Risk Perception and Medical Utilization: Evidence from the PGen Study

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Question & Background

- How does personal genomic testing (PGT) impact medical risk perceptions and medical utilization?
- The Impact of Personal Genomics (PGen) Study uses genetic test results and longitudinal surveys of new customers of 23andMe and Pathway Genomics

Study Design

Personal genomic testing ordered by 23andMe and Pathway Genomics customers

Informed consent obtained for the PGen Study

Baseline Survey → **Data Collection:** Baseline Perceived Risk, Demographics, Motivations

Return of personal genomic testing results → **Data Collection:** SNP-based Relative Risks

2-3 Week Follow-up Survey

6 Month Follow-up Survey → **Data Collection:** Perceived Risk, Follow-up Medical Appointment / Actions

Diagram Courtesy of Deanna Alexis Carere

Methods

- We analyzed data from 706 23andMe participants
- Participants reported risk perceptions on a 5-point Likert scale for eight conditions at baseline, and 6 months after receiving results
- Using linear regression, we evaluated the impact of PGT test results on risk perception changes (resulting coefficients displayed in bar graphs)
- We used logistic regression to assess how shifts in risk perception are associated with propensity to take make follow-up medical appointments, or undergo a medical exam or procedure related to the PGT results

Baseline Risk Perceptions (5-Point Likert Scale)

	N	Mean	Std. Dev.
Coronary Heart Disease	591	3.0	1.1
Prostate Cancer	260	2.8	0.9
Breast Cancer	323	2.7	1.0
Type II Diabetes	580	2.7	1.2
Alzheimer's Disease	538	2.7	1.0
Colorectal Cancer	615	2.7	1.0
Parkinson's Disease	554	2.4	1.0
Lung Cancer	614	2.3	1.0
Total	**4613**	**2.6**	**1.1**

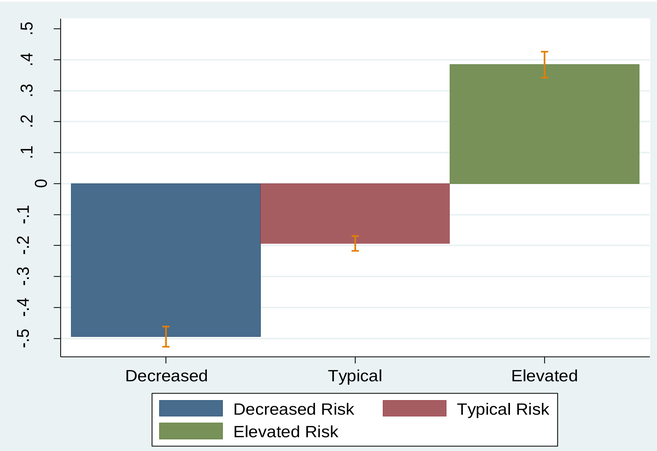
Counts differ because 1) some conditions only apply to one gender, 2) we exclude observations where participant has been diagnosed with the condition, and 3) participants did not unlock their result for some conditions

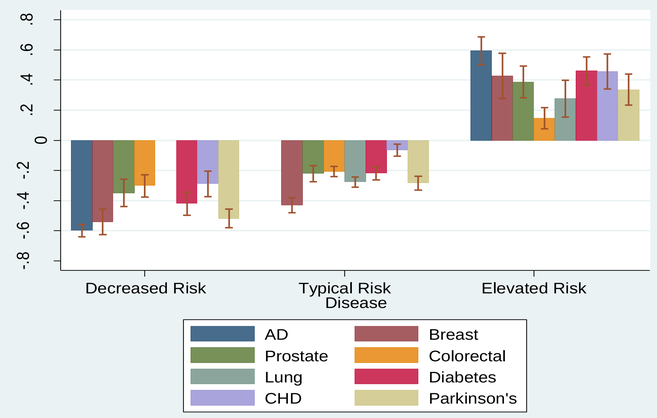
Baseline Demographics (n=706)

Age (std. dev.)	50.8 (16.0)
Male	44.8%
College Degree or Higher	82.3%
White	89.7%
Income >=$100K	50.3%

Perception Changes, by Result Type

(adjusted for baseline risk perceptions)

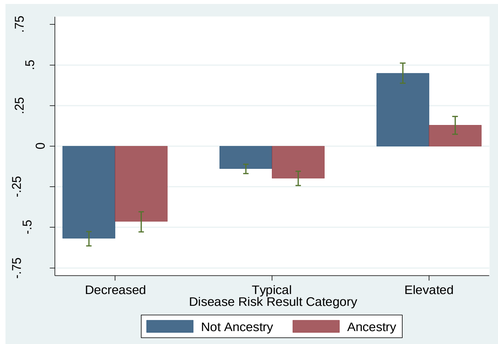




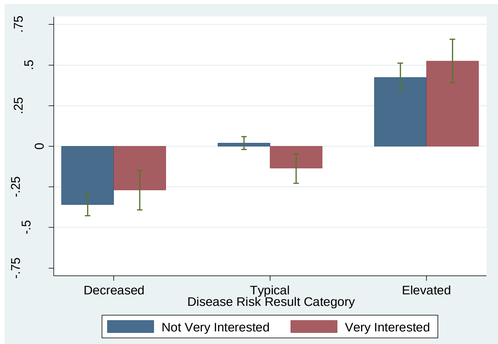
Magnitude of bars determined by coefficients from linear regressions of risk perception changes on result type, covariates and interactions terms for baseline perceptions, and motivations for testing (where applicable).

Heterogeneous Effects Across Testing Motivations

A. Ancestry Interest

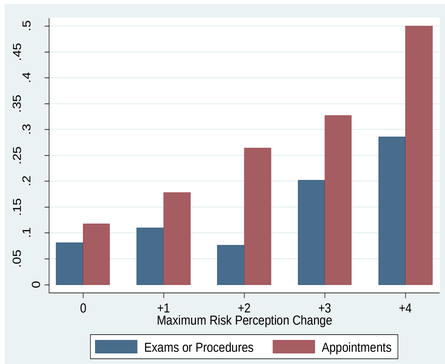


B. Condition-Specific Interest

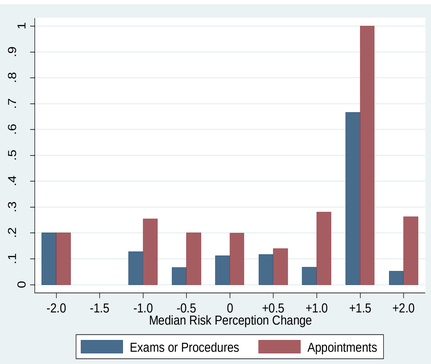


Follow-up Medical Actions Driven by Individual's Maximum Risk Perception Change

A. By Maximum Risk Perception Change



B. By Median Risk Perception Change



Logistic Regressions

Dependent Variable: Individual Made a Follow-up Appointment (1/0)

	(Model1)	(Model2)	(Model3)
Max. Risk Perception Increase	1.526**	1.639**	
	(0.164)	(0.190)	
Avg. Baseline Risk Perception		1.255†	1.089
		(0.161)	(0.147)
Avg. Risk Perception Change			1.161
			(0.230)

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Odds ratios displayed (std. errors in parentheses). When evaluated at the mean, we can interpret Model2 as a one point increase in maximum perception change (on a 5-point Likert Scale) is associated with a 7% increase in likelihood of scheduling a follow-up appointment.

Conclusions

- Participants updated perceptions in a predictable direction
- Risk updating varied by condition and motivation for testing
- Individuals undertook medical follow-up actions in response to their largest risk perception increases, rather than in response to average trends across their results

Acknowledgments

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