Journal of Family Studies

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rjfs20

Estimating the prevalence of children living with a stepparent in New Zealand using linked administrative, census, and survey data

Megan E. Gath, Robert A. Didham & Martin Daly

To cite this article: Megan E. Gath, Robert A. Didham & Martin Daly (2021): Estimating the prevalence of children living with a stepparent in New Zealand using linked administrative, census, and survey data, Journal of Family Studies, DOI: 10.1080/13229400.2021.1954539

To link to this article: https://doi.org/10.1080/13229400.2021.1954539

Published online: 14 Jul 2021.

JOURNAL OF FAMILY STUDIES
https://doi.org/10.1080/13229400.2021.1954539

Routledge
Taylor & Francis Group

Estimating the prevalence of children living with a stepparent in New Zealand using linked administrative, census, and survey data

Megan E. Gath[a], Robert A. Didham[a] and Martin Daly[b]

[a]Stats NZ, Christchurch, New Zealand; [b]Department of Psychology, Neuroscience & Behaviour, McMaster University, Hamilton, Canada

ABSTRACT

Robust estimates of the incidence of children living with a stepparent are lacking, partly due to a lack of the requisite questions on census and survey questionnaires. Even when these questions are included, resultant estimates are impacted by how respondents choose to portray their relationships. Our first aim was to develop a method for combining census or survey data with administrative data (birth registrations and migrant visa applications) to identify step-relationships. Our second aim was to use this methodology to calculate estimates of children living with a stepparent in New Zealand. We estimate 7.5% of children aged 17 and under were living with a stepparent at the 2013 Census. Estimates using Household Labour Force Survey data produced slightly lower estimates of 6.3-6.9% of all children aged 17 and under for the years 2016 through 2019. Our results provide the most comprehensive attempt to estimate the prevalence of children living with stepparents in New Zealand to date, and demonstrate a novel methodology for identifying step-relationships using administrative data in a linked data environment.

ARTICLE HISTORY
Received 19 November 2020
Accepted 8 July 2021

KEYWORDS
Stepfamilies; stepchildren; households; families; New Zealand; family structure; administrative data; Integrated Data Infrastructure; methodology; census

Introduction

The traditional family nucleus has undergone significant change over recent decades, with high rates of divorce and re-marriage, and other means of family formation such as same-sex and de-facto (cohabiting) unions, gaining prevalence. Diversity in family forms is now commonplace across developed countries worldwide (e.g. Steinbach et al., 2016). New patterns of partnering, family formation, relationship dissolution, and re-partnering have led to a multiplicity of family forms as well as more frequent transitions among these family forms (Ministry of Social Development, 2004; Families Commission, 2009). An important change of relevance to this paper is the number of children living in stepfamilies (Pool et al., 2007). Despite these societal changes, there remains a gap in research and statistics on stepfamilies in many countries, including New Zealand. Despite the importance of understanding patterns of family demography and family

CONTACT Megan E. Gath megan.gath@canterbury.ac.nz Child Well-being Research Institute, University of Canterbury, New Zealand Note author is now at the University of Canterbury

structure, the prevalence of adults and children living in stepfamilies is not known in many countries because the appropriate questions are not included in censuses or surveys. In New Zealand, the lack of official statistics on the prevalence of stepfamilies and stepchildren is a primary driver of the information gap on stepfamilies (Cribb, 2009; Mitchell, 2020).

Filling this gap is critical due to the unique challenges faced by parents and children who live within stepfamilies at some point in their lives. Transitions between family roles, changes in parental figures, and increases in family complexity are a few examples of the challenges facing children and parents living in stepfamilies (Cartwright, 2012). Certain sociodemographic characteristics are associated with the likelihood of living in a stepfamily, such as lower levels of education and income (Mignot, 2008). Even after controlling for a variety of family, social, and individual characteristics that existed prior to stepfamily formation, longitudinal data collected over 18 years in the Christchurch Health and Development Study indicate that exposure to stepfamily life during middle childhood and early adolescence is associated with an increased risk of poor outcomes such as criminal offending and school dropout (Nicholson et al., 1999). It is important to note that although children in stepfamilies are at an increased risk of negative outcomes (e.g. anxiety and depression (Falci, 2006), and mistreatment by parents (Trocmé et al., 2001)), there is great diversity in stepfamily experiences and outcomes (Pryor, 2020). Research has highlighted the large variation in family dynamics, relationship closeness, and parental monitoring within stepfamilies (Pyke, 1994; Ganong & Coleman, 2018), and the fact that many stepchildren and stepparents experience these relationships as positive and emotionally supportive (Metts et al., 2017).

Stepfamilies in New Zealand

Stats NZ defines a stepfamily as a couple with child(ren) usually residing in the same household with at least one child who is the biological or adopted child of one partner but not the other. In a legal sense, stepparents in New Zealand can only be appointed legal guardians of a child if they are married to the biological parent of the child (e.g. Stewart & Timothy, 2020), but for statistical and research purposes it is more common that both married and cohabiting partners are included in the definition of stepparents (Stats NZ, 2009; Gath, 2016). In this paper, we use the term 'stepparent' to refer to the co-residing partner of a child's biological parent, regardless of marital status.

Currently stepfamilies are not identified in New Zealand's census of population and dwellings, and all couples living with children are included in the family type category of 'couple with children'. This is similarly the case in Stats NZ's household surveys (such as the Household Labour Force Survey and General Social Survey) as well as in the *Growing Up in New Zealand* study (a comprehensive, longitudinal study of child development and well-being; see Mitchell, 2020). However, stepfamilies have been identified as a key variable of interest to users of family statistics (eg, Ministry of Social Development, 2004; Mitchell, 2020) and one of the main gaps in information about families and households in New Zealand, particularly as there are no official estimates.

Despite a lack of national level data, survey research within New Zealand has provided some early estimates of prevalence. Using data from the New Zealand Women: Family, Education and Employment (NZWFEE) survey of women aged 20–59 who had ever had

a child, Dharmalingam and colleagues found that 18.4% had lived in a stepfamily in their own childhood, and 20.0% of children aged 17 or under had lived in a stepfamily (Dharmalingam et al., 2004). However, it is worth noting that the NZWFEE data were collected in 1995, and thus are now quite dated.

In a birth cohort of 1,265 children born in 1977, the Christchurch Health and Development Study found that 18.4% had lived in a stepfamily for some period of time between birth and 16 years of age (Nicholson et al., 1999). A point-in-time estimate is provided by a survey of almost 2,000 parents and caregivers in New Zealand by the Roy Mackenzie Centre for the Study of Families (2007), who found that approximately 10.9% of these parents or caregivers were living in step or complex families (a combined category). Using data from the Survey of Families, Income, and Employment (SoFIE), Gath (2016) provided a point-in-time estimate of 9.3% of children aged 17 and under living in a stepfamily. This estimate was derived using family transitions over the 8-year period of the study and was not able to identify pre-existing stepfamilies. The above reported estimates all include both married and cohabiting stepfamilies. Note that the first two studies reported provide estimates of the incidence of ever living in a stepfamily while the latter two provide point-in-time estimates, which makes comparison difficult.

These research studies provide an initial estimate of the prevalence of stepfamilies within New Zealand. However, for many research purposes it is important to differentiate between children who themselves live with a stepparent, and children who live with their biological parents but in a stepfamily. For example, the former group (children living with a stepparent) are of particular importance given evidence supporting the 'Cinderella effect': the higher incidence of various forms of child abuse and mistreatment by stepparents compared to biological parents (Daly & Wilson, 2001, 2008; Tooley et al., 2006). Research using pairwise sibling comparisons to compare stepchildren to biological children within the same family (i.e. half-siblings) has demonstrated unfavourable outcomes for the well-being of American stepchildren, including parental investment, educational attainment, and emotional well-being (Evenhouse & Reilly, 2004). For this reason, it is critical to generate estimates of the number of children who live with a stepparent as distinct from the larger number of children living in stepfamilies.

Stepfamilies internationally

Although there is a lack of official or national level data on stepfamilies and on children living with a stepparent in New Zealand, information is available internationally on the prevalence and characteristics of stepfamilies worldwide. These data can provide a benchmark for comparisons against New Zealand data. In particular, other countries with similar rates of separation and remarriage could be expected to have similar rates of children living with a stepparent. The Australian Institute of Family Studies reports that 5% of children aged 15 and under were living with a stepparent at the time of the 2011 Census (4% with a stepfather, 1% with a stepmother; Baxter, 2016). In Canada, 10.0% of children under 25 years of age and living at home were living in stepfamilies in 2011 (Statistics Canada, 2012, 2015). In England and Wales, approximately 9% of dependent children were living in a stepfamily in 2011 (Office for National Statistics, 2014; 'dependent children' are those aged 15 and under, or aged 16–18 in full-time

education and living with their parents or grandparents). The Pew Research Center (2015) reports that 16% of American children aged 17 and under live in a household with a stepparent, stepsibling, or half-sibling. Using data from the US Census Bureau they report that 8% of children live with a stepparent (Pew Research Center, 2015).

The preceding statistics were all obtained through national censuses that included a specific question asking whether people lived in a stepfamily. This means that step-relationships are self-identified (i.e. respondents perceive themselves or their partner as a stepparent or stepchild). In all cases, both married and cohabiting relationships are included. Again, however, there is a focus on 'living in a stepfamily' rather than identifying children who live with stepparents versus biological parents, with the exception of the Australian and American estimates.

Self-identification of step-relationships

While in some countries, such as New Zealand, the lack of good estimates on the incidence of children living with a stepparent results from the absence of requisite distinctions on census and survey questionnaires, even when the necessary questions are included, the resultant estimates still depend on how respondents choose to portray their relationships. Reliance on self-identification is likely to underestimate the prevalence of step-relationships for a number of reasons. In particular, stepfamilies may reject using 'step' terms in order to avoid negative connotations associated with the term (Ganong et al., 1990) or because they do not feel like a family unit (Marsiglio, 2004).

Indeed, a national cohort study in Ireland determined that in approximately 10% of stepfamilies, neither parent declared their stepfamily status (ie, they did not self-identify as such; Hadfield & Nixon, 2013). These stepparents were either misrepresented as 'parents' or 'adoptive parents', or as 'other nonrelatives.' Thus, there remains the potential for improvements to existing estimates of stepfamilies and children living with stepparents through methods that do not rely on self-identification of step-relationships.

Administrative data

In this paper, we investigate the suitability of government administrative (admin) data for providing information about children living with a stepparent. We propose that admin data can be used in the absence of census or large-scale survey measures of stepfamily prevalence, or to improve current estimates through an indirect method that does not rely on self-identification. *Admin data* refers to data collected by agencies or organisations for operational purposes rather than for statistical or research purposes. For example, admin data may come from legal requirements to register events (such as births, deaths, and marriages) or from records of transactions (such as tax payments or overseas travel journeys).

In recent years, admin data have been increasingly recognised as a valuable source of information for use in official statistics and research (Hand, 2018). Benefits of admin data include its breadth, often covering large sections of the population, and its objectivity. Admin data sources often do not rely on respondent recall and correct interpretation of questions in the way that a census or survey does. For these reasons, admin data present a promising and novel means to identify step-relationships. In the context of a

census or survey question, responses stand to be influenced by family members' subjective perception and presentation of their relationships (eg, families who self-present as a birth family because the stepparent has been involved from an early age). Thus, the use of admin data provides the potential to pick up instances of step-relationships that are missed through processes of self-identification, and may provide a valuable alternative approach to measuring stepfamilies even when census or survey collections are available.

In New Zealand, Stats NZ is investigating the use of admin data as an alternative means for producing information about the population, including social and economic characteristics (Stats NZ, 2015). A preliminary investigation into the usefulness of admin data for providing information about households and families indicates a number of data sources available, including birth registrations and migrant visa applications (Gath & Bycroft, 2018). This work has informed the admin data sources utilised in the present research, which we use in combination with census data and survey data linked at the unit record level.

The present research

The aims of this research were:

1) To develop a method for combining census or survey data with admin data in a linked data environment to identify step-relationships
2) To use this methodology to calculate estimates of children living with a stepparent in New Zealand as at collection date for the 2013 Census and four collection points of the Household Labour Force Survey (HLFS; 2016 through 2019).

Linked census data, survey data, and admin data were used to determine whether children were living with their birthparents, non-biological parents, or the combination of a birthparent and a non-biological parent. We define 'non-biological parents' as anyone in a parent role who is not the birthparent of the child. Our sample of interest were all children aged 17 and under living in two-parent families (in a child role).

Methods

Data sources

Data for this research came from the Integrated Data Infrastructure (IDI), a linked research database that holds microdata at the individual level from various admin and survey data sources. The IDI consists of a central spine to which a series of data collections are linked. The spine is intended to include all individuals who have ever resided in New Zealand, and aims to include each individual only once. Datasets from different source agencies are linked to the spine using deterministic and probabilistic linking methods based on information such as names and dates of birth (Gibb et al., 2019).

We used IDI data from the 2013 Census, Household Labour Force Survey (HLFS) data, birth registration data from the Department of Internal Affairs, and visa applications data from the Ministry of Business, Innovation, and Employment.

New Zealand Census of Population and Dwellings. The census produces the official count of people and dwellings in New Zealand. It provides a snapshot of society at a point in time and tells the story of social and economic change in New Zealand. The most recent censuses were held in March 2013 and March 2018 (at the time of analysis and writing, the household and family datasets for the 2018 Census were not available within the IDI). The census aims to count everyone who is in the country on census night, but also collects information on people absent on census night for the purposes of including them in household and family information.

Families are constructed in the census using information about the address of the dwelling, the usual residence of individuals, any reported absentees from a dwelling, the relationships of individuals at a dwelling to the reference person (the person who completed the census dwelling form), and the living arrangements of individuals (their relationships to the people they usually live with). Parent–child relationships in census families are not differentiated among biological, step, adopted, foster or other possible types. As relationship information is only collected in relation to one reference person in the dwelling, some family relationships need to be inferred based on the other known relationships, and not all can be (Stats NZ, 2020).

Household Labour Force Survey. The Household Labour Force Survey (HLFS) is a nationwide, quarterly survey run by Stats NZ. It is a sample survey that is designed to represent the country as a whole. Each quarter includes approximately 15,000 households, which corresponds to roughly 30,000 people. While the HLFS is primarily focused on collecting data about people aged 15 and over to produce statistics on employment and the labour force, data are collected about all members of the household.

Survey weights are provided for each person in the HLFS in order to allow for weighted estimates that approximate the full New Zealand population. The weights account for selection bias (for primary sampling units and households) and non-response bias (within region-by-month cells) and are calibrated to population benchmarks for five-year age groups by sex, the number of Māori adults by two age groups (age 15-29, 30+) and 12 regions (Stats NZ, 2017).

In the present research, HLFS data from the September quarter were used for years 2016 through 2019. Survey weights have been applied to all of the estimates in this paper.

Birth registrations. The Department of Internal Affairs (DIA) provides birth registration data for integration to the IDI. This dataset has a target population of everybody born in New Zealand and children who were born overseas but adopted in New Zealand. Birth registration data give access to the biological or adoptive relationships between mothers, fathers, and children.

Information contained in birth registrations is provided by parents following a child's birth. By law, parents of a child born in New Zealand must notify DIA as soon as is reasonably practicable after the birth (deemed by the Registrar-General as generally being within two months of the birth).

Although some historical birth records are incomplete within the IDI, we only used birth registrations data from 1996 onwards, which have been fully digitised and should have nearly full coverage of all children born in New Zealand and their parents at birth for the relevant time period.

Visa applications. The Ministry of Business, Innovation & Employment (MBIE) provides immigration data on migrants and international visitors who apply for a visa to

enter New Zealand. This includes all resident visa applications, and applications for temporary stay (work, study, or visitor). Data are available from 1997 onwards.

Information from MBIE on visa applications includes the policy under which the application was made and whether an application was approved or declined. Records are provided for all individuals listed on an application, which can be linked through the visa application number. We used MBIE visa application data to infer a relationship between adults and children who were jointly listed on an application. Joint applicants are not always parents and children, and as relationships among applicants are not available within the IDI, a set of criteria (outlined below) was used to identify situations most likely to represent parents and children.

Measures

To classify the living situation of children as at census/survey date, we first identified their parents at birth (using admin data) and their parents at census/survey date to categorise their current status (as at census/survey collection date) in terms of living with birthparents or non-biological parents.

Birthparents. Birthparents were identified via different methods for children who were born in New Zealand versus overseas. We used census data on country of birth to classify children as NZ-born or overseas-born.

For all NZ-born children, data on birth parents were obtained from DIA birth registrations. This data source provided unique, encrypted identifiers for the child and either one or two birthparents.

For overseas born children, information on parents at the time a child arrived to New Zealand was obtained from visa approvals data. This required inference of parent–child relationships based on a set of criteria. Parent–child relationships were inferred when there was at least a 14-year age gap between the oldest child and the adult on the application, and no more than two adults were included in the application. We used publicly available code provided by NZ Treasury to implement these criteria (see also Gath & Bycroft, 2018).

Current parents. Census data or HLFS data were used to identify each child's parents as at census/survey date. These were identified as the parents within the child's family nucleus. For this analysis, 'children' were defined as people aged 17 and under in a child role.

Living situation. Children's current living situation (at the time of census or survey collection) was coded via comparison between 'birthparents' and 'current parents'. As true birth parents are not known for overseas-born children, an assumption was made that 'parents at the time of arriving in New Zealand' were equivalent to 'birth parents'. This will not be true in all cases and means that we may miss counting children who arrive to New Zealand as part of a stepfamily.

To identify children living with a stepparent, we only considered children who:

- Lived with two parents at census/survey date AND
- Had one or two parents listed on their birth registration, OR had two parents identified through the visa approvals criteria AND
- All identified parents could be linked to the IDI spine

While it is possible for children to live with a stepparent in a one-parent household, we used the official definition of a stepfamily in New Zealand, which requires one biological parent and one stepparent (Stats NZ, 2009). Comparison between birthparents and current parents resulted in children coded to one of three current living situations:

1) Two birth parents
2) One birth parent and one non-biological parent
3) Two non-biological parents

Children coded to category 2 (one birth parent and one non-biological parent) were considered to be children living with a stepparent. Category 3 (two non-biological parents) is expected to cover situations such as adoptive and foster families as well as other situations where children are not in parental care (and hence were not counted as children living with a stepparent).

Analysis was only conducted on records with no missing data, as missing data on either birth parents or census parents means it is impossible to establish whether parents have changed over time. The exception was children with only one parent listed on their birth registration. If these children had a second parent at the time of the census or survey, this second parent was counted as a stepparent.

Results

As per the confidentiality requirements of the IDI, all data relevant to the 2013 Census have been randomly rounded to base 3 and all data relevant to the HLFS have been rounded to base 100. Additionally, all weighted counts using HLFS data that are less than 1,000 are suppressed.

2013 Census

Sample. Out of the 715,347 children 17 and under who were living as a child in a two-parent family in the 2013 Census, sufficient data were available to include 577,140 (80.7%) in the present analyses (see Table 1). Demographic characteristics of children were compared between those who had sufficient information to be included in the analysis and those who were excluded (within the group of children living in two-parent families). While 92% of the included group were born in New Zealand, only 56% of the excluded group were born in New Zealand.

Table 1. Counts of New Zealand-born and overseas-born children included in the 2013 Census analysis and missing data

	NZ-born N = 608,391		Overseas Born N = 95,589		Missing country of birth	
	Included in analysis	Excluded	Included in analysis	Excluded	Excluded	Total included in analysis
2013 Census	531,249	77,142	45,891	49,698	11,370	577,140 *(80.7%)*

NOTE: Children were excluded from the analysis if there was insufficient information about either their birth parents or their census parents, this includes missing information, inability to identify birthparents from migrant visas, and information that could not be linked to the IDI spine.

Data source: Linked data from 2013 Census, DIA births data, and MBIE visa applications available in Stats NZ's IDI

Children excluded from analysis were more likely to be of Pacific Peoples and Asian ethnicity than those included (10% of included children were Pacific Peoples and 12% were of Asian ethnicity, compared to 15% and 20% of excluded children, respectively). People of Māori ethnicity were similarly represented in the included and excluded children (18% vs 16%, respectively). Younger children were included at a higher rate than older children (for example, 86% of one year olds were included compared to 77% of 15 year olds). Children excluded from analysis also came from families with lower income (59% with income above $70,000) than those included (66% with income above $70,000; although note that that excluded children were disproportionately from families with missing income data).

Estimates of children living with stepparents – 2013 Census

Children in two-parent families were identified as living in the following living situations:

- 88.1% were living with two birthparents
- 10.7% were living with one birth parent and one non-biological parent ('stepparent')
- 1.2% were living with two non-biological parents

These results, obtained using the sample of children in two-parent families with non-missing data, were then used to estimate the total number of children living with a stepparent. To do this, the prevalence rates calculated using children with available data were assumed to apply to those with missing data, controlling for year of age and birthplace. For example, the prevalence rate for children aged 5 based on those included in the analysis was assumed to apply to children aged 5 who were not included in the analysis.

This allowed for calculation of the number of children living with a stepparent as a percentage of all children aged 17 and under. Figure 1 shows the percent of children living with a stepparent – provided both as a percent of all children living in two-parent families, and as a percent of all children aged 17 and under.

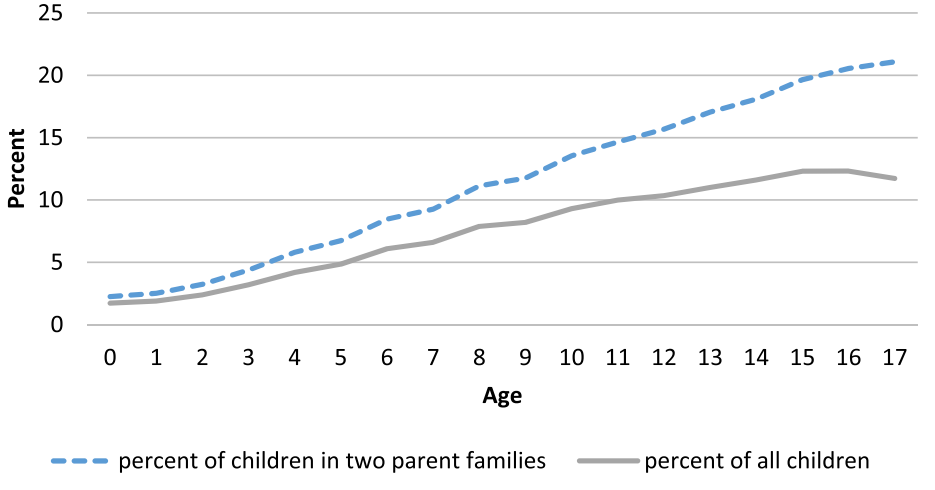

Figure 1. Percentage of children living with a stepparent in 2013

Table 2. Children living with a stepparent by age of child and sex of stepparent in 2013

Children living with a stepparent by age of child and sex of stepparent in 2013						
	Percent of all children aged 17 and under			Percent of children in two-parent families		
Age	Living with stepfather	Living with stepmother	Total with a stepparent	Living with stepfather	Living with stepmother	Total with a stepparent
0	0.97	0.75	1.72	1.27	0.98	2.25
1	1.18	0.70	1.88	1.58	0.94	2.52
2	1.59	0.80	2.39	2.16	1.09	3.24
3	2.34	0.86	3.20	3.21	1.18	4.39
4	3.15	1.03	4.18	4.38	1.43	5.81
5	3.63	1.22	4.85	5.04	1.70	6.74
6	4.68	1.40	6.08	6.52	1.95	8.47
7	5.09	1.51	6.60	7.15	2.12	9.27
8	5.88	2.00	7.88	8.31	2.82	11.14
9	6.12	2.08	8.20	8.77	2.99	11.76
10	6.84	2.47	9.31	9.96	3.59	13.55
11	7.33	2.66	9.99	10.76	3.90	14.66
12	7.32	3.03	10.34	11.10	4.59	15.69
13	7.80	3.20	11.00	12.09	4.95	17.05
14	8.05	3.55	11.60	12.55	5.54	18.09
15	8.24	4.06	12.30	13.17	6.48	19.65
16	8.01	4.30	12.31	13.36	7.19	20.55
17	7.38	4.34	11.72	13.28	7.81	21.09
All Children	5.31	2.22	7.53	7.55	3.15	10.71

Data source: Linked data from 2013 Census, DIA births data, and MBIE visa applications available in Stats NZ's IDI

Consistent with expectations based on previous literature, with increasing age there is an increasing proportion of children living with a stepparent. Overall, 7.5% of all children aged 17 and under were living with a stepparent (10.7% of children in two-parent families). At a national level, this equates to 78,596 children. When considering only children 10 and under, 5.1% of all children were living with a stepparent. Table 2 provides the number of children living with a stepparent (broken down by the sex of the stepparent) for each year of age as a percent of all children aged 17 and under and also as a percent of all children living in two-parent families.

Figure 2 presents the percent of children living with a stepfather and living with a stepmother, calculated for overseas born children and for New Zealand born children. Figure 2 shows a different pattern for children born overseas compared to those born in New Zealand. The prevalence of living with a stepparent is much lower for children born overseas and does not increase to a similar degree as the prevalence rate for children born in New Zealand. This finding can be seen as consistent with previous literature indicating that foreign-born couples are less likely to divorce than native-born couples (Schultz-Nielsen & Bonke, 2016). However, the lower prevalence for overseas born children could also reflect the methodology used to identify 'birth parents' and the fact that only newly formed stepfamilies (after arrival to New Zealand) could be identified.

Household Labour Force Survey

Sample. Table 3 presents the number of children eligible to be included in the analyses for each quarter of the HLFS (ie children aged 17 and under living with two parents) and the number of children who had sufficient data to be included in the analysis sample.

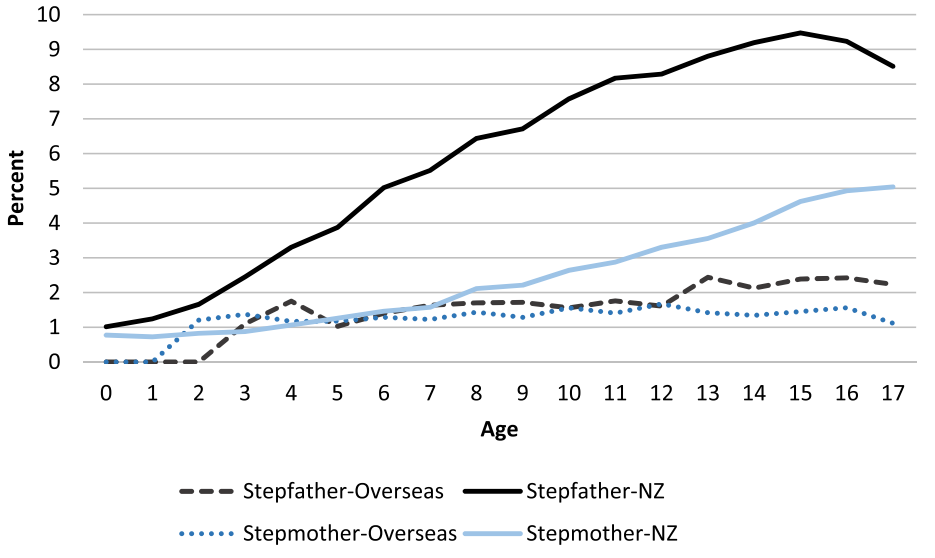

Figure 2. Percent of overseas born and New Zealand born children living with a stepfather and living with a stepmother in 2013 (for all children aged 17 and under)

Estimates of children living with stepparents – HLFS. Children in two-parent families were identified as living in the following living situations (ranges provide the highest and lowest percentages from the four analysis dates):

- 88.7 - 89.0% were living with two birthparents
- 8.9 - 9.5% were living with one birth parent and one non-biological parent ('stepparent')
- 1.8 - 2.2% were living with two non-biological parents

Similar to the analyses reported for 2013 Census, these rates were assumed to apply to children excluded from the analyses and were used to calculate the number of all children 17 and under living with a stepparent.

Table 4 presents the percent of children living with stepfathers and stepmothers for the four quarters of the HLFS under analysis. Due to the confidentiality rules applied to HLFS data within the IDI, results for some of the younger ages are too small to be released. For this reason, we present the results for three-year age groups. The two youngest age groups

Table 3. Counts of children eligible and children included in the HLFS analyses

HLFS Quarter	Children aged 17 and under living with two parents	Children with sufficient data to be included in the analysis	Percent of eligible children included in the analysis
Sept 2016	723,000	609,300	84.3%
Sept 2017	726,100	608,500	83.8%
Sept 2018	759,000	637,400	84.0%
Sept 2019	752,500	604,900	80.4%

NOTE: All counts presented in the table have been calculated with survey weights applied, and have been rounded to the nearest hundred.

Data source: Linked data from HFLS, DIA births data, and MBIE visa applications available in Stats NZ's IDI

also needed to be combined in order to produce estimates for children living with stepmothers above the suppression threshold (ie, due to the low level of prevalence).

Figures 3 and 4 present the results from Table 4 graphically, showing the percent of children living with a stepfather (Figure 3) and stepmother (Figure 4) across the four HLFS samples.

Discussion

In this paper, we have provided a method for combining census or survey data with birth records and migrant visa applications in a linked data environment to identify step-relationships. This method has been applied to 2013 Census data and to four quarters of the HLFS to provide estimates of the number of children living with a stepparent in New Zealand. While our analysis has been restricted to prevalence rates within New Zealand, our methods of linking birth records to survey or census datasets could be applied in other countries facing similar circumstances of a paucity of information on stepfamilies.

Using linked census and admin data, we estimate that 7.5% of children were living with a stepparent at the time of the 2013 Census (10.7% of children living in two-parent families). We then used admin data linked to HLFS survey data to provide additional estimates for the years 2016 through 2019. These results provided slightly lower estimates of 6.3-6.9% of all children aged 17 and under (8.9-9.5% of children in two-parent families). The consistently lower estimates obtained from the HLFS analyses could reflect a sampling bias that has not been accounted for in the survey weights.

Our results provide the most comprehensive attempt to estimate the prevalence of children living with stepparents in New Zealand to date. To determine whether our estimates of 6.3-7.5% of all children are reasonable, they can be compared against previous estimates derived from survey data within New Zealand as well as national estimates from other countries.

Gath (2016) used survey data to estimate that 9.3% of children in New Zealand were living in a stepfamily. This figure includes children living with a stepparent (ie the focus of the present analysis) as well as children living with two biological parents and at least

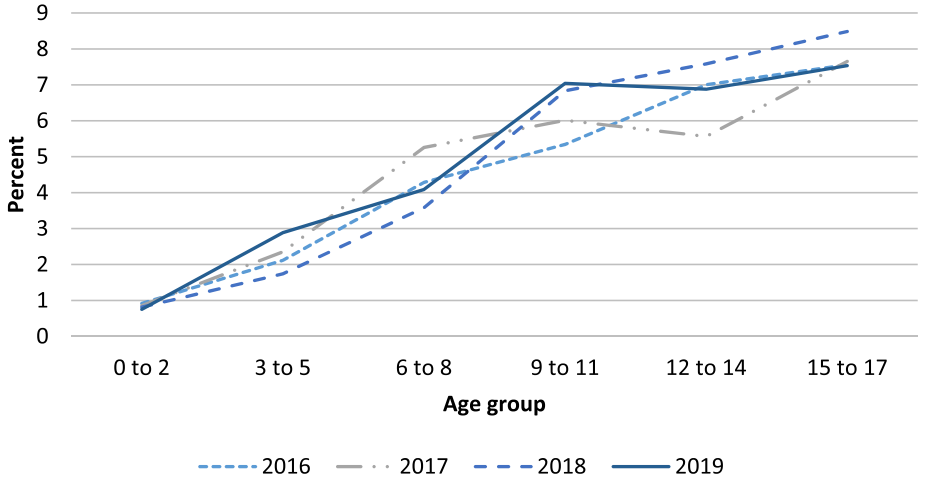

Figure 3. Percent of all children living with a stepfather in 2016 through 2019

Table 4. Percent of children living with a stepparent in 2016 through 2019 by age group and sex of stepparent

	Percent living with a stepfather				Percent living with a stepmother				Total percent living with a stepparent			
Age	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
0–2	0.92	0.86	0.81	0.75								
3–5	2.12	2.35	1.74	2.89								
0–5	1.54	1.64	1.28	1.84	0.70	0.48	0.37	0.70	2.24	2.12	1.65	2.54
6–8	4.29	5.26	3.58	4.09	1.04	1.33	1.55	2.25	5.33	6.59	5.13	6.33
9–11	5.34	6.01	6.84	7.04	2.16	2.56	2.87	1.65	7.51	8.57	9.71	8.69
12–14	7.01	5.57	7.59	6.88	3.18	3.98	2.48	2.45	10.19	9.54	10.07	9.33
15–17	7.56	7.66	8.49	7.53	2.50	3.38	4.06	2.65	10.06	11.04	12.55	10.19
All Children	4.60	4.74	4.93	4.95	1.72	2.07	1.98	1.74	6.32	6.80	6.92	6.69

Note: Percentages calculated out of all children (not restricted to those in two-parent families)
Data source: Linked data from HLFS, DIA births data, and MBIE visa applications available in Stats NZ's IDI

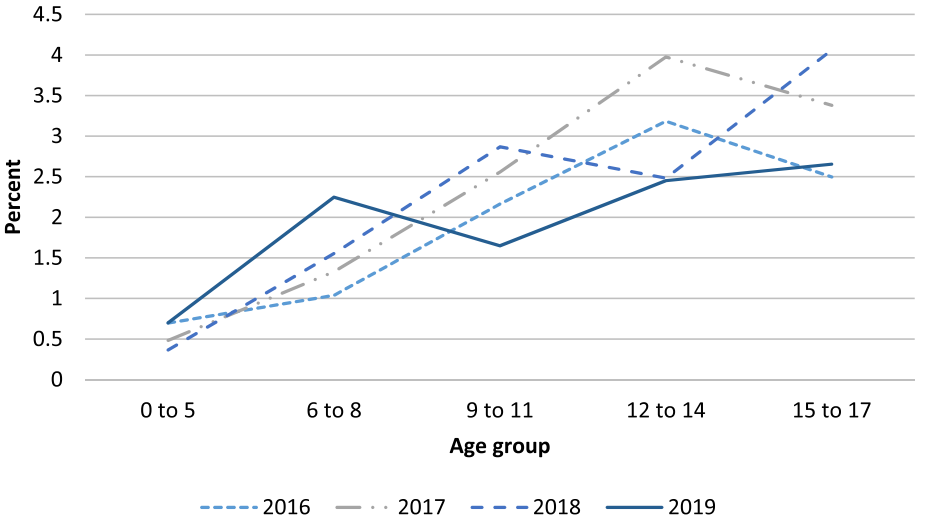

Figure 4. Percent of all children living with a stepmother in 2016 through 2019

one step-sibling. Canadian data from the 2011 Census indicate that 10.0% of children under 25 years of age and living at home were living in stepfamilies (Statistics Canada, 2012, 2015), while census data from England and Wales estimate that 9.0% of children under 18 years of age were living in stepfamilies in 2011 (Office for National Statistics, 2014). These estimates all include children living with their biological parents who have a step-sibling (as they are also living 'in a stepfamily') in addition to children living with a stepparent. The present analysis considers only children who are themselves living with a stepparent. Thus, a more comparable estimate is that from Australia, where 5% of children aged 15 and under live with a stepparent (Baxter, 2016). This estimate is lower than the range identified in the present research, although note that the inclusion of 16- and 17-year-olds in our sample will be contributing to some of this difference.

It is also worth noting that the counts from Australia, Canada, and England and Wales rely on respondents self-reporting their step-relationships. In the present research we use a set of criteria to identify a specific living situation as a stepparent-stepchild relationship which may not correspond to how these people would subjectively self-define their relationships. For example, a stepparent who has been in a child's life from a very young age may prefer to think of themselves as the child's 'parent' rather than 'stepparent'. Alternatively, some people may prefer not to identify as the stepparent of their partner's children. As research has shown that a certain proportion of stepfamilies do not self-identify (Hadfield & Nixon, 2013), the use of admin data presents a unique means to classify relationships without depending on respondent self-identification. Further work could explore the relative importance of objective versus subjective classification of step-relationships for predicting various risk and resilience factors.

Infants living with stepparents

The estimates of infants living with stepparents in New Zealand provided in this paper are the first of their kind, and thus, there is a lack of data for comparison. From existing

international estimates, however, we suspect that the present estimates have been inflated by linkage error. For example, the Millennium Cohort Study (MCS) in the United Kingdom (University of London, 2007), provides a detailed categorisation of children's caregivers for their samples of approximately 15,000 children born in the year 2000. At 9 months of age there were no children living with stepmothers and 0.33% living with a stepfather or mother's partner. At 3 years of age, 0.04% of children were living with a biological father and a stepparent or other parent, and 2.33% were living with a biological mother and a step/adoptive/other parent.

The present estimates for children aged 0–1 are substantially larger than the MCS 9 month estimates, as are the estimates for children living with a stepmother at age 3. We hypothesise that our methodology of using linked data contains a small amount of linkage error that has resulted in an inflation of estimates for the least frequent categories. While all of our estimates will contain some amount of linkage error, it is likely for the larger categories that the effect is negligible. The impact is more apparent for very young ages and particularly for the stepmother categories, so these results should be interpreted with caution.

In the future, it will be important to better understand the nature of linkage error within the IDI in order to adjust or control for this error and produce more precise estimates.

Overseas-born children

The estimates presented in this paper will be most accurate for children born in New Zealand, due to the high quality admin data available for these children (eg, legal birth registrations) and our ability to include a high proportion of all children born in New Zealand in our sample. On the other hand, roughly half of children born overseas had to be excluded from our sample due to a lack of necessary data for analysis. The estimates for overseas-born children should therefore be interpreted with caution. We found a significantly lower prevalence of children living with a stepparent in our group of overseas-born children compared to New Zealand-born children, but this result may be biased by the children included in the sample (versus excluded) and our inability to identify any children arriving to the country as part of a stepfamily. However, it may also be true that parents migrating from overseas are less likely to separate and re-partner than parents of children born in New Zealand. Despite these limitations, our results present some preliminary data on stepfamily prevalence within overseas-born children. In the 2018 Census, around 15% of all children living with a parent were overseas-born, suggesting that exclusion of migrant children from analysis would exclude a substantial proportion of New Zealand's child population (Didham, 2021).

Importance of admin data

The methods and results presented in this paper demonstrate the usefulness of admin data for enhancing data already collected through the census or through surveys to produce information that is not available from either source on its own. Stats NZ's IDI provides a world-leading, integrated data environment where admin, census, and survey data are securely linked to enable opportunities of combining data sources in this way.

In an assessment of New Zealand's current gaps in stepfamily information and how to fill them, Mitchell (2020) makes clear recommendations for Stats NZ to collect step-relationships in either the census or the Household Economic Survey (HES). Until this type of official collection begins, admin data provide an alternative means to obtaining this information, and the methodology presented in this paper offers our best estimates of the current prevalence rates of children living with a stepparent in New Zealand.

Even if step-relationship data were to be collected through a national census or survey, the use of admin data presents a means to identify instances of step-relationships that the self-identification process misses. Comparing self-identified data to admin data is an important area for future research, in terms of understanding the validity of the current methodology and for better understanding the complexities of the self-identification and subjective experience of family relationships.

Further, the use of admin data could enable the capture of transitions between family situations, which would not be possible using only a census or household survey alone. This is particularly important given evidence that family instability may be a stronger determinant of child outcomes than living in a stepfamily per se (Hadfield et al., 2018).

Limitations

An assumption has been made that children have arrived to New Zealand with their birth parents and not stepparents. This means that only newly formed stepfamilies, formed after arrival to New Zealand, can be identified for overseas-born children. We will not be able to count any children who arrive to New Zealand with a stepparent and are still living with that same stepparent at the time of the census. Note that the proportion of children born overseas is very low at young ages and increases with age (eg, in 2013, 0.3% of children under 1 year of age were born overseas compared to 13.9% of 17 year olds).

There are also more missing data for children born overseas than children born in New Zealand. This is due to better historical coverage of birth records than of migration data, and also the criteria used to link parents and children through the visa applications data. Any complex visa applications data, or applications for children that don't include parents, will not be able to provide 'birth parent' information for overseas-born children. As a result, the overall estimate for each year of age comes disproportionately from New Zealand-born children.

Data were also missing at a higher rate for children from lower-income families. Although there is mixed evidence as to whether stepfamilies are more economically disadvantaged than biological families (Brown et al., 2015; Vézina, 2012), the pattern of missing data may reflect more missing data in less stable households, in which case the families excluded from analysis may include proportionately more stepchildren.

It is important to note that an overestimate of the number of children living with a stepparent could result from either linkage error or from errors in the coding of census or survey data. In the IDI, the records within all datasets are linked to the IDI spine based on information such as date of birth, name, and sex. Any records that could not be linked to the spine have been excluded from the present analysis to avoid inflation of the estimates. However, a small number of records will end up linked to an incorrect spine identity (ie, false positive links; Kvalsvig et al., 2019). In the present research, if census/survey parents or children have been incorrectly linked to the IDI

spine, this would make it appear as if the child has different birth parents than current (census/survey) parents when it might not be the case. The false positive rate is 1% for the 2013 Census dataset and 1.4% for the HLFS (Gibb et al., 2019). These errors will be unevenly distributed across the population and it is difficult to estimate the impact on the current results. Due to the small prevalence rates of children living with stepparents, particularly at young ages and those living with stepmothers, there will be some inflation of estimates from false positive links.

Family information in the census and the HLFS is collected in relation to one reference person in the household. This requires a process of family coding to derive the relationships among all household members. If family coding errors result in an incorrect parent–child relationship, it could falsely appear as if a child has a different parent from those at birth. Both of these cases (linkage error or family coding errors) would inflate the estimates of children living with stepparents.

Conclusion

This research presents a method for combining census or survey data with admin data in a linked data environment to identify step-relationships. Applying this methodology to data collection points spanning 2013–2019, we estimate that 6.3-7.5% of children aged 17 and under live with a stepparent in New Zealand. Importantly, our results go beyond a generalised estimate of children 'living in a stepfamily' and estimate those children who are living with stepparents (ie, those most at risk for a number of disadvantages). Our results provide the most comprehensive attempt to estimate the prevalence of children living with stepparents in New Zealand to date, and also demonstrate a novel and versatile methodology for identifying step-relationships using admin data in a linked data environment. While our analysis has been restricted to prevalence rates within New Zealand, our methods of linking birth records to survey or census datasets could be applied in other countries facing similar circumstances of a paucity of information on stepfamilies.

Data disclaimer

Access to the anonymised data used in this study was provided by Stats NZ in accordance with security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation. The results in this paper have been confidentialised to protect these groups from being identified. Careful consideration has been given to the privacy, security, and confidentiality issues associated with using administrative and survey data in the Integrated Data Infrastructure.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Baxter, J. (2016). *The modern Australian family*. Australian Institute of Family Studies.

Brown, S. L., Manning, W. D., & Stykes, J. B. (2015). Family structure and child well-being: Integrating family complexity. *Journal of Marriage and Family*, *77*(1), 177–190. https://doi.org/10.1111/jomf.12145

Cartwright, C. (2012). The challenges of being a mother in a stepfamily. *Journal of Divorce & Remarriage*, *53*(6), 503–513. https://doi.org/10.1080/10502556.2012.682904

Cribb, J. (2009). Focus on families: New Zealand families of yesterday, today and tomorrow. *Social Policy Journal of New Zealand*, *35*, 4–16.

Daly, M., & Wilson, M. (2001). An assessment of some proposed exceptions to the phenomenon of nepotistic discrimination against stepchildren. *Annales Zoologici Fennici*, *38*(3/4), 287–296.

Daly, M., & Wilson, M. (2008). Is the "Cinderella effect" controversial? A case study of evolution-minded research and critiques thereof. In C. B. Crawford, & D. Krebs (Eds.), *Foundations of evolutionary psychology* (pp. 381–398). Erlbaum.

Dharmalingam, A., Pool, I., Sceats, J., & Mackay, R. (2004). *Patterns of family formation and change in New Zealand*. Centre for Social Research and Evaluation, Ministry of Social Development.

Didham, R. A. (2021, 8–9 September). *Dynamics of language within multilingual families in New Zealand [paper presentation]*. Population association of New Zealand conference, Auckland, New Zealand.

Evenhouse, E., & Reilly, S. (2004). A sibling study of stepchild well-being. *Journal of Human resources. Journal of Human Resources*, *39*(1), 248–276. https://doi.org/10.3368/jhr.xxxix.1.248

Falci, C. D. (2006). Family structure, closeness to residential and nonresidential parents, and psychological distress in early and middle adolescence. *The Sociological Quarterly*, *47*(1), 123–146. https://doi.org/10.1111/j.1533-8525.2006.00040.x

Families Commission. (2009). *Family-centred communities: The planning process (research report No 1/09)*. Families Commission, Ministry of Social Development.

Ganong, L., & Coleman, M. (2018). Studying stepfamilies: Four eras of family scholarship. *Family Process*, *57*(1), 7–24. https://doi.org/10.1111/famp.12307

Ganong, L., Coleman, M., & Kennedy, G. (1990). The effects of using alternate labels in denoting stepparent or stepfamily status. *Journal of Social Behavior and Personality*, *5*(5), 82–97. https://doi.org/10.5172/jfs.327.15.1.82

Gath, M. (2016). *Identifying stepfamilies in longitudinal data (working paper No 16–01)*. Stats NZ. Available: archive.stats.govt.nz (accessed 29 October 2020).

Gath, M., & Bycroft, C. (2018). *The potential for linked administrative data to provide household and family information*. Stats NZ.

Gibb, S., Kvalsvig, A., & Teng, A. (2019). *Understanding linkage in the IDI*. Available: www.vhin.co.nz (accessed 29 October 2020).

Hadfield, K., Amos, M., Ungar, M., Gosselin, J., & Ganong, L. (2018). Do changes to family structure affect child and family outcomes? A systematic review of the instability hypothesis. *Journal of Family Theory & Review*, *10*(1), 87–110. https://doi.org/10.1111/jftr.12243

Hadfield, K., & Nixon, E. (2013). Including those that exclude themselves: Comparisons of self-identifying and non-self-identifying stepfamilies. *Journal of Family Studies*, *19*(2), 207–216. https://doi.org/10.5172/jfs.2013.19.2.207

Hand, D. J. (2018). Statistical challenges of administrative and transaction data. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *181*(3), 555–605. https://doi.org/10.1111/rssa.12315

Kvalsvig, A., Gibb, S., & Teng, A. (2019). *Linkage error and linkage bias: A guide for IDI users*. Department of Public Health, University of Otago.

Marsiglio, W. (2004). *Stepdads: Stories of love, hope, and repair*. Rowman & Littlefield.

Metts, S. M., Schrodt, P., & Braithwaite, D. O. (2017). Stepchildren's communicative and emotional journey from divorce to remarriage: Predictors of stepfamily satisfaction. *Journal of Divorce & Remarriage*, *58*(1), 29–43. https://doi.org/10.1080/10502556.2016.1257904

Mignot, J. F. (2008). Stepfamilies in France since the 1990s: An interdisciplinary overview. In J. Pryor (Ed.), *The international handbook of stepfamilies: Policy and practice in legal, research, and clinical environments* (pp. 53–78). John Wiley & Sons.

Ministry of Social Development. (2004). *New Zealand families today*.
Mitchell, L. (2020). *The challenges facing children in stepfamilies: What we know, don't know, and how to fill the gaps*. Family First.
Nicholson, J. M., Fergusson, D. M., & Horwood, L. J. (1999). Effects on later adjustment of living in a stepfamily during childhood and adolescence. *Journal of Child Psychology and Psychiatry*, *40* (3), 405–416. https://doi.org/10.1111/1469-7610.00458
Office for National Statistics. (2014). *Stepfamilies in* 2011. Available: www.ons.gov.uk (accessed 29 October 2020).
Pew Research Center. (2015). *Parenting in America: The American family today.* Available: www.pewsocialtrends.org (accessed 29 October 2020).
Pool, I., Dharmalingam, A., & Sceats, J. (2007). *The New Zealand family from 1840: A demographic history*. Auckland University Press.
Pryor, J. (2020). *Stepfamilies: A global perspective on research, policy, and practice*. Routledge.
Pyke, K. D. (1994). Women's employment as a gift or burden? Marital power across marriage, divorce and remarriage. *Gender and Society*, *8*(1), 73–91. https://doi.org/10.1177/089124394008001005
Roy Mackenzie Centre for the Study of Families. (2007, 24 September). *Youth connectedness project: A selection of results from year 1 data*. Presentation at the 6th Australia and New Zealand Health Conference.
Schultz-Nielsen, M. L., & Bonke, J. (2016). *Integration of ethnic minorities: Do they divorce as natives do?* (IZA Discussion Paper No. 9727). Bonn, Germany: Institute for the Study of Labor (IZA).
Statistics Canada. (2012). *Portrait of families and living arrangements in Canada: Families, households and marital status, 2011 Census of Population* (Catalogue no. 98- 312-X2011001). Available: www.statcan.gc.ca (accessed 29 October 2020).
Statistics Canada. (2015). 2011 *Census of Population, Statistics Canada* (Catalogue no. 98-312-XCB2011017). Available: www.statcan.gc.ca (accessed 29 October 2020).
Stats, NZ. (2009). *Statistical standard for family type*. Available: www.stats.govt.nz (accessed 29 October 2020).
Stats, NZ. (2015). *Census transformation – a promising future*. Available: www.stats.govt.nz (accessed 29 October 2020).
Stats, NZ. (2017). *Household Labour Force Survey sources and methods: 2016.* Available: www.stats.govt.nz (accessed 29 October 2020).
Stats, NZ. (2020). *Families and households in the 2018 Census: Data sources, family coding, and data quality*. Stats NZ.
Steinbach, A., Kuhnt, A. K., & Knüll, M. (2016). The prevalence of single-parent families and stepfamilies in Europe: Can the hajnal line help us to describe regional patterns? *The History of the Family*, *21*(4), 578–595. https://doi.org/10.1080/1081602X.2016.1224730
Stewart, S. D., & Timothy, E. E. (2020). Stepfamily policies and laws in the United States: Lessons from the west. *Journal of Family Issues*, *41*(7), 891–912. https://doi.org/10.1177/0192513X20918429
Tooley, G. A., Karakis, M., Stokes, M., & Ozanne-Smith, J. (2006). Generalising the Cinderella effect to unintentional childhood fatalities. *Evolution and Human Behavior*, *27*(3), 224–230. https://doi.org/10.1016/j.evolhumbehav.2005.10.001
Trocmé, N., MacLaurin, B., Fallon, B., Daciuk, J., Billingsley, D., Tourigny, M., Mayer, M., Wright, J., Barter, K., Burford, G., Hornick, J., Sullivan, R., & McKenzie, B. (2001). *Canadian incidence study of reported child abuse and neglect: Final report*. Minister of Public Works and Government Services Canada. https://www.phac-aspc.gc.ca/publicat/cisfr-ecirf/pdf/cis_e.pdf.
University of London. (2007). *Millennium Cohort Study: first survey, 2001-2003 (6th edition)*. Centre for Longitudinal Studies, UCL Institute of Education.
Vézina, M. (2012). 2011 *General Social Survey: Overview of families in Canada – Being a parent in a stepfamily: A profile* (Catalogue no. 89–650–X — No. 002). Available: www.statcan.gc.ca (accessed 29 October 2020).