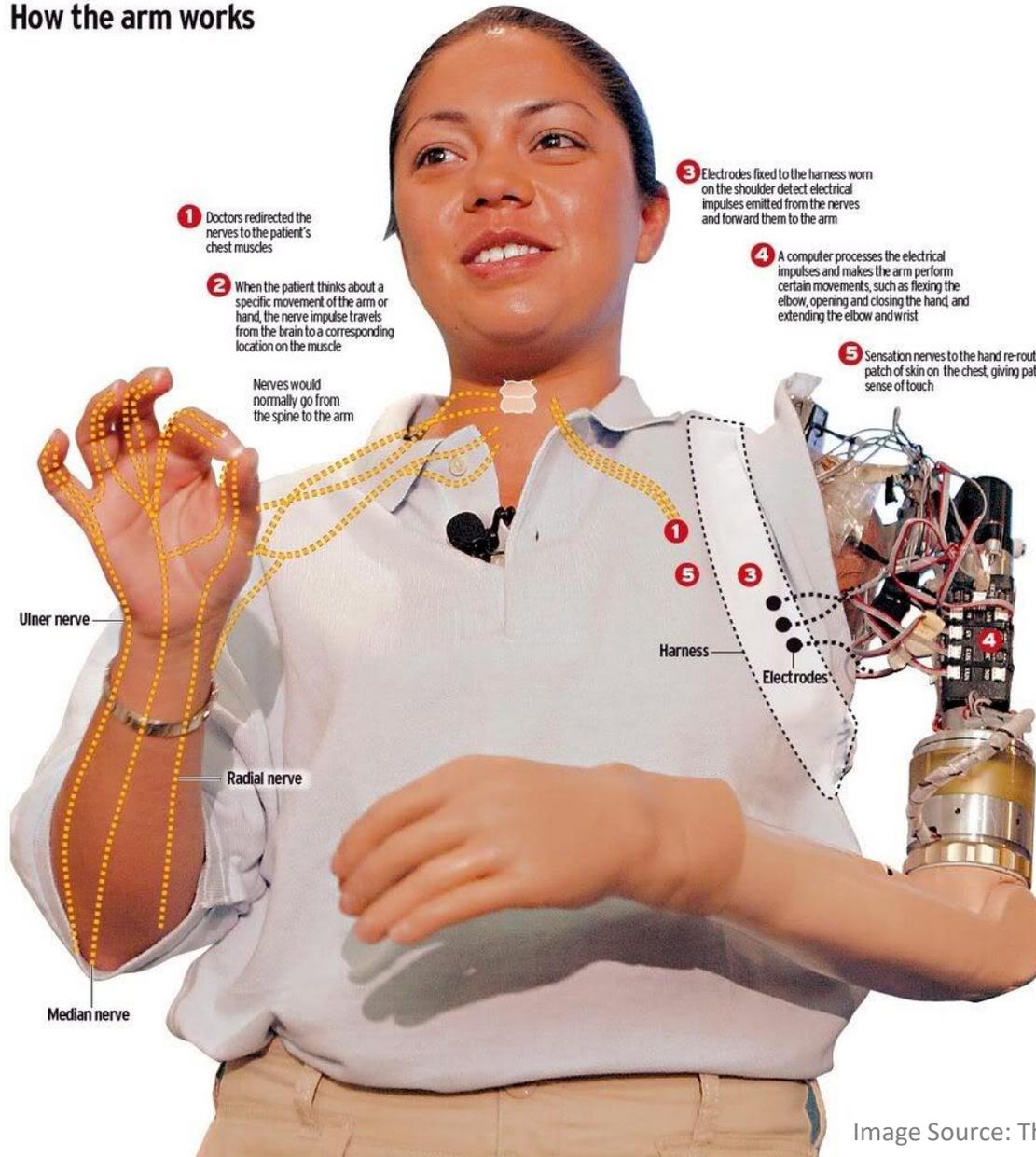


STRUCTURE OF NEURONS



NEURAL SIGNALS

How the arm works



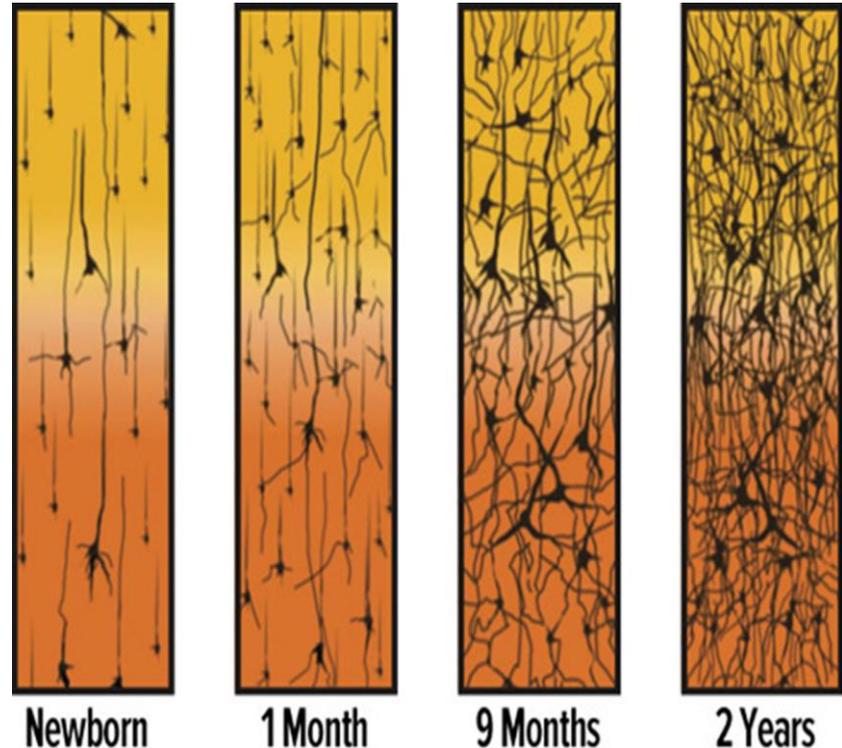
- Neurons transmit electrical and chemical signals to send information through your body
- Signals move your muscles, transfer thoughts, and build pathways

NEURAL DEVELOPMENT

BUILDING CONNECTIONS

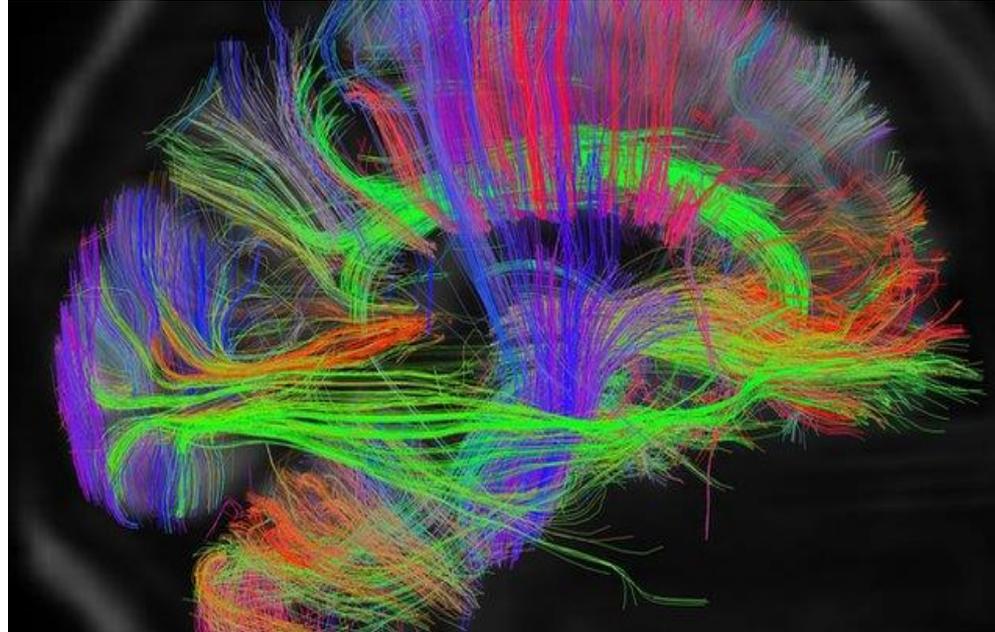
During the first few years of life,
700 new neural connections are
formed every second

Source: Harvard Center for the Developing child



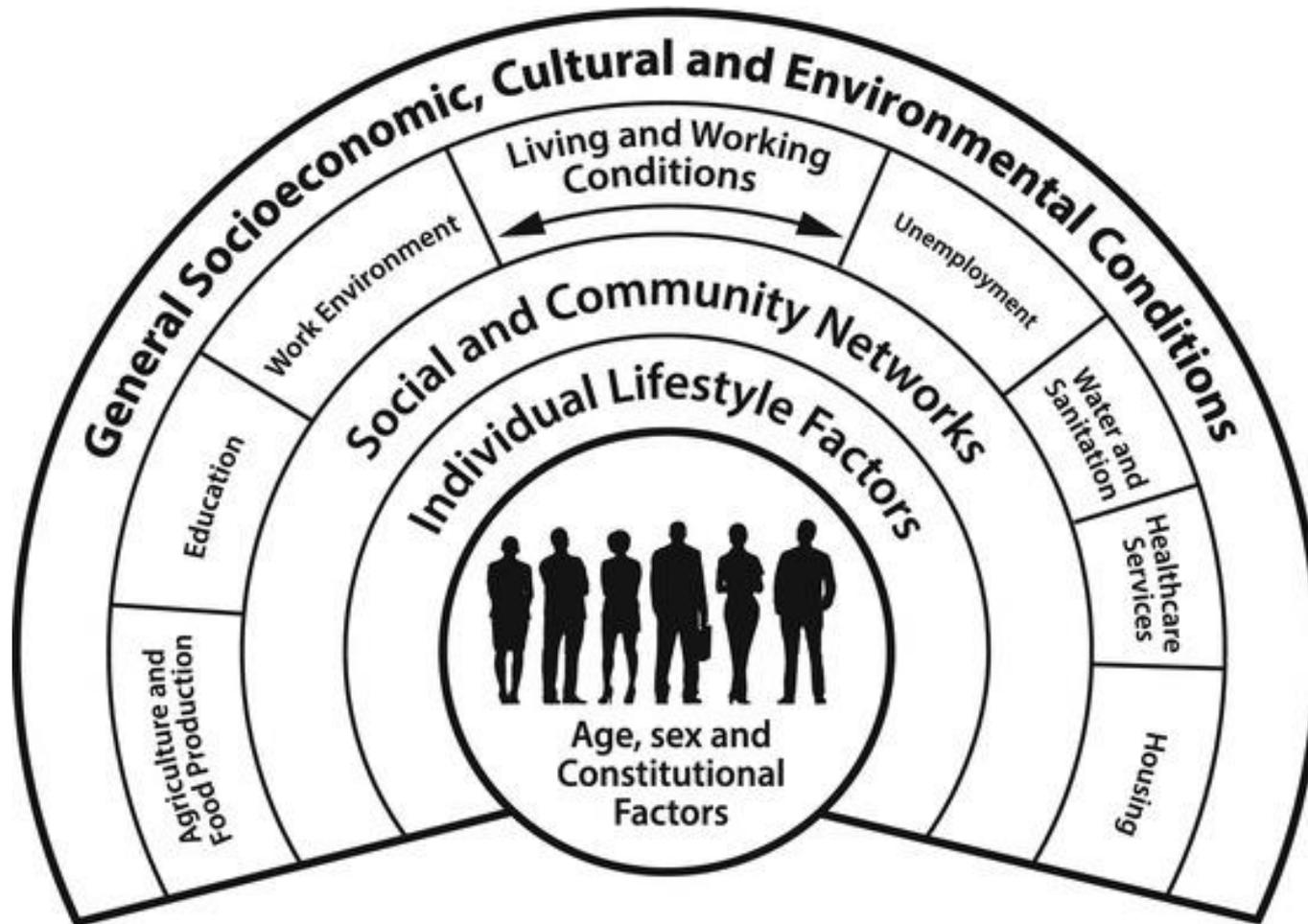


NEURAL PATHWAYS



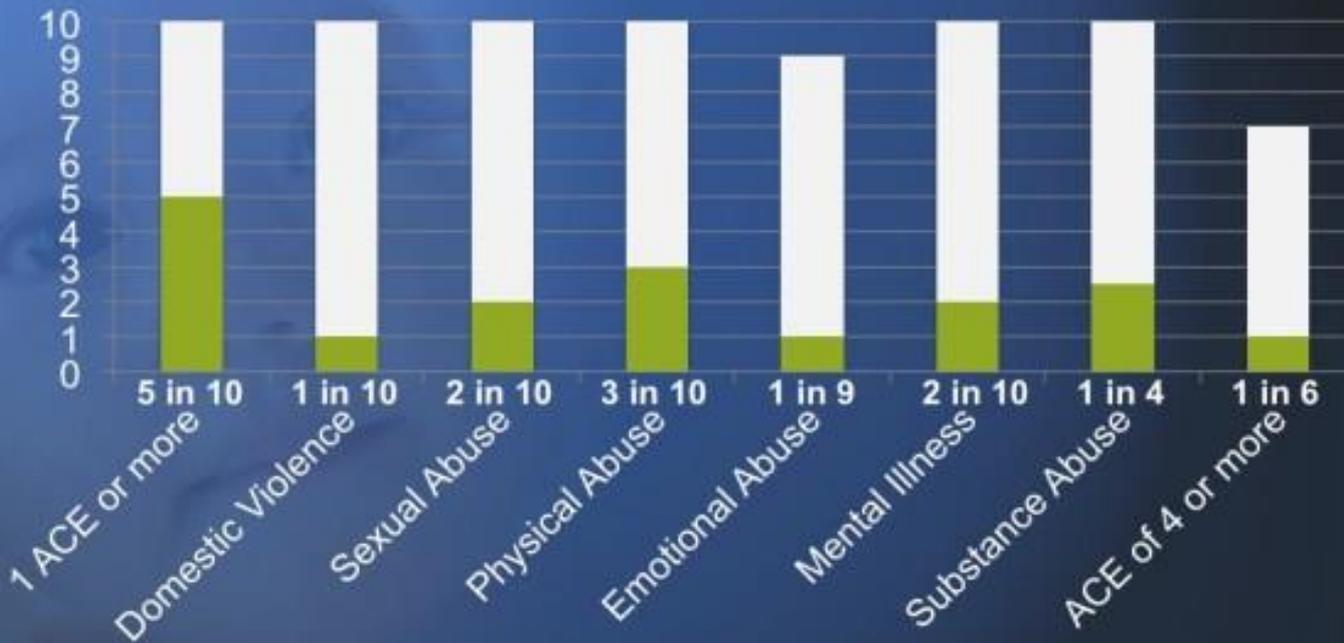
- Experiences organize pathways in the brain
- Brain organization is based on repetition
- If trauma is present, pathways develop to compensate, such as seeking external emotional regulation or distrust

SOCIAL DETERMINANTS OF MENTAL HEALTH



ADVERSE CHILDHOOD EXPERIENCES

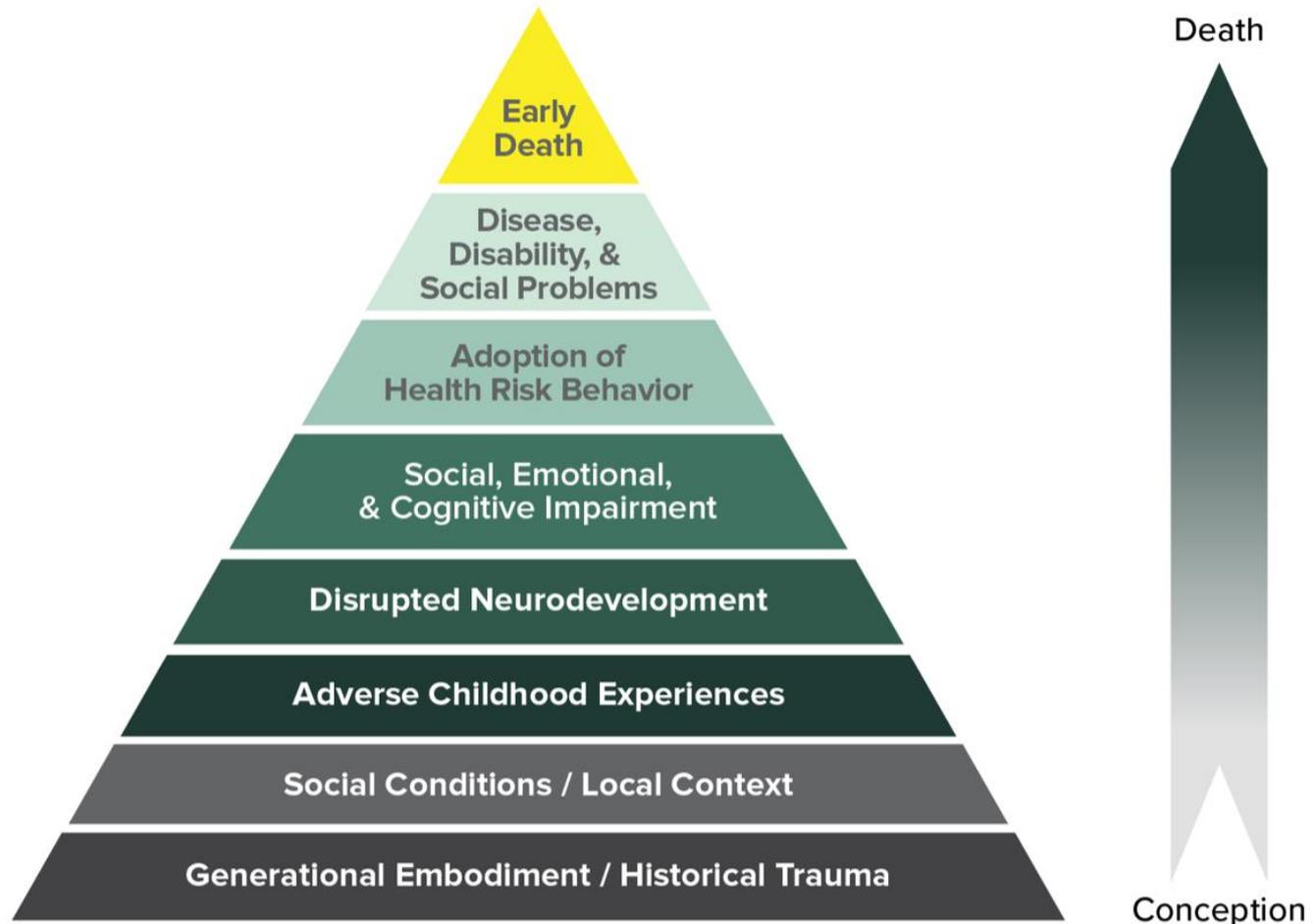
How many of us grew up with ACEs?



ACE studies: 50% of the population has an ACE of 1 or more; 16 % have an ACE of 4 or more

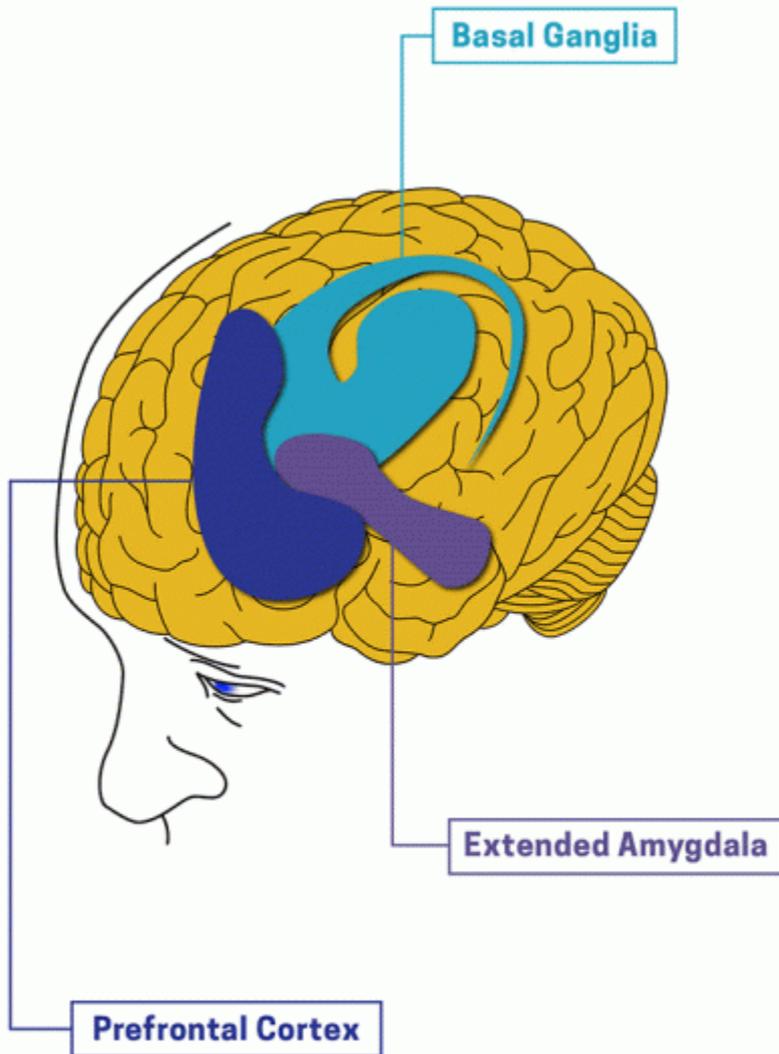
Felitti, 1998

THE ACE PYRAMID



Mechanism by which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

NEUROBIOLOGY OF ADDICTION

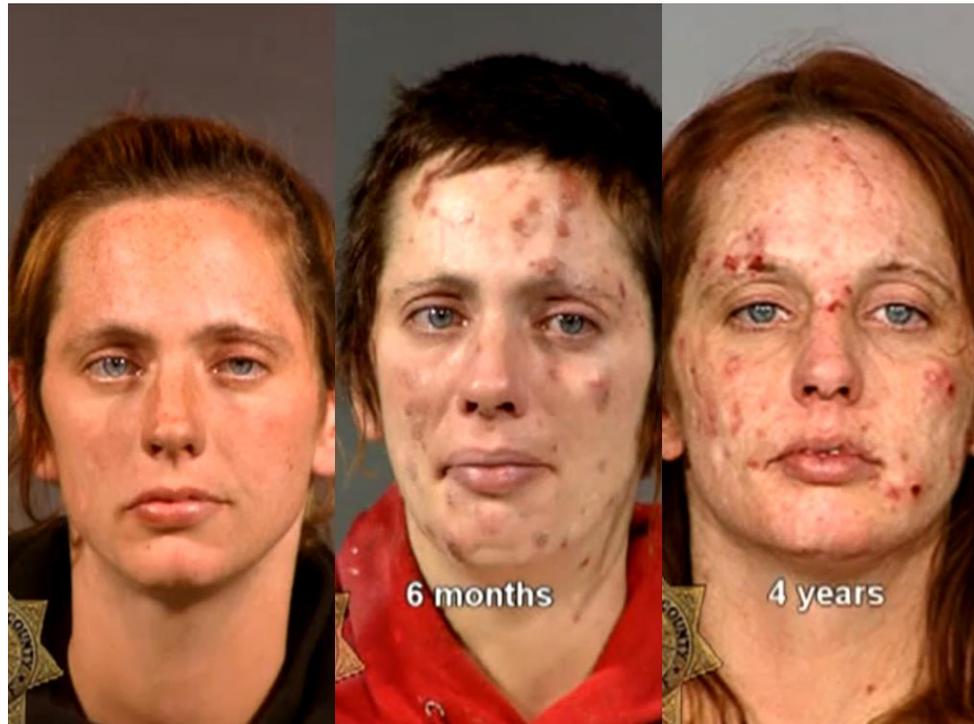


- Hormones and neurotransmitters impact our mood, emotions, and behavior
- Dopamine, epinephrine, serotonin, endorphins, etc. flood the brain during drug use
- Repeated use hardwires brain's reward center, homeostasis, and survival instinct around the drug
- Prefrontal cortex is not able to mediate, drug use becomes chronic and compulsive

Source: Facing Addiction in America:
The Surgeon General's Report on
Alcohol, Drugs, and Health

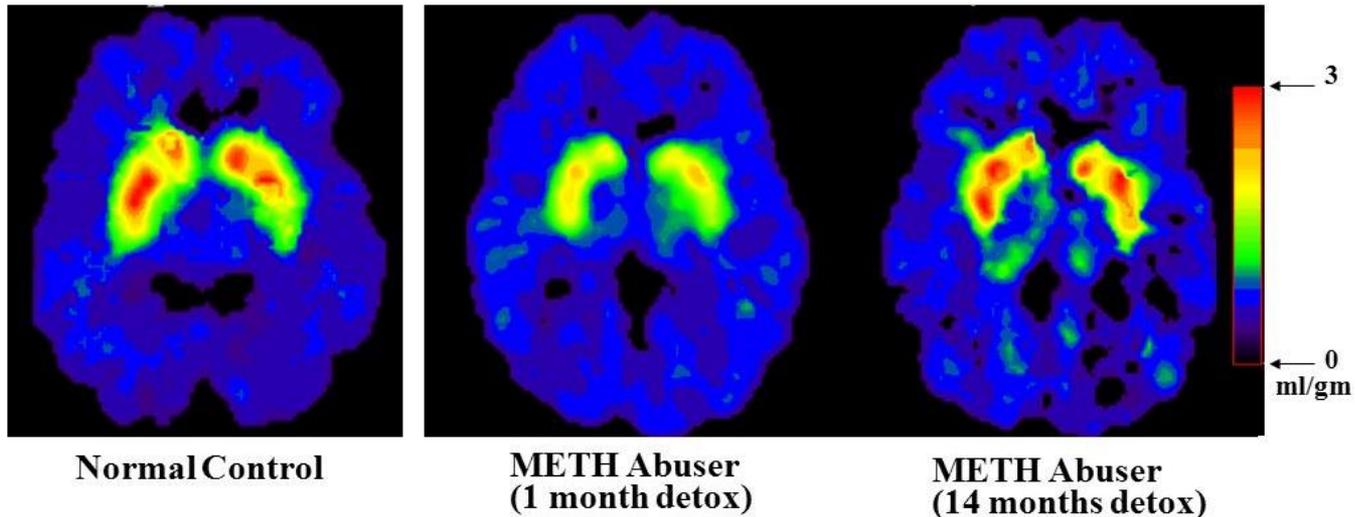
THE DISEASE OF ADDICTION

- Addiction, or Substance Use Disorders, are chronic, serious mental health disorders that changes the brain on a neurobiological level
- Individuals with SUDs lose the choice of whether or not to use
- Addiction is not a choice and cannot be controlled by willpower



NEUROLOGICAL RECOVERY

Partial Recovery of Brain Dopamine Transporters in Methamphetamine (METH) Abuser After Protracted Abstinence



Source: Volkow, ND et al., *Journal of Neuroscience* 21, 9414-9418, 2001.

- The same way that chemical imbalances can cause mental illness – the chemicals that one ingests can alter brain chemistry
- Brain chemistry is altered not just when using the substance but for long periods afterwards

RETRAINING THE BRAIN



- Like you rehab a muscle – you can rejuvenate the brain
- Cognitive behavioral therapy exercises like positive thinking create new neural pathways
- You can increase creativity, memory and regrow brain tissue through focused, repetitive practice

TYPES OF TREATMENT

Traditional treatment includes detox, residential treatment, therapy like CBT and relapse prevention, and sober living

- Takes opportunity and triggers to use away
- Has been abstinence based and long term (when possible)
- Brain heals with treatment (retraining the brain) and learning new coping mechanisms
- Return to the community often means a sober living environment

Medication Assisted Treatment (MAT)

- Brain heals with treatment (retraining the brain)
- Medication that blocks receptors in the brain so that the person can be in the community while in treatment
- Titrated off medication as the brain heals



REPETITION IS KEY

- No new skill is learned or mastered quickly
- It takes time and practice to make or break patterns of thinking and behavior
- A new skill does not automatically translate to new environments or become instantly accessible



12 STEP RECOVERY

- Bill W. and Dr. Bob, the founders of Alcoholics Anonymous, practiced CBT before CBT was invented
 - Self soothing, self regulation
 - Identifying emotions
 - Cognitive distortions
 - Forgiveness
 - Social support
- Where do these fit in step work?



THE TWELVE STEPS OF ALCOHOLICS ANONYMOUS

1. We admitted we were powerless over alcohol—that our lives had become unmanageable.
2. Came to believe that a Power greater than ourselves could restore us to sanity.
3. Made a decision to turn our will and our lives over to the care of God *as we understood him*.
4. Made a searching and fearless moral inventory of ourselves.
5. Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
6. Were entirely ready to have God remove all these defects of character.
7. Humbly asked Him to remove our shortcomings.
8. Made a list of all persons we had harmed, and became willing to make amends to them all.
9. Made direct amends to such people whenever possible, except when to do so would injure them or others.
10. Continued to take personal inventory and when we were wrong promptly admitted it.
11. Sought through prayer and meditation to improve our conscious contact with God *as we understood Him*, praying only for knowledge of His will for us and the power to carry that out.
12. Having had a spiritual awakening as a result of these steps, we tried to carry this message to alcoholics, and to practice these principles in all our affairs.

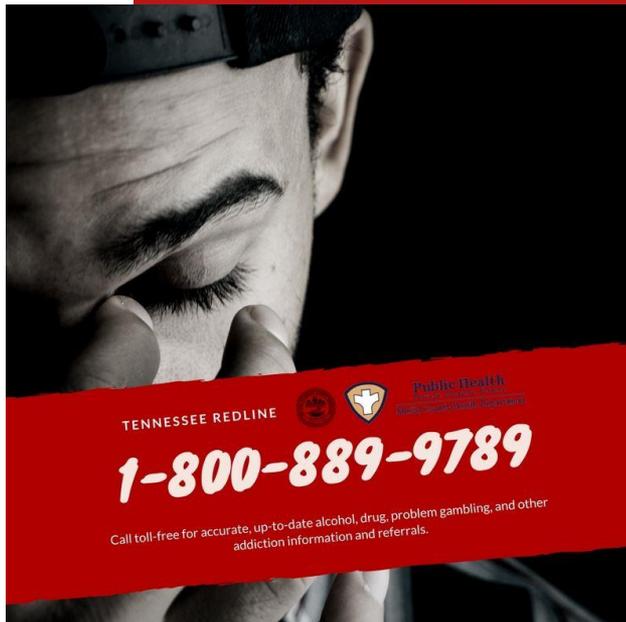
TENNESSEE REDLINE

TENNESSEE REDLINE 1.800.889.9789

Toll free. 24/7.

- Alcoholism
- Drug Dependence
- Gambling Addiction
- Eating Disorders
- Depression
- NAS
- PTSD
- Resources for Domestic Violence
- Smoking / Tobacco
- General Mental Health
- HIV/Aids
- Free Literature (Shipped to your door)
- Federal Marketplace Assistance
- Shelters & Transitional Living

This project is funded by the Tennessee Department of Mental Health & Substance Abuse Services.





FURTHER READING

Felitt, V.J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Medicine*, 14(4), 245-258. [https://doi.org/10.1016/S0749-3797\(98\)00017-8](https://doi.org/10.1016/S0749-3797(98)00017-8)

Heijmans, B. T., Tobi, E. W., Stein, A. D., Putter, H., Blauw, G. J., Susser, E. S., Slagboom, P. E., & Lumey, L. H. (2008). Persistent epigenetic differences associated with prenatal exposure to famine in humans. *Proceedings of the National Academy of Sciences of the United States of America*, 105(44), 17046–17049. <https://doi.org/10.1073/pnas.0806560105>

NIDA. 2020, June 16. Genetics and Epigenetics of Addiction Drug Facts. <https://www.drugabuse.gov/publications/drugfacts/genetics-epigenetics-addiction>

NIDA. 2020, July 10. Drugs and the Brain. <https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drugs-brain>

Rice, L. & Sara, R. (2019). Updating the determinants of health model in the information age. *Health Promotion International*, 34(6), 1241–124. <https://doi.org/10.1093/heapro/day064>

Sacks, V., Murphey, D. 2018, February 12. The prevalence of adverse childhood experiences, nationally, by state, and by race or ethnicity. *Child Trends*. <https://www.childtrends.org/publications/prevalence-adverse-childhood-experiences-nationally-state-race-ethnicity>

World Health Organization. 2014. Social determinants of mental health. https://apps.who.int/iris/bitstream/handle/10665/112828/9789241506809_eng.pdf;jsessionid=DA7A64F31CEDD81C4E6CE57D3CDB38E2?sequence=1