

Identical Individuals?

Population Structure: How Individuals Differ

Significance for Population Dynamics

Genetic structure, Spatial structure

Stage structure, Size structure, *Age Structure*

Life History

Age-specific schedule of survival and reproduction

Population growth at time t

Ensemble of differently aged individuals

Individual life history:

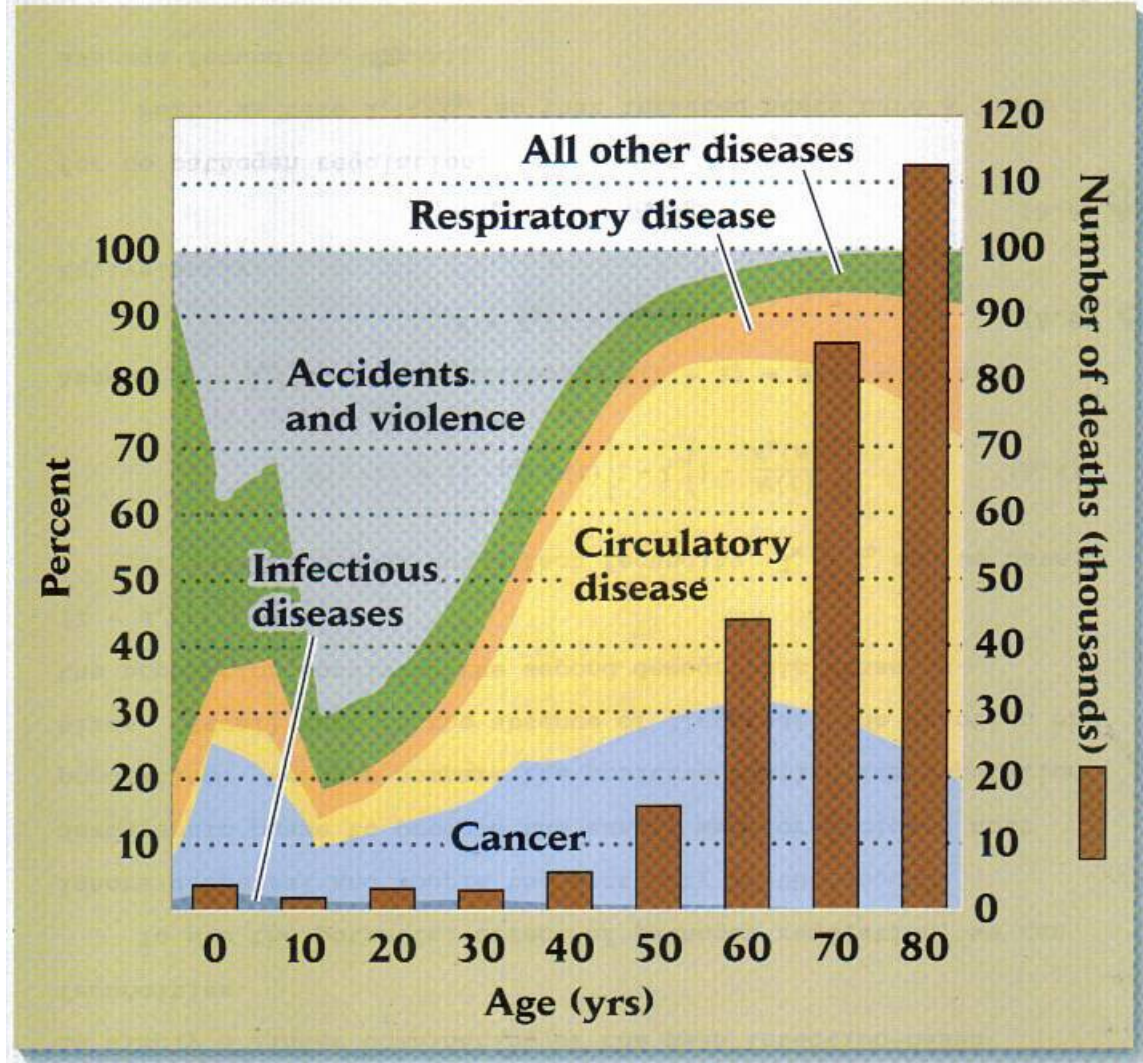
Age and net reproductive rate, R_0

Population projection:

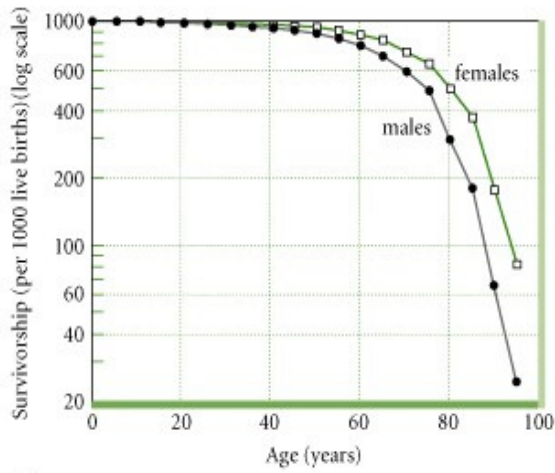
Age structure and population projection

US Males

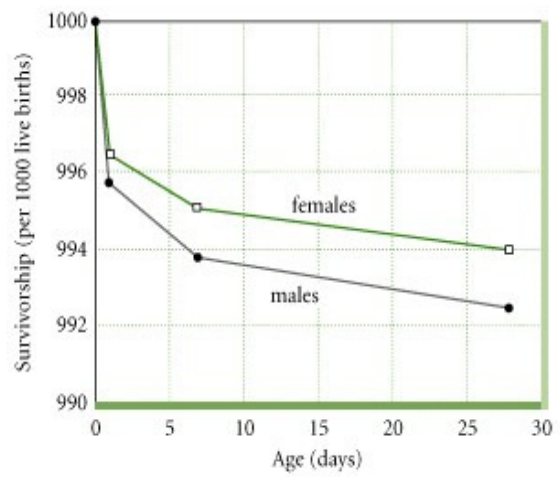
AGE ⇒ MORTALITY



Survivorship (Ricklefs & Miller, 1999)

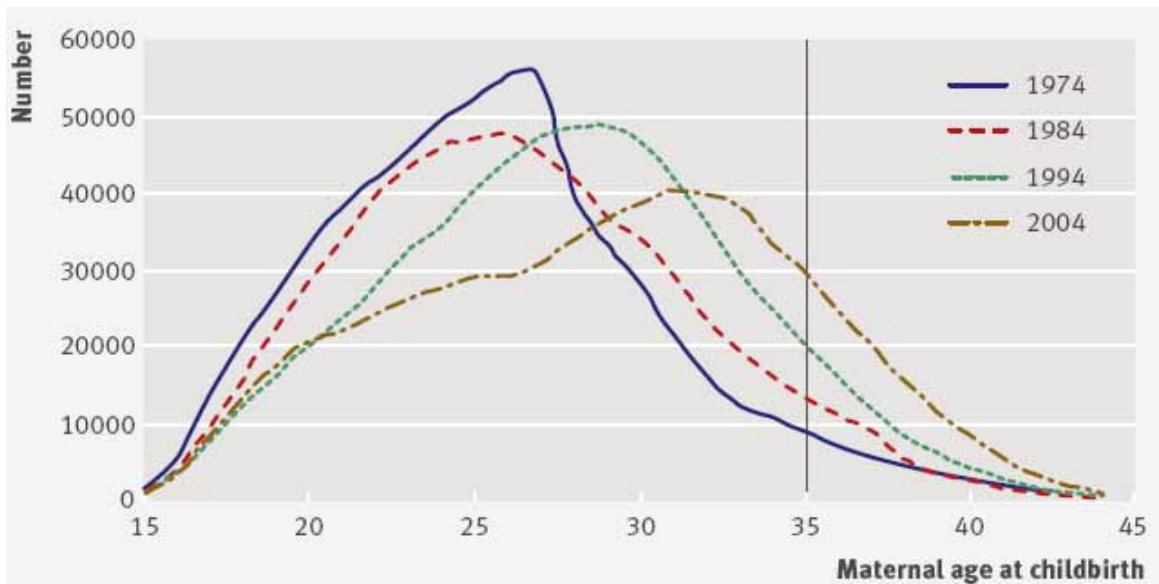


(a)



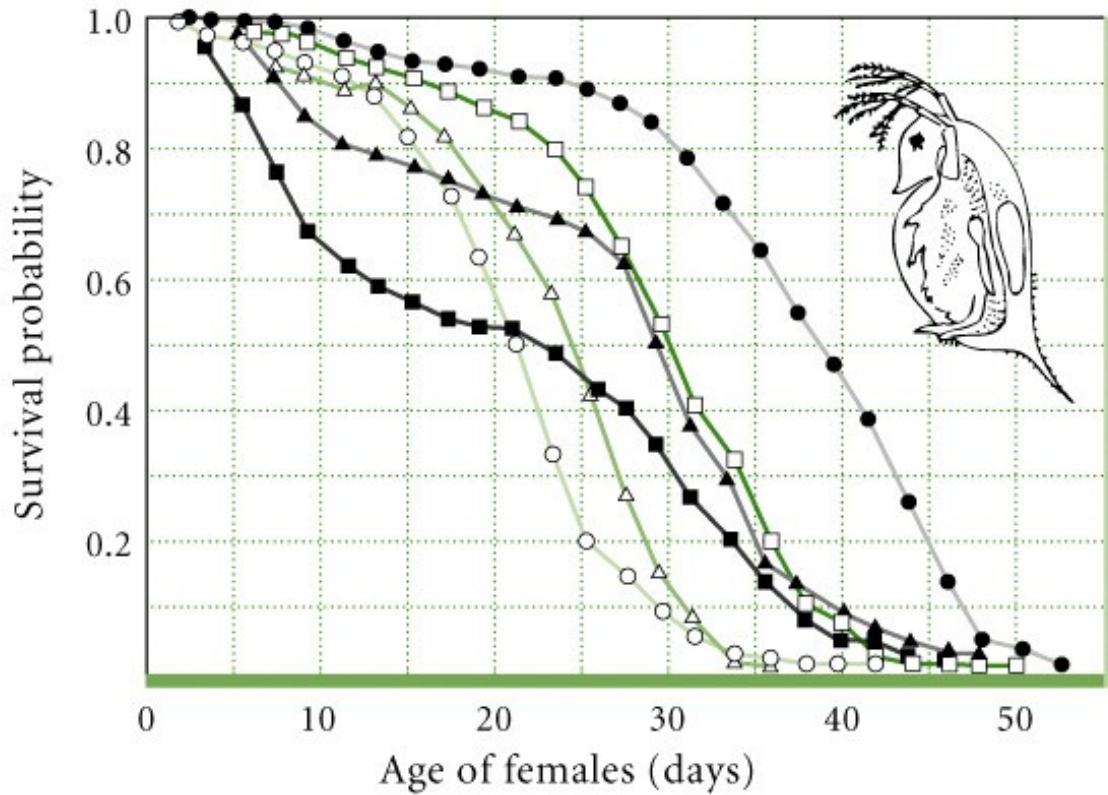
(b)

Fecundity: England & Wales (Female)



Daphnia survivorship (Ricklefs & Miller, 1999)

Symbols: Population density

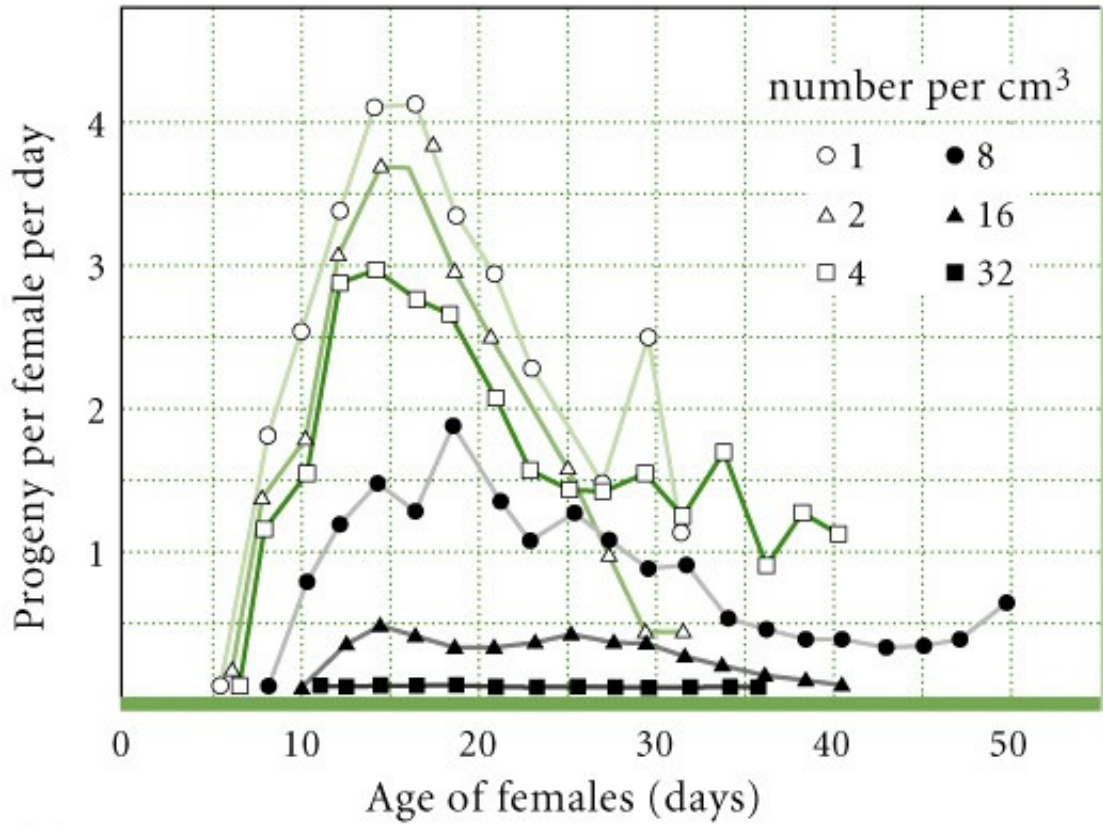


(b)

Open circle: Minimal density

Opaque square: maximal density

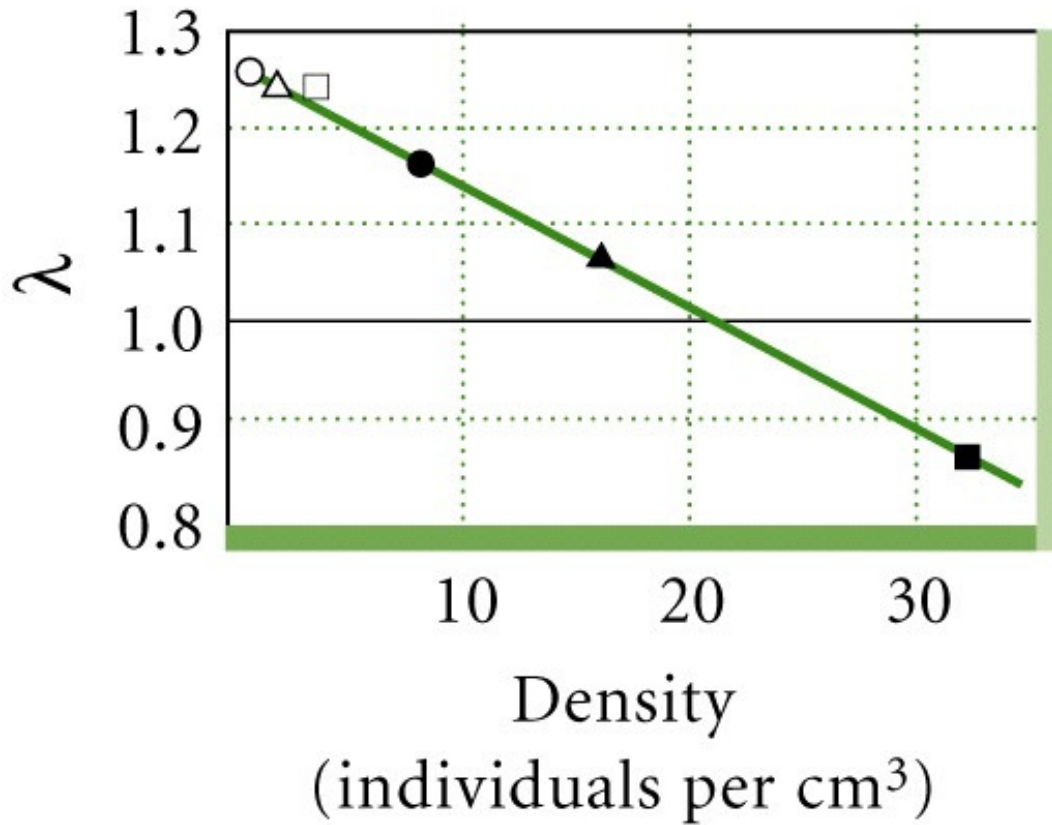
Fecundity



(a)

Survival and reproduction depend on age and density

Daughters/Female lifetime

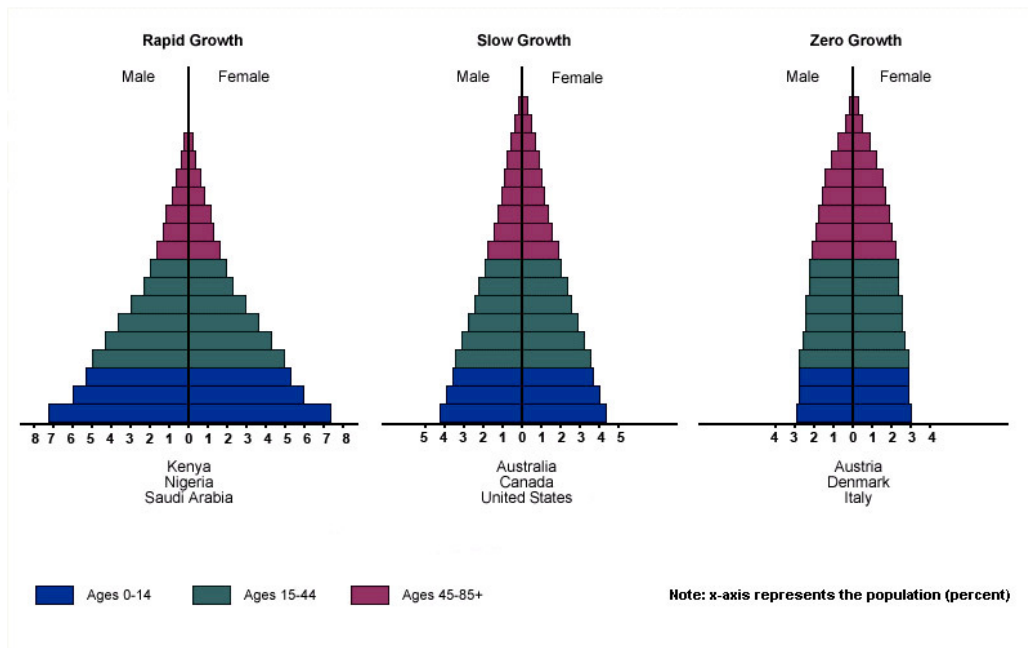


Survival and reproduction depend on age.

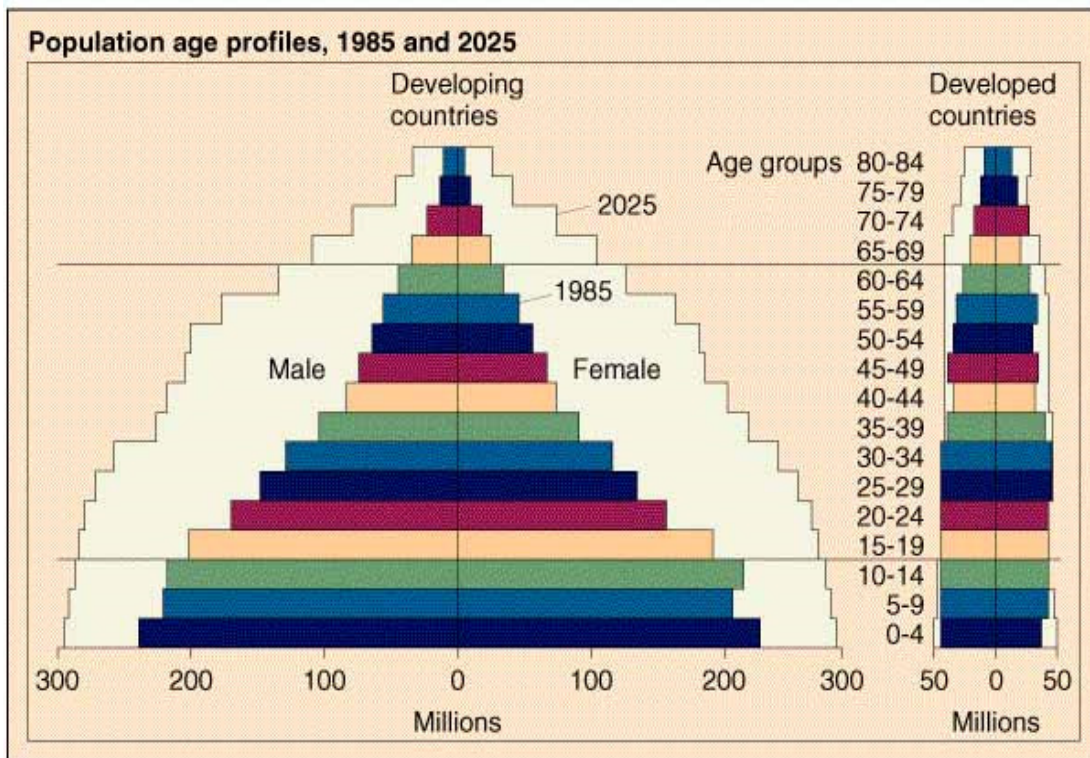
Therefore, population growth depends on age structure.

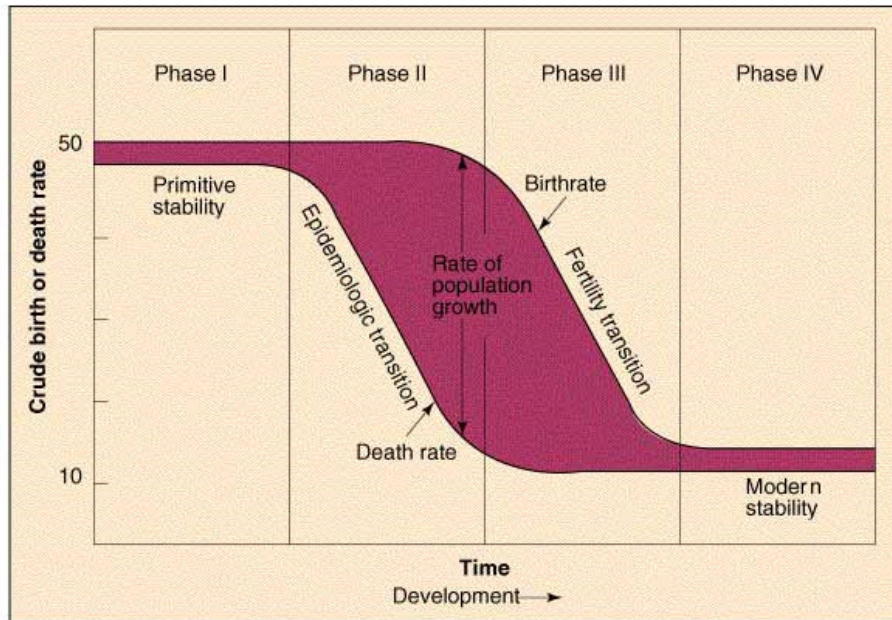
Age structure: number (age class, time t)

e.g. Pre-reproductive, Reproductive, Post-reproductive



(Gende, 1998)





Human Populations: Slow growth or equilibrium

Sanitation, birth control