TRUAGE BY TRUDIAGNOSTIC

# Alcohol Consumption

*This report explores the impacts of alcohol consumption habits on biological age and accelerated biological aging by examining associated methylation patterns at various locations of your DNA.*

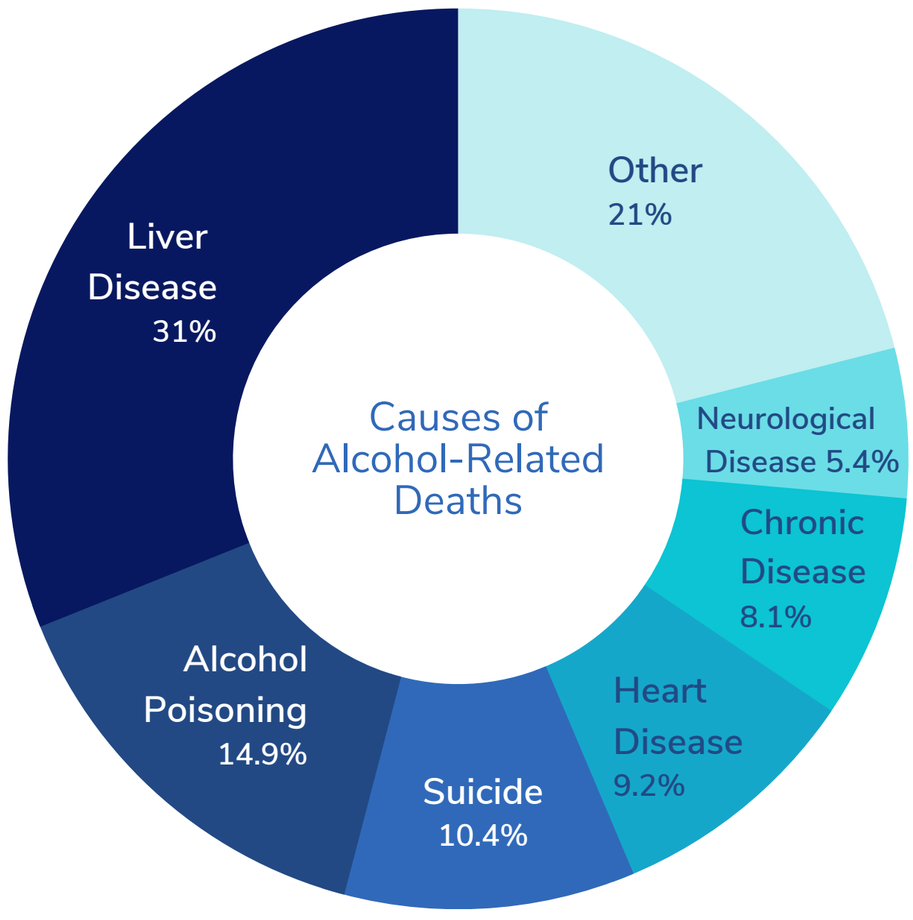
*Developed By TruDiagnostic's Bioinformatics & Research Department*


UNDERSTANDING

## What alcohol does to my biology.

Drinking alcohol is a major lifestyle risk factor contributing to the worldwide burden of chronic disease and death. Modest alcohol use may increase disease risk, but **the greatest risks are observed in chronic drinking**.

Excessive alcohol consumption, over time, can lead to long-term health risks. As the CDC explains, these chronic diseases include alcohol-related hypertension, liver disease, cancer, dementia, alcohol use disorder, and more.




With the help of epigenetics, we can understand how our lifestyle behaviors, such as drinking, affect gene expression. This report looks at the **methylation markers leftover from alcohol consumption**.

These markers appear to be reversible after time spent abstaining from drinking, but do take substantial time to reflect those changes. Therefore, heavy drinking several years ago followed by recent abstinence may show up as a light drinker, despite having no alcohol consumed at all within the last year.

# How alcohol speeds up my biological aging.

### SLEEP

Sleep is crucial for cellular regeneration. Alcohol intake disrupts sleep and thus interferes with your body's ability to produce new, healthy cells; accelerating your biological aging processes. Over time, this disruption can affect physical appearance, as well as decrease cognitive function.

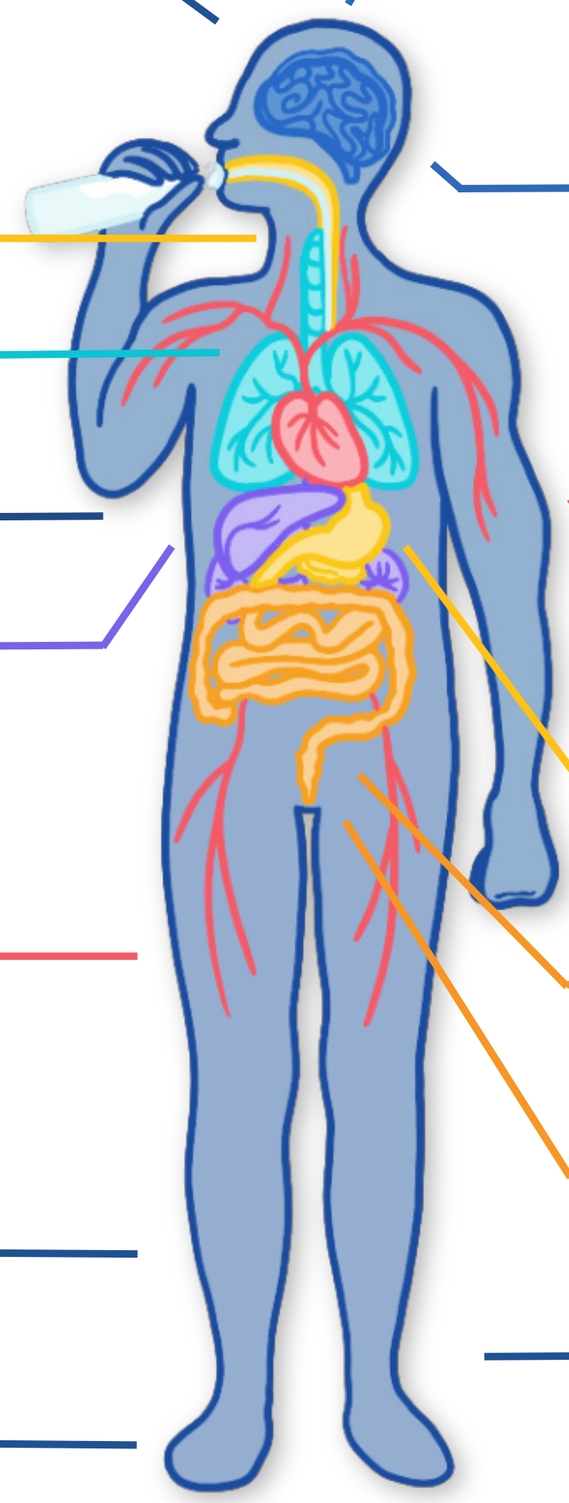
### SKIN

Drinking alcohol causes dehydration and depleted levels of vitamin A and collagen; both of which notably decline with age. This can lead to premature wrinkling of the skin and loss of elasticity.

### BLOOD & LIVER

Accelerated biological aging has been observed in blood and liver tissue samples, but not in brain tissue. Studies show that epigenetic aging differs in the blood and liver tissue of individuals with alcohol dependence compared to healthy volunteers. Excessive alcohol consumption may be associated with epigenetic aging in a tissue-specific manner.

## LONG-TERM HEALTH EFFECTS OF DRINKING ALCOHOL



### WHOLE BODY

- Existing health conditions made worse. such as
- Mental illness and diabetes death from injury or disease

### MOUTH, THROAT AND VOICEBOX

- Cancer

### LUNGS

- Inflammation, usually from infections

### BREAST

- Cancer (In Women)

### LIVER

- Swelling and pain
- Alcoholic liver disease, such as cirrhosis
- Cancer

### BLOOD AND IMMUNE SYSTEM

- Changes in red and white Blood cells
- Anemia
- less ability to fight off infections

### SKIN AND FAT

- Yellowing of skin and spider veins
- Potential weight gain

### BONES AND MUSCLES

- Yellowing of skin and spider veins
- Potential weight gain

### MENTAL HEALTH AND ADDICITION

- **Mood Disorders, such as depression and anxiety**
- **Alcohol dependence**

### BRAIN AND NERVOUS SYSTEM

- **Brain damage**
- **Memory loss**
- **Disrupted sleep**
- **Stroke (bleeding on the brain)**
- **Nerve Damage**

### HEART AND CIRCULATION

- **Cardiovascular disease**
- **High blood pressure**

### STOMACH AND FOOD PIPE

- **Inflammed lining and bleeding**
- **Cancer of the food pipe**

### PANCREAS

- **Inflammation and damange**
- **Pancreatitis**

### INTESTINES

- **Inflammed lining**
- **Cancer**

### SEX ORGANS

- **Impotence and loss of sex drive**
- **Reduced fertility (both sexes)**

UNDERSTANDING

# My data & results.

DNA Methylation is a robust biomarker that provides significant detection of past and current alcohol intake, and substantially out performs many other biomarkers for detecting the impacts of heavy alcohol drinking. Analysis of the epigenome in drinkers and former drinkers has identified **over 140 locations on your DNA related to habitual drinking**.

Lifestyle, medical, and environmental factors affect how, where, and to what degree DNA methylation occurs. These known factors include drinking, nutrition, chronic or acute stress, sleep habits, activity levels, inflammation, oxidative stress, and hypoxia. Although not permanent, **reducing these factors can reverse patterns of methylation**.


JANE,

your risk of alcohol consumption impacting how your DNA is expressed, and accelerating your biological aging is

**HIGHER THAN 30%**

of the tens of thousands of patients we have tested.

# Your Results.

Do you ever wonder why many older adults experience a harder time battling diseases like COVID-19 or the flu, compared to younger people who typically have an easier time recovering from the same illnessess boils down to the capabilities of one's immune cells to effectively respond to internal and foreign health threats; capabilities which tend to decrease with age. This age-related decline of the immune response in our blood is called immunosenescence.

ADDING CONTEXT TO

## Your drinking score.

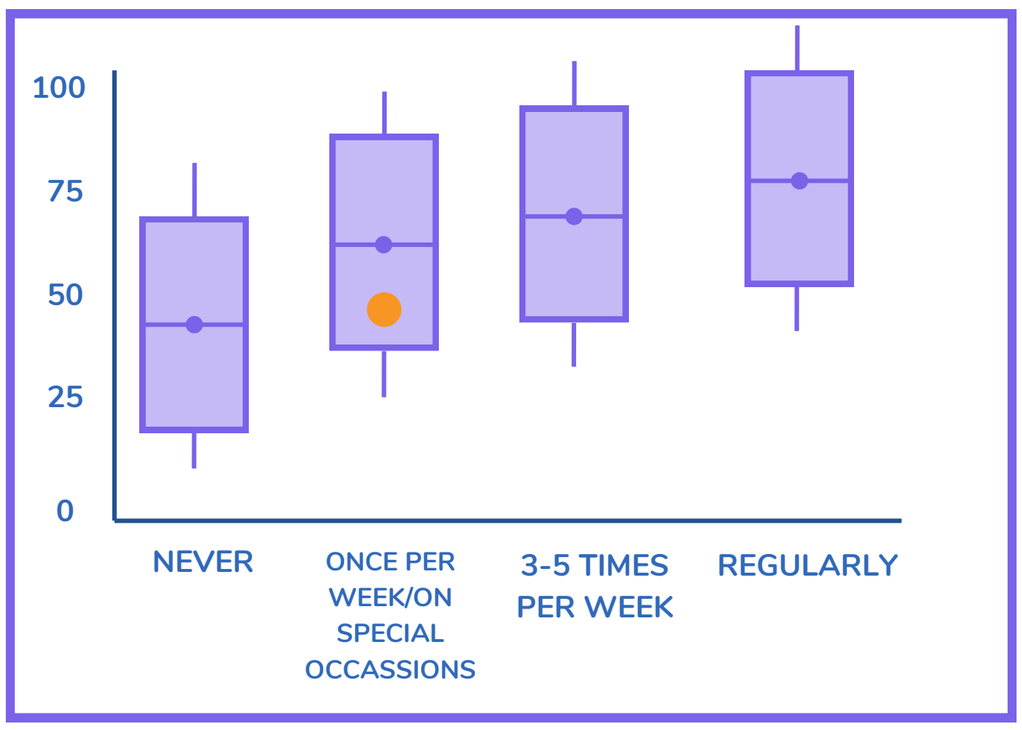
The methylation markers we look for appear quickly in response to alcohol consumption, and heavy drinking in the past two months can rapidly increase an individual's drinking status.

Methylation on these DNA locations for women tend to be more sensitive to alcohol consumption than for men.


You reported your drinking status to be **RARELY OR ONCE WEEKLY.**

Your biology more closely resembles alcohol impacts among people who **NEVER DRINK.**

### Alcohol Consumption and DNA Methylation



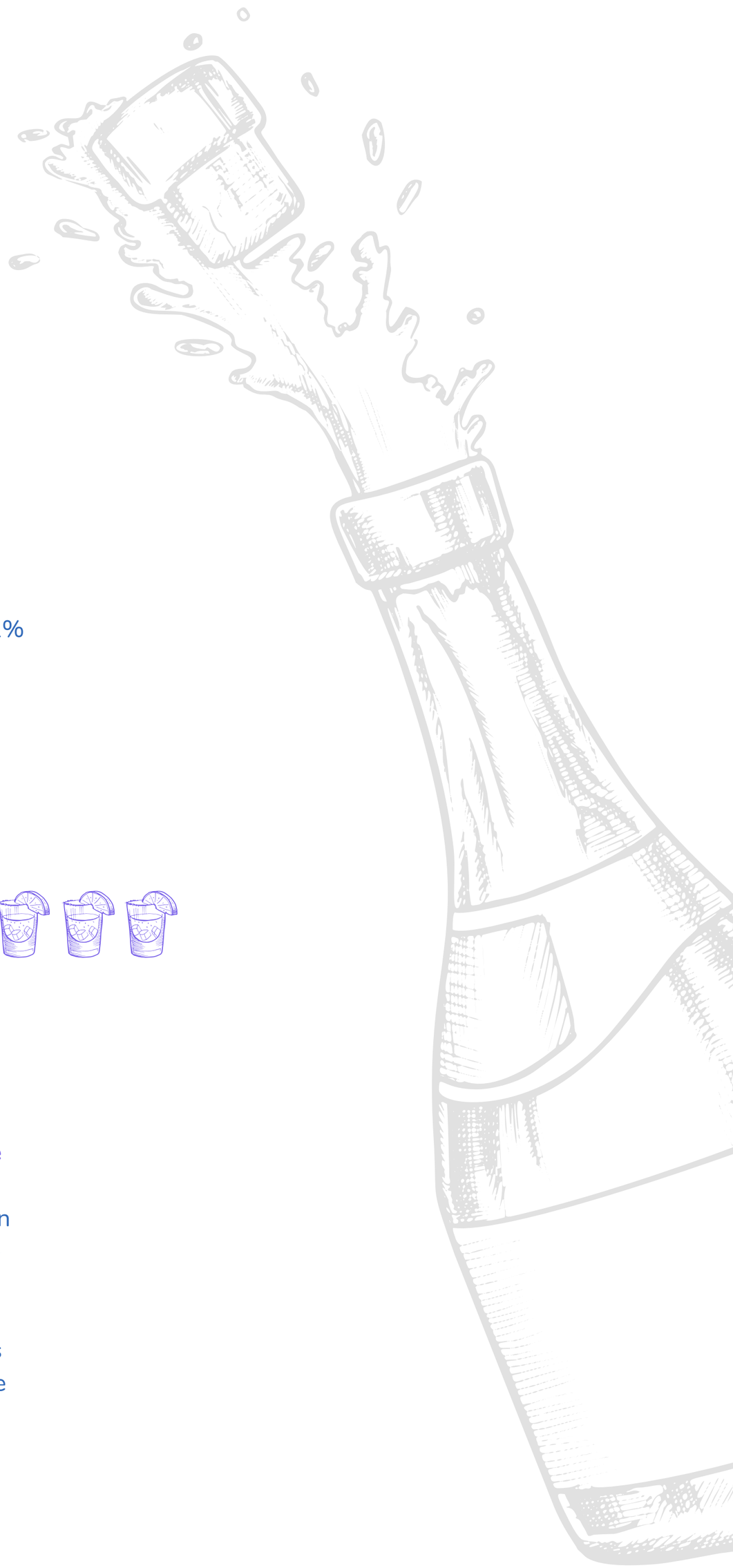

The methylation risk percentile is a measurement of your drinking behavior, based on changes we see in the epigenome from alcohol consumption. With this method of comparison, people who consume alcohol often have higher scores overall; meaning they experience greater biological and aging impacts directly tied to drinking.

On your intake survey, you self-reported your drinking status as **RARELY OR ONCE WEEKLY.** In the graph above, you can see how your self-reported drinking relates to these methylation scores.

With our custom methylation risk score, you are in the **30th percentile.** This means the impact of alcohol consumption on your DNA expression is higher than 30% of our tested population.

UNDERSTANDING

# What I can do to improve my score.



Scaling back on your alcohol consumption is an easy way to see improvements without the sometimes challenging commitment of abstaining from drinking all together.

In the U.S., one “standard” drink contains ≈14 gm of pure alcohol. This can look like a 12 oz, regular beer (5% alcohol), a 5 oz glass of wine (12% alcohol), or 1.5 oz of distilled spirits (40% alcohol). **Binge** and **Heavy Drinking** are considered too much.

**BINGE DRINKING**


Women: 4+ drinks per occasion
Men: 5+ drinks per occasion

**HEAVY DRINKING**

Women: 8+ drinks per week
Men: 15+ drinks per week

Studies have found that people who stop drinking alcohol completely, even if they had previously been a habitual and heavy user, **can reverse their methylation patterns to eventually match the group who never drank at all**! However, some studies suggest this process of methylation reversal could take more than 10 years for cases of excessive and long-term alcohol abuse.

The good news is that even a single year of abstaining from alcohol has shown positive effects on methylation patterns and corresponding gene expressions impacted by that methylation.

EDUCATIONAL CONTENT

# FAQs

## TOP QUESTIONS

**I have not drank at all in recent years OR I have never consumed alcohol in my entire life. Why do I have any methylation at all in this report?**

The epigenetic locations we looked at for this report are most strongly impacted by alcohol consumption, however, methylation of these areas can naturally occur with age, regardless if alcohol consumption is increasing or expediting the methylation process.

EDUCATIONAL CONTENT

# Report references.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