An introduction to Shiny apps for health and demographic research

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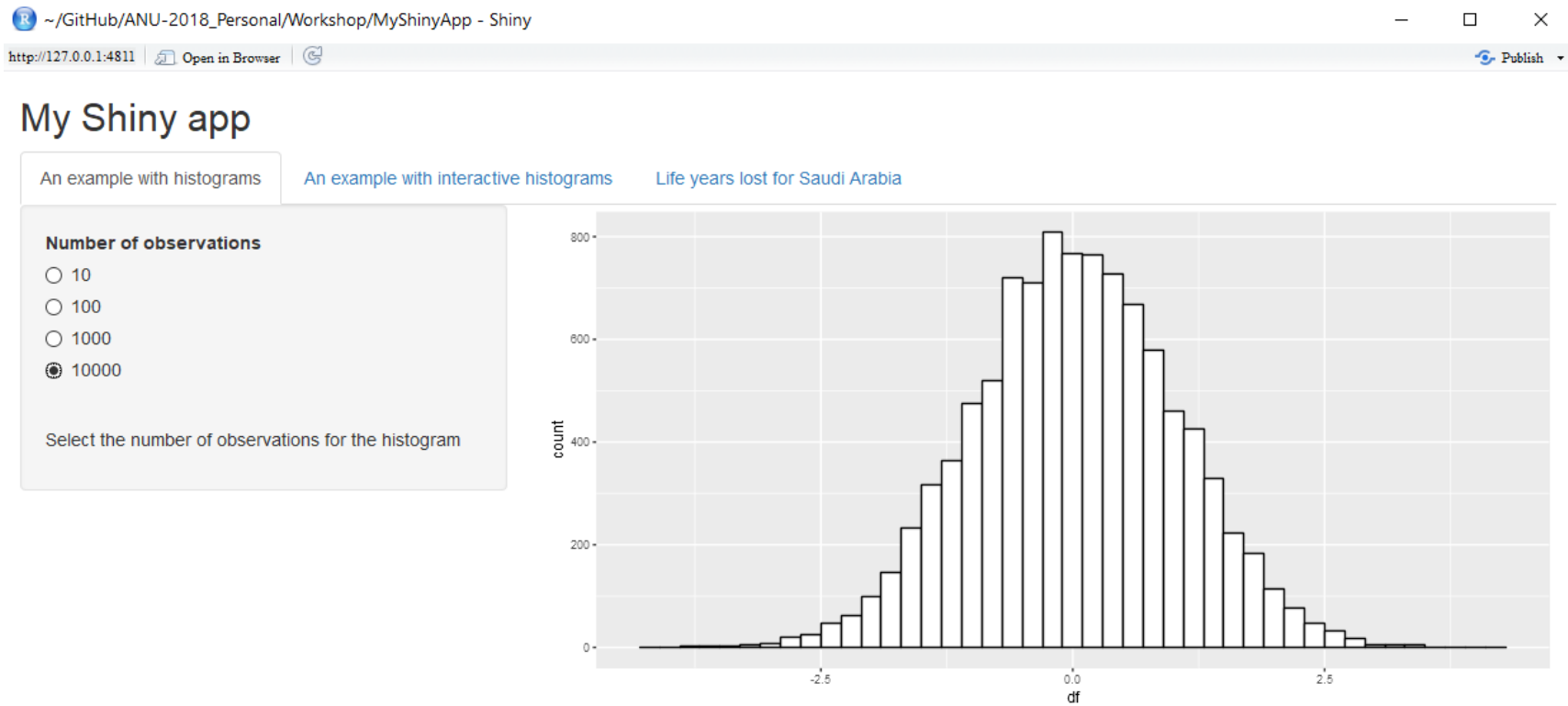
What is Shiny?

1) A graphical user-interface for an R program

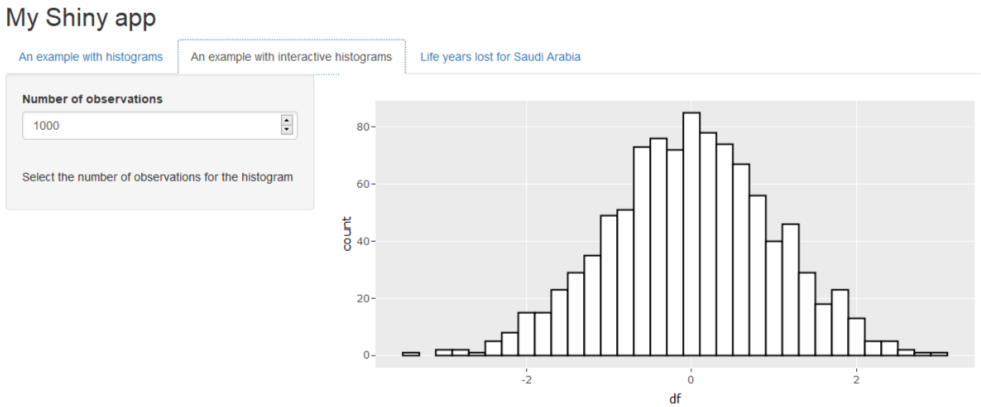


What is Shiny?

2) Translates your R program into a web-page

What is Shiny?

3) A web interactive application framework for R



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4. Easily play with different scenarios.
5. ...

Lets get started

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1. **UI** - nested R functions that assemble an HTML user interface for your app.
2. **Server** - a function with instructions on how to build and rebuild the R objects displayed in UI
3. **shinyApp** - combines both into a functioning app.

Start building an easy shiny app

Cause-specific life lost

Preliminaries: Assume cause-specific mortality rates are exclusive and exhaustive

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$$ {}_xq_0^i = \int_0^x {}_ap_0\mu^i(a)da $$

Then it follows that

$$ {}_xp_0 + \sum_i {}_xq_0^i = 1 $$

Because at age x each individual is alive or has died from one of k causes.

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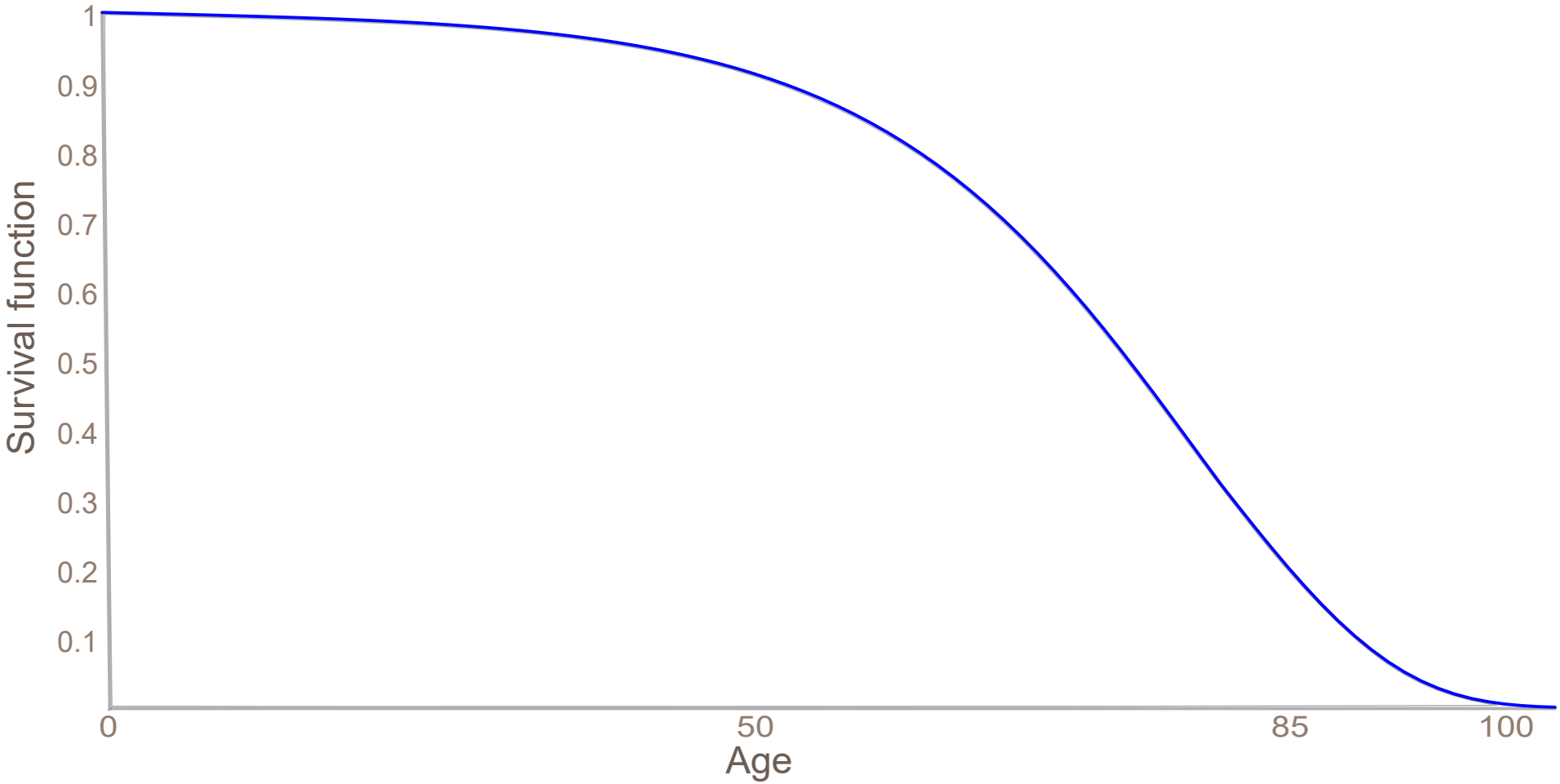
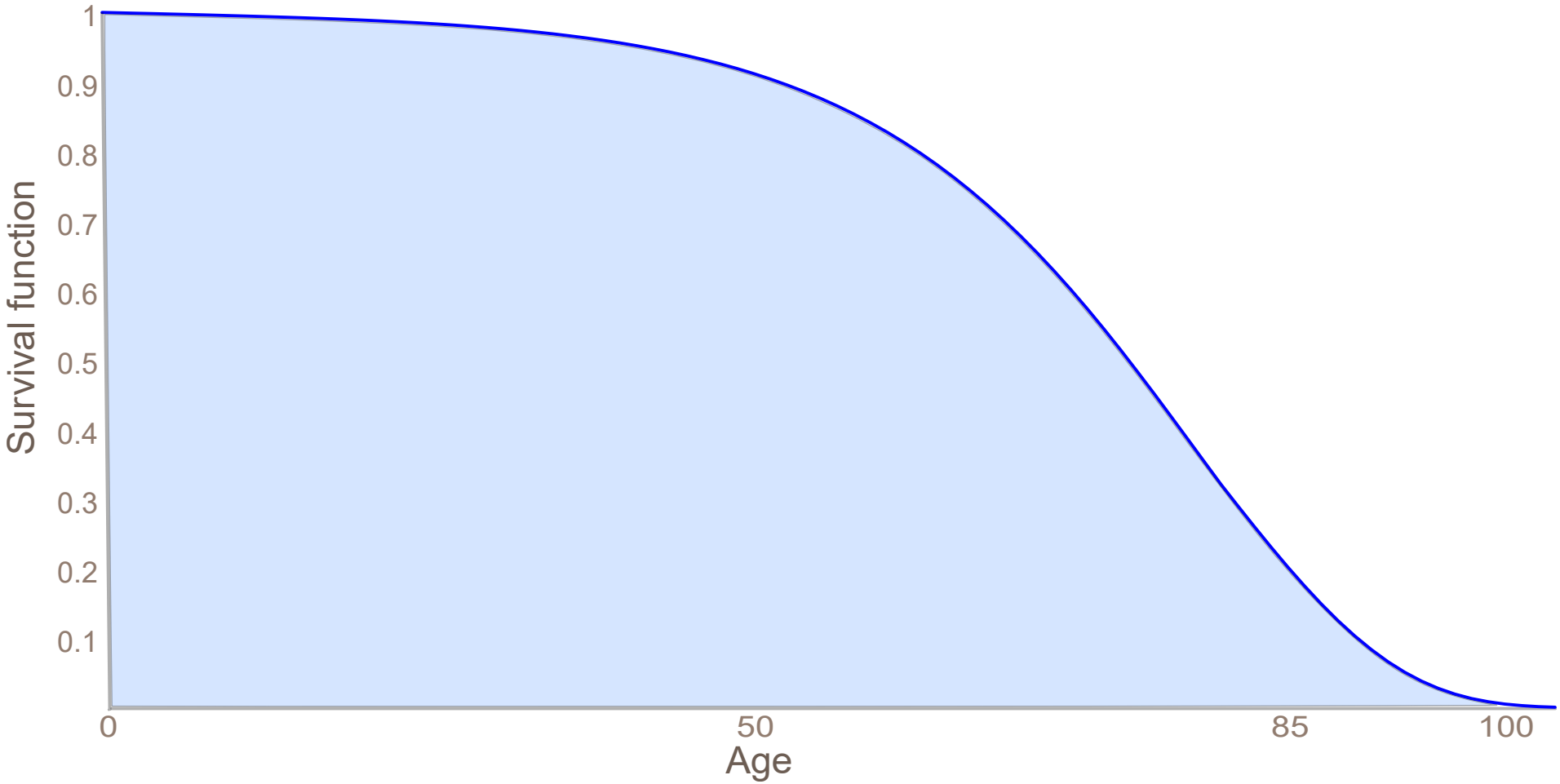
$$\underbrace{{}_a e_0}_{\text{Temporary life expectancy}} + \underbrace{\sum_i \int_0^a {}_x q_0^i \, dx}_{\text{Expected years lost}} = a \qquad (1)$$

Main result in Andersen et al (2013)


Survival function
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
50
85
100
Age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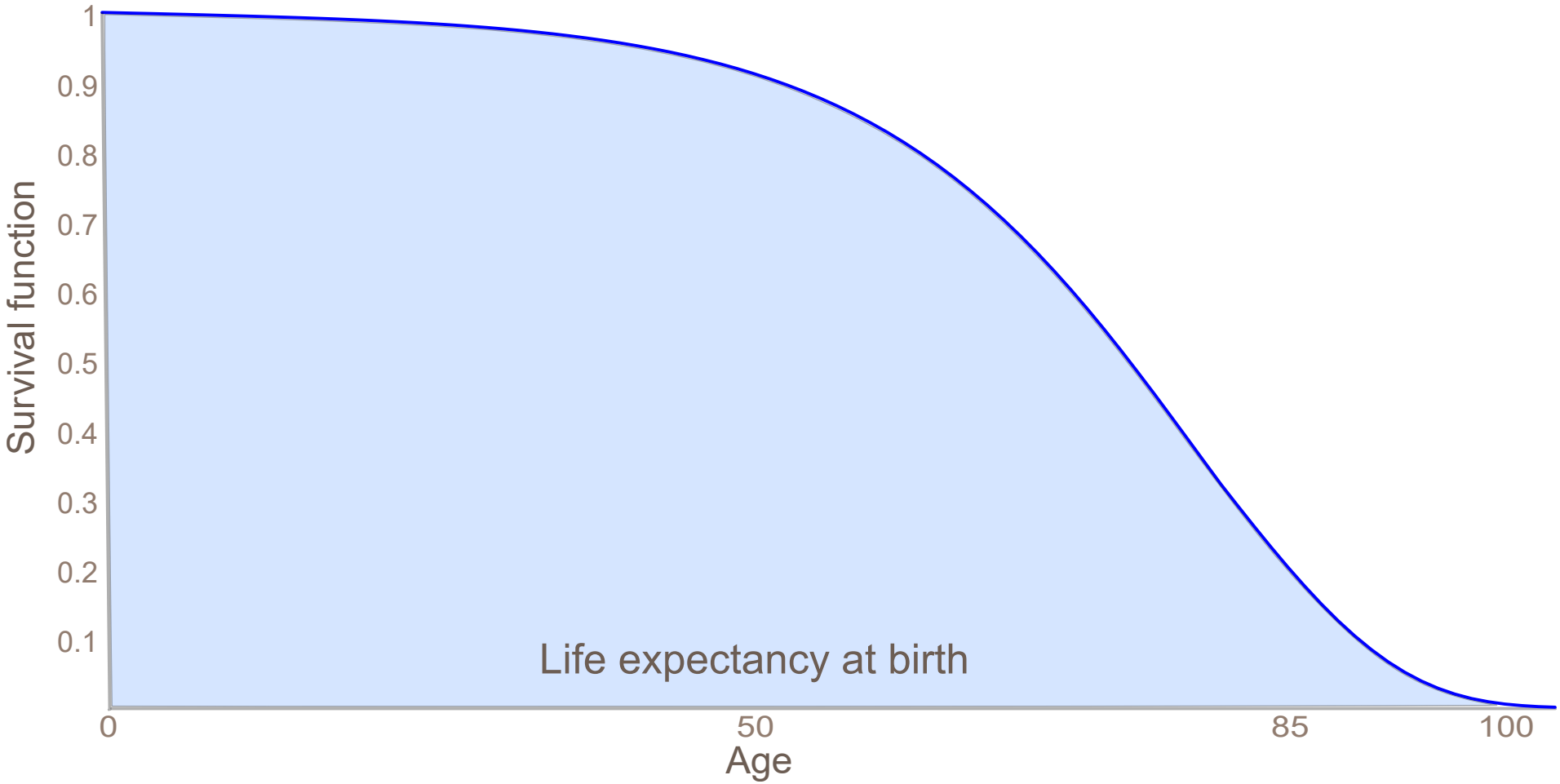
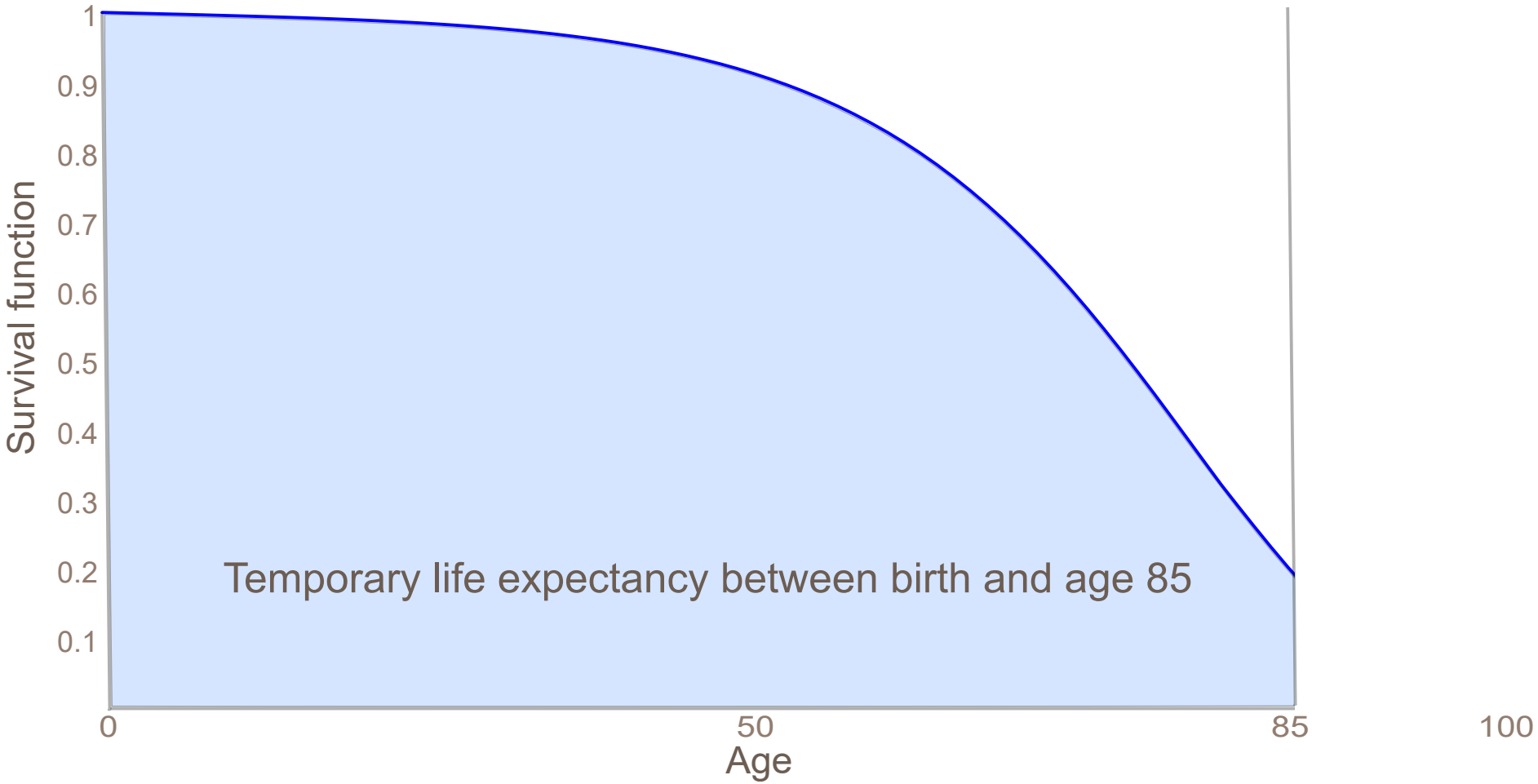
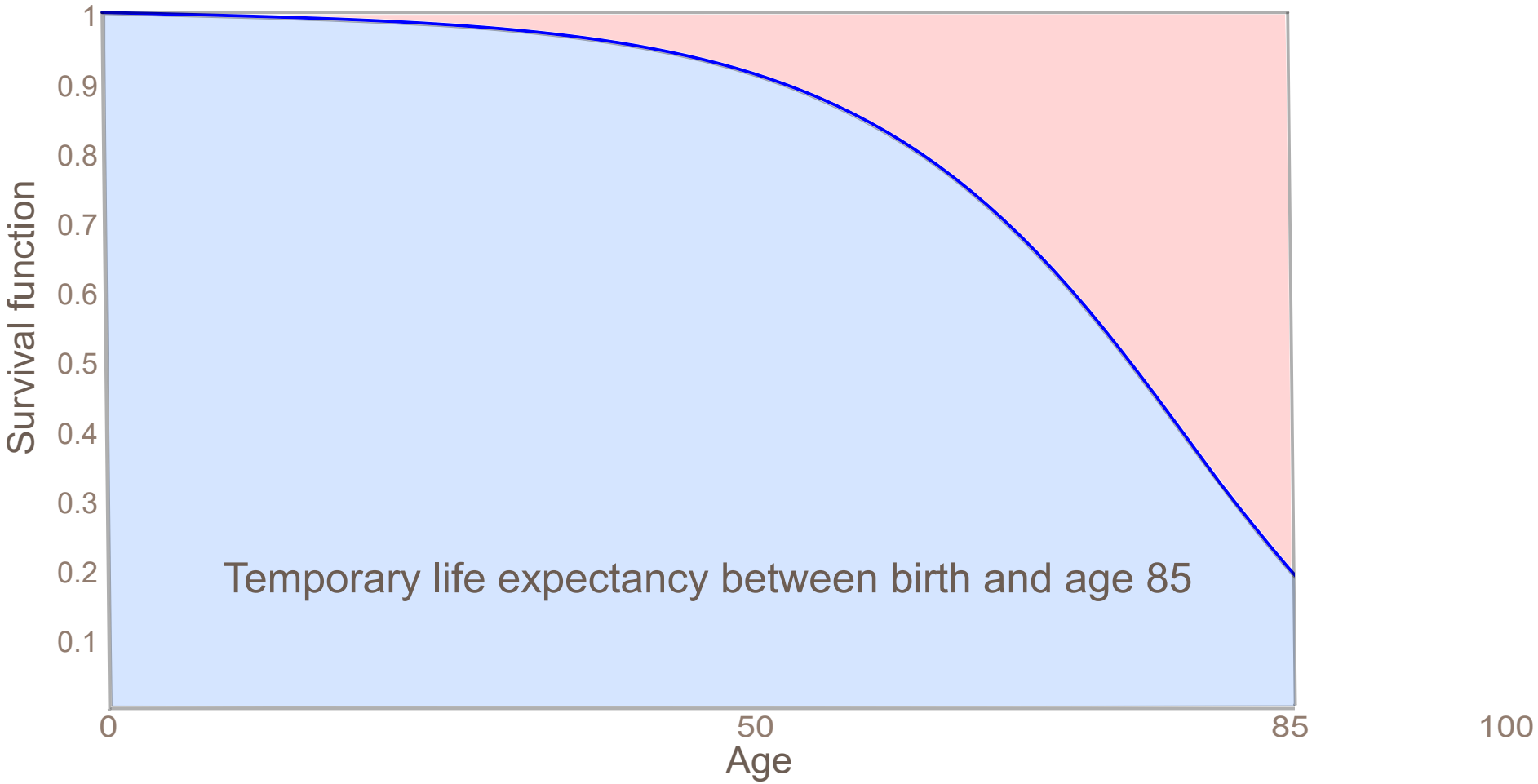

Survival function
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Life expectancy at birth
0
50
85
100
Age


Survival function
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Temporary life expectancy between birth and age 85
0
50
85
100
Age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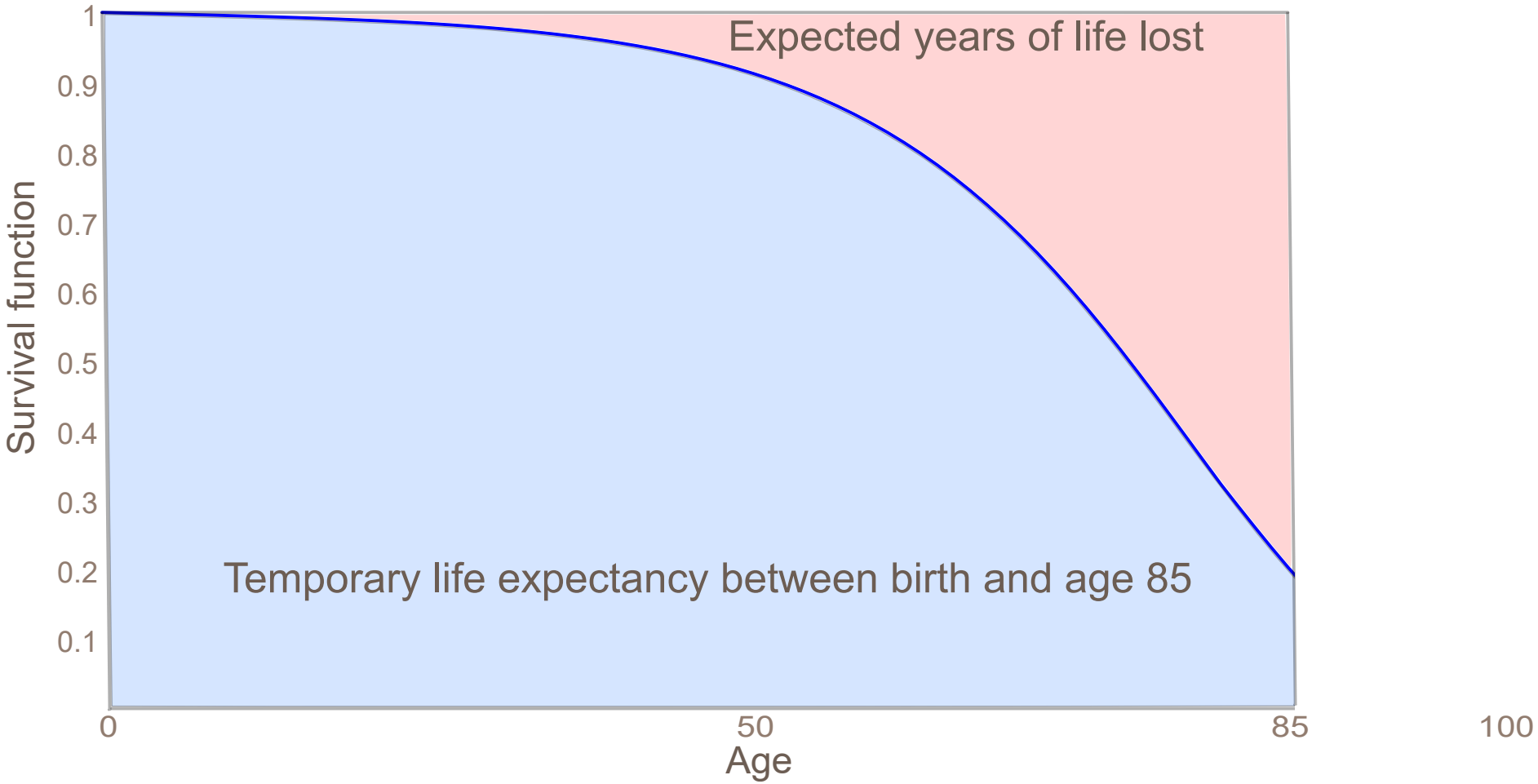
Expected years of life lost
Temporary life expectancy between birth and age 85
Survival function
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
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100
Age

Example

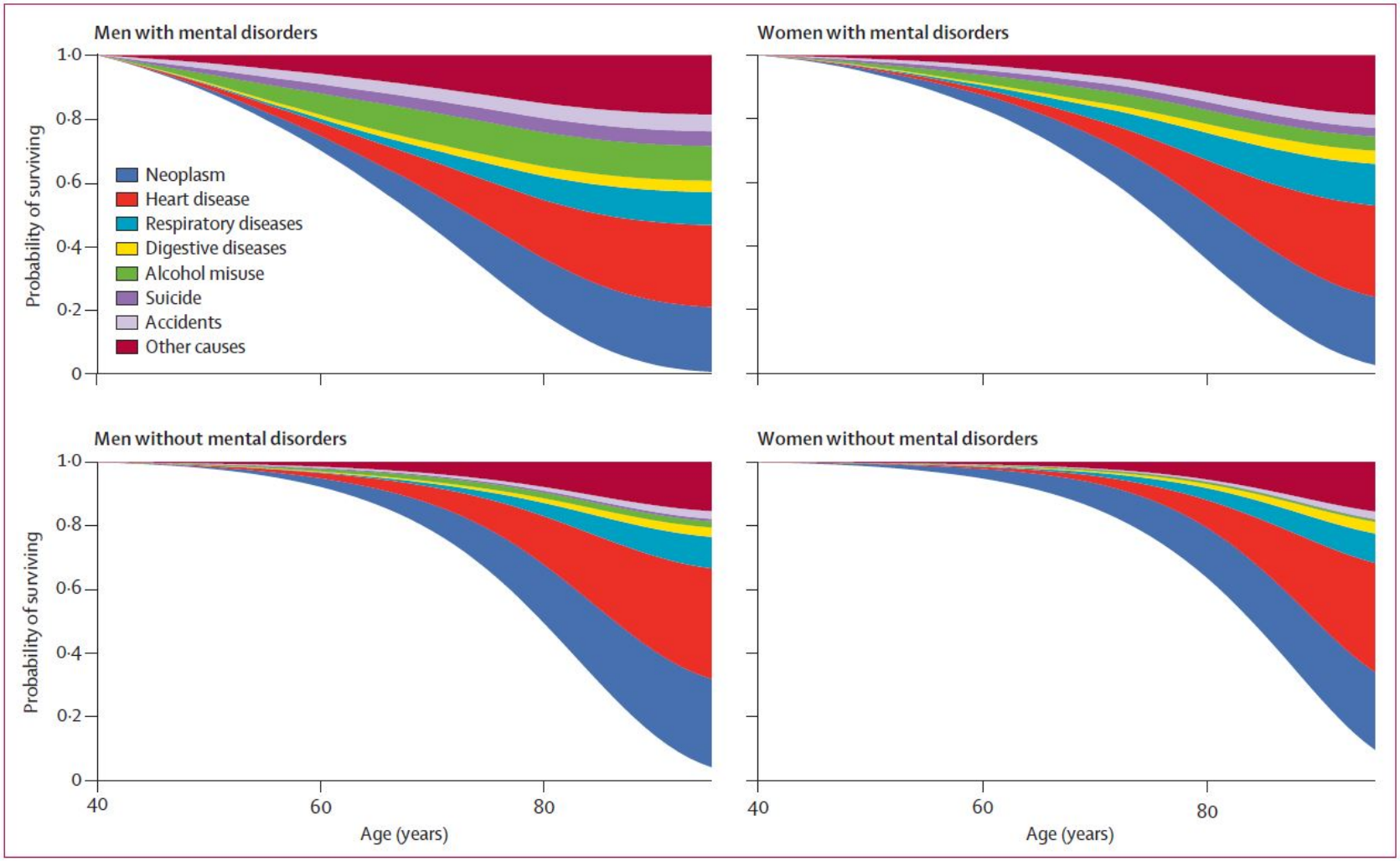

Figure 1: **Probabilities of survival and deaths from different causes for people with and without mental disorders aged between 40 and 94 years living in Denmark between 1995 and 2014**

Source: Erlangsen et al (2017)

Add LYL to our shiny app

Use R and shiny!

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