Reproductive BioMedicine and Society Online (2018) 5, 1–4

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ARTICLE

Differences in the utilization of gestational surrogacy between states in the U.S.

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Abstract Gestational surrogacy policy in the USA varies by state, but information on state differences is lacking. This study used data from the National Assisted Reproductive Technology Surveillance System from 2010 to 2014 to calculate state differences in gestational carrier cycle characteristics. Of the 662,165 in-vitro fertilization cycles in the USA between 2010 and 2014, 16,148 (2.4%) used gestational carriers. Non-USA residents accounted for 18.3% of gestational carrier cycles, and 29.1% of gestational carrier cycles by USA residents were performed in a state other than the state of residence of the intended parent. USA gestational surrogacy practice varies by state, potentially impacting patients' access to surrogacy services.

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KEYWORDS: gestational surrogacy, IVF, gestational carrier

Introduction

A gestational carrier is a woman who bears a genetically unrelated child for another individual or couple (intended parent[s]), through in-vitro fertilization (IVF), an assisted reproductive technology (ART) procedure involving the fertilization of oocytes outside the body and transferring the resulting embryo(s) into a woman's uterus (American Society for Reproductive Medicine, 2013). The USA is one of few industrialized countries where compensated gestational surrogacy is not restricted at the national level (Armour, 2012; Burrell and Edozien, 2014; Mortazavi, 2012); however, surrogacy laws are complex and vary between states

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https://doi.org/10.1016/j.rbms.2017.08.002
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(Mortazavi, 2012). This study investigated state differences in the utilization of gestational carriers.

Materials and methods

Data from the Centers for Disease Control and Prevention's (CDC) National ART Surveillance System (NASS), which captures information on >97% of all ART procedures performed in the USA were used in this study (CDC et al., 2014). All IVF cycles in which at least one embryo was transferred during the most recent 5 years of available data (2010–2014) were included. ART clinic state location was used to calculate state-specific prevalence of IVF cycles using gestational carriers, number of infants born from these cycles, number and percentage of multiple livebirths (i.e. twin, triplet and higher-order livebirths) resulting from gestational carrier cycles, and proportion of cycles using donor oocytes. The proportions of gestational carrier cycles in which the intended parents were non-USA residents, and the proportions of gestational carrier cycles in which the intended parents' state of residence differed from the state of clinic location were also calculated. Finally, the above values were calculated for two groups of states – states that are 'favourable' and states that are 'less favourable' to gestational surrogacy based on available assessments of gestational surrogacy law and policy (Creative Family Connections: Gestational Surrogacy Law Across the United States, accessed August 2017 at https://www.creativefamilyconnections.com/us-surrogacy-law-map/). NASS does not routinely collect information on whether a gestational carrier cycle is for a same-sex couple, and whether a gestational carrier cycle is compensated; therefore, all types of gestational surrogacy are included in the analysis. Data were analysed using SAS 9.3 (SAS Institute Inc.,Cary, NC, USA). This research was approved by an institutional review board at CDC.

Results

Of the 662,165 IVF cycles performed in the USA between 2010 and 2014, 16,148 (2.4%) were gestational carrier cycles, resulting in 10,009 infants born in 49 states and one USA territory (Table 1). Over half (50.6%, *n* = 8170) were performed in California, Connecticut, Texas and Illinois; California had the highest number of gestational carrier cycles (29.0%, *n* = 4677). Nationally, multiple livebirths accounted for 30.7% (*n* = 2341) of all livebirths that resulted from gestational carrier cycles, and this proportion ranged from 22.6% (*n* = 55) in New York to 41.2% (*n* = 40) in Nevada.

Use of donor oocytes was common and was most prevalent in Connecticut (73.0%, *n* = 916); nationally, 50.1% (*n* = 8088) of gestational carrier cycles used donor oocytes. Connecticut also had the highest proportion of gestational carrier cycles performed among intended parents who were non-USA residents (35.2%, *n* = 442). Nationally, 18.3% (*n* = 2852) of gestational carrier cycles occurred among intended parents who were non-USA residents, with over half (52.2%, *n* = 1488) of these performed in California.

Approximately 29.1% (*n* = 3705) of gestational carrier cycles were performed in a state other than the state of residence of the intended parent, compared with 12.8% of non-gestational carrier cycles performed in a state other than the state of residence of the intended parent (data not shown). Among USA residents, out-of-state intended parents accounted for 70.1% (*n* = 570) of gestational carrier cycles in Connecticut. The majority of these cycles (71.6%, *n* = 408) were performed among intended parents who were residents of New York City (41.9%, *n* = 239) or other parts of New York State (29.7%, *n* = 169).

States with policies favourable to gestational surrogacy had a higher proportion (2.9%, *n* = 13,275) of gestational carrier cycles among all ART cycles; however, states with less favourable policy environments still accounted for 17.7% (*n* = 2860) of all gestational carrier cycles in the country. The proportion of multiple livebirths resulting from gestational carrier cycles was comparable among both types of states (30.8% among states with favourable policies and 30.3% among states with unfavourable policies). About one-fifth of gestational carrier cycles in states with favourable policies were performed among non-USA residents, compared with only 6% for states with less favourable policies. Approximately one-third of gestational carrier cycles in states with a less favourable policy environment were performed in a state other than the residence of the intended parent.

Discussion

This report demonstrates the high variability in the distribution of gestational carrier cycles in the USA by state, likely influenced by the heterogeneity and complexity of gestational surrogacy law in the USA.

Overall, the rate of multiple livebirths resulting from gestational carrier cycles was almost one-third of all livebirths resulting from such cycles. This proportion is higher than the multiple livebirth rate of 25.9% for IVF cycles not using gestational carriers during the same time period (data not shown). This difference in multiple livebirth rate is likely to be partly due to the higher number of donor cycles among gestational carrier cycles compared with IVF cycles not using gestational carriers. The high multiple livebirth rate among gestational carrier cycles raises concern regarding the reproductive impacts on gestational carriers, and such concerns have been noted previously (Perkins et al., 2016). Although state variation in the rate of multiple livebirths did exist, the gestational surrogacy policy environment in the states did not seem to affect these proportions as both favourable and unfavourable states had similar proportions of multiple livebirths among gestational carrier cycles.

Variations in the prevalence of donor oocyte use for gestational surrogacy may reflect differences in gestational surrogacy state regulations for same-sex couples. Male–male couples who use a gestational carrier and donor oocytes may need to travel to states with favourable policies; this may explain the relatively high use of donor oocytes in states such as Connecticut, where policies tend to be more favourable towards same-sex couples seeking gestational surrogacy (Creative Family Connections: Gestational Surrogacy Law Across the United States, accessed August 2017 at https://www.creativefamilyconnections.com/us-surrogacy-law-map/). Non-USA intended parents accounted for a

Table 1 Gestational carrier cycles (GCC) by location of assisted reproductive technology (ART) clinic in the USA, 2010–2014. [a]

Clinic location	Number of GCC (% of all IVF cycles)	Percentage of GCC among all GCC in the USA	Number of liveborn infants resulting from GCC	Number of multiple livebirths resulting from GCC (% of all livebirths resulting from GCC)	Number of GCC using donor oocytes [b] (% of all GCC)	Number of GCC among non-USA residents [c] (% of all GCC)	Number of GCC among out-of-state USA residents (% of all USA resident GCC) [d e]
California	4677 (5.2)	29.0	2954	671 (29.6)	2614 (55.9)	1488 (32.8)	591 (19.4)
Connecticut	1255 (8.5)	7.8	723	169 (30.8)	916 (73.0)	442 (35.2)	570 (70.1)
Texas	1210 (2.7)	7.5	844	209 (33.1)	550 (45.5)	56 (4.7)	166 (14.5)
Illinois	1028 (2.4)	6.4	632	150 (31.3)	614 (59.7)	112 (12.0)	161 (19.6)
Florida	780 (2.7)	4.8	459	123 (36.9)	403 (51.7)	145 (19.0)	81 (13.1)
New Jersey	730 (2.1)	4.5	531	134 (33.9)	347 (47.5)	33 (4.5)	370 (53.2)
New York	728 (0.8)	4.5	297	55 (22.6)	217 (29.8)	88 (12.5)	123 (20.0)
Massachusetts	679 (1.5)	4.2	364	69 (23.4)	326 (48.0)	95 (16.9)	141 (30.3)
Maryland	565 (1.5)	3.5	338	63 (23.0)	302 (53.5)	59 (11.6)	268 (59.7)
Oregon	444 (7.1)	2.7	412	109 (36.1)	279 (62.8)	139 (31.5)	156 (51.7)
Ohio	397 (2.3)	2.5	219	48 (28.4)	146 (36.8)	9 (2.3)	105 (27.1)
Pennsylvania	345 (1.7)	2.1	169	34 (25.2)	126 (36.5)	5 (1.6)	65 (21.5)
Colorado	336 (2.9)	2.1	278	78 (39.0)	99 (29.5)	44 (13.3)	144 (50.3)
Virginia	285 (2.1)	1.8	167	38 (29.9)	131 (46.0)	17 (6.0)	87 (32.5)
North Carolina	255 (1.9)	1.6	170	41 (32.3)	92 (11.1)	[h]	47 (18.8)
Georgia	196 (1.5)	1.2	114	25 (28.4)	84 (42.9)	[h]	29 (17.5)
Minnesota	191 (1.9)	1.2	140	35 (33.3)	69 (36.1)	6 (3.1)	48 (25.9)
Nevada	176 (3.7)	1.1	137	40 (41.2)	99 (56.3)	60 (34.1)	41 (35.3)
Washington	162 (1.2)	1.0	95	18 (23.7)	80 (49.4)	15 (9.3)	18 (12.2)
USA total [e]	16,148 (2.4)	100	10,009	2341 (30.7)	8088 (50.1)	2852 (18.3)	3705 (29.1)
States classified by policy environment related to gestational surrogacy (Puerto Rico excluded)							
Favourable [f]	13,275 (2.9)	82.3	8355	1958 (30.8)	6934 (52.2)	2681 (21.0)	2810 (27.9)
Less favourable [g]	2860 (1.4)	17.7	1650	382 (30.3)	1145 (40.0)	171 (6.1)	889 (33.7)

IVF, in-vitro fertilization.

[a] Only includes data from states that are among the 20 states with the highest frequency of GCC (as these accounted for approximately 90% of GCC in the country), listed in descending order, and data from the USA overall. Although the state of Idaho was among the top 20 states, the data for Idaho, which had only one ART clinic, are not shown due to the limitations of the Assurance of Confidentiality, prohibiting publication of clinic-specific data other than in the ART Fertility Clinic Success Rates Report; these data are included in the totals.

[b] Oocytes that are retrieved from a woman who is not the gestational carrier or the intended parent.

[c] Residency status of intended parent.

[d] Due to missing values, percentages may not be directly calculable from estimates in table.

[e] Includes all USA states and territories.

[f] Includes CA, CT, DE, ME, NH, NV, OR, RI, AL, AR, CO, FL, GA, HI, IL, KS, KY, MA, MD, MN, MO, NC, ND, NM, OH, OK, PA, SC, SD, TX, UT, VT, WI and WV.

[g] Includes AK, AZ, IA, ID, IN, LA, MS, MT, NE, TN, VA, WY, DC, MI, NJ, NY and WA.

[h] To protect confidentiality, cells with values between 1 and 4 are suppressed. These values are included in the total.

substantial proportion (18.3%) of carrier cycles in the USA, and were more prevalent in states such as California and Connecticut, where favourable policies towards compensated gestational surrogacy exist (Mortazavi, 2012). This study suggests that, understandably, non-USA residents prefer travelling to states with surrogacy-favourable policy environments to undergo gestational carrier cycles. Additionally, close to one-third of gestational carrier cycles among USA residents were performed in states other than the intended parents' state of residence, suggesting that intended parents are travelling across state lines for reasons more complex than any one policy in a particular state. Intended parents from states with unfavourable policies, such as New York where compensated surrogacy contracts are illegal and those in violation are subject to fines, may find it safest to travel to nearby states such as Connecticut, where compensated gestational surrogacy is accepted among both heterosexual and same-sex couples.

Despite lack of information on the residency status of gestational carriers or delivery location, and the inability to routinely determine which cycles are intended for same-sex couples, this is the first study to our knowledge that demonstrates state differences in gestational surrogacy practice.

Such variability has potential implications for couples' ability to access gestational surrogacy, a form of fertility treatment. Costs associated with travel for intended parents can add to the already high cost of gestational carrier cycles for USA residents. These results may help inform policy makers, healthcare providers and patients considering gestational surrogacy in the USA.

Acknowledgements

The authors would like to thank Rich Vaughn, Esq. for his helpful review of the text. Mr Vaughn received no compensation for his contributions.

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Declaration: The authors report no financial or commercial conflicts of interest. The findings and conclusions in this report are those of the authors, and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Received 1 June 2017; refereed 21 July 2017; accepted 21 August 2017. Available online 28 September 2017