The Impact of Multiple Births on Fertility and Family Support in the Early 20th-Century

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Short Abstract

Multiple births strain the resources of mothers and families in ways that should highlight preferences for family size, birth spacing, and support from kin. Couples with surviving twins reach a target family size sooner than other couples, and they should be more likely to practice family limitation. Twins are also a greater burden on both the mother's time and health, which may lead to postponing the next birth even among couples who want additional children. Other kin, especially grandmothers, may play an important role in easing the burden on mothers after multiple births. We propose to examine these hypotheses by analyzing families with twins in the US censuses of 1900 and 1910. We will use event history methods (Kaplan-Meier curves, Cure Models) to compare birth intervals following a twin birth to women with singleton births to find evidence of increased family limitation and birth spacing following twin births. Household composition at the time of the census and the availability of nearby potential kin will be examined for evidence that families with twins were more likely to include grandmothers or other female kin. We will also ask whether grandmothers were a substitute for family limitation and birth spacing.

Extended Abstract

Multiple births strain the resources of mothers and families in ways that should highlight preferences for family size, birth spacing, and support from kin. Couples with surviving twins reach a target family size sooner than other couples, and they should be more likely to practice family limitation. Twins are also a greater burden on both the mother's time and health, which may lead to postponing the next birth even among couples who want additional children. Other kin, especially grandmothers, may play an important role in easing the burden on mothers after multiple births.

We propose to examine these hypotheses by analyzing families with twins in the US censuses of 1900 and 1910. Multiple births are less than two percent of all births, but the full count censuses of these years provide enough cases for our analysis. We will use event history methods (Kaplan-Meier curves, Cure Models) to compare birth intervals following a twin birth to those of a random sample of women with singleton births to find evidence of increased family limitation and birth spacing following twin births. Household composition at the time of the census and the availability of nearby potential kin will be examined for evidence that families with twins were more likely to include grandmothers or other female kin. We will also ask whether grandmothers were a substitute for family limitation and birth spacing. Twin births provide a new way of studying differences in family building by region, socio-economic status, race, and ethnicity during the transition to small families.

Data

We rely on the 1900 and 1910 complete-count IPUMS datasets, which include individual-level on over 162 million individuals. Both censuses included questions on children ever born and children surviving, which allow women's complete birth histories to be imputed using probabilistic techniques (Luther and Cho 1989; Hacker 2019). To date, we have reconstructed complete birth histories for 1,180,518 women

in the 1900 IPUMS sample (5% density) and 45,829 women in the 1910 IPUMS sample (1% density). Imputed births are summarized in Table 3. Among women age 15-68 in both samples, birth histories were comprised of 2,093,500 co-resident children with known ages, 846,118 deceased children with imputed ages and 685,317 unmatched children with imputed ages. We anticipate that reconstruction of complete birth histories the 1900 and 1910 complete birth histories will be straight-forward (although computer intensive) and will result in complete birth histories for over 50 million women.

The birth reconstruction method appears to yield excellent results, with age-specific fertility rates closely corresponding to estimates made with Own-Child Methods. One feature of the imputation process should be mentioned here: We follow Luther and Cho in not imputing the birth of a deceased or unmatched child to be the same age as that of a living, coresident child. Our knowledge of multiple births, therefore, will rely solely on multiples who survived to the census and were still co-resident with their mothers.

Preliminary Example

Figure 6 illustrates the potential for the new data. The figure shows the percentages of currently-married women with 2 or more children ever born who had not progressed to a third or higher order birth by the number of months since her last birth. Results are shown for all women and for women residing the Northeast Census region currently married to spouse with a professional occupation (a group known to be on the vanguard of the fertility transition). For both groups, the results are stratified according to whether the previous birth was a singleton or a multiple. The survival curves indicate that birth intervals following a multiple birth were longer for both groups of women and longer for women married to professional men in the northeast. The results are consistent with hypotheses that couples with surviving twins strained economic and physical resources of mothers and families. In our analysis of the complete-count datasets, we will explore the impact of grandmothers and other kin, both inside and outside the household, on birth intervals following a multiple birth.

References

Luther, Norman Y. and Cho, Lee-Jay. 1988. “Reconstruction of Birth Histories from Census and Household Survey Data.” Population Studies 42:3, 451-472.

Hacker, J. David. 2019. “Reconstructed Birth Histories for the Study of Fertility Decline in the United States.” Unpublished manuscript.

Table 3. Number of living, deceased and unmatched (non coresident) children by mothers' age at birth, mothers' birth cohort, and sample, Luther and Cho birth reconstruction method

1900 IPUMS Sample

1830-39 Birth Cohort (71,566 women)

Age	Living, coresident		Dead		Unmatched		Total	
17-19[1]	1,167	4%	12,520	44%	14,798	52%	28,485	100%
20-24	6,063	8%	28,308	39%	37,553	52%	71,924	100%
25-29	10,204	14%	26,530	35%	38,828	51%	75,562	100%
30-34	14,525	21%	21,741	31%	34,047	48%	70,313	100%
35-39	18,531	32%	15,716	27%	24,104	41%	58,351	100%
40-44	15,689	48%	7,965	24%	8,911	27%	32,565	100%
45-49	4,414	71%	1,083	18%	689	11%	6,186	100%
Total	70,593	21%	113,863	33%	158,930	46%	343,386	100%

1840-49 Birth Cohort (125,469 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	2,792	6%	18,187	40%	24,921	54%	45,900	100%
20-24	16,179	13%	43,773	35%	64,578	52%	124,530	100%
25-29	37,237	27%	40,390	29%	60,829	44%	138,456	100%
30-34	59,498	46%	31,776	25%	37,447	29%	128,721	100%
35-39	62,639	65%	21,847	23%	11,557	12%	96,043	100%
40-44	36,171	74%	11,359	23%	1,400	3%	48,930	100%
45-49	7,512	81%	1,624	62%	98	1%	9,234	100%
Total	222,028	38%	168,956	29%	200,830	34%	591,814	100%

1850-59 Birth Cohort (183,708)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	10,673	16%	24,018	36%	32,300	48%	66,991	100%
20-24	71,999	40%	52,318	29%	57,718	32%	182,035	100%
25-29	131,246	66%	42,128	21%	25,472	13%	198,846	100%
30-34	135,990	78%	33,495	19%	5,635	3%	175,120	100%
35-39	102,501	78%	26,468	20%	1,988	2%	130,957	100%
40-44[2]	40,684	78%	10,912	21%	412	1%	52,008	100%
45-49[2]	3,217	79%	825	20%	14	0%	4,056	100%
Total	496,310	61%	190,164	23%	123,539	15%	810,013	100%

1860-69 Birth Cohort (254,897 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	39,286	52%	23,233	31%	12,998	17%	75,517	100%
20-24	165,753	72%	49,289	22%	13,882	6%	228,924	100%
25-29	208,399	81%	41,783	16%	7,632	3%	257,814	100%
30-34[2]	142,151	82%	28,610	16%	2,698	2%	173,459	100%
35-39[2]	39,300	82%	8,448	18%	323	1%	48,071	100%
40-44	-	-	-	-	-	-	-	
45-49	-	-	-	-	-	-	-	
Total	594,889	76%	151,363	19%	37,533	5%	783,785	100%

1870-79 Birth Cohort (352,143 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	62,190	68%	20,512	22%	8,621	9%	91,323	100%
20-24[2]	169,820	80%	32,686	15%	9,566	5%	212,072	100%
25-29[2]	72,188	85%	11,731	14%	1,480	2%	85,399	100%
30-34	-	-	-	-	-	-	-	
35-39	-	-	-	-	-	-	-	
40-44	-	-	-	-	-	-	-	
45-49	-	-	-	-	-	-	-	
Total	304,198	78%	64,929	17%	19,667	5%	388,794	100%

1880-89 Birth Cohort (192,735 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19[2]	10,228	76%	1,963	15%	1,292	10%	13,483	100%
20-24	-	-	-	-	-	-	-	
25-29	-	-	-	-	-	-	-	
30-34	-	-	-	-	-	-	-	
35-39	-	-	-	-	-	-	-	
40-44	-	-	-	-	-	-	-	
45-49	-	-	-	-	-	-	-	
Total	10,228	76%	1,963	15%	1,292	10%	13,483	100%

1890-99 Birth Cohort (0 women)

Age	Living, coresident	Dead	Unmatched	Total
15-19	-	-	-	-
20-24	-	-	-	-
25-29	-	-	-	-
30-34	-	-	-	-
35-39	-	-	-	-
40-44	-	-	-	-
45-49	-	-	-	-
Total	-	-	-	-

Total, all birth cohorts

Age	Living, coresident		Dead		Unmatched		Total	
15-49	1,698,246	58%	691,238	24%	541,791	18%	2,931,275	100%

1910 IPUMS Sample

1830-39 Birth Cohort

Age	Living, coresident	Dead	Unmatched	Total
15-19	-	-	-	-
20-24	-	-	-	-
25-29	-	-	-	-
30-34	-	-	-	-
35-39	-	-	-	-
40-44	-	-	-	-
45-49	-	-	-	-
Total	-	-	-	-

1840-49 Birth Cohort (17,926 women)

Age	Living, coresident		Dead		Unmatched		Total	
17-19[1]	273	4%	2,800	42%	3,605	54%	6,678	100%
20-24	1,536	8%	6,920	37%	10,137	55%	18,593	100%
25-29	2,717	13%	6,831	34%	10,793	53%	20,341	100%
30-34	3,603	19%	5,591	30%	9,637	51%	18,831	100%
35-39	4,251	30%	3,725	26%	6,319	44%	14,295	100%
40-44	3,398	45%	1,847	25%	2,292	30%	7,537	100%
45-49	904	70%	233	18%	157	12%	1,294	100%
Total	16,682	19%	27,947	32%	42,940	49%	87,569	100%

1850-59 Birth Cohort (31,490 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	744	6%	4,099	35%	6,783	58%	11,626	100%
20-24	4,039	13%	10,290	32%	17,556	55%	31,885	100%
25-29	8,765	25%	9,311	27%	16,591	48%	34,667	100%
30-34	14,170	46%	6,871	22%	9,825	32%	30,866	100%
35-39	14,466	64%	5,021	22%	2,963	13%	22,450	100%
40-44	7,933	73%	2,588	24%	410	4%	10,931	100%
45-49	1,446	78%	387	21%	27	1%	1,860	100%
Total	51,563	36%	38,567	27%	54,155	38%	144,285	100%

1860-69 Birth Cohort (46,238 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	2,361	16%	4,906	33%	7,802	52%	15,069	100%
20-24	17,836	41%	11,373	26%	14,811	34%	44,020	100%
25-29	31,967	67%	9,186	19%	6,818	14%	47,971	100%
30-34	31,092	77%	7,525	19%	1,577	4%	40,194	100%
35-39	21,973	77%	6,024	21%	471	2%	28,468	100%
40-44[2]	8,391	77%	2,412	22%	101	1%	10,904	100%
45-49[2]	603	77%	171	22%	5	1%	779	100%
Total	114,223	61%	41,597	22%	31,585	17%	187,405	100%

1870-79 Birth Cohort (63,731 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	9,846	55%	4,897	27%	3,246	18%	17,989	100%
20-24	39,247	74%	10,355	20%	3,379	6%	52,981	100%
25-29	47,136	81%	9,061	16%	1,939	3%	58,136	100%
30-34[2]	32,199	82%	6,183	16%	677	2%	39,059	100%
35-39[2]	8,748	82%	1,801	17%	59	1%	10,608	100%
40-44	-	-	-	-	-	-	-	
45-46	-	-	-	-	-	-	-	
Total	137,176	77%	32,297	18%	9,300	5%	178,773	100%

1880-89 Birth Cohort (84,102 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19	14,759	69%	4,280	20%	2,229	10%	21,268	100%
20-24[2]	41,232	81%	7,229	14%	2,557	5%	51,018	100%
25-29[2]	17,075	86%	2,493	13%	371	2%	19,939	100%
30-34	-	-	-	-	-	-	-	
35-39	-	-	-	-	-	-	-	
40-44	-	-	-	-	-	-	-	
45-49	-	-	-	-	-	-	-	
Total	73,066	79%	14,002	15%	5,157	6%	92,225	100%

1890-99 Birth Cohort 45,829 women)

Age	Living, coresident		Dead		Unmatched		Total	
15-19[2]	2,544	75%	470	14%	389	11%	3,403	100%
20-24	-	-	-	-	-	-	-	
25-29	-	-	-	-	-	-	-	
30-34	-	-	-	-	-	-	-	
35-39	-	-	-	-	-	-	-	
40-44	-	-	-	-	-	-	-	
45-49	-	-	-	-	-	-	-	
Total	2,544	75%	470	14%	389	11%	3,403	100%

Total, all birth cohorts

Age	Living, coresident		Dead		Unmatched		Total	
15-49	395,254	57%	154,880	22%	143,526	21%	693,660	100%

Notes: (1) Childbearing not observed at ages 15 and 16 for women in these cohorts.

(2) Childbearing for women in these cohorts and age groups not fully observed.

Figure 6. Birth Interval Survival Curve for Currently-Married Women age 15-68 with 2 or more Children Ever Born in the 1900 and 1910 IPUMS samples