

# Life Tables

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# Life Tables

- A life table is a collection of more or less standard statistics describing the mortality experience of an actual or hypothetical group of persons followed from birth to extreme old age
- There is a lot to learn about life tables, but we only need a little; these notes will teach only what we need

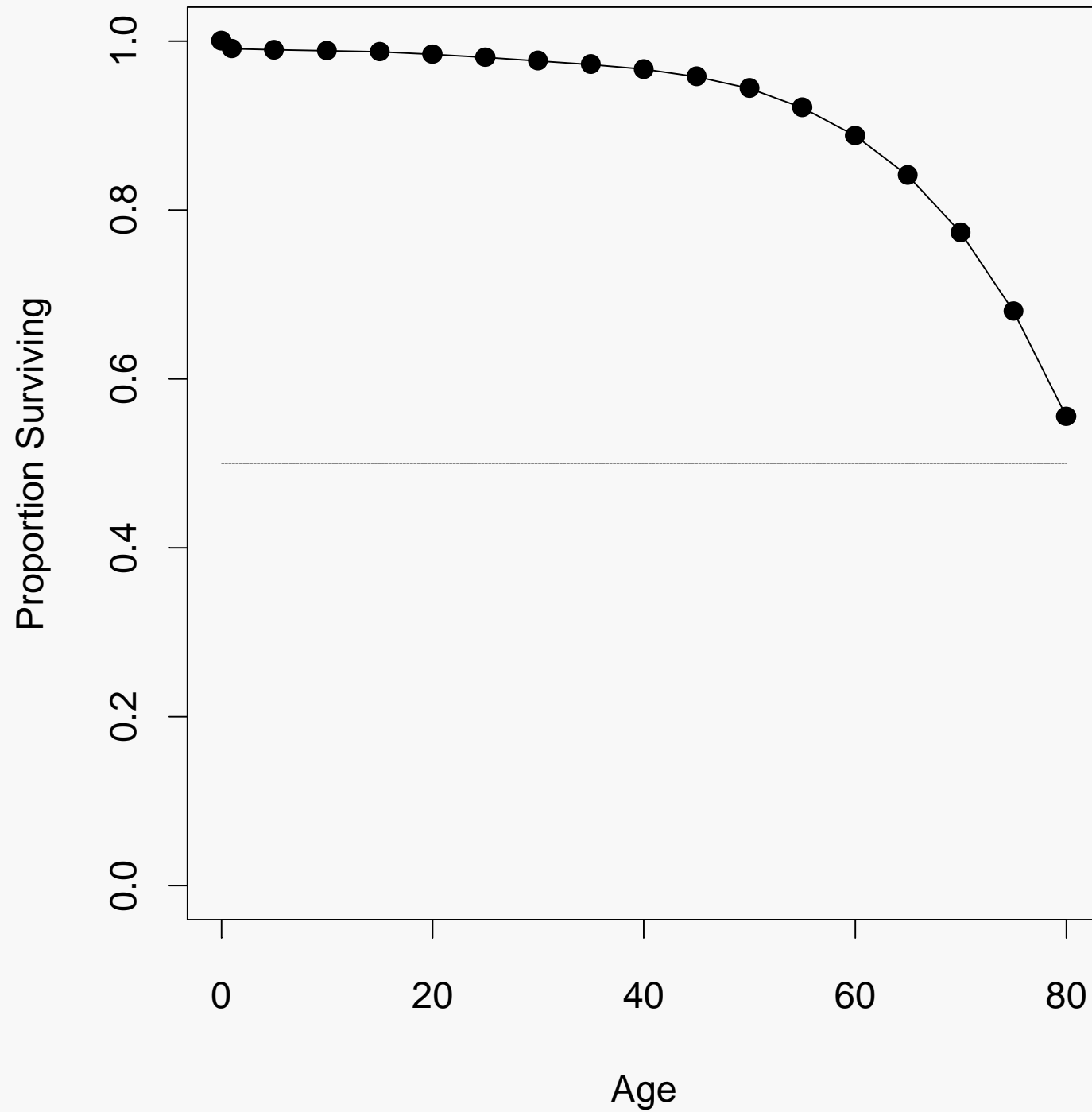
# What We Need to Know

- The **rows** of a life table refer to exact ages and age intervals; the **columns** refer to statistics defined for each age or age interval
- The *survival curve* is given by the “little  $l_x$ ” column of the life table
- *Survivorship ratios* are computed from the “big  $L_x$ ” column of the life table

# The Survival Curve

- The survival curve shows the proportion of persons surviving to each exact age represented in the table
- These survival proportions are plotted against age to show the pattern of survivorship in a population
- Here is an example, from a life table for Hawaii as of 1985

# Survivorship: Hawaii, 1985



# What did you see?

- Describe the shape of the survival curve
- At what ages does most mortality occur?
- What proportion of persons survive into working ages?
- What proportion of persons survive to retirement age?
- Note the reference line at proportion 0.5

# The “Big $L_x$ ” Life Table Column

- The “big  $L_x$ ” value  ${}_nL_x$  refers to *person years lived between aged  $x$  and age  $x+n$*  in the cohort to which the life table refers
- These values have several uses, but we are interested in their interpretation as the number of persons aged  $x$  to  $x+n$  in the “stationary population” corresponding to the life table

# Survivorship Ratios

- To know how the age distribution of a population changes over time we need to know the proportion of persons aged 0-4 at one time who are still alive five years later; and necessarily aged 5-9; and similarly for older age groups
- These proportions are called **survivorship ratios**

# Calculation of Survivorship Ratios

- **Case 1:** One quinquennial age group to another; simply take the ratio of the corresponding big  ${}_nL_x$  values
- **Case 2:** Survivorship from birth during a five year period to the end of the period is given by  ${}_5L_0/5l_0$
- **Case 3:** Survivorship into the open-ended age group; see if you can figure this out!

# Survivorship and Age Distribution

- The age distribution of a population is determined by three factors
- The numbers of persons born in the past
- The proportions of persons born in the past who survive to the present
- Net migration for persons of each age at the reference time

Questions?  
Comments?  
Discussion?