

## *Statement*

# Statement on Genetic Testing and Insurance

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## STATEMENT ON GENETIC TESTING AND INSURANCE

This statement represents the view of the Canadian Institute of Actuaries (the CIA) with respect to genetic testing and insurance. The opinions expressed are based on the CIA Task Force on Genetic Testing's review of the issues involving genetics and insurance, and have been approved by the Member Services Council of the CIA. This updated statement supersedes the prior statement released in November 2000.

### INTRODUCTION

One of the main roles of the actuarial profession is to serve the public. It can do so in a variety of ways, including informing public debate, educating the public on actuarial matters such as the working of insurance, and providing decision makers with all the necessary and relevant information to make wise choices.

On subjects such as the interaction between genetics and insurance, the profession wishes to ensure that public policy is determined in full knowledge of the facts by making available its technical insights, including an analysis of the possible outcomes of specific policy decisions on the public, life insurance applicants, and the insurance industry. The profession aims to evaluate the financial impact on all groups that are likely to be affected, and does not advocate the interests of any particular group.

The rapid pace of discovery in the field of genetics has resulted in ongoing speculation and debate for many years about the potential impact on consumers and insurers. Consumers are concerned that insurers will use genetic information<sup>1</sup> to deny insurance or charge exorbitant premiums. Insurers are concerned about the possibility of adverse selection if consumers purchase insurance without disclosing their known genetic risks, thereby adversely impacting insurance costs.

There is a genetic contribution to all aspects of health and disease. Genetic differences are associated with potential health outcomes—both adverse and favourable. The rapid evolution of technology has refined genetic testing, improved access to it, and improved its clinical application.

Within this statement, the following topics are covered:

- Definition of Genetic Test;
- Foundations of Insurance;
- The Role of Actuaries;
- Genetic Testing and Insurance Risk;
- Anti-selection and Insurance Risk; and
- Conclusions.

### DEFINITION OF GENETIC TEST

A *genetic test* is a type of medical test that identifies an individual's chromosomal or genetic makeup either in whole or in part. The results of a genetic test can confirm or rule out a

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<sup>1</sup> This includes information obtained through genetic testing and/or family history. The latter has been part of the underwriting process for decades in Canada.

suspected genetic condition or help determine a person's chance of developing or passing on a genetic disorder.

Certain physiological characteristics are passed between generations through DNA found in every living cell. Genes are the parts of DNA that control the way humans develop. In the same way, genes can determine other physical traits that can cause or contribute to a disease. In some cases, genetic testing can reveal if someone has a higher than average probability of developing a disease. However, it is important to note that genetic tests should not, in general, be used in isolation to draw conclusions about the current or future health status of a particular individual.

## **FOUNDATIONS OF INSURANCE**

Several types of insurance exist in the current marketplace. For the purposes of this statement, *insurance* refers primarily to individual life insurance, although the concepts could, by extension, also apply to other insurance types, such as critical illness insurance.

Consumers pay premiums to insurance companies to secure their protection against financial loss caused by an insured event, the happening of which is uncertain. This uncertain financial loss is more commonly referred to as *risk*. On an individual basis, risks are unpredictable; however, when a sufficiently large number of comparable risks are pooled together the aggregate loss may be predicted with some accuracy. The risk presented by a particular applicant is determined using a number of factors (e.g., age, smoking status). In general, applicants with similar risk factors are considered to have comparable risks. In exchange for the premiums paid, insurance companies manage the accepted risks and ensure that funds are available to pay all future claims. Ultimately, it is the premiums paid by individual policyholders that are used to fund claim payments.

Insurance premium levels are determined according to the risk of the pool. That is to say that the premiums are based on the expected future claims—both frequency and severity—of the pool in aggregate. Expected future claims are estimated using actuarial models that may be based, at least in part, on the claim experience of the pool or industry studies of risks comparable to those included in the pool. Pools that include policyholders who are more likely to die sooner (i.e., make a claim during the term of the policy) will have a higher premium level than pools with policyholders more likely to die later and/or potentially live beyond the end of the term of the policy. For insurers and policyholders, this ensures all individuals pay their fair share—no one pool cross-subsidizes another, and claims are shared within the pool. In the absence of pools, lower-risk policyholders would subsidize higher-risk policyholders via higher premiums. This leads to under-insuring by lower-risk policyholders and over-insuring by higher-risk policyholders.

A fundamental precept of an insurance contract is that it is a good-faith agreement between all parties to the contract. To ensure a level playing field, the insurer and the applicant must have the same information about the risk so the insurer can assign the applicant to the appropriate pool. There is also an implicit good-faith agreement between the policyholders within a pool that each individual has a comparable risk profile based on the available information. As consumers have the advantage of being able to choose the type and extent of insurance coverage they desire, as well as the timing of their purchases, sharing their risk information or knowledge with insurers is essential and critical. This applies to all information, whether it is financial, family or personal health history, genetic testing results, or other.

Moreover, there should be no expectation of gain for the policyholder from the purchase of insurance. That is, the insurer and the policyholder should have similar views of the policyholder's life expectancy at time of policy issue. It would be wrong for a policyholder to anticipate a gain because he or she knows, through information not shared with the insurer, that an early death is more likely than other risks in the pool. This is so because it would be unfair to the other policyholders who would have to bear this extra cost.

This is explained further in the section below on anti-selection and insurance risk.

## **THE ROLE OF ACTUARIES**

Actuaries play an integral role in the operation of insurance companies. Using their skills and professional standards, actuaries price and value insurance products, and play a key role in the risk management functions of the insurer. Actuarial work requires familiarity with the risks inherent in the business, the selection of appropriate assumptions, and the development of models that enable the insurer to prudently and effectively manage its business. Although actuaries are not necessarily involved in the risk selection process at the policy level, they do incorporate knowledge of the insurer's underwriting practices into their work.

Actuaries will need to work with medical practitioners on genetic testing developments, recognizing that clinical utility of genetic data in refining prevention, diagnosis, and treatment of disease is rapidly evolving. Actuaries will need to ensure that testing is reliable and relevant, and that results are predictive. Actuaries will also have a role in ensuring that underwriting processes are fair and that the needs for equity and risk classification are properly balanced.

## **GENETIC TESTING AND INSURANCE RISK**

The premiums charged by an insurer must reflect the characteristics of the risk being covered. This ensures that premiums are charged to each insurance pool according to its characteristics and their expected financial consequences.

A significant proportion of policyholders—over 90 percent in Canada, the U.S., and the UK—are issued insurance at standard rates.<sup>2</sup> Information gathered during the underwriting process (such as blood tests and family history) has traditionally been used to categorize applicants as standard risks, substandard risks, or uninsurable.

The assessment of the risk of illness and death is not necessarily modified by additional genetic information. While additional genetic information may be of some assistance to insurers in deciding whether to offer or decline insurance coverage for an individual, the vast majority of applicants would still be accepted as standard risks and pay standard premiums. Despite all of the medical advances over the last 50 years, the percentage of people applying for life insurance being accepted as standard risks has remained fairly stable. The presence of genetic testing information would not be expected to change that fact. This is because, for those risks that are not standard, much of the information that could be provided by today's genetic testing is available through conventional questions about medical and family history, and is already being factored into traditional underwriting. Information gathered from genetic tests should simply be seen as additional medical information which is analyzed by the insurer in the unique medical context of each applicant.

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<sup>2</sup> In this context, "standard" means that no additional premiums are assessed for physical conditions or impairments that could result in higher mortality.

At the present level of knowledge, it appears that there are relatively few diseases for which the presence or absence of a specific gene will directly result in an individual contracting that disease. For the time being, habits such as smoking and lifestyle remain far more useful and reliable in predicting an individual's health and lifespan than his or her specific genetic testing information.

It should also be remembered that genetic testing will not only aid in the identification of disease, it will also facilitate treatment through the development of gene therapies. Currently, treatment is not keeping pace with testing. However, genetic testing may cause individuals to change their lifestyle or health management in response to positive test results, thereby lengthening their life expectancy or decreasing their morbidity rates.

In addition, genetic testing results could be used to offset information available from other sources. A favourable test result might enable an insurer to ignore some unfavourable information that was available from the family history, and proceed to approve applications for insurance at the appropriate rating.

The end result is that genetic testing information is currently complementary to the underwriting process, and does not negate or replace traditional information.

#### **ANTI-SELECTION AND INSURANCE RISK**

*Anti-selection*, also known as *adverse selection* or *negative selection*, is an undesired market result stemming from buyers and sellers having access to different information.

An example to illustrate anti-selection is the accessibility to the information of an individual's smoking status. This is a risk-relevant piece of information as smokers have shorter average life expectancy than non-smokers. Although insurers currently have access to smoking status, consider the scenario where they would not, and simply based their premium rates on the general population's proportion of smokers and non-smokers. For example, they would charge a blended premium rate equal to 80 percent non-smoker rate plus 20 percent smoker rate, which is roughly the proportion of non-smokers and smokers in Canada. These blended premiums compared to those of pools made entirely of smokers will clearly be more attractive to smokers, and would lead them to purchase insurance more frequently and in greater amount than if they were offered pure smoker rates. Conversely, non-smokers would purchase less insurance because they are paying a higher price than non-smoking rates.

Taking this situation to an extreme, suppose that the non-smokers are so deterred by the relatively higher prices that none purchase life insurance. In this extreme situation, the insurance premiums will spiral upwards until they reach smoking rates. This clearly is an undesired state in that the life insurance need of the non-smoking population is no longer being addressed. Fortunately we are not in this situation as insurance companies have access to the applicant's smoking status today, as well as a number of other risk-relevant factors.

If the insured and the insurer both have access to the information relevant to the insurance risk, then the risk of anti-selection will be minimized. If the ability to share the risk-relevant information is not possible (e.g., by regulation), then two fundamental methods used by insurance companies to reduce anti-selection are (1) mandatory insurance purchase; and (2) premium adjustability. These two fundamentals are the base of the Canadian group life insurance (life insurance offered by employers) marketplace. That is, when life insurance is offered to employee groups in Canada, it is most often offered on a mandatory basis to all employees

within that group, and the insurers have the option to increase premiums in agreed-upon intervals—most often yearly.

The marketplace for Canadian individual life insurance has evolved such that coverage is completely voluntary (not mandatory), and the premiums are mostly not adjustable (more than 90 percent of the insurance amount sold today is with unadjustable guaranteed premiums over the lifetime of the policy). Therefore, the individually sold insurance policies are much more susceptible to anti-selection than group life insurance coverages by their evolution and design.

It is important to note that group insurance premium rates are based on the characteristics of the group as a whole (e.g., size, industry, average age), rather than those of the individual members of the group. In many cases, these factors are public knowledge, unlike individual insurance where the premium rates are based on personal information. Such information may only be known with certainty by the applicant.

Genetic testing information is not required for group insurance because of the fundamental reasons stated above: mandatory participation, adjustable rates, and the nature of the rating factors. However, in the current voluntary purchase and guaranteed premium design of the Canadian individual life insurance market, when genetic testing information is known by the insurance applicant but unknown to the insurance company, this would increase anti-selective risk.

Some individuals may not anti-select simply because they do not have enough disposable income to purchase insurance. Another reason is they may not have a life insurance need, such as no family or acquaintances to leave an estate to. In either of these situations, however, anti-selection should increase in provinces which allow secondary insurance markets. Currently, Québec, Saskatchewan, Nova Scotia, and New Brunswick allow secondary purchasing and selling of individual life insurance policies. In such markets, an opportunistic insurance policy purchasing program could be constructed to encourage individuals who have positively tested for genetic conditions to purchase insurance policies and sell the policies to this program in exchange for cash.

In addition, anti-selection could result in insurers setting aside smaller funds (known as actuarial liabilities) than required to pay all future claims. This does not mean that claims would not be paid in full but it could weaken the financial strength of insurers and make them more vulnerable during economic downturns.

Finally, it should be remembered that since every applicant must disclose all known relevant circumstances, asking that genetic testing results be shared is simply treating it like all other information. In Canada, withholding of information can void an insurance contract. The CIA agrees with this position.

## **CONCLUSIONS**

1. Genetic information (including family history) may or may not have relevance when underwriting a given insurance application. Insurers assess the predictive value of genetic tests (based on current knowledge) to clarify potential risk within the unique context of each applicant. The predictive value of genetic testing for common diseases is currently limited, but evolving. The CIA welcomes medical advances that can be reliably used in risk assessment, and considers genetic testing to potentially be another tool in underwriting insurance risk.

2. The CIA does not support mandatory genetic testing for insurance, nor the disclosure of test results without an individual's authorization. However, the Institute believes that if relevant genetic test results are available to an individual applicant, the results must be shared with the insurer in order to preserve the integrity and proper functioning of the insurance mechanism.
3. Genetic testing is unlikely to result in across-the-board premium increases for Canadians. As it becomes more reliable it may lead to improved risk assessment and classification. Premiums, in turn, would become more equitable, with some policyholders paying more and others less. Rates of accident, death, and illness in the general population will not increase simply due to the increased availability of genetic testing information.
4. Actuaries will play an important role in determining whether and under what circumstances genetic testing will be used for insurance purposes, and in balancing the issues of privacy, equity, and risk classification as this technology develops.

### **ABOUT THE CANADIAN INSTITUTE OF ACTUARIES**

The Canadian Institute of Actuaries (CIA) is the national organization and voice of the actuarial profession in Canada, with over 3,700 fully qualified actuaries who are Fellows of the CIA. The CIA follows its Guiding Principles, including Principle 1, which holds the duty of the profession to the public above the needs of the profession and its members.

The CIA serves both the public interest and its members by:

- Establishing and maintaining professional guidance, quality education programs, validation of eligibility, and continuing professional development requirements;
- Conducting relevant research;
- Maintaining a code of conduct and a disciplinary process of the highest standard; and
- Making meaningful and timely contributions to public policy discussions.