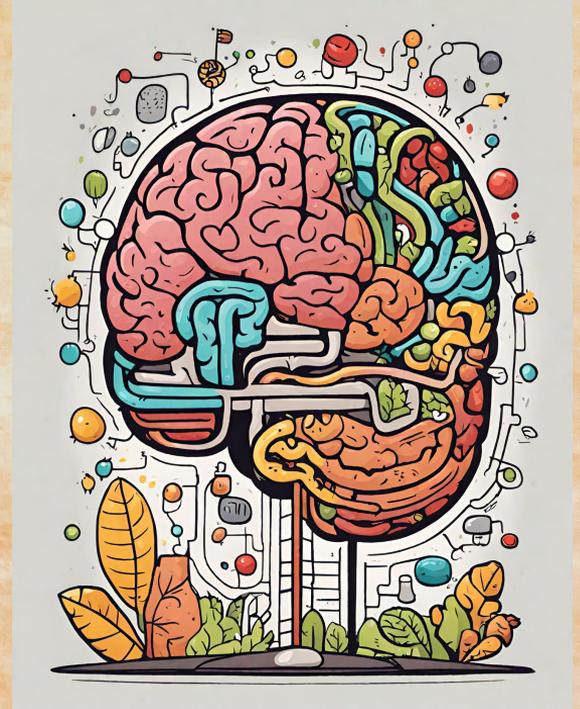


I Think Rising Rates of Depression & Anxiety and Colorectal Cancer in Young Adults are Linked

Data from the United States show that rates of colorectal cancer, anxiety, and depression have been rising among people under age 50. In this slide deck and video I explain why I think these phenomena are linked, and how we can make positive changes.



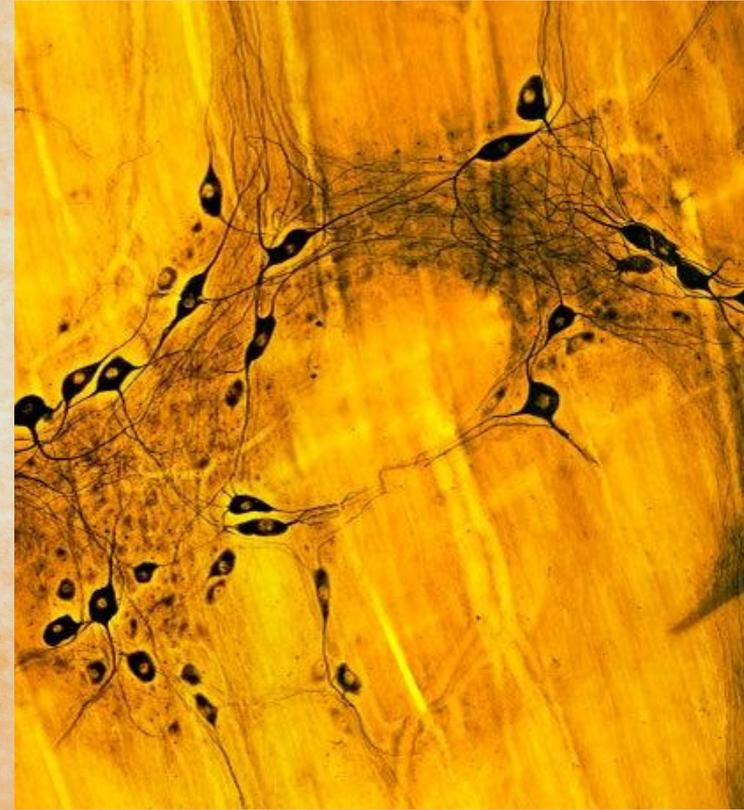
[Link to YouTube Video](#)

| [Link to Blog Post](#)

| [Link to Research Paper](#)

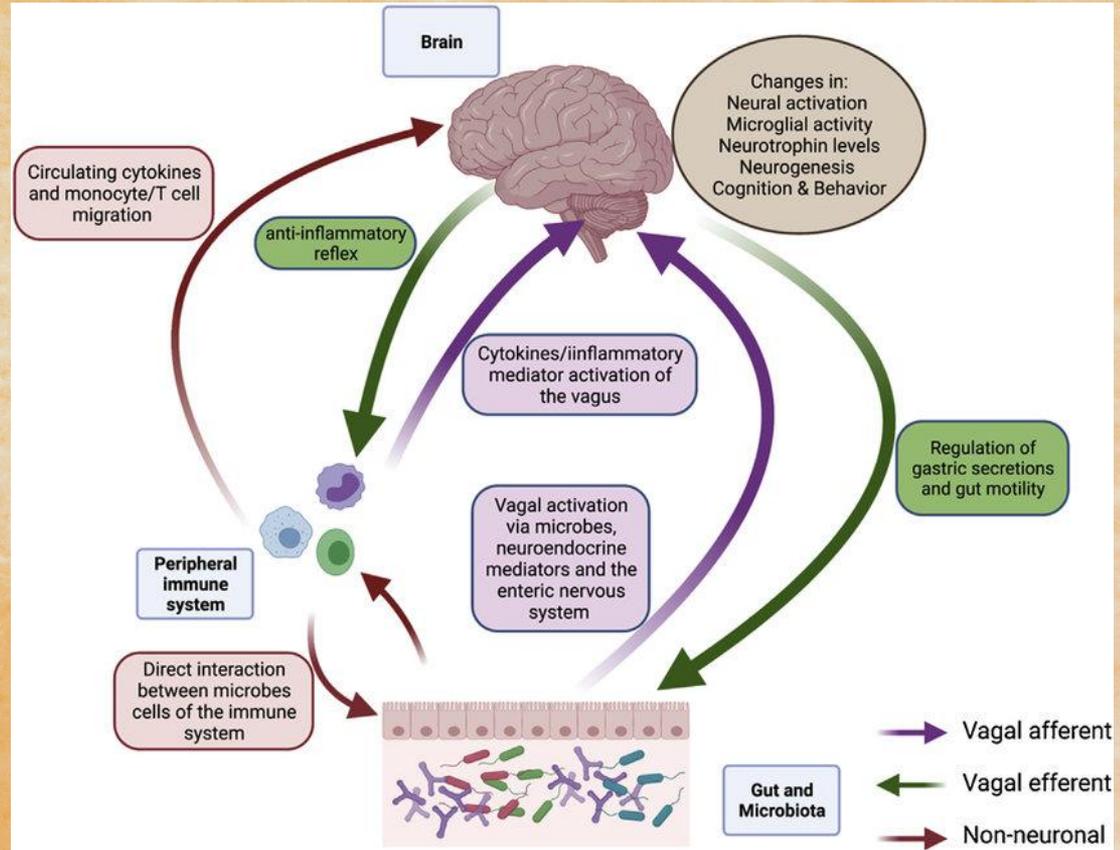
Brief Overview of the Gut-Brain Neural Axis

- The Enteric Nervous System consists of over 100 million neurons that line the GI tract
 - Regulates digestion, absorption, and excretion
 - Known to impact cognition and mood
- Neurons in the gut and brain impact each other—mood symptoms can initiate in either and alter the other
- Neurotransmitter levels in the gut have been associated with many different health conditions including Irritable bowel syndrome and Osteoporosis.



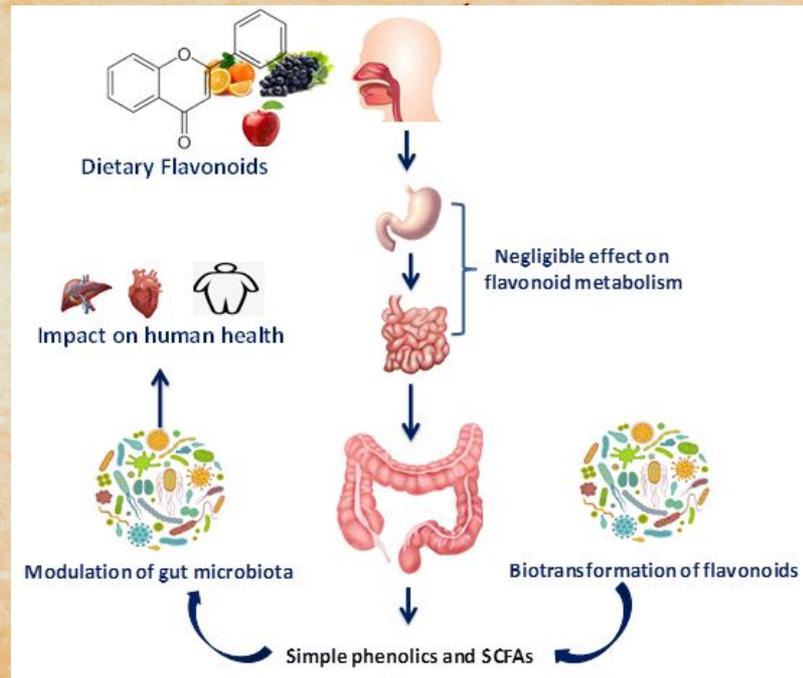
The Neural and Immune Connection

Immune cells pervade the lymphatic and circulatory tissue surrounding the intestines. They interact directly with microbes and absorbed nutrients and chemicals. There's direct signalling between the gut and brain, along with communication that's mediated by the immune system.



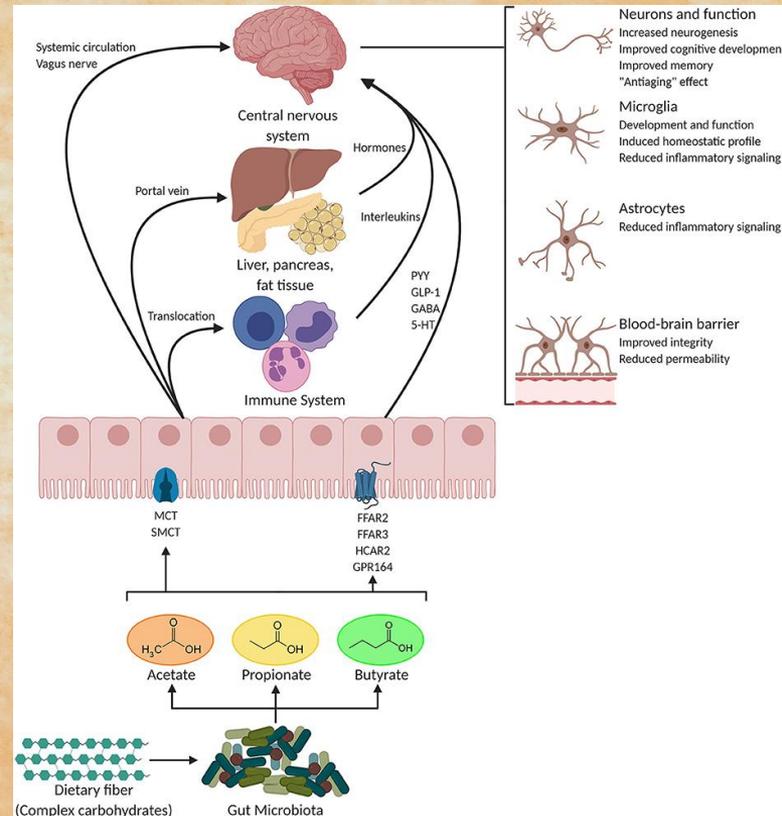
Nutritional Connection 1 - Flavonoids

- Microbiota in the colon produce myriad nutritional compounds and make others absorbable
- 95% of flavonoids aren't absorbed through the intestine. They interact with and are altered by the gut microbiome.
 - Immunomodulation
 - Inflammatory modulation
 - Modulate blood sugar
 - Reduce insulin resistance



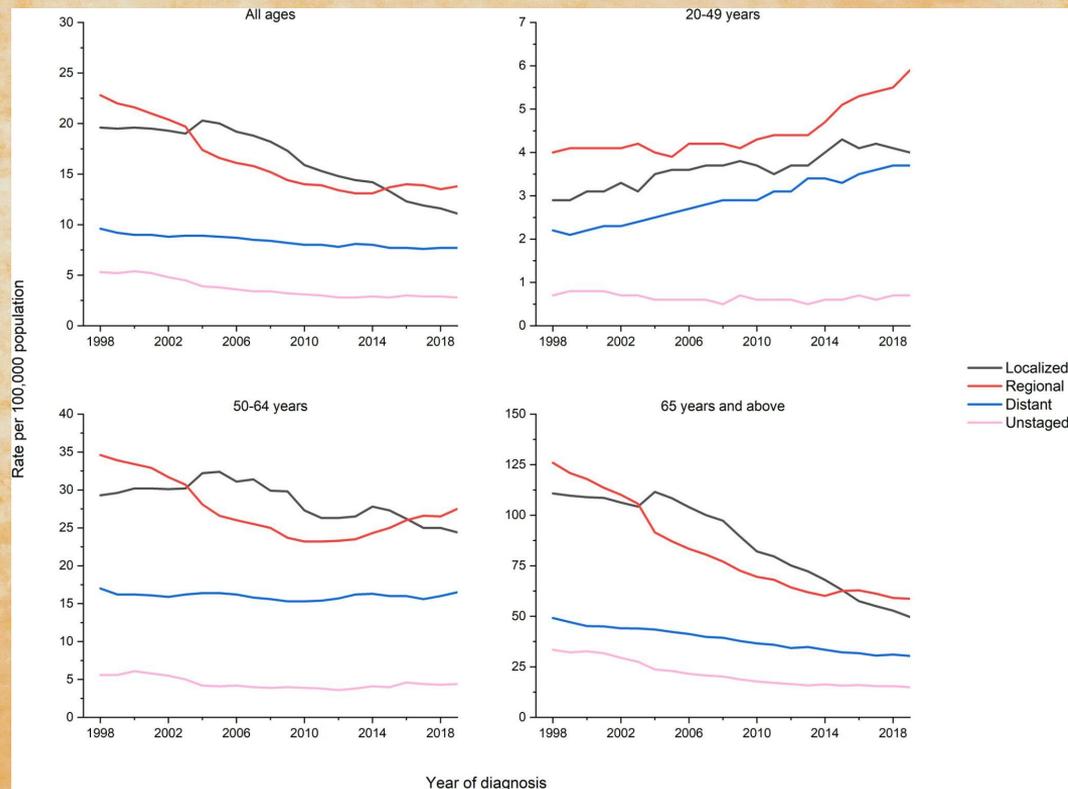
Nutritional Connection 2 - SCFAs

- Short-Chain Fatty Acids are released by different bacteria in the microbiome when they break down dietary fiber in the large intestine
- SCFAs promote integrity of tight junctions between endothelial cells. Among other things, these types of cells line the gut, blood vessels, kidneys, and blood-brain barrier.
- Contribute to neurotransmitter production
- Regulate inflammatory signalling
- Regulate mitochondrial activity in the liver
- Induce apoptosis in colorectal cancer cells



Colorectal Cancer Rates Have Risen in Adults Under 55, While Falling Among Older Americans

The vast majority of colorectal cancer cases occur in folks over 65. Overall rates have been falling because rates among older Americans have dropped. But rates among younger adults have risen by about 50% since 1998, with stage 2 and 3 rates spiking since 2012.



Depression & Anxiety Rates Among Younger Americans Are Rising at Crisis Speeds

- Rates of [anxiety](#) and [depression](#) have risen significantly over the last 25 years, with rates jumping significantly since 2011
- The spike has been most pronounced in people under age 45
- [Feelings of isolation](#) have also increased, along with a decline in real social engagement

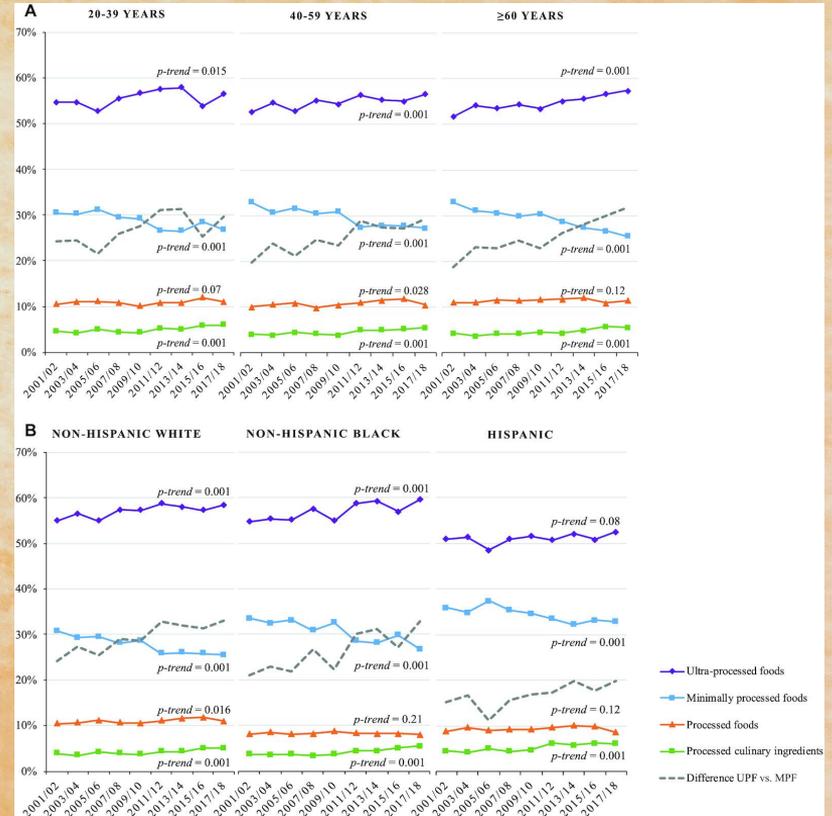
Lifetime and Current Depression Rates, by Subgroup

| | Diagnosed with depression in lifetime | | | Currently have/treated for depression | | |
|-----------------------|---------------------------------------|----------|--------------------|---------------------------------------|----------|--------------------|
| | 2017 (%) | 2023 (%) | Change (pct. pts.) | 2017 (%) | 2023 (%) | Change (pct. pts.) |
| U.S. adults | 20.6 | 29.0 | 8.4 | 13.5 | 17.8 | 4.3 |
| Gender | | | | | | |
| Men | 14.7 | 20.4 | 5.7 | 9.3 | 11.3 | 2.0 |
| Women | 26.2 | 36.7 | 10.5 | 17.6 | 23.8 | 6.2 |
| Age | | | | | | |
| 18 to 29 | 20.4 | 34.3 | 13.9 | 13.0 | 24.6 | 11.6 |
| 30 to 44 | 22.3 | 34.9 | 12.6 | 14.2 | 20.7 | 6.5 |
| 45 to 64 | 20.4 | 26.1 | 5.7 | 14.0 | 16.2 | 2.2 |
| 65 and older | 19.3 | 21.3 | 2.0 | 12.1 | 11.9 | -0.2 |
| Race/Ethnicity | | | | | | |
| Black adults | 20.1 | 34.4 | 14.3 | 12.3 | 15.9 | 3.6 |
| Hispanic adults | 18.4 | 31.3 | 12.9 | 13.0 | 18.8 | 5.8 |
| White adults | 22.3 | 29.0 | 6.7 | 14.7 | 18.2 | 3.5 |

GALLUP

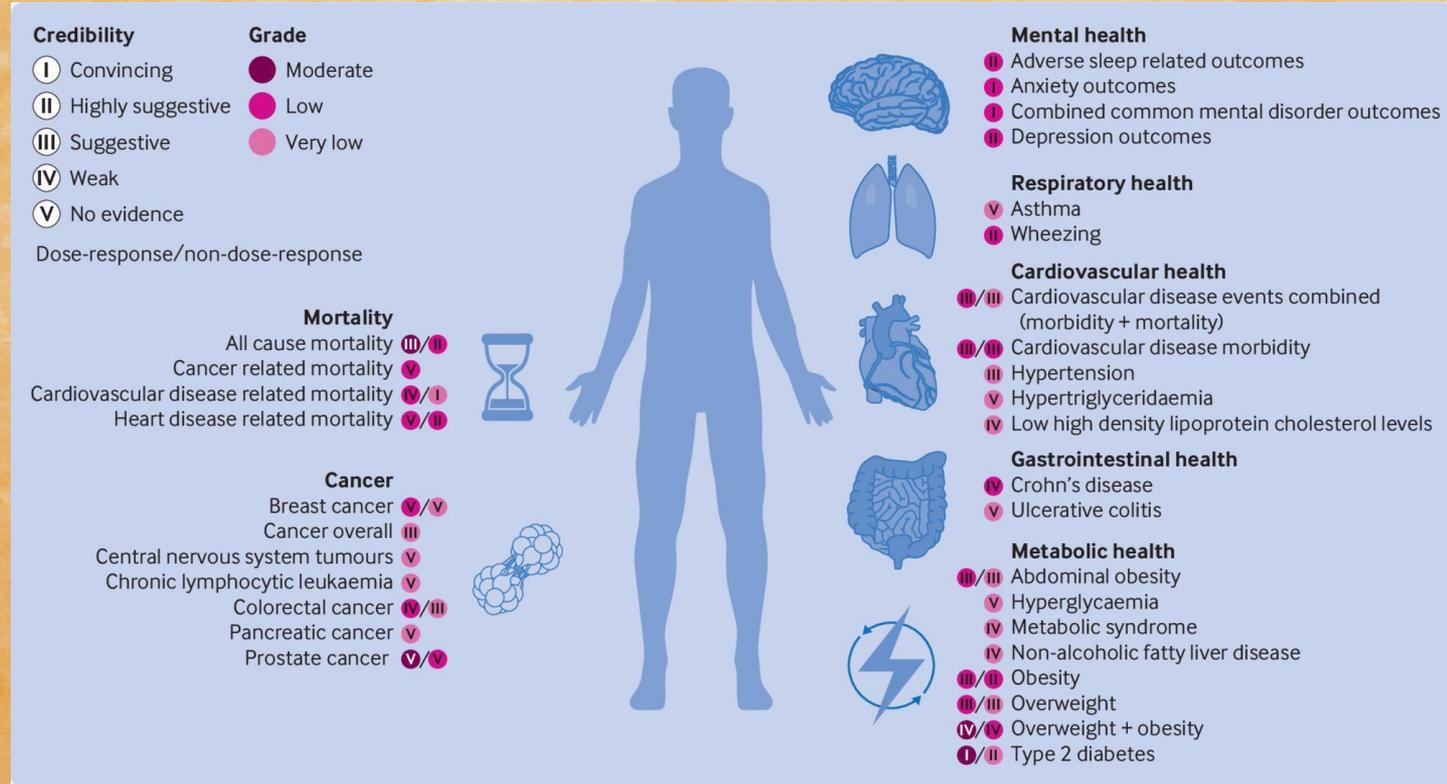
Ultra Processed Food Makes Up Nearly 60 of the American Diet...

Ultra-processed foods tend to be high in salt, sugar, and fat. They're low in naturally-occurring fiber, vitamins, minerals, and flavinoids. Many have artificial additives and preservatives as well, which have been shown to disrupt the gut lining and microbiome. A study published in 2022 found that over 50% of the Standard American Diet since at least 2001 has consisted of ultra-processed food.



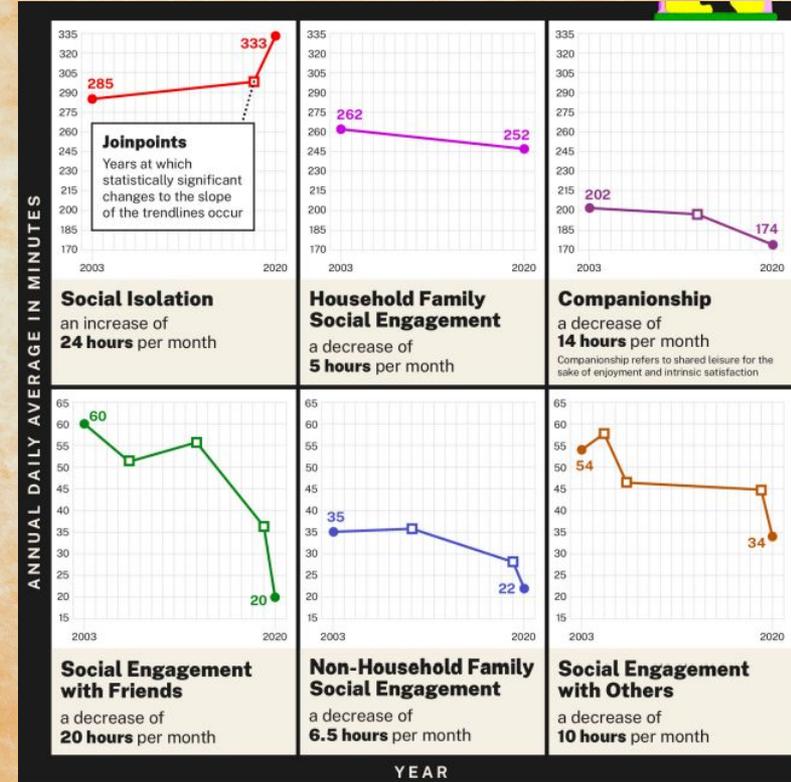
...And Are Linked to Several Disorders

A [study just published in the BMJ](#) found strong evidence of linkage between UPF exposure and Mental Health Disorders, and suggestive evidence of linkage to Colorectal cancer.



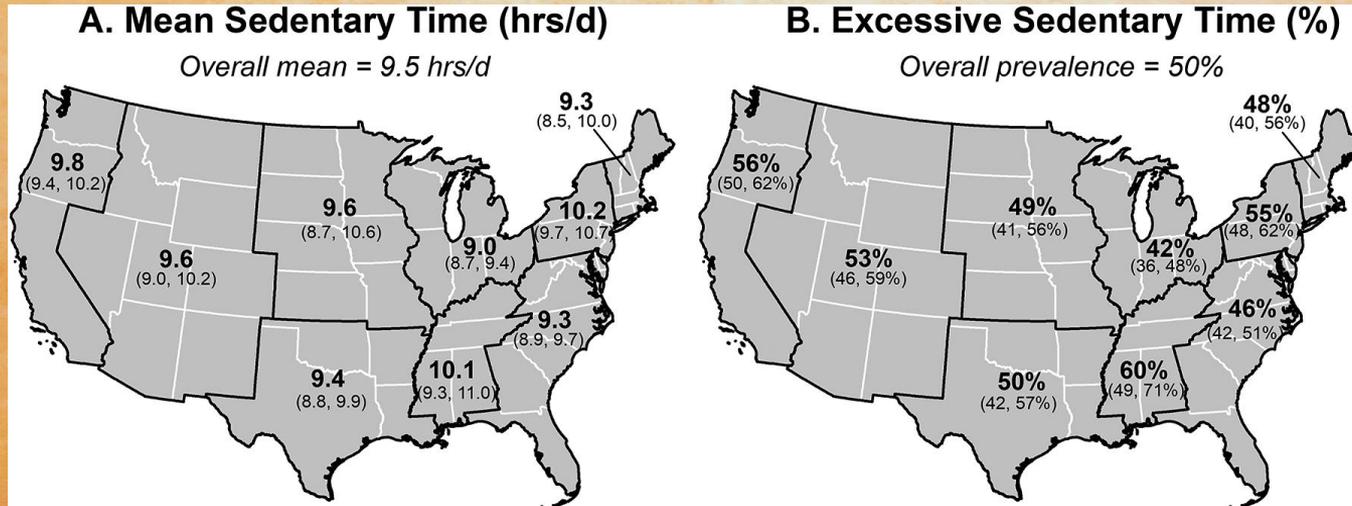
As Social Connection Has Fallen, Symptoms of Anxiety and Depression Have Risen

The average amount of time American adults spend with others in-person has consistently declined since the year 2000. It's largely been replaced with screen time. While elder Americans have the highest rates of loneliness, they're followed closely by young adults.



Screen Time Is Replacing In-Person and Outdoor Time

Time socializing in person, and time spent outdoors are both associated with enormous mental and physical health benefits. But social and outdoor time have been falling, and being replaced by time spent sitting and consuming electronic media.

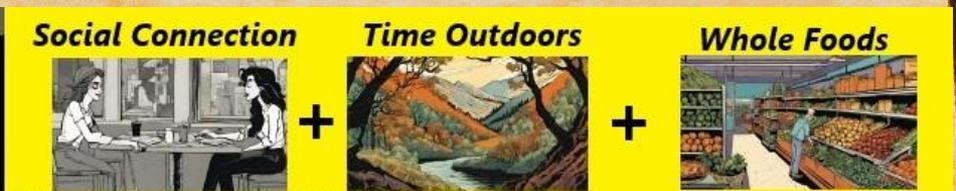
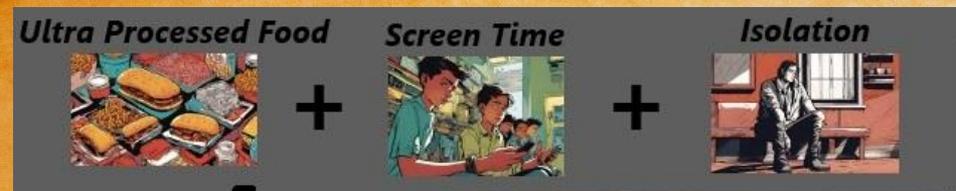


Mental Health and Gut Health Are Tightly Connected, and Affect the Rest of the Body

Things that are shown to have enormous physical and mental health benefits include:

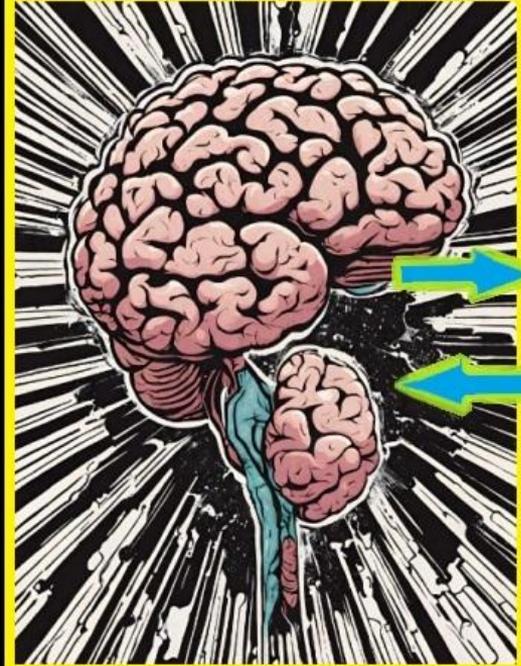
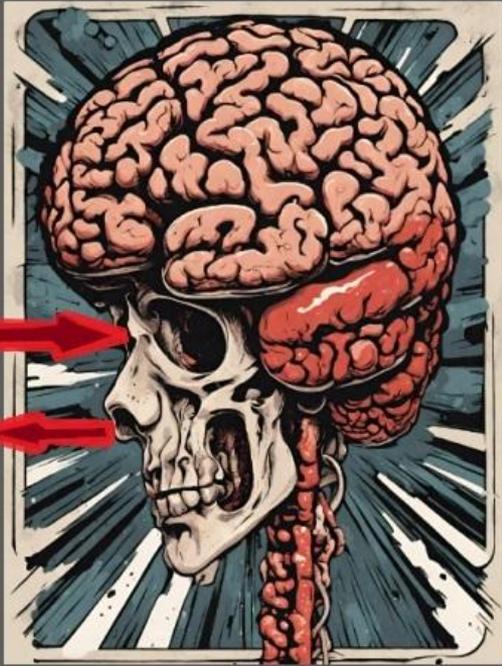
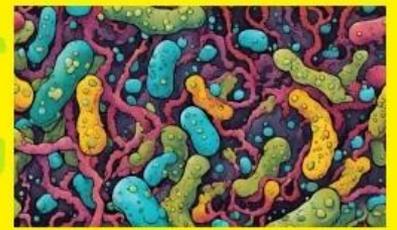
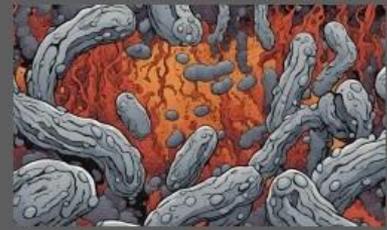
- [Time spent outdoors](#)
- Time spent socializing
- Moderate exercise
- Regular sleep
- Creative activity
- Whole food diets

But these have been steadily [replaced](#) by [sedentary screen time](#), [alcohol](#), [nicotine](#), and [substance](#) dependence, social isolation, and ultra processed food. These trends must be reversed



Sick Gut Biome

Healthy Gut Biome



Heart Disease



Depression

Anxiety

Cancer

Type 2 Diabetes

Creativity

Physical Health

Emotional Wellbeing

Future Implications

- Depression and anxiety have historically been approached solely as mood disorders. While this works for many individuals, it's failing on the large scale.
- D & A can destroy quality of life on their own, and are also harbingers of bigger health problems, and earlier death, down the line
- D & A monitoring should include social, physical, and gut health factors, including stool samples
- The D & A epidemic should be treated as an imminent health crisis



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