

Appendix 5: Population estimates and indirect age-standardisation

Indirect age-standardisation is the process of applying a set of age-specific rates from a standard population to the population being studied. This publication uses indirect age-standardisation throughout (except where crude rates are indicated) in order to make rates comparable within the publication and to provide a measure that is robust with small cell sizes.

The standard population used for calculation of age-specific rates in this publication was the estimated resident population of Australia for June 1999. Standard rates were derived using the separations, patient days or psychiatric care days for the 1999-00 financial year. Sex was not used as a contributing factor, and the age groups were defined as set out in Table A5.1.

The example below outlines the calculation of the indirectly age-standardised overnight separation rates per 1,000 population for each jurisdiction:

Calculations for indirectly age-standardised rate for overnight separations per 1,000 population

Age-specific separation rates for the standard population are calculated by dividing the number of overnight separations for each age group for Australia by the Australian population for that age category and multiplying by 1,000 (see Table A5.4),

e.g. for 15-19 age category the age-specific standard separation rate would be $(7,168/1,330,972) \times 1,000 = 5.39$ overnight separations per 1,000 population

These rates are then applied to the specific population (e.g. NSW 15-19 years age group) to give the expected number of separations for that age and jurisdiction category (see Table A5.5).

These expected numbers of separations are summed over age categories to give an expected number of separations for each jurisdiction.

Finally, the indirectly age-standardised rate for each jurisdiction is given by dividing the actual number of separations for the jurisdiction (see Table A5.4) by the expected number of separations for the jurisdiction (Table A5.5) and multiplying by the separation rate of the standard population (Table 5.4),

e.g. for NSW rate = $(28,392/33,582.69) \times 5.25$
= 4.44 per 1,000 population (See Table A5.6)

Table A5.1: Estimated resident population by age group, States and Territories, 30 June 1999

| Age group (yrs) | NSW | Vic | Qld | WA | SA | Tas | ACT | NT | Australia ^(a) |
|-----------------|------------------|------------------|------------------|------------------|------------------|----------------|----------------|----------------|--------------------------|
| 0–4 | 432,457 | 307,498 | 241,753 | 127,176 | 94,167 | 31,582 | 21,159 | 17,565 | 1,273,589 |
| 5–9 | 445,762 | 323,526 | 255,400 | 133,223 | 99,276 | 34,151 | 21,797 | 17,412 | 1,330,883 |
| 10–14 | 437,248 | 317,100 | 251,154 | 137,028 | 100,627 | 34,791 | 21,918 | 15,495 | 1,315,727 |
| 15–19 | 439,958 | 322,372 | 258,370 | 135,854 | 100,700 | 34,517 | 24,396 | 14,582 | 1,330,972 |
| 20–24 | 444,561 | 342,394 | 254,096 | 139,690 | 99,714 | 29,913 | 27,308 | 16,760 | 1,354,582 |
| 25–29 | 495,711 | 372,696 | 274,289 | 146,196 | 106,770 | 31,425 | 26,161 | 20,095 | 1,473,616 |
| 30–34 | 472,718 | 359,122 | 256,357 | 139,992 | 106,704 | 31,417 | 23,939 | 17,836 | 1,408,398 |
| 35–39 | 510,109 | 372,024 | 276,598 | 150,338 | 116,358 | 36,487 | 24,905 | 17,080 | 1,504,210 |
| 40–44 | 477,010 | 350,625 | 260,893 | 143,826 | 111,552 | 35,568 | 23,941 | 14,678 | 1,418,368 |
| 45–49 | 443,135 | 326,012 | 247,075 | 134,272 | 106,384 | 33,470 | 23,747 | 13,003 | 1,327,381 |
| 50–54 | 404,560 | 296,094 | 226,441 | 116,886 | 97,746 | 30,366 | 21,142 | 10,629 | 1,204,027 |
| 55–59 | 313,003 | 227,705 | 169,969 | 86,859 | 74,382 | 23,971 | 13,908 | 7,004 | 916,926 |
| 60–64 | 262,196 | 191,688 | 135,599 | 69,993 | 63,697 | 20,137 | 10,038 | 4,081 | 757,490 |
| 65–69 | 238,079 | 175,120 | 117,795 | 60,016 | 59,414 | 18,477 | 7,886 | 2,628 | 679,446 |
| 70–74 | 218,905 | 159,753 | 106,553 | 51,929 | 57,398 | 16,556 | 6,759 | 1,801 | 619,665 |
| 75–79 | 175,579 | 127,316 | 84,177 | 40,517 | 46,884 | 13,410 | 5,378 | 1,061 | 494,330 |
| 80–84 | 103,406 | 73,625 | 50,270 | 23,237 | 27,605 | 8,196 | 2,856 | 545 | 289,752 |
| 85+ | 82,306 | 62,920 | 40,092 | 20,554 | 23,030 | 6,369 | 2,057 | 469 | 237,804 |
| Total | 6,396,703 | 4,707,590 | 3,506,881 | 1,857,586 | 1,492,408 | 470,803 | 309,295 | 192,724 | 18,937,166 |

(a) Includes other Australian territories.

Source: ABS 1999.

Table A5.2: Projected Aboriginal and Torres Strait Islander population by age group, States and Territories, 30 June 1999

| Age group | NSW | Vic | Qld | WA | SA | Tas | ACT | NT | Australia |
|------------------|----------------|---------------|----------------|---------------|---------------|---------------|--------------|---------------|------------------|
| 0-4 | 16,669 | 3,366 | 16,248 | 7,765 | 3,092 | 2,181 | 476 | 7,022 | 56,828 |
| 5-9 | 15,850 | 3,126 | 15,572 | 7,808 | 3,140 | 2,022 | 392 | 6,976 | 54,911 |
| 10-14 | 14,090 | 2,688 | 13,437 | 7,494 | 2,846 | 2,020 | 403 | 6,096 | 49,087 |
| 15-19 | 12,300 | 2,306 | 11,867 | 6,164 | 2,450 | 1,913 | 377 | 5,836 | 43,239 |
| 20-24 | 9,680 | 1,992 | 10,075 | 5,275 | 1,987 | 1,451 | 324 | 5,376 | 36,178 |
| 25-29 | 9,796 | 2,063 | 9,811 | 5,192 | 2,112 | 1,207 | 372 | 5,276 | 35,848 |
| 30-34 | 8,261 | 1,902 | 8,407 | 4,659 | 1,849 | 1,062 | 261 | 4,367 | 30,785 |
| 35-39 | 7,622 | 1,658 | 7,226 | 4,075 | 1,603 | 1,106 | 268 | 3,470 | 27,037 |
| 40-44 | 6,187 | 1,346 | 5,808 | 3,218 | 1,232 | 945 | 217 | 2,847 | 21,818 |
| 45-49 | 5,017 | 995 | 4,604 | 2,351 | 946 | 763 | 128 | 2,153 | 16,969 |
| 50-54 | 3,715 | 752 | 3,360 | 1,725 | 682 | 536 | 76 | 1,679 | 12,539 |
| 55-59 | 2,730 | 526 | 2,201 | 1,202 | 522 | 315 | 37 | 1,156 | 8,697 |
| 60-64 | 1,821 | 360 | 1,615 | 827 | 356 | 228 | 11 | 943 | 6,163 |
| 65-69 | 1,320 | 292 | 1,241 | 714 | 242 | 166 | 12 | 568 | 4,559 |
| 70-74 | 775 | 187 | 727 | 404 | 153 | 83 | 12 | 385 | 2,727 |
| 75+ | 819 | 242 | 912 | 509 | 193 | 108 | 6 | 437 | 3,230 |
| Total | 116,652 | 23,801 | 113,111 | 59,382 | 23,405 | 16,106 | 3,372 | 54,587 | 410,615 |

Source: ABS 1998c.

Table A5.3: Estimated resident population by age group and metropolitan, rural and remote area, States and Territories, 30 June 1999

| Age group | NSW | Vic | Qld | WA | SA | Tas | ACT | NT | Australia |
|---------------------|------------------|------------------|------------------|------------------|------------------|----------------|----------------|---------------|-------------------|
| Metropolitan | | | | | | | | | |
| 0-4 | 325,554 | 229,248 | 138,126 | 87,976 | 66,535 | 12,216 | 21,138 | 7,490 | 888,283 |
| 5-9 | 324,465 | 235,287 | 142,670 | 91,414 | 68,491 | 13,505 | 21,764 | 6,825 | 904,421 |
| 10-14 | 314,998 | 227,962 | 139,730 | 96,494 | 69,875 | 14,332 | 21,903 | 6,455 | 891,749 |
| 15-19 | 329,377 | 240,555 | 155,242 | 103,056 | 74,562 | 14,835 | 24,378 | 6,532 | 948,537 |
| 20-24 | 362,565 | 279,795 | 167,173 | 108,259 | 79,365 | 13,603 | 27,290 | 7,420 | 1,045,470 |
| 25-29 | 405,903 | 304,924 | 173,178 | 107,965 | 82,041 | 13,338 | 26,116 | 9,516 | 1,122,981 |
| 30-34 | 377,817 | 286,326 | 154,665 | 100,637 | 78,957 | 12,832 | 23,916 | 8,299 | 1,043,449 |
| 35-39 | 392,743 | 286,199 | 161,507 | 108,061 | 84,464 | 15,023 | 24,878 | 8,050 | 1,080,925 |
| 40-44 | 360,886 | 264,619 | 152,470 | 105,052 | 81,098 | 14,981 | 23,919 | 6,790 | 1,009,815 |
| 45-49 | 335,185 | 244,776 | 147,456 | 100,832 | 78,149 | 14,161 | 23,723 | 6,494 | 950,776 |
| 50-54 | 306,656 | 224,560 | 135,226 | 88,546 | 71,900 | 12,360 | 21,120 | 5,270 | 865,638 |
| 55-59 | 230,892 | 170,139 | 97,342 | 64,407 | 53,460 | 9,474 | 13,896 | 3,520 | 643,130 |
| 60-64 | 187,493 | 140,799 | 75,375 | 51,255 | 45,406 | 7,712 | 10,027 | 2,027 | 520,094 |
| 65-69 | 169,059 | 127,214 | 65,894 | 44,170 | 42,750 | 7,364 | 7,867 | 1,355 | 465,673 |
| 70-74 | 156,402 | 115,284 | 61,735 | 38,857 | 42,315 | 6,764 | 6,753 | 954 | 429,064 |
| 75-79 | 128,403 | 92,913 | 50,958 | 31,208 | 35,411 | 5,703 | 5,377 | 556 | 350,529 |
| 80-84 | 75,442 | 53,450 | 30,649 | 17,719 | 20,540 | 3,485 | 2,851 | 266 | 204,402 |
| 85+ | 60,384 | 45,834 | 24,354 | 15,767 | 17,050 | 2,701 | 2,057 | 233 | 168,380 |
| <i>Total</i> | <i>4,844,224</i> | <i>3,569,884</i> | <i>2,073,750</i> | <i>1,361,675</i> | <i>1,092,369</i> | <i>194,389</i> | <i>308,973</i> | <i>88,052</i> | <i>13,533,316</i> |
| Rural | | | | | | | | | |
| 0-4 | 102,282 | 77,467 | 86,360 | 22,781 | 25,225 | 19,159 | 21 | 1,436 | 334,731 |
| 5-9 | 116,473 | 87,304 | 95,057 | 25,496 | 28,297 | 20,416 | 33 | 1,434 | 374,510 |
| 10-14 | 118,009 | 88,111 | 96,217 | 26,521 | 28,580 | 20,261 | 15 | 1,228 | 378,942 |
| 15-19 | 107,228 | 80,934 | 90,978 | 22,057 | 24,530 | 19,571 | 18 | 1,154 | 346,470 |
| 20-24 | 78,870 | 62,134 | 74,205 | 17,204 | 18,564 | 16,153 | 18 | 1,232 | 268,380 |
| 25-29 | 85,745 | 67,091 | 84,810 | 20,079 | 22,407 | 17,945 | 45 | 1,405 | 299,527 |
| 30-34 | 90,840 | 72,085 | 86,043 | 21,986 | 25,275 | 18,369 | 23 | 1,544 | 316,165 |
| 35-39 | 112,796 | 84,833 | 98,397 | 25,447 | 29,531 | 21,261 | 27 | 1,786 | 374,078 |
| 40-44 | 112,039 | 84,907 | 93,748 | 24,819 | 28,299 | 20,359 | 22 | 1,607 | 365,800 |
| 45-49 | 104,252 | 80,273 | 86,387 | 22,007 | 26,385 | 19,098 | 24 | 1,327 | 339,753 |
| 50-54 | 94,459 | 70,612 | 79,309 | 18,973 | 24,275 | 17,815 | 22 | 1,160 | 306,625 |
| 55-59 | 79,144 | 56,804 | 63,482 | 15,924 | 19,636 | 14,331 | 12 | 690 | 250,023 |
| 60-64 | 72,113 | 50,164 | 53,571 | 14,221 | 17,377 | 12,279 | 11 | 276 | 220,012 |
| 65-69 | 66,861 | 47,249 | 46,621 | 12,656 | 15,959 | 11,037 | 19 | 191 | 200,593 |
| 70-74 | 60,781 | 43,893 | 40,698 | 10,654 | 14,506 | 9,706 | 6 | 130 | 180,374 |
| 75-79 | 46,100 | 34,019 | 30,428 | 7,682 | 11,060 | 7,613 | 1 | 76 | 136,979 |
| 80-84 | 27,246 | 19,968 | 17,745 | 4,387 | 6,834 | 4,663 | 5 | 29 | 80,877 |
| 85+ | 21,322 | 16,895 | 14,294 | 3,556 | 5,682 | 3,628 | 0 | 27 | 65,404 |
| <i>Total</i> | <i>1,496,560</i> | <i>1,124,743</i> | <i>1,238,350</i> | <i>316,450</i> | <i>372,422</i> | <i>273,664</i> | <i>322</i> | <i>16,732</i> | <i>4,839,243</i> |

(continued)

Table A5.3 (continued): Estimated resident population by age group and metropolitan, rural and remote area, States and Territories, 30 June 1999

| Age group | NSW | Vic | Qld | WA | SA | Tas | ACT | NT | Australia |
|------------------|---------------|---------------|----------------|----------------|---------------|--------------|------------|---------------|------------------|
| | Remote | | | | | | | | |
| 0-4 | 4,621 | 783 | 17,267 | 16,419 | 2,407 | 207 | 0 | 8,639 | 50,343 |
| 5-9 | 4,824 | 935 | 17,673 | 16,313 | 2,488 | 230 | 0 | 9,153 | 51,616 |
| 10-14 | 4,241 | 1,027 | 15,207 | 14,013 | 2,172 | 198 | 0 | 7,812 | 44,670 |
| 15-19 | 3,353 | 883 | 12,150 | 10,741 | 1,608 | 111 | 0 | 6,896 | 35,742 |
| 20-24 | 3,126 | 465 | 12,718 | 14,227 | 1,785 | 157 | 0 | 8,108 | 40,586 |
| 25-29 | 4,063 | 681 | 16,301 | 18,152 | 2,322 | 142 | 0 | 9,174 | 50,835 |
| 30-34 | 4,061 | 711 | 15,649 | 17,369 | 2,472 | 216 | 0 | 7,993 | 48,471 |
| 35-39 | 4,570 | 992 | 16,694 | 16,830 | 2,363 | 203 | 0 | 7,244 | 48,896 |
| 40-44 | 4,085 | 1,099 | 14,675 | 13,955 | 2,155 | 228 | 0 | 6,281 | 42,478 |
| 45-49 | 3,698 | 963 | 13,232 | 11,433 | 1,850 | 211 | 0 | 5,182 | 36,569 |
| 50-54 | 3,445 | 922 | 11,906 | 9,367 | 1,571 | 191 | 0 | 4,199 | 31,601 |
| 55-59 | 2,967 | 762 | 9,145 | 6,528 | 1,286 | 166 | 0 | 2,794 | 23,648 |
| 60-64 | 2,590 | 725 | 6,653 | 4,517 | 914 | 146 | 0 | 1,778 | 17,323 |
| 65-69 | 2,159 | 657 | 5,280 | 3,190 | 705 | 76 | 0 | 1,082 | 13,149 |
| 70-74 | 1,722 | 576 | 4,120 | 2,418 | 577 | 86 | 0 | 717 | 10,216 |
| 75-79 | 1,076 | 384 | 2,791 | 1,627 | 413 | 94 | 0 | 429 | 6,814 |
| 80-84 | 718 | 207 | 1,876 | 1,131 | 231 | 48 | 0 | 250 | 4,461 |
| 85+ | 600 | 191 | 1,444 | 1,231 | 298 | 40 | 0 | 209 | 4,013 |
| <i>Total</i> | <i>55,919</i> | <i>12,963</i> | <i>194,781</i> | <i>179,461</i> | <i>27,617</i> | <i>2,750</i> | <i>0</i> | <i>87,940</i> | <i>561,431</i> |

Source: ABS 1999.

Table A5.4: Overnight separations by age group, Australia, 1999–00

| Age group | Overnight separations | | | | | | | | | Australian population | Age-specific separation rate |
|---------------|-----------------------|---------------|---------------|---------------|--------------|--------------|--------------|------------|---------------|-----------------------|------------------------------|
| | NSW | Vic | Qld | WA | SA | Tas | ACT | NT | Total | | |
| 0–4 | 58 | 14 | 28 | 1 | 0 | 0 | 0 | 3 | 104 | 1,273,589 | 0.08 |
| 5–9 | 128 | 45 | 49 | 39 | 19 | 0 | 0 | 1 | 281 | 1,330,883 | 0.21 |
| 10–14 | 334 | 309 | 367 | 157 | 120 | 10 | 10 | 2 | 1,309 | 1,315,727 | 0.99 |
| 15–19 | 1,893 | 1,603 | 1,658 | 807 | 801 | 106 | 235 | 65 | 7,168 | 1,330,972 | 5.39 |
| 20–24 | 3,374 | 2,761 | 2,523 | 1,342 | 1,145 | 252 | 341 | 131 | 11,869 | 1,354,582 | 8.76 |
| 25–29 | 3,924 | 3,145 | 2,857 | 1,470 | 1,235 | 385 | 400 | 132 | 13,548 | 1,473,616 | 9.19 |
| 30–34 | 3,500 | 2,697 | 2,414 | 1,362 | 1,258 | 271 | 279 | 116 | 11,897 | 1,408,398 | 8.45 |
| 35–39 | 3,403 | 2,577 | 2,448 | 1,341 | 1,100 | 295 | 320 | 89 | 11,573 | 1,504,210 | 7.69 |
| 40–44 | 2,654 | 2,030 | 2,048 | 1,066 | 998 | 254 | 282 | 79 | 9,411 | 1,418,368 | 6.64 |
| 45–49 | 2,215 | 1,855 | 1,618 | 900 | 823 | 217 | 298 | 39 | 7,965 | 1,327,381 | 6.00 |
| 50–54 | 1,936 | 1,508 | 1,471 | 622 | 726 | 195 | 266 | 36 | 6,760 | 1,204,027 | 5.61 |
| 55–59 | 1,196 | 869 | 803 | 375 | 420 | 147 | 101 | 14 | 3,925 | 916,926 | 4.28 |
| 60–64 | 834 | 733 | 564 | 256 | 254 | 51 | 79 | 11 | 2,782 | 757,490 | 3.67 |
| 65–69 | 670 | 772 | 458 | 261 | 248 | 68 | 54 | 3 | 2,534 | 679,446 | 3.73 |
| 70–74 | 773 | 724 | 456 | 293 | 270 | 87 | 45 | 2 | 2,650 | 619,665 | 4.28 |
| 75–79 | 632 | 813 | 505 | 291 | 305 | 51 | 36 | 6 | 2,639 | 494,330 | 5.34 |
| 80–84 | 392 | 538 | 249 | 198 | 209 | 41 | 42 | 1 | 1,670 | 289,752 | 5.76 |
| 85+ | 256 | 356 | 155 | 219 | 177 | 75 | 4 | 0 | 1,242 | 237,804 | 5.22 |
| Not specified | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | | |
| Total | 28,392 | 23,014 | 20,105 | 10,885 | 9,830 | 2,528 | 2,554 | 734 | 99,329 | 18,937,166 | 5.25 |

Table A5.5: Expected number of separations

| | NSW | Vic | Qld | WA | SA | Tas | ACT | NT | Australia |
|--------------|------------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|
| 0–4 | 34.60 | 24.60 | 19.34 | 10.17 | 7.53 | 2.53 | 1.69 | 1.41 | 101.89 |
| 5–9 | 93.61 | 67.94 | 53.63 | 27.98 | 20.85 | 7.17 | 4.58 | 3.66 | 279.49 |
| 10–14 | 432.88 | 313.93 | 248.64 | 135.66 | 99.62 | 34.44 | 21.70 | 15.34 | 1,302.57 |
| 15–19 | 2,371.37 | 1,737.59 | 1,392.61 | 732.25 | 542.77 | 186.05 | 131.49 | 78.60 | 7,173.94 |
| 20–24 | 3,894.35 | 2,999.37 | 2,225.88 | 1,223.68 | 873.49 | 262.04 | 239.22 | 146.82 | 11,866.14 |
| 25–29 | 4,555.58 | 3,425.08 | 2,520.72 | 1,343.54 | 981.22 | 288.80 | 240.42 | 184.67 | 13,542.53 |
| 30–34 | 3,994.47 | 3,034.58 | 2,166.22 | 1,182.93 | 901.65 | 265.47 | 202.28 | 150.71 | 11,900.96 |
| 35–39 | 3,922.74 | 2,860.86 | 2,127.04 | 1,156.10 | 894.79 | 280.59 | 191.52 | 131.35 | 11,567.37 |
| 40–44 | 3,167.35 | 2,328.15 | 1,732.33 | 955.00 | 740.71 | 236.17 | 158.97 | 97.46 | 9,417.96 |
| 45–49 | 2,658.81 | 1,956.07 | 1,482.45 | 805.63 | 638.30 | 200.82 | 142.48 | 78.02 | 7,964.29 |
| 50–54 | 2,269.58 | 1,661.09 | 1,270.33 | 655.73 | 548.36 | 170.35 | 118.61 | 59.63 | 6,754.59 |
| 55–59 | 1,339.65 | 974.58 | 727.47 | 371.76 | 318.35 | 102.60 | 59.53 | 29.98 | 3,924.44 |
| 60–64 | 962.26 | 703.49 | 497.65 | 256.87 | 233.77 | 73.90 | 36.84 | 14.98 | 2,779.99 |
| 65–69 | 888.03 | 653.20 | 439.38 | 223.86 | 221.61 | 68.92 | 29.41 | 9.80 | 2,534.33 |
| 70–74 | 936.91 | 683.74 | 456.05 | 222.26 | 245.66 | 70.86 | 28.93 | 7.71 | 2,652.17 |
| 75–79 | 937.59 | 679.87 | 449.51 | 216.36 | 250.36 | 71.61 | 28.72 | 5.67 | 2,639.72 |
| 80–84 | 595.62 | 424.08 | 289.56 | 133.85 | 159.00 | 47.21 | 16.45 | 3.14 | 1,668.97 |
| 85+ | 429.64 | 328.44 | 209.28 | 107.29 | 120.22 | 33.25 | 10.74 | 2.45 | 1,241.34 |
| Total | 33,582.69 | 24,714.85 | 18,411.13 | 9,752.33 | 7,835.14 | 2,471.72 | 1,623.80 | 1,011.80 | 99,420.12 |

Table A5.6: Indirectly age-standardised rates for overnight separations per 1,000 population

| NSW | Vic | Qld | WA | SA | Tas | ACT | NT | Total |
|------|------|------|------|------|------|------|------|-------|
| 4.44 | 4.89 | 5.73 | 5.86 | 6.59 | 5.37 | 8.26 | 3.81 | 5.25 |