Marriage and Divorce – Basic Measures

Crude rates

General rates

Age-specific rates

Duration-specific rates

Synthetic cohort measures

  Total first marriage rate / Total remarriage rate

  Total divorce rate

Synthetic cohort trajectories
Crude rates

\[ CMR = \frac{M}{P} \times 1,000 \]

Crude marriage rate

- The denominator includes people who are
  - Too young
  - Already married

- Also influenced by population age structure

\[ CDR = \frac{D}{P} \times 1,000 \]

Crude divorce rate
Note on general marriage/divorce rates

\[ \text{GMR}^f = \frac{M}{P^f_{15-49}} \]

1) Can specify with greater accuracy if marital status distributions are available

2) Not everyone is at risk of marriage/remarriage/divorce

3) e.g., \( \text{GMR}^f = \frac{M}{P^f_{15-49}} \) or \( \text{GFMR}^f = \frac{\text{FM}^f}{P^f_{15-49}} \)

where \( \text{FM}^f = \# \) first marriages to women and \( n \) references the never married population
Figure 8-6  Annual General Divorce Rates, United States, 1920–1998

Note: The GDR is the rate of divorces per 1,000 married women.
Measures of marriage timing

1) Mean age at (first) marriage
2) Median age at (first) marriage
3) Marital status distributions (stock vs. flow)
4) Singulate Mean Age at Marriage – SMAM
   a. Rationale – limited data
   b. Calculation
Mean age at marriage

• Mean age at marriage for females

\[ A_{M(f)} = \frac{\sum_{15}^{55+} M^f_x \cdot (x + \frac{n}{2})}{\sum_{15}^{55+} M^f_x} \]

• Can calculate from information on number of marriages by age (often not available)
Median age at marriage

• Median age at marriage for females

\[ A_{Med(f)} = l_f + \left( \frac{N_f}{2} - F_f \right) \times \left( \frac{i}{f_f} \right) \]

• As on p.92 of text.
  – \( l \) is lower limit of age group w/middle marriage
  – \( N \) is total number of marriages
  – \( F \) is cumulative frequency up to \( l \)
  – \( f \) is number of marriages in age group containing middle marriage
  – \( I \) is the width of age group containing middle marriage (e.g., 5 yrs)
SMAM - Three components

1) \[ 1500 + \sum_{x=15-19}^{45-49} 100 \times \frac{N_x}{P_x} \times 5 \] # years lived single thru age 50 among group of 100

2) \[ 100 \times \left[ \left( \frac{N_{45-49}}{N_{50-54}} \div \frac{P_{45-49}}{P_{50-54}} \right) / 2 \right] \] Pct. never marrying by age 50

3) \[ 50 \times 100 \times \left[ \left( \frac{N_{45-49}}{N_{50-54}} \div \frac{P_{45-49}}{P_{50-54}} \right) / 2 \right] \] # years lived single thru age 50 among those who never married
$$\text{SMAM} = \left(1500 + \sum_{x=15-19}^{45-49} 100 \times \frac{N_x}{P_x} \times 5\right) - \left[50 \times 100 \times \left(\frac{N_{45-49}}{N_{50-54}} \div \frac{P_{45-49}}{P_{50-54}}\right)/2\right]$$

$$100 - \left[100 \times \left(\frac{N_{45-49}}{N_{50-54}} \div \frac{P_{45-49}}{P_{50-54}}\right)/2\right]$$

Intuitively = the number of years lived single among those who ever married by age 50
Mean age at marriage/divorce/remarriage

1) Two methods for calculation
   a. Simple average if enumerated by single years of age
   b. Weighted average if enumerated by age group
   c. Same is true for median
Comparison of SMAM and Mean age at first marriage – Japanese Men
Age specific marriage rate

• If data about age at marriage are provided:

\[
\text{ASFMR}^f_{x,t} = \frac{M^f_x}{P_{f,n}^x} \times 1,000
\]

• Usually calculated for women and men separately, because timing of marriage is different
First Marriage Trajectories – Japan 2000
Figure 17-2 Diversity of Nuptiality Patterns in the World: Female Nuptiality Rates for Four Nations.
Synthetic Cohort Measures

1) Total First Marriage Rate

$$\text{TFMR}^i = \sum_{x=15-19}^{45-49} \text{ASFMR}^i * 5$$

where $i$ indexes sex.

2) Analogous measures for remarriage, divorce

3) Can also use age-specific rates to represent marriage behavior in other ways
   a. Trajectories
   b. Cumulative failure/survival curves
Construct cumulative experience trajectories

\[ EM_n = \sum_{x=15-19}^{n-1} (NM_x \cdot ASFMR_x) \cdot 5 \]

\[ EM_n = \sum_{x=15-19}^{n-1} [(100 - EM_x) \cdot ASFMR_x] \cdot 5 \]

for example,

\[ EM_{20} = (100 \cdot ASFMR_{15-19}) \cdot 5, \]

\[ EM_{25} = [(100 \cdot ASFMR_{15-19}) + (NM_{20} \cdot ASFMR_{20-24})] \cdot 5 \]

e tc.

Survival curves

\[ NM_n = 100 - EM_n = 100 - \sum_{x=15-19}^{n-1} (NM_x \cdot ASFMR_x) \cdot 5 \]
Cumulative survival curves for first marriage