Expect Profit from Personal Genomics

The US Food and Drug Administration recently gave 23andMe the green light to restart its consumer health genetic testing service. It's "chocks away" for personal genomics' next flight – and a good time to take a look at how this radical new future is unfolding.

Previously, the US FDA has been rather down on the idea of consumers getting genetic information – to some extent reasonably. Its view has been that these little snippets of genetic information don't give a full picture. Consequently, such tests can worry the well – and give false confidence to the reckless.

Today I'll have a quick look at how the future unlocked by 23andMe, and its ilk, will change healthcare in the 21st century.

I was an early adopter for 23andMe technology. I wanted to make sure that I was planning my life around the "inconvenient truth" embedded in my genes.

One cheek swab later – and my genome was online

Note for nerds: 23andMe actually only looks at single nucleotide polymorphisms (SNPs). There's a lot of the genome that falls outside its standard tests.

Seeing my genes gave me a plethora of useful information on my health risks, and characteristics. One of the most useful things I learned was that I have an above-average chance of Alzheimer's disease. Another was that I'm a carrier for alpha-1 antitrypsin disorder – meaning I'm particularly vulnerable to ill health if I smoke or drink heavily. *(Note for nerds: this disorder is partially dominant, and partially recessive – so if you're a carrier, you likely get some symptoms.)*

The impact of this technology starts before conception

Already, it's possible for parents to get DNA-tested before trying to conceive. Members of distinct populations, who frequently marry into their own communities, are now routinely tested for genetic disorders. For example, Tay-Sachs disease is more common among Ashkenazi Jews than in the general population. Cheaper testing, and increasing knowledge of the range of possible conditions, means this approach is likely to become far more prevalent in future. It may even be a useful approach for dealing with the appalling suffering caused by the practice of first-cousin marriage. Shockingly, this is still legal in the UK – despite being responsible for as many as one in five infant deaths in some London boroughs.

Then, it's on to the baby-making bit

If you are trying to conceive by IVF, as an increasing number of people are, then it's perfectly possible to analyse the baby's genome before the embryo is even implanted. We may therefore start to have babies in a completely different way. If we learn to make eggs outside the , it's possible that we could routinely produce large numbers of embryos – potentially thousands – and then select the one with the characteristics we want. It works a little like genetic engineering, but without the insertion of any new genes. A benign way of looking at this is that it lets you have the best possible child – free of any illness or trait that might hold it back. A more cynical perspective is that it lets parents make all their prejudices flesh – having a child who was guaranteed to be straight, studious and chaste.

Of course, genetic engineering unlocks a whole raft of possibilities. Now we have CRISPR gene editing, we can insert new genes to replace those that are broken. This gives hope to families that carry genetic diseases. Even after birth, the ability to conduct gene therapy is still present. Conditions such as cystic fibrosis can now be treated this way – giving lasting relief to otherwise life-limiting conditions.

But you don't have to change genes to make use of genetic technology. Much of the future for DNA tech will be based around personal medicine. When you go to the doctor in the future, it is likely that your preion – be that for drugs, surgery, or life changes – will be adjusted to take account of your genetic makeup. For example, 23andMe showed that I'm sensitive to warfarin – so I need a lower-than-normal dose. That's very useful information – as a fatal hemorrhage or stroke can be a side-effect of this medicine.

23andMe is an interesting firm. It's currently aiming to be the lead in consumer genetics – owning the knowledge that results. We can see from the rise of Facebook that such dominance leads to a minefield of legal and ethical issues.

From an investment point of view, this is the beginning of a revolution. Just like every major business now has some form of social media strategy, it's likely that personal genetics will become just as embedded into our lives. Of course, medicine is an obvious sector, where the effects may be felt first. Beyond that, food supplements are a logical next-step. I now routinely take Macushield, to reduce the risk of age-related macular degeneration that 23andMe uncovered. In time, we might end up with food and consumer products, matched to our genetic makeup. You might laugh, but uptake of folic acid is genetically-determined – and that's a common fortification for breakfast cereals.

Personalised Sugar Puffs? You heard it here, first.

Which genetically-controlled disease would you most like to know your risks for? We'd love to hear: andrew@southbankresearch.com.

Best,

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