A self-study of my child's genetic risk

Using 23andMe data to get an accurate prediction.

Mad Price Ball
@madprime

(day job @ Open Humans)
Me
My uncles.
Moderate intellectual disability.
My uncles.
Moderate intellectual disability.
X-linked?
My mother. Maybe a carrier?
Brothers not affected.
(That’s good...)
What about me?
Traditional genetic tests: negative.

Inconclusive
\[ P(A \mid B) = \frac{P(B \mid A) \cdot P(A)}{P(B)} \]
\[ p( \text{Mom carrier} \mid \text{unaffected sons} ) = \frac{p( \text{unaffected sons} \mid \text{Mom is carrier} ) \ast p( \text{Mom is carrier} )}{p( \text{unaffected sons} )} = \frac{0.25 \ast 0.5}{0.25 \ast 0.5 + 1.0 \ast 0.5} = 0.2 \]

- \( p(\text{Mom carrier}) = 20\% \)
- \( p(\text{I am carrier}) = 10\% \)
- \( p(\text{son inherits}) = 5\% \)
I realized we had more data.

23andMe.
First, a little about my X chromosomes.
I'm worried about the X from mom.

worried about X from mom

not the one from dad
Mom's chromosome is a mix.
I'm worried about X from grandma.
I'm worried about X from grandma.

(Uncles got X from grandma.)
This chromosome is hypothetical.
I used 23andMe to compare my data to my grandfather.
# Me vs. Maternal Grandfather

<table>
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<th>Comparison</th>
<th>Chrom.</th>
<th>Start Position</th>
<th>End Position</th>
<th>Genetic Distance (cM)</th>
<th>Number of SNPs</th>
<th>Identity</th>
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</table>
Me vs. Maternal Grandfather
Me vs. Maternal Grandfather
This hasn't helped much yet!

still worried.
I compared my brother to my grandfather.
Brother vs. Maternal Grandfather

Safe!
My brother's X vs. Mine shows I'm safe.
My brother's X vs. Mine shows I'm safe.

8,682,950

9,588,255
What I learned
What I learned

I ruled out being a carrier of this hypothetical X-linked disease.
What I learned

Having data about ourselves can matter a lot,
What I learned

Having data about ourselves can matter a lot,
and in unexpected ways.
What I learned

Having data about ourselves can matter a lot, and in unexpected ways.

We might need to compare it to others.
Mad Price Ball

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(Open Humans Foundation, Executive Director)

**Breakout & Office Hours**

**What Are My Data Rights?** Saturday Session 2 (12-1pm)  
**Open Humans Office Hours** Sunday Lunch (1-2pm)