

# Alcohol Flush Reaction

Genetic factors help explain why some people flush red in the face after drinking a small amount of alcohol (one drink or less). People who experience flushing may also experience unpleasant symptoms like headaches, nausea, and sleepiness.

[Overview](#) [Scientific Details](#)

Jamie, based on your genetics, you are **unlikely to flush** after drinking alcohol.

People with your genetic result can typically process alcohol normally. As a result, they don't tend to flush bright red in the face or experience unpleasant symptoms like headaches and nausea after having just one drink.



→ [Tell us whether you experience flushing in response to alcohol](#)

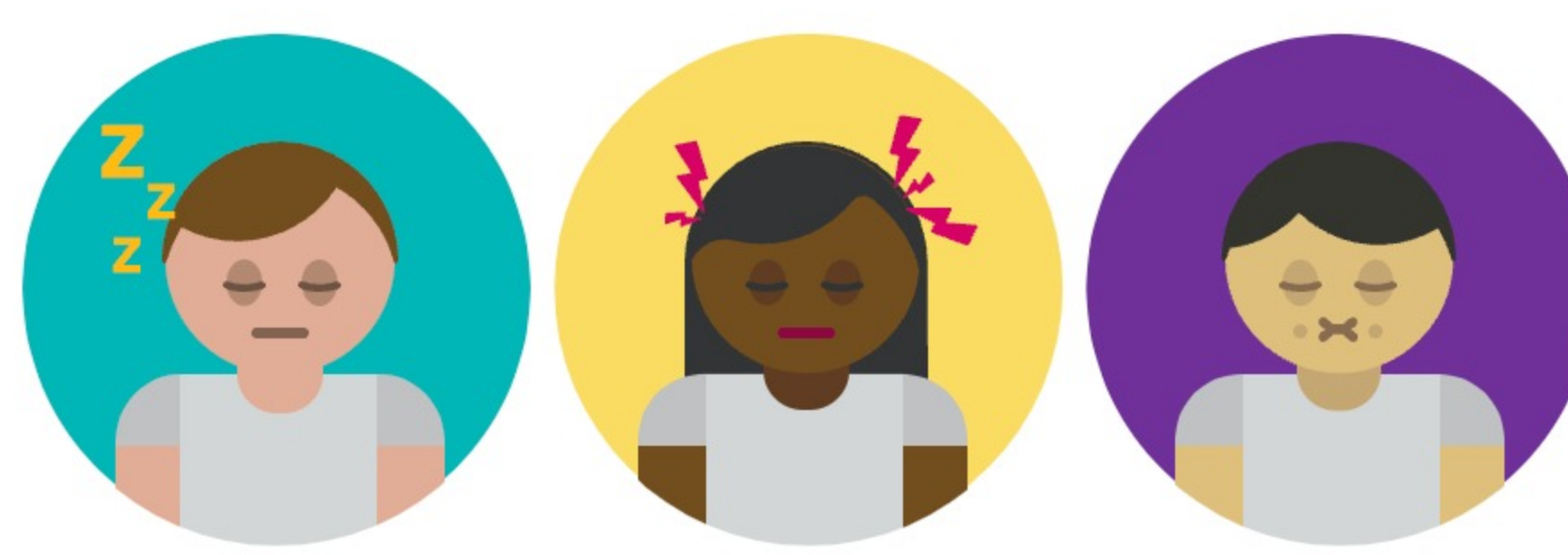
## What this means for you

While you're unlikely to begin flushing bright red after having one drink or less, you may still experience unpleasant symptoms like flushing if you drink too much in a short amount of time. That's because alcohol is broken down into a toxic substance that may build up faster than it can be cleared out. Avoiding heavy alcohol consumption is important for overall health.

## Genetics and Alcohol

### What causes the alcohol flush reaction?

In people who experience the alcohol flush reaction, a toxic substance called acetaldehyde builds up after drinking. Acetaldehyde causes tiny blood vessels in the face to temporarily expand and fill with more blood — similar to what happens when people blush. But acetaldehyde can also cause other effects, like nausea, headaches, and sleepiness. Studies have found that people who flush are less likely to drink alcohol because this reaction is so uncomfortable.



### A genetic bottleneck in alcohol breakdown

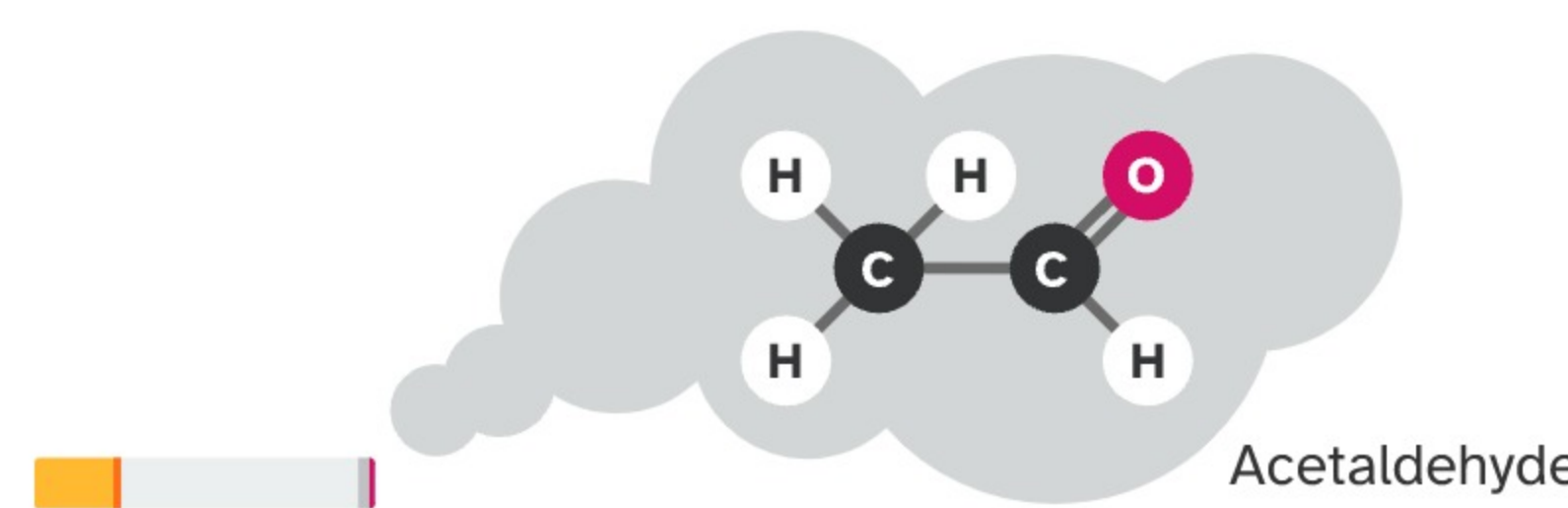
Before alcohol molecules can be cleared from the body, they have to be broken down into smaller molecules. Acetaldehyde is one of the molecules created during this process. For people who don't have the alcohol flush reaction, acetaldehyde is quickly broken down further into another, harmless substance. But for people who have one or two copies of the alcohol flush variant, the enzyme responsible for breaking down acetaldehyde is less efficient, so acetaldehyde builds up in the body faster than it can be cleared away.

Genetic result	What it means
AA	Likely to flush after drinking alcohol
AG	Likely to flush after drinking alcohol
<b>You</b> GG	<b>Unlikely to flush after drinking alcohol</b>

[See the percentage of customers with these results](#)

### Drinking, smoking, and health

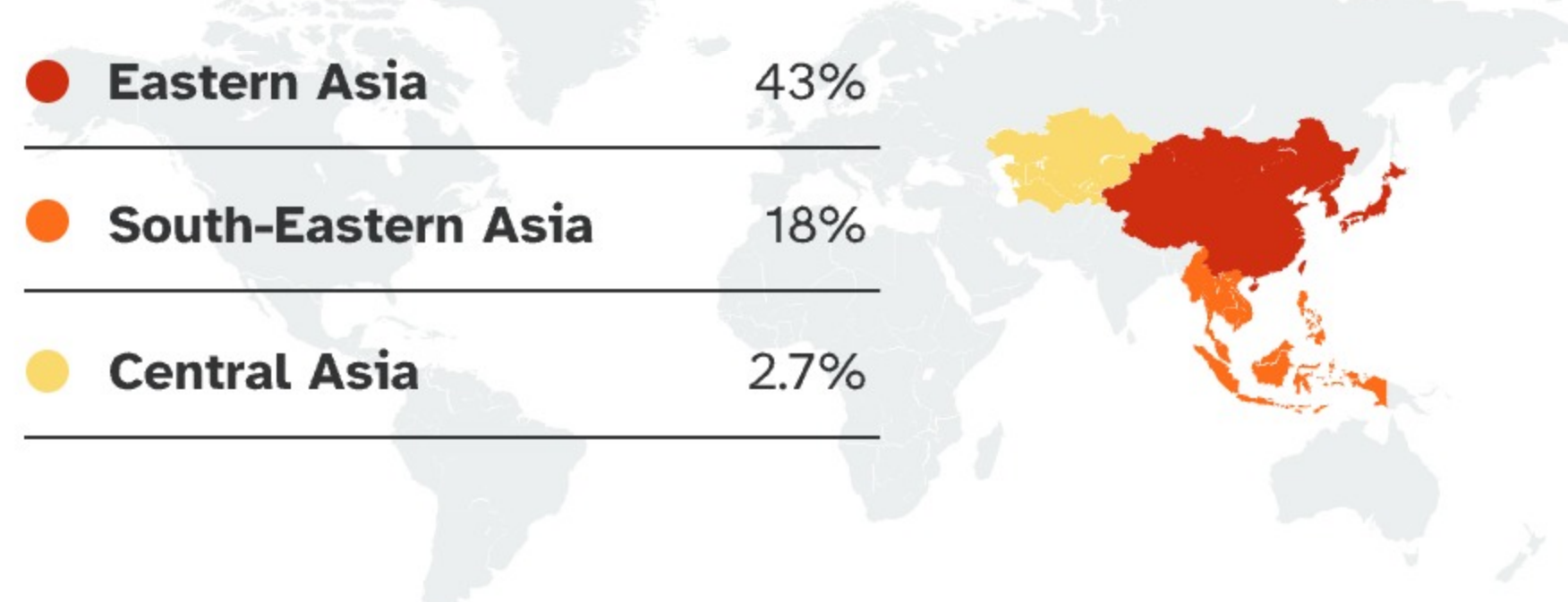
For people with the alcohol flush variant in this report, drinking alcohol carries additional health risks because their bodies can't break down the toxic substance acetaldehyde normally. Acetaldehyde is also one of many toxic substances in cigarette smoke. Just like with alcohol, when people with the alcohol flush variant smoke, acetaldehyde builds up in their system. That means it's especially unhealthy for them to smoke, too.



### The role of ancient human migration

Scientists believe that the variant in this report first appeared in ancient China due to a random genetic mutation, and spread to neighboring regions as people migrated. It's very rare for people who don't have East Asian ancestry to carry the variant, though it does happen. For example, some Iranian individuals have the alcohol flush variant, possibly because millennia ago, traders traveling along the Silk Road brought the variant from China to the Middle East.

### Where is the alcohol flush variant most common?



### What else affects the alcohol flush reaction?

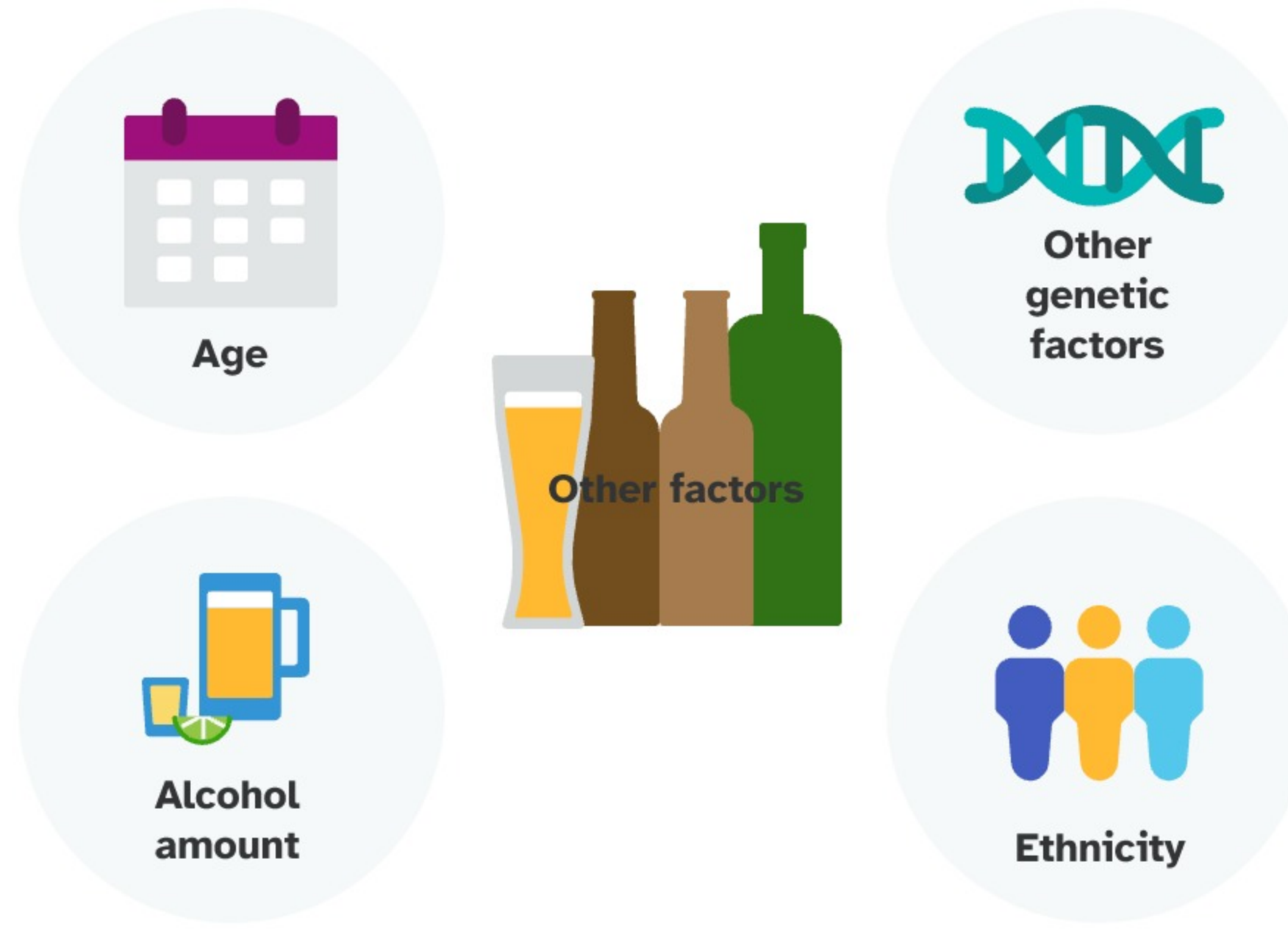
Besides the alcohol flush variant in this report, other factors can affect the alcohol flush reaction:

**Age:** Some people with the alcohol flush variant start out flushing when they first begin drinking alcohol, and flush less as they get older. But heavy alcohol consumption still carries health risks for them.

**Other genetic variants:** Some evidence suggests that variants in other genes, including one called ADH1B, might also affect how people respond to alcohol.

**Alcohol amount:** For people with the alcohol flush variant in this report, drinking even one beer, one glass of wine, or one cocktail is enough to cause the alcohol flush reaction. But even for people without this variant, drinking more than that may cause a little flushing.

**Ethnicity:** The alcohol flush variant covered in this report is found mostly in people with East Asian ancestry.



**This report does not diagnose any health conditions or provide medical advice.** Consult with a healthcare professional before making any major lifestyle changes or if you have any other concerns about your results.

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# Alcohol Flush Reaction

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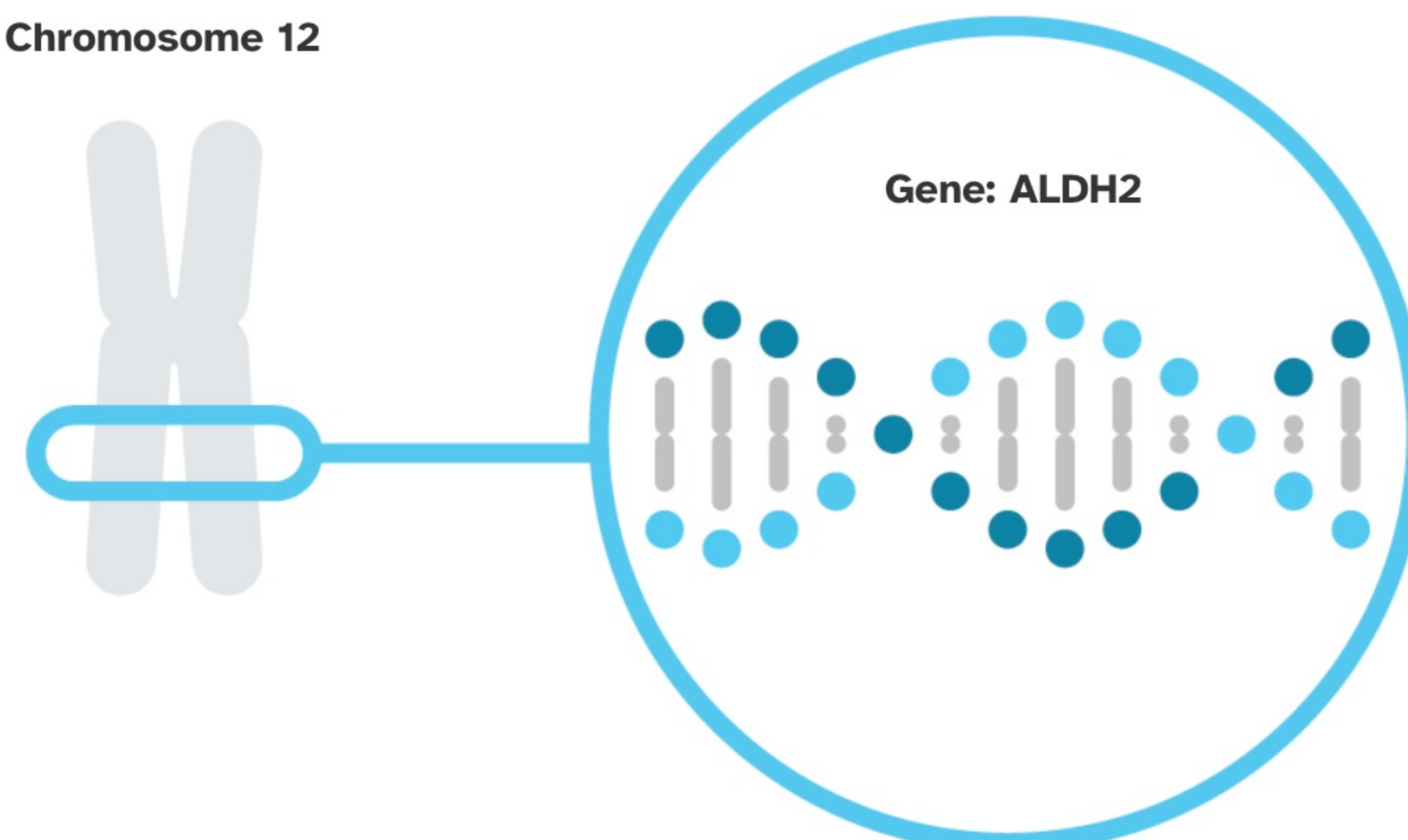
[Overview](#)
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A variant in the ALDH2 gene causes an alcohol flush reaction.

**ALDH2**


The ALDH2 gene contains instructions for making an enzyme called aldehyde dehydrogenase. This enzyme breaks down acetaldehyde, a harmful byproduct of alcohol metabolism.

Read more at [Genetics Home Reference](#)

**Chromosome 12**


You have two copies of the G variant.

[Variants Detected](#)
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Marker Tested	Your Genotype*	Additional Information
<b>ALDH2*2</b> Gene: ALDH2 Marker: <b>rs671</b>	<b>G</b> Typical copy from one of your parents 	<b>G</b> Typical copy from your other parent <ul style="list-style-type: none"> <li>✓ <b>Biological explanation</b></li> <li>✓ <b>Typical vs. variant DNA sequence(s)</b></li> <li>✓ <b>Percent of 23andMe customers with variant</b></li> <li>✓ <b>References [ 2, 3, 6 ]   ClinVar<sup>†</sup></b></li> </ul>

\*This test cannot distinguish which copy you received from which parent. This test also cannot determine whether multiple variants, if detected, were inherited from only one parent or from both parents. This may impact how these variants are passed down.

23andMe always reports genotypes based on the 'positive' strand of the human genome reference sequence (build 37). Other sources sometimes report genotypes using the opposite strand.

## References

- Brooks PJ et al. (2009). "The alcohol flushing response: an unrecognized risk factor for esophageal cancer from alcohol consumption." *PLoS Med.* 6(3):e50. <sup>†</sup>
- Crabb DW et al. (1989). "Genotypes for aldehyde dehydrogenase deficiency and alcohol sensitivity. The inactive ALDH2(2) allele is dominant." *J Clin Invest.* 83(1):314-6. <sup>†</sup>
- Kim JS et al. (2005). "Association of ALDH2 polymorphism with sensitivity to acetaldehyde-induced micronuclei and facial flushing after alcohol intake." *Toxicology.* 210(2-3):169-74. <sup>†</sup>
- Li H et al. (2009). "Refined geographic distribution of the oriental ALDH2\*504Lys (nee 487Lys) variant." *Ann Hum Genet.* 73(Pt 3):335-45. <sup>†</sup>
- Luczak SE et al. (2011). "ALDH2 and ADH1B interactions in retrospective reports of low-dose reactions and initial sensitivity to alcohol in Asian American college students." *Alcohol Clin Exp Res.* 35(7):1238-1245. <sup>†</sup>
- Peng GS et al. (2002). "Alcohol sensitivity in Taiwanese men with different alcohol and aldehyde dehydrogenase genotypes." *J Formos Med Assoc.* 101(11):769-74. <sup>†</sup>
- Tanaka F et al. (2010). "Strong interaction between the effects of alcohol consumption and smoking on oesophageal squamous cell carcinoma among individuals with ADH1B and/or ALDH2 risk alleles." *Gut.* 59(11):1457-64. <sup>†</sup>
- Yokoyama T et al. (2003). "Alcohol flushing, alcohol and aldehyde dehydrogenase genotypes, and risk for esophageal squamous cell carcinoma in Japanese men." *Cancer Epidemiol Biomarkers Prev.* 12(11 Pt 1):1227-33. <sup>†</sup>

## Change Log

Your report may occasionally be updated based on new information. This Change Log describes updates and revisions to this report.

Date	Change
<b>May 4, 2017</b>	Alcohol Flush Reaction report updated with revised content and design.
<b>Feb. 18, 2016</b>	Due to improvements in data analysis, some customers who previously received a "Not Determined" result for this report may see an updated result.
<b>Oct. 21, 2015</b>	Alcohol Flush Reaction report created.



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