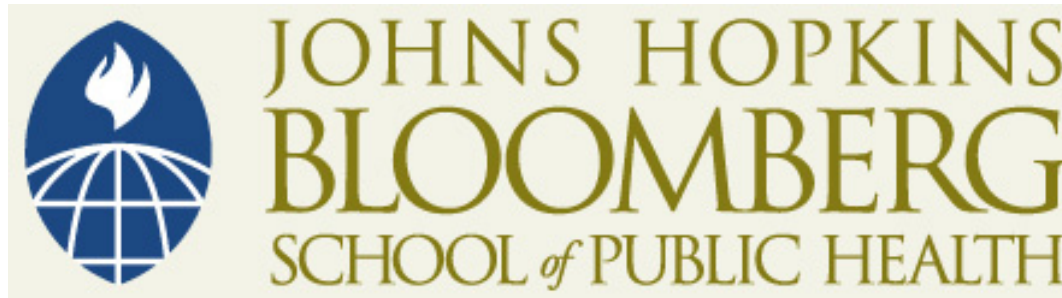


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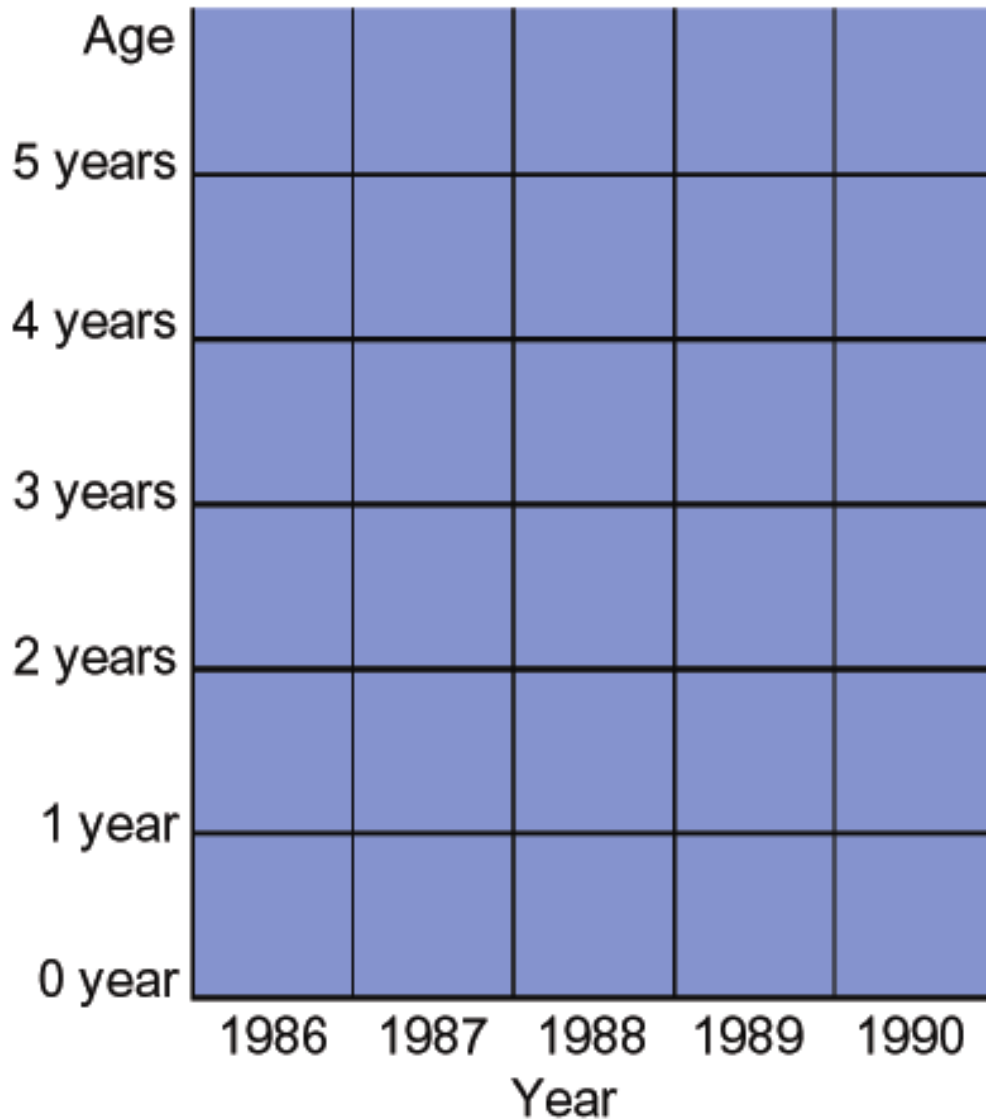
Lexis Diagrams

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Construction

- ◆ Lexis diagrams provide a graphical representation of the relationships between demographic events in time and persons at risk and they also assist in calculating rates
- ◆ Every demographic event is characterized by two numbers: the time (e.g., year) at which it occurs and the age (or other duration measure) of the person to whom it occurs

Construction



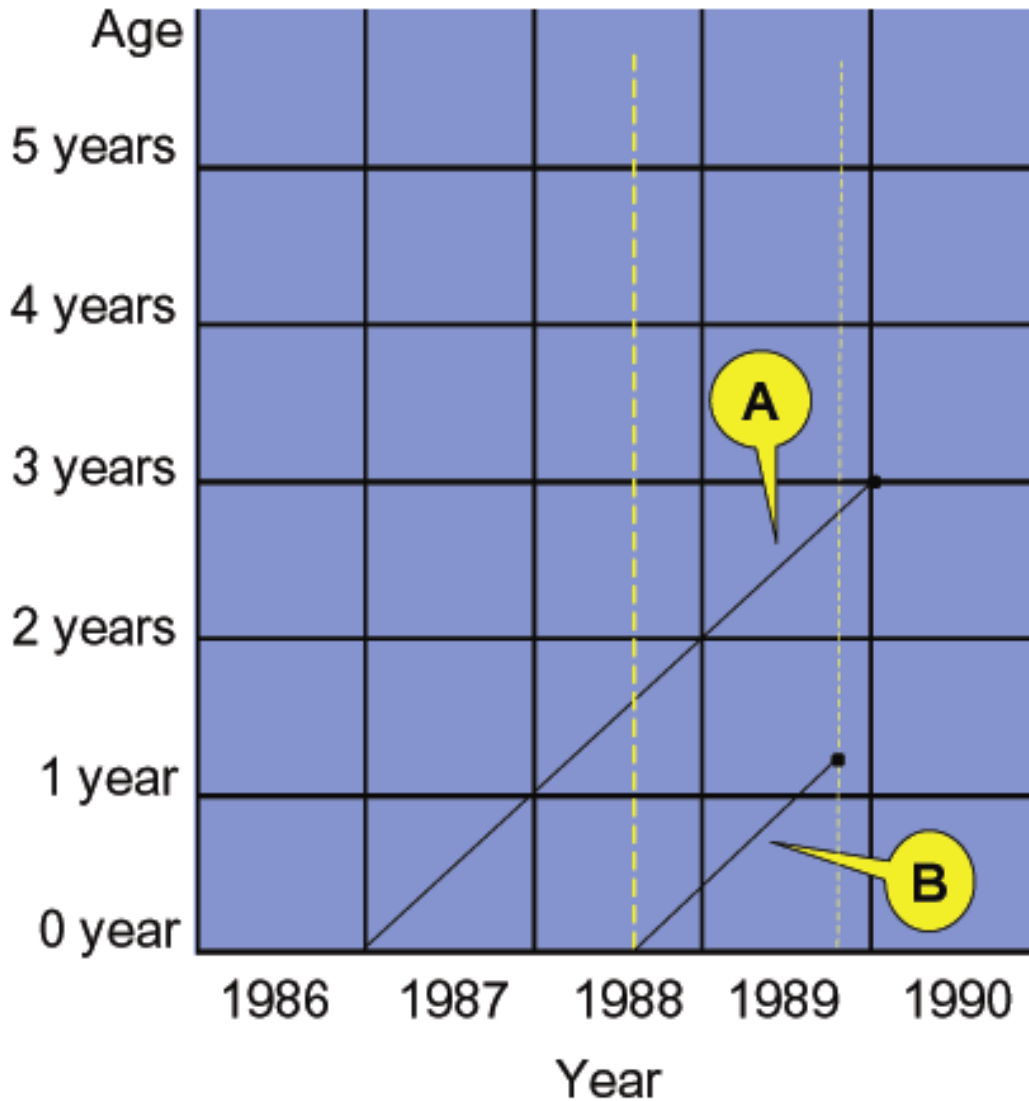
By convention

- Time is represented on the horizontal axis
- Age (or other duration measure) is represented on the vertical axis

Life Lines

- ◆ A person's life is represented in the Lexis diagram by a straight line called "life line"
 - The line begins on the time axis at the time of the person's birth
 - Continues diagonally upwards
 - And ends at the age/time point representing the person's death (or other demographic event)

Life Lines



A: From birth on
1/1/1987 to age
3 on 1/1/1990

B: From birth on
7/15/1988 to 1
year and 3
months on
10/15/1989

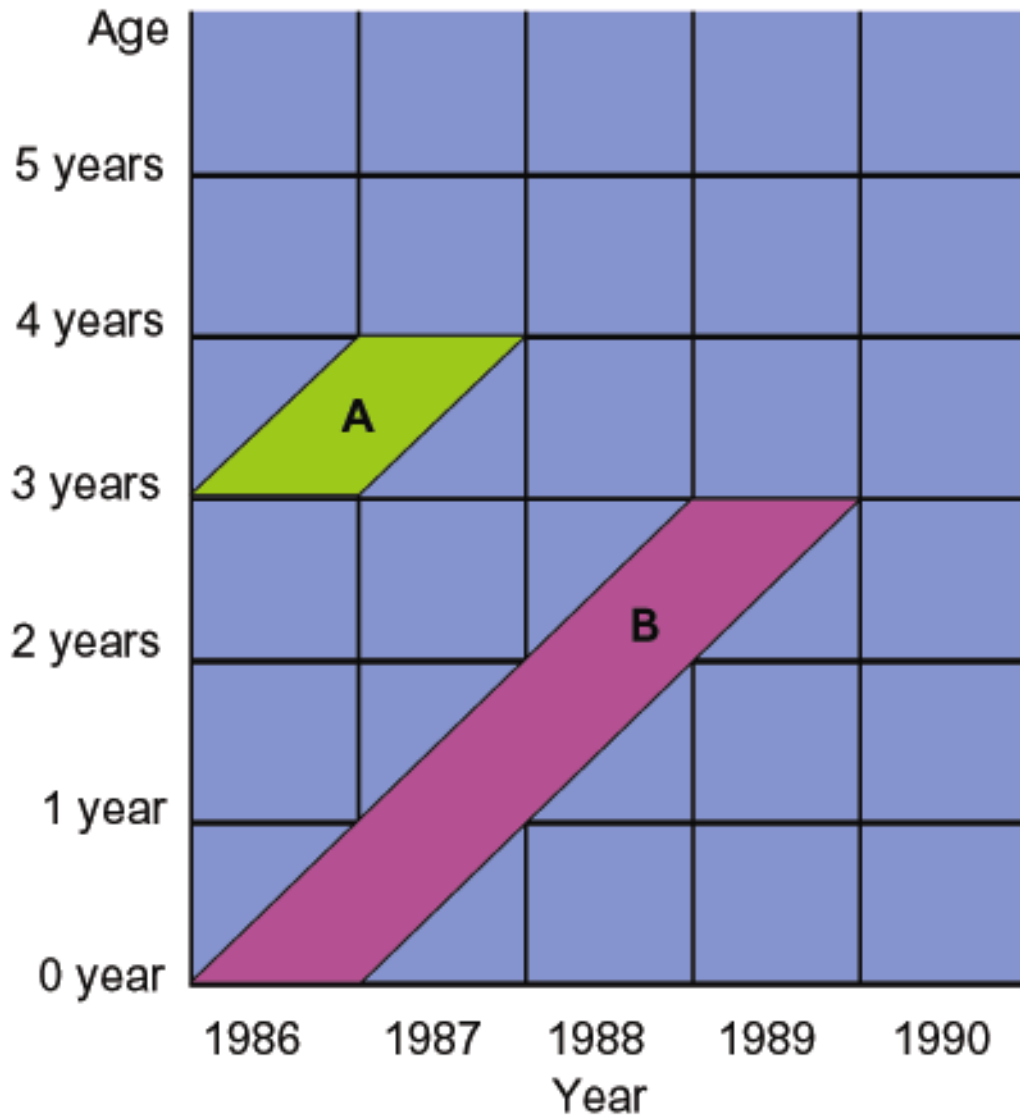
Life Lines

- ◆ The sum of all the life line lengths in a particular portion of the diagram represents person-years lived or exposure in that area
- ◆ Life lines and events can be considered from a cohort or period perspective

Cohort Data

- ◆ *Cohort*—A group of persons who experience an event in the same time period, e.g., birth, marriage
- ◆ The Lexis diagram can show the experience of a cohort in a particular age interval (A)
- ◆ It can also show the experience of a cohort as they move through life (B)

Cohort Data



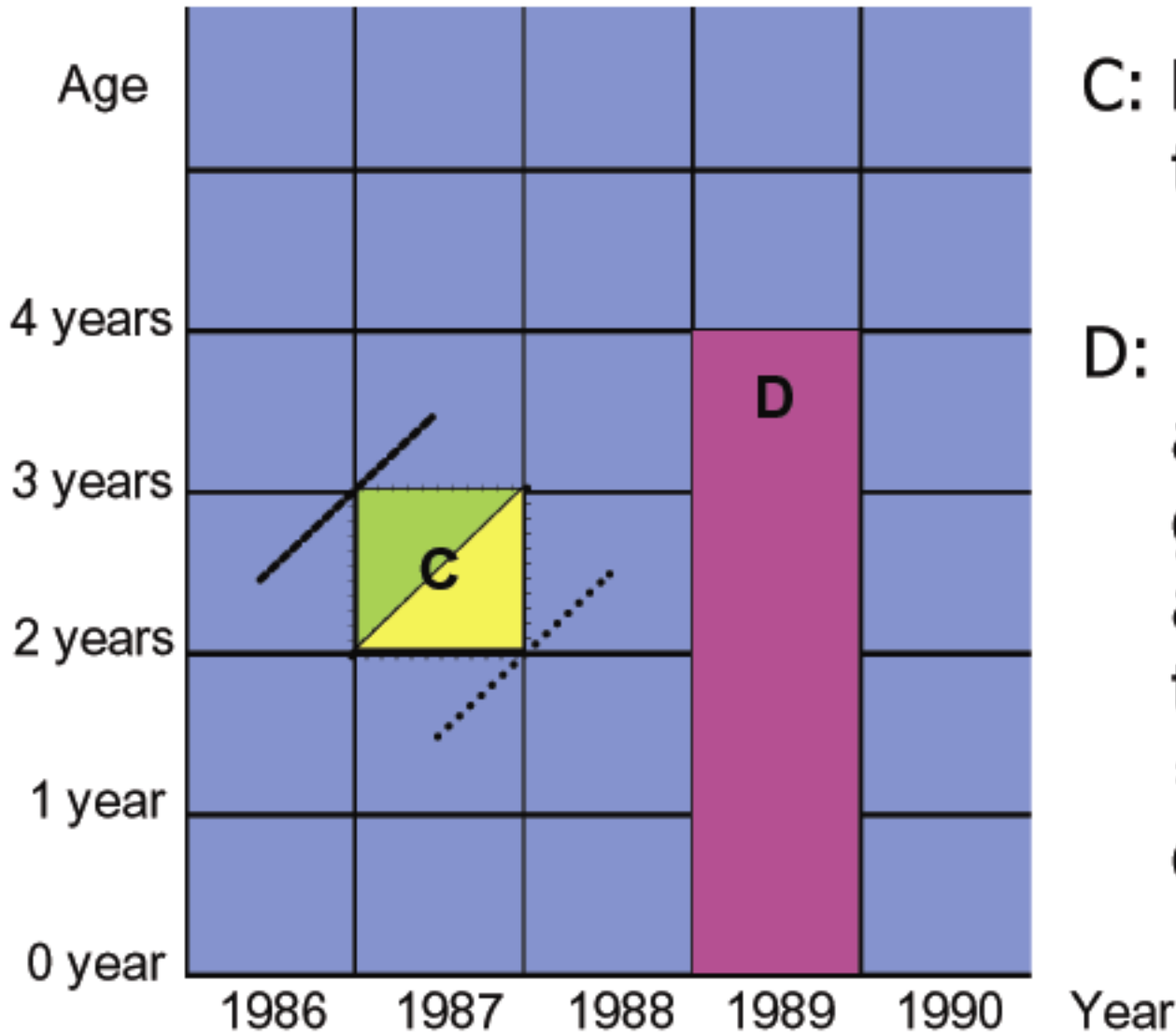
A: Person-years lived at age three by a cohort

B: Persons born in 1986, as they move through life until their 3rd birthday

Period Data

- ◆ Most demographic data are period data
- ◆ Square (C) = person-time of exposure at a particular age and period
- ◆ A square includes the life lines from experiences of two different cohorts
- ◆ Column (D) = experience of all age groups of interest during a specific time period

Period Data



C: Persons of age two in 1987

D: Experience of all the age groups under age four during the year 1989 = population during 1989

Examples

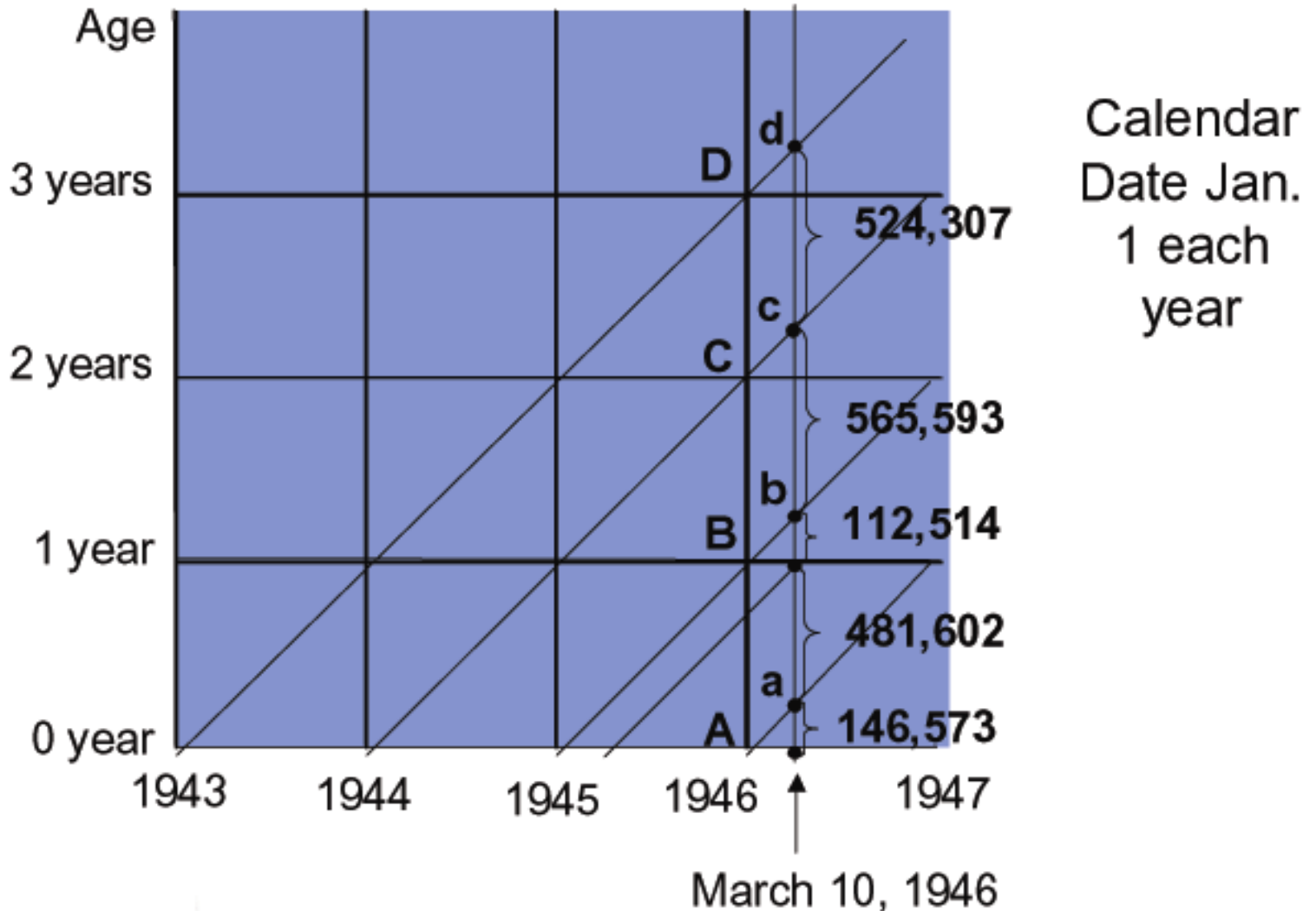
- ◆ Display of census information by age and year of birth

Examples

France: Total Enumerated Population, March 10, 1946

Year of Birth	Age in Completed Years on 1-Jan-46	Population
1946: January 1 to March 9	-	146,573
1945: March 10 to December :	0	481,602
1945: January 1 to March 9	0	112,514
1944	1	565,593
1943	2	524,307

Examples



Examples

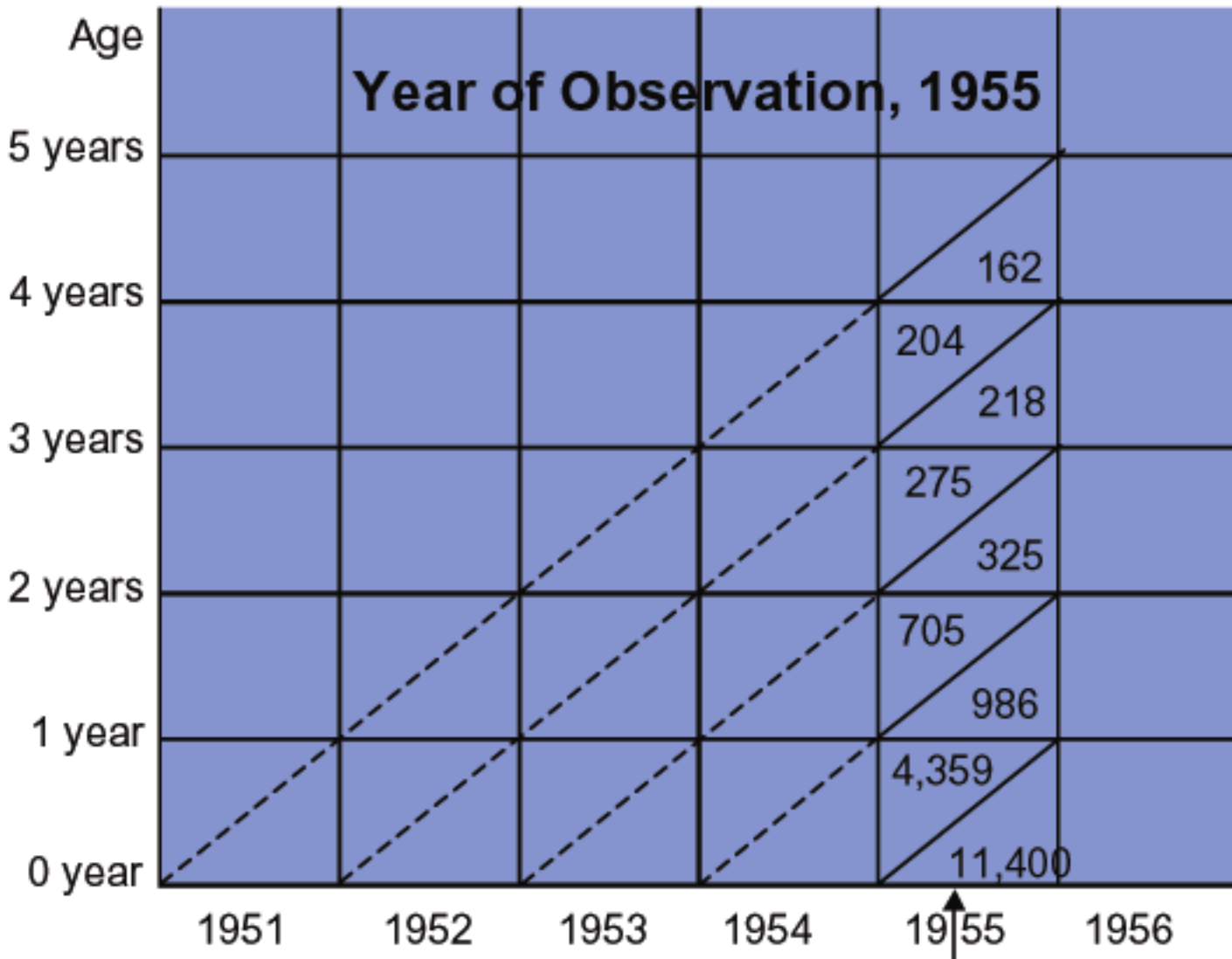
- ◆ Each square in a Lexis Diagram represents the experience of two cohorts (distribution of deaths during a calendar year between different birth cohorts)

Examples

France: Male Deaths in 1955,
by Year of Birth and by Age

Year of Birth	Age in Completed Years	Number of Deaths
1955	0	11,400
1954	0	4,359
1954	1	986
1953	1	705
1953	2	325
1952	2	275
1952	3	218
1951	3	204
1951	4	162

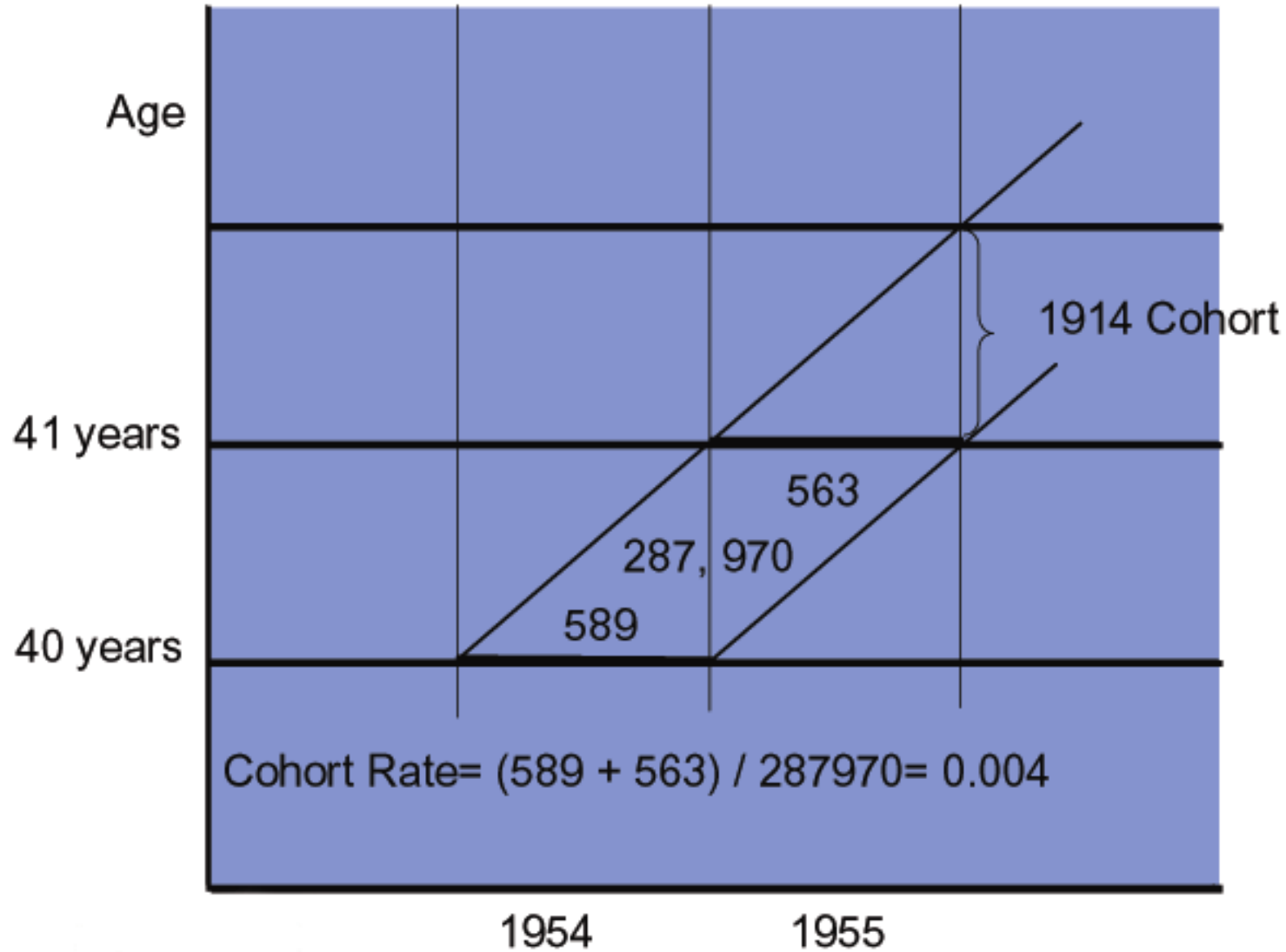
Examples



Examples

- ◆ Representation of the deaths occurring to a specific cohort at a particular age

Examples

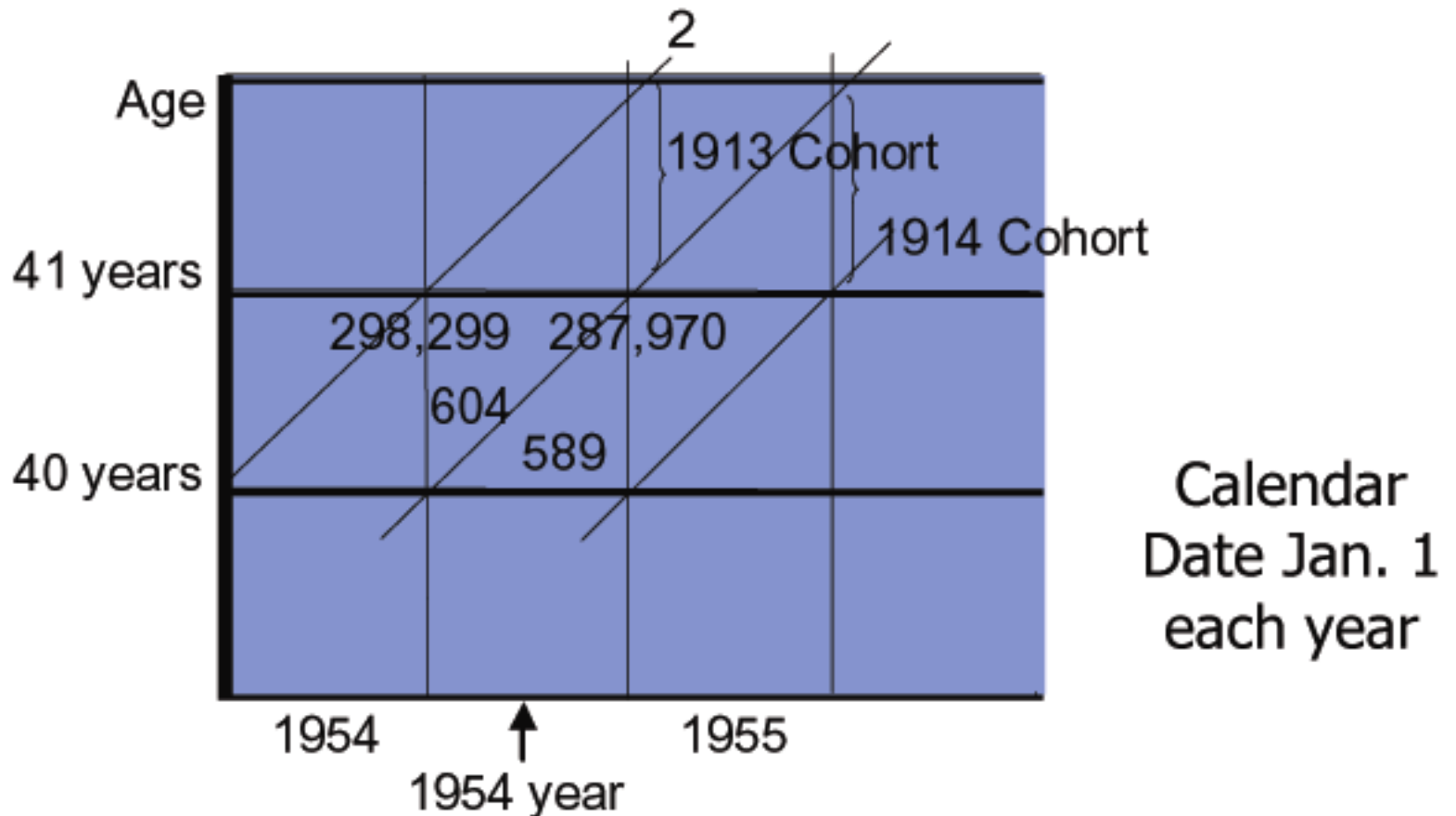


Examples

- ◆ Each square in a Lexis Diagram represents the experience of two birth cohorts (distribution of the deaths occurring at a specific age during a calendar year)

Examples

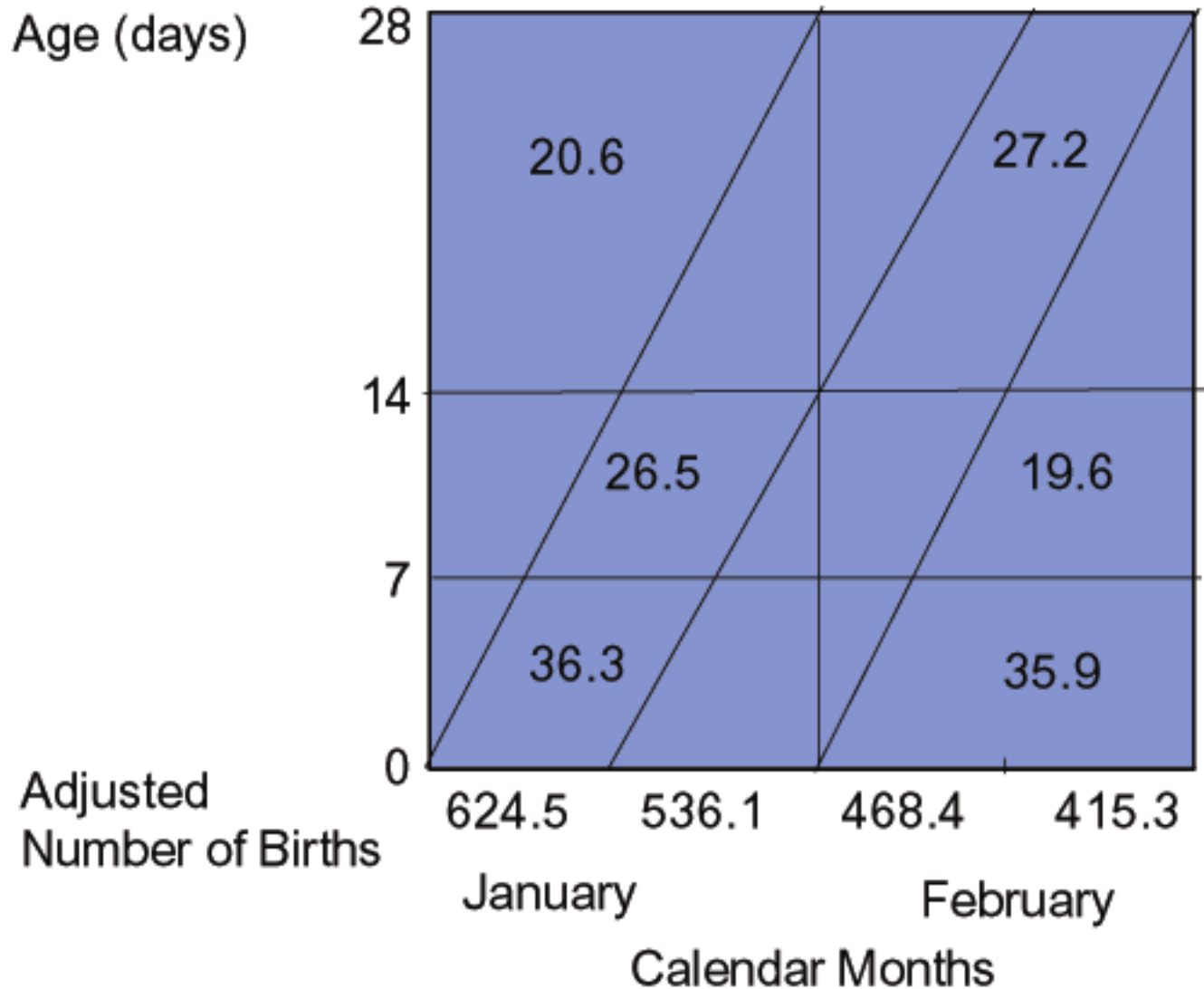
$$\text{Period rate} = \frac{604 + 589}{298299 + 287970} = 0.008$$



Examples

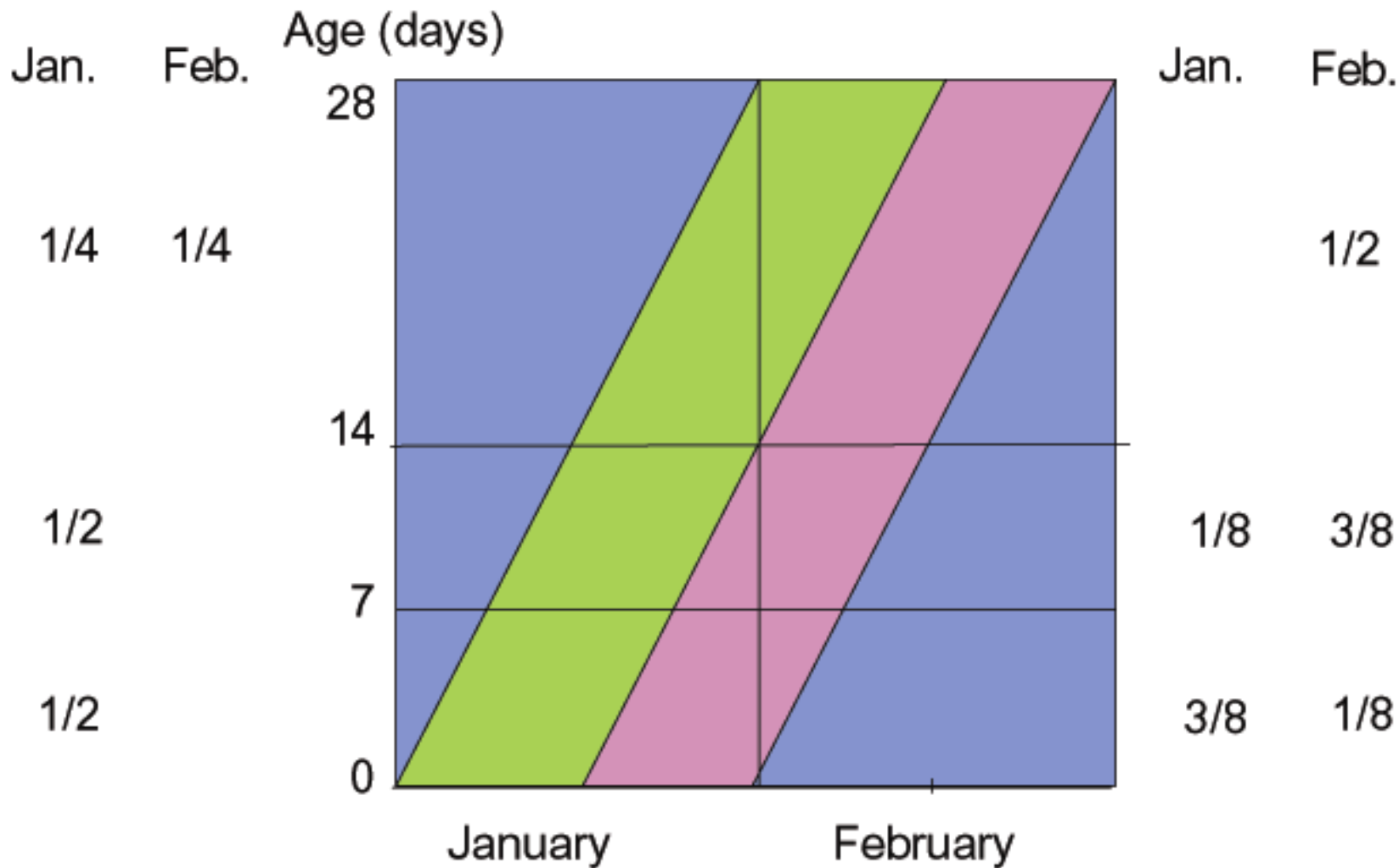
- ◆ Relating events in periods of time to cohorts of individuals—attributing period numbers of deaths to birth cohorts

Examples

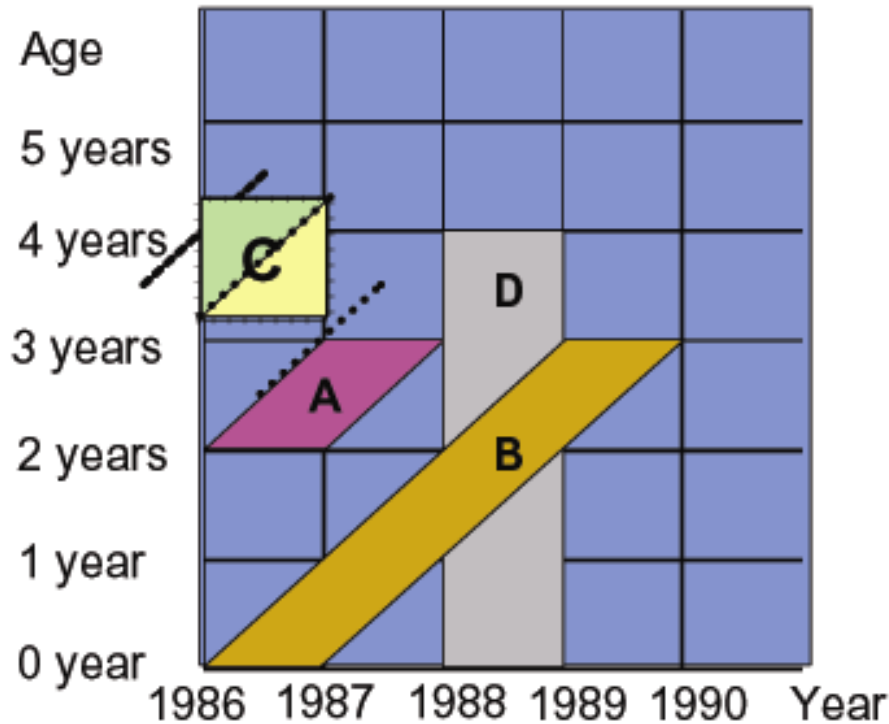


Fraction of deaths attributed to birth cohort of 1st half of Jan.

Fraction of deaths attributed to birth cohort of 2nd half of Jan.



Summary



A: Experience of a cohort at age two

B: Experience of a cohort of persons born in 1986, as they move through the first three years of life

C: Persons of age three in 1986

D: Experience of all the age groups under four in 1988