Communication Strategies in a Direct -to-Consumer Context

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23andMe

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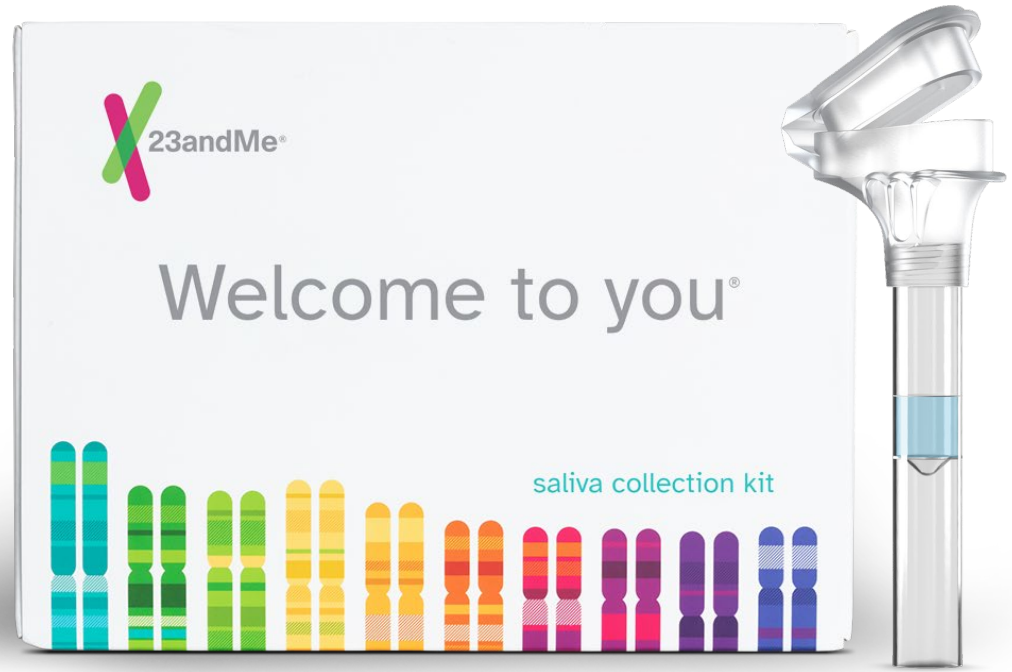
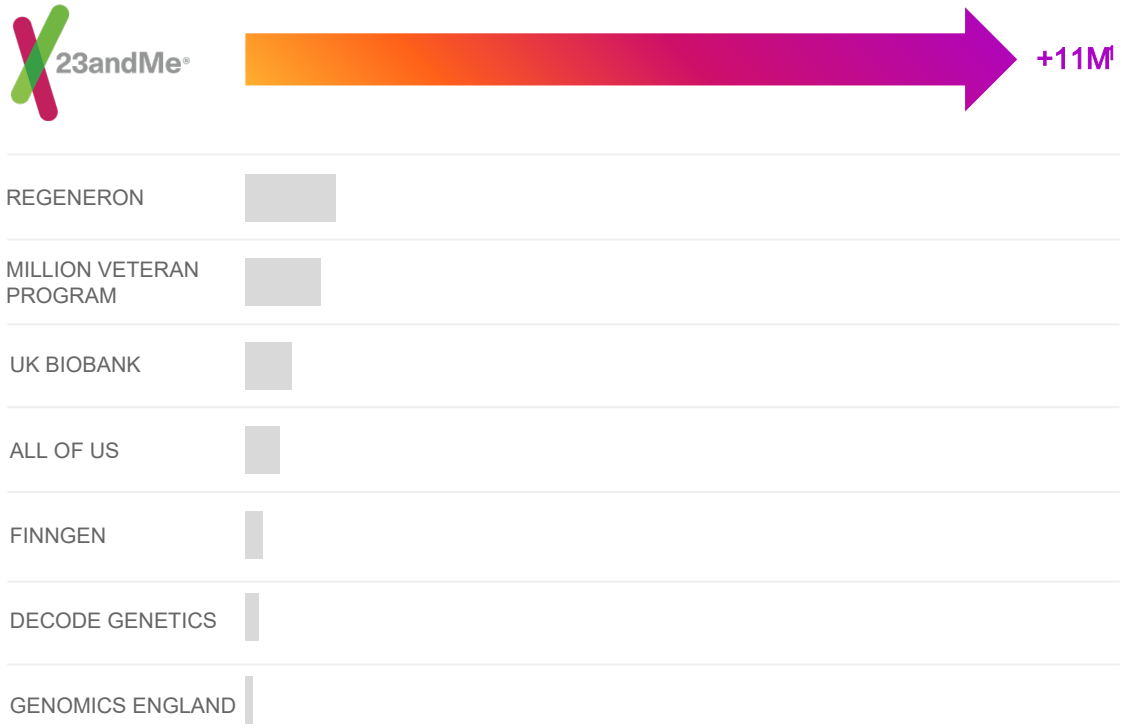
Our Mission is to Help People and Benefit from the Access, Understand Human Genome

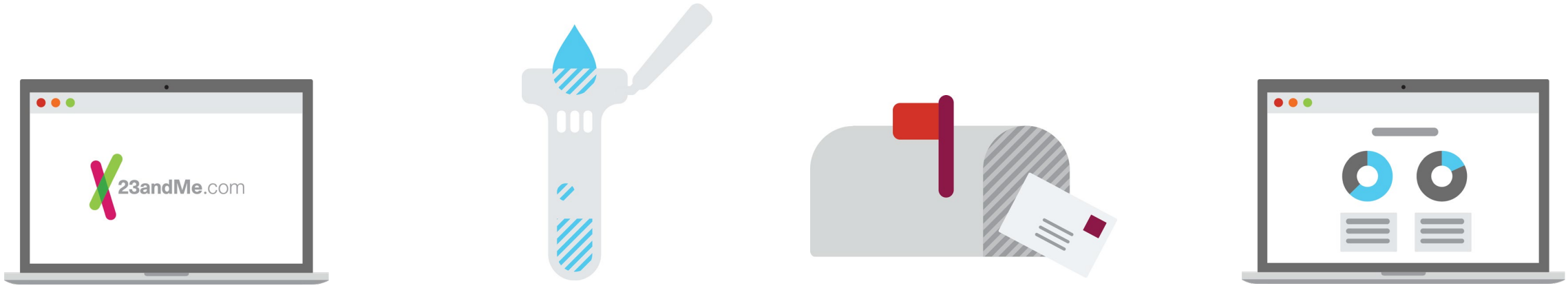




Size and scale of 23andMe enables rapid, novel discoveries

[1] 8.5M of 23andMe's genotyped customers consented to research. Participant counts sourced from company websites (January 19, 2021). This comparison was conducted against databases that collect genetic information (genotypes, exomes, or genomes) on research participants and have disclosed or published their consented research participant numbers, as of December 31, 2020.

How it works



Order Spit Send Discover

23andMe Health + Ancestry Service is the first DTC service to include genetic health risk reports authorized by the FDA

10+

Health Predispositions*

40+

Carrier Status*

30+

Traits

5+

Wellness

2,000 +

Ancestry Regions

*The 23andMe PGS test includes health predisposition and carrier status reports. Health predisposition reports include both reports that meet FDA requirements for genetic health risks and the 23andMe Type 2 Diabetes health predisposition report which is based on 23andMe research and has not been reviewed by the FDA. The test uses qualitative genotyping to detect select clinically relevant variants in the genomic DNA of adults from saliva for the purpose of reporting and interpreting genetic health risks and reporting carrier status. It is not intended to diagnose any disease. Your ethnicity may affect the relevance of each report and how your genetic health risk results are interpreted. Each genetic health risk report describes if a person has variants associated with a higher risk of developing a disease, but does not describe a person's overall risk of developing the disease. The test is not intended to tell you anything about your current state of health, or to be used to make medical decisions, including whether or not you should take a medication, how much of a medication you should take, or determine any treatment. Our carrier status reports can be used to determine carrier status, but cannot determine if you have two copies of any genetic variant. These carrier reports are not intended to tell you anything about your risk for developing a disease in the future, the health of your fetus, or your newborn child's risk of developing a particular disease later in life. For certain conditions, we provide a single report that includes information on both carrier status and genetic health risk. For important information and limitations regarding each genetic health risk and carrier status report, visit 23andme.com/test-info

Our Health Service

The First and Only Multi-Disease DTC Genetic Service That Includes FDA-Authorized Reports and Provides Personalized Genetic Insights and Tools

8 FDA Authorizations/ Clearances

Health Predispositions

14

Including:
- Type 2 Diabetes (Powered by 23andMe Research)
- *MUTYH*-Associated Polyposis
- *BRCA1/BRCA2* (Selected Variants)
- Familial hypercholesterolemia (Selected Variants)
- Celiac Disease
- Uterine Fibroids (Powered by 23andMe Research)
- Chronic Kidney Disease
- G6PD Deficiency

Wellness [1]

8

Including:
- Genetic Weight
- Muscle Composition
- Alcohol Flush Reaction
- Saturated Fat and Weight
- Sleep Movement

Carrier Status

40+

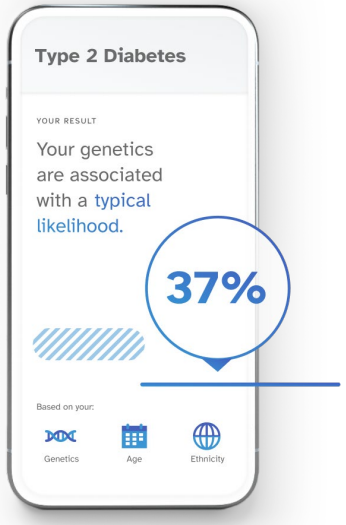
Including:
- Tay-Sachs Disease
- Cystic Fibrosis
- Sickle Cell Anemia
- Familial Hyperinsulinism (*ABCC8*-Related)
- Glycogen Storage Disease (Type 1a)

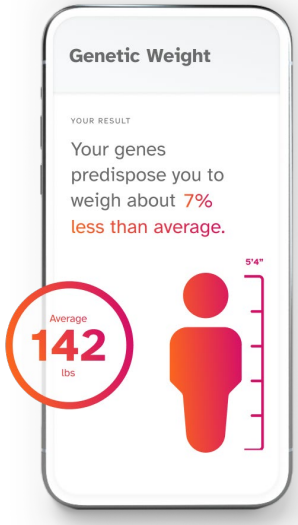
Pharmacogenetics

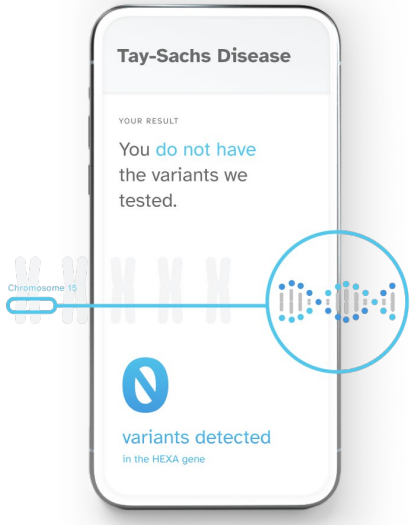
3

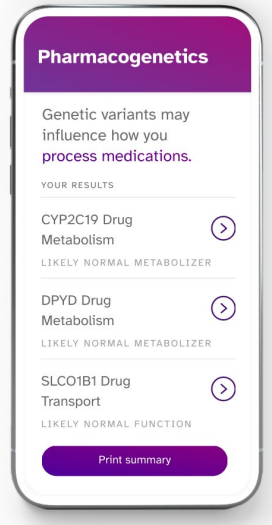
23andMe+

Including:
- *CYP2C19* Drug Metabolism
- *SLCO1B1* Drug Transport
- *DPYD* Drug Metabolism









[1] Wellness information does not require FDA Authorization.

A Meaningful, Engaging, (and Fun) Experience

Strong Engagement and Trust Drive Longitudinal Data Collection

~80%
customers consent to research

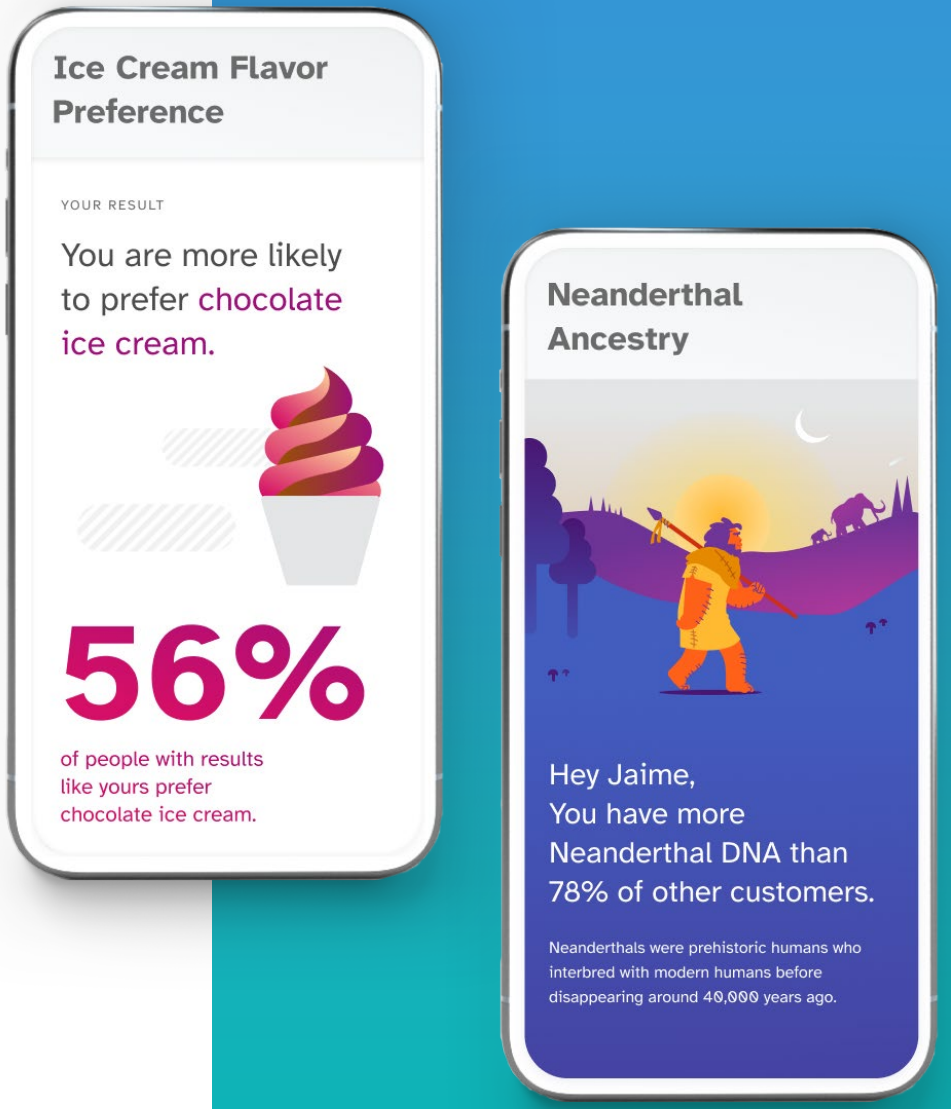
30K
research surveys completed daily

4B+
phenotypic data points

180+
published research papers

7M
genotyped customers logged-in in 2020

60%
pre-2015 customers logged-in during 2020



The Path to FDA -Authorized DTC Genetic Results Reports

User Comprehension Studies

- Many studies conducted
  - We consistently met ≥90% comprehension of each concept to demonstrate that the education module and test reports are adequate for over-the-counter use
  - Robust user comprehension study reports used for each FDA authorization
    - Recessive carrier status, Genetic Health Risk (i.e *BRCA)* Pharmacogenetic reports
    - Additional studies on other key concepts (i.e. X-linked inheritance)
    - Study to show reports viewed on mobile app perform similarly to reports viewed on desktop/laptop
- Iterative development and user testing process
  - Cycled between quantitative surveys and qualitative studies
    - *Quantitative studies and data may not be necessary if not required to show a certain level of comprehension to a regulatory agency*

Take Home Messages from User Comprehension Studies

- Focus on 3-5 main concepts that are critical for a person to understand about their result
- Most people don’t read, and if they do, not that much!
  - Resist the urge to put too much into the report - Keep it short and succinct.
- Repeat key concepts
- Information hierarchy and design are important
  - Layering of concepts: “Primary” and “secondary”
  - “Primary” in top layer; “secondary” in next layer, behind a click
  - Include white space and visuals
- Don’t make it cold like a typical lab report

Primary Communication Objectives

- The **primary communication objectives** of our labeling are drawn from a predefined list of **major communication messages**
  - For Pharmacogenetic Reports these are the comprehension concepts
    - Purpose of the test
    - Test result and meaning
    - Limitations of variant coverage
    - Limitations of medication coverage
    - The role of non-genetic factors on drug response
    - Treatment adherence
    - Appropriate follow-up action

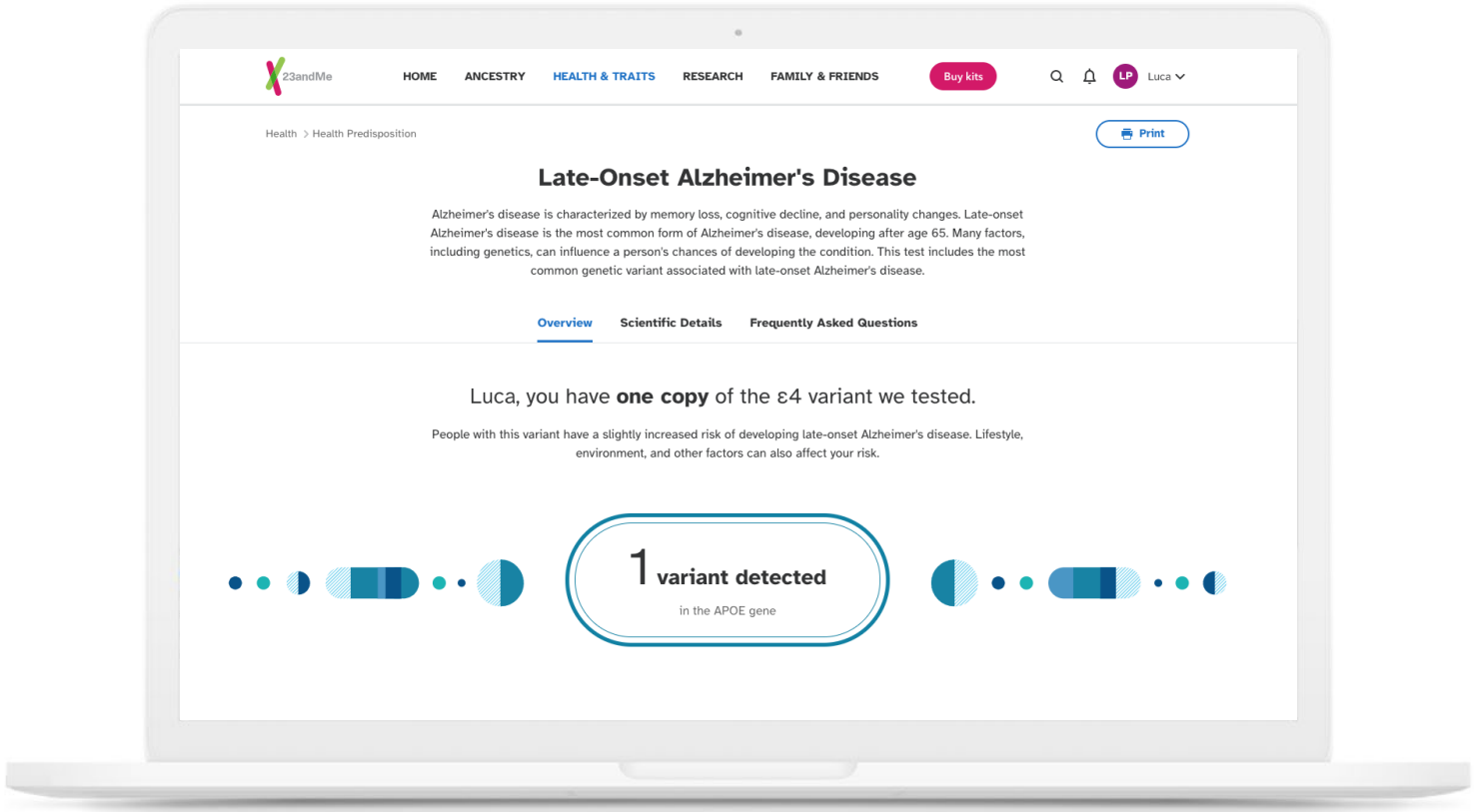
- *Treatment adherence* and *Limitations of medication coverage* are a message unique to Pharmacogenetic Reports
- All other messages were also tested for Carrier Status and Genetic Health Risk reports, and leverage these already developed templated labeling approaches

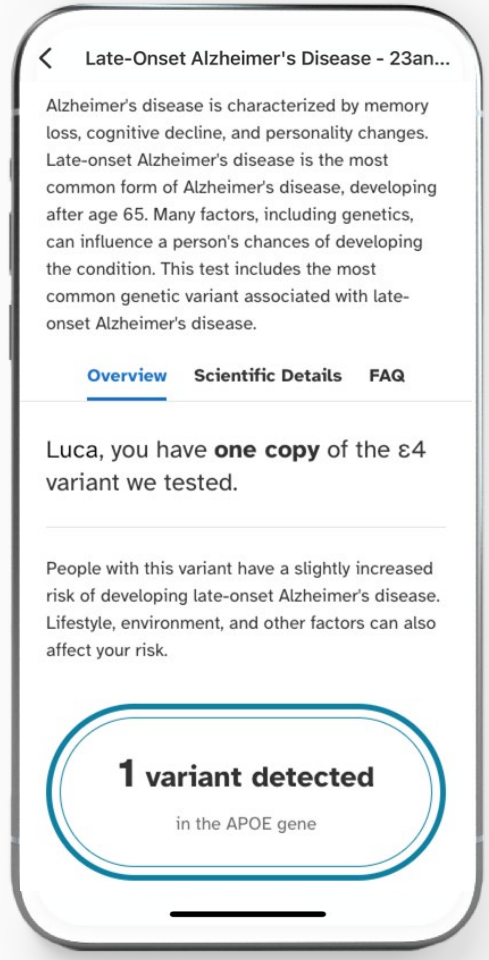
Design and Usability

“The colors and illustrations make the report much easier to read and comprehend than if it were just a long readout of technical jargon. My daughter actually came and asked me about something completely unrelated to the survey while I was reading through "Jamie's results", and the little icons helped me quickly and easily find exactly where I left off.”

“I sometimes have difficulty reading and maintaining focus on lengthy chunks of text, so the layout of the report was extremely helpful for me to understand what I was reading. I wish all of my lab results were this easy to skim and interpret.”

Sample Genetic Health Risk Report





Sample Medication Insight Report

Clopidogrel (Plavix®)

Clopidogrel (Plavix®) is primarily used to prevent harmful blood clots, in order to reduce the risk for heart attack and stroke.

Jamie, based on your genetic result, clopidogrel (Plavix®) is likely to be less effective for you.

Keep in mind that both genetic and non-genetic factors may influence your response. A healthcare provider considers many factors when choosing an appropriate course of treatment. **Do not use this result to start, stop, or change any course of treatment.** Medications should always be taken as directed.

Learn more about your result

GENE	VARIANT(S) DETECTED	OVERALL FUNCTIONAL EFFECT
CYP2C19	*2 (one copy)	Decreased enzyme function

How does my genetic result affect my ability to process clopidogrel (Plavix®)?

Clopidogrel is a medication primarily used to prevent harmful blood clots, in order to reduce the risk for heart attack and stroke.

Based on your genetic result, you are predicted to be a CYP2C19 intermediate metabolizer, and clopidogrel is likely to be less

Sample Wellness Report

Lactose Intolerance

Almost everyone is born with the ability to digest dairy products. But most people lose that ability as they age, becoming lactose intolerant.

Overview | Scientific Details

Luca, based on your genetics, you are **not likely** to be lactose intolerant.

Your genetic result suggests that you are able to eat or drink dairy without experiencing digestive problems.

Tell us whether you experience lactose intolerance

What you can do

If you do experience indigestion when you consume dairy products, consider speaking with a healthcare professional to determine whether your symptoms may be caused by lactose intolerance or another condition.

Genetics and Lactose Intolerance

What does it mean to be lactose intolerant?

Dairy products like milk, yogurt, and cheese contain a type of sugar called lactose. Although dairy is a staple of many diets, at least 70% of adults worldwide have trouble digesting lactose.

The severity of lactose intolerance varies from person to person — some people can drink a full glass of milk without experiencing indigestion, while other people will feel uncomfortable after just a bite of cheese. Also, some people's personal experience does not match their genetic result. This is because other factors — including your diet, your digestive system, other genetic variants, and other health conditions — can impact whether you experience symptoms of lactose intolerance.

Approximate lactose content per serving

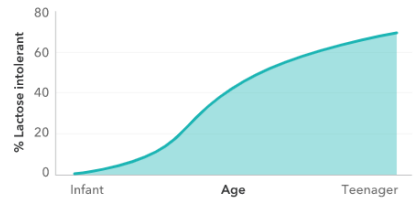
Milk	Yogurt	Butter	Cheesecake
15 g	**6 g**	**< 0.1 g**	**3.4 g**
1 cup	*1/2 cup*	*1 tbsp*	*3.5 oz*

Cheddar Cheese	Ice Cream	Whipped Cream	Cottage Cheese
< 0.1 g	**4 g**	**0.1 g**	**2.3 g**
1 oz	*1/2 cup*	*1 tbsp*	*1/2 cup*

Growing out of milk

Just about everybody is born with the ability to digest lactose, and this allows babies to live and grow by drinking their mothers' milk. But as children grow older and begin to eat different foods, many of them lose that ability. People become lactose intolerant because their bodies stop producing lactase, the enzyme that digests lactose. The ability to continue producing lactase after childhood has evolved multiple times in different populations across the world, whenever a group of people depended on milk and dairy products as important sources of nutrition.

Lactose intolerance increases with age



Can people who are lactose intolerant eat cheese?

Not all cheese is created equal — some kinds of cheese

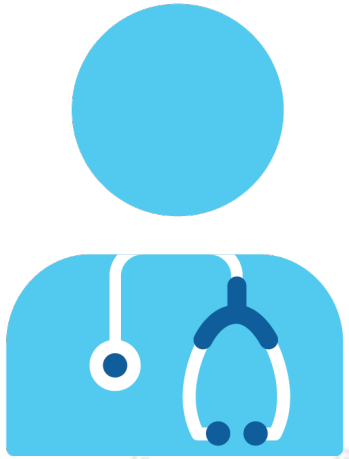
A Recent Customer’s Experience

Jarrod and Ginger

- Jarrod and Ginger, a married couple, join 23andMe with Health+Ancestry kits for Christmas in 2019
- Jarrod has 2 variants for *MUTYH*-associated polyposis
  - Inherited condition that increases the risk for colon cancer
- They'd never heard of it before and when Ginger, a nurse, asked about it at work, no one was familiar with it
- Jarrod took the report to his physician

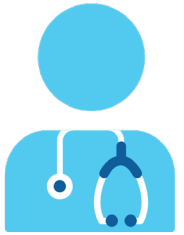
“I just turned 43, I still had a few years to go [before regular screenings], but I thought we should go get it checked out.”

- Jarrod



The path to care and prevention

- Because of the pandemic and an insurance change, it took Jarrod almost a year to see a GI specialist
- Specialist skeptical at first, but decided to order a colonoscopy based on some slight rectal bleeding
- One month later, Jarrod had a colonoscopy and was found to have ~80-100 polyps
- At 6 month follow-up, another ~30-40 polyps were found
- Confirmatory genetic testing ordered and confirmed 23andMe results
- Referred to a geneticist and had video visit, referred to Colorectal Surgeon
- The following month, Jarrod had another upper and lower GI evaluation which revealed 38 polyps
- Jarrod decided to have colon and rectum removed in October 2022



“This test has saved my husband’s future, with myself and our children. So thankful this was found and my 43 year old husband can hopefully have a healthy and long future!”

- Ginger

Looking back, Jarrod doesn’t believe he would have gone in for preventive screening before the routine age of 45-50 unless there were additional symptoms. Given the number of polyps removed in just 18 months, Jarrod’s GI doctor believes that had he waited that long, he most likely would have had progressive cancer by the time he was seen. Because of this experience, Jarrod’s family members, including his brother who has not had cancer, have learned they are carriers but do not have Jarrod’s same 2 variant result. However they’re all aware of the risk profile they fall into and are also now able to share this information with their children when they are older so they can choose to get the necessary testing when the time comes.

Thank you!

Product Science - Shirley Wu

Health R&D - Bertram Koelsch, James Ashenhurst

Regulatory Affairs - Nikki Arora

Communications - Andy Kill


23andMe®