Underwriting Genetic Information

March 2020

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