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Research Article

Capturing trends in Canadian divorce in an era without vital statistics

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Capturing trends in Canadian divorce in an era without vital statistics

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Abstract

BACKGROUND

Statistics Canada ceased publishing vital statistics on marriage and divorce in 2008, leaving a knowledge gap in these important demographic indicators.

OBJECTIVE

This paper makes the methodological contribution of examining how best to operationalize divorce with tax data, and the substantive contribution of presenting recent trends in divorce in Canada.

METHODS

We examine trends in divorce using both vital statistics and administrative tax data and compare them during the period for which they are available (through 2008). Then, using administrative tax data, we update trends in divorce through 2016. We examine overall, age-specific, and age-standardized trends in divorce.

RESULTS

We document “gray divorce” from the 1990s through 2008 and then flat divorce rates for older adults and a continued decline in divorce for younger adults through 2016.

CONCLUSIONS

Tax data show a recent decline in divorce trends in Canada. However, there are important limitations to estimating divorce with tax data. We discuss data gaps and make suggestions for more accurate measures of union dissolution.

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CONTRIBUTION

Divorce is important for demographers to measure well, and this paper carefully examines recent trends and critically evaluates administrative data's ability to fill the void left by the termination of vital statistics.

1. Introduction

Measures of marriage and divorce are key indicators of formal unions, which are also important for understanding the family context where most fertility takes place, as well as wealth accumulation, housing, and caregiving. Vital statistics are the key source of marriage and divorce information in most countries, although some countries have recently moved away from this mode of data collection into alternate strategies of estimation. For example, the United States stopped collecting detailed divorce data in 1996, arguing that similar data could be collected more easily and inexpensively through surveys (such as the American Community Survey and the Survey of Income and Program Participation) (Elliott, Simmons, and Lewis 2010; Kennedy and Ruggles 2014). In Canada, Statistics Canada ceased publishing estimates of marriage and divorce in 2008, with no alternative data source in place. This decision was made in the face of fiscal constraints, challenges of data comparability across jurisdictions, and low usage of these data online (McKinnon 2018). The chair of the Advisory Committee on Demographic Statistics and Studies from that time noted that the committee strongly recommended adding new questions to estimate marriage and divorce into the census or a very large survey (Beaujot 2009). However, this did not occur, and the divorce data gap remains to this day.

This paper seeks to fill four important gaps. First, it is unknown how well we can measure divorce with administrative data. It is important to measure divorce itself well. It is also important to understand the quality of marital status information in tax data more generally, as it has been used in much other policy-informing research. Some recent research has used administrative tax data in Canada to study the consequences of divorce for income trajectories, but without assessing the quality of the divorce measures (e.g., Corak 2001; LaRochelle-Côté, Myles, and Picot 2012; Le Bourdais et al. 2016). Understanding how well administrative data capture trends in divorce can help put these findings in perspective.

Second, there are no estimates of the overall divorce rate in Canada for the last decade. Existing studies have focused on current marital status or divorce rates by province (Milan 2013; Statistics Canada 1998a; 1998b; 1999; 2001; 2005; 2006; 2008a), but none reports recent age-specific divorce rates or age-standardized rates. Our

updated estimates of divorce rates are from tax data. This is the first paper to use this data source for this purpose. Note that we focus on formal divorce, not dissolution of cohabiting unions.

Third, we do not know how the age pattern of divorce has changed in Canada since the early 1990s. Canada's southern neighbor, the United States, had a relatively flat overall divorce rate in the 1990s and 2000s that masked dramatic changes in the age pattern of divorce, with reductions at younger ages and increases in "gray divorce" (Kennedy and Ruggles 2014; Brown and Lin 2012). The factors leading to increased selectivity into marriage for younger adults (Kennedy and Ruggles 2014) and higher risk of divorce for older adults are likely similar in Canada. Baby boomers in Canada are also experiencing a decreased stigma around divorce (Uhlenberg and Myers 1981); increased prevalence of older adults in higher-order marriages, which are associated with higher risks of divorce (Brown and Lin 2012); increased financial independence of female baby boomers (Schoen et al. 2002); and increasing life expectancy, combined with high expectations about marital relationships and the increased social acceptability of being unpartnered (Cherlin 2004; Wu and Schimmele 2007). We examine how divorce has changed among both younger and older Canadians and whether the gray divorce revolution has occurred in Canada.

Last, we examine how sensitive the divorce trend is to changes in age composition by examining both unstandardized and age-standardized divorce rates. Recent work by Kennedy and Ruggles (2014) finds that the age-standardized divorce rate increased in the United States in the 1990s and 2000s, even though the unstandardized divorce rate declined. This was due to profound changes in the composition of the married population, with younger people being less likely to be married, and recent increases in divorce are seen at age 40 and above. We provide similar analysis for Canada.

This paper first makes the methodological contribution of examining how best to operationalize divorce with tax data. Second, we make the substantive contribution of presenting recent trends in divorce in Canada. We examine trends and the age pattern of divorce from administrative tax records and compare them with vital statistics during the period for which they are all available (1991–2008). Then, using administrative tax data, we update trends in divorce through 2016. Last, we discuss the implications of these data gaps and make suggestions for improving the measurement of marital dissolution in Canada.

2. The Canadian data landscape

No survey data that can be used to estimate period marriage and divorce rates currently exist in Canada. The short- and long-form censuses (both collected every five years),

the Labour Force Survey, and many other surveys include a question about current marital status but do not include questions on marriages or divorces in the last year or about length of current marriage. The General Social Survey (GSS) cycles on the family (1990, 1995, 2001, 2006, 2011, and 2017) include respondents' partnership histories, including their current marital status, number of total marriages, and the start and end dates of two to four marriages (depending on the wave). We used several cycles of the GSS to test whether we could estimate trends in divorce from these data, and although these are large population surveys, we found that the number of divorces estimated in the year before each survey wave was not large enough to provide robust estimates of divorce overall, let alone measures by length of marriage or various demographic characteristics. The results of this analysis are available in Appendix 1. Apart from surveys, Canada does not have a population register system or a national identity system. Statistics Canada is moving toward a greater reliance on administrative data (such as health data or vital statistics linked with tax data) (Statistics Canada, <https://www.statcan.gc.ca/eng/sdle/overview>).

3. Data and methods

The first data source we use is a vital statistics database available from 1969 to 2008. To estimate divorce rates from vital statistics (divorces per 1,000 legally married women), the numerator is the number of divorces granted to women in the vital statistics divorce database and the denominator is the number of legally married women from Statistics Canada's population estimates. To count the number of divorces granted in a given year, we used all records in the given year of the vital statistics divorce database file. This matches the trend of divorces at the national level reported in *Annual Demographic Statistics*, published by Statistics Canada. Data on the number of legally married women come from *Demographic Estimates Compendium*, also published by Statistics Canada. For the years 1971 to 2007, the source is the CD-ROM *Demographic Estimates Compendium, 2007* (2008b). This data source for the denominator allows us to replicate divorce rate trends published in *Annual Demographic Statistics* for the entire time series since 1971. This data source doesn't include population estimates for 2008, so for that year, we use the population estimates for July 1, 2008, available here: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710006001> (Statistics Canada 2019, Table 17-10-0060-01).

Some changes in how the data are collected or what they represent have occurred over time; these are important for how we can measure divorce over time. One issue is that we are unable to distinguish between married women and those in common-law (nonmarital cohabitation) relationships prior to 1991 because these two marital statuses

were combined in population estimates that form the denominator for divorce rates (Statistics Canada 1992). Starting in 1991, the married and common-law relationships (nonmarital cohabitation)⁴ can be distinguished. Another issue to note is that starting in 2006, same-sex marriages and divorces entered vital statistics; therefore, our estimates for 2006–2008 include events for same-sex couples twice and include both women in the denominator. Due to these issues of data comparability, we can show numbers of divorces for 1969–2008 and then compute divorce rates for the period 1991–2008.

The second data source is administrative data from the T1 Family File tax form (T1FF) from 1993 to 2016. This source includes tax data for all individuals who filed taxes in Canada in a given year. (The T1 is the primary Canadian tax form.)⁵ Most Canadians file taxes. For example, in 2014 about 75% of the Canadian population (all ages) filed a tax return. Statistics Canada's T1 Family File includes not only those who file taxes but also their non-filing family members, such as partners/spouses and children, whose information can be inferred from information about dependents and benefits on the tax forms. (For example, information about children is relevant on tax forms for benefits such as the child benefit.) By combining family data across multiple years, the completed T1FF sample is approximately 96% of the population (Statistics Canada 2016). The tax data are not designed to measure marriage and divorce. In fact, eligibility for most benefits does not differ for married or unmarried cohabiting couples. There are no questions about the date of a marriage or divorce. However, the data do include a question about one's self-reported marital status as of December 31 of the tax year, and this information may be used to measure changes in marital status across years.

Respondents can choose one of six options: married, common law, widowed, divorced, separated, or single. Legally married individuals are those who report being married or separated; the others count as unmarried. We use year-to-year changes in individuals' marital status to identify divorces in a given year. To do so, we link the same individual in the two consecutive tax years with the longitudinal person ID and estimate divorce rates using individuals observed over subsequent years. We exclude those who are not a tax filer, a deceased filer, or a living tax filer matched to a deceased filer in either year. This restriction reduces our sample size by less than 5%. Estimated divorce rates without this restriction are similar to results with the restriction.

We estimate three measures of divorce to examine how well these measures estimated on tax data fit the vital statistics trends. Note that all three measures have

⁴ Note that "common law" is a Canadian term for nonmarital cohabitation.

⁵ Individual income tax in Canada is based on an individual's income, not family income.

numerators and denominators from the tax data, and all women counted in the numerators are also in the denominators as legally married in year $t-1$.⁶

The first way we operationalize the divorce rate is with the number of women reporting a marital status of divorced on December 31 of year t divided by the number of *those women* who report being legally married on December 31 of year $t-1$. This is the most straightforward measure and should capture marriages that span the end of a calendar year, although we likely miss short-lived marriages that begin and end within the same calendar (tax) year with this measure.

The next two operationalizations of divorce include women with a broader set of marital status categories at the end of year t in the numerator. This is designed to capture divorces that have already taken place but that never showed up in the tax data because women went from being legally married in one year to another marital status by the end of the next tax year. For example, a woman could have been legally married in year $t-1$, gotten divorced in year t , and be cohabiting with or married to a new partner on December 31 of year t . Each measure below includes a more expansive numerator and the same denominator (legally married women on December 31 of year $t-1$). The second operationalization includes women in the numerator who report their marital status as either divorced or living common law with someone other than the person they were legally married to in the previous year. The third operationalization includes women who report being divorced, living common law with a different partner than in the previous year, or being married to a new spouse in year t .

Our analysis aims to understand changes in the overall trend and age pattern of divorce in Canada and compares trends and levels across our two data sources to assess our ability to capture divorce with tax data. First, we chart the annual number of divorces estimated with vital statistics and tax data (1994–2016) and examine divorce counts by age to determine which age groups are responsible for discrepancies in divorce counts (Figure 1). Second, using both data sources (vital statistics 1969–2008, tax data 1994–2016), we plot the number of divorces by age (Figure 2). Next, we use tax data to first see whether we can capture the overall trend in divorces per 1,000 married women using various measures (Figure 3). We chart age-specific divorce rates (Figure 4). Next, we examine the unstandardized and age-standardized divorce rates estimated with both vital statistics and tax data to examine whether the trend is sensitive to changes in the age composition of the population (Figure 5).⁷ For vital statistics, age-standardized rates use a standard population of married women in 2008. For tax data,

⁶ All measures of divorce are based on the reported marital status of tax filers. We do not consider having the same mailing address as a precondition to being considered married. Legally married couples living at separate addresses would be considered married according to our analysis.

⁷ Note that the standardization is done by the respondent's age, not by the age of the marriage. (Data on the length of marriages are not available.)

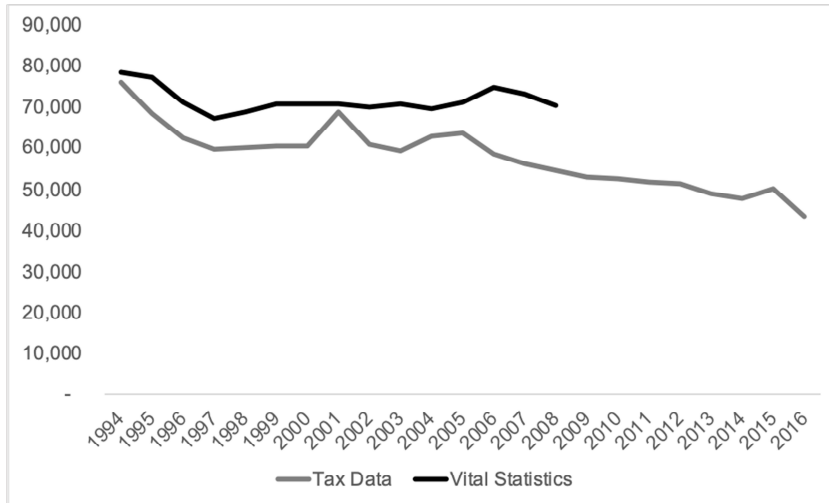
age-standardized rates use the tax population standard for 2008. Finally, we compare the trends in Canada to the US data (Figure 6).

4. Results

Figure 1a presents the annual number of divorces captured with vital statistics and tax data. In 1994, the first year where we have comparable data, and in 2001, the counts from tax data are just 3% lower than estimates from vital statistics. However, over most years, the undercount of divorce in tax data relative to vital statistics is much greater. The average undercount across all the years in the chart is 9,558 divorces, or 14%. Also, the gap is greatest in the last three years of vital statistics (2006–2008), where 22% of vital statistics divorces are missing in the tax data. The variation in the counts of divorce captured by the tax data relative to vital statistics likely relates to the coverage of tax filers and changes in tax regulations. For example, the increase in coverage in 2001 may relate to an increase in the tax filing rate between 2000 and 2001 (from 72% to 73%), and if the increase was concentrated among the divorced, this could explain the lower difference in this year. Another factor could be that 2001 was the first year that cohabiting couples had the same tax benefits as married couples. A third factor was that 2001 was the first year that the Canadian Revenue Agency allowed same-sex couples to file taxes as couples. Another year that had a smaller gap between the two data sources was 2005. This was the first year that same-sex marriage was legalized at the federal level. This year also saw an increase in the tax filing rate of half of a percentage point.

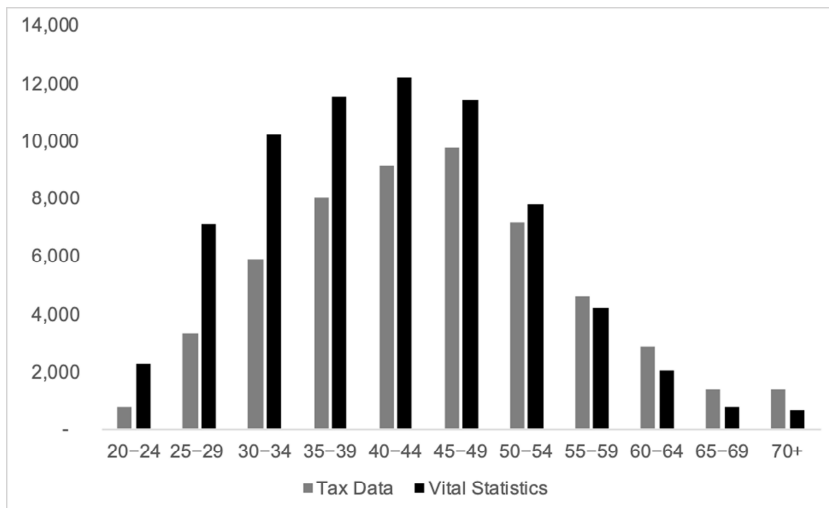
Figure 1b examines which age groups are responsible for the undercount in the year 2008, the last year of vital statistics divorce collection and the year in which the undercount was the greatest. The undercount of divorces in the tax data is due to much lower counts among women ages 20–49, with less than half of divorces captured for women in their 20s. The degree of undercount decreases as women's age increases, but even at age 45–49, tax data still pick up only three-quarters of divorces found in vital statistics.

Figure 1a: Annual number of divorces estimated with vital statistics and tax data



Note: Divorces measured with tax data are the number of women who were legally married on December 31 of year $t-1$ and divorced on December 31 of year t .

Figure 1b: Number of divorces estimated with vital statistics and tax data by age, 2008



We also examine the number of divorces in Canada over time for women by age group, showing a huge change in the age pattern of divorce. Figures 2a and 2b both show that the age at which the most divorces were granted has increased over time. In the 1980s and 1990s, women in their 20s and 30s were granted the most divorces. In 2000, the most divorces were granted to women in their late 30s and 40s, and by 2008 and 2016, the most divorces occurred among women in their 40s.

Figure 2: Number of divorces in Canada among women aged 20 and above by age group

Figure 2a: Data from vital statistics (1969–2008)

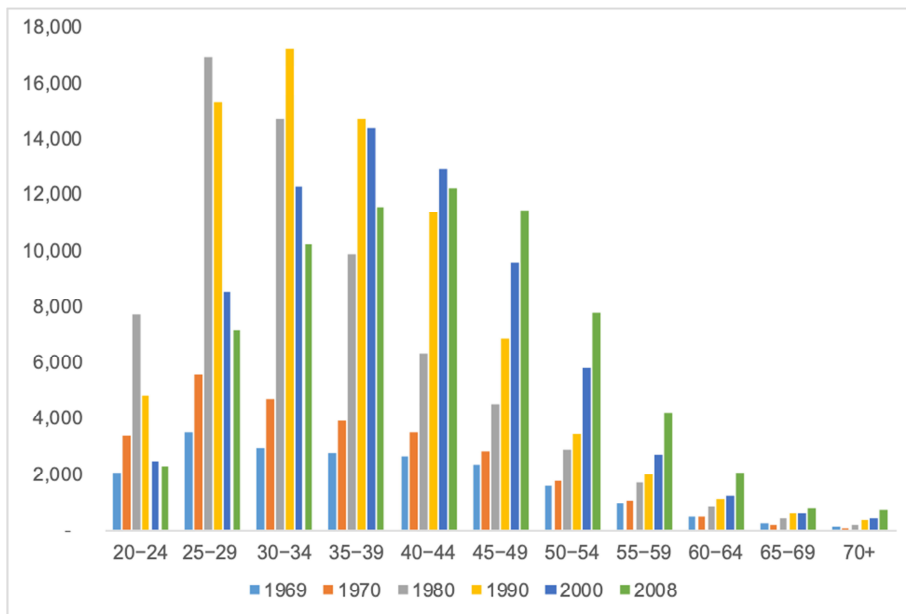
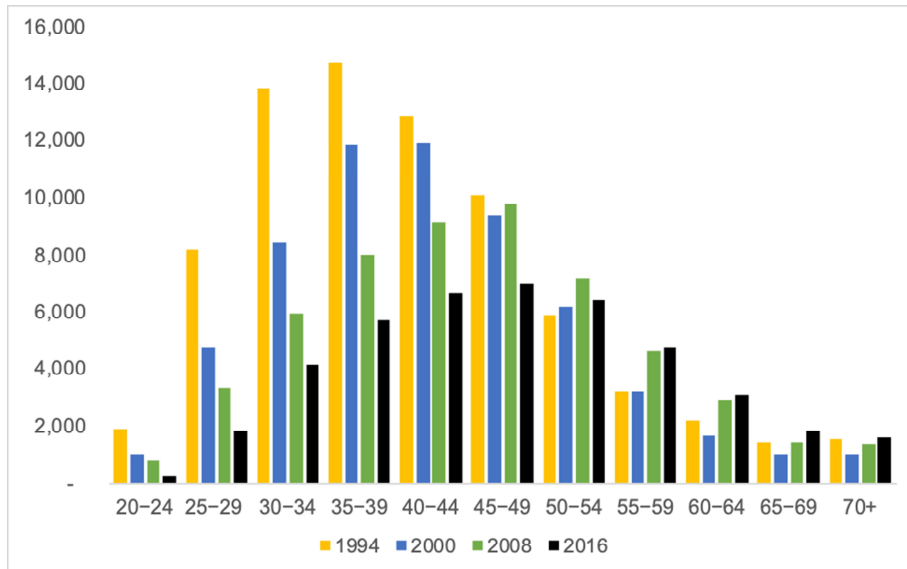
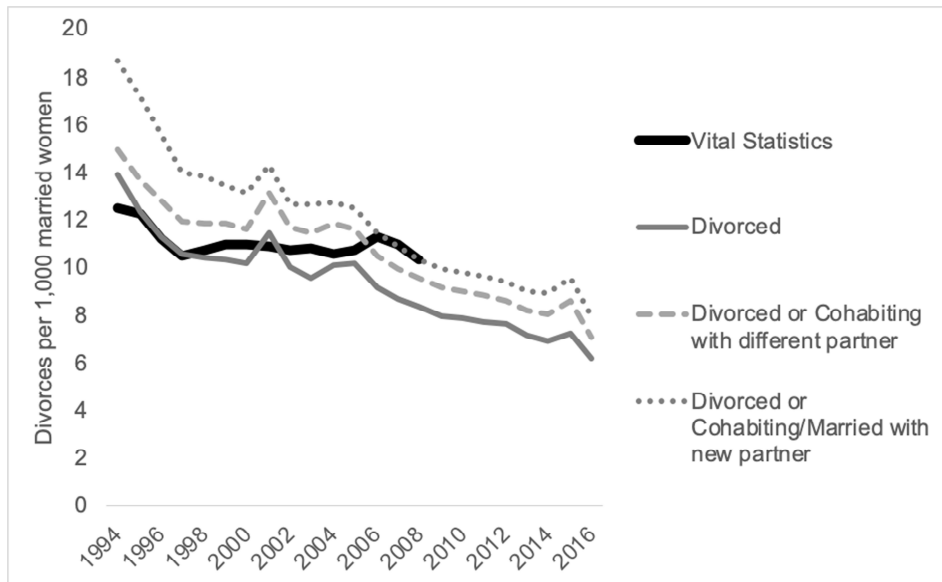


Figure 2b: Data from tax data (1994–2016)



Next, we examine how well administrative tax data can capture trends in the divorce rate over time and whether we have confidence in our ability to extrapolate past the end of vital statistics to know what is happening to divorce rates since 2008. Figure 3 shows three definitions of divorce in the tax data. The measure that fits vital statistics trends best is the simplest, defining a divorced respondent as a person who reports themselves as married in one year and divorced in the subsequent tax year. This trend closely matches that of vital statistics until 2005. Then, between 2006 and 2008, the divorce rate declines relative to the vital statistics, and it continues to decline after the end of vital statistics divorce data. We find that the other two measures – which include, in addition to women reporting being divorced, those who are cohabiting with or married to a different partner than the one they were married to in year $t-1$ – both overestimate the divorce rate measured with vital statistics. Even though these measures show a higher divorce rate than vital statistics through 2006, they also show a pronounced decline through 2016.

Figure 3: Divorces per 1,000 married women, all ages

Note: Each line is a different definition, with the self-reported marital status variable in the tax data compared with vital statistics.

Figure 4 examines age-specific divorce rates for women in panel (a) from vital statistics for 1991–2008 and in panel (b) from tax data for the period 2007–2016. Panel (a) shows that over the entire period, the highest divorce rates are for younger women, and as age increases, the divorce rate decreases. However, there have been some changes in the age-specific rates over this period. There have been some decreases in the divorce rate for women 20–29 and 30–39, some increases in the divorce rate for women 40–49 and 50–59, and small increases in divorce among women 60–69 and 70 and above. These changes are rather modest in size. For example, the divorce rate changed from 21.9 to 20.6 for 20- to 29-year-old women, from 18.1 to 16.6 for 30- to 39-year-old women, from 12.8 to 13.7 for 40- to 49-year-old women, from 5.6 to 7.6 for 50- to 59-year-old women, and from 2.2 to 2.7 for 60- to 69-year-old women. Panel (b) charts age-specific rates through 2016 and finds a decline in divorce among ages 20–29, 30–39, and 40–49 and flat divorce rates for those 50 and above. Thus, the trend of the moderate increase in divorce among middle-aged Canadians observed for the 1990s and 2000s seems to have ceased.

Figure 4: Age-specific divorce rates, women

Figure 4a: Vital statistics (1991–2008)

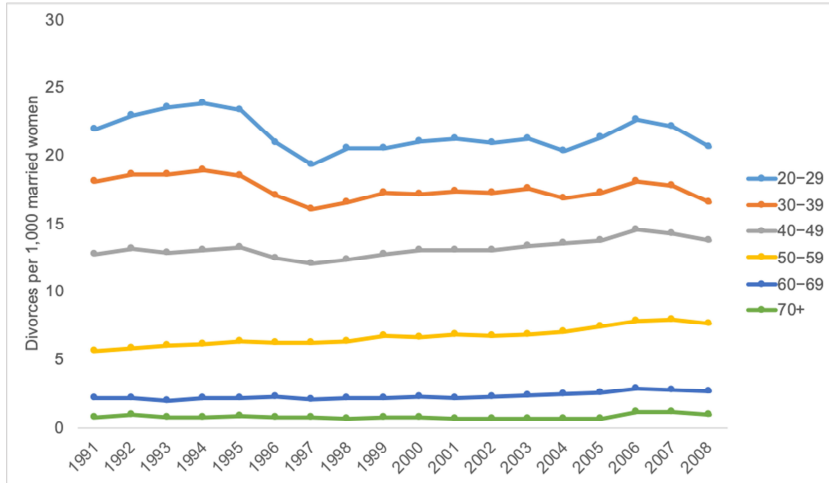
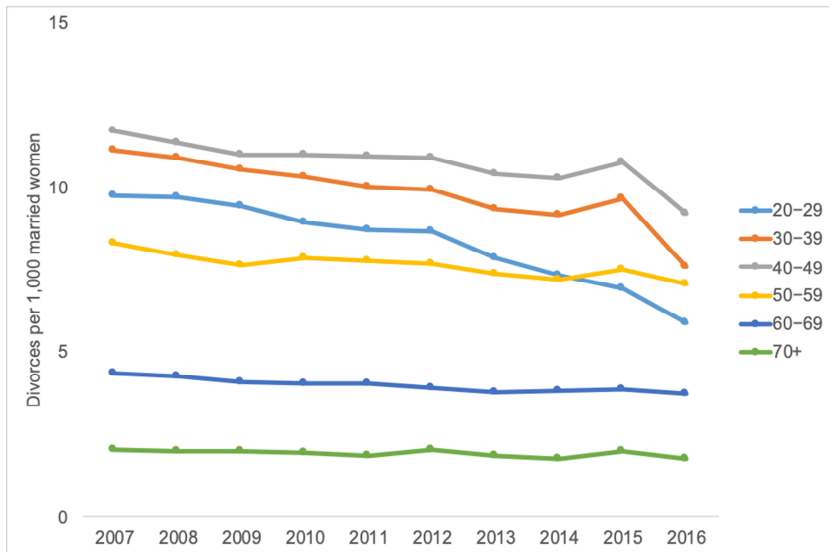
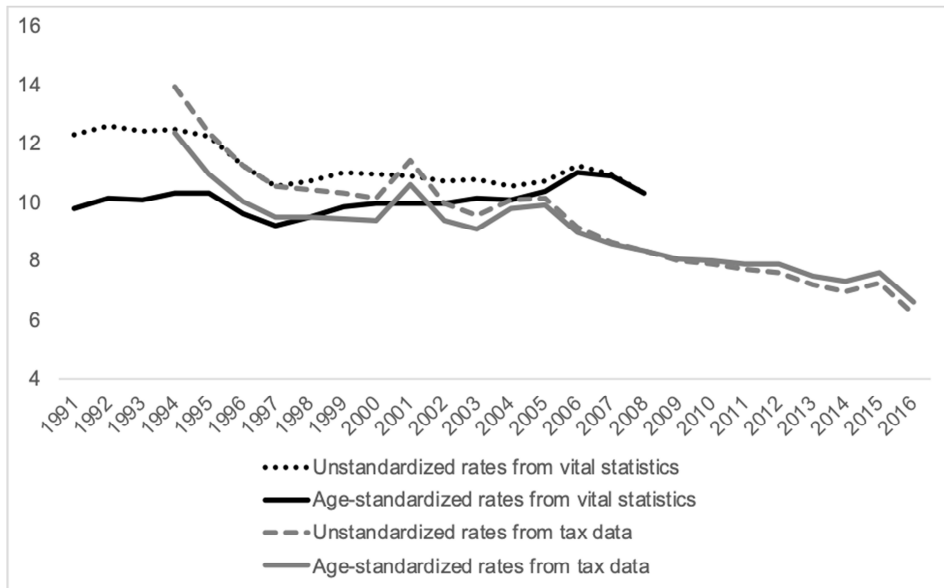


Figure 4b: Tax data (2007–2016), divorces are measured as legally married in previous year and divorced in year t



Next, we examine to what extent declines in the divorce rate are due to the changing age distribution versus changes in the rates. We show unstandardized and age-standardized rates from both vital statistics and tax data (Figure 5). Vital statistics show a steady decline in the unstandardized divorce rate over this period, from 12.3 divorces per 1,000 married women to 10.3 divorces per 1,000 married women. However, the age-standardized pattern differs, showing a small increase over the period, from 9.8 in 1991 to 10.3 in 2008. Here we use the 2008 age distribution as the standard; however, the same results hold with another choice of standard. This finding is similar to that of Kennedy and Ruggles (2014; Figure 3); they find that age-standardized rates from vital statistics in the United States show an upward trend in divorce but that the unstandardized rates from vital statistics show a downward trend starting in the 1980s. Trends from tax data show that both unstandardized and standardized rates show a decline in divorce between 2008 and 2016.

Figure 5: Comparison of unstandardized and age-standardized divorces per 1,000 married women using vital statistics (1991–2008), tax data (1994–2015)

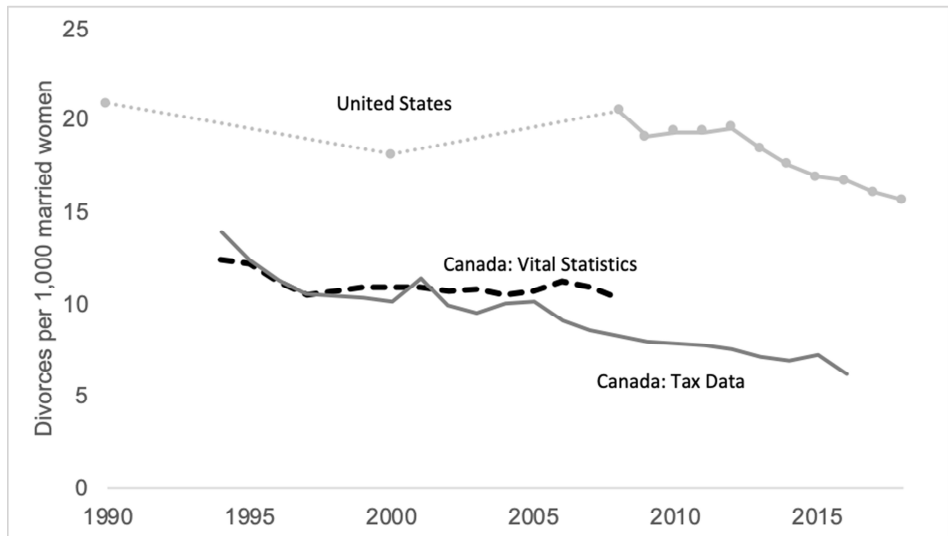


Notes: Estimated for women aged 20 or older. For vital statistics, age-standardized rates use a standard population of married women in 2008. For tax data, age-standardized rates use the tax population standard for 2008.

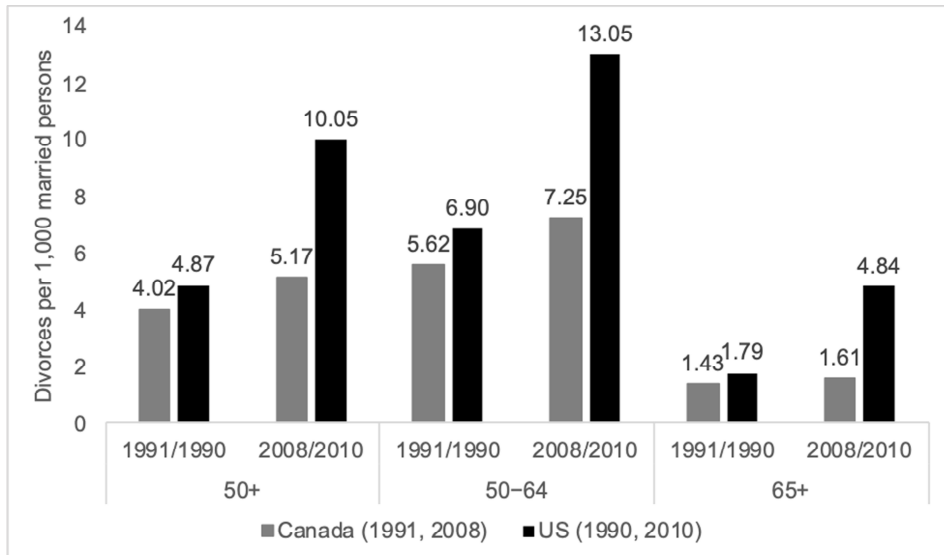
Last, we compare the level of divorce and recent trends to those in the United States. Figure 6a compares the divorce rate from our two data sources with that from the United States. From this figure, we can see that the overall trends in divorce rates over this period are similar in the United States and Canada. However, from the late 1990s onward, the divorce rate in Canada is about half as high as in the United States. Figure 6b examines Canadian age-specific divorce rates and those published by Brown and Lin (2012) on the “gray divorce revolution.” Their paper finds that divorce rates for the 50-plus population doubled in size, from 4.87 to 10.05 per 1,000 married persons. Our results, which also include both men and women, find that the comparable increase in Canada is from 4.02 to 5.17 divorces per 1,000 married persons. We document a much more modest increase in divorce among older adults of about 25% between 1991 and 2008. Moreover, our results from Figure 4b, which examines age-specific divorce rates for the period 2007–2016, find no further increases in divorce for middle-aged or older adults.

Figure 6: Comparison of divorce in Canada and the United States

Figure 6a: Divorces per 1,000 married women, United States and Canada



Note: US data come from Allred (2019).

Figure 6b: Divorce rates for adults aged 50 and above in the United States and Canada (“gray divorce”)

Data: Canadian vital statistics; US data are from Brown and Lin (2012).

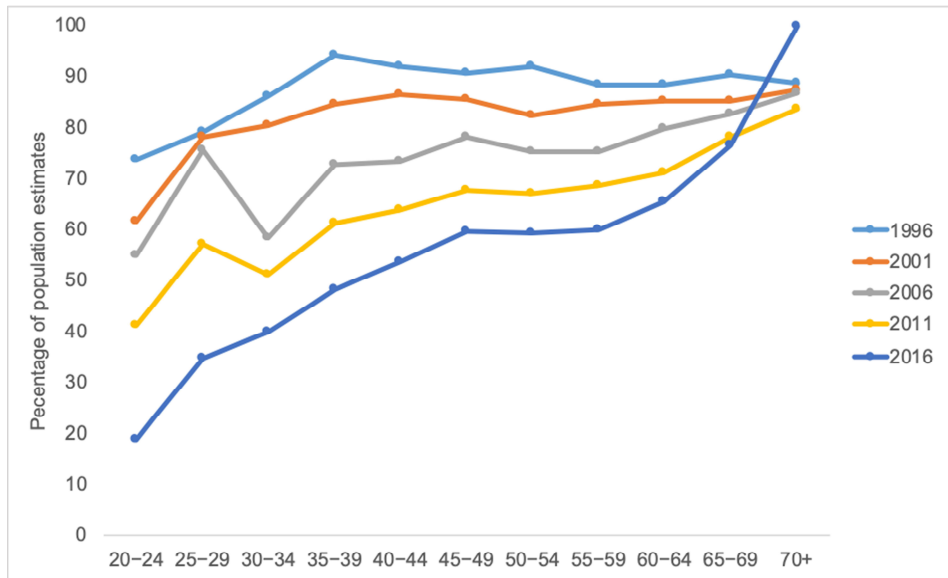
Note: Estimates for both countries include both sexes.

5. Discussion

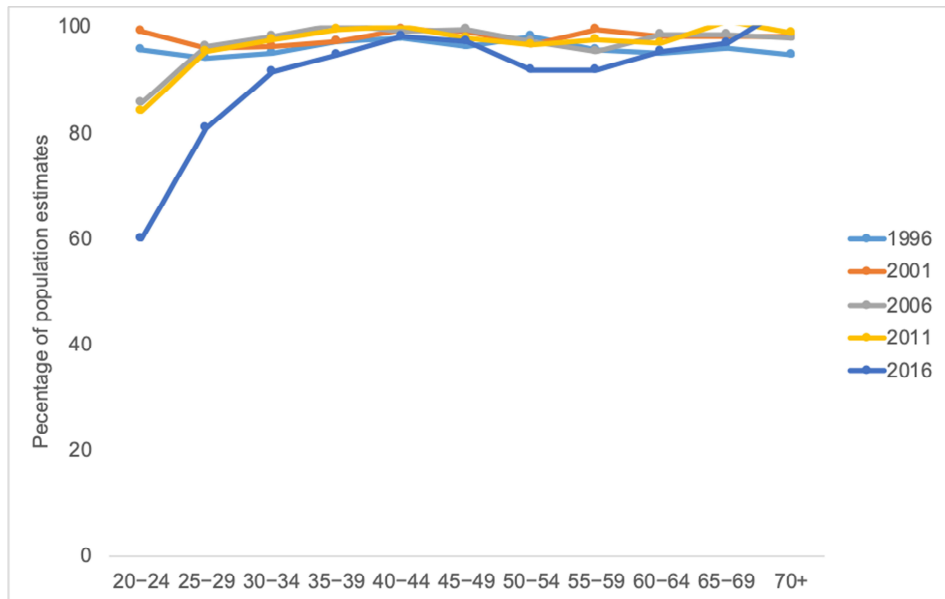
Any good demographic analysis should compare multiple data sources to assess quality and to decide which source to use in the future. Canadian census data cover essentially the entire population, and this is a good reference source to verify T1FF’s population coverage. A recent Statistics Canada report compares self-reported marital status in the T1FF tax data and the 2016 census (Bérard-Chagnon, Laflamme, and Ménard 2018), and this can provide some context for assessing data quality of divorce statistics with the tax data. It finds that the concordance of marital status is very high across the two data sets for married or single people; more than 96% have the same marital status in both the census and the tax data. However, the concordance is low for divorced people: among those who reported as divorced in the census, only 57% had a self-report of divorce in the T1FF, and more than one-quarter (27%) were self-reported as single in the tax data (Bérard-Chagnon, Laflamme, and Ménard 2018). We have extended the Statistics Canada analysis by comparing population counts of divorced people in the

censuses since 1996 (1996, 2001, 2006, 2011, and 2016) by age to examine whether the concordance of self-reported marital status is comparable over time (Figures 7a and 7b). We found that coverage rates of divorced people in the tax data compared to the census are declining over time for all age groups below age 70 and that coverage rates for divorced people are lowest for younger adults. For example, for adults aged 20 or older, the tax data captured 90% of divorced people in the census in 1996, but in 2016 that number had declined to 66%. For adults aged 25–29 and 35–39, the tax data captured 79% and 94% of divorced people in the 1996 census; this fell to 35% and 45% in 2016. This is potentially very problematic because we may increasingly underestimate divorce in the tax data over time. Also, it becomes unclear how much of the decline in divorce in recent years is due to a decline in data quality.

Figure 7a: TIFF coverage rates – divorced (not living common law)



Notes: Population estimates come from Statistics Canada's estimates of population as of July 1, by marital status or legal marital status, age, and sex; retrieved from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710006001>. For population estimates of the divorced, we use divorced (not living common law).

Figure 7b: T1FF coverage rates – legally married

Notes: Population estimates come from Statistics Canada's estimates of population as of July 1, by marital status or legal marital status, age, and sex; retrieved from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710006001>. For population estimates, "legally married" is defined as the sum of those married and those separated (not living common law).

This undercount of divorced persons might be an especially big problem for younger adults for several reasons. Our best estimates of divorce all underestimate divorce relative to vital statistics below age 40 but match vital statistics much better among older adults. This could be due to lower tax filing rates among younger people, and especially those getting divorced. According to the *T1 Personal Master File (T1PMF)/T1 Historical (T1 H) SAMD Analytical Files (2018 Vintage) User Guide and Data Dictionary* (Statistics Canada 2018), in 2010 T1FF data captured 87% and 90% of population estimates among young adults aged 20–24 and 25–29, respectively. A second issue is that it is more common for younger people to be married in subsequent years, but to different spouses. A third issue is that younger people may be more likely to self-report as “single” rather than “divorced” after getting divorced; this could also explain why our best estimates would underestimate divorces for them. We also estimated measures of divorce, which include a transition from legally married to single, and found that this overestimated divorces among younger people. While many transitions to single are likely due to separation, some of these transitions may be due to divorce.

There are some limitations of this analysis that leave room for future work. This paper did not examine all aspects of union dissolution. Nonmarital cohabitation has become more common and more similar to marriage, especially in the province of Quebec. However, even with the rise of cohabitation, it is still important to measure formal unions and their dissolution. The tax data do offer the opportunity to study trends in the formation and dissolution of cohabitation, and the characteristics of persons in those unions. One limitation is that the tax data capture only unions that span the end of a tax year. This is, of course, also a limitation of tax data for marriage and divorce, but it is likely that there are more short-lived cohabitations than marriages. Second, our analysis focused on national trends in divorce. A full analysis for each of Canada's ten provinces and three territories is beyond the scope of the paper. However, we did conduct additional analysis for the province of Quebec and the rest of Canada, since Quebec stands out as the most different in terms of the high proportion of cohabiting unions and the fact that most fertility in Quebec takes place in nonmarital unions while the rest of Canada looks much different. In Part 2 of the Appendix, we plot divorce rates measured with tax data and vital statistics for the province of Quebec and the rest of Canada, and we find that levels and trends across the two data sources are quite similar overall. In the mid-1990s, the two data sources are more similar for the rest of Canada than for Quebec, but from the late 1990s onward, the two data sources actually match better in Quebec than in the rest of the country. Last, we did not present comparable analysis for men here. However, that can be done in a separate analysis.

Where do we go next to estimate divorce in Canada? There are important limitations in relying on tax data for the estimation of divorce – issues regarding data quality and its potential decline in recent years. We recommend adding questions about marriage and divorce in the last year to a large annual survey with a high response rate, such as the Labour Force Survey. Similar recommendations were also made in a recent op-ed in the *Globe and Mail* (Globe and Mail 2019). Accurately measuring divorce is an important task in an era where changes in marital status have important implications for poverty and income trajectories, physical and mental health, living arrangements, and need for services. Given the important changes occurring within family life and the increasing number of divorced older adults, data on formal union dissolution is necessary.

6. Acknowledgments

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Appendix

Part 1: Measuring trends in divorces using the Canadian General Social Survey

Here we document trends in divorce in Canada using data from the General Social Survey (GSS) cycles on the family and compare them with vital statistics during the period for which they are available. We then discuss the limitations of using the GSS for measuring marital dissolution in Canada.

The GSS is a potential data source to estimate divorce in Canada after published vital statistics stopped including divorce and marriage in 2008. The GSS family cycles include partnership histories of respondents, including their current marital status, number of total marriages, and the start and end dates of two to four marriages, depending on the wave. The GSS is a large-scale data set that is representative of Canada's ten provinces but not its territories or residents of institutions. We used four cycles of the GSS (1990, 2001, 2011, and 2017). Sample sizes for these waves vary from 13,495 to 24,310.

Using these surveys, we estimated divorce rates for the calendar year before the survey. The divorce rate in calendar year t is measured as the number of divorces granted in year t divided by the number of legally married women in July of year t . A divorce in a given year was counted if the divorce or annulment of the marriage occurred during that year. If the year of divorce was missing, then we estimated the date of divorce based on the respondent's age at divorce and age at the time of the survey. The denominator for the divorce rate is the number of legally married women midyear. We use person weights provided in the GSS data set to calculate population estimates.

There are three main points to note from Table A-1. First, the number of divorces observed in the calendar year prior to the GSS is quite small. There are between 40 and 70 counts of divorce in the surveys examined. This means that the counts are too small to accurately estimate divorces by age or by length of marriage. Second, the GSS underestimates the number of divorces, and the underestimation has become worse over time. In 1991 the underestimate of divorces was about 10,000, but that had more than doubled by 2010. Last, we find that the quality of the estimates relative to vital statistics is declining over time. In the 1991 survey, the weighted GSS estimate of divorce was 11.2 divorces per 1,000 married women and was 12.3 per 1,000 measured in vital statistics, but by 2000, the GSS estimate was about three-quarters of the vital statistics estimate. The declining quality of the GSS estimates is due to underestimating the number of divorces and overestimating the number of legally married females.

Table A-1: Estimated number of divorces, number of legally married women, and divorce rates from the General Social Survey and vital statistics for women aged 20 and older

Statistics	Data Source	Data Sources and Years			
		1989 Estimates from 1990 GSS and 1991 Vital Statistics	2000 Estimates from 2001 GSS and 2000 Vital Statistics	2010 Estimates from 2011 GSS and 2008 Vital Statistics	2016 Estimates from 2017 GSS
Number of divorces [a]	GSS – raw	52	77	58	40
	GSS – weighted	66,071	53,160	47,379	36,833
	vital statistics	76,363	70,826	70,378	
Number of legally married females [b]	GSS – weighted	5,885,551	6,633,658	7,362,379	7,513,933
	population estimates	6,217,212	6,448,796	6,819,179	
Divorce rates [a/b*1000]	GSS – weighted	11.2	8.0	6.4	4.9
	vital statistics	12.3	11.0	10.3	

Notes: Estimates from both data sources are available for the year 2000, but for GSS cycles from 1989 and 2010, we compare the closest year where vital statistics data are available (1991 and 2008).

Table 2 presents estimates for the number of divorces and divorce rates by age group. The small sample sizes of divorces measured in a given year mean that we cannot generate robust estimates of age-specific divorce rates. Note that estimates are unavailable for older populations (aged 60 and above in 1990 and aged 70 and above in 2011). Moreover, with the small counts, the weights become very important and make the estimates vary greatly. This means that small numbers of divorces in certain age groups can change estimates greatly.

Table A-2: Age-specific divorce rates, in 1990 and 2011 GSS and vital statistics in 1991 and 2008

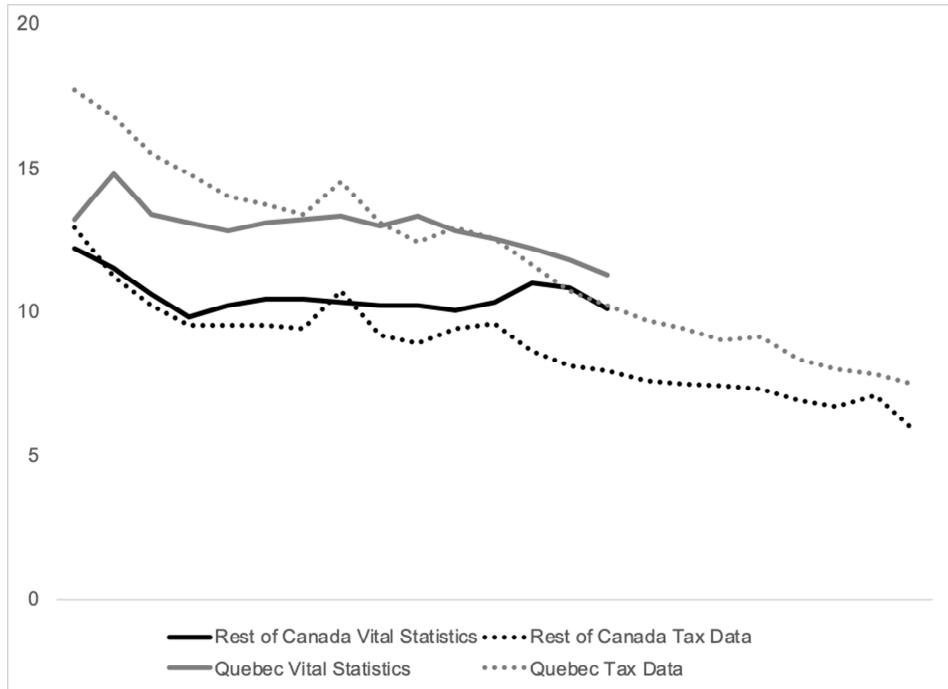
		1989 Estimates from 1990 GSS and 1991 Vital Statistics						
Description	Data Sources	20–29	30–39	40–49	50–59	60–69	70–79	80+
Number of divorces	vital statistics	18,980	31,462	18,386	5,494	1,700	290	51
	GSS	15,262	26,479	14,580	9,892	–	–	–
Divorce rates	vital statistics	21.9	18.1	12.8	5.6	2.2	0.8	0.7
	GSS	17.0	16.2	11.4	10.1	–	–	–
		2010 Estimates from 2011 GSS and 2008 Vital Statistics						
Description	data sources	20–29	30–39	40–49	50–59	60–69	70–79	80+
Number of divorces	vital statistics	9,416	21,791	23,654	11,985	2,833	416	283
	GSS	7,392	13,917	10,983	10,752	4,218	–	–
Divorce rates	vital statistics	20.6	16.6	13.7	7.6	2.7	0.8	1.7
	GSS	14.4	9.3	6.1	6.4	3.6	–	–

Conclusions

This appendix shows that the Canadian General Social Survey is unable to capture period measures of divorce because (1) sample sizes of divorces measured in the calendar year before the survey are not large enough, (2) there are not enough older respondents to get estimates of divorce among this demographic group, and (3) estimates of divorces of legally married women from the GSS have declined over time relative to vital statistics. Another issue to note is that response rates for these surveys have declined over time. The response rates for the surveys we analyzed are between 65.8% and 81.4%. This would be a problem for the analysis of divorce if divorce is correlated with the probability of response. Our analysis in Figure 7 shows that divorced people are less likely to show up in administrative data; therefore it seems likely that this under-coverage also exists in survey data. These issues make these surveys very limited in what they can tell us about changes in divorce over time.

Part 2

Figure A-1: Comparison of divorce rates (divorces per 1,000 married women), Quebec versus the rest of Canada, with data from vital statistics and tax data



Note: With the tax data, divorces are operationalized as women who were legally married in year t-1 and divorced in year t.