

Probabilities

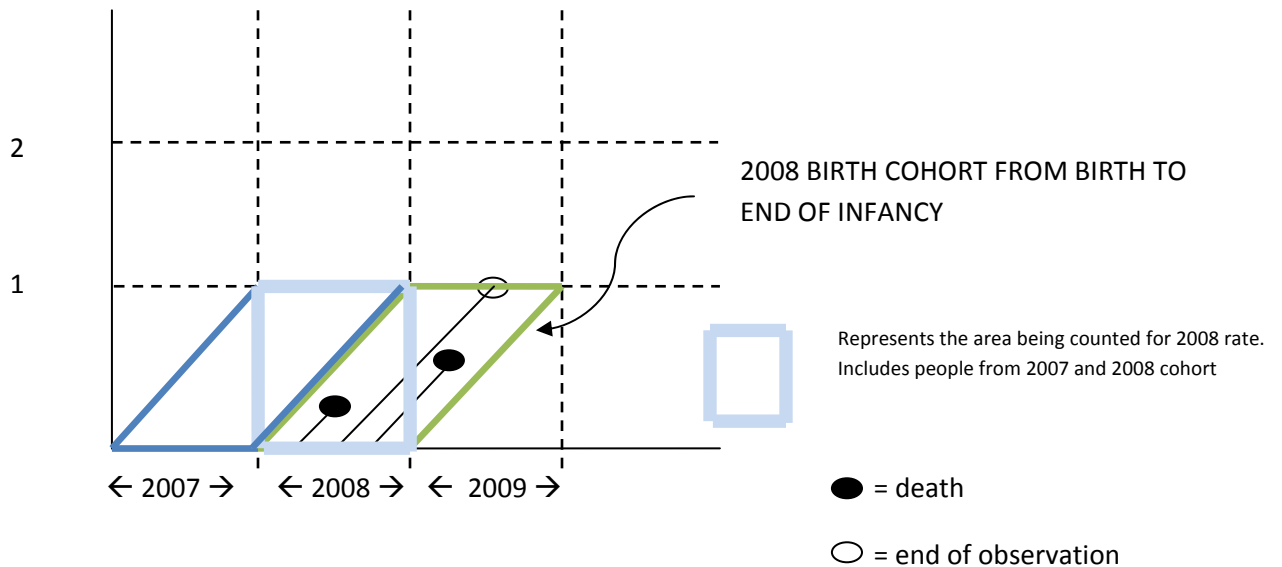
- The chance that at least one event happens to an exposed individual over a specified period of time.
 - o Think of time and age as the same thing
 - Most commonly used in mortality measures and life tables.
 - E.g. ${}_5q_0$ = probability of dying before 5th birthday
 - ${}_{10}q_{30}$ = probability of dying between 30th and 40th birthday, conditional on having a conditional birthday (if you survive to 30 what is the probability you wont survive to 40)
 - ${}_{5}q_{95}$ = probability of dying between 95th and 100th birthdays, conditional on having a 95th birthday
 - o Probabilities are ≥ 0 and ≤ 1

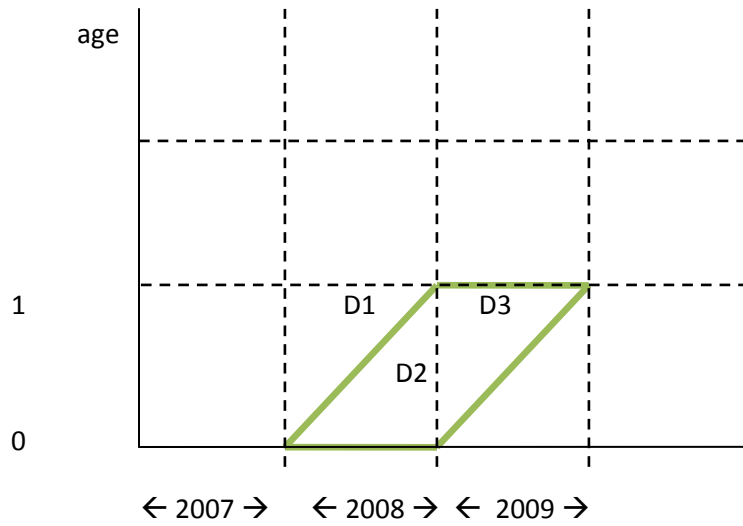
Another “rate”, besides the crude birth rate, that’s not exactly (events/person-yr), is the Infant mortality rate (IMR)

- e.g. IMR for Leon County in 2008

$$\frac{\text{\# deaths to <1 yr olds in 2008}}{\text{\# births in 2008}}$$

- But this is not quite the proper rate.. Suppose a 9 month old was born in 2008 or when an infant born in December dies when he is 6 months old.



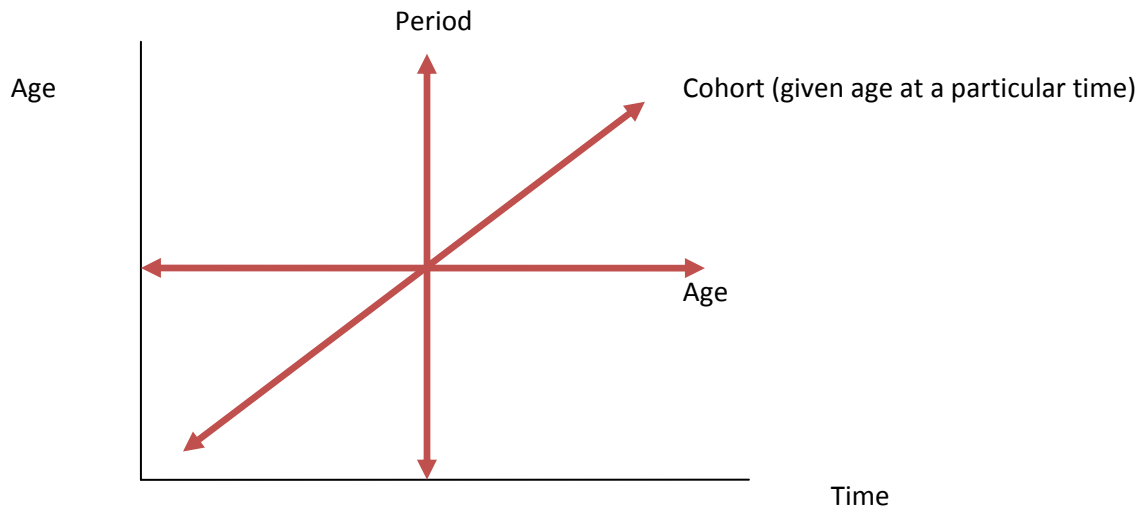


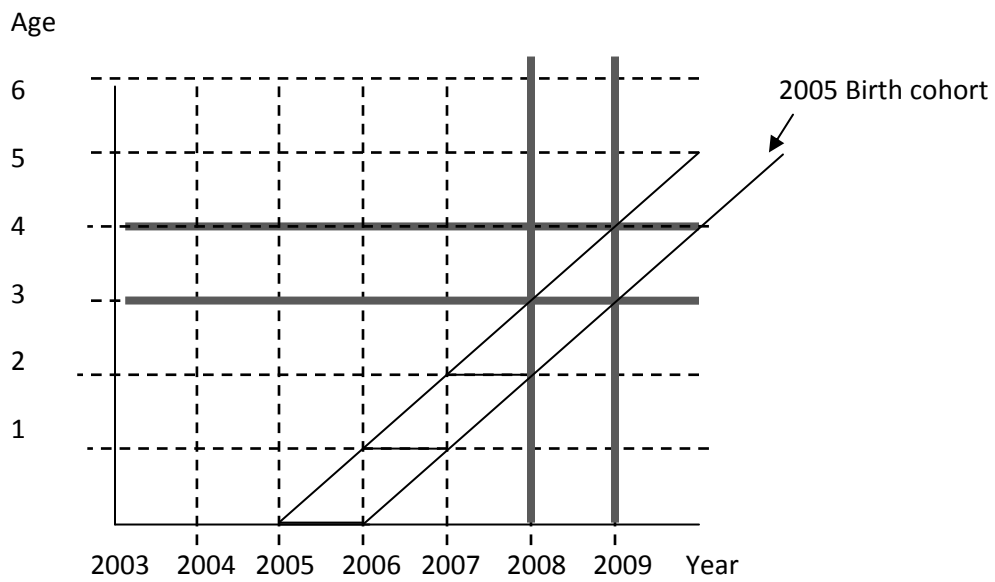
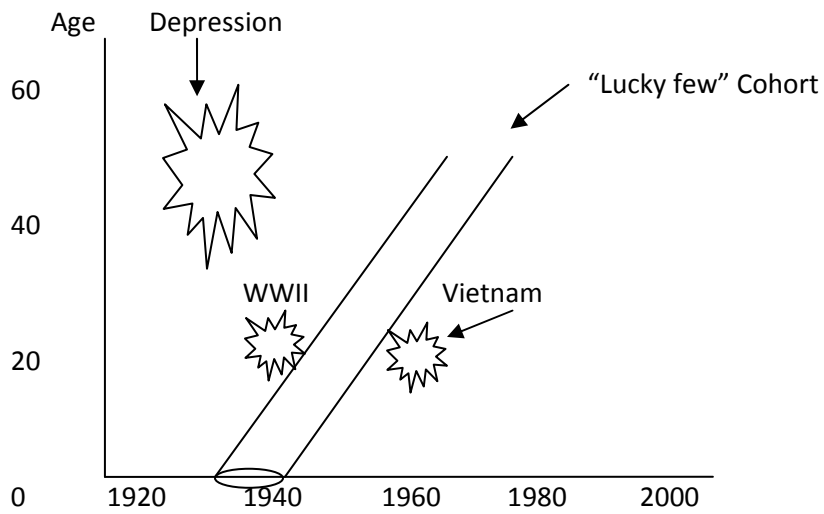
For mortality of 2008 births in infancy we'd like to use D2 and D3 deaths

IMR uses D1 and D2

- If D1 and D3 are similar, then it is not a problem

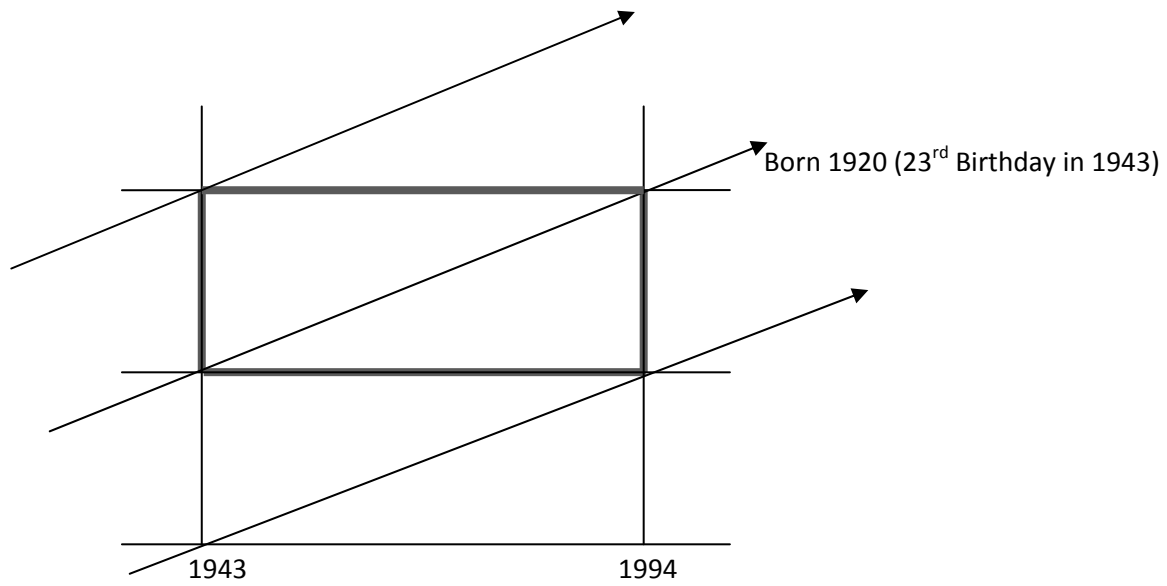
Lexis diagrams help us see the 3 major dimensions of demography analysis: age, period, and cohort





Born 1919

Who was 23 in 1943?

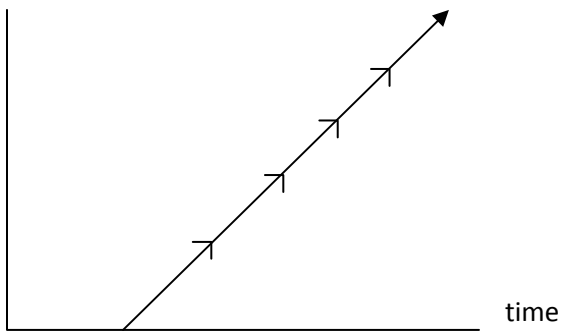


Both the 1919 and 1920 cohorts spent time as 23 yr olds in 1943

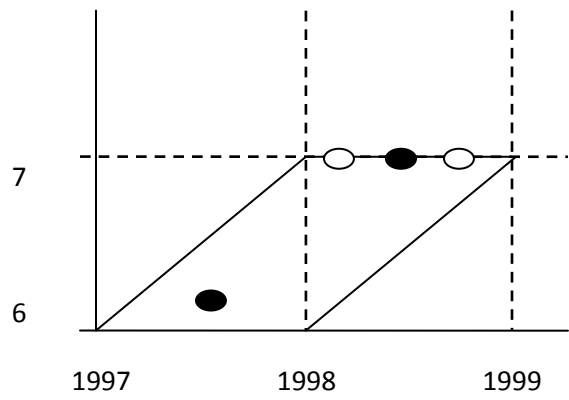
LIFELINES

age

Each yr of time and age corresponds to 1 person-yr of exposure



e.g person-yrs lived at age 6 by cohort born 1991



● = death

○ = end of observation