



# ASQ CRE Prep course

Lesson II. A. 3. d.

Probability Distributions

Bathtub Curve

A photograph of a two-lane asphalt road that curves gently through a green, rolling landscape. The sun is low on the horizon to the right, casting a warm glow and long shadows. The sky is a mix of soft blues and oranges. The road has a dashed white center line and solid white edge lines. The overall mood is serene and contemplative.

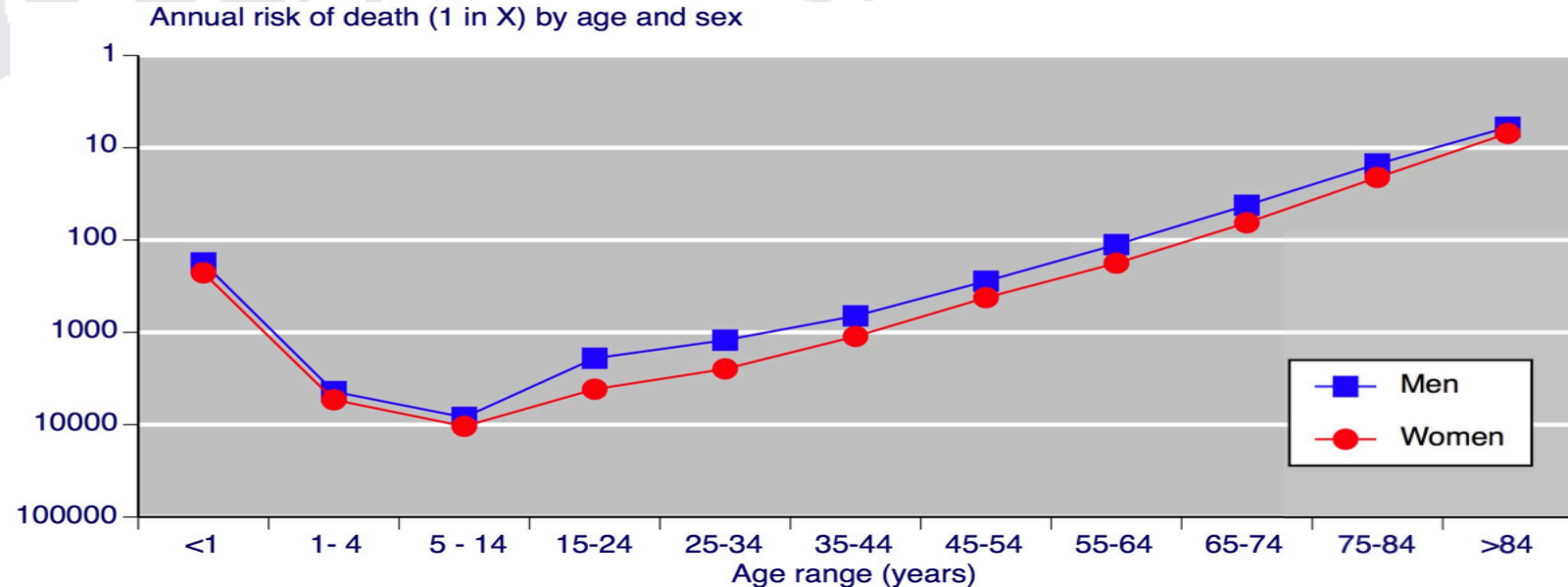
Even though it doesn't really exist

# THE FAMOUS BATHTUB CURVE



# Human Mortality

Figure 1: Annual risk of death by age and sex in the UK



From <http://www.medicine.ox.ac.uk/bandolier/booth/Risk/dyingage.html>

# The bathtub is a nice convention

- **Doesn't really exist**
- **Composite of the many failure mechanisms**

$h(t)$

Time,  $t$

# Early Life Failures (infant mortality)

- **Workmanship**
- **Faulty components**
- **Batch defects**
- **Assembly errors**
- **Transportation & Installation damage**
- **Decreasing failure rate**

# Constant Failure Rate

- **Accidents**
- **Random events –  
which tend to be rare,  
like lighten strikes**
- **Constant failure rate**

# Wearout Period

- **Fatigue**
  - **Wear**
  - **Corrosion**
- 
- **Increasing failure rate**

Can wear out  
occur quickly?





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Lesson II. A. 4.

Poisson Process Models

**Work the Examples, too**

**Take another Sample Exam**

**Send over your questions**

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