# DISABILITY AND DEATH PROBABILITY TABLES FOR INSURED WORKERS BORN IN 1996 

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## Introduction

The Social Security program is not just a program for providing income during retirement. Workers who meet certain requirements for insured status may receive monthly cash benefits before retirement age if they have impairments resulting in disability. ${ }^{1}$ Survivors may receive benefits after the death of an insured worker, retired worker, or a disabled worker. This note illustrates the likelihood that a young worker, while maintaining insured status, will become disabled or die, resulting in payment of disability or survivor benefits prior to becoming eligible for full retirement benefits. We make these illustrations using the intermediate assumptions of the 2016 Trustees Report. This note succeeds Actuarial Note Number 2015.6, which was based on the intermediate assumptions of the 2015 Trustees Report.

We make projections of the number of insured workers who die or become disabled each year for the next 75 years. These projections depend on the age-sex-specific projections of mortality and disability incidence, and age-sex-duration-specific projections of disabledlife mortality and recovery. Additional information regarding these projections is provided in annual reports of the Board of Trustees of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds (Trustees Reports) and in actuarial studies. ${ }^{2}$
Using rates of death, recovery, and disability incidence from the intermediate assumptions, we present estimates of the probability that an illustrative worker will become disabled or die before reaching normal retirement age. We define an illustrative worker in this note as follows: (a) born in 1996, that is, belongs to the 1996 birth cohort; (b) becomes insured at age 20 in 2016; (c) maintains insured status thereafter; and (d) retires at Normal Retirement Age. Normal retirement age, the age at which full Social Security benefits can be received, is age 67 for our illustrative worker. Tables A and B compare these estimates using the 1996 birth cohort with those published in prior years. The projected probabilities of death before normal retirement age have

[^0]decreased between the 1966 and 1996 cohorts, reflecting in part the actual improvement in mortality experience between 1986 and 2016. The projected probability of becoming disabled before normal retirement age has decreased for insured men between the 1966 and 1996 cohorts, but has increased for insured women. For the 1996 birth cohort, we project that the probability of surviving from age 20 to normal retirement age without ever being disabled is 64 percent for males and 70 percent for females. Comparable probabilities projected for the 1966 birth cohort are 58 percent for males and 70 percent for females.

Table B shows the total projected probability of death as the sum of the probability of death while disabled and the probability of death while not disabled. Between the 1995 and 1996 cohorts, the projected probability of death before normal retirement age decreased slightly for males and stayed essentially the same for females. However, the projected probability of becoming disabled (as shown in Table A) decreased slightly between these cohorts.

## Assumptions and Methods

Tables C and D show disability and death probabilities for insured males and females, respectively, who were born in 1996. We derive death and disability rates by sex and single year of age (20 through 67) for four population groups: total, active, disabled, and recovered. The active group is composed of insured workers who are alive and have never been disabled. The disabled group consists of workers who are currently entitled to receive a Social Security disabled worker benefit. The recovered group consists of insured workers who have had a prior disability, but are not currently entitled to receive a disabled worker benefit. All workers are assumed to be fully and disability insured at all times after reaching age $20 .{ }^{3}$ For each age, we calculate deaths, entitlements to disability-worker-benefits, and recoveries from the disability rolls. For each population group (active, disabled, recovered, and total), we determine the number of persons alive at the beginning of the next year by adding

[^1]or subtracting the relevant components of change to the number of persons alive at the beginning of the year.

For those born in 1996, we develop cohort insured life tables for each sex, from age 20 to age 67. To calculate total deaths for the insured population, we apply the age-sex-specific mortality rates of the general population to the total population at the beginning of the year. ${ }^{4}$

We calculate deaths for the disabled population by applying age-sex-duration-specific ${ }^{5}$ mortality rates to the disabled population at the beginning of the year. We assume that newly entitled disabled-worker beneficiaries, that is, those in duration 0 , are exposed for half a year, since on average they become entitled at mid-year. We calculate deaths for those who have recovered from disability ("recovered deaths") by applying the age-sexspecific mortality rates of the general population to the recovered population at the beginning of the year, with adjustments. To make these adjustments, we add half of the newly recovered population and subtract half of those newly disabled from the recovered population. Active deaths are the residual: we subtract the disabled deaths and recovered deaths from the total population deaths.

We develop cohort disability incidence rates for each sex, from age 20 to age 67, for those born in 1996. To calculate the number of new disabled-worker beneficiaries, we apply the age-sex-specific incidence rates to the active and recovered populations at the beginning of the year.

Finally, we develop rates of recovery from disability for each sex, from age 20 to age 67, for those born in 1996. To calculate the number of recoveries from the disabled population, we apply age-sex-duration-specific ${ }^{5}$ recovery rates to the beginning of the year disabled popula-

[^2]tion. We assume that newly entitled disabled-worker beneficiaries (in duration 0 ) are exposed for half a year.

## Results

Table C provides tabulations which allow for the computation of various probabilities of survival, death, and disability for insured males born in 1996. Table D provides the same information for insured females born in 1996. For example, the probability that an insured female, age 25 in 2021, will survive to age 60 without ever becoming disabled is 79 percent. To get this result, we divide the number of active lives at age $60(777,907)$ by the number of active lives at age $25(989,860)$.

Table E uses the tabulations in tables C and D to derive various probabilities of disability, death, and survival for insured males and females born in 1996. We calculate the probability of survival without disability from age 20 to age $x$ by dividing the active population at the beginning of the year at age $x$ by the active population at the beginning of the year at age 20 . The probability of dying or becoming disabled after age 20 and before age $x$ is calculated as the complement, that is, 1 minus the probability of surviving without disability from age 20 to age $x$. For example, we project that an insured male worker who attained age 20 in 2016 has a 64 percent chance of surviving to age 67 without ever becoming disabled and a 36 percent chance of either dying or becoming disabled prior to age 67 .

Table E also includes probabilities of an insured worker becoming disabled and of an insured worker dying while never disabled. These probabilities are shown from age 20 to age $x$. We calculate these values by dividing the total newly disabled and the total deaths from the active population prior to age $x$, respectively, by the active population alive at the beginning of the year at age 20 . For example, we project that an insured female worker who attained age 20 in 2016 has a 19 percent chance of becoming disabled before age 60 . In addition, the probability that she will die before age 60 without ever receiving Social Security disability benefits is only 3 percent.

Table A: Probability of Disability and Death for Illustrative Cases of Insured Workers

| $\begin{aligned} & \text { Trustees Report } \\ & \text { Year } 1 \\ & \text { (Year of Attainment } \\ & \text { of Age 20) } \end{aligned}$ | Year of Birth | Probability of Disability Before NRA |  |  | Probability of Death While Never Disabled Before NRA |  |  | Probability of Survival to NRA With No Disability |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Male | Female | Total ${ }^{2}$ | Male | Female | Total ${ }^{2}$ | Male | Female | Total ${ }^{2}$ |
| 1986 | 1966 | 0.322 | 0.240 | 0.281 | 0.095 | 0.060 | 0.077 | 0.583 | 0.700 | 0.642 |
| 2011 | 1991 | 0.276 | 0.260 | 0.268 | 0.091 | 0.049 | 0.070 | 0.633 | 0.691 | 0.662 |
| 2012 | 1992 | 0.276 | 0.264 | 0.270 | 0.090 | 0.048 | 0.069 | 0.634 | 0.688 | 0.661 |
| 2013 | 1993 | 0.275 | 0.264 | 0.270 | 0.085 | 0.044 | 0.065 | 0.639 | 0.692 | 0.666 |
| 2014 | 1994 | 0.277 | 0.263 | 0.270 | 0.082 | 0.042 | 0.062 | 0.641 | 0.695 | 0.668 |
| 2015 | 1995 | 0.279 | 0.265 | 0.272 | 0.078 | 0.040 | 0.059 | 0.643 | 0.695 | 0.669 |
| 2016 | 1996 | 0.277 | 0.262 | 0.270 | 0.078 | 0.041 | 0.059 | 0.645 | 0.697 | 0.671 |

${ }^{1}$ Calculations are based on the intermediate assumptions of that year's Trustees Report (alternative II-B for the 1986 Trustees Report).
${ }^{2}$ Totals are obtained by combining tables C and D. For example, the probability of death while never disabled before NRA equals 5.9 percent for the 1996 birth cohort $(78,281+40,684) /(1,000,000+1,000,000)$.
Notes: Probabilities are determined assuming all illustrative workers are disability insured throughout their working lives.
For a recent historical perspective, see Actuarial Study 123, Social Security Disability Insurance Program Worker Experience, at: http://www.ssa.gov/OACT/NOTES/actstud.html.

Table B: Probability of Death for Illustrative Cases of Insured Workers by Disabled Status

| $\begin{gathered} \text { Trustees Report } \\ \text { Year }{ }^{1} \\ \text { (Year of Attainment } \\ \text { of Age 20) } \\ \hline \end{gathered}$ | Year of Birth | $(\mathrm{A})=(\mathrm{B})+(\mathrm{C})$ <br> Probability of Death Before NRA |  |  | (B) |  |  | (C) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Probability of Death While Disabled Before NRA |  |  | Probability of Death While Not Disabled Before NRA ${ }^{2}$ |  |  |
|  |  | Male | Female | Total ${ }^{3}$ | Male | Female | Total ${ }^{3}$ | Male | Female | Total ${ }^{3}$ |
| 1986 | 1966 | 0.221 | 0.129 | 0.175 | 0.121 | 0.067 | 0.094 | 0.100 | 0.062 | 0.081 |
| 2011 | 1991 | 0.155 | 0.096 | 0.125 | 0.061 | 0.045 | 0.053 | 0.094 | 0.050 | 0.072 |
| 2012 | 1992 | 0.153 | 0.095 | 0.124 | 0.061 | 0.045 | 0.053 | 0.092 | 0.049 | 0.071 |
| 2013 | 1993 | 0.149 | 0.090 | 0.119 | 0.061 | 0.045 | 0.053 | 0.088 | 0.045 | 0.066 |
| 2014 | 1994 | 0.145 | 0.088 | 0.116 | 0.061 | 0.045 | 0.053 | 0.084 | 0.043 | 0.064 |
| 2015 | 1995 | 0.143 | 0.087 | 0.115 | 0.063 | 0.045 | 0.054 | 0.080 | 0.042 | 0.061 |
| 2016 | 1996 | 0.142 | 0.087 | 0.115 | 0.062 | 0.045 | 0.053 | 0.081 | 0.042 | 0.061 |

[^3]| Age $x$ | Living At Beginning Of Year |  |  |  | Deaths |  |  |  |  |  |  |  | Newly Disabled |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Total |  | Active |  | Disabled |  | Recovered |  | Total |  | Active |  | Recovered |  | Newly Recovered |  |
|  | Total | Active | Disabled | Recovered | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 2 to $x+1$ |
| 20 | 1,000,000 | 1,000,000 | 0 | 0 | 958 | 958 | 951 | 951 | 7 | 7 | 0 | 0 | 2,396 | 2,396 | 2,396 | 2,396 | 0 | 0 | 4 | 4 |
| 21 | 999,042 | 996,653 | 2,385 | 4 | 1,074 | 2,032 | 1,053 | 2,004 | 21 | 28 | 0 | 0 | 2,468 | 4,864 | 2,468 | 4,864 | 0 | 0 | 15 | 19 |
| 22 | 997,968 | 993,132 | 4,817 | 19 | 1,161 | 3,193 | 1,126 | 3,130 | 35 | 63 | 0 | 0 | 2,604 | 7,468 | 2,604 | 7,468 | 0 | 0 | 29 | 48 |
| 23 | 996,807 | 989,402 | 7,357 | 48 | 1,208 | 4,401 | 1,157 | 4,287 | 51 | 114 | 0 | 0 | 2,691 | 10,159 | 2,691 | 10,159 | 0 | 0 | 50 | 98 |
| 24 | 995,599 | 985,554 | 9,947 | 98 | 1,226 | 5,627 | 1,160 | 5,447 | 66 | 180 | 0 | 0 | 2,695 | 12,854 | 2,695 | 12,854 | 0 | 0 | 97 | 195 |
| 25 | 994,373 | 981,699 | 12,479 | 195 | 1,234 | 6,861 | 1,145 | 6,592 | 89 | 269 | 0 | 0 | 2,147 | 15,001 | 2,147 | 15,001 | 0 | 0 | 248 | 443 |
| 26 | 993,139 | 978,407 | 14,289 | 443 | 1,246 | 8,107 | 1,139 | 7,731 | 106 | 375 | 1 | 1 | 1,673 | 16,674 | 1,672 | 16,673 | 1 | 1 | 390 | 833 |
| 27 | 991,893 | 975,596 | 15,466 | 831 | 1,261 | 9,368 | 1,148 | 8,879 | 112 | 487 | 1 |  | 1,726 | 18,400 | 1,725 | 18,398 | 1 | 2 | 451 | 1,284 |
| 28 | 990,632 | 972,723 | 16,629 | 1,280 | 1,280 | 10,648 | 1,153 | 10,032 | 125 | 612 | , | 4 | 1,785 | 20,185 | 1,783 | 20,181 | 2 | 4 | 499 | 1,783 |
| 29 | 989,352 | 969,787 | 17,790 | 1,775 | 1,303 | 11,951 | 1,160 | 11,192 | 140 | 752 | 3 |  | 1,845 | 22,030 | 1,842 | 22,023 | 3 | 7 | 522 | 2,305 |
| 30 | 988,049 | 966,785 | 18,973 | 2,291 | 1,326 | 13,277 | 1,162 | 12,354 | 161 | 913 | 3 | 10 | 1,983 | 24,013 | 1,978 | 24,001 | 5 | 12 | 575 | 2,880 |
| 31 | 986,723 | 963,645 | 20,220 | 2,858 | 1,345 | 14,622 | 1,154 | 13,508 | 187 | 1,100 | 4 | 14 | 2,154 | 26,167 | 2,148 | 26,149 | 6 | 18 | 617 | 3,497 |
| 32 | 985,378 | 960,343 | 21,570 | 3,465 | 1,357 | 15,979 | 1,146 | 14,654 | 206 | 1,306 | 5 | 19 | 2,275 | 28,442 | 2,267 | 28,416 | 8 | 26 | 624 | 4,121 |
| 33 | 984,021 | 956,930 | 23,015 | 4,076 | 1,361 | 17,340 | 1,130 | 15,784 | 225 | 1,531 | 6 | 25 | 2,401 | 30,843 | 2,391 | 30,807 | 10 | 36 | 633 | 4,754 |
| 34 | 982,660 | 953,409 | 24,558 | 4,693 | 1,360 | 18,700 | 1,094 | 16,878 | 259 | 1,790 | 7 | 32 | 2,516 | 33,359 | 2,504 | 33,311 | 12 | 48 | 647 | 5,401 |
| 35 | 981,300 | 949,811 | 26,168 | 5,321 | 1,367 | 20,067 | 1,080 | 17,958 | 279 | 2,069 | 8 | 40 | 2,661 | 36,020 | 2,646 | 35,957 | 15 | 63 | 658 | 6,059 |
| 36 | 979,933 | 946,085 | 27,892 | 5,956 | 1,383 | 21,450 | 1,072 | 19,030 | 302 | 2,371 | 9 | 49 | 2,839 | 38,859 | 2,821 | 38,778 | 18 | 81 | 652 | 6,711 |
| 37 | 978,550 | 942,192 | 29,777 | 6,581 | 1,403 | 22,853 | 1,056 | 20,086 | 337 | 2,708 | 10 | 59 | 3,012 | 41,871 | 2,991 | 41,769 | 21 | 102 | 664 | 7,375 |
| 38 | 977,147 | 938,145 | 31,788 | 7,214 | 1,429 | 24,282 | 1,045 | 21,131 | 373 | 3,081 | 11 | 70 | 3,203 | 45,074 | 3,179 | 44,948 | 24 | 126 | 651 | 8,026 |
| 39 | 975,718 | 933,921 | 33,967 | 7,830 | 1,464 | 25,746 | 1,041 | 22,172 | 411 | 3,492 | 12 | 82 | 3,418 | 48,492 | 3,390 | 48,338 | 28 | 154 | 656 | 8,682 |
| 40 | 974,254 | 929,490 | 36,318 | 8,446 | 1,508 | 27,254 | 1,049 | 23,221 | 445 | 3,937 | 14 | 96 | 3,616 | 52,108 | 3,583 | 51,921 | 33 | 187 | 655 | 9,337 |
| 41 | 972,746 | 924,858 | 38,834 | 9,054 | 1,573 | 28,827 | 1,062 | 24,283 | 496 | 4,433 | 15 | 111 | 3,832 | 55,940 | 3,795 | 55,716 | 37 | 224 | 677 | 10,014 |
| 42 | 971,173 | 920,001 | 41,493 | 9,679 | 1,670 | 30,497 | 1,099 | 25,382 | 554 | 4,987 | 17 | 128 | 4,061 | 60,001 | 4,019 | 59,735 | 42 | 266 | 688 | 10,702 |
| 43 | 969,503 | 914,883 | 44,312 | 10,308 | 1,808 | 32,305 | 1,174 | 26,556 | 614 | 5,601 | 20 | 148 | 4,292 | 64,293 | 4,244 | 63,979 | 48 | 314 | 683 | 11,385 |
| 44 | 967,695 | 909,465 | 47,307 | 10,923 | 1,979 | 34,284 | 1,279 | 27,835 | 677 | 6,278 | 23 | 171 | 4,532 | 68,825 | 4,478 | 68,457 | 54 | 368 | 682 | 12,067 |
| 45 | 965,716 | 903,708 | 50,480 | 11,528 | 2,171 | 36,455 | 1,389 | 29,224 | 755 | 7,033 | 27 | 198 | 4,772 | 73,597 | 4,712 | 73,169 | 60 | 428 | 713 | 12,780 |
| 46 | 963,545 | 897,607 | 53,784 | 12,154 | 2,374 | 38,829 | 1,501 | 30,725 | 842 | 7,875 | 31 | 229 | 5,028 | 78,625 | 4,961 | 78,130 | 67 | 495 | 756 | 13,536 |
| 47 | 961,171 | 891,145 | 57,214 | 12,812 | 2,589 | 41,418 | 1,611 | 32,336 | 943 | 8,818 | 35 | 264 | 5,285 | 83,910 | 5,210 | 83,340 | 75 | 570 | 747 | 14,283 |
| 48 | 958,582 | 884,324 | 60,809 | 13,449 | 2,813 | 44,231 | 1,724 | 34,060 | 1,049 | 9,867 | 40 | 304 | 5,504 | 89,414 | 5,422 | 88,762 | 82 | 652 | 731 | 15,014 |
| 49 | 955,769 | 877,178 | 64,533 | 14,058 | 3,048 | 47,279 | 1,858 | 35,918 | 1,144 | 11,011 | 46 | 350 | 5,693 | 95,107 | 5,603 | 94,365 | 90 | 742 | 674 | 15,688 |
| 50 | 952,721 | 869,717 | 68,408 | 14,596 | 3,283 | 50,562 | 2,009 | 37,927 | 1,223 | 12,234 | 51 | 401 | 6,910 | 102,017 | 6,796 | 101,161 | 114 | 856 | 695 | 16,383 |
| 51 | 949,438 | 860,912 | 73,400 | 15,126 | 3,532 | 54,094 | 2,117 | 40,044 | 1,358 | 13,592 | 57 | 458 | 8,348 | 110,365 | 8,204 | 109,365 | 144 | 1,000 | 724 | 17,107 |
| 52 | 945,906 | 850,591 | 79,666 | 15,649 | 3,814 | 57,908 | 2,212 | 42,256 | 1,538 | 15,130 | 64 | 522 | 8,489 | 118,854 | 8,336 | 117,701 | 153 | 1,153 | 682 | 17,789 |
| 53 | 942,092 | 840,043 | 85,935 | 16,114 | 4,133 | 62,041 | 2,348 | 44,604 | 1,713 | 16,843 | 72 | 594 | 8,446 | 127,300 | 8,287 | 125,988 | 159 | 1,312 | 660 | 18,449 |
| 54 | 937,959 | 829,408 | 92,008 | 16,543 | 4,474 | 66,515 | 2,494 | 47,098 | 1,900 | 18,743 | 80 | 674 | 8,733 | 136,033 | 8,562 | 134,550 | 171 | 1,483 | 606 | 19,055 |
| 55 | 933,485 | 818,352 | 98,235 | 16,898 | 4,857 | 71,372 | 2,673 | 49,771 | 2,095 | 20,838 | 89 | 763 | 10,315 | 146,348 | 10,106 | 144,656 | 209 | 1,692 | 649 | 19,704 |
| 56 | 928,628 | 805,573 | 105,806 | 17,249 | 5,227 | 76,599 | 2,766 | 52,537 | 2,363 | 23,201 | 98 | 861 | 12,190 | 158,538 | 11,934 | 156,590 | 256 | 1,948 | 672 | 20,376 |
| 57 | 923,401 | 790,873 | 114,961 | 17,567 | 5,500 | 82,099 | 2,781 | 55,318 | 2,613 | 25,814 | 106 | 967 | 12,431 | 170,969 | 12,161 | 168,751 | 270 | 2,218 | 669 | 21,045 |
| 58 | 917,901 | 775,931 | 124,110 | 17,860 | 5,641 | 87,740 | 2,701 | 58,019 | 2,829 | 28,643 | 111 | 1,078 | 12,524 | 183,493 | 12,242 | 180,993 | 282 | 2,500 | 642 | 21,687 |
| 59 | 912,260 | 760,988 | 133,163 | 18,109 | 5,706 | 93,446 | 2,532 | 60,551 | 3,060 | 31,703 | 114 | 1,192 | 13,214 | 196,707 | 12,907 | 193,900 | 307 | 2,807 | 593 | 22,280 |
| 60 | 906,554 | 745,549 | 142,724 | 18,281 | 5,756 | 99,202 | 2,367 | 62,918 | 3,272 | 34,975 | 117 | 1,309 | 13,969 | 210,676 | 13,635 | 207,535 | 334 | 3,141 | 709 | 22,989 |
| 61 | 900,798 | 729,547 | 152,712 | 18,539 | 5,889 | 105,091 | 2,164 | 65,082 | 3,602 | 38,577 | 123 | 1,432 | 14,735 | 225,411 | 14,370 | 221,905 | 365 | 3,506 | 848 | 23,837 |
| 62 | 894,909 | 713,013 | 162,997 | 18,899 | 6,178 | 111,269 | 2,087 | 67,169 | 3,959 | 42,536 | 132 | 1,564 | 15,151 | 240,562 | 14,760 | 236,665 | 391 | 3,897 | 805 | 24,642 |
| 63 | 888,731 | 696,166 | 173,384 | 19,181 | 6,677 | 117,946 | 2,125 | 69,294 | 4,407 | 46,943 | 145 | 1,709 | 14,464 | 255,026 | 14,076 | 250,741 | 388 | 4,285 | 752 | 25,394 |
| 64 | 882,054 | 679,965 | 182,689 | 19,400 | 7,340 | 125,286 | 2,371 | 71,665 | 4,806 | 51,749 | 163 | 1,872 | 12,148 | 267,174 | 11,811 | 262,552 | 337 | 4,622 | 650 | 26,044 |
| 65 | 874,714 | 665,783 | 189,381 | 19,550 | 8,111 | 133,397 | 2,992 | 74,657 | 4,937 | 56,686 | 182 | 2,054 | 8,888 | 276,062 | 8,634 | 271,186 | 254 | 4,876 | 510 | 26,554 |
| 66 | 866,603 | 654,157 | 192,822 | 19,624 | 8,885 | 142,282 | 3,624 | 78,281 | 5,058 | 61,744 | 203 | 2,257 | 6,009 | 282,071 | 5,834 | 277,020 | 175 | 5,051 | 451 | 27,005 |
| 67 | 857,718 | 644,699 | 193,322 | 19,697 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table D: Disability and Death Probabilities for the Female 1996 Birth Cohort

| Age $x$ | Living At Beginning Of Year |  |  |  | Deaths |  |  |  |  |  |  |  | Newly Disabled |  |  |  |  |  | Newly Recovered |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Total |  | Active |  | Disabled |  | Recovered |  | Total |  | Active |  | Recovered |  |  |  |
|  | Total | Active | Disabled | Recovered | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+12$ | to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 20 to $x+1$ | $x$ to $x+1$ | 0 to $x+1$ |
| 20 | 1,000,000 | 1,000,000 | 0 | 0 | 348 | 348 | 343 | 343 | 5 | 5 | 0 | 0 | 1,518 | 1,518 | 1,518 | 1,518 | 0 | 0 | 3 | 3 |
| 21 | 999,652 | 998,139 | 1,510 | 3 | 384 | 732 | 369 | 712 | 15 | 20 | 0 | 0 | 1,581 | 3,099 | 1,581 | 3,099 | 0 | 0 | 11 | 14 |
| 22 | 999,268 | 996,189 | 3,065 | 14 | 417 | 1,149 | 393 | 1,105 | 24 | 44 | 0 | 0 | 1,673 | 4,772 | 1,673 | 4,772 | 0 | 0 | 22 | 36 |
| 23 | 998,851 | 994,123 | 4,692 | 36 | 443 | 1,592 | 409 | 1,514 | 34 | 78 | 0 | 0 | 1,717 | 6,489 | 1,717 | 6,489 | 0 | 0 | 35 | 71 |
| 24 | 998,408 | 991,997 | 6,340 | 71 | 466 | 2,058 | 421 | 1,935 | 45 | 123 | 0 | 0 | 1,716 | 8,205 | 1,716 | 8,205 | 0 | 0 | 61 | 132 |
| 25 | 997,942 | 989,860 | 7,950 | 132 | 489 | 2,547 | 430 | 2,365 | 59 | 182 | 0 | 0 | 1,519 | 9,724 | 1,519 | 9,724 | 0 | 0 | 136 | 268 |
| 26 | 997,453 | 987,911 | 9,274 | 268 | 513 | 3,060 | 443 | 2,808 | 70 | 252 | 0 | 0 | 1,382 | 11,106 | 1,382 | 11,106 | 0 | 0 | 219 | 487 |
| 27 | 996,940 | 986,086 | 10,367 | 487 | 538 | 3,598 | 459 | 3,267 | 79 | 331 | 0 | 0 | 1,459 | 12,565 | 1,458 | 12,564 | 1 | 1 | 258 | 745 |
| 28 | 996,402 | 984,169 | 11,489 | 744 | 563 | 4,161 | 476 | 3,743 | 86 | 417 | 1 | 1 | 1,535 | 14,100 | 1,534 | 14,098 | 1 | 2 | 287 | 1,032 |
| 29 | 995,839 | 982,159 | 12,651 | 1,029 | 590 | 4,751 | 494 | 4,237 | 95 | 512 | 1 | 2 | 1,613 | 15,713 | 1,611 | 15,709 | 2 | 4 | 303 | 1,335 |
| 30 | 995,249 | 980,054 | 13,866 | 1,329 | 618 | 5,369 | 500 | 4,737 | 117 | 629 | 1 | 3 | 1,845 | 17,558 | 1,843 | 17,552 | 2 | 6 | 342 | 1,677 |
| 31 | 994,631 | 977,711 | 15,252 | 1,668 | 647 | 6,016 | 508 | 5,245 | 138 | 767 | 1 | 4 | 2,124 | 19,682 | 2,120 | 19,672 | 4 | 10 | 381 | 2,058 |
| 32 | 993,984 | 975,083 | 16,857 | 2,044 | 673 | 6,689 | 515 | 5,760 | 156 | 923 | 2 | 6 | 2,309 | 21,991 | 2,304 | 21,976 | 5 | 15 | 400 | 2,458 |
| 33 | 993,311 | 972,264 | 18,610 | 2,437 | 697 | 7,386 | 513 | 6,273 | 182 | 1,105 | 2 | 8 | 2,524 | 24,515 | 2,518 | 24,494 | 6 | 21 | 418 | 2,876 |
| 34 | 992,614 | 969,233 | 20,534 | 2,847 | 721 | 8,107 | 511 | 6,784 | 208 | 1,313 | 2 | 10 | 2,749 | 27,264 | 2,741 | 27,235 | 8 | 29 | 436 | 3,312 |
| 35 | 991,893 | 965,981 | 22,639 | 3,273 | 749 | 8,856 | 516 | 7,300 | 230 | 1,543 | 3 | 13 | 2,929 | 30,193 | 2,919 | 30,154 | 10 | 39 | 462 | 3,774 |
| 36 | 991,144 | 962,546 | 24,876 | 3,722 | 783 | 9,639 | 519 | 7,819 | 261 | 1,804 | 3 | 16 | 3,084 | 33,277 | 3,072 | 33,226 | 12 | 51 | 479 | 4,253 |
| 37 | 990,361 | 958,955 | 27,220 | 4,186 | 820 | 10,459 | 527 | 8,346 | 289 | 2,093 | 4 | 20 | 3,285 | 36,562 | 3,271 | 36,497 | 14 | 65 | 514 | 4,767 |
| 38 | 989,541 | 955,157 | 29,702 | 4,682 | 858 | 11,317 | 535 | 8,881 | 319 | 2,412 | 4 | 24 | 3,481 | 40,043 | 3,464 | 39,961 | 17 | 82 | 529 | 5,296 |
| 39 | 988,683 | 951,158 | 32,335 | 5,190 | 901 | 12,218 | 538 | 9,419 | 358 | 2,770 | 5 | 29 | 3,702 | 43,745 | 3,682 | 43,643 | 20 | 102 | 547 | 5,843 |
| 40 | 987,782 | 946,938 | 35,132 | 5,712 | 948 | 13,166 | 555 | 9,974 | 387 | 3,157 | 6 | 35 | 3,922 | 47,667 | 3,898 | 47,541 | 24 | 126 | 596 | 6,439 |
| 41 | 986,834 | 942,485 | 38,071 | 6,278 | 1,008 | 14,174 | 591 | 10,565 | 410 | 3,567 | 7 | 42 | 4,147 | 51,814 | 4,120 | 51,661 | 27 | 153 | 625 | 7,064 |
| 42 | 985,826 | 937,774 | 41,183 | 6,869 | 1,089 | 15,263 | 617 | 11,182 | 464 | 4,031 | 8 | 50 | 4,372 | 56,186 | 4,340 | 56,001 | 32 | 185 | 637 | 7,701 |
| 43 | 984,737 | 932,817 | 44,454 | 7,466 | 1,195 | 16,458 | 676 | 11,858 | 510 | 4,541 | 9 | 59 | 4,615 | 60,801 | 4,578 | 60,579 | 37 | 222 | 656 | 8,357 |
| 44 | 983,542 | 927,563 | 47,903 | 8,076 | 1,324 | 17,782 | 748 | 12,606 | 565 | 5,106 | 11 | 70 | 4,841 | 65,642 | 4,799 | 65,378 | 42 | 264 | 660 | 9,017 |
| 45 | 982,218 | 922,016 | 51,519 | 8,683 | 1,459 | 19,241 | 821 | 13,427 | 625 | 5,731 | 13 | 83 | 5,192 | 70,834 | 5,144 | 70,522 | 48 | 312 | 702 | 9,719 |
| 46 | 980,759 | 916,051 | 55,384 | 9,324 | 1,597 | 20,838 | 884 | 14,311 | 697 | 6,428 | 16 | 99 | 5,553 | 76,387 | 5,497 | 76,019 | 56 | 368 | 755 | 10,474 |
| 47 | 979,162 | 909,670 | 59,485 | 10,007 | 1,746 | 22,584 | 965 | 15,276 | 763 | 7,191 | 18 | 117 | 5,771 | 82,158 | 5,708 | 81,727 | 63 | 431 | 757 | 11,231 |
| 48 | 977,416 | 902,997 | 63,736 | 10,683 | 1,905 | 24,489 | 1,041 | 16,317 | 843 | 8,034 | 21 | 138 | 5,967 | 88,125 | 5,897 | 87,624 | 70 | 501 | 754 | 11,985 |
| 49 | 975,511 | 896,059 | 68,106 | 11,346 | 2,071 | 26,560 | 1,104 | 17,421 | 942 | 8,976 | 25 | 163 | 6,141 | 94,266 | 6,064 | 93,688 | 77 | 578 | 717 | 12,702 |
| 50 | 973,440 | 888,891 | 72,588 | 11,961 | 2,246 | 28,806 | 1,227 | 18,648 | 991 | 9,967 | 28 | 191 | 7,399 | 101,665 | 7,301 | 100,989 | 98 | 676 | 744 | 13,446 |
| 51 | 971,194 | 880,363 | 78,252 | 12,579 | 2,418 | 31,224 | 1,291 | 19,939 | 1,095 | 11,062 | 32 | 223 | 8,860 | 110,525 | 8,735 | 109,724 | 125 | 801 | 735 | 14,181 |
| 52 | 968,776 | 870,337 | 85,282 | 13,157 | 2,572 | 33,796 | 1,299 | 21,238 | 1,237 | 12,299 | 36 | 259 | 8,896 | 119,421 | 8,764 | 118,488 | 132 | 933 | 726 | 14,907 |
| 53 | 966,204 | 860,274 | 92,215 | 13,715 | 2,702 | 36,498 | 1,320 | 22,558 | 1,343 | 13,642 | 39 | 298 | 8,767 | 128,188 | 8,629 | 127,117 | 138 | 1,071 | 724 | 15,631 |
| 54 | 963,502 | 850,325 | 98,915 | 14,262 | 2,814 | 39,312 | 1,290 | 23,848 | 1,482 | 15,124 | 42 | 340 | 8,965 | 137,153 | 8,817 | 135,934 | 148 | 1,219 | 659 | 16,290 |
| 55 | 960,688 | 840,218 | 105,739 | 14,731 | 2,953 | 42,265 | 1,366 | 25,214 | 1,541 | 16,665 | 46 | 386 | 10,085 | 147,238 | 9,911 | 145,845 | 174 | 1,393 | 683 | 16,973 |
| 56 | 957,735 | 828,941 | 113,600 | 15,194 | 3,107 | 45,372 | 1,430 | 26,644 | 1,627 | 18,292 | 50 | 436 | 11,452 | 158,690 | 11,246 | 157,091 | 206 | 1,599 | 686 | 17,659 |
| 57 | 954,628 | 816,265 | 122,739 | 15,624 | 3,227 | 48,599 | 1,406 | 28,050 | 1,767 | 20,059 | 54 | 490 | 11,588 | 170,278 | 11,370 | 168,461 | 218 | 1,817 | 643 | 18,302 |
| 58 | 951,401 | 803,489 | 131,917 | 15,995 | 3,299 | 51,898 | 1,269 | 29,319 | 1,974 | 22,033 | 56 | 546 | 11,621 | 181,899 | 11,394 | 179,855 | 227 | 2,044 | 634 | 18,936 |
| 59 | 948,102 | 790,826 | 140,930 | 16,346 | 3,355 | 55,253 | 1,088 | 30,407 | 2,209 | 24,242 | 58 | 604 | 12,076 | 193,975 | 11,831 | 191,686 | 245 | 2,289 | 601 | 19,537 |
| 60 | 944,747 | 777,907 | 150,196 | 16,644 | 3,410 | 58,663 | 1,035 | 31,442 | 2,314 | 26,556 | 61 | 665 | 11,993 | 205,968 | 11,742 | 203,428 | 251 | 2,540 | 673 | 20,210 |
| 61 | 941,337 | 765,130 | 159,202 | 17,005 | 3,534 | 62,197 | 968 | 32,410 | 2,501 | 29,057 | 65 | 730 | 11,983 | 217,951 | 11,722 | 215,150 | 261 | 2,801 | 727 | 20,937 |
| 62 | 937,803 | 752,440 | 167,957 | 17,406 | 3,803 | 66,000 | 972 | 33,382 | 2,760 | 31,817 | 71 | 801 | 12,267 | 230,218 | 11,990 | 227,140 | 277 | 3,078 | 647 | 21,584 |
| 63 | 934,000 | 739,478 | 176,817 | 17,705 | 4,263 | 70,263 | 1,127 | 34,509 | 3,055 | 34,872 | 81 | 882 | 11,754 | 241,972 | 11,479 | 238,619 | 275 | 3,353 | 526 | 22,110 |
| 64 | 929,737 | 726,872 | 184,990 | 17,875 | 4,872 | 75,135 | 1,446 | 35,955 | 3,332 | 38,204 | 94 | 976 | 9,971 | 251,943 | 9,732 | 248,351 | 239 | 3,592 | 465 | 22,575 |
| 65 | 924,865 | 715,694 | 191,164 | 18,007 | 5,590 | 80,725 | 2,101 | 38,056 | 3,380 | 41,584 | 109 | 1,085 | 7,969 | 259,912 | 7,773 | 256,124 | 196 | 3,788 | 358 | 22,933 |
| 66 | 919,275 | 705,820 | 195,395 | 18,060 | 6,317 | 87,042 | 2,628 | 40,684 | 3,564 | 45,148 | 125 | 1,210 | 6,013 | 265,925 | 5,863 | 261,987 | 150 | 3,938 | 294 | 23,227 |
| 67 | 912,958 | 697,329 | 197,550 | 18,079 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table E: Probabilities of Disability, Death, and Survival for Insured Workers Attaining Age 20 in 2016 (1996 Birth Cohort)

|  | Males Attaining Age 20 in 2016 |  |  |  | Females Attaining Age 20 in 2016 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age $x$ | Probability of Survival With No Disability From Age 20 To Age $x$ | Probability of Disability From Age 20 To Age $x$ | Probability of Death While Never Disabled From Age 20 To Age $x$ | Probability of Death or Disability From Age 20 To Age $x$ | Age $x$ | Probability of Survival With No Disability From Age 20 To Age $x$ | Probability of Disability From Age 20 To Age $x$ | Probability of Death While Never Disabled From Age 20 To Age $x$ | Probability of Death or Disability From Age 20 To Age $x$ |
| 21 | 99.7 | 0.2 | 0.1 | 0.3 | 21 | 99.8 | 0.2 | 0.0 | 0.2 |
| 22 | 99.3 | 0.5 | 0.2 | 0.7 | 22 | 99.6 | 0.3 | 0.1 | 0.4 |
| 23 | 98.9 | 0.7 | 0.3 | 1.1 | 23 | 99.4 | 0.5 | 0.1 | 0.6 |
| 24 | 98.6 | 1.0 | 0.4 | 1.4 | 24 | 99.2 | 0.6 | 0.2 | 0.8 |
| 25 | 98.2 | 1.3 | 0.5 | 1.8 | 25 | 99.0 | 0.8 | 0.2 | 1.0 |
| 26 | 97.8 | 1.5 | 0.7 | 2.2 | 26 | 98.8 | 1.0 | 0.2 | 1.2 |
| 27 | 97.6 | 1.7 | 0.8 | 2.4 | 27 | 98.6 | 1.1 | 0.3 | 1.4 |
| 28 | 97.3 | 1.8 | 0.9 | 2.7 | 28 | 98.4 | 1.3 | 0.3 | 1.6 |
| 29 | 97.0 | 2.0 | 1.0 | 3.0 | 29 | 98.2 | 1.4 | 0.4 | 1.8 |
| 30 | 96.7 | 2.2 | 1.1 | 3.3 | 30 | 98.0 | 1.6 | 0.4 | 2.0 |
| 31 | 96.4 | 2.4 | 1.2 | 3.6 | 31 | 97.8 | 1.8 | 0.5 | 2.2 |
| 32 | 96.0 | 2.6 | 1.4 | 4.0 | 32 | 97.5 | 2.0 | 0.5 | 2.5 |
| 33 | 95.7 | 2.8 | 1.5 | 4.3 | 33 | 97.2 | 2.2 | 0.6 | 2.8 |
| 34 | 95.3 | 3.1 | 1.6 | 4.7 | 34 | 96.9 | 2.4 | 0.6 | 3.1 |
| 35 | 95.0 | 3.3 | 1.7 | 5.0 | 35 | 96.6 | 2.7 | 0.7 | 3.4 |
| 36 | 94.6 | 3.6 | 1.8 | 5.4 | 36 | 96.3 | 3.0 | 0.7 | 3.7 |
| 37 | 94.2 | 3.9 | 1.9 | 5.8 | 37 | 95.9 | 3.3 | 0.8 | 4.1 |
| 38 | 93.8 | 4.2 | 2.0 | 6.2 | 38 | 95.5 | 3.6 | 0.8 | 4.5 |
| 39 | 93.4 | 4.5 | 2.1 | 6.6 | 39 | 95.1 | 4.0 | 0.9 | 4.9 |
| 40 | 92.9 | 4.8 | 2.2 | 7.1 | 40 | 94.7 | 4.4 | 0.9 | 5.3 |
| 41 | 92.5 | 5.2 | 2.3 | 7.5 | 41 | 94.2 | 4.8 | 1.0 | 5.8 |
| 42 | 92.0 | 5.6 | 2.4 | 8.0 | 42 | 93.8 | 5.2 | 1.1 | 6.2 |
| 43 | 91.5 | 6.0 | 2.5 | 8.5 | 43 | 93.3 | 5.6 | 1.1 | 6.7 |
| 44 | 90.9 | 6.4 | 2.7 | 9.1 | 44 | 92.8 | 6.1 | 1.2 | 7.2 |
| 45 | 90.4 | 6.8 | 2.8 | 9.6 | 45 | 92.2 | 6.5 | 1.3 | 7.8 |
| 46 | 89.8 | 7.3 | 2.9 | 10.2 | 46 | 91.6 | 7.1 | 1.3 | 8.4 |
| 47 | 89.1 | 7.8 | 3.1 | 10.9 | 47 | 91.0 | 7.6 | 1.4 | 9.0 |
| 48 | 88.4 | 8.3 | 3.2 | 11.6 | 48 | 90.3 | 8.2 | 1.5 | 9.7 |
| 49 | 87.7 | 8.9 | 3.4 | 12.3 | 49 | 89.6 | 8.8 | 1.6 | 10.4 |
| 50 | 87.0 | 9.4 | 3.6 | 13.0 | 50 | 88.9 | 9.4 | 1.7 | 11.1 |
| 51 | 86.1 | 10.1 | 3.8 | 13.9 | 51 | 88.0 | 10.1 | 1.9 | 12.0 |
| 52 | 85.1 | 10.9 | 4.0 | 14.9 | 52 | 87.0 | 11.0 | 2.0 | 13.0 |
| 53 | 84.0 | 11.8 | 4.2 | 16.0 | 53 | 86.0 | 11.8 | 2.1 | 14.0 |
| 54 | 82.9 | 12.6 | 4.5 | 17.1 | 54 | 85.0 | 12.7 | 2.3 | 15.0 |
| 55 | 81.8 | 13.5 | 4.7 | 18.2 | 55 | 84.0 | 13.6 | 2.4 | 16.0 |
| 56 | 80.6 | 14.5 | 5.0 | 19.4 | 56 | 82.9 | 14.6 | 2.5 | 17.1 |
| 57 | 79.1 | 15.7 | 5.3 | 20.9 | 57 | 81.6 | 15.7 | 2.7 | 18.4 |
| 58 | 77.6 | 16.9 | 5.5 | 22.4 | 58 | 80.3 | 16.8 | 2.8 | 19.7 |
| 59 | 76.1 | 18.1 | 5.8 | 23.9 | 59 | 79.1 | 18.0 | 2.9 | 20.9 |
| 60 | 74.6 | 19.4 | 6.1 | 25.4 | 60 | 77.8 | 19.2 | 3.0 | 22.2 |
| 61 | 73.0 | 20.8 | 6.3 | 27.0 | 61 | 76.5 | 20.3 | 3.1 | 23.5 |
| 62 | 71.3 | 22.2 | 6.5 | 28.7 | 62 | 75.2 | 21.5 | 3.2 | 24.8 |
| 63 | 69.6 | 23.7 | 6.7 | 30.4 | 63 | 73.9 | 22.7 | 3.3 | 26.1 |
| 64 | 68.0 | 25.1 | 6.9 | 32.0 | 64 | 72.7 | 23.9 | 3.5 | 27.3 |
| 65 | 66.6 | 26.3 | 7.2 | 33.4 | 65 | 71.6 | 24.8 | 3.6 | 28.4 |
| 66 | 65.4 | 27.1 | 7.5 | 34.6 | 66 | 70.6 | 25.6 | 3.8 | 29.4 |
| 67 | 64.5 | 27.7 | 7.8 | 35.5 | 67 | 69.7 | 26.2 | 4.1 | 30.3 |

Note: Totals do not necessarily equal the sums of rounded components.


[^0]:    ${ }^{1}$ Disabled means inability to engage in any substantial gainful activity as a result of physical or mental impairments.
    ${ }^{2}$ These publications may be found at: http://www.ssa.gov/OACT/pubs.html.

[^1]:    ${ }^{3}$ Computing disability incidence rates by age using insured workers gives a larger probability of disability entitlement than if all workers were included in the calculations.

[^2]:    ${ }^{4}$ Using general population mortality rates may slightly overstate death rates for the insured population because the group excluded, the uninsured, are likely to have higher death rates than the general population.
    ${ }^{5}$ Age is age at entitlement to a disabled-worker benefit. Duration refers to the complete number of years since entitlement to a disabled-worker benefit.

[^3]:    ${ }^{1}$ Calculations are based on the intermediate assumptions of that year's Trustees Report (alternative II-B for the 1986 Trustees Report).
    ${ }^{2}$ Includes workers who recovered from disabilities.
    ${ }^{3}$ Totals are obtained by combining tables C and D. For example, the probability of death while disabled before NRA equals 5.3 percent for the 1996 birth cohort $(61,744+45,148) /(1,000,000+1,000,000)$.
    Notes: Probabilities are determined assuming all illustrative workers are disability insured throughout their working lives.
    For a recent historical perspective, see Actuarial Study 123, Social Security Disability Insurance Program Worker Experience, at: http://www.ssa.gov/OACT/NOTES/actstud.html.

