

Underwriting Genetic Information

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The talk in three parts

1. Insurance Basics
2. Underwriting Basics
3. Genetics and Life Insurers

Part 1: Insurance basics

A quick overview

Individual Life, DI, and LTC Insurance

- Life insurers offer life, disability income (DI), and long-term care (LTC) insurance.
- Insurers want to sell and issue insurance. We do not look for ways to decline applications.
- For the past 75 years, insurance coverage has become cheaper and more widely available.

Individual Life, DI, and LTC Insurance

- Individual means that each person
 - Decides when and how much to buy
 - Is underwritten or risk assessed only at the time of purchase
- Once underwritten, the price and terms of the contract cannot change even if the health of the applicant deteriorates.
- Claims may not be filed and paid for many decades.
- Long-term viability requires accurate risk assessment.

Group coverage is also available

- Life and DI products are also available as group insurance to employers, unions, and associations
- These group products are not individually underwritten.
- This means there is almost always some coverage available.

The main reason people do not have coverage

- They don't apply.

Differences between life and health insurances

	Life insurance	Health insurance
Decision to buy	Buyer chooses when and how much to buy	Annually as part of open enrollment
Underwriting	Can only be done at time of issuance	Generally none
Rates	Set at time of issue and cannot be changed	Reset annually based on prior experience
Benefits	Contracted amount paid to named beneficiaries	Paid to third-party providers for service provided

Part 2 Underwriting basics

Underwriting at the time of application is essential

- By law and regulation, insurers must demonstrate that
 - Individuals with similar risks are treated the same way
 - The treatment is justified by sound actuarial principles or reasonably anticipated experience.
- This is reinforced by regular visits from state auditors.
- Insurers only get one opportunity— at the time of application—to assess the applicant’s risk.

Sharing personal information

- Applicants have shared willingly their personal information with insurers for > 100 years.
- They trust us with the information and know that this sharing is part of how the process works so well.
- Insurers have a superb history of protecting private and personal information.

Medical underwriting

- Insurers use personal information to assess an applicant's risk.
- The rating puts each applicant into a pool with other people with similar mortality expectation.
- Insurers gather personal information including medical records with the consent of the applicant.
- The amount and kind of information gathered is proportional to the age of the applicant and the dollar amount of the policy.

Medical underwriting

- Underwriters follow written guidelines when assessing risk.
- Companies have medical directors with special training in life insurance risk assessment to
 - Ensure that highest standards are followed
 - Interpret medical advances and new tests

Underwriting advances as medical science advances

- As the science and knowledge advance, insurers look for ways to use information to improve offers where possible.
- Fifty years ago, people with a myocardial infarct were either uninsurable or highly rated. Today most people with heart attacks are offered insurance and some at very low ratings.
- Everyone who receives a rated policy should be encouraged to check back in with the company every few years.

Types of medical tests of interest

- All medical tests that help the physician treat also help the underwriter more accurately assess risk.
 - For a diabetic → the A1C and blood sugar
 - For a person with breast cancer → the hormone markers of the tumor
 - For a person with lymphoma → the genetic markers of the tumor

Adverse selection

- Adverse selection is information asymmetry between the applicant and the insured.
 - When the applicant withholds this relevant information, they receive a more favorable rating than they should.
 - Other more honest people will pay the difference.

Part 2 Genetics and life insurers

Genetics science

- The human genome's 23 billion base pairs exist in *every* cell in your body except red blood cells.
- Sequencing the whole genome is a research tool.
- Different cells only use specific genes at specific times.
 - Enamel is only made on teeth and bile is only made in the liver.
- We only have 20,000 genes.
- The majority of DNA is either regulatory DNA (turns other DNA on or off) or of unknown function.

Genetic tests

- Genes control the production of proteins and enzymes, which are essential for life but sometimes cause disease.
- Epigenetics is the control of which genes turn on or off and when.
- A gene mutation may be
 - Inherited
 - Turned on or off by lifestyle choices
 - Mutate later in life either spontaneously or in response to irritants (e.g., cigarette smoke)
- Only very rarely are inherited genes determinative.
 - Most genes are influenced by the patient's choices.

Genetics science

- Genes are only rarely determinative (e.g., cystic fibrosis).
- Genetic mutations may indicate an increased risk.
 - There is no one single gene for getting a heart attack.
 - The interplay of your lifestyle choices and multiple (think hundreds) genes determines whether you get a heart attack.
 - Lipids, inflammatory markers, nitric oxide production, endothelial functions, etc., etc.
- Your lifestyle also turns genes on or off (Smoker or not? Thin or not? Physically fit or sedentary?)

Genetics and insurance

- Genetic tests are becoming increasingly common in medical records
- Many diseases can be diagnosed by both genetic or protein tests. They are still the same disease
 - Familial hypercholesterolemia can be diagnosed by
 - A cholesterol (blood component)
 - An ApoB test (protein)
 - A genetic test (genetic)

Genetic tests can be helpful to people

- When inherited genes increase a health risk, the risk can be treated most often preventively
 - Familial Hypercholesterolemia with statins
 - Lynch Syndrome (an inherited colon cancer syndrome) with colonoscopy to find cancers early when they are more easily treated
- A genetic test can indicate that some cancers need much less aggressive treatment.

Genetic tests can be helpful to people

- A person with 2 aunts and one uncle dying of breast cancer in their late 40s
 - Based on family history, this person is at increased risk of a future cancer
- Their physician orders a BRCA panel
 - A negative test result removes the risk of disease (did not inherit the mutation)
 - A positive test shows they have an increased risk of future disease
 - Cancer is not a certainty
 - Their physician recommends increased surveillance to find any cancer at an early stage
- Insurers sell lots of insurance to people with breast cancer. A BRCA test on indicates a possible future risk. These are insurable, often at low rates.

Consumers should be able to benefit from advances in genetic science

- A negative genetic test forgives a positive family history
- Genetic tests can subtype cancers. These show that some cancers are less lethal than other cancers of the same type. This makes them more insurable at lower rates.
- Genetic tests can show which medications work best. This means the patient is more accurately treated, likely making them more insurable.

Direct-to-consumer (DTC) genetic tests

- DTC tests that give ancestry results, hair color, etc. are not of interest to life insurers because they do not predict mortality
- What do insurers want to know about DTC tests?
 - Insurers want to know when the DTC test result says, “We suggest you discuss this result with your physician.”
 - The physician will repeat the test using a known laboratory
 - Insurers want the confirmed test result that is in the medical record.

Insurers and genetic tests

- Insurers want to know what the applicant knows.
- Insurers want to use all the relevant information in the medical record including genetic test information.
- Insurers want to use the confirmed genetic test in the medical record that the physician has correlated with the patient's history.
- Insurers are not interested in a person's complete genome sequence.

Restrictions on an insurers use of genetic test information in underwriting

- Restrictions or limitations on the use of genetic tests in underwriting would create a special risk class that receives more favorable treatment and rates
- The resulting higher mortality costs would be paid by other policyholders

Conclusion

- Life insurers want to issue policies and coverage.
- Underwriting is one of the cornerstones of financial stability for the industry. The others are investment returns and expense control.
- Underwriting is strictly regulated by state law.
 - Like risks are to be treated the same, and insurers must be able to show they treated similar risks similarly.
- Genetic tests are one more bit of underwriting information in the medical record where they help physicians and underwriters better understand the disease.

Questions