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# Ethnicity Explained:

## Percentages, Discrepancies, Updates, and More

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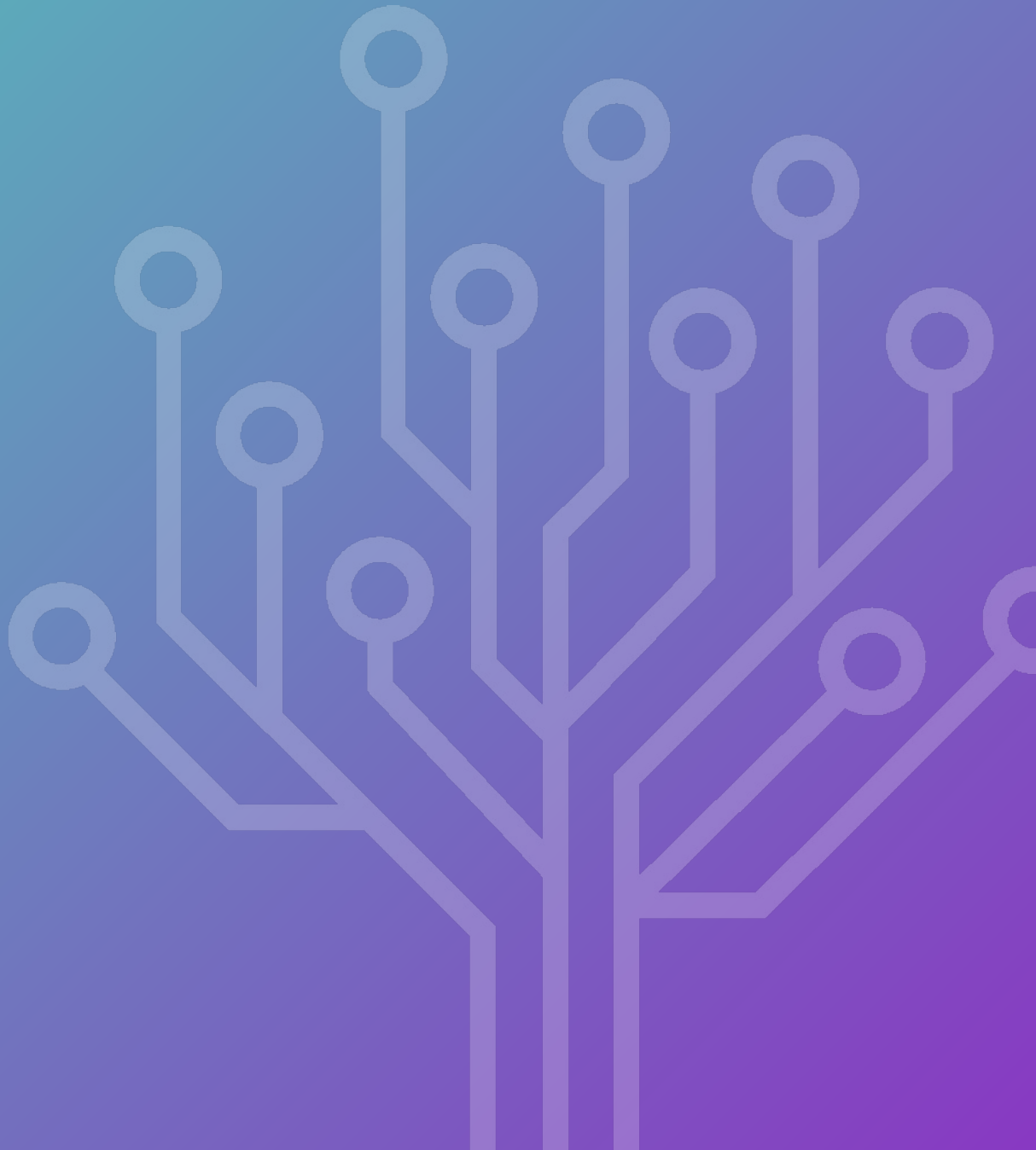


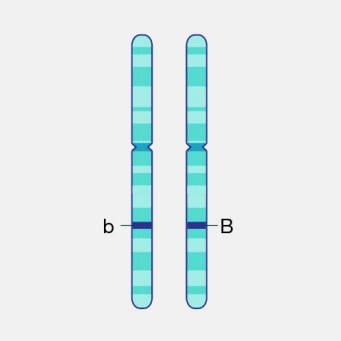
# Overview

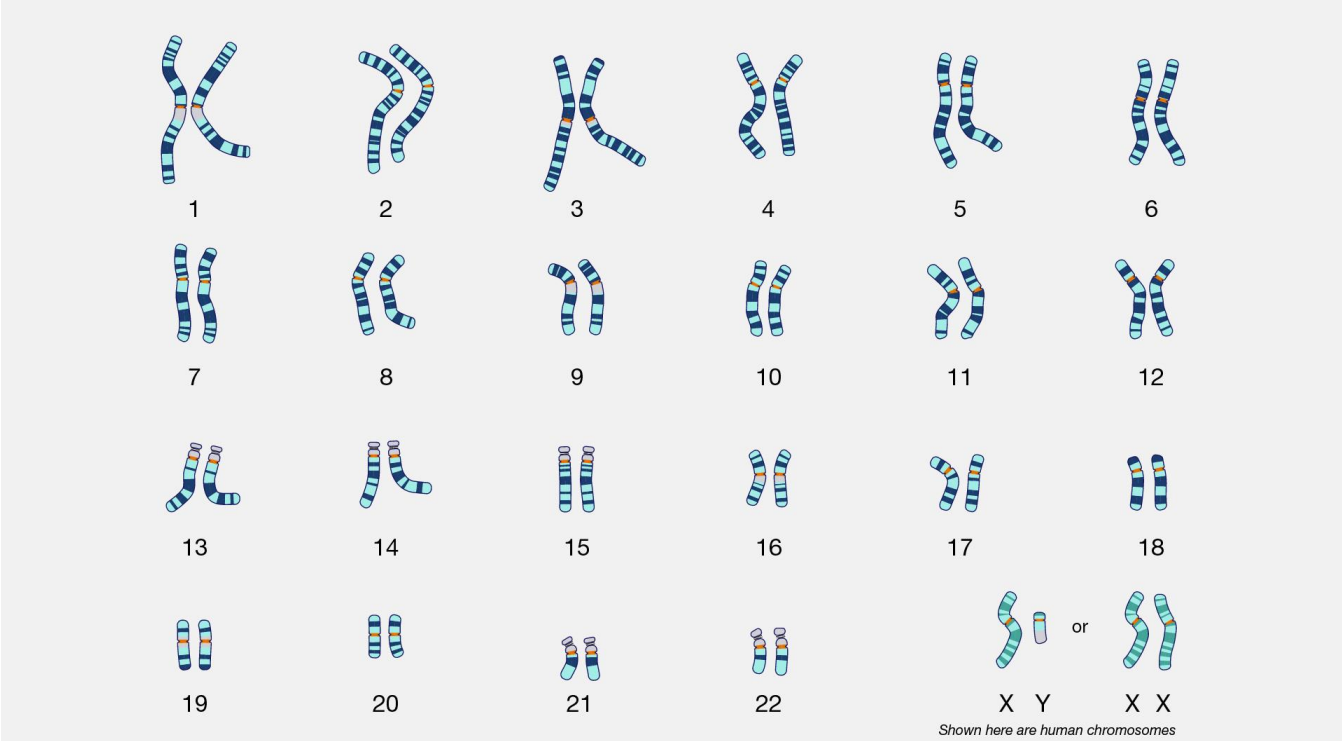
- Basics of Inheritance
    - Genetic inheritance
    - Recombination
- How ethnicity is decided
    - Reference populations
    - DNA test updates
- Discrepancies in results
    - Unexpected country
    - Differing results from siblings
- What these results mean for you

# Genetic Inheritance

Humans have 23 pairs of chromosomes, 22 of which are autosomes. The 23rd pair is sex chromosomes which determine whether one is male (XY) or female (XX).

Genes are located on each chromosome. Genes specify certain traits such as height or blood type. Everyone has two variations of each gene, called alleles. Each parent passes on one of their alleles, so their child also has two alleles.




Courtesy: National Human Genome Research Institute



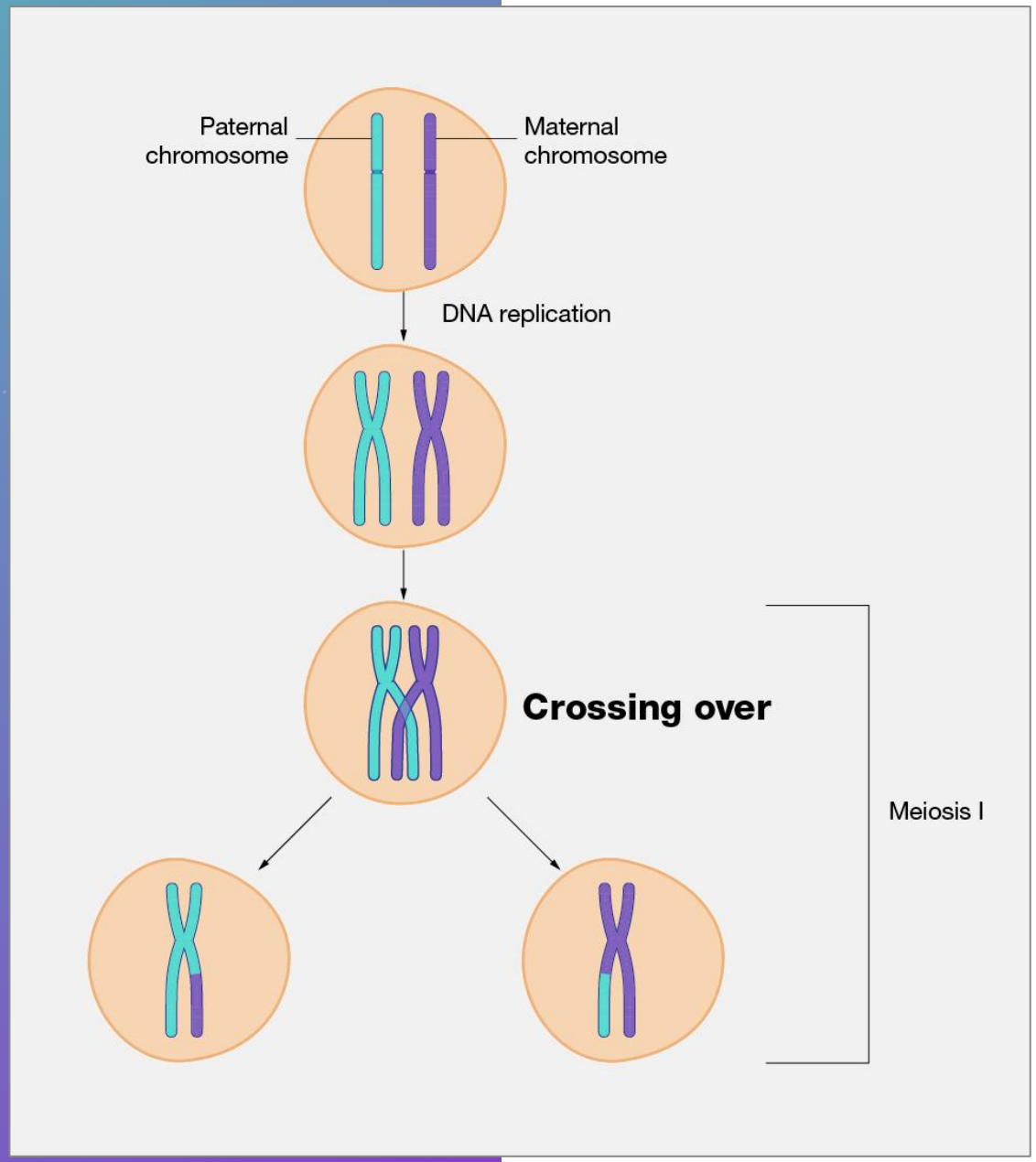
https://www.genome.gov/genetics-glossary/Allele
https://www.genome.gov/genetics-glossary/Karyotype

# Recombination

## or Crossing Over

During sexual reproduction, each chromosome replicates to form sister chromatids. The sister chromatids cross over and exchange alleles which creates genetic diversity.

The maternal and paternal chromosomes separate into different cells in Meiosis I. Then the sister chromatids separate into different daughter cells in Meiosis II (not pictured). Each of the final four daughter cells have a unique chromosome with alleles from both mom and dad.




Courtesy: National Human Genome Research Institute
https://www.genome.gov/genetics-glossary/Crossing-Over

# Reference Populations

- Testing companies create reference populations by testing people with long family histories in certain parts of the world.
- Your DNA is compared to the reference populations and is assigned to regions it best matches.
- You can expect your ethnicity results to update as testing companies get more data and as their scientific processes improve.



https://www.familysearch.org/en/blog/traditional-german-clothing

# Slovakia

- Early 1900s: Austro-Hungarian Empire
- 1918: Czechoslovakia
- 1939: Slovak State
- 1944-1945: Germany Influence
- 1945: Czechoslovakia
- 1948: USSR Influence
- 1993: Slovakia



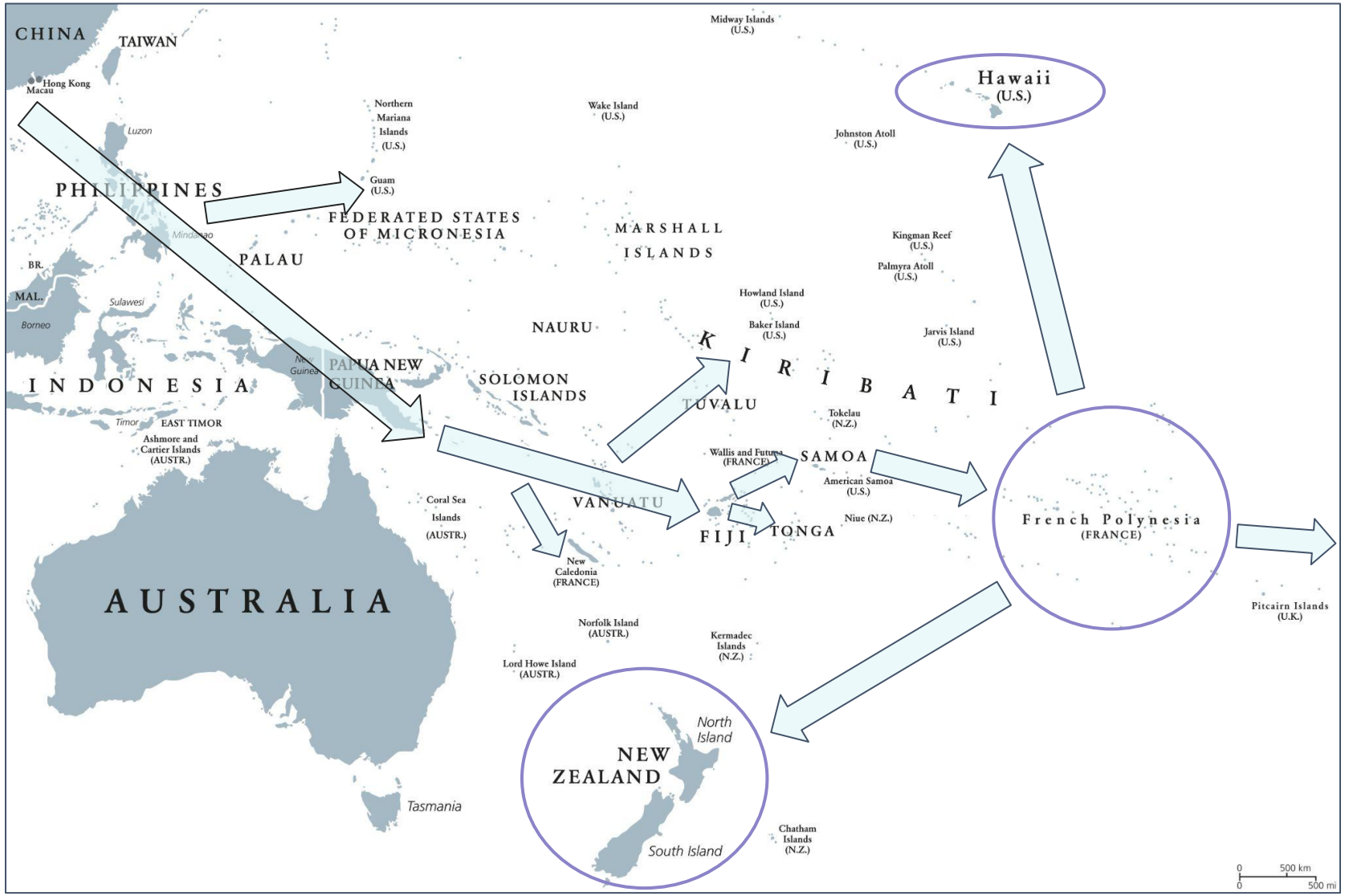
https://slovakia.travel/en/about-slovakia/history
https://www.britannica.com/topic/Czechoslovak-history/National-awakening-and-the-rise-of-constitutionalism

“

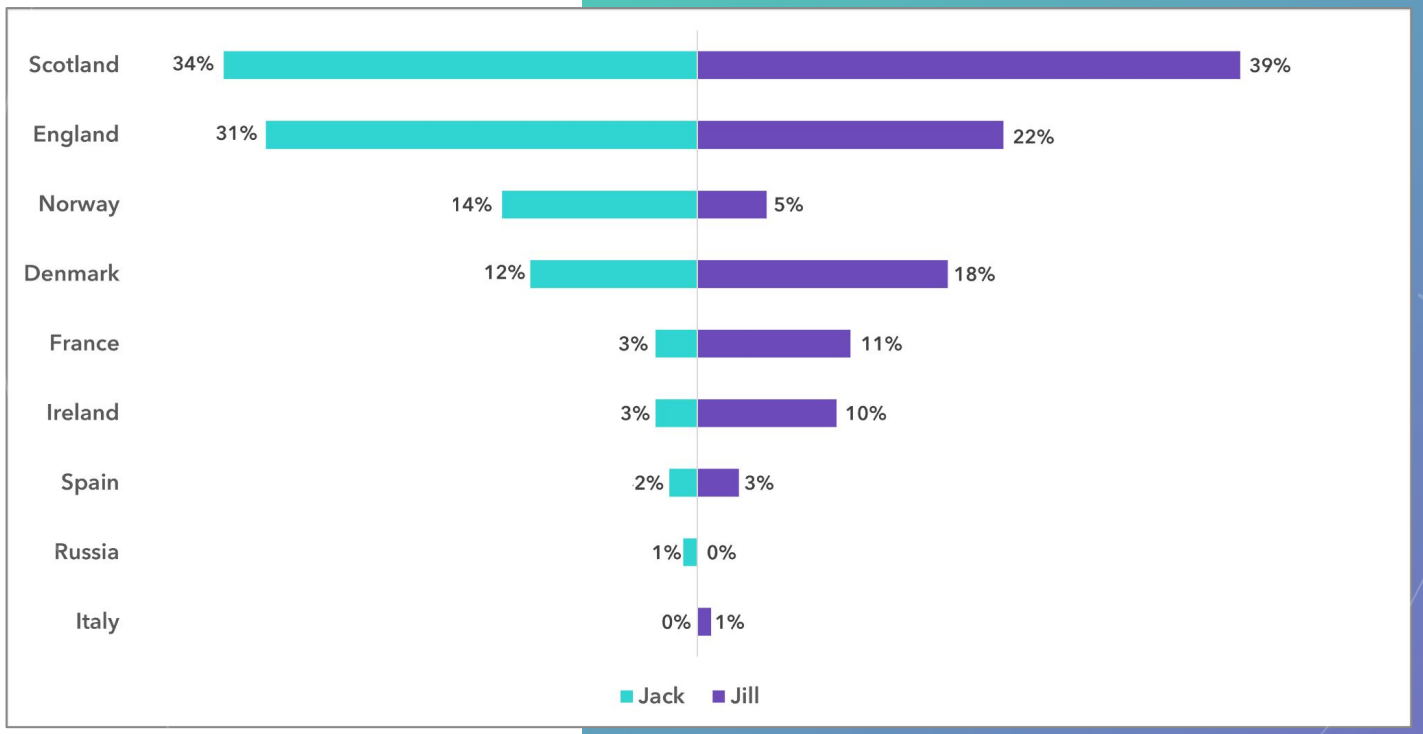
Ancestry Composition populations are defined by genetically similar groups of people, not by the political borders of countries. In some cases, your ancestry may highlight the differences between population history and political history. For example, if you have ancestry from a part of France that is very close to the border with Spain, your DNA may be classified as Spanish & Portuguese instead of French & German.

23andMe

https://customercare.23andme.com/hc/en-us/articles/115004349807-Understanding-Your-Ancestry-Composition-Results




https://nzhistory.govt.nz/culture/encounters/polynesian-voyaging
https://support.ancestry.com/s/article/AncestryDNA-results-for-Hawaii-and-New-Zealand-Maori?language=en_US




# Siblings

- Because of recombination, siblings don't inherit the same 50% of DNA from each parent.
- One sibling may inherit more DNA from a specific ancestor than the other sibling.
- Autosomal DNA is only useful about 5 or 6 generations back.

Importantly, having this region in your ethnicity results does not prove or disprove whether you belong to this ethnic group. Identifying with or being a member of an ethnic or cultural group involves much more than genetics… It can also be a matter of choices, upbringing, family history, tradition, law, and many other factors.

Ancestry
https://www.ancestry.com/c/dna/ancestry-dna-ethnicity-estimate-update

# Takeaways

- We have 22 autosomal chromosomes which specify traits passed down.
- Chromosomes cross over and recombine which creates genetic variation.
- Testing companies create reference populations by testing people with long family histories in certain areas.
- Your DNA is compared to the reference populations and assigned to the closest matching region.
- Ethnicity results update as science improves and as more people are tested.
- You may see an unexpected region in your results due to changing of borders and migration over time.
- Certain regions are not yet available. In these cases, your DNA is assigned to the closest matching region, usually a neighboring region.
- Because of recombination, siblings are different and will have different DNA results.
- Ethnicity results are an estimate and are there to supplement family history research.

# Contact Information

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# Additional Sources

- https://customercare.23andme.com/hc/en-us/articles/115004349807-Understanding-Your-Ancestry-Composition-Results
- https://www.myheritage.com/dna/ethnicity-estimate?tr_id=m_9od7puic25_jp67url3v6
- https://www.ancestrycdn.com/support/us/2023/09/Ethnicity2023whitepaper.pdf
- https://www.ancestry.com/c/dna/ancestry-dna-ethnicity-estimate-update
- https://help.familytreedna.com/hc/en-us/articles/4411203169679-Our-Autosomal-DNA-Test-Family-Finder-#h_01HF79NWVJCJQS8B2FPWMRD1JQ
- https://www.thetech.org/ask-a-geneticist/articles/2015/same-parents-different-ancestry/#:~:text=DNA%20isn't%20passed%20down,how%20much%20DNA%20siblings%20share


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