Comparing functions and testing efficiency

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```
##This is an example and comparison
ex<-ahmd$Ex[,1]#crude death rate
dx<-ahmd$Dx[,1]#death count
x<-seq(0,length(ex),1)


mytest<-myLT(x,ex,dx, initpop = 100000)
```

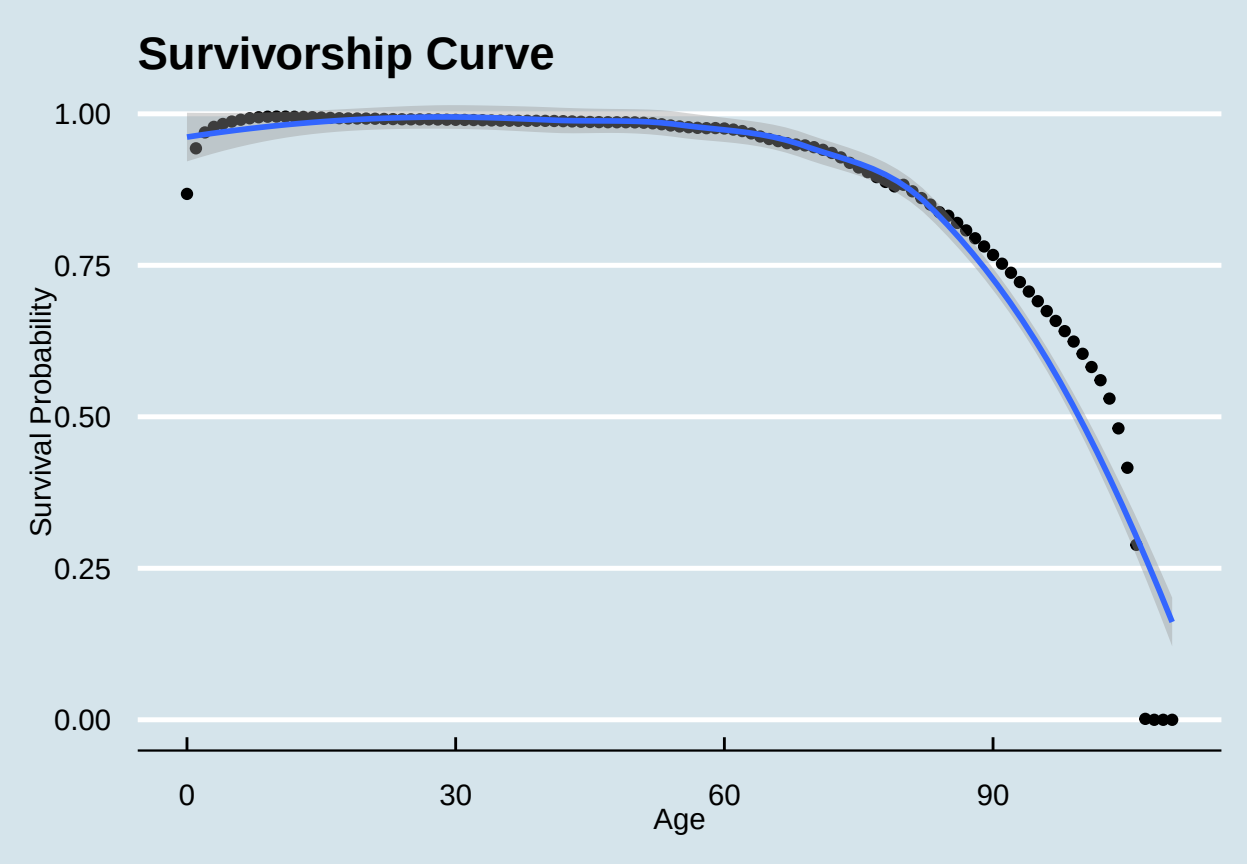
```
## Warning in nx * lx: longer object length is not a multiple of shorter object
## length
```

```
## Warning in (p1) * dx: longer object length is not a multiple of shorter object
## length
```

```
mytest[2]
```

```
## $`Survivorship Curve`

## `geom_smooth()` using formula 'y ~ x'
```




```
head(mytest[1])
```

```
## $`Life Table`
##       x          mx        nqx2       cumul  ax           lx           dx
## 1     0 0.141754793 0.132165971 0.867834029 0.5 1.000000e+05 1.321660e+04
## 2     1 0.058616680 0.056931803 0.943068197 0.5 8.678340e+04 4.940736e+03
## 3     2 0.031199645 0.030717959 0.969282041 0.5 8.184267e+04 2.514040e+03
## 4     3 0.021730865 0.021496451 0.978503549 0.5 7.932863e+04 1.705284e+03
## 5     4 0.016885878 0.016744111 0.983255889 0.5 7.762334e+04 1.299734e+03
## 6     5 0.012800287 0.012718712 0.987281288 0.5 7.632361e+04 9.707380e+02
## 7     6 0.009752498 0.009705097 0.990294903 0.5 7.535287e+04 7.313069e+02
## 8     7 0.007367308 0.007340236 0.992659764 0.5 7.462156e+04 5.477399e+02
## 9     8 0.005696056 0.005679864 0.994320136 0.5 7.407383e+04 4.207293e+02
## 10    9 0.004773693 0.004762317 0.995237683 0.5 7.365310e+04 3.507594e+02
## 11   10 0.004573473 0.004563031 0.995436969 0.5 7.330234e+04 3.344808e+02
## 12   11 0.004629299 0.004618600 0.995381400 0.5 7.296786e+04 3.370094e+02
## 13   12 0.004832535 0.004820877 0.995179123 0.5 7.263085e+04 3.501444e+02
## 14   13 0.005152328 0.005139078 0.994860922 0.5 7.228070e+04 3.714562e+02
## 15   14 0.005565682 0.005550222 0.994449778 0.5 7.190925e+04 3.991123e+02
## 16   15 0.006134435 0.006115658 0.993884342 0.5 7.151013e+04 4.373315e+02
## 17   16 0.006733304 0.006710686 0.993289314 0.5 7.107280e+04 4.769472e+02
## 18   17 0.007255384 0.007229127 0.992770873 0.5 7.059585e+04 5.103464e+02
## 19   18 0.007654138 0.007624920 0.992375080 0.5 7.008551e+04 5.343964e+02
## 20   19 0.007765672 0.007735597 0.992264403 0.5 6.955111e+04 5.380194e+02
## 21   20 0.007852191 0.007821443 0.992178557 0.5 6.901309e+04 5.397820e+02
```

```
## 76   75 0.092760769 0.088588488 0.911411512 0.5 1.951917e+04 1.729174e+03
## 77   76 0.101140931 0.096194350 0.903805650 0.5 1.779000e+04 1.711297e+03
## 78   77 0.110301470 0.104435891 0.895564109 0.5 1.607870e+04 1.679193e+03
## 79   78 0.119201293 0.112370891 0.887629109 0.5 1.439951e+04 1.618085e+03
## 80   79 0.127524435 0.119728094 0.880271906 0.5 1.278142e+04 1.530295e+03
## 81   80 0.124583197 0.117135194 0.882864806 0.5 1.125113e+04 1.317903e+03
## 82   81 0.136850000 0.127898968 0.872101032 0.5 9.933223e+03 1.270449e+03
## 83   82 0.149665598 0.139004153 0.860995847 0.5 8.662774e+03 1.204162e+03
## 84   83 0.162298871 0.149812930 0.850187070 0.5 7.458612e+03 1.117397e+03
## 85   84 0.177031663 0.162246741 0.837753259 0.5 6.341216e+03 1.028842e+03
## 86   85 0.184147694 0.168187059 0.831812941 0.5 5.312374e+03 8.934726e+02
## 87   86 0.198472621 0.180017779 0.819982221 0.5 4.418902e+03 7.954808e+02
## 88   87 0.213691546 0.192402547 0.807597453 0.5 3.623421e+03 6.971554e+02
## 89   88 0.229882810 0.205373281 0.794626719 0.5 2.926265e+03 6.009767e+02
## 90   89 0.247019757 0.218874740 0.781125260 0.5 2.325289e+03 5.089469e+02
## 91   90 0.265098709 0.232869777 0.767130223 0.5 1.816342e+03 4.229711e+02
## 92   91 0.284156272 0.247350982 0.752649018 0.5 1.393371e+03 3.446516e+02
## 93   92 0.304211047 0.262294841 0.737705159 0.5 1.048719e+03 2.750736e+02
## 94   93 0.325216735 0.277629226 0.722370774 0.5 7.736454e+02 2.147866e+02
## 95   94 0.347115066 0.293275996 0.706724004 0.5 5.588588e+02 1.638999e+02
## 96   95 0.369927338 0.309215477 0.690784523 0.5 3.949590e+02 1.221274e+02
## 97   96 0.393826238 0.325528757 0.674471243 0.5 2.728315e+02 8.881451e+01
## 98   97 0.418207681 0.341774487 0.658225513 0.5 1.840170e+02 6.289232e+01
## 99   98 0.444136017 0.358621823 0.641378177 0.5 1.211247e+02 4.343796e+01
## 100  99 0.471297989 0.375808452 0.624191548 0.5 7.768674e+01 2.919533e+01
## 101 100 0.504174120 0.395995796 0.604004204 0.5 4.849141e+01 1.920239e+01
## 102 101 0.541000000 0.417834205 0.582165795 0.5 2.928901e+01 1.223795e+01
## 103 102 0.579127459 0.439612886 0.560387114 0.5 1.705106e+01 7.495866e+00
## 104 103 0.634822804 0.469970601 0.530029399 0.5 9.555195e+00 4.490661e+00
## 105 104 0.732142857 0.519122566 0.480877434 0.5 5.064534e+00 2.629114e+00
## 106 105 0.877300613 0.584095916 0.415904084 0.5 2.435420e+00 1.422519e+00
## 107 106 1.242424242 0.711316470 0.288683530 0.5 1.012901e+00 7.204933e-01
## 108 107 6.500000000 1.000000000 0.001503439 0.5 2.924079e-01 2.919683e-01
##               Lx           tx        ex
## 1   9.339170e+04 4.353795e+06 267659.38
## 2   8.431304e+04 4.260403e+06 233346.55
## 3   8.058565e+04 4.176090e+06 218207.61
## 4   7.847599e+04 4.095504e+06 215407.90
## 5   7.697348e+04 4.017028e+06 214084.22
## 6   7.583824e+04 3.940055e+06 211806.97
## 7   7.498722e+04 3.864217e+06 208163.08
## 8   7.434770e+04 3.789229e+06 204960.89
## 9   7.386346e+04 3.714882e+06 202053.85
## 10  7.347772e+04 3.641018e+06 199591.79
## 11  7.313510e+04 3.567540e+06 195348.25
## 12  7.279935e+04 3.494405e+06 190925.23
## 13  7.245577e+04 3.421606e+06 186618.40
## 14  7.209497e+04 3.349150e+06 183876.09
## 15  7.170969e+04 3.277055e+06 183355.78
## 16  7.129147e+04 3.205346e+06 181636.93
## 17  7.083433e+04 3.134054e+06 178353.76
## 18  7.034068e+04 3.063220e+06 175537.23
## 19  6.981831e+04 2.992879e+06 174060.09
## 20  6.928210e+04 2.923061e+06 177314.99
```

```
## 75  2.037787e+04 1.601950e+05  21398.18
## 76  1.865458e+04 1.398172e+05  19320.56
## 77  1.693435e+04 1.211626e+05  17487.48
## 78  1.523910e+04 1.042282e+05  15712.03
## 79  1.359046e+04 8.898912e+04  14137.85
## 80  1.201627e+04 7.539866e+04  12744.93
## 81  1.059217e+04 6.338238e+04  12466.93
## 82  9.297998e+03 5.279021e+04  10733.65
## 83  8.060693e+03 4.349221e+04   9170.11
## 84  6.899914e+03 3.543152e+04   7787.30
## 85  5.826795e+03 2.853161e+04   6457.15
## 86  4.865638e+03 2.270481e+04   5256.27
## 87  4.021161e+03 1.783917e+04   4271.37
## 88  3.274843e+03 1.381801e+04   3364.85
## 89  2.625777e+03 1.054317e+04   2608.59
## 90  2.070815e+03 7.917391e+03   2041.78
## 91  1.604856e+03 5.846576e+03   1556.59
## 92  1.221045e+03 4.241720e+03   1154.40
## 93  9.111822e+02 3.020675e+03    848.72
## 94  6.662521e+02 2.109493e+03    609.04
## 95  4.769089e+02 1.443241e+03    422.54
## 96  3.338952e+02 9.663319e+02    291.76
## 97  2.284243e+02 6.324366e+02    200.85
## 98  1.525709e+02 4.040123e+02    133.57
## 99  9.940572e+01 2.514415e+02     86.46
## 100 6.308907e+01 1.520358e+02     54.70
## 101 3.889021e+01 8.894668e+01     33.54
## 102 2.317004e+01 5.005647e+01     20.00
## 103 1.330313e+01 2.688643e+01     11.69
## 104 7.309865e+00 1.358330e+01      6.49
## 105 3.749977e+00 6.273436e+00      3.36
## 106 1.724161e+00 2.523459e+00      1.63
## 107 6.526546e-01 7.992982e-01      0.66
## 108 1.464238e-01 1.466436e-01      0.04
```

```
existingtest<- LifeTable(x, Dx = dx, Ex = ex)
```

```
## Warning in x >= 100 & (is.na(ux) | is.infinite(ux) | ux == 0): longer object
## length is not a multiple of shorter object length
```

```
head(existingtest)
```

```
## $lt
##         x.int   x          mx          qx        ax           lx           dx
## 1       [0,1)   0 0.141754793 0.132165971 0.4881911 1.000000e+05 1.321660e+04
## 2       [1,2)   1 0.058616680 0.056931803 0.4951156 8.678340e+04 4.940736e+03
## 3       [2,3)   2 0.031199645 0.030717959 0.4974001 8.184267e+04 2.514040e+03
## 4       [3,4)   3 0.021730865 0.021496451 0.4981891 7.932863e+04 1.705284e+03
## 5       [4,5)   4 0.016885878 0.016744111 0.4985929 7.762334e+04 1.299734e+03
## 6       [5,6)   5 0.012800287 0.012718712 0.4989333 7.632361e+04 9.707380e+02
## 7       [6,7)   6 0.009752498 0.009705097 0.4991873 7.535287e+04 7.313069e+02
## 8       [7,8)   7 0.007367308 0.007340236 0.4993861 7.462156e+04 5.477399e+02
## 9       [8,9)   8 0.005696056 0.005679864 0.4995253 7.407383e+04 4.207293e+02
```

```
## 10     [9,10)   9 0.004773693 0.004762317 0.4996022 7.365310e+04 3.507594e+02
## 11    [10,11)  10 0.004573473 0.004563031 0.4996189 7.330234e+04 3.344808e+02
## 12    [11,12)  11 0.004629299 0.004618600 0.4996142 7.296786e+04 3.370094e+02
## 13    [12,13)  12 0.004832535 0.004820877 0.4995973 7.263085e+04 3.501444e+02
## 14    [13,14)  13 0.005152328 0.005139078 0.4995706 7.228070e+04 3.714562e+02
## 15    [14,15)  14 0.005565682 0.005550222 0.4995362 7.190925e+04 3.991123e+02
## 16    [15,16)  15 0.006134435 0.006115658 0.4994888 7.151013e+04 4.373315e+02
## 17    [16,17)  16 0.006733304 0.006710686 0.4994389 7.107280e+04 4.769472e+02
## 18    [17,18)  17 0.007255384 0.007229127 0.4993954 7.059585e+04 5.103464e+02
## 19    [18,19)  18 0.007654138 0.007624920 0.4993622 7.008551e+04 5.343964e+02
## 20    [19,20)  19 0.007765672 0.007735597 0.4993529 6.955111e+04 5.380194e+02
## 21    [20,21)  20 0.007852191 0.007821443 0.4993457 6.901309e+04 5.397820e+02
## 22    [21,22)  21 0.008144640 0.008111562 0.4993213 6.847331e+04 5.554255e+02
## 23    [22,23)  22 0.008438297 0.008402794 0.4992968 6.791788e+04 5.707000e+02
## 24    [23,24)  23 0.008725733 0.008687774 0.4992729 6.734718e+04 5.850971e+02
## 25    [24,25)  24 0.008958468 0.008918461 0.4992535 6.676209e+04 5.954151e+02
## 26    [25,26)  25 0.009106919 0.009065577 0.4992411 6.616667e+04 5.998391e+02
## 27    [26,27)  26 0.009197045 0.009154882 0.4992336 6.556683e+04 6.002566e+02
## 28    [27,28)  27 0.009281254 0.009238316 0.4992266 6.496658e+04 6.001818e+02
## 29    [28,29)  28 0.009433154 0.009388801 0.4992139 6.436640e+04 6.043233e+02
## 30    [29,30)  29 0.009712490 0.009665476 0.4991906 6.376207e+04 6.162908e+02
## 31    [30,31)  30 0.009955548 0.009906155 0.4991704 6.314578e+04 6.255319e+02
## 32    [31,32)  31 0.010078575 0.010027956 0.4991601 6.252025e+04 6.269503e+02
## 33    [32,33)  32 0.010283615 0.010230919 0.4991430 6.189330e+04 6.332253e+02
## 34    [33,34)  33 0.010582141 0.010526348 0.4991182 6.126007e+04 6.448448e+02
## 35    [34,35)  34 0.010971540 0.010911572 0.4990857 6.061523e+04 6.614074e+02
## 36    [35,36)  35 0.011277658 0.011214304 0.4990602 5.995382e+04 6.723404e+02
## 37    [36,37)  36 0.011421111 0.011356137 0.4990482 5.928148e+04 6.732086e+02
## 38    [37,38)  37 0.011508595 0.011442624 0.4990410 5.860827e+04 6.706324e+02
## 39    [38,39)  38 0.011557435 0.011490905 0.4990369 5.793764e+04 6.657559e+02
## 40    [39,40)  39 0.011578818 0.011512041 0.4990351 5.727188e+04 6.593163e+02
## 41    [40,41)  40 0.011659292 0.011591586 0.4990284 5.661257e+04 6.562294e+02
## 42    [41,42)  41 0.011855083 0.011785088 0.4990121 5.595634e+04 6.594504e+02
## 43    [42,43)  42 0.012151228 0.012077700 0.4989874 5.529689e+04 6.678592e+02
## 44    [43,44)  43 0.012603646 0.012524553 0.4989497 5.462903e+04 6.842042e+02
## 45    [44,45)  44 0.013158809 0.013072611 0.4989034 5.394482e+04 7.051997e+02
## 46    [45,46)  45 0.013552743 0.013461318 0.4988706 5.323962e+04 7.166755e+02
## 47    [46,47)  46 0.013767562 0.013673223 0.4988527 5.252295e+04 7.181580e+02
## 48    [47,48)  47 0.013938483 0.013841792 0.4988385 5.180479e+04 7.170712e+02
## 49    [48,49)  48 0.014027018 0.013929098 0.4988311 5.108772e+04 7.116059e+02
## 50    [49,50)  49 0.014019849 0.013922029 0.4988317 5.037611e+04 7.013377e+02
## 51    [50,51)  50 0.014236416 0.014135558 0.4988136 4.967478e+04 7.021807e+02
## 52    [51,52)  51 0.014825293 0.014715940 0.4987646 4.897260e+04 7.206778e+02
## 53    [52,53)  52 0.015780969 0.015657102 0.4986849 4.825192e+04 7.554852e+02
## 54    [53,54)  53 0.017370376 0.017220381 0.4985525 4.749643e+04 8.179067e+02
## 55    [54,55)  54 0.019415736 0.019228465 0.4983820 4.667853e+04 8.975564e+02
## 56    [55,56)  55 0.021096264 0.020875295 0.4982420 4.578097e+04 9.556912e+02
## 57    [56,57)  56 0.022324695 0.022077343 0.4981396 4.482528e+04 9.896230e+02
## 58    [57,58)  57 0.023411828 0.023139897 0.4980490 4.383566e+04 1.014353e+03
## 59    [58,59)  58 0.023944124 0.023659738 0.4980047 4.282130e+04 1.013141e+03
## 60    [59,60)  59 0.023832876 0.023551116 0.4980139 4.180816e+04 9.846289e+02
## 61    [60,61)  60 0.024487061 0.024189685 0.4979594 4.082353e+04 9.875084e+02
## 62    [61,62)  61 0.026354484 0.026010236 0.4978038 3.983602e+04 1.036144e+03
## 63    [62,63)  62 0.028863117 0.028450556 0.4975948 3.879988e+04 1.103878e+03
```

```
## 64    [63,64)  63 0.032872222 0.032337803 0.4972607 3.769600e+04 1.219006e+03
## 65    [64,65)  64 0.038097509 0.037380928 0.4968253 3.647700e+04 1.363544e+03
## 66    [65,66)  65 0.042467042 0.041577948 0.4964612 3.511345e+04 1.459945e+03
## 67    [66,67)  66 0.046063363 0.045018550 0.4961615 3.365351e+04 1.515032e+03
## 68    [67,68)  67 0.049567275 0.048358865 0.4958696 3.213848e+04 1.554180e+03
## 69    [68,69)  68 0.051995533 0.050666892 0.4956672 3.058429e+04 1.549611e+03
## 70    [69,70)  69 0.053543760 0.052135539 0.4955382 2.903468e+04 1.513739e+03
## 71    [70,71)  70 0.056621610 0.055048438 0.4952818 2.752094e+04 1.514985e+03
## 72    [71,72)  71 0.061264338 0.059425422 0.4948950 2.600596e+04 1.545415e+03
## 73    [72,73)  72 0.066740720 0.064562290 0.4944387 2.446054e+04 1.579229e+03
## 74    [73,74)  73 0.074596348 0.071881952 0.4937842 2.288132e+04 1.644754e+03
## 75    [74,75)  74 0.084327265 0.080869593 0.4929736 2.123656e+04 1.717392e+03
## 76    [75,76)  75 0.092760769 0.088588488 0.4922710 1.951917e+04 1.729174e+03
## 77    [76,77)  76 0.101140931 0.096194350 0.4915730 1.779000e+04 1.711297e+03
## 78    [77,78)  77 0.110301470 0.104435891 0.4908101 1.607870e+04 1.679193e+03
## 79    [78,79)  78 0.119201293 0.112370891 0.4900689 1.439951e+04 1.618085e+03
## 80    [79,80)  79 0.127524435 0.119728094 0.4893758 1.278142e+04 1.530295e+03
## 81    [80,81)  80 0.124583197 0.117135194 0.4896208 1.125113e+04 1.317903e+03
## 82    [81,82)  81 0.136850000 0.127898968 0.4885994 9.933223e+03 1.270449e+03
## 83    [82,83)  82 0.149665598 0.139004153 0.4875325 8.662774e+03 1.204162e+03
## 84    [83,84)  83 0.162298871 0.149812930 0.4864810 7.458612e+03 1.117397e+03
## 85    [84,85)  84 0.177031663 0.162246741 0.4852551 6.341216e+03 1.028842e+03
## 86    [85,86)  85 0.184147694 0.168187059 0.4846630 5.312374e+03 8.934726e+02
## 87    [86,87)  86 0.198472621 0.180017779 0.4834715 4.418902e+03 7.954808e+02
## 88    [87,88)  87 0.213691546 0.192402547 0.4822059 3.623421e+03 6.971554e+02
## 89    [88,89)  88 0.229882810 0.205373281 0.4808600 2.926265e+03 6.009767e+02
## 90    [89,90)  89 0.247019757 0.218874740 0.4794359 2.325289e+03 5.089469e+02
## 91    [90,91)  90 0.265098709 0.232869777 0.4779343 1.816342e+03 4.229711e+02
## 92    [91,92)  91 0.284156272 0.247350982 0.4763521 1.393371e+03 3.446516e+02
## 93    [92,93)  92 0.304211047 0.262294841 0.4746881 1.048719e+03 2.750736e+02
## 94    [93,94)  93 0.325216735 0.277629226 0.4729463 7.736454e+02 2.147866e+02
## 95    [94,95)  94 0.347115066 0.293275996 0.4711317 5.588588e+02 1.638999e+02
## 96    [95,96)  95 0.369927338 0.309215477 0.4692428 3.949590e+02 1.221274e+02
## 97    [96,97)  96 0.393826238 0.325528757 0.4672657 2.728315e+02 8.881451e+01
## 98    [97,98)  97 0.418207681 0.341774487 0.4652505 1.840170e+02 6.289232e+01
## 99    [98,99)  98 0.444136017 0.358621823 0.4631098 1.211247e+02 4.343796e+01
## 100  [99,100)  99 0.471297989 0.375808452 0.4608698 7.768674e+01 2.919533e+01
## 101 [100,101) 100 0.504174120 0.395995796 0.4581624 4.849141e+01 1.920239e+01
## 102 [101,102) 101 0.541000000 0.417834205 0.4551351 2.928901e+01 1.223795e+01
## 103 [102,103) 102 0.579127459 0.439612886 0.4520070 1.705106e+01 7.495866e+00
## 104 [103,104) 103 0.634822804 0.469970601 0.4474500 9.555195e+00 4.490661e+00
## 105 [104,105) 104 0.732142857 0.519122566 0.4395263 5.064534e+00 2.629114e+00
## 106 [105,106) 105 0.877300613 0.584095916 0.4278126 2.435420e+00 1.422519e+00
## 107 [106,107) 106 1.242424242 0.711316470 0.3990340 1.012901e+00 7.204933e-01
## 108 [107,108) 107 6.500000000 0.998496561 0.1523405 2.924079e-01 2.919683e-01
## 109 [108,109) 108          NA 1.000000000 0.1523405 4.396175e-04 4.396175e-04
## 110 [109,110) 109          NA 1.000000000 0.1523405 0.000000e+00 0.000000e+00
## 111 [110,111) 110          NA 1.000000000 0.1523405 0.000000e+00 0.000000e+00
## 112   [111,+) 111          NA 1.000000000 0.1523405 0.000000e+00 0.000000e+00
##               Lx           Tx         ex
## 1   9.323563e+04 4.353215e+06 43.5321494
## 2   8.428890e+04 4.259979e+06 49.0874887
## 3   8.057911e+04 4.175690e+06 51.0209472
## 4   7.847290e+04 4.095111e+06 51.6221119
```

```
## 5   7.697165e+04 4.016638e+06 51.7452380
## 6   7.583721e+04 3.939667e+06 51.6179300
## 7   7.498662e+04 3.863830e+06 51.2764736
## 8   7.434736e+04 3.788843e+06 50.7741016
## 9   7.386326e+04 3.714496e+06 50.1458586
## 10  7.347758e+04 3.640632e+06 49.4294538
## 11  7.313497e+04 3.567155e+06 48.6635883
## 12  7.279922e+04 3.494020e+06 47.8843695
## 13  7.245563e+04 3.421221e+06 47.1042362
## 14  7.209481e+04 3.348765e+06 46.3299998
## 15  7.170950e+04 3.276670e+06 45.5667426
## 16  7.129124e+04 3.204961e+06 44.8182717
## 17  7.083406e+04 3.133669e+06 44.0909780
## 18  7.034037e+04 3.062835e+06 43.3854834
## 19  6.981797e+04 2.992495e+06 42.6977700
## 20  6.928175e+04 2.922677e+06 42.0220017
## 21  6.874285e+04 2.853395e+06 41.3457082
## 22  6.819522e+04 2.784652e+06 40.6677042
## 23  6.763213e+04 2.716457e+06 39.9961971
## 24  6.705421e+04 2.648825e+06 39.3308938
## 25  6.646394e+04 2.581771e+06 38.6712108
## 26  6.586630e+04 2.515307e+06 38.0147094
## 27  6.526625e+04 2.449441e+06 37.3579201
## 28  6.466602e+04 2.384174e+06 36.6984748
## 29  6.406376e+04 2.319508e+06 36.0360132
## 30  6.345343e+04 2.255445e+06 35.3728234
## 31  6.283250e+04 2.191991e+06 34.7131834
## 32  6.220625e+04 2.129159e+06 34.0555038
## 33  6.157614e+04 2.066952e+06 33.3954139
## 34  6.093708e+04 2.005376e+06 32.7354519
## 35  6.028392e+04 1.944439e+06 32.0783927
## 36  5.961702e+04 1.884155e+06 31.4267740
## 37  5.894424e+04 1.824538e+06 30.7775403
## 38  5.827231e+04 1.765594e+06 30.1253367
## 39  5.760412e+04 1.707322e+06 29.4682632
## 40  5.694159e+04 1.649718e+06 28.8050154
## 41  5.628382e+04 1.592776e+06 28.1346701
## 42  5.562596e+04 1.536492e+06 27.4587678
## 43  5.496228e+04 1.480866e+06 26.7802799
## 44  5.428621e+04 1.425904e+06 26.1015780
## 45  5.359145e+04 1.371618e+06 25.4263066
## 46  5.288048e+04 1.318026e+06 24.7564892
## 47  5.216305e+04 1.265146e+06 24.0874843
## 48  5.144542e+04 1.212983e+06 23.4144881
## 49  5.073109e+04 1.161537e+06 22.7361339
## 50  5.002463e+04 1.110806e+06 22.0502549
## 51  4.932285e+04 1.060782e+06 21.3545306
## 52  4.861137e+04 1.011459e+06 20.6535648
## 53  4.787318e+04 9.628473e+05 19.9545915
## 54  4.708630e+04 9.149741e+05 19.2640600
## 55  4.622830e+04 8.678878e+05 18.5928715
## 56  4.530144e+04 8.216595e+05 17.9476220
## 57  4.432863e+04 7.763581e+05 17.3196492
## 58  4.332650e+04 7.320295e+05 16.6994074
```

```
## 59  4.231271e+04 6.887030e+05 16.0831858
## 60  4.131389e+04 6.463903e+05 15.4608628
## 61  4.032776e+04 6.050764e+05 14.8217540
## 62  3.931568e+04 5.647486e+05 14.1768313
## 63  3.824529e+04 5.254329e+05 13.5421275
## 64  3.708316e+04 4.871876e+05 12.9241196
## 65  3.579090e+04 4.501045e+05 12.3394063
## 66  3.437831e+04 4.143136e+05 11.7992836
## 67  3.289018e+04 3.799353e+05 11.2896189
## 68  3.135497e+04 3.470451e+05 10.7984307
## 69  2.980278e+04 3.156901e+05 10.3219686
## 70  2.827106e+04 2.858874e+05  9.8464085
## 71  2.675630e+04 2.576163e+05  9.3607359
## 72  2.522536e+04 2.308600e+05  8.8771956
## 73  2.366215e+04 2.056346e+05  8.4067886
## 74  2.204872e+04 1.819725e+05  7.9528853
## 75  2.036580e+04 1.599238e+05  7.5305863
## 76  1.864122e+04 1.395580e+05  7.1497899
## 77  1.691993e+04 1.209167e+05  6.7968956
## 78  1.522367e+04 1.039968e+05  6.4679872
## 79  1.357439e+04 8.877315e+04  6.1650136
## 80  1.200001e+04 7.519876e+04  5.8834427
## 81  1.057850e+04 6.319874e+04  5.6171039
## 82  9.283514e+03 5.262025e+04  5.2973991
## 83  8.045680e+03 4.333673e+04  5.0026391
## 84  6.884808e+03 3.529105e+04  4.7315841
## 85  5.811625e+03 2.840624e+04  4.4796210
## 86  4.851935e+03 2.259462e+04  4.2532054
## 87  4.008013e+03 1.774268e+04  4.0151797
## 88  3.262438e+03 1.373467e+04  3.7905261
## 89  2.614274e+03 1.047223e+04  3.5787024
## 90  2.060349e+03 7.857959e+03  3.3793477
## 91  1.595523e+03 5.797610e+03  3.1919157
## 92  1.212895e+03 4.202087e+03  3.0157709
## 93  9.042196e+02 2.989192e+03  2.8503269
## 94  6.604414e+02 2.084972e+03  2.6949974
## 95  4.721774e+02 1.424531e+03  2.5489998
## 96  3.301390e+02 9.523537e+02  2.4112726
## 97  2.255170e+02 6.222147e+02  2.2805822
## 98  1.503854e+02 3.966978e+02  2.1557666
## 99  9.780328e+01 2.463124e+02  2.0335436
## 100 6.194665e+01 1.485091e+02  1.9116400
## 101 3.808683e+01 8.656242e+01  1.7851085
## 102 2.262098e+01 4.847560e+01  1.6550778
## 103 1.294338e+01 2.585461e+01  1.5163051
## 104 7.073881e+00 1.291123e+01  1.3512265
## 105 3.590985e+00 5.837352e+00  1.1525941
## 106 1.621473e+00 2.246367e+00  0.9223735
## 107 5.799093e-01 6.248944e-01  0.6169352
## 108 4.491820e-02 4.498517e-02  0.1538439
## 109 6.697153e-05 6.697153e-05  0.1523405
## 110 0.000000e+00 0.000000e+00  0.0000000
## 111 0.000000e+00 0.000000e+00  0.0000000
## 112 0.000000e+00 0.000000e+00  0.0000000
```

```
##
## $call
## LifeTable(x = x, Dx = dx, Ex = ex)
##
## $process_date
## [1] "Sat Dec 04 13:40:43 2021"
```

As shown, with slight decimal exceptions, the function I made is very similar to the existing function; and it comes with a plot as well! TOwards the end of the new datasets, the figures do start becoming more and more apart.

```
system.time(LifeTable(x, Dx = dx, Ex = ex)) #existing function
```

```
## Warning in x >= 100 & (is.na(ux) | is.infinite(ux) | ux == 0): longer object
## length is not a multiple of shorter object length
```

```
##    user  system elapsed
##       0       0       0
```

```
system.time(myLT(x,ex,dx, initpop = 100000)) # my function
```

```
## Warning in nx * lx: longer object length is not a multiple of shorter object
## length
```

```
## Warning in (p1) * dx: longer object length is not a multiple of shorter object
## length
```

```
##    user  system elapsed
##       0       0       0
```

Unfortunately it appears my function is not as fast as the preesxisting one.