Jeanne Calment, Actuarial Paradoxography and the Limit to Human Lifespan

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Abstract

The case of Jeanne Calment and her exceptional longevity has attracted worldwide attention, detailed examination, and some skepticism. Most recently, it has been suggested that Jeanne Calment's record is spurious and the result of identity fraud by her daughter. Although there is merit to subjecting claims of extreme longevity to scrutiny, either validating or debunking a single case has a negligible impact on scientific knowledge of aging and lifespan.

Keywords: Jeanne Calment, mortality plateau, supercentenarians, validation

PERHAPS THE BEST-KNOWN FINDING from the field on gerontology, recognizable even to nonspecialists, is Jeanne Calment's unsurpassed longevity record. Her death in 1997 at the age of 122 attracted worldwide attention and has stood for more than two decades as the high water mark of human lifespan. With this attention comes doubt, and in his examination of demographic and documentary evidence,¹ Zak questions the validity of Jeanne Calment's record longevity and proposes that her identity was assumed by her daughter, who died at a much less remarkable age of 99 years old. Calment's longevity has attracted skepticism for some time, much of it justified by its extraordinary nature. However, the facts of her life have been extensively validated by Robine and Allard² and reviewed in Robine et al.³ The question of whether the issues raised by Zak¹ are sufficient to outweigh the evidence they have collected is left to the judgment of other commentators. That someone should live for >120 years seems unlikely, but so too seems the alternative, in which a case of identity theft passes undetected for >80 years, despite worldwide scrutiny.

A more pressing concern is what would the invalidation of Jeanne Calment's age at death mean for our understanding of human longevity? In short, not much. No scientific finding should hinge on a single data point, and Jeanne Calment's record, even if of utmost veracity, should not dictate the results of any analysis. Fortunately, those interested in the limits to human longevity do not have to worry about a revision to Jeanne Calment's age at death upending the field. Despite advances in the 19th and 20th centuries, survival at extremely old ages has stagnated⁴ and it is unlikely that anyone will live past 125, a finding that is

robust even if one or several data points (including, but not limited to, Calment's) are removed from the analysis.^{5–7} With time and an increasing population of supercentenarians, it is possible that Calment's record, whether genuine or not, will be matched or even slightly exceeded in the next century,⁸ but even the most optimistic analyses concede that longevity for supercentenarians is stagnant; this stagnation implies that observing an individual living much longer, such as to 125 or 150, is prohibitively unlikely.^{9,10} Analyses from large data sets of elderly individuals, drawing on Swedish, Dutch, American, and Belgian populations that do not include Calment, have also concluded that improvement in the human lifespan has ceased,^{11–14} and their results are naturally unaffected by the validity of her longevity.

If no analysis can or should depend on one person's longevity, however extraordinary, is there any use, then, to actuarial paradoxography, the practice of seeking the longest-lived people? In short, yes. Certainly, it would be futile to suggest that it be discontinued, as it has persisted for thousands of years.¹⁵ However alluring it may be, there is a temptation to dismiss actuarial paradoxography as a sort of stamp collecting, remarking on interesting cases without connecting them to a broader scientific theory. But it may rise above the level of gerontological philately by providing a set of rigorously verified data on which to base the study of aging and demarcating the boundaries of longevity. The current practices of the field represent a huge improvement over those of the past. If, for example, we were to revert to the ancient standards that allowed the Sumerian King List¹⁶ to be taken credibly, many scientists would waste their time

trying to reconcile the human life expectancy of a few decades with tales of kings living tens of thousands of years.

Thus, with regard to validating claims of extreme longevity, we can see that immense gains result even from minimal stringency in evaluation. Going further than that, perfection is something to be pursued, even if never attained. Perhaps the current list of validated claims contains a few that do not belong; perhaps clerical error has resulted in the exclusion of some genuine claims; and it is probable that a few people have attained supercentenarian status, but were never recorded as such due to being born in the wrong time or place (this last drawback somewhat mitigated by the fact that improvements in longevity and record-keeping tend to go hand in hand). However, the current standards of the field do well at preventing the most egregious cases from being taken seriously. There is always room for refinement and further improvement, but undue attention to the case of Jeanne Calment risks missing the forest for one very tall tree.

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