

# LifeSelect™

*Fasano Associates' top priority is providing Accuracy, Consistency and Professionalism in estimating life expectancies!*

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## The Actuarial Syndrome

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It goes without saying that the actuarial function is a critical part of our business. We believe that a combination of medical expertise and actuarial insight are the two key elements required to provide consistent and accurate life expectancy estimates. We need both physicians with insurance medicine and clinical experience to reliably establish relative mortality and talented actuaries to develop mortality tables that establish survival (and mortality) patterns over time.

Unlike life insurance underwriting, which is mostly focused on healthy lives, life settlement underwriting requires assessing the risk of both healthy and very impaired lives, as well as everything in between. The wide range of files we have reviewed has given us great insight into the relationship between the pattern of mortality over time and level of impairment. One of our most important findings has been that the *level of impairment has more to do with the pattern of survival than the impairment itself*. A failure to understand this dynamic can lead to significant mistakes in estimating life expectancy. We refer to this failure as the **Actuarial Syndrome**, which is:

- Assuming that large populations — by definition — are always good;
- Failing to ensure that populations are comparable; and
- Averaging and extrapolating inappropriately.

We have been underwriting cases for the life settlement market since 2001, while our two

major competitors have been estimating life expectancies even longer. However, the life settlement market did not become statistically robust until 2003. Thus, we only have about seven good “durations” (or years) of life settlement mortality experience. This means that we all have to extrapolate from other populations when estimating the pattern of mortality over time. We believe it is critically important that any such extrapolation makes appropriate adjustments for population differences related to differences in income levels and level of impairment.

### *Problems with Population Data*

Large population databases, such as **Medicare**, are often based on heterogeneous populations that include poor as well as rich, those with and without life insurance and those who have always had good health care along with those whose only health care has been provided since they became Medicare eligible. In addition, Medicare and other government databases do not distinguish smokers from non-smokers and often do not discriminate by severity of disease.

According to AARP, 17% of Medicare beneficiaries have incomes below the federal poverty level and almost 70% have family incomes below \$44,000 (based on 2010 Poverty Guidelines and assuming average family size of two persons). Another interesting Medicare statistic has to do with the type of services used: A full 35% of Medicare spending is for hospital services, 18% is for managed care and 9% is for home health or nursing care.

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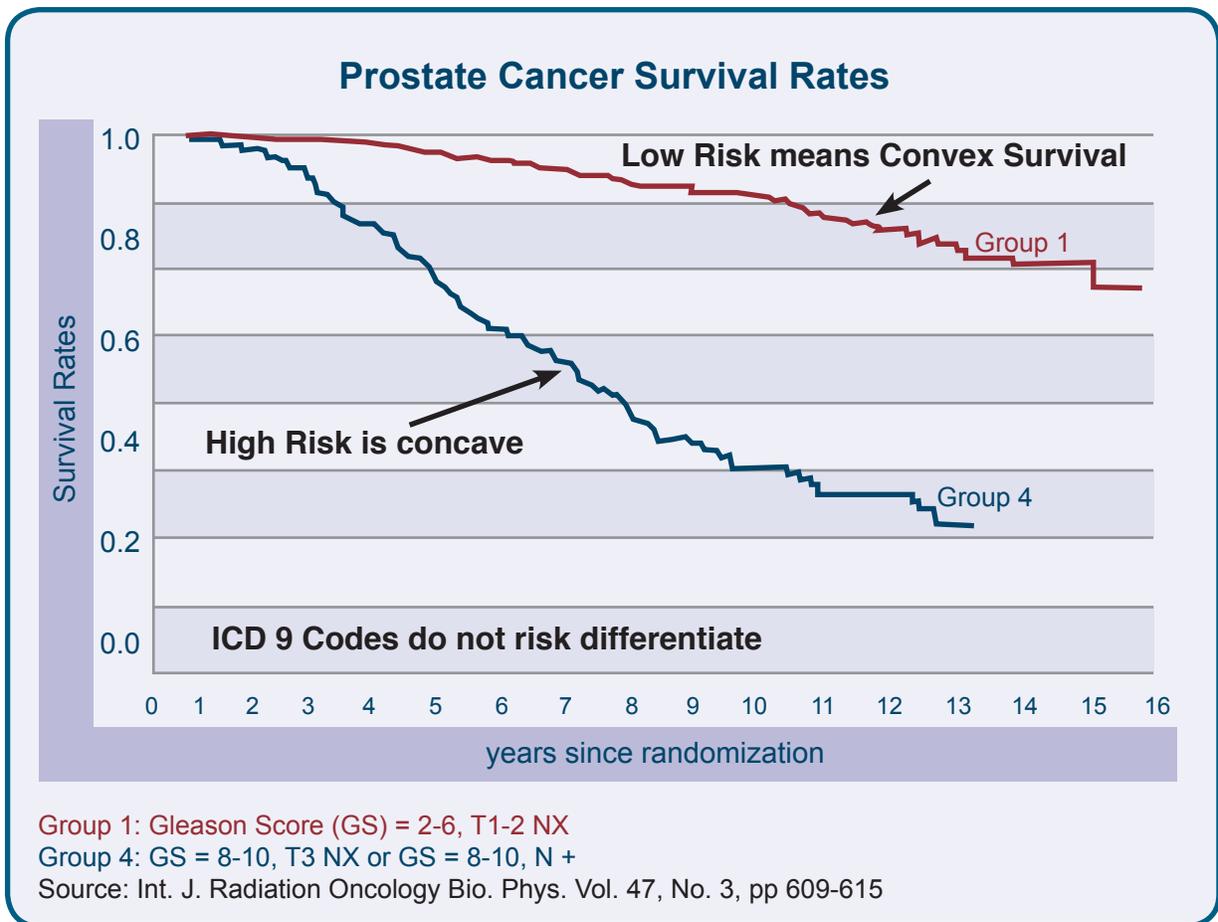
This adds up to 62% of Medicare spending for what likely are the most severely impaired of the eligible population. Only 26% of Medicare spending is for the usually more benign physician and other fee-for-services, while 12% is spent on outpatient prescription drugs.

The life settlement population, on the other hand, is a wealthier, more homogeneous population that has had better access to health care. In short, **the Medicare population is both poorer and sicker than the life settlement population.** Extrapolations from Medicare or other government databases can **result in inflated mortality**

**ratings**, life expectancy estimates that are too short and survival patterns that are too concave.

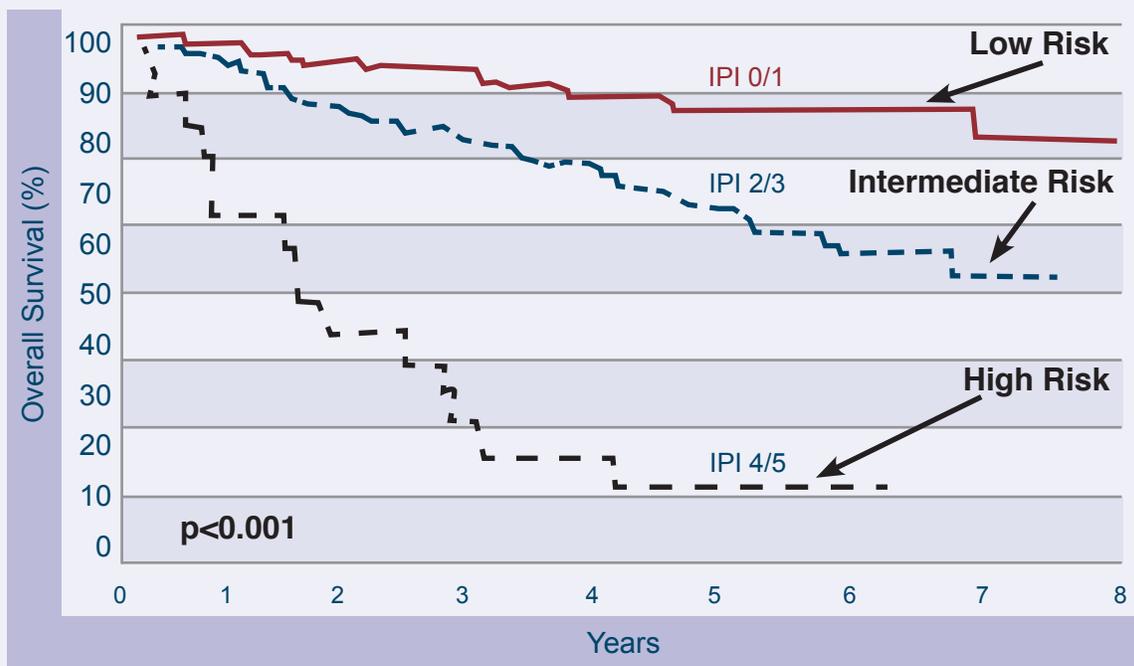
**Survival Patterns Related to Level of Impairment**

One of the least understood dynamics of life settlement underwriting is the difference in survival patterns between low and high risk impairments. Low risk impairments often have a convex pattern of survival, while high risk impairments often have a concave pattern of survival. This differential pattern of mortality is illustrated below in risk differentiated survival curves for three different impairments — prostate cancer, follicular lymphoma and cardiomyopathy.



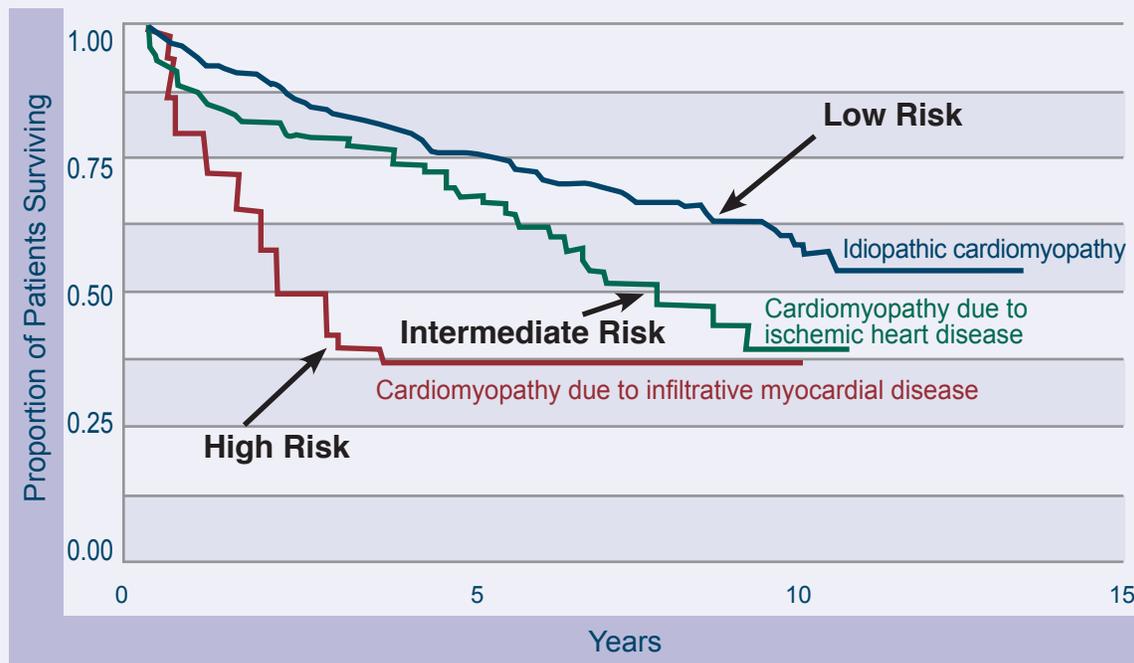
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### Follicular Lymphoma Survival Curves



Source: AJCC Cancer Staging Handbook 6th Edition 2002

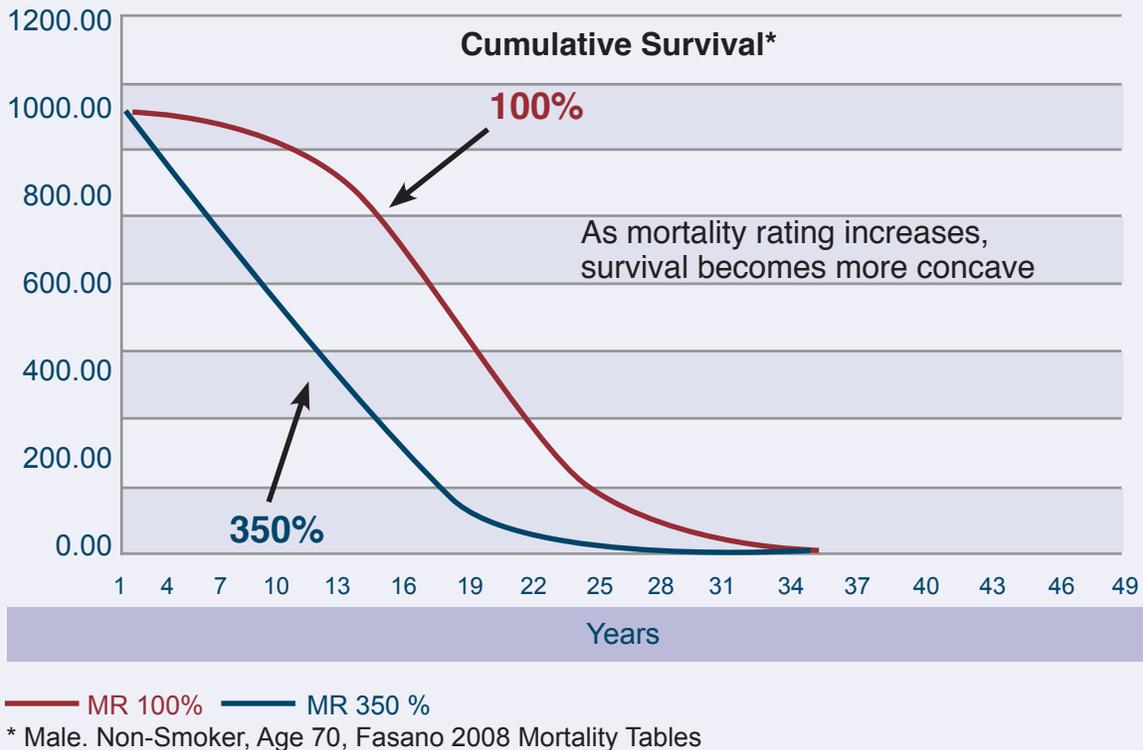
### Cardiomyopathy: Survival Curves Based on Underlying Cause



Source: NEJM, vol. 342, Number 15

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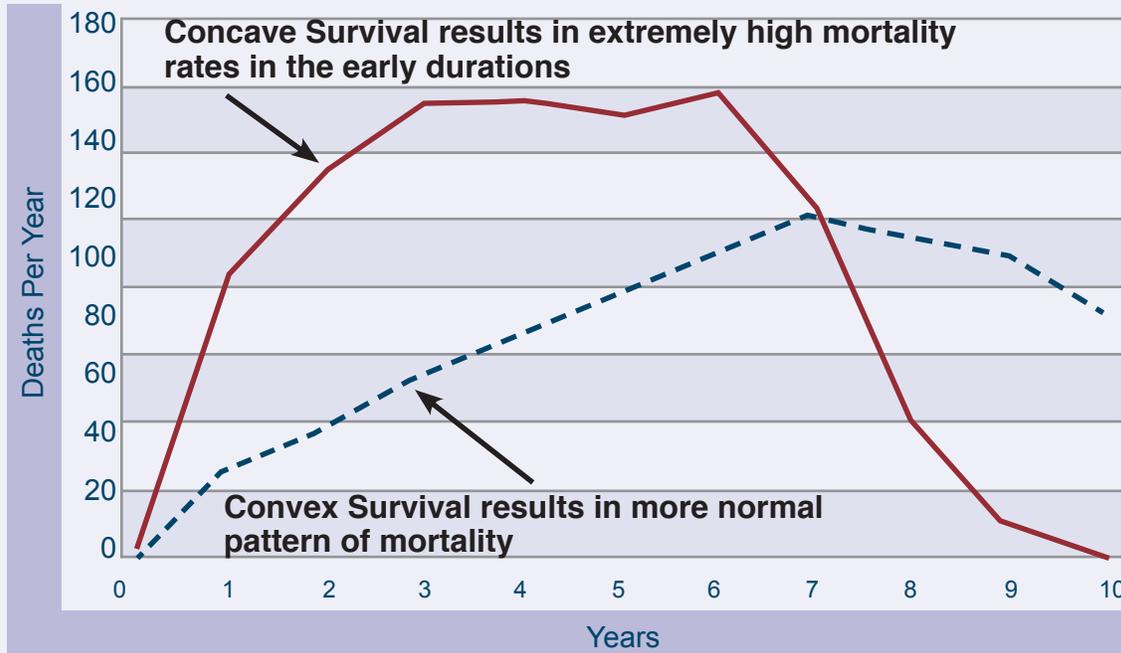
## Low Risk Profile Impairments Have Convex Survival



Time and again, we see this pattern of transition from convex to concave survival as the severity of impairment increases. The concave pattern of survival that is associated with the most severe diseases translates into very high mortality rates in the early durations that taper off or wear down in the later durations. Population databases with poorer and sicker people, like Medicare, will project greater concavity in survival than we see for most cases in the life settlement market.

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## Mortality Curves for Concave and Convex Survival Patterns



Underwriters who naively use a database (like Medicare) that doesn't distinguish smoker status, level of impairment or income level, are more likely to project an overly concave pattern of survival that should only be associated with the more severely impaired. This would **result in overstated mortality ratings and underestimated life expectancies** for most impairments while ratings for the most severe impairments would be understated. In short, they will more likely get it wrong most of the time.

Unfortunately, such underwriter mistakes can cost investors dearly. When too much concavity is estimated in survival curves, investors will overpay

for the associated life policies. Correspondingly, for the most extreme cases, if too little concavity is estimated, investors will miss buying opportunities. These pricing errors can also result in costly portfolio valuation errors.

The temptation to use large, population based databases in developing mortality curves for life settlement business is great, but if we don't avoid the Actuarial Syndrome in using such information, the mistakes we make and the consequences of those mistakes will be even greater.

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