On August 9, 2011, SCOR SE, a global reinsurer with offices in more than 31 countries, acquired substantially all of the life
reinsurance business, operations and staff of Transamerica Reinsurance, the life reinsurance division of the AEGON companies. The business of Transamerica Reinsurance will now be conducted through the SCOR Global Life companies, and Transamerica Reinsurance is no longer affiliated with the AEGON companies.

While articles, treaties and some historic materials may continue to bear the name Transamerica, AEGON is no longer producing new reinsurance business.

**Archive Materials**

**Hereditary vs. Genetic Disorders in Mortality Risk Assessment**

Reprinted from the June 2011 Messenger newsletter

Steve Zimmerman, MD, Vice President & Chief Medical Director

Family history has been long recognized as an important factor in risk assessment for life insurance. There are numerous examples of diseases that have very high correlation with family history, based upon the genetic nature of the disease. Those include autosomal (dominant and recessive) disorders and those that are associated with mutations on the X chromosome. These latter are referred to as X-linked diseases, and can be dominant (rare) and recessive.

Autosomal dominant diseases include Huntington’s disease and polycystic kidney disease. In these cases, only one altered gene is necessary for the disease to be transmitted from parent to child. Thus, if one of the individual’s parents has an autosomal dominant disease, each child has a one-in-two chance of inheriting it. Autosomal recessive disorders require mutations in both genes, and an individual must inherit the alteration from both parents. In these cases, there is a one-in-four chance of passing the disorder to the child. In addition, it is likely that neither parent will exhibit the disease. Examples include sickle cell anemia and cystic fibrosis. Finally, for the X-linked disorders, the abnormality is on the X-chromosome. For the recessive disorders, such as hemophilia and Duchesne muscular dystrophy, a male has a 50 percent chance of inheriting the disorder from his mother who is a carrier; he cannot inherit the disease if the father is the carrier. For a female to inherit the disorder, both mother and father must be carriers (with some rare exceptions).

More commonly, diseases fall under the category of polygenic disorders. While these disorders are not completely inherited, there may be a slight familial inheritance. A significant risk factor in such disorders is a family history of disease. However, these diseases are also influenced by environmental factors, such as diet and exposure to toxic materials (e.g., tobacco smoke, asbestos). Examples of these multi-factorial diseases include coronary artery disease, diabetes, breast cancer, obesity and autoimmune diseases. While in some of these disorders family history is the most significant risk factor, in others it is only a minor contributor to the risk.
Family History and Cancer

In life insurance, a great deal of emphasis has been placed upon the family history of cancer in determining if an individual qualifies for the best available rates. I believe this emphasis has been misplaced.

As physicians, we do not dispute that all cancer is due to genetic abnormalities. However, there is a significant difference between hereditary disorders and genetic disorders. All hereditary disorders have one or more genetic mutations. What makes hereditary disorders different from “acquired” genetic disorders is that in the former the genetic mutation is in all cells in the body since it is obtained from one or both parents from conception. In cancers that are due to acquired genetic mutations the defect is only in the affected cells.

The BRCA1 gene, which has a strong association with breast cancer, is present in all cells in the body. That is why BRCA mutations are associated with other malignancies such as ovarian and gastrointestinal cancers. For non-hereditary breast cancer the genetic mutation occurs only in the breast tissue, and if the body is unable to eradicate the cells with the mutation, then uncontrolled growth occurs in the breast tissue leading to the detectable malignancy. The risk of second malignancies is much lower in these individuals than in individuals who acquire the cancer through hereditary disorders.

In addition, while hereditary cancer is associated with a high likelihood of developing a malignancy in the offspring, these account for a very small percentage of all cancer-related mortality. For example, while a woman with the BRCA1 mutation has an 85 percent lifetime risk for developing breast cancer, the likelihood that a woman with breast cancer will have this mutation is less than 10 percent. The single greatest risk factor for breast cancer is simply being a woman, with a lifetime risk of one in eight.

To my knowledge there are no actuarial or clinical studies that strongly associate the simple family history of cancer with increased mortality. Using early death (below age 60) in a parent due to cancer as a mortality risk factor fails to take into account a variety of external factors, including smoking status and medical care. Could we be insuring more of these individuals without adversely affecting our mortality results? The evidence appears to support it.