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

Non-Traditional Mortality Studies
Reprinted from the April 2010 Messenger newsletter

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Using the Social Security Administration’s Death Master File (DMF) provides the opportunity to perform non-traditional mortality studies – non-traditional in that they are not subject to the constraints of policy issue and policy administration. Non-traditional mortality studies can provide important information about underwriting decisions, the predictive value of laboratory tests, the accuracy of life expectancy (LE) estimation or post-lapse mortality.

In many situations, there will be repeated encounters: Multiple underwriting decisions at different points in time with changing medical history; multiple lab tests at different points in time with different results; multiple LE estimations. The multiplicity of encounters begs the question: Which encounter should be used to define the onset of exposure to risk – the first, last or every?

When It’s About People Not Policies
The question does not arise in traditional experience studies. These are policy-centric with both actual and expected mortality measured in dollars and based on face amounts. Exposure is defined by policy anniversaries. Were the question asked here, the answer would be “every,” because every policy counts, no matter how many apply to a single policyholder.

However, traditional experience methods pose problems, especially if the interest is in the quality of underwriting decisions, the predictive ability of lab tests or patients in clinical settings. In the case of life insurance, not all applicants are made an offer and not all offers are placed. Lapse of those that are placed rapidly erodes the exposure available for study.

Using the DMF for mortality follow-up sidesteps these issues but raises a new one: Which of multiple underwriting (or other) encounters should be used for mortality study? We know of one applicant who was underwritten more than 50 times in less than a decade, but only three or four policies were placed. This large number is uncommon but two, three, six or ten are not. Similarly, if the study interest is lab tests, many individuals get multiple lab tests over the years.
Figure 1 displays the weighted average of the four discrete underwriting encounters.

When performing exposure-based mortality analysis, it may not be desirable to use every encounter. Over-representation of repeaters can bias both the exposure and the actual death count when a repeater dies. The easiest thing to do is to choose just one encounter – but which one? Some argue for using the most recent (last), but the desire to maximize exposure leads us to prefer the first.

If we choose “every,” we first eliminate what we consider to be redundant encounters. Facultative underwriting provides an example of redundancies in what can be called rubberstamping. We frequently see identical requirements from more than one company and we strive to make identical offers to each. Clearly, this should count as a single encounter not as several. In fact, we ignore any event where there is no substantive change in the evidence of insurability, even if separated by a long period of time. The resulting set of non-redundant encounters is satisfactory for Cox Proportional Hazard modeling and many other uses, but it is not optimal for exposure-based mortality study.

**The Weighted Every Approach**

For experience-type studies, the best solution is the weighted-every approach. In a nutshell, it works like this:

- Eliminate redundant encounters.
- From the point in time of an individual’s first encounter, the weight for exposure (and death, if necessary) is one. If there is a second encounter, the weight for the first is changed to one-half at that point in time and the second starts at one-half. If a third encounter, one-third all around, and so on. If the weight is one-quarter at the time of death, each of the encounters (each being a unique set of attributes) is assigned one-fourth death.
- Thus, a subject only contributes one person-year of exposure for one year of follow-up and a subject who dies contributes only one death – no matter how many encounters!

This can be very complex to follow – and to implement. We offer additional diagrams on our website to help you visualize what is happening, and we offer Stata code to show how weighted-every can be implemented. Please contact us if you have an interest in these issues or you would like assistance with DMF-matching.