

Toe Length Ratio

Overview Scientific Details



Ancient footprints

Footprints left behind by some of our early human ancestors, including Australopithecus afarensis, show a longer second toe.



Jamie, the combination of your genetics and other factors makes you **more likely to have a longer big toe.**

Of 23andMe research participants with results like yours:



→ Which is longer, your big toe or your second toe?

How did we calculate your result?

We added up the effect of your genetic variants at 35 places in your DNA (genetic markers) plus the effect of other factors, including your age and sex.

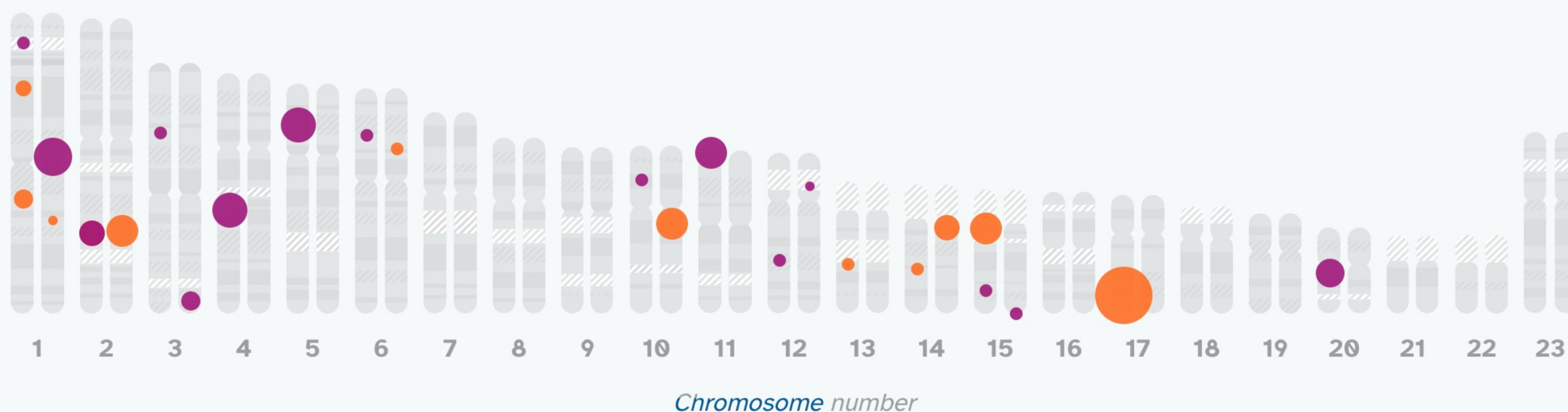
Total effect of your genetics + other factors



YOUR GENETICS	OTHER FACTORS
● longer big toe	●
● longer second toe	●

Breakdown of your genetics

The bigger the circle, the stronger the effect your variants have on your overall chances.



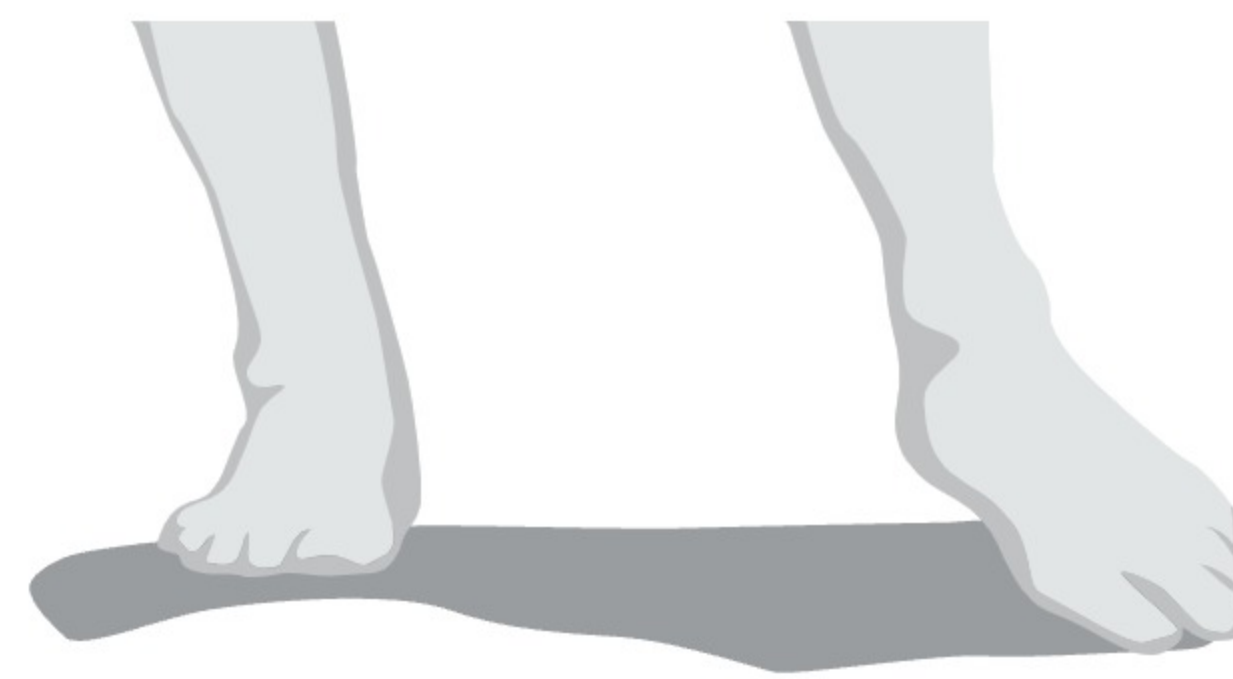
At 12 of the genetic markers we looked at you have variants that make you more likely to have a longer big toe, and at 15 you have variants that make you more likely to have a longer second toe. At 8 of the markers that we looked at, you have variants with no effect either way (not shown).

[See Scientific Details](#)

More about toe length ratio

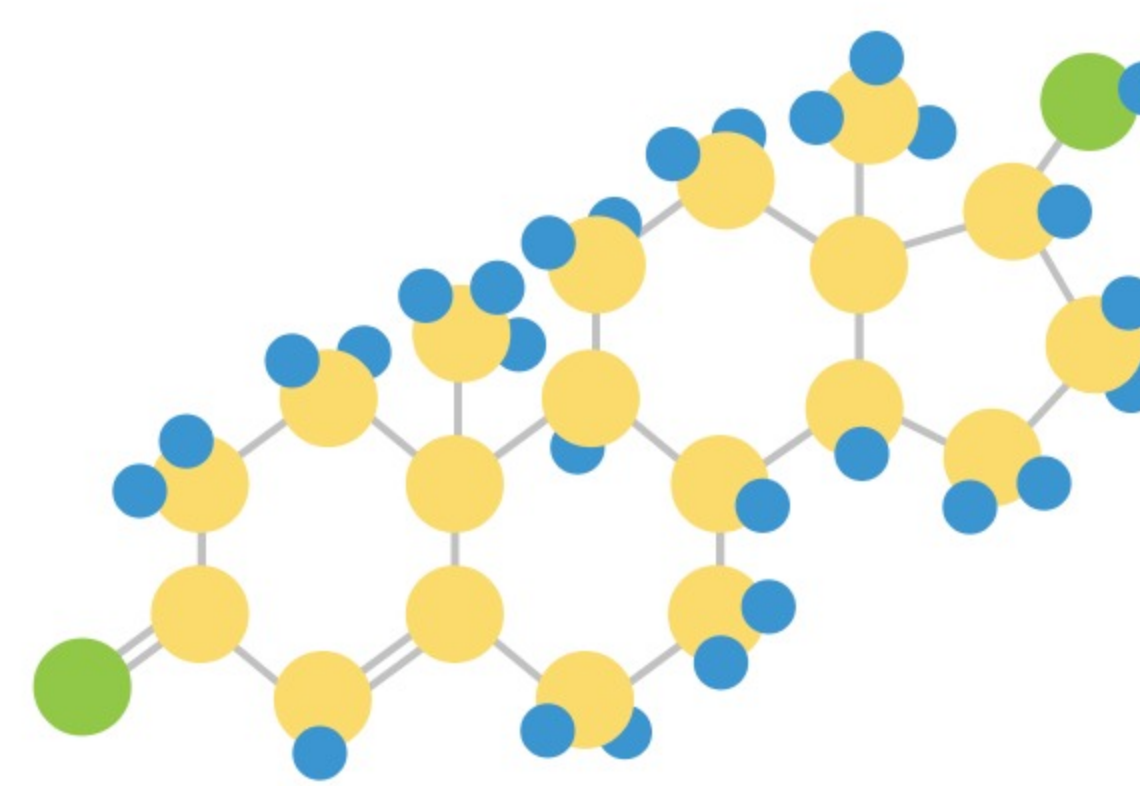
Skeleton bones and mummy feet, oh my!

In 1864, noticing that many Roman statues had longer second toes, a British anthropologist named James Park Harrison was inspired to perform one of the earliest studies on human toe length. Harrison found that toe length ratio varied from country to country. He even measured the toes of old skeletons displayed in museums, and at least one Egyptian mummy.



Fingers, toes and hormones

Like finger length, toe length may be influenced by the balance of testosterone and estrogen present in the womb during early pregnancy. Fingers and toes form at the same time during pregnancy, and both finger and toe length ratios may tend to differ between males and females. Because of this, some scientists study how finger and toe lengths relate to hormone-linked diseases and behaviors later in life.



Keep exploring your Traits results.



Contribute

Join the research effort and contribute to new discoveries.



Compare

Compare your results to your family and friends.



Discuss

Join the discussion with other 23andMe customers interested in Traits.

Did you find this interesting?

Yes

No



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Toe Length Ratio

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We use one of two different methods to calculate your trait results.

Statistical Model

Most traits are influenced by many different factors, including genetics, lifestyle, and environment. Usually, a statistical model using many factors provides better predictions than looking at single factors by themselves. To develop our models, we first identify genetic markers associated with a trait using data from tens of thousands of 23andMe customers who have consented to research. Then, we use statistical methods to generate a "score" for that trait using your genotype at the relevant genetic markers as well as your age and sex. We predict your likelihood of having different versions of the trait based on the survey responses of 23andMe customers with similar scores. These predictions apply best to customers who are of the same ethnicity as the people whose data contributed to the model. The accuracy of these predictions varies from trait to trait.

[Read more about our statistical methodology](#)

Curated Model

For some traits, just a few genetic markers can strongly predict whether a person will have a particular version of the trait. For curated models, we first evaluate published scientific studies to identify genetic markers with well-established associations with the trait. Then, we look at genetic and survey data from tens of thousands of 23andMe customers who have consented to research. We estimate your likelihood of having different versions of the trait based on survey responses from customers who are genetically similar to you at those markers. These results apply best to customers who are of the same ethnicity as the people whose data contributed to the predictions.

About your Toe Length Ratio result

Your result for this trait was calculated using a **statistical model**.

About the Toe Length Ratio model

Created based on customers of ethnicity: **European**

Number of customers used to create: **60,000**

Number of markers: **35**

Area Under Curve (AUC): **0.585**

Non-genetic factors: **Age, Sex**

Bin #	Big toe longer	Second toe longer
1	73.47%	26.53%
2	70.53%	29.47%
3	66.98%	33.02%
4	65.42%	34.58%
5	63.19%	36.81%
6	61.72%	38.28%
7	61.05%	38.95%
8	60.61%	39.39%
9	57.45%	42.55%
10	57.73%	42.27%
11	56.29%	43.71%
12	55.49%	44.51%
13	53.44%	46.56%
JW 14	52.71%	47.29%
15	51.48%	48.52%
16	48.64%	51.36%
17	48.39%	51.61%
18	47.47%	52.53%
19	44.93%	55.07%
20	39.49%	60.51%
Overall European	56.83%	43.17%

References

- Harrison JP. (1884). "On the relative length of the first three toes of the human foot." *The Journal of the Anthropological Institute of Great Britain and Ireland*. 13:258-69. ↗
- Harrison MA. (2010). "An exploratory study of the relationship between second toe length and androgen-linked behaviors." *Journal of Social, Evolutionary, and Cultural Psychology*. 4(4):241-253. ↗
- Voracek M and Dressler SG. (2010). "Relationships of toe-length ratios to finger-length ratios, foot preference, and wearing of toe rings." *Percept Mot Skills*. 110(1):33-47. ↗
- White TD et al. (1987). "Hominid footprints at Laetoli: facts and interpretations." *Am J Phys Anthropol*. 72(4):485-514. ↗

Change Log

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

Date	Change
Dec. 15, 2017	Toe Length Ratio report updated with revised content and design.
June 22, 2017	Toe Length Ratio report separated from the Physical Characteristics report.
Oct. 21, 2015	Physical Characteristics report created.



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