



SOCIETY OF ACTUARIES

Article from:

Health Section News

April 2003 – Issue No. 45



Health Section News

"For Professional Recognition of the Health Actuary"

Genetic Testing, Medical Progress and the Health Insurance Industry

by Bruce S. Pyenson

Genetic testing promises to be an important healthcare technology and it can profoundly affect the insurance industry. Public policy experts, ethicists and legislators have spent a lot of effort discussing how to regulate genetic testing, but the insurance industry and actuaries play almost no role at all in that public debate. For reasons I will describe, I fear that without actuarial input, we could end up with regulations that poorly serve both the public and the insurance industry.

This article is taken from a presentation I gave at the SOA's Boston meeting in Fall 2002. That session focused on genetic testing and health insurance as will this article. A United States Senate Republican staffer spoke on genetic testing legislation, and a technical researcher who has been active in ethics spoke on why the technology of genetic testing poses unusual social issues. The text of presentations will appear in a forthcoming *Record*.

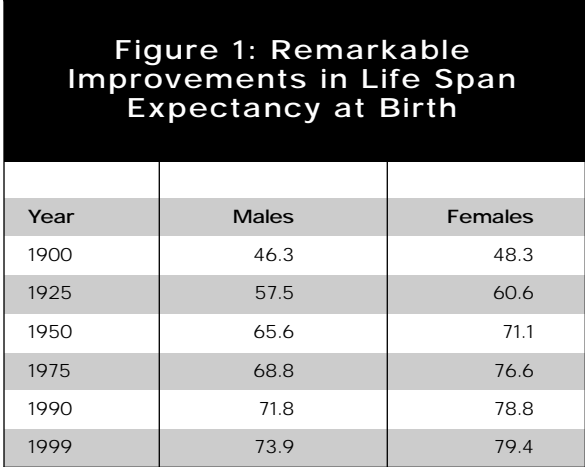
The American Academy of Actuaries (AAA) recently issued few statements on genetic testing as it relates to long-term care insurance (LTC) and health insurance, and a recent article in *Contingencies* addressed related life insurance issues. However, the genetic testing debate has been gone for years. Some of the genetic testing discussion documents available through the National Institute of Health and on various Web sites are more than a



decade old. Academics and other professionals have built whole careers on the topic. I hope this paper will help inform you on this important issue, so the profession will have the member support to get involved.

Genetic testing involves identifying "misspellings" in DNA. Some misspellings are very specific—all of the people with that flaw get the disease—while others define a susceptibility that also depends on environmental factors. Some genetic diseases manifest themselves at younger ages, while others may not appear until old age. As we will see, the specificity issue can have important impact on insurance.

(continued on page 4)

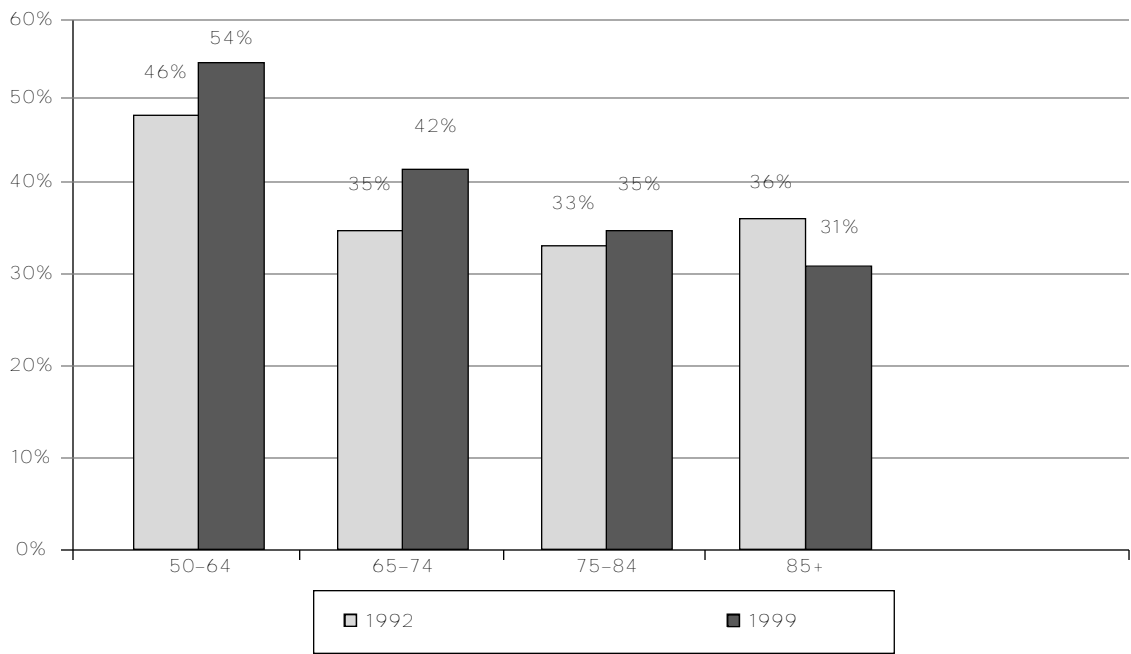


Similar pattern for people age 65 and 75

National Vital Statistics System: *Health, United States, 2002*, Table 28, p. 116

Figure 2: Americans Are Getting Healthier

Total Population Who Self-Reported Excellent or Very Good Health, 1982 and 1999



AARP, *Beyond 50.02: A Report to the Nation on Trends in Health Security*, Source: National Center for Health Statistics, Trends in Aging Database, unpublished data, August 2001

Disease-specific genetic research usually starts with identifying the particular genetic misspellings associated with that disease. Genetic testing for those flaws can follow quickly. Identifying the flaws provides the leads for understanding the disease, which brings the promise of treatments and cures.

Genetic Testing in the Context of Medical Progress

In my opinion, genetic testing and, more broadly, the genomic revolution are the next steps in the amazing story of society's improving health. What we now call life science has fundamentally changed medical care. That story shows accelerating progress from roughly the middle of the 1800s—the great chemist Louis Pasteur and germ theory, the development of antibiotics—to more recent developments—hormone replacements (including insulin) and the emergence of specialized medical devices. Today the revolution continues with computer chips and microdevices, and as new pharmaceuticals move from today's breakthrough enzyme-based medicines and into genomics and proteomics. The improvements in medical care and public health are truly amazing.

As Figure 1 on page 4 shows, the life expectancy at birth has profoundly increased through the 20th century. Evidently, living in an industrial society is good for your health, and for both males and females, life expectancy has increased dramatically. This, in fact, is the case throughout the world. The United Nations recently stated that mortality rates are improving throughout the world. The same pattern holds in the United States for people in the oldest cohorts—age 65, age 75 and so forth. Life expectancy is improving across the board, and mortality experts predict it will continue to improve. Sanitation, better food and housing, a safer society have played vital roles in that progress along with what we more narrowly consider medical practice improvements.

Health status seems to be improving along with longevity. About 20 years ago a controversial theory was aired called the compression of morbidity. The theory says that we're living longer to actually spend less time disabled. The dismal, if common sense view is that we are living longer but spending more time disabled and sick. Happily, statistics support the compression of morbidity theory.

Figure 2 on page 4 is based on Centers of Medicare and Medicaid Services (CMS) statistics. It shows the population who reported "excellent" or "very good" health, compared over a course of roughly 20 years. More people are saying they're healthier. The statistics for nursing home stays shows the same phenomenon.

Insurance and Progress in Healthcare

There have been dramatic improvements in Americans' health, even recently, and certainly over the 20th century. I believe the role of insurers in that improvement has been very important and largely unappreciated.

These days, it seems to be part of popular culture to hate health insurers and pharmaceutical companies, but the fact is that a lot of the progress that has come in the course of the last 40 or 50 years has been due to pharmaceutical and insur-



ance programs, including Medicare—the largest insurance company in the world (as it sometimes describes itself). I want to elaborate on how insurers, especially, have promoted better health and ask whether insurer use of genetic testing may also lead to better public health.

One example of insurers' public health role is disease management programs. Today, disease management is a billion-dollar industry—spent

(continued on page 6)

through insurance companies and disease management outsource companies. Disease management is performed directly for employers, sold to insurers or performed by insurers themselves.

Today, it is largely the pharmaceutical industry salespeople and the insurance company medical staff performing disease management that educated the medical profession to adopt this standard of practice. I believe that the actions of these two “hated” industries—the pharmaceutical industry and the health insurance industry—have changed the treatment pattern for asthma for the better—towards evidence-based medicine.

Information from genetic testing can threaten the stability of certain kinds of insurance.

Improving physician practices is also implicit in the Health Employer Data Information Set (HEDIS) measures. HEDIS measures include the appropriate use various pharmaceuticals and other basic evidence-based medical practices. These apply to chronic conditions such as asthma, coronary artery disease, congestive heart failure and diabetes. These quality measures represent a huge expenditure on the part of the insurance industry, employers and to some extent, the federal government. The HEDIS focus is one example of how the insurance industry promotes new technology and better physician practices.

The growing use of much medical technology is linked to reimbursement. This isn't the place to discuss the abuse of technology, which is real. But stable reimbursement has promoted beneficial new technology. Medicare has been fairly consistent about adjusting RBRVS (Resource Based Relative Value Schedule) as well as creating HCPCS codes for new devices, and the American Medical Association has been fairly consistent about adding new CPT, common procedural terminology) codes for new technology. Funding has been available for new technology.

Payment for tests and vaccinations is an important public social issue. The government, through regulations and reimbursement policy, requires some services (such as child vaccinations) and encourage others through benefit mandates and reimbursement.

Insurers are even promoting genetic testing in a non-controversial way. It is mostly associated with diagnosing particular kinds of cancer to fine-tune the chemotherapy or other treatment. Most of you people in the audience work in health insurance. If your company is paying claims for patients with leukemia or other kinds of cancer, your company is probably paying for tissue testing for genetic markers.

Why Genetic Testing Can Threaten the Insurance Industry

While genetic testing promises huge advances in treatment, it may also cause adverse selection. Traditionally, insurers assume that the applicant may know of risks that the insurer doesn't know about, and the applicant makes decisions based on that. The example everyone uses is the applicant knows his or her house is on fire, but the insurance company doesn't know it. The traditional ways of protecting include policy terms, underwriting, Medical Information Bureau checks, risk classification and risk rating.

Information from genetic testing can threaten the stability of certain kinds of insurance. For example, the people who test positive for diseases needing long-term care are more likely to buy LTC insurance. The technology for that to happen probably does not yet exist. However, a strong, predictive test for Alzheimer's, combined with a ban on insurers having access to that information, could cause insurers to stop selling LTC insurance.

So, if you're a health benefits insurer, in the future you will likely be paying for genetic tests for someone who wants to see if he or she is inclined to get Alzheimer's. The person likely to get Alzheimer's can then invest in long-term-care insurance, perhaps even from the company that paid for the genetic test! Insurance 101 teaches that a stable and competitive insurance industry is good for society, but *future* genetic testing could sharply reduce the availability of LTC insurance or other types of insurance.

Potential Societal Benefits of Underwriting

I'd offer another kind of social benefit of underwriting—beyond enabling a stable insurance industry. Underwriting can serve the public by identifying hidden but treatable conditions.

Currently, life insurers routinely test for hepatitis C—HCV. HCV infects approximately 2 percent of American adults under age 65. The disease can remain asymptomatic for decades, but it can progress to liver failure and death. HCV is largely undiagnosed because it's often asymptomatic for long periods.

Life insurance testing is one of the main ways people discover they have HCV. The disease is treatable and potentially curable through pharmaceuticals. Lifestyle changes, including giving up alcohol, can have a profound impact on the infected individuals' health. This is an example of how underwriting and individual's is in the public health interest.

I believe that the overlap of underwriting and the public good for HCV may extend more broadly to genetic testing. Genetic testing can help identify treatable or avoidable risks—which sounds like it's in the public interest. That commonality may very well exist, but if we don't discover it, we could face poorly conceived legislation that discourages genetic testing and hurts both the insurance industry and public health.

I think that genetic testing will be part of the routine physical of the 21st century. If I'm right, we need to add the results of genetic tests to the list of what the applicant can know about but the insurer doesn't. That can certainly lead to adverse selection, as individuals imminently facing some particular high risk choose to insure themselves against that risk. However, as described below, several factors may moderate the risk of adverse selection.

My view is that genetic tests are going to be followed fairly closely by effective treatments, given the rapid acceleration of medical technology and medical treatments. The connection between the two and the incredible acceleration in the progress of medicine suggests treatment or medical risk-amelioration will quickly follow many of the identified genetic conditions.

How Big a Risk?

Can genetic tests really tell the future? I think for most diseases the answer today is "No," and it's going to continue to be "No." The public is likely to overreact to the results of genetic tests. That could actually be a good thing for the insurance industry, depending on what kind of insurance you're selling.

I use the term "likely low specificity." The technical term among genetic scientists is "low penetrance." That is, someone who gets genetic test results saying he or she is likely to die of heart failure or cancer (I could probably guarantee that now for most readers) is likely to overreact and run out and buy insurance. Genetic testing could lead to a surge of insurance buying!

I think that genetic testing will be part of the routine physical of the 21st century.

On the other hand, depending on what kind of insurance you're selling, this is potentially a huge threat. If you're in long-term care, if you're in long-term disability, people with the "clean" tests will avoid buying some kinds of insurance, especially if they also have healthy lifestyles. People who test positive for some of those conditions, or can cause adverse selection.

Particularly scary to me are unintended consequences of well-meaning legislation. We're close to the 35th anniversary of the federal Medicare program. Medicare benefits are still based on the benefit wisdom of the 1960s—there is no prescription drug benefit in Medicare because prescription drugs were not a big issue in the 1960s. The rules now being set for genetic testing, an emerging science, could be with us for a very long time. These rules could profoundly affect what insurers are allowed to do, the kinds of products they sell and the profitability of different lines of business.

Our industry, our profession, needs to identify a common ground for this emerging science that is, I hope, an unqualified good for public health, the future of our individual health and the insurance industry. To identify people at risk for treatable diseases is a common public good. Please support the efforts of the AAA to get actuaries involved in this great issue of our times. 📧



Bruce S. Pyenson, FSA, MAAA, is a principal at Milliman USA in New York, NY. He can be reached at bruce.pyenson@milliman.com.