**Supplementary Table 1: Background characteristics of the immigrant study population by country of origin and gender in percentages or mean (standard deviation) for continuous variables**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Germany | | Norway | | Poland | | Former Soviet Union | | Sweden | |
| Characteristic | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| Widowed, 1980-2014 | 14.7 | 46.2 | 14.8 | 40.4 | 12.2 | 29.9 | 19.4 | 51.3 | 16.5 | 41.4 |
| Age at entry into the study\* | 57.6(9.5) | 57.3(9) | 56.6(8.2) | 55.7(7.7) | 56.3(8.9) | 54.7(8.1) | 62.8(10.8) | 60.7(9.8) | 59.6(10.5) | 57.9(9.6) |
| Age at exit from the study\*\* | 70(11.1) | 71.8(10.8) | 69.8(11.3) | 70.8(10.6) | 67.4(11.8) | 65.5(11.2) | 75(12.1) | 73.8(11.1) | 70.6(11.4) | 71.7(11.1) |
| Income at study entry (tertiles) |  |  |  |  |  |  |  |  |  |  |
| Low | 40.3 | 44.2 | 32.2 | 30.3 | 49.4 | 48.7 | 50.5 | 52.8 | 39.9 | 35.4 |
| Medium | 28.1 | 27.6 | 24.9 | 30.8 | 27.7 | 30.1 | 24.5 | 24.0 | 23.6 | 25.3 |
| High | 31.6 | 28.2 | 42.9 | 38.8 | 22.9 | 21.2 | 25.0 | 23.2 | 36.5 | 39.3 |
| Employment status at study entry for cohorts born in 1922 and after | | | |  |  |  |  |  |  |  |
| Employed | 56.2 | 43.4 | 60.0 | 49.9 | 53.5 | 45.6 | 42.1 | 29.7 | 50.7 | 45.9 |
| Not working | 43.8 | 56.6 | 40.0 | 50.1 | 46.5 | 54.4 | 57.9 | 70.3 | 49.3 | 54.1 |
| Education at study entry |  |  |  |  |  |  |  |  |  |  |
| Low | 10.2 | 34.7 | 12.2 | 31.4 | 10.1 | 16.4 | 13.3 | 28.9 | 12.9 | 27.1 |
| Medium | 42.6 | 32.5 | 29.4 | 33.9 | 28.7 | 34.4 | 32.4 | 26.0 | 32.7 | 33.0 |
| High | 29.3 | 22.3 | 40.3 | 27.3 | 31.4 | 27.4 | 35.5 | 26.7 | 35.0 | 31.6 |
| Missing | 17.8 | 10.5 | 18.1 | 7.4 | 29.7 | 21.9 | 18.6 | 18.3 | 19.4 | 8.3 |
| Parental status at study entry for cohorts born in 1940 and after | | | |  |  |  |  |  |  |  |
| Childless | 25.5 | 24.3 | 27.5 | 16.6 | 29.7 | 27.8 | 20.0 | 21.1 | 23.8 | 16.6 |
| Parents | 74.5 | 75.7 | 72.5 | 83.4 | 70.3 | 72.2 | 80.0 | 78.9 | 76.2 | 83.4 |
| Immigration contexts |  |  |  |  |  |  |  |  |  |  |
| Years since immigrating | 11.8(10.8) | 12.6(11.4) | 10.8(10.9) | 15.3(11.8) | 10.5(9.6) | 13.4(9.5) | 9.1(9.1) | 10.1(8.6) | 10.7(10.5) | 14.4(11.3) |
| Age at time of immigration | 41.7(14.4) | 40.3(14.5) | 44.3(16.2) | 38.0(15.8) | 42.6(13.1) | 38.3(11.5) | 47.2(15.1) | 44.1(13.4) | 43.9(15.0) | 38.8(15.1) |
| Employment year after immigrating | |  |  |  |  |  |  |  |  |  |
| Employed | 57.5 | 41.4 | 59.6 | 49.7 | 46.2 | 35.0 | 38.0 | 25.1 | 52.2 | 45.8 |
| Not working | 39.1 | 56.7 | 36.9 | 48.5 | 50.3 | 62.7 | 58.6 | 72.3 | 44.1 | 52.3 |
| Missing | 3.4 | 1.9 | 3.5 | 1.8 | 3.5 | 2.3 | 3.5 | 2.6 | 3.7 | 1.9 |
| Spouse’s immigration background | |  |  |  |  |  |  |  |  |  |
| Native Danish | 74.7 | 81.6 | 77.6 | 88.9 | 20.5 | 43.6 | 51.4 | 58.2 | 76.7 | 87.4 |
| Immigrant from same country | 21.1 | 15.7 | 16.9 | 8.0 | 71.9 | 48.5 | 25.5 | 19.7 | 17.2 | 8.6 |
| Immigrant from other country | 4.2 | 2.7 | 5.5 | 3.1 | 7.5 | 7.9 | 23.1 | 22.1 | 6.2 | 4.0 |
| Total N | 6775 | 8116 | 2214 | 4163 | 1723 | 2381 | 432 | 538 | 2338 | 4243 |
| N of deaths 1980-2014 (%) | 3043 (44.9) | 4037  (49.7) | 1068 (48.2) | 1871  (44.9) | 636  (36.9) | 710  (29.8) | 284  (65.7) | 350  (65.1) | 1166  (49.9) | 2020  (47.6) |

\* Age 50 if married. age at marriage if 50+ when entering marriage. and age at immigration if married and 50+ on arrival to Denmark.

\*\* Age at death or end of the study period (December 31. 2014).

**Supplementary Table 1 Cont. Background characteristics of the immigrant study population by country of origin and gender in percentages or mean (standard deviation) for continuous variables**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Turkey | | UK | | US | | Vietnam | | Former Yugoslavia | |
| Characteristic | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| Widowed, 1980-2014 | 5.5 | 19.6 | 6.6 | 31.5 | 12.3 | 35.2 | 6.4 | 19.3 | 6.6 | 18.6 |
| Age at entry into the study\* | 51.1(2.7) | 51(2.3) | 53.3(5.9) | 54.3(7) | 57.2(8.4) | 57(8.1) | 54.4(7) | 53.6(5.7) | 52.8(5.1) | 52.2(4.3) |
| Age at exit from the study\*\* | 62.3(9.5) | 61.8(8.9) | 63.5(10.1) | 67.7(11.2) | 67(11.8) | 68.3(11.6) | 64.5(11.5) | 63.9(10.5) | 63.0(9.1) | 62.1(8.5) |
| Income at study entry (tertiles) |  |  |  |  |  |  |  |  |  |  |
| Low | 68.4 | 77.8 | 27.2 | 28.7 | 40.1 | 40.3 | 63.3 | 67.7 | 67.5 | 72.1 |
| Medium | 26.8 | 19.4 | 30.5 | 26.9 | 23.4 | 17.7 | 24.2 | 17.7 | 25.8 | 21.3 |
| High | 4.5 | 2.8 | 42.3 | 44.3 | 36.5 | 42.0 | 12.6 | 14.6 | 6.8 | 6.6 |
| Employment status at study entry |  |  |  |  |  |  |  |  |  |  |
| Employed | 43.5 | 23.2 | 64.9 | 47.9 | 53.0 | 38.8 | 42.3 | 30.6 | 38.6 | 28.4 |
| Not working | 56.5 | 76.8 | 35.1 | 52.1 | 47.0 | 61.2 | 57.7 | 69.4 | 61.7 | 71.6 |
| Education at study entry for cohorts born in 1922 and after | | | |  |  |  |  |  |  |  |
| Low | 59.8 | 46.5 | 12.9 | 21.8 | 7.4 | 16.2 | 18.2 | 27.8 | 20.9 | 28.4 |
| Medium | 21.4 | 11.3 | 32.7 | 32.9 | 21.5 | 19.6 | 28.6 | 22.8 | 41.9 | 36.6 |
| High | 8.5 | 4.0 | 34.1 | 29.8 | 37.7 | 35.8 | 23.3 | 16.5 | 19.2 | 16.8 |
| Missing | 10.3 | 38.2 | 20.3 | 15.5 | 33.3 | 28.5 | 29.8 | 32.8 | 18.0 | 18.1 |
| Parental status at study entry for cohorts born in 1940 and after | | | |  |  |  |  |  |  |  |
| Childless | 3.3 | 3.7 | 23.7 | 22.1 | 39.5 | 40.6 | 7.4 | 14.0 | 12.5 | 16.1 |
| Parents | 96.7 | 96.3 | 76.3 | 77.9 | 60.5 | 59.4 | 92.6 | 86.0 | 87.5 | 83.9 |
| Immigration contexts |  |  |  |  |  |  |  |  |  |  |
| Years since immigrating | 24.8(9.7) | 20.0(11.1) | 14.8(10.7) | 14.3(11.1) | 9.5(10.0) | 10.0(11) | 14.9(12.2) | 12.7(10.7) | 9.8(8.4) | 10.5(8.3) |
| Age at time of migration | 26.2(11.2) | 30.9(12.1) | 37.7(13.6) | 38.2(14.0) | 45.0(14.4) | 44.1(14.7) | 39.3(17.4) | 40.7(14.7) | 43.3(12.2) | 41.9(11.3) |
| Employment year after immigrating | |  |  |  |  |  |  |  |  |  |
| Employed | 57.3 | 30.0 | 66.2 | 46.6 | 51.4 | 36.0 | 18.3 | 14.7 | 25.2 | 17.9 |
| Not working | 39.9 | 67.3 | 28.2 | 50.3 | 38.6 | 55.9 | 79.0 | 82.7 | 73.1 | 80.7 |
| Missing | 2.8 | 2.8 | 5.6 | 3.1 | 10.0 | 8.1 | 2.7 | 2.6 | 1.6 | 1.4 |
| Spouse’s immigration background |  |  |  |  |  |  |  |  |  |  |
| Native Danish | 4.2 | 0.7 | 76.1 | 79.4 | 73.6 | 76.3 | 7.8 | 16.5 | 3.3 | 3.3 |
| Immigrant from same country | 94.9 | 98.6 | 14.4 | 14.6 | 19.0 | 18.8 | 87.8 | 80.5 | 94.8 | 95.4 |
| Immigrant from other country | 0.8 | 0.7 | 9.5 | 6.0 | 7.4 | 4.8 | 4.5 | 3.0 | 1.9 | 1.3 |
| Total N | 2885 | 2489 | 2476 | 1934 | 1517 | 1301 | 1660 | 1433 | 5079 | 4332 |
| N of deaths (%) | 564  (19.5) | 272  (10.9) | 522  (21.1) | 590  (30.5) | 567  (37.4) | 507  (39.0) | 347  (20.9) | 200  (14.0) | 924  (18.2) | 466  (10.8) |

\* Age 50 if married. age at marriage if 50+ when entering marriage. and age at immigration if married and 50+ on arrival to Denmark.

\*\* Age at death or end of the study period (December 31. 2014).

**Supplementary Table 2: Post-widowhood mortality hazard ratios by immigration background among men and women in Denmark, adjusted for education and parental status**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Men | | | Women | | |
|  | HR\* | 95% CI\* | | HR | 95% CI | |
| **MODEL 1: Education** |  |  | |  |  |  |
| Immigrant (ref.: Native-born) | 0.931 | 0.899 | 0.963 | 0.919 | 0.882 | 0.951 |
| Widowhood status (ref.: Married) | |  |  |  |  |  |
| Widowed 0-2 years | 1.488 | 1.457 | 1.52 | 1.373 | 1.346 | 1.400 |
| Widowed 3-5 years | 1.439 | 1.411 | 1.467 | 1.304 | 1.281 | 1.326 |
| Widowed 6+ years | 1.435 | 1.417 | 1.453 | 1.439 | 1.422 | 1.455 |
| Income (ref.: Low) |  |  |  |  |  |  |
| Medium | 0.861 | 0.852 | 0.870 | 0.905 | 0.869 | 0.914 |
| High | 0.770 | 0.762 | 0.779 | 0.813 | 0.804 | 0.823 |
| Employment status (ref.: Not working) | |  |  |  |  |  |
| Employed | 0.779 | 0.771 | 0.788 | 0.685 | 0.676 | 0.695 |
| Education (ref.: Low) |  |  |  |  |  |  |
| Medium | 0.910 | 0.902 | 0.918 | 0.845 | 0.836 | 0.854 |
| High | 0.751 | 0.742 | 0.761 | 0.700 | 0.688 | 0.712 |
| Missing | 0.910 | 0.873 | 0.948 | 0.871 | 0.828 | 0.916 |
| Immigrant \* Widowed 0-2 years | 1.188 | 1.000 | 1.411 | 1.130 | 0.997 | 1.281 |
| Immigrant \* Widowed 3-5 years | 1.071 | 0.904 | 1.268 | 1.121 | 1.003 | 1.251 |
| Immigrant \* Widowed 6+ years | 1.010 | 0.897 | 1.137 | 1.056 | 0.991 | 1.125 |
| N persons | 785,841 |  |  | 811,397 | |  |
| N person-years | 13,573,652 |  |  | 15,102,280 | |  |
| N deaths | 254,729 |  |  | 215,264 |  |  |
| **MODEL 2: Parental status** |  |  | |  |  |  |
| Immigrant (ref.: Native-born) | 0.908 | 0.855 | 0.964 | 0.717 | 0.660 | 0.778 |
| Widowhood status (ref.: Married) | |  |  |  |  |  |
| Widowed 0-2 years | 1.990 | 1.844 | 2.146 | 1.603 | 1.502 | 1.711 |
| Widowed 3-5 years | 1.863 | 1.735 | 2.001 | 1.549 | 1.460 | 1.644 |
| Widowed 6+ years | 1.917 | 1.824 | 2.015 | 1.782 | 1.714 | 1.853 |
| Income (ref.: Low) |  |  |  |  |  |  |
| Medium | 0.713 | 0.692 | 0.734 | 0.779 | 0.755 | 0.804 |
| High | 0.541 | 0.526 | 0.557 | 0.592 | 0.574 | 0.612 |
| Employment status (ref.: Not working) | |  |  |  |  |  |
| Employed | 0.707 | 0.690 | 0.724 | 0.598 | 0.581 | 0.616 |
| Parental status (ref.: No children) | |  |  |  |  |  |
| 1+ child | 0.773 | 0.744 | 0.803 | 0.715 | 0.685 | 0.748 |
| Immigrant \* Widowed 0-2 years | 1.166 | 0.760 | 1.790 | 0.800 | 0.515 | 1.242 |
| Immigrant \* Widowed 3-5 years | 1.167 | 0.761 | 1.791 | 0.970 | 0.673 | 1.398 |
| Immigrant \* Widowed 6+ years | 0.783 | 0.543 | 1.129 | 1.100 | 0.879 | 1.378 |
| N persons | 445,483 | |  | 457,142 | |  |
| N person-years | 5,582,224 |  |  | 5,901,793 |  |  |
| N deaths | 38,539 |  |  | 29,421 |  |  |
| \* HR = hazard ratio, CI = confidence interval | | | | | | |

**Supplementary Table 3: Mortality hazard ratios by immigration background and marital status among men and women in Denmark**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Model 1 | | | Model 2 | | | Model 3 | | |
|  | HR\* | 95% CI\* | | HR | 95% CI | | HR | 95% CI | |
| **MEN** |  |  | |  |  | |  |  | |
| Immigrant (ref.: Native-born) | 0.981 | 0.963 | 0.999 | 0.985 | 0.964 | 1.005 | 0.946 | 0.926 | 0.967 |
| Marital status (ref.: Stably married) | |  |  |  |  |  |  |  |  |
| Divorced | 1.588 | 1.570 | 1.606 | 0.984 | 0.963 | 1.006 | 1.710 | 1.691 | 1.730 |
| Widowed and remarried | 0.897 | 0.854 | 0.942 | 1.593 | 1.574 | 1.611 | 0.946 | 0.900 | 0.994 |
| Widowed 0-2 years | 1.361 | 1.346 | 1.377 | 0.897 | 0.853 | 0.943 | 1.328 | 1.313 | 1.343 |
| Widowed 3-5 years | 1.293 | 1.279 | 1.307 | 1.359 | 1.343 | 1.375 | 1.268 | 1.254 | 1.282 |
| Widowed 6+ years | 1.229 | 1.220 | 1.209 | 1.293 | 1.279 | 1.307 | 1.249 | 1.239 | 1.259 |
| Immigrant \* Marital status |  |  |  |  |  |  |  |  |  |
| Immigrant \* Divorced |  |  |  | 0.897 | 0.834 | 0.965 | 0.877 | 0.816 | 0.944 |
| Immigrant \* Widowed and remarried | |  |  | 1.012 | 0.757 | 1.354 | 0.971 | 0.726 | 1.300 |
| Immigrant \* Widowed 0-2 years | |  |  | 1.111 | 1.017 | 1.213 | 1.149 | 1.052 | 1.254 |
| Immigrant \* Widowed 3-5 years | |  |  | 1.026 | 0.939 | 1.120 | 1.063 | 0.973 | 1.160 |
| Immigrant \* Widowed 6+ years | |  |  | 0.990 | 0.927 | 1.056 | 1.029 | 0.964 | 1.098 |
| Income (ref.: Low) |  |  |  |  |  |  |  |  |  |
| Medium |  |  |  |  |  |  | 0.838 | 0.833 | 0.843 |
| High |  |  |  |  |  |  | 0.697 | 0.693 | 0.702 |
| Employment status (ref.: Not working) | | |  |  |  |  |  |  |  |
| Employed |  |  |  |  |  |  | 0.819 | 0.813 | 0.825 |
| N persons | 1,366,188 | |  |  |  |  |  |  |  |
| N person-years | 21,285,480 | |  |  |  |  |  |  |  |
| N deaths | 659,657 | | |  |  |  |  |  |  |
| **WOMEN** |  |  |  |  |  |  |  |  |  |
| Immigrant (ref.: Native-born) | 0.998 | 0.981 | 1.016 | 0.981 | 0.955 | 1.008 | 0.964 | 0.938 | 0.990 |
| Marital status (ref.: Stably married) | | |  |  |  |  |  |  |  |
| Divorced | 2.207 | 2.170 | 2.244 | 2.207 | 2.170 | 2.245 | 2.343 | 2.304 | 2.384 |
| Widowed and remarried | 1.004 | 0.919 | 1.096 | 1.005 | 0.919 | 1.099 | 1.005 | 0.919 | 1.099 |
| Widowed 0-2 years | 1.305 | 1.290 | 1.321 | 1.305 | 1.289 | 1.320 | 1.280 | 1.264 | 1.295 |
| Widowed 3-5 years | 1.237 | 1.224 | 1.250 | 1.237 | 1.224 | 1.250 | 1.217 | 1.204 | 1.230 |
| Widowed 6+ years | 1.233 | 1.224 | 1.242 | 1.232 | 1.223 | 1.241 | 1.244 | 1.235 | 1.254 |
| Immigrant \* Marital status |  |  |  |  |  |  |  |  |  |
| Immigrant \* Divorced |  |  |  | 1.002 | 0.917 | 1.096 | 0.978 | 0.894 | 1.070 |
| Immigrant \* Widowed and remarried | |  |  | 0.899 | 0.447 | 1.810 | 0.877 | 0.436 | 1.765 |
| Immigrant \* Widowed 0-2 years | |  |  | 1.014 | 0.943 | 1.091 | 1.036 | 0.963 | 1.114 |
| Immigrant \* Widowed 3-5 years | |  |  | 1.024 | 0.960 | 1.091 | 1.047 | 0.982 | 1.116 |
| Immigrant \* Widowed 6+ years | |  |  | 1.040 | 1.000 | 1.082 | 1.068 | 1.027 | 1.112 |
| Income (ref.: Low) |  |  |  |  |  |  |  |  |  |
| Medium |  |  |  |  |  |  | 0.872 | 0.867 | 0.879 |
| High |  |  |  |  |  |  | 0.741 | 0.736 | 0.747 |
| Employment status (ref.: Not working) | | |  |  |  |  |  |  |  |
| Employed |  |  |  |  |  |  | 1.355 | 1.340 | 1.370 |
| N persons | 1,290,984 | |  |  |  |  |  |  |  |
| N person-years | 22,365,690 | |  |  |  |  |  |  |  |
| N deaths | 518,917 | |  |  |  |  |  |  |  |
| \* HR = hazard ratio, CI = confidence interval | | | | | | | | | |