Longer life?

Is the life expectancy of severely injured claimants really increasing?

David Strauss of the University of California Life Expectancy Project examines the evidence

The largest part of a catastrophic injury award is generally the cost of care for the balance of the claimant’s life. In cases of severe cerebral palsy, spinal cord injury or traumatic brain injury, these costs typically run to several millions of pounds over the lifespan.

The cost of lifetime care has two main components:

- the annual cost of care; and
- the number of years the claimant may be expected to survive.

The second issue – life expectancy – is the subject of this article. In the case of normal life expectancy, the appropriate figures are enshrined in the Ogden Tables. However, for persons with severe disabilities, and thus reduced life expectancy, the issue is often contentious.

It has been argued that the life expectancy question becomes moot if, instead of receiving a lump sum for life, the claimant receives a guaranteed stream of periodic payments for life – a so-called structured settlement or life annuity. In this case, the uncertainty over the claimant’s expected life span becomes an issue for the defendant (or the defendant’s insurer) rather than for the claimant. The option of periodic payments has been much discussed recently, and it appears the Lord Chancellor’s office may shortly announce changes that will encourage this in some cases. Nevertheless, the issue of life expectancy seems unlikely to disappear entirely in the near future.

In PILJ (September 2002, p2), Julian Chamberlayne has argued eloquently that life expectancy both in the general population and in persons with severe disabilities is increasing dramatically. If so, this should presumably be reflected in larger awards. The aim of this article is to review the evidence on increasing life expectancy, and to discuss its implications for litigation.

What is life expectancy?

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What is life expectancy?

To begin with, it will be useful to dispel a common misconception about life expectancy. An individual’s life expectancy is not a prediction of how long they will live – such a prediction is both impossible and unnecessary to make. Instead it is the average number of additional years of life in a very large group of similar persons. This average is based on a set of mortality rates for persons of age one year, two years, and so on up to age 105. As such, it is a convenient summary of these age-specific mortality rates, and therefore a widely used indicator of overall health in a given population at a given time.

As an example of the distinction between life expectancy and survival time, the life expectancy of a UK male of age 70 is known rather precisely from government statistics – 11.9 additional years. But 10% of 70-year-old men will die in the next four years, while another 10% will survive well into their 90s (The Stationery Office (1999), Interim life tables, 1996-1998). Clearly, even in the general population, it would be foolish to predict how long a given individual will live. Nevertheless, the cost of care ‘multiplier’ is exactly specified in Table 19 of the Ogden Tables – it is 10.86. So, for example, if the annual cost of care is £100,000 then the award for total cost of care will be £1.086m.

The confusion of life expectancy with prediction of actual survival time leads to erroneous statements such as:

The claimant’s severe disabilities make him at risk of respiratory infections, deep vein thrombosis, and other medical conditions. Nevertheless, it is more likely than not that he will survive for the foreseeable future despite these complications, especially with good care. That is, it is more likely than not that he will live a normal life span. Therefore his life expectancy should be considered normal.

The error of this argument is immediately clear when one recalls that life expectancy is the average number of additional years in a large group. So even if only 10% of the group die prematurely of complications, the result...
Trends in life expectancy in the general population over time

Life expectancies have been tracked in many developed countries for nearly 100 years. There is no question that for the most part, life expectancy has been increasing. In ‘Broken limits to life expectancy’ (Science 296:1029-1031), Oeppen and Vaupel provide a graph of ‘best practice’ life expectancy from 1840 to the present. (Best practice refers to the highest reported life expectancy in any country during that calendar year.) The result is a remarkably steady annual increase of one quarter of a year. If this continues, it would mean, for example, a 15-year increase in life expectancy in 60 years’ time.

Secondly, despite the impressive regularity of the increase in the past, there is no guarantee that it will continue in the future, as recent events in the US stock market have confirmed. Oeppen and Vaupel note that, in the first half of the 20th century, most of the improvement was in infant mortality. This is now low in Western countries, and the main source of further improvements must be reduction in heart disease and other diseases of the circulatory system in adults and the elderly. Many epidemiologists warn, however, of a worldwide epidemic of obesity, with a corresponding increase in rates of heart disease, diabetes and other serious conditions.

Thirdly, it could be argued that the most appropriate guide to the trends in a given country is that country’s own experience, rather than the somewhat artificial ‘world’s best practice’. Certainly, Oeppen and Vaupel do not claim that their one-quarter-of-a-year annual increase applies to any specific country. In the UK, reductions in mortality rates over the years have been plotted and extrapolated into the future by the government actuary’s department. The result is the government actuary’s projected life tables, which are reflected in Ogden Tables 19-36. Their counterparts, Tables 1-18, are instead based on current mortality rates. These tables were constructed specifically to reflect projections of future improvements, and indicate an approximately five-year increase in life expectancy at birth compared to current mortality rates.

Projected rates now appear to be accepted as the legal standard for

What does this mean for personal injury litigation in the UK?

First, it does not mean that a 20-year-old claimant, who will be 80 in 60 years’ time, has an estimated 15-year increase in life expectancy. This increase would apply, hypothetically, only to an infant born 60 years hence by comparison to one born now.


The same faulty reasoning would lead to the incorrect conclusion that a normal ten-year-old boy has the same life expectancy as that of a ten-year-old girl (the difference is actually seven years, according to current mortality rates).

In this brief article it is not possible to provide technical coverage of life expectancy and related issues. Interested readers are referred elsewhere (see boxes). Many of the articles discussed in this essay can be viewed on, and downloaded from, the Internet.
persons with ‘normal’ life expectancy. There does not appear to be any evidence to suggest that the Ogden Tables are unduly conservative and should be abandoned.

**Improvements in life expectancy in spinal cord injury patients**

Of the major types of chronic disability, spinal cord injury has perhaps the largest scientific literature on mortality and life expectancy, with major studies from Britain, Canada, Australia and the United States (see box). During the last few decades there has been dramatic improvement in survival of ventilator-dependent patients. There have also been substantial improvements in the survival rates of all groups of patients during the critical early period (up to two years) after spinal injury. This is no doubt due in part to advances in medical care and therapy.

In most personal injury cases, awards are made several years after the injury occurred. The most statistically-sensitive investigation of long-term trends in a large US spinal cord injury database found that, after the first three years post-injury, mortality rates have not declined appreciably in the last decade (Strauss et al, 2000). However, ventilator-dependent patients may represent an exception. Indeed, DeVivo et al (1999) suggest that long-term spinal injury mortality rates in the US may actually have increased recently.

**Improved survival in traumatic brain injury?**

Here again, it is likely that survival during the critical early period after traumatic brain injury has improved in recent decades. With regard to long-term survival, there is much less data than is available on, for example, the spinal cord-injured. The largest database may be that of the University of California Life Expectancy Project, which has not detected any trends in long-term mortality rates during the last decade (see box).

**Trends in survival in cerebral palsy**

It is often asserted that life expectancy in cerebral palsy has been increasing steadily. While it is likely that survival of persons with cerebral palsy has increased since, for example, the 1950s, the case for such a trend during the last 20 years is much weaker.

The University of California Life Expectancy Project has reported substantially improved survival of infants with extremely severe disabilities (so-called ‘vegetative state’ – see box), and there may be some evidence for improved survival in children with very severe disabilities. For higher-functioning children, and for all adults, however, careful examination of the data has revealed no evidence of a trend. Published studies from Britain and Australia also failed to detect a trend.

**Should we rely on evidence or guesswork?**

The discussion so far has focused on what the facts say rather than on what has been speculated or guessed at. Indeed, many people prefer solid facts to educated guesswork. Not everyone agrees, however. The issue is sometimes disguised as a discussion over who should give evidence to the court. It may be presented as a choice between statisticians or actuaries on the one hand, and clinical experts on the other.
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Life expectancy in cerebral palsy

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<th>Author(s)</th>
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<td>Hutton JL, Pharoah POD (2002)</td>
<td>'Effects of cognitive, motor, and sensory disabilities on survival in cerebral palsy'</td>
<td>Archives of Disease in Childhood, 86:84-89. Includes commentary by Dr Lewis Rosenbloom.</td>
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As noted by Julian Chamberlayne in his article, one Court of Appeal judge (Sir Anthony Evans in Royal Victoria Infirmary and Associated Hospitals NHS Trust v B (A Child) [2002]) opined that:

The court must still rely primarily, in my judgement, on expert medical witnesses. It would be wrong to allow a statistician, or an actuary, to do more than inform the opinions of the medical witnesses and the decision of the court, on what is essentially a medical, or clinical, issue.

I think that the wrong question is being discussed here. In science, at least, one does not ask 'whose opinion is it?' but rather 'what is the evidence for it?' With respect to life expectancy, the real choice for the court is between relying on evidence – regardless of who is presenting it – or on unsupported guesswork.

My impression is that the preference for clinicians’ speculation over scientific evidence in some courts is a historical accident. It seems to have arisen some decades ago, before actuarial evidence on people with disabilities was available. This is no longer the case, and expert witnesses on life expectancy, both actuarial and clinical experts, increasingly refer to published studies and other evidence.

The comparison with life insurance companies may be of interest here – insurance companies rely on a medical examination to determine the applicant’s present condition then refer the case to the underwriters to assess the mortality risk, and hence the appropriate premium for the insurance. Such companies would never ask clinicians to assess the applicant’s life expectancy, considering this a question beyond their expertise. One explanation is that insurance companies have to estimate life expectancy correctly in order to survive.

Conclusion

It is heart-warming to believe that life expectancy of persons with catastrophic injury is rapidly increasing, and approaching that of the general population. An examination of the facts, however, suggests at best a mixed picture. Improved survival has been documented for a few groups, notably ventilator-dependent spine and infants and often with extremely severe disabilities. For other groups, including adults with cerebral palsy, the available evidence does not suggest improved survival in recent years.

When considering these issues, courts may prefer to rely on scientific evidence rather than on speculation.

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Case reference

Royal Victoria Infirmary and Associated Hospitals NHS Trust v B (A Child) (Unreported, but see Lawtel, 14 March 2002)