Insurance

Genetic Testing: a Catch-22 for the Insurance Industry?

This article is an extract of the CH&Co.'s Fintank yearly publication.

This article is an extract of our CH&Co. Fintank yearly publication on Innovation for Financial Services. The 2018 edition addresses ways for incumbents to collaborate with Fintechs, Insurtechs and Regtechs through technologies driving the industry's digital transformation.

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Genetic Testing: a Catch-22 for the Insurance Industry?

We have come far in our knowledge of genetics. Scientists today have access to the complete DNA sequence for the entire human genome thanks to the Human Genome Project, completed in 2003, nearly 15 years ago.

Companies offering $99 genetic testing have flourished, and many are linked to ancestry research, like 23andMe or FamilyTree.

The Human Genome Project also brought about a revolution in the science of genetics for Healthcare, resulting in more than 1,800 possible disease genes now identified, and more than 1,000 genetic tests available for human conditions.

An article published by Fast Company in February, 2016, told the story of a woman in her mid-30s–typically a favorable age for buying life insurance–with no medical conditions, who was denied coverage specifically because of her positive BRCA1 mutation[1].

According to the article, "[w]hile the woman was able to take steps to lessen her risk of cancer, she was unable to secure life insurance to protect her family, a catch-22..."[2]

"People really thrive when they actually are empowered... roughly 40% or 50% of 23andMe's customers have been prompted to make changes to their lifestyle or health habits due to what they've learned about their genes."
Anne Wojcicki , CEO of 23andMe

1. BRCA1: Human gene typically associated with breast and ovarian cancer

2. Fast company (2016): If You Want Life Insurance, Think Twice Before Getting a Genteic Test.

BUT DOES GENE TESTING REALLY PREDICT YOUR RISK?

Despite all testing, it is still a challenge to determine how the many complex parts of the genome work together in human health and disease. While early genetic tests looked at specific mutations in single genes, research has now turned to the link between several groups of weak genes and how these interact together with lifestyle factors.

As advertised by testing company One DNA, "it is environmental factors such as diet and lifestyle that determine which of the genetically predisposed individuals actually succumb to these health issues. Genetics loads the gun but your diet and lifestyle pull the trigger."

When discussing genetics, it is important to understand 4 main strategies:

Comparison of Genetic Testing Strategies

Method	Description	Advantages	Disadvantages
Single Gene	All tests for a single gene	Identifies nearly all mutations at a specific locus	May need multiple tests Variable costs
Exome panel (ThromboGenomics	Coding regions from selected genes	Rapid Low cost Fewer VUS	Only tests genes on the panel May miss gross abnormalities
Whole Exome Sequencing (BRIDGE)	Screens all exomes (2%) in the genome	Covers entire human coding sequencing Discovers new genes	Laborious More VUS May miss gross abnormalities
Whole Genome Sequencing (BRIDGE)	>99% of human sequence (coding and non-coding)	Non-coding sequence covered Includes regulatory elements Discovers new genes	Very laborious Many VUS May miss gross abnormalities

Exomes = coding sequence and flanking regions

VUS = Variant of uncertain signifiance

At the time these tests could cost between $2,000 to $4,900, reported Reuters. Kaiser Permanente, which insures its own members, covered the tests for patients with family histories of cancer, while UnitedHealth Group covered the tests if patients met "required criteria", or Michigan-based Priority Health would cover "comprehensive genetic testing".

Genetic testing is so far seen as a "pure cost" for insurers. For instance, following the "Angelina effect" in 2015 (attributed to Angelina Jolie's decision to undergo genetic testing to detect hereditary breast cancer) major US insurers like Aetna, Anthem and Cigna, decided not to cover the multi-gene panel tests.

EMERGING TRENDS/ USE CASES

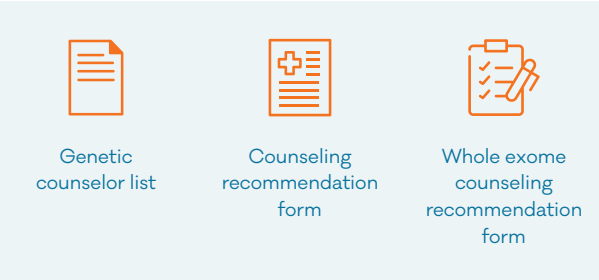
So even if states are enforcing the prohibition of life insurance discrimination based on genetics (since the key US GINA legislation in 2008), we foresee two different approaches to this critical issue: a) include genetics in the underwriting process; or b) propose "advisory or third-party" services.

a) GWG Life, the first genetic-driven InsurTech?

GWG Life, a company focusing on the secondary life insurance market, said in March 2017, it had begun collecting saliva samples and analyzing epigenetic biomarkers, developed by researchers at the University of California, in potential customers as part of its underwriting process. The Minneapolis-based company, which was founded in 2006, said this makes it the first InsurTech firm to apply DNA methylation testing to life insurance underwriting.

b) The 2025 Insurer, a Genetic Advisor?

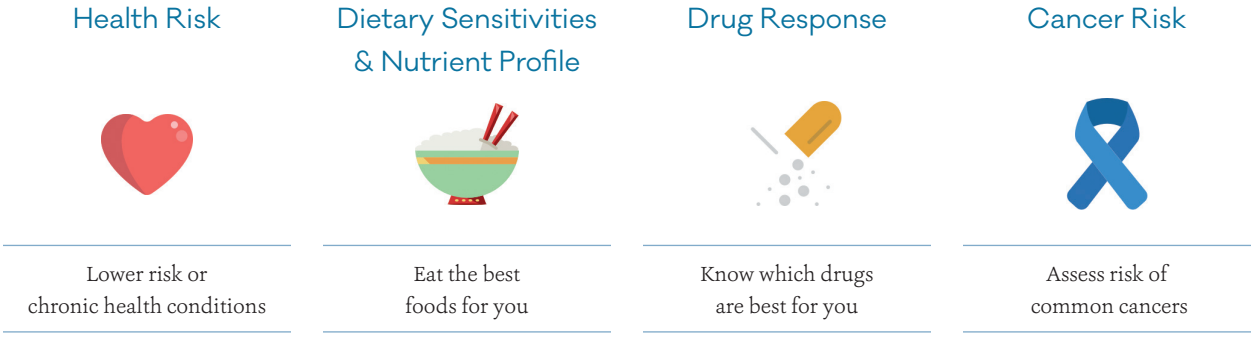
Cigna, one of the largest US insurers, has developed a whole Genetic Testing and Counseling Program since 2013. Cigna seeks to help customers achieve improved health outcomes with increased quality, information, and transparency. The requirement impacts customers whose health plans require preauthorization.



Sources: Cigna website

HSBC Bank, while offering life insurance plans to their Hong-Kong clients, advertises genetic test services provided by a third party (One DNA) as a service to « help you understand how to stay healthy today and anticipate your future health picture"

With a Simple Saliva Sample... analyze over 300 of your Genes



Sources: ONEdna website

HOW CAN INSURERS AND POLICY HOLDERS BENEFIT FROM GENETIC TESTING?

1 Newborn screening

Newborn screening is used just after birth to identify genetic disorders that can be treated early in life. For example, millions of babies are tested each year in the United States, for phenylketonuria (a genetic disorder that causes intellectual disability if left untreated) and congenital hypothyroidism (a disorder of the thyroid gland).

2 Diagnostic testing

Diagnostic testing is used to identify or rule out a specific genetic or chromosomal condition. In many cases, genetic testing is used to confirm a diagnosis when a particular condition is suspected based on physical signs and symptoms. Diagnostic testing can be performed before birth or at any time during a person's life, but is not available for all genes or all genetic conditions. The results of a diagnostic test can influence a person's choices about health care and the management of the disorder.

3 Carrier testing

Carrier testing is used to identify people who carry one copy of a gene mutation, that when present in two copies, causes a genetic disorder. This type of testing is offered to individuals who have a family history of a genetic disorder and to people in certain ethnic groups with an increased risk of specific genetic conditions.

4 Prenatal testing

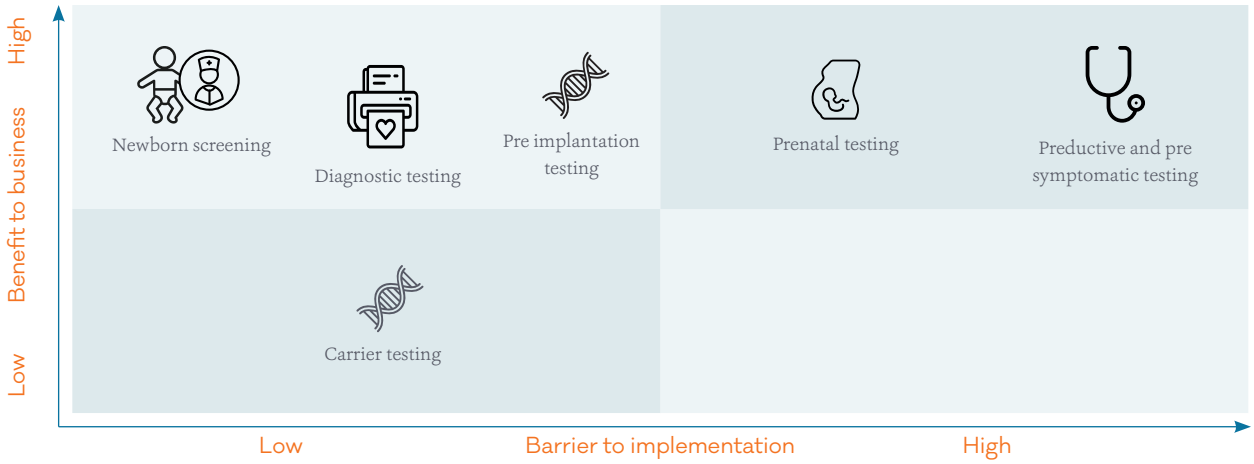
Prenatal testing is used to detect changes in a fetus's genes or chromosomes before birth. This type of testing is offered during pregnancy if there is an increased risk that the baby will have a genetic or chromosomal disorder.

5 Preimplantation testing

Preimplantation testing, also called preimplantation genetic diagnosis (PGD), is a specialized technique that can reduce the risk of having a child with a particular genetic or chromosomal disorder. It is used to detect genetic changes in embryos that were created using assisted reproductive techniques such as in-vitro fertilization.

6 Predictive and presymptomatic testing

Predictive and presymptomatic types of testing are used to detect gene mutations associated with disorders that appear after birth, often later in life. These tests can be helpful to people who have a family member with a genetic disorder, but who have no features of the disorder themselves at the time of testing. Predictive testing can identify mutations that increase a person's risk of developing disorders with a genetic basis, such as certain types of cancer.



Acknowledgements & Contacts

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Booklet Editorial Team

Pierre Bustamante
Patrick Bucquet
Edith Hitt
Elodie Cohen
Megan Armitage
Julien Soulard
Guillaume Rico
Yannick Gaillard
Sébastien Meunier

AMERICAS

CIB:

Charles Dally
cdally@chappuishalder.com

Sébastien Meunier
smeunier@chappuishalder.com

Retail:

Alexandre Hovette
ahovette@chappuishalder.com

Edith Hitt
ehitt@chappuishalder.com

Insurance and Wealth:

Patrick Bucquet
pbucquet@chappuishalder.com

Hélène Driancourt
hdriancourt@chappuishalder.com

EUROPE

CIB & Retail:

Stéphane Eyraud
seyraud@chappuishalder.com

Louis Forteguerre
lforteguerre@chappuishalder.com

Marc Lapostolle
mlapostolle@chappuishalder.com

Julien Soulard
jsoulard@chappuishalder.com

Insurance and Wealth:

Pierre Bustamante
pbustamante@chappuishalder.com

Daniel Corrales
dcorrales@chappuishalder.com

Yannick Gaillard
ygaillard@chappuishalder.com

Sylvain Hostetler
shostetler@chappuishalder.com

ASIA-PACIFIC

CIB & Retail:

Laurent Liotard
lliotard@chappuishalder.com

Guillaume Rico
grico@chappuishalder.com

Jit Yew
jyew@chappuishalder.com

Insurance and Wealth:

Sebastien Vorger
svorger@chappuishalder.com

Karen Yip
kyip@chappuishalder.com

DATA STRATEGY

Stéphanie Baruk
sbaruk@chappuishalder.com

Vincent Wiencek
vwiencek@chappuishalder.com

REG TECH

Oliver Garcia
ogarcia@chappuishalder.com

Florent Palayret
fpalayret@chappuishalder.com

CH LAB

Benoit Genest
bgenest@chappuishalder.com

Patrick Seifert
pseifert@chappuishalder.com

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