Cassandra's Conundrum

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NEXT TIME YOU VISIT THE DOCTOR, you may be asked whether you want to know which diseases you're heir to: perhaps the same ones that killed your parents or grandparents—perhaps something entirely new. Now that we've sequenced approximately 30,000 human genes, medicine has been able to predict such possibilities. But do you want to know? Is your curiosity tempered by whether or not your disease is treatable? And if it is not currently treatable, how likely is it that new treatments will appear before you need them?

Huntington's disease exemplifies the dilemma that occurs when individuals and families are caught between advancing technology and a therapeutic vacuum. In 1983, Huntington's was the first genetic disorder localized through the use of DNA markers, and in certain families, presymptomatic testing then became possible. A decade later, the gene itself was isolated, and anyone could be tested. For the past 20 years, it has been possible to determine definitively that members of some families will die of a dreadful, inexorable, implacable unraveling of body and mind. Before the test was available, more than 80% of people with a genetic risk for Huntington's wished to know their fate. Now that this possibility is no longer theoretical, fewer than 1% of people worldwide have selected testing.[1]

For those who have chosen to know, the effect has been harrowing. In the United States, where there is no universal health coverage, individuals in families with Huntington's are uninsurable. Since 1996, legislation to protect genetic privacy has been languishing in Congress. Having finally passed in the Senate, the Genetic Information Nondiscrimination Act of 2003 may be trapped in the House.

And what hope is there for new therapies in the future? It is often said that the development cost of a new drug is about $880 million.[2] If the U.S. health care system were prepared to pay $5,000 annually for a drug that treats the 100,000 individuals who are either symptomatic or presymptomatic for Huntington's, that would yield $500 million per year to the drug's innovator. In addition, Huntington's qualifies for orphan, or extremely rare, disease protection, which confers additional financial advantages to the drug developer. Nevertheless, despite these appealing economic estimates, the drug industry is not willing to search for targets for Huntington's. And while academic laboratories, supported by the National Institutes of Health and voluntary health organizations, sometimes identify viable drug targets, proposed cuts to the NIH budget threaten to dismantle the recent gains.

Funds are so constrained that people who may be reluctant to be tested are urged to do so in order to be enrolled in clinical trials, even for drugs that may have only modest efficacy in preventing Huntington's. People are torn between wanting to help research and resisting the test and its implications—loss of insurance, employment, home life, security, mental equilibrium—all for a drug that may not work.

If we are opening the doors to genetic testing, we should be prepared to provide universal health coverage and genetic privacy. We should also support the search for viable targets. Having made our genetic heritage freely available on the Web, it would be perverse to assume our moral commitment stops after we download.

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1 Nance, M. et al. (1999) Trends in predictive and prenatal testing for Huntington's disease, 1993–1999. *American Journal of Human Genetics* 65: A406.

2 The Boston Consulting Group (November 2001) *A Revolution in R&D: How Genomics and Genetics Are Transforming the Biopharmaceutical Industry.* The Boston Consulting Group.