

Can life insurance pass the genetic test?



The future is bright for genetic testing, but it's a double-edged sword for insurers. Genetic testing kits have gone mainstream, medically prescribed tests are more accessible, and the results promise positive things like early diagnosis and healthier living. However, if not treated in a careful, balanced way, this information could also put life insurers – and the security they provide – in a challenging situation.

So, who's taking genetic tests? And what do they do with their information? What are the implications for life insurance and what steps can we take to mitigate the risks of anti-selection? At the same time, how can we leverage the benefits of genetic testing to offer affordable insurance that supports healthier, longer lives?

Executive summary

Genetic testing has become big business. Today, more people are taking genetic tests than ever before and the results will only increase in importance and usefulness as technology advances. There are two main classes of genetic tests.



“ By the end of 2018, direct-to-consumer genetic testing companies tested more than 12 million people and a huge surge of those tests – almost eight million – occurred after 2017.

The genetic testing market is booming with exponential growth rates observed in recent years. To better understand the potential impact of genetic testing on the life insurance industry, this report will examine:

- Who's taking genetic tests, and why
- How consumers respond to genetic test results
- Impact on life underwriting and claims
- The sensible path forward

Key findings

In the US, more than 20% of those we interviewed said they have taken a genetic test –14% took a medical genetic test to diagnose or predict disease, while 6% took a DTC test. Those who took a medical genetic test and received results that showed an increased health risk, were four times more likely to buy life insurance.

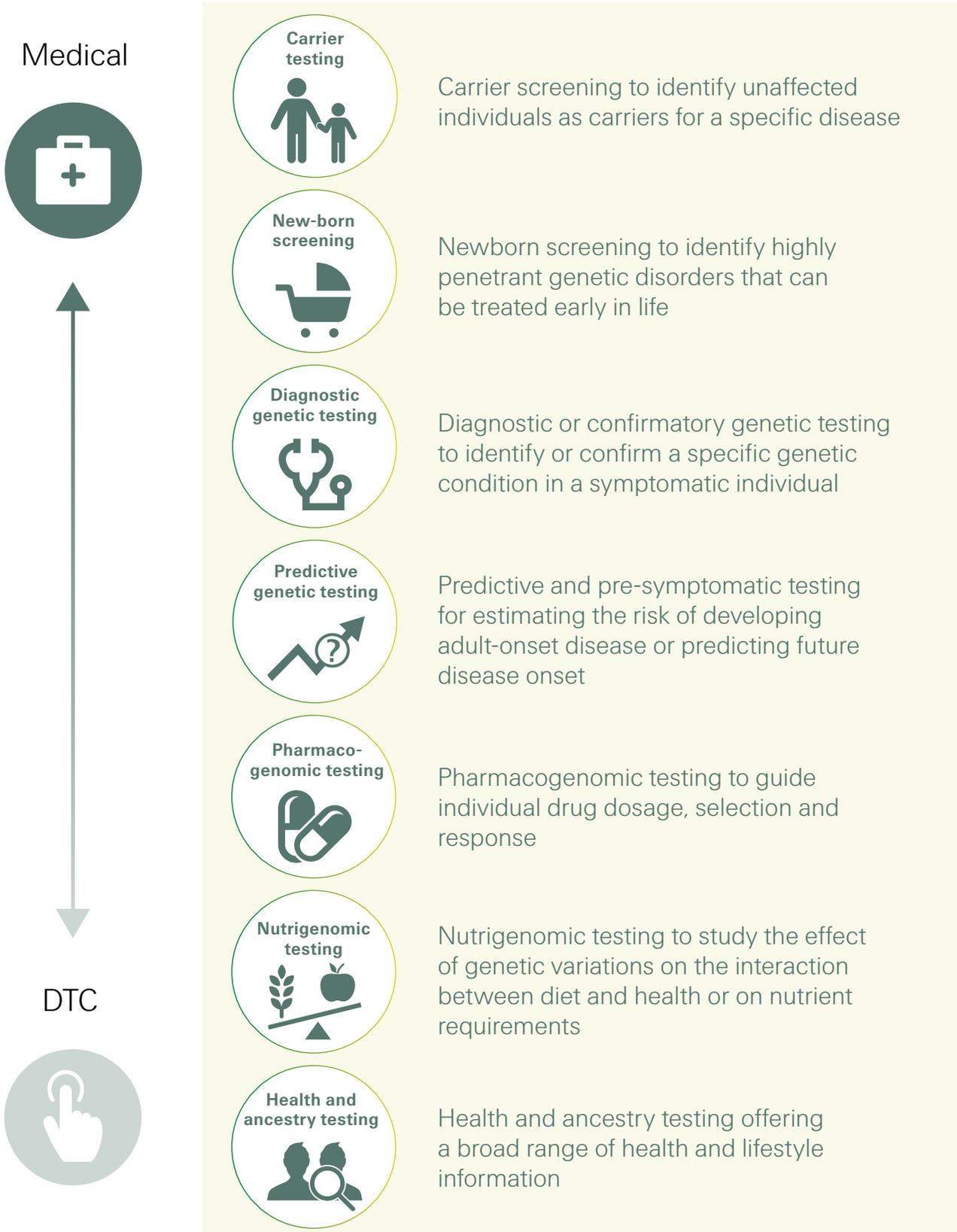
People are generally evenly split about whether an insurance company should be allowed to use genetic testing data when calculating insurance premiums. However, 80% of those surveyed were willing to share their genetic test results in exchange for health prevention or disease management support or an insurance premium discount.

Genetic testing creates a very material threat of anti-selection for the insurance industry. However, it also offers great societal benefits that include better prevention, diagnosis and treatment of critical diseases. Indeed, 60% of survey participants confirmed that their own genetic test results motivated them to live a healthier lifestyle, which shows the potential health benefits as tests continue to become more affordable and accessible.

Introduction

Genetic testing can take many forms

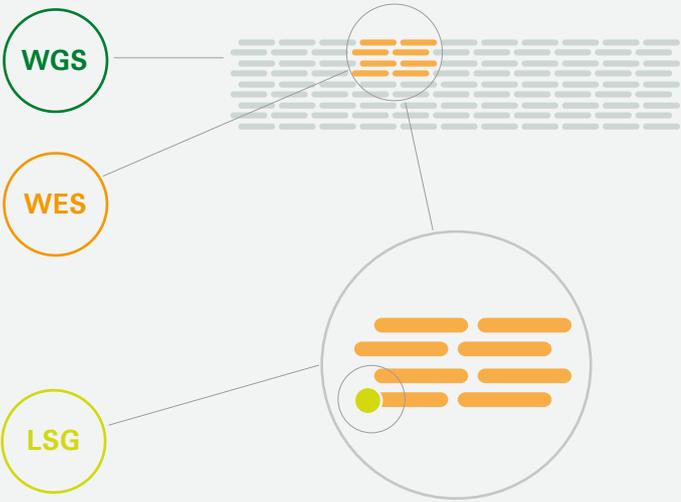
Depending on an individual's interest or health situation, different types of genetic tests are now available. Our research concentrates on medical and DTC tests that help to predict health outcome.



The Human Genome Project opened the door to genetic testing, which has the potential to greatly expedite the prevention, diagnosis and treatment of disease. Public health agencies across the globe are conducting genome sequencing projects, which will aid research and lead to medical breakthroughs. In the US, the All of Us Research Program is compiling health and genetic data from over one million people, while the 100 000 Genomes Project in the UK is sequencing the complete genetic blueprints of National Health Service patients with cancers and rare diseases, and the commitment to expand the project to complete five million genomes over the next five years. Additionally, a number of other countries are gathering and analysing genomic data with the goal of improving health outcomes at reduced costs.

The more granular the test, the more expensive

Someone wanting to take a genetic test has three main options. Each comes with a range of pros and cons that balance cost with information.

 <p>WGS</p> <hr/> <p>Whole genome sequencing</p> <p>This test determines the exact order of three billion plus base pairs. WGS provides the most comprehensive characterisation of the genome. It's cost has dramatically reduced in recent years and companies are working to reach a new target of only USD 1 000 per test.</p>	 <p>WES</p> <hr/> <p>Whole exome sequencing</p> <p>In this case, only 2% of the entire genome is sequenced, but these genes are estimated to harbour about 85% of the disease-causing mutations. WES provides a more cost effective approach to identify genetic variants that cause genetic diseases.</p>	 <p>LSG</p> <hr/> <p>Large scale genotyping</p> <p>Large scale genotyping is the most affordable test and offered by most DTC providers. This method identifies single base changes in specific locations in the genome where variations associated with physical and health-related traits often occur. It reveals about 0.03% of the genome and the cost for genotyping is in the low USD 100 range or even lower.</p>
<p>3 000 000 000 bases 100% of human genome</p> <p>60 000 000 bases 2% of human genome</p> <p>1 000 000 bases 0.03% of human genome</p>	<p>Medical</p>  <p>DTC</p> 	

Consumer survey

Swiss Re wanted to learn more about genetic testing and its potential impact on life underwriting and claims, so we conducted research to:

- 1. Discover**
who undergoes genetic testing and why
- 2. Assess**
how consumers use their genetic information
- 3. Understand**
how genetic testing affects life insurance

A sample of 23 000 individuals aged 18 and over in the US and another 13 000 people in four additional countries (Canada, UK, China and Australia) were surveyed. Both medical and DTC testing were considered in scope, as the DTC test is often a natural gateway to more comprehensive medical genetic testing.



The results confirmed that genetic testing has become mainstream as it is more affordable and accessible than ever. In the US, the market for DTC genetic testing kits more than doubled in 2018 over previous years. Surprisingly, 20% of the survey respondents have taken a genetic test (DTC and/or medical) and another 35% plan to take one at some point.



Who's taking genetic tests, and why?

“ The profile of the typical genetic test taker is strikingly similar to the profile of the typical person looking for insurance coverage.

Test participants tend to be highly educated and affluent men between 20 and 40, which is also currently a significant demographic for life insurance applicants.

Medically prescribed tests were primarily administered to either diagnose or predict disease, while those who take DTC tests cited the desire for information about ancestry and general health as their primary reason to take the test.



Demographics

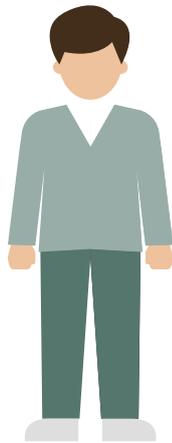
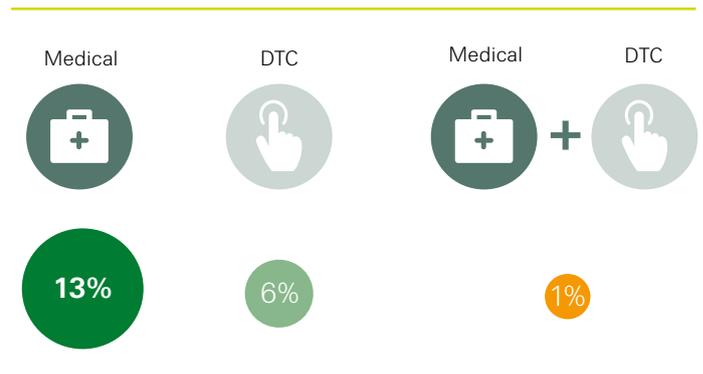
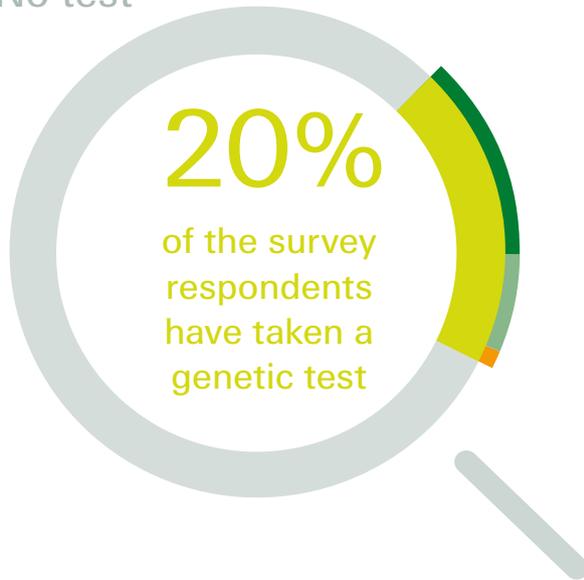
The demographics match: younger, male, affluent

	All tests	Survey demographics
Age		
 20–39	26%	50%
40–60	14%	50%
Gender		
 Male	25%	48%
 Female	16%	53%
Salary		
 > USD 75K	26%	37%
< USD 75K	17%	56%
Education		
 Post-graduate degree	25%	44%
College degree or less	16%	56%

Genetic testing rates

20% of the survey respondents have taken a genetic test, and 35% intend to.

80%
No test



Target for
life insurer



Genetic test consumers tend to be highly educated and affluent men between age 20 and 40, which is also a significant demographic for life insurance applicants.

The survey also found that individuals with a family history of heart disease, certain cancers or diabetes are three times more likely to undergo medical genetic testing than those with no family history.

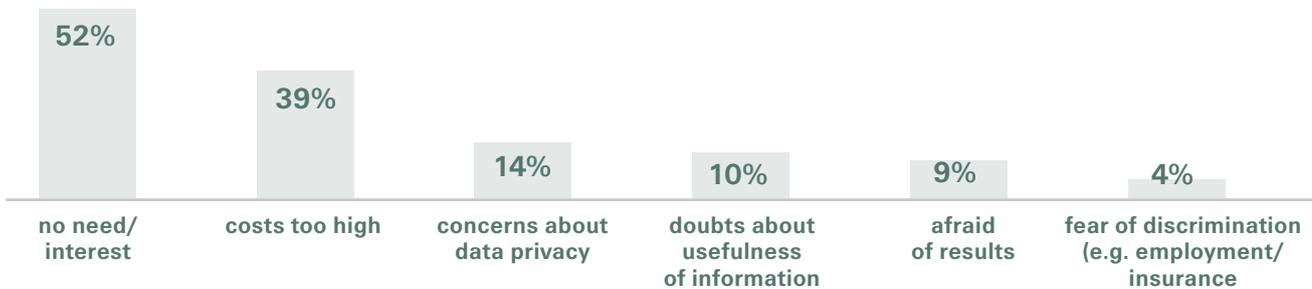
The vast majority of medically prescribed genetic tests have been conducted in the last five years and they focus on diagnosis, disease risk assessment, family planning and drug matching.

“ Genetic testing has become mainstream as it's more affordable and accessible than ever. While medical genetic tests are leading, the DTC market more than doubled in 2018 compared to previous years.

The survey also cleared up some misconceptions. The assumption that most people don't take a genetic test because they don't want the information used against them didn't hold true. Fear of discrimination was cited by only four percent of respondents. There are other more formidable obstacles, such as no interest (cited by half of respondents), too expensive (four in ten) and concerns about data privacy (14%).

Reasons for not taking a genetic test

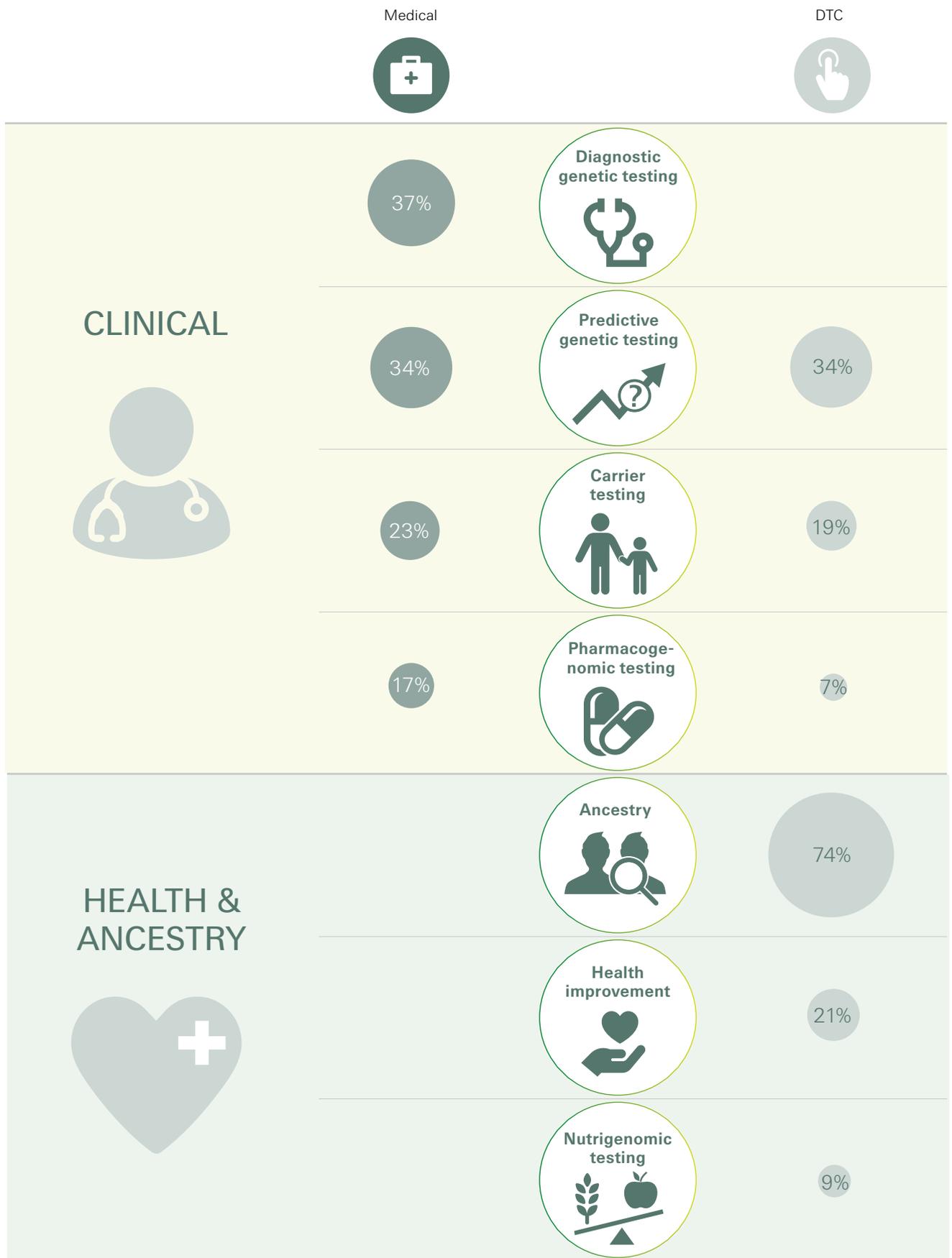
Cost and data privacy cited more than fear of discrimination



About one-third of respondents who haven't been tested said they plan to have a genetic test at some point in the future. Interestingly, 20% said they would never undergo genetic testing.

Reasons for testing

To know the past and predict the future



How consumers respond to genetic test results

People who take a genetic test are motivated to live healthier. This is especially true for patients who undergo a prescribed medical test: 77% say they started taking vitamins and supplements, improved their diet, hit the gym or changed medication. Even a significant share of those who took a DTC test (42%) said they made lifestyle changes.

75% of individuals who underwent medical genetic testing discussed the results with their primary care provider and/or a genetic specialist, and about 60% have undergone additional lab imaging or other medical tests. By contrast, only about 30% of DTC test takers discussed their results with a professional and only 20% had follow-up exams.



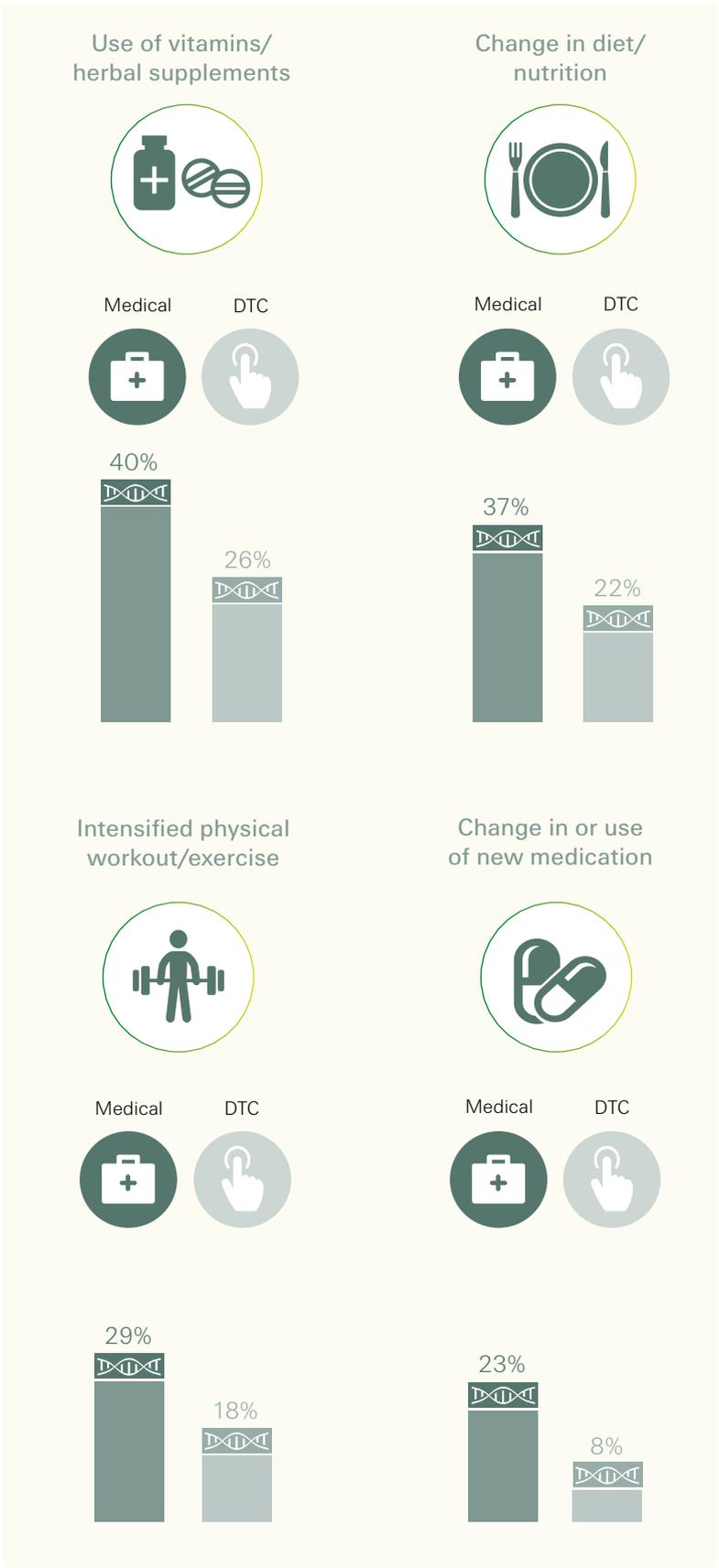
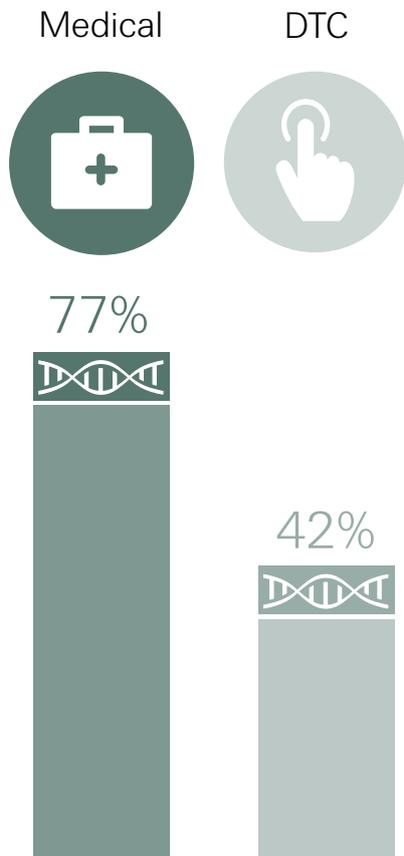
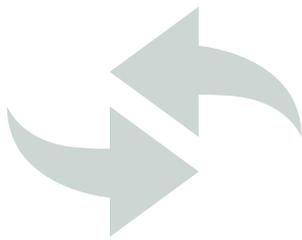
Medical genetic tests motivate more healthy actions

Genetic tests motivate people to be healthier

Even DTC tests inspire lifestyle changes.

Actions prompted by genetic test results

ANY HEALTH CHANGES





Medical

Perhaps the biggest takeaway for life insurers is the distinct connection between genetic test results and consideration of purchasing life insurance. A third (35%) of individuals who underwent medical genetic testing reported that their tests supported their decision to buy new or additional coverage. 38% of individuals undergoing predictive medical testing were identified as at high risk of developing a common disorder like cancer, diabetes or heart disease. These individuals are about four times more likely to buy life insurance than those at average or low disease risk.

Disease risk

The greater the health risk, the more likely insurance is purchased.





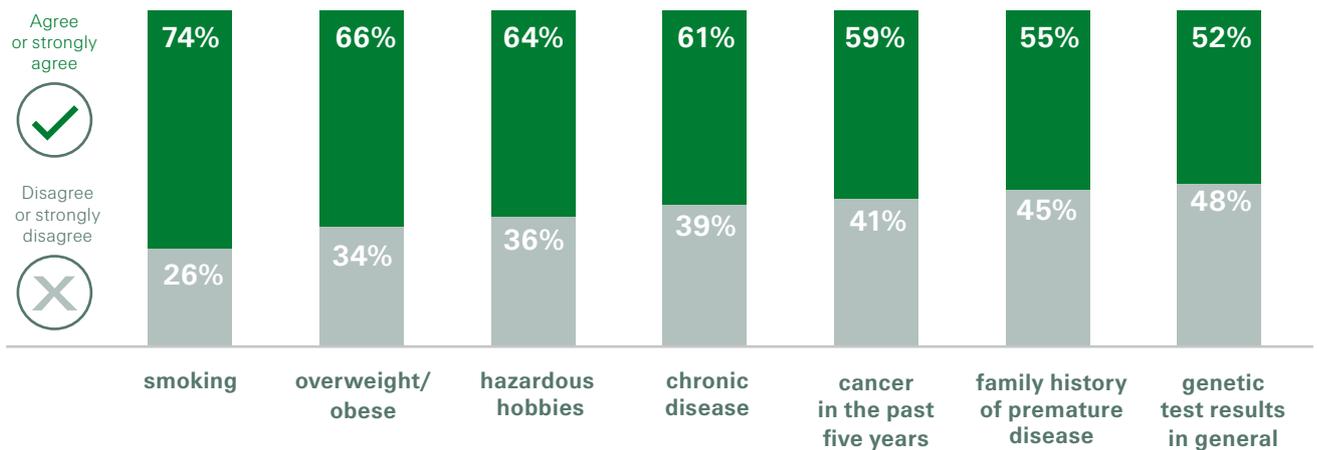
DTC

By contrast, only 15% of respondents who took a DTC test said their results led them to consider their life insurance needs. Further, low- and high-risk individuals who took a DTC test bought about the same amount of new life insurance, which supports the view that these kits lack the medical relevance of prescribed medical genetic tests.

Respondents appear to accept the fact that being at high risk comes at a price when it comes to life insurance. But they're less accepting of the unknown: when asked which factors insurers should be allowed to use to calculate an applicant's premium, genetic test results ranked lowest while factors such as smoking, obesity or hazardous hobbies were more acceptable. Nevertheless, about half believe insurance companies should be allowed to use genetic test results for calculating an applicant's insurance premium. For the most part, respondents view their contract with their life insurer as a partnership dedicated to improving their health. Three out of four people who took a genetic test, regardless of test type, said they would be willing to share their results with a life insurer in exchange for access to health prevention and disease management programmes as well as premium discounts.

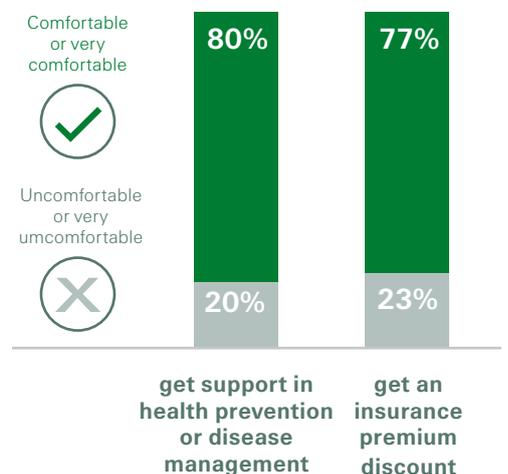
Fear of the unknown? Half don't want an insurer to use genetic test results

Respondents said insurance companies should be allowed to consider the following factors for calculating an applicant's insurance premium.



Most would share test results in exchange for health tips or reduced premium.

How comfortable would you feel sharing your genetic test results with a health or life insurer to...



Impact on underwriting and claims

Genetic tests results could have a profound effect on life insurance underwriting. While about 60% of individuals who underwent predictive medical genetic testing reported a low or average risk for a major disease, the other 40% were found to have an elevated risk for common disorders such as cancer, heart disease or nervous system diseases like Alzheimer's or Parkinson's disease. The latter are four times more likely to buy life insurance than individuals at lower risk supporting the view that reliable and risk-relevant genetic information can support decisions of customers to purchase or alternate insurance cover.

For insurance to serve its function to society, relevant information about an applicant's health must always be accessible and the sharing of that information equitable. The fair sharing of data allows insurers to more accurately assess and price for risk and ensure sustainable protection for more people at an affordable cost.

Genetic testing has introduced new uncertainties and opportunities for the insurance industry:

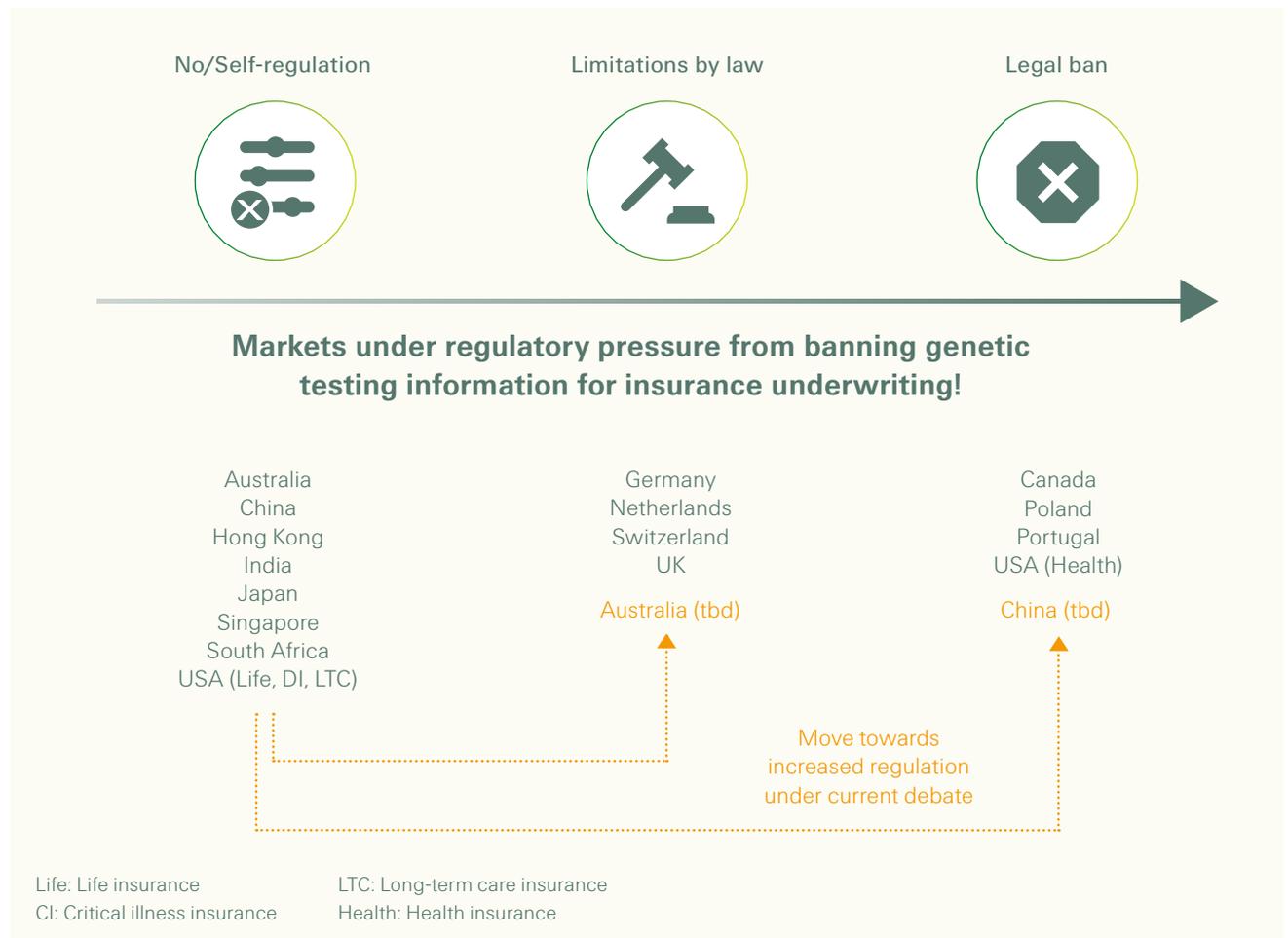
Uncertainties 	Opportunities 
<p>A growing asymmetry of genetic health information between insurers and applicants exposes life insurers to increased anti-selection. Moreover, the effects of anti-selection will be amplified as regulations restrict the use and disclosure of genetic test results in underwriting.</p>	<p>Nearly four in five consumers who underwent genetic testing were motivated to make positive changes for their health. A majority of individuals undergoing medical genetic testing discussed the results with a medical professional and have undergone additional medical examinations, which can lead to better outcomes. Our survey offers hope that reliable information from personal genetic testing can guide individuals to healthier and longer lives.</p>

The sensible path forward

As genetic testing becomes more common, insurers must closely monitor developments on the regulatory front, in their markets and in their portfolios.

Current regulatory approaches to insurers' access and use of genetic data fall into three major categories

Lack of uniform regulation shows need for continual engagement.



Genetic testing raises regulatory, ethical and privacy concerns for the insurance industry. The anti-selection threat is real, and it puts insurers and ultimately consumers at risk.

The foundational principles of insurance – accessibility, affordability and equitable spread of risk – will be compromised unless thoroughly informed policies and procedures on genetic testing are implemented. To preserve the societal benefits and financial protection of insurance, insurers must be able to evaluate relevant consumer information when underwriting, and that includes risk-relevant data from genetic tests.

Regulatory action is increasing around the globe, and as the debate continues over the appropriate use of genetic information in life insurance underwriting, Swiss Re is prepared to work with clients to review their models, analyse their experience and adjust underwriting guidelines when necessary.

What's next?

After more than 20 years of developments and careful observation, our industry is about to reach a critical tipping point around issues of genetic testing. There are great societal benefits of advances in genetic testing including enhancements in health prevention, diagnosis and treatment of critical diseases. Equally, genetic data can create new threats that can undermine the basic principles of fair access to information upon which insurers rely to assess risk and offer protection at an affordable price.

Key survey takeaways



More people are taking genetic tests.



Test takers typically match the profile of the typical insurance buyer.



Those who test and discover they are at higher risk of disease are four times more likely to buy life insurance.



People are willing to share results with insurers but want a commitment in return.

Insurance considerations

Underwriting considerations	Guided by country specific regulation, insurers may or may not be allowed to take genetic results into account when underwriting. About 80% of survey respondents declared their willingness to share genetic information with their insurer in return for a premium or health management benefit. 20% said that they would never want to know their genetic profile, which supports common market practice, not to request applicants undergo a genetic test. Family history is a key driver for taking a genetic test and, where allowed, should be considered at underwriting stage to limit exposure to anti-selection.
Anti-selection impact modelling	Understanding consumer buying behaviour and its propensity for anti-selection is critical for insurers. Respondents tested who learn that they are at higher risk for disease declare that they are four times more likely to take out additional insurance. Modelling the impact to insurers will provide confidence in the sustainability of different lines of products and help to develop mitigation actions. This report addresses many of the parameters such an anti-selection impact model needs to consider.
Products including genetic testing services	Genetic tests motivate people to make lifestyle changes or take healthy actions. Hence, life insurers are exploring ways to offer customers genetic testing services as a way to improve long-term health outcomes. The health benefits of offering predictive genetic testing should be balanced against the risk for potential anti-selection, claims experience and increased exposure to legal and reputational challenges.
Mitigating regulatory risk	More and more governments are considering regulating the use of genetic information but solutions vary by market and range from requiring self-regulation, to imposing strict legal limitations or raising an outright ban. We see it as imperative that industry groups and regulators work together to agree on reasonable self-regulation in order to help balance the interests of consumers and preserve the ability of insurers to underwrite sustainable products.

Swiss Re is ready to support insurers who want to apply innovations and solutions to their products including genetic testing services. We can help you identify high risk areas and apply a combination of global expertise, behavioural customer insights and research to improve the performance of your in-force portfolio and make underwriting adjustments.

Contact your Swiss Re representative to start a discussion.

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