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No evidence that genetic tests change people's behavior

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Genetic tests that provide an estimate of an individual's risk of developing diseases such as lung cancer and heart disease do not appear to motivate a change in behaviour to reduce the risk, according to a study led by the University of Cambridge and published in *The BMJ* today.

Researchers at the Behaviour and Health Research Unit analysed a number of studies that looked at whether testing an individual's DNA for genetic variants that increased their risk of developing so-called 'common complex diseases' influenced their health-related behaviour. Complex diseases are those such as heart disease, most cancers and diabetes, where no single gene causes the disease, but rather it is the interaction of dozens—possibly hundreds—of genes together with an individual's environment and behaviour that leads to the disease.

Genome sequencing—reading an individual's entire DNA—has opened up the potential to provide individuals with information on whether or not they carry genes known to increase their risk of disease. Such tests are controversial—knowing that an individual carries these variants does not mean that individual will develop the disease; however, proponents argue that if an individual knows that he or she is at a greater risk of a particular disease, they can make an informed decision about whether or not to change their behaviour.

In the early 2000s, several companies launched direct-to-consumer tests for a range of common complex disorders, and these tests continue to be

sold in Canada, the United Kingdom, and other European countries. In 2013 in the United States, the Food and Drug Administration ordered the company 23andme to stop selling its testing kits because of concerns about their accuracy and usefulness, but in October 2015 the company resumed selling some health related services.

The Cambridge researchers examined over 10,000 abstracts from relevant studies and identified from these 18 studies that matched their criteria for inclusion in their analysis. By compiling the data, they found that informing individuals of their genetic risk had little or no effect on their health-related behaviour, particularly for smoking cessation and physical activity.

Professor Theresa Marteau, who led the study, says: "Expectations have been high that giving people information about their genetic risk will empower them to change their behaviour - to eat more healthily or to stop smoking, for example - but we have found no evidence that this is the case. But nor does the evidence support concerns that such information might demotivate people and discourage them from changing their behaviour."

However, the researchers recognise that DNA testing may still play a role in improving people's health. "DNA testing, alone or in combination with other assessments of disease risk, may help clinicians identify individuals at greatest risk and allow them to target interventions such as screening tests, surgery, and drug treatments," explains co-author Dr Gareth Hollands.

The team argue that these results are consistent with other evidence that risk communication typically has at best only a small effect on health behaviour.

More information: Hollands, GJ et al. The impact of communicating

genetic risks of disease on risk-reducing health behaviour: systematic review with meta-analysis. *BMJ*; March 15, 2016; www.bmj.com/cgi/doi/10.1136/bmj.i1102