

LETTER TO THE EDITOR

Discrepancies in the estimates of life expectancy after SCI

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Middleton *et al.*¹ recently reported life expectancies after spinal cord injury (SCI), based on a cohort of 2014 persons in New South Wales. Calculation of life expectancy requires mortality rates at all ages.

The authors' approach to this was complex, involving the derivation of standardized mortality ratios (SMRs) relative to the 1995–1997 Australian General Population, fitting a 'smooth curve of SMRs

Table 1 Data and results derived from Table 5 of Middleton *et al.*,¹ C5–8ABC group

Age	Study population		Empirical mortality rate ^b	Life expectancy (years)	
	Deaths ^a	Exposure ^a		Empirical ^c	GP ^d
20–29	12	1740	0.0069	40	61
30–39	14	2240	0.0063	33	51
40–49	21	1866	0.0113	25	41
50–59	32	1075	0.0298	17	32
60–69	35	469	0.0746	11	23
70–79	19	199	0.0955	8	15
80–89	8	42	0.1905	5	9

^aDeaths and exposure time (years) figures taken directly from Table 5 of the study.
^bComputed as deaths divided by exposure time.
^cLife expectancy at the beginning of the age interval, computed using the empirical mortality rates in this table; see Table 2 below.
^dGeneral population (GP) life expectancy computed using the mortality rates in the Australia Life Table 2005–2007 (80% male, 20% female).

Table 2 Life table for the C5–C8ABC group, based on empirical mortality rates derived from the data in Table 5 of the Middleton study

Age	$l(x)$	$d(x)$	$q(x)$	$m(x)$	$L(x)$	$T(x)$	$e(x)$
20	100 000	687	0.0069	0.0069	99 656	4 021 940	40.2
25	96 610	664	0.0069	0.0069	96 279	3 530 461	36.5
30	93 336	582	0.0062	0.0063	93 045	3 055 640	32.7
35	90 464	564	0.0062	0.0063	90 182	2 596 176	28.7
40	87 681	981	0.0112	0.0113	87 190	2 150 847	24.5
45	82 883	928	0.0112	0.0113	82 420	1 724 544	20.8
50	78 348	2298	0.0293	0.0298	77 199	1 321 567	16.9
55	67 513	1980	0.0293	0.0298	66 523	957 558	14.2
60	58 177	4184	0.0719	0.0746	56 085	643 887	11.1
65	40 059	2881	0.0719	0.0746	38 619	400 994	10.0
70	27 584	2512	0.0911	0.0955	26 328	233 745	8.5
75	17 113	1558	0.0911	0.0955	16 334	123 996	7.2
80	10 617	1841	0.1734	0.1905	9696	55 906	5.3
85	4096	710	0.1734	0.1905	3741	21 570	5.3

Table 3 Percentage of normal life expectancy for the C5–8ABC group

Age	Authors' Table 6 (%)	Empirical (%) ^a
25	74	66
35	72	62
45	68	57
55	66	51
65	65	52

^aBased on Tables 1 and 2 above, computed as the empirical life expectancy divided by the corresponding general population life expectancy. We note that the empirical figures given here are very similar to those from other countries, including the U.S. study by DeVivo and Stover.²

across the life-age spectrum', 'blending into a flat extra mortality loading at the oldest ages selected using the observed data to confirm the reducing trend in SMRs at advanced ages'. The SMRs they actually used were not provided in the study.

We re-calculated the life expectancies using empirical age-specific mortality rates computed directly from the data in Table 5 of the study. We note that this is appropriate because there was no secular trend over the time period. The rates over the period are thus as relevant today as they were at any point during the period.

As an example, Table 1 here reproduces Middleton's values for the case of C5–C8ABC injuries. This simple approach, which requires no major assumptions, yields the life table shown here as Table 2. For example, the life expectancy at age 25 is 36.5 additional years, which represents 66% of the Australian general population figure.

Table 3 shows life expectancies expressed as percentages of normal. As may be seen, the percentages reported by the authors in their Table 6 are systematically higher than those computed directly from their own data, especially at older ages. The explanation for this discrepancy awaits clarification.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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1 Middleton JW, Dayton A, Walsh J, Rutkowski SB, Leong G, Duong S. Life expectancy after spinal cord injury: a 50-year study. *Spinal Cord* 2012; **50**: 803–811.
 2 DeVivo MJ, Stover SL. Long-term survival and causes of death. In: Stover SL, DeLisa JA and Whiteneck GG (eds) *Spinal Cord Injury*; See Table 14–3. Aspen: Gaithersburg, MD, 1995.