

## Length of life in the ancient world: a controlled study

**J D Montagu** MRCS LRCP *Formerly Department of Clinical Neurophysiology, Charing Cross Hospital, London*

*Keywords:* length of life; classical era

### Summary

The length of life for a population of ancient Greek and Roman men with quoted dates of birth and death has been compared statistically with three sample populations from different periods. It was found that the ancients who were born before 100 BC lived as long as the moderns who died before 1950; they lived significantly shorter lives than those who have died in the present half century.

### Introduction

It is axiomatic that the inhabitants of the ancient world did not live as long as we do today. For example, Deevey<sup>1</sup> reported that the average length of life in ancient Greece was 35 years whereas in classical Rome it was even shorter at 32 years. Dorn<sup>2</sup> revised these figures downwards to less than 30 years and contrasted them with the average of 70 years in North America and Western Europe in 1959-1960. In a more recent survey Garland<sup>3</sup> concludes that life expectancy for both men and women in ancient Greece was 'well below fifty'.

The figures quoted by Deevey and Dorn are estimates of the average length of life of every member of the sample population. This includes those who succumbed in infancy and early childhood, the victims of fatal accidents, and those who met violent deaths. However, did the survivors of these perils live for a shorter time than those of today? A study of these survivors would supply more information about genetic and constitutional influences on health than the mortality of the total population. A murdered man has nothing to say on this score.

To test the hypothesis that the survivors of yore did live as long as their counterparts of today, a study has been made of the lengths of life of ancient Greeks and Romans whose dates of birth and death are known to us either firmly or with a close degree of approximation. These have then been compared statistically with similar population samples from recent times.

### Methods

The ancient population was obtained from the *Oxford Classical Dictionary*<sup>4</sup> and consisted initially of every male entered in the *Dictionary* who has been accorded either firm dates of birth and death or *circa* dates. When a date was quoted as a range (usually consecutive years), the mean was calculated. The total number of individuals in the resulting sample was 397. Of these, 99 met violent ends by assassination,

forced suicide or death in battle. They were rejected from the series, leaving a final total of 298. Firm dates had been accorded to 70 of these; the remaining 228 were in the *circa* group. Females were not included on the grounds that the sexes might differ in life expectancy. Modern male populations for comparison with the ancient group were obtained from *Chambers Biographical Dictionary*<sup>5</sup>. Thus, both ancient and modern samples were comparable with respect to males who survived into adulthood and who achieved notability (or notoriety). Three modern groups were examined. One group consisted of males who died in or after 1950 AD. The two other groups died between 1850-1899 and between 1900-1949, respectively. In each group, every third appropriate entry was taken in order to eliminate possible familial influences, i.e. if father and son had both been included. The groups were compared statistically by means of the non-parametric Mann-Whitney *U*-test<sup>6</sup>.

### Results

The figures for length of life of the ancient population were first analysed in isolation. The 298 observations were grouped in consecutive 5-year periods, when the distribution showed a negative skew with a mode at 75-80 years. The median was 70 years; the range was 19-107. To test the homogeneity of the population the 298 members were arranged in chronological order according to year of birth, ranging from 650 BC to 602 AD. When their lengths of life were grouped according to their century of birth, a drop in length of life after the second century BC was strikingly apparent. A lower level was maintained in succeeding centuries. The subgroups with firm dates and with *circa* dates were therefore examined separately, when

*Table 1. Median length of life in ancient populations with 'circa' and 'firm' dates born before and after 100 BC. The figures in parentheses denote the numbers in the samples. The P values are for two-tailed significance limits*

	'Circa' dates		'Firm' dates
Born before 100 BC	72 years (128)	$z=0.15$ ← → NS	71.5 years (30)
	↑ $z=2.31$ $P<0.05$		↑ $z=3.03$ $P<0.005$
Born after 100 BC	66 years (100)	$z=2.37$ ← → $P<0.02$	58 years (40)

Table 2. Median length of life in populations of 158 individuals from different eras. The test results (U-test) are for comparison of the BC group with each of the three AD groups, respectively

Population	Median length of life (years)	Range (years)	z	P
Born before 100 BC	72	32-107		
Died 1950-1990 AD	78	46-101	4.08	<0.001
Died 1900-1949 AD	71.5	29-105	0.15	NS
Died 1850-1899 AD	71	19-95	0.39	NS

NS=Not significant

both subgroups were seen to show the group trend with drops in the median length of life after 100 BC (Table 1). The decreases were statistically significant in both cases.

It is clear from Table 1 that the classical sample was not homogeneous. Not only were there significant differences before and after 100 BC but the subgroups born after 100 BC differed significantly. In contrast, the subjects born before 100 BC showed no such variation. For comparison with modern populations the ancients born before 100 BC were therefore pooled to give a total sample of 158. This was then compared with three samples from recent times, each also of 158 subjects. The results are given in Table 2. This shows that the ancients lived significantly shorter lives than people of the present age who have died since 1950. However, they did live as long as the moderns who died in the preceding 100 years.

### Discussion

On this analysis, it is only in the present half-century that advances in medicine have allowed us to outlive those ancients of the BC era who managed to survive the early perils.

The drop in length of life after 100 BC in this sample is consistent with earlier findings of a shorter

average life in classical Rome compared with Greece<sup>1</sup>. The sampling procedure used here suggests that the factors responsible for the higher mortality after 100 BC operated in adult life. The use of lead plumbing in Roman times could be implicated.

The ancient population in this study was highly unrepresentative of the population as a whole. They were men of achievement and fame (or notoriety). One could surmise that their abilities to achieve were genetically and constitutionally determined and that these factors might in turn have been related to their longevity. None the less, whatever the truth of these speculations, the same considerations apply to the modern control groups who, drawn as far as possible from a similar source, were also achievers and men of renown.

The term 'life span' is often used erroneously as a synonym for 'length of life'. The span of life has been defined as the maximum age beyond which an individual cannot live even under the most favourable conditions<sup>2</sup>. On the evidence available it is probably within the range of 115-120 years. In contrast to the length of life, which is the concern of this study, there is no evidence that the human span of life has varied since the beginning of recorded history<sup>1-3</sup>.

### References

- 1 Deevey ES. The probability of death. *Sci Am* 1952;182: 58-60
- 2 Dorn HF. Life span, human. *Encyclopaedia Britannica* 1962;14:55-56A
- 3 Garland R. *The Greek way of life*. London: Duckworth, 1990
- 4 *Oxford Classical Dictionary*, 2nd edn. Oxford: Clarendon, 1970
- 5 *Chambers Biographical Dictionary*, 5th edn. Edinburgh: Chambers, 1990
- 6 Siegel S. *Nonparametric statistics for the behavioural sciences*. New York: McGraw Hill, 1956:116-27

(Accepted 23 March 1993)