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Counting Marriages in the United States: The Value of County-Level Administrative Data

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Abstract

Rapid family change has occurred in the United States, but it has not been accurately charted at the local level. Our capacity to understand spatial variation in marriage is hindered by the deterioration and defunding of the U.S. marriage and divorce vital statistics system. While there is easily accessible state-level data, there is no central depository of county-level administrative marriage data preventing researchers from addressing questions about the geographic concentration as well as variation in marriage rates. We compiled 2010 county-level administrative marriage data from over 3000 counties in 49 states. We find there is wide variation in marriage rates within states with marriage rates varying more across states than within states. While the American Community Survey (ACS) is often used to study marriage rates in the U.S., we find that ACS data can only be used to assess local marriage rates for less than one in ten counties. Our findings demonstrate the high level of spatial variation in marriage and the significance of relying on county- rather than state-level marriage rates.

Keywords

Demography; Marriage; Vital Statistics; American Community Survey

Introduction and research objectives

Marriage in the United States has undergone rapid transformation with a growing share of Americans forgoing and delaying marriage.¹ Americans continue to value marriage, and even if they dissolve a union the remarriage rate remains high.² Rapid family change has occurred, but it has not been accurately charted at the local level. The inability to examine marriage patterns at local levels is a notable shortcoming as Lesthaeghe and Neidert³ found, “the overall American pattern hides large spatial differentials” (p. 5). When analysis is limited to geographic units of the state or higher, or when counties are excluded due to population size, these spatial differences in marriage are overlooked.

To fill this void, we compiled 2010 administrative data (ADMIN) from all U.S. counties on marriage and divorce.⁴ While the American Community Survey (ACS) started including questions about marital events occurring in the last year in 2008, these data do not allow for a complete assessment of marriage rates, because the ACS single year estimates only

represent one-quarter of counties in the U.S. Until now, researchers and policy makers have lacked a comprehensive and systematic local-level approach to examine and evaluate the state of marriage at the local level. These data are key in the facilitation of program planning, program evaluation, and resource allocation. Our primary goal in this paper is to examine variation in marriage rates at the county level by showcasing the importance of county- versus state-level marriage indicators by illustrating heterogeneity in county-level marriage rates *within* states. In doing so, we demonstrate the value of administrative data in assessments of U.S. marriage patterns.

Background

In the U.S. administrative (ADMIN) data are the only source of counts of marriage at the local level. Survey data cannot be used to comprehensively calculate marriage rates across counties. Marriages are filed at the county clerk of courts, and typically reported to the state vital or health statistics systems, with many reporting state-level counts to the National Center for Health Statistics (NCHS). The collection and maintenance of these data is determined by state laws, resulting in wide variation across states in the type and content of data.⁵ Data range from basic counts of marriages to more detailed demographic indicators of both spouses. During the 1960s and 80s, data were accumulated at the county- and state-level and reported by the NCHS in the “Vital Statistics of the United States” volume on marriage and divorce. The federal funding for data aggregation was discontinued in 1996 in part because of budget cuts, incomplete reporting by many states, and questions about the centrality of these data to the NCHS mission.^{5,6} Thus, our collection, confirmation, accuracy checks, and release of the 2010 county-level marriage counts (ADMIN) as well as our analysis of our subsequently derived adjusted marriage rates help to fill an important gap in our knowledge about marriage at the local-level.

In 2008, the ACS started including items about marriages and divorces occurring in the last 12 months that can be used to calculate marriage and divorce rates. Although the ACS provides complete coverage of all U.S. counties in the five-year estimates (first released in 2012), these estimates represent marriages and divorces that occurred over a six-year time frame (2007–2012). Meaning these temporally aggregated data do not allow for the investigation of time-trend difference for smaller counties. This is particularly problematic given the immense economic crisis with potential consequences for marriage and divorce. Indeed, the ACS, can only provide a single year estimate for 25% of counties in the U.S. In other words, **annual** marriage counts (beginning in 2008) are not available at the county-level via the ACS for 75% of counties. A further limitation is that ACS county-level marriage data are not provided via American Fact Finder or in the PUMS files. Thus, it is important to have a single point actual count for 2010 that can be used to monitor change in marriage which the ACS cannot provide.

Assessments of ACS marriage data quality have occurred at the national level, but have not considered county-level contrasts. Elliott et al.⁷ evaluated the marital events items on the 2008 ACS finding comparable estimates of crude marriage rates between the ACS and tabulations provided to the NCHS as part of the vital statistics data at the national level. However, analysis of the one-year 2008 ACS and administrative data provided to NCHS at

the state level indicate considerable variation with about half of states having substantial differentials.⁸ Certainly, differences in the ACS and administrative data reported in the NCHS vital statistics reports are expected. The ACS establishes the number of marriages based on residence of the respondents whereas vital statistics are based on the state where the marriage certificate was filed. Thus, locales for destination weddings (e.g., Nevada and Hawaii) will experience higher marriage rates and do not reflect the residence of the bride and groom. The ACS has sampling error, which will be greatest in states with small populations, whereas the administrative data represent actual counts of filed marriages. There is potential error associated with administrative data, but this is due to data entry and reporting error.

To demonstrate the importance of county- rather than state-level marriage rates, we examine variability in marriage rates within states. We consider the absolute range in marriage rates as well as the average percentage and absolute difference in counties within states. Then, we contrast county-level marriage rates using the ADMIN and county-level estimates of marriage rates using the ACS data applying the margin of error estimates for the ACS for the available 375 counties that can be identified in the IPUMS-ACS data. A fundamental question is what share of variability in marriage rates occurs between versus within states. In other words, how well does the state encapsulate the range of county-level marriage rates?

Data and Methods

The 2010 county-level marriage and divorce data have not been amassed in one location. In 2010 there were 3,143 counties in the U.S. The number of counties within a state range from 1 in District of Columbia (which we refer to as a state) to 254 in Texas. Unlike census tracts, the population of counties ranges widely from 82 in Loving County, Texas to 9,818,605 in Los Angeles County, California. With funding support from the National Institute of Child Health and Human Development (NICHD) we amassed the ADMIN data from over 3,000 counties (or county equivalents) by seeking electronic reports from state health departments via the internet, contacting state and local (county or town) offices directly, and making in-person visits to obtain data. This project was not without challenges, including incomplete reporting, issues with data entry, and unwillingness of individual states or counties to provide counts. For example, the state of New Mexico did not have a centralized count of their county-level data, therefore to obtain counts, we had to contact each individual county's clerk to obtain the data. These data provide the most comprehensive overall assessment of county-level marriage in the United States to date.

The analysis of the county marriage rates relative to the state is based on a series of contrasts. We calculate county-level rates within each state: the range of marriage rates across counties within the state, the average percentage difference from the state level, and the absolute difference from the state level. The mean (μ) and SD differences from states were calculated by solving for each county's deviation from the state rate *separately* for each state. Negative deviations were multiplied by -1 to refer to *average distance* from the state. With our emphasis on differentiating between state-produced marriage rates and county-level estimates, we opted to provide estimates for the average distance between county-level rates and the broader state rates for each state. We estimated the average mean percent

difference from the state rate by averaging the percentage difference (dividing the difference in the state and county rate by the state rate) across counties within a state. Once again negative scores were multiplied by -1 to account for distance from the state rate – regardless of direction.

A limitation of the ACS is that single year estimates of marriage are not available for the majority of counties; The ACS one-year estimates are limited to counties with 65,000 or more respondents (25% of counties). Further, the number of marriages in the last year is not publically available for all these counties. We limit contrasts of ADMIN and ACS one-year data to a subset of counties (375 or 12%) that have publicly available data through the Minnesota Population Center's IPUMS-USA files. These counties all contain at least 100,000 residents and the PUMA and county boundaries align with one another.

We compute two county- and two state-level adjusted marriage rates, one using marriage count data from ADMIN data in the numerator and the other using ACS estimates of the number married in the last year. The denominator for the adjusted marriage rate (henceforth, referred to as marriage rate) is derived from ACS population estimates, regardless of the data source of the numerator. Simply, the marriage rate refers to the number of people who married per 1,000 single persons (i.e., divorced, widowed, never married). Because the denominator is based on the ACS any variation in rates can be attributable to variation in the count marriages versus estimation of the number of people experiencing a marital event. Using the ACS data we calculate margin of error (MOE) estimates that are effected by both the overall population of a given geographic area as well as the rarity of the event being estimated. The number of people marrying in a given year ($n = 4.2$ million) is a relatively uncommon event so MOE associated with the estimate of the number of people who married in the last year is larger than the MOE associated with the estimate of the single population.

Results

Figure 1 presents a U.S. map of the county-level marriage rates based on the ADMIN data and demonstrates the variability in marriage rates. Table 1 focuses on the heterogeneity of marriage rates within states and is organized by region. The first column presents the state marriage rate, and the second column presents the county-level range within the state based on ADMIN data. The national marriage rate is 38.0, but there is wide variation across counties. County-level marriage rates range from 0.0 to 571.4. Data checks confirmed all counties with a marriage rate of 0.0 were plausible as they had very small currently single populations as well as low instances of marriage in subsequent years. At the other end of the spectrum, the particularly high marriage rates corresponded to states with prominent destination locales or a very small single population. Texas had the greatest absolute range in marriage rates and Delaware had the smallest. In Texas, there were three counties with no marriages and one county with 7 single persons and 2 marriages. In contrast, Delaware only has three counties with marriage rates within a narrow range (marriage rates were 21.1, 26, and 33.9).

For each state, we calculate the mean percentage difference between the county and state marriage rates. To provide a reference point, the national level's overall percentage

difference is 30.2%. This level signifies a high average difference in the county and national marriage rates. Our calculations based on states indicate that the lowest percentage difference in the county and state marriage rates is West Virginia (19.2%) with 55 counties. In other words, on average, the county-level rates in West Virginia differ from the state marriage rate by 19%. The greatest difference in the county and state marriage rates is Hawaii, 77.6%.

A similar approach compares the absolute differences in marriage rates across counties within states. The overall mean difference between state and county-level marriage rates is 11.2 with values ranging from 4.6 to 104.6. Consideration of the mean difference between county and marriage rates along with its standard deviation gives some indication of how prominent outliers are for each state. Both New Hampshire and New Jersey have a comparably low average difference in county- and state-level marriage rates (5.0 and 4.6 per 1,000 respectively). However, New Jersey's maximum county-level marriage rate is approximately 20 per 1,000 higher than New Hampshire's (see also the relatively higher standard deviation 8.9 versus 3.5). At the other end of the spectrum, the average difference between county and state-marriage rates for Nevada is 104.7 per 1,000. Similarly, by boasting the highest standard deviation as well (42.4) it is apparent Nevada's state-marriage rate is heavily influenced by outliers (such as Las Vegas) that call into question the viability of using state-level indicators to assess marriage patterns in Nevada. Supplemental analyses (based on an intraclass coefficient in multilevel analyses and available on request) indicate that only 9% of the variation in county marriage rates is captured at the state level.

Next we turn to contrasts between the ACS and administrative county-level marriage data for the 375 counties where PUMAS are identifiable and reported by IPUMS-USA. The margin of errors (MOEs) for the ACS data are derived from direct standard errors estimated in Stata via the use of the full-sample weights and replicate weights (using the `brrweight` option) provided by IPUMS. For 27% of identifiable counties, the ADMIN data based rates fall outside the ACS MOE. Thus, we are only able to rely on the ACS estimate for less than 10% (273/3143) of counties in the United States. Every state differs in the extent to which the ACS and ADMIN data align. For example in Wisconsin there are 72 counties but only 8 meet the criteria to be identifiable with ACS data. The ADMIN county marriage rates fall outside the margin of errors associated with the ACS estimates for 1 of the 8 identifiable counties, and an additional 3 have large MOEs leaving less than 6% of Wisconsin counties with a reliable ACS marriage rate estimate. Thus, there are two reasons that in many states the ACS has limited applicability to study county-level marriage rates. First, the data are not available due to the sampling limitations of the ACS and second there is substantial discrepancy in the marriage rates based on ADMIN and ACS data. Given these serious data omissions and discrepancies (it appears that in only one in 10 counties of the U.S. are the ACS data applicable), it does not seem that the ACS can be adjusted to accurately report marriage rates at the county level.

DISCUSSION

The ADMIN data are critical for tracking marriage in the U.S. and provide opportunities to analyze county-level marriage patterns at single points in time that are not available in the

ACS. The investments in the marriage data collection have been waning, but our findings suggest the federal and state governments should continue to invest in the collection of marriage and divorce statistics.

We showcase the value of county-level data by demonstrating the high level of marriage rate variability within states. States do not appear to be the best geographic units to describe marriage rates. Less than ten percent of the variation in county marriage rates is captured with a state indicator of marriage. Accordingly, a wide range in marriage rates exist within states, with the average percentage difference in the county and state marriage rates ranging from 19% to 78%. Taken together, using state-level marriage rates masks considerable heterogeneity across counties in a given state and could result in biased estimates with high levels of error. This may be important as assessments of marriage patterns typically rely on state indicators. For example, analyses of the impact of the economic recession on marriage and divorce have been focused on state-level⁹ rather than the more relevant county-level contrasts. This further questions the value of using techniques that rely on data from nearby areas for adjusting county level estimates.

Second, we assess the value of using ACS to study county-level marriage rates. At the national level the ADMIN and ACS estimates are similar and at the state-level—the majority of states have small but substantial differences in marriage rates. Hawaii and Nevada are outliers because they are destination states for weddings. The county-level comparisons are limited to the 375 counties (12%) where ACS data are available, because county-level contrasts are not available with the PUMS files provided by the Census. Further, the large MOEs associated with the identifiable counties (ranging from a low of 4.7 to a high of 29.3) is of concern. Our results indicate there is substantial variation in marriage rates using the ACS and ADMIN and that reliable marriage rates in the ACS are available for less than one in ten counties. Thus, it appears that the ACS data are unsuitable for marriage analysis at the county-level.

Despite multiple advantages of obtaining the county-level data, we acknowledge there are some limitations. First, the ADMIN marriage data is based on where the certificate is filed rather than the residence of the bride and groom, inflating marriage rates in destination locales (e.g., Nevada and Hawaii). Some states provide data on residence of bride and groom as well as location of the event so more refined contrasts could be made in the few states where extensive data are available. Second, the ADMIN data do not include marriages occurring outside the U.S. Third, historically, marriage and divorce rates reference different-sex couples. Same-sex marriage was not legal in most states, but in 2010 five states (Connecticut, Iowa, Massachusetts, New Hampshire, Vermont) and D.C. had legal same-sex marriages.¹⁰ Further attention to the use of administrative data to track same-sex marriages is warranted. Fourth, the county (and state) is not a uniform geographic unit in terms of population or land mass. However, the county or county equivalent is a legal unit and offers a more refined estimate beyond state-level indicators. Finally, our contrasts of ACS and ADMIN data are not representative of the full distribution of counties and focus only on those with larger populations. However, given the largest populated counties are those represented among the 12% of identifiable counties, because of their large population size their associated MOEs will be proportionally smaller than the less populated unidentifiable

counties. Hence, variability between the ADMIN data counts versus the ACS estimates will be exacerbated in the unidentifiable smaller counties. Further, because the denominators are the same (both coming from the ACS), any variability can be attributed to the enumeration of the marital events.

In sum, despite investment in marriage and divorce data in earlier time periods, the U.S. vital statistics system has lapsed making our approach is one of the few ways to track the geographic concentration of marriage. The ACS is the only way to track marriage rate differentials according to socioeconomic status as well as marital history, but unfortunately cannot be used to assess local level marriage rates for the nation. National and state-level estimates of marriage mask the high level of variation in American marriage rates and consequently the best available portrait of marriage rates in the United States relies on county-level measures.

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Figure 1.

Table 1

Within-state variation in marriage rates

	Number of Counties	Marriage Rate per 1,000 population	Range in County Marriage Rates Within the State	μ % difference from state	μ difference from state	SD of diff from state
National		38.0				
<i>Midwest</i>						
Iowa	99	36.7	(20.4, 132.8)	22.0%	8.1	10.4
Illinois	102	27.6	(16.3, 83.2)	28.7%	7.9	8.9
Indiana ^a	92	—	—	—	—	—
Kansas	105	38.3	(16.0, 127.5)	22.1%	8.5	10.0
Michigan	83	26.6	(16.6, 91.7)	32.7%	8.7	10.3
Minnesota	87	28.0	(7.5, 60.9)	23.0%	6.4	5.7
Missouri	115	33.0	(6.8, 140.7)	24.8%	8.2	11.9
North Dakota	53	33.4	(2.1, 79.5)	29.7%	9.9	8.9
Nebraska	93	36.0	(8.5, 108.1)	27.9%	10.1	10.0
Ohio	88	28.3	(16.3, 50.8)	22.4%	6.3	5.0
South Dakota	66	38.8	(1.7, 99.5)	36.9%	14.3	12.6
Wisconsin	72	26.7	(17.9, 91.3)	26.4%	7.1	8.9
<i>Northeast</i>						
Connecticut	8	26.6	(14.7, 39.2)	20.9%	5.6	4.8
Massachusetts	14	25.5	(19.1, 108.9)	63.8%	16.3	28.1
Maine ^b	16	36.5	(25.1, 61.0)	19.4%	7.1	6.3
New Hampshire	10	37.5	(29.3, 49.7)	13.4%	5.0	3.6
New Jersey	21	24.8	(19.2, 67.9)	18.7%	4.6	8.9
New York	62	29.1	(17.6, 73.5)	28.6%	8.3	9.6
Pennsylvania	67	25.8	(18.1, 51.9)	21.1%	5.5	4.7
Rhode Island	5	25.0	(19.8, 67.6)	52.9%	13.2	16.4
Vermont	14	43.9	(32.9, 90.3)	29.8%	13.1	13.3
<i>South</i>						
Alabama	67	40.3	(17.1, 186.3)	33.9%	13.6	19.9
Arkansas	75	55.3	(21.3, 468.1)	39.2%	21.7	48.6

	Number of Counties	Marriage Rate per 1,000 population	Range in County Marriage Rates Within the State	μ % difference from state	μ difference from state	SD of diff from state
DC	1	23.9	–	–	–	–
Delaware	3	24.8	(21.1, 33.9)	19.5%	4.8	3.8
Florida	67	33.9	(18.4, 139.5)	33.6%	11.4	18.2
Georgia	159	36.5	(3.3, 156.7)	32.0%	11.7	16.5
Kentucky	120	38.0	(2.9, 362.1)	43.7%	16.6	40.6
Louisiana	64	32.1	(16.2, 76.3)	19.3%	6.2	7.3
Maryland	24	27.7	(15.2, 75.2)	44.1%	12.2	13.0
Mississippi	82	23.8	(0.0, 45.1)	24.8%	5.9	4.9
North Carolina	100	33.7	(13.2, 200.8)	37.2%	12.5	20.5
Oklahoma	77	37.6	(13.3, 172.5)	25.1%	9.4	16.8
South Carolina	46	36.0	(6.3, 78.5)	31.0%	11.2	8.7
Tennessee	95	44.1	(24.9, 476.5)	28.6%	12.6	44.2
Texas	254	36.6	(0.0, 571.4)	33.4%	12.2	34.9
Virginia	133	35.0	(1.9, 169.1)	38.5%	13.5	18.5
West Virginia	55	34.1	(17.4, 53.9)	19.1%	6.5	5.2
<i>West</i>						
Alaska	29	41.1	(0.0, 142.2)	49.3%	20.2	20.4
Arizona	15	29.7	(12.4, 40.3)	20.0%	6.0	5.0
California	58	27.9	(15.6, 108.9)	30.3%	8.5	14.8
Colorado	64	42.9	(13.7, 125.0)	33.3%	14.3	15.9
Hawaii	5	79.7	(0.0, 181.1)	77.7%	61.9	37.8
Idaho	44	51.3	(22.1, 119.2)	29.1%	14.9	14.4
Montana	56	39.4	(16.4, 97.3)	25.5%	10.1	10.6
New Mexico	33	33.9	(15.0, 64.3)	25.8%	8.8	7.3
Nevada	17	161.0	(7.9, 185.4)	65.0%	104.7	42.4
Oregon	36	32.4	(20.5, 83.3)	32.0%	10.4	14.2
Utah	29	53.5	(7.2, 128.2)	28.4%	15.2	15.5
Washington	39	30.7	(11.5, 103.7)	30.1%	9.2	14.7
Wyoming	23	43.7	(19.7, 105.8)	26.0%	11.3	12.6

Notes:

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^bData from Indiana were preliminary and questions remained regarding the quality of the data, so they were not included in the analyses.

^qCounts for the counties in ME are based on estimates. The state would not provide county-level marriage data and county-level data was not available via individual county-clerks offices, but instead at individual city offices. We contacted the most populated cities in each county and requested the number of marriages (either issued or filed). Based on the proportion of the counties' populations living in the cities we contacted, we estimated the number of marriages occurring in their associated counties.