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Transgender Treatment Ascertained from Electronic Medical Records and Survey Results: An Analysis of Disagreement

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Master of Public Health

Epidemiology

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An abstract of
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Abstract

Transgender Treatment Ascertained from Electronic Medical Records and Survey Results: An Analysis of Disagreement

By Joseph M. Gerth

Background: Transgender individuals often seek gender confirmation treatment, which includes hormone therapy and/or surgery, to better align their physical characteristics with their identity. The long-term effects of these therapies remain unclear and are subject to increasing research interest. Proper assessment of treatment receipt is critical to understanding the outcomes of these interventions.

Methods: The "Study of Transition, Outcomes & Gender (STRONG)" is an electronic medical records (EMR) based cohort of transgender individuals identified from three Kaiser Permanente health plans located in Georgia, Northern California, and Southern California. As subset of cohort members were asked to complete a survey. Treatment information from the EMR was compared to their survey responses to assess the extent of agreement regarding transmasculine(TM)/transfeminine (TF) status, hormone therapy, top surgery, and bottom surgery. A logistic regression model was used to assess how certain demographic characteristics were related to disagreement between data sources. To account for non-response these models were weighted based on inverse probability of participation.

Results: Agreement was high between EMR and survey information regarding TM/TF status (99%) and hormone therapy status (97%). Lower agreement was observed for top surgery (72%) and bottom surgery (83%). Using survey responses as the "gold standard", both top and bottom had reasonably high specificity (95% and 93%, respectively), but the sensitivity of EMR-based treatment history was low (49% and 68%, respectively). The likelihood of disagreement between EMR and survey data varied across different groups of study participants. For top surgery the disagreement was more evident among TM while history of bottom surgery was more discordant among TF subjects. In addition, the disagreement with respect to both types of surgery was more evident among older study cohort members than in their younger counterparts.

Discussion: Our findings offer assurance that EMR-based data are less likely to misclassify cohort participants with respect to their TM/TF status or hormone therapy receipt. However, EMR data may not capture the complete history of gender affirmation surgeries. This information is useful in future study of outcomes related to gender confirmation therapy.

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Introduction

Transgender people are a heterogeneous group of individuals whose gender identity does not match their biological sex and their male or female gender assigned at birth.[1] Some transgender people do not accept the conventional binary male or female categories;[2] however, a person whose gender identity differs from male gender assigned at birth is often referred to as male-to-female or transfeminine (TF), and a person whose gender identity differs from female gender assigned at birth may be referred to as a female-to-male or transmasculine (TM).[3, 4]

Some transgender individuals pursue medical gender affirmation, which aims to align primary and secondary sex characteristics with their gender identity.[5, 6] There are three main types of gender affirmation interventions: hormone therapy (HT), surgical interventions to change the appearance of the chest ("top surgery"), and genital sex reassignment ("bottom surgery").[1, 7-9] Each of these gender affirmation therapies and procedures can be administered alone or in a combination with other treatments. While standards of care for gender affirmation therapies are available, the risks and benefits for each treatment option are an area of considerable uncertainty.[6, 10, 11]

This existing gap in knowledge includes a need to better understand morbidity and health related quality of life among the transgender community in general, as well as the specific short- and long-term outcomes of gender affirmation therapy. The expanding literature shows transgender people may be disproportionately affected by somatic and mental problems, although these problems can be alleviated, at least in part, by hormonal or surgical interventions. On the other hand, gender affirmation therapy may be associated with a variety of adverse effects, which may include increased incidence of certain hormone-related cancers, hematologic problems, and cardiovascular and metabolic disease. Although biologically and clinically plausible, these beneficial and adverse effects remain poorly understood, and the available data remain at a hypothesis-generating level.[12] The limitations of the

available studies include the predominance of cross-sectional designs, relatively small sample sizes, and a lack of comparable reference group.[13]

Most of the unanswered research questions about the effects of gender affirmation therapies cannot be addressed via clinical trials because randomizing participants to receiving or not receiving the desired therapy is not ethically acceptable. Moreover, many of the outcomes of interest may require very large sample sizes and prolonged follow up, which may not be feasible in a randomized trial. For all the above reasons, many of the existing knowledge gaps can only be addressed via large scale observational studies that involve a systematic recruitment and follow up of participants representing the full range of gender affirmation treatments. A critical methodological challenge in conducting these types of observational studies is accurate determination of treatment receipt.

In general, medical records have been proven to be the gold standard for treatment ascertainment in observational studies.[14] Use of medical records prevents recall and social desirability biases associated with self-reporting. The increasing availability of electronic medical records (EMR) facilitates research because receipt of treatment can be ascertained from standardized codes, such as those used in the International Classification of Diseases (ICD) or Current Procedures Terminology (CPT) nomenclature.[15] In the case of gender affirmation therapy, however, the accuracy and completeness of EMR data remain questionable.[15, 16] The concern about the validity of EMR-derived data on gender affirmation data is often attributed to the decentralized nature of transgender care. The fact that gender affirmation is generally not covered under many health plans forces some transgender patients to seek treatment outside of their insurance.[1, 15] Consequently, it can be argued that self-reports may serve as a better source of gender affirmation therapy data than traditional medical records. These considerations notwithstanding, the frequency and extent of disagreement between self-reports and medical records as alternative methods for evaluating history of HT and gender affirmation surgeries have not been examined in a systematic fashion.

Another methodological challenge facing EMR based studies of transgender people is the need to accurately ascertain TM/TF status. The determination of TF or TM status presents a methodological challenge because the available demographic data can reflect natal sex or gender identity, without specifying which is which.[17] Assessing TM/TF status can be achieved by asking two questions about natal sex and gender identity[18]; however, reliance on self-report requires contact with individual participants and is subject to non-response, which increases the risk of selection bias.

The present study compares EMR-derived and self-reported data from the on-going longitudinal study of transgender people enrolled in three integrated healthcare systems. Our goal is to examine the frequency and determinants of disagreement between self-reports and EMR as alternative methods of determining TM/TF status and ascertaining receipt of gender affirmation therapy.

Methods

Study Data & Population

The present study utilizes EMR-based information and survey responses pertaining to transgender individuals enrolled in the "Study of Transition, Outcomes & Gender (STRONG)". The STRONG cohort includes transgender people who are members of from three Kaiser Permanente (KP) health plans located in Georgia (KPGA), Northern California (KPNC) and Southern California (KPSC). The study was conducted in partnership with Emory University, which served as the coordinating center. All activities were reviewed and approved by the Institutional Review Boards (IRB) of the four participating institutions (Emory, Kaiser Georgia, Kaiser Northern California, Kaiser Southern California). The three KP organizations are members of several research consortia; they use similar electronic medical record (EMR) systems, and have comparably organized databases with identical variable names, formats, and specifications across sites.[16]

The methods of the STRONG study are described in detail elsewhere.[16, 17] The cohort was ascertained by searching the EMR to identify all KP members whose records indicated evidence of transgender status. The subjects were considered potentially eligible if they had relevant International Classification of Diseases, Ninth Edition (ICD-9), or if their clinical notes contained relevant transgender-specific keywords. Two trained reviewers independently analyzed the free-text notes separately to verify eligibility, determine TM/TF status, and assess gender affirmation treatment status. Disagreements among reviewers were adjudicated by a review committee that included two physician investigators and the project manager. Following adjudication, medical record numbers of eligible cohort members were linked to multiple data sources including diagnostic and procedural codes, laboratory reports, and pharmacy records.

After the EMR cohort was established, a subset of participants was invited to complete a survey focusing on the experience of life as a transgender person, health outcomes, gender affirmation

treatment status, and gender-based demographic information. To be eligible to participate in the survey, the cohort members must have been: aged 18 years of age, currently enrolled in one of the participating health plans, have at least one relevant ICD-9 diagnostic code and a text string-confirmed transgender status. Participants were excluded from the survey if their evidence of transgender status was limited to mental health records, their Kaiser Permanente physicians did not provide consent for initiating the contact, or their responses to the screening questions noted that gender identity was the same as natal sex. All initial invitations were sent via regular mail. To protect subject confidentiality the letter referred to the STRONG project as a "study of gender, identity and health." The letter included a website and a unique password linked to the Study ID. Subjects who did not respond to the initial invitation were sent up to two reminders.

TM/TF Status Ascertainment

The self-reported TM/TF status was determined based on a two-step question: first inquiring about participants' natal (assigned at birth) sex and then asking about their current gender identity. If the gender identity was different from the natal male sex, the participant was considered TF; if the gender identity was different from the natal female sex the participant was considered TM.

The corresponding EMR-based information on TM/TF status was used to categorize study participants as TF or TM using several different methods. First computer searches were used to identify specific keywords such as 'male-to-female', 'female-to-male' and TM- and TF-specific codes for gender affirmation procedures. During validation of study eligibility, the reviewers were instructed to use text strings to categorize each eligible person as 'natal male', 'natal female' or 'unclear'. For persons whose TF/TM status was unclear after the initial review and for persons with ICD-9 codes only, another free-text program was developed to search for keywords reflecting natal sex anatomy ('testes' or 'ovaries'), history of specific procedures (orchiectomy or hysterectomy) or evidence of hormonal therapy (estrogen

or testosterone). Text strings containing TF-specific and TM-specific keywords were reviewed as discussed above, as were any disagreements.

Determination of Gender Affirmation Treatment Status

The self-reported gender affirmation treatment status was determined by asking participants about their past and current therapies. Subjects were asked about their use of HT, and histories of top and bottom surgery.

The EMR-based data collection to determine gender affirmation used several approaches. During initial cohort validation and TM/TF determination, reviewers were instructed to check a box for 'Evidence of treatment' if the text strings provided an indication of receipt or referral for HT, surgery, or other relevant secondary sexual procedures. In addition to text string reviews, HT receipt was determined by linkages with pharmacy records using national drug codes. ICD-9, ICD-10 and Current Procedure Terminology (CPT) codes were used to ascertain histories of top and bottom surgeries.

Data Analyses

The goal of the data analysis was to assess agreement between information on TM/TF status and gender affirmation derived from the EMR and the corresponding information obtained from the survey. With respect to gender identity each person was characterized as survey- and EMR-based TM or TF. Similarly, each data source was used separately to assign each participant a 'yes' or 'no' value for HT and for top and bottom surgery.

The level of concordance for each parameter of interest was evaluated by calculating percent agreement, and a kappa statistic with a corresponding 95% confidence interval (CI). Kappa values of <0.20, 0.21–0.40, 0.41–0.60, and 0.61–0.80 were interpreted as showing poor, fair, moderate, and good agreement, respectively.[19] Sensitivities and specificities and corresponding 95% CIs were calculated using self-reported results as the gold-standard.

Multivariable logistic regression models were used to further examine the association between EMR/survey agreement and various participant characteristics. These models were only used in instances when the discordant results represented at least 10% of all observations. The independent variables in these models included TM/TF status, age, race, and education status. The results were expressed as adjusted odds ratios (OR) and 95% CIs.

To address the effect of survey non-response on study results, both logistic regression analyses were replicated using weighted models. The weights for the models represented inverse selection probabilities drawing from all invited participants. The selection probabilities were obtained from a separate logistic model, which included all STRONG cohort members who were invited to participate in the survey. The binary dependent variable in this model was response to the survey and independent variables included age, TM/TF status, race/ethnicity, study site and receipt of HT and GCS. All analyses were conducting using SAS 9.4 (SAS Institute, Cary, NC).

Results

As shown in Table 1, the initial cohort included 640 people (320 TM and 320 TF) who answered all relevant survey questions. The TM and TF participants were similar with respect to race and education. Compared to TF participants, TM included a greater proportion of individuals under the age of 40 years (73% vs. 35%).

Table 2 shows the extent of agreement between EMR- and survey-derived data across the four parameters of interest: TM/TF status, hormone therapy, and bottom and top surgery receipt. There was an over 99% agreement with respect to TM/TF status (kappa = 0.98). Of the gender affirming therapies considered, the highest level of agreement (97%; kappa = 0.71) was observed for HT, followed by bottom surgery (83%; kappa=0.63). The greatest level of disagreement was found for top surgery (72%; kappa = 0.44). Table 2 also shows that the specificities for all four parameters of interest were over 0.90, whereas sensitives ranged from 0.49 for top surgery to 0.99 for TM/TF status.

Tables 3 and 4 examine factors associated with data discordance for top and bottom surgery – the two parameters with more than 10% disagreement between survey and EMR results. Compared to TF cohort members, TM study participants were more likely to have discordant information regarding top surgery (OR: 2.41, 95% CI: 1.60-3.64). The association between TM/TF status and discordance of bottom surgery information was in the opposite direction (OR=0.66) but was not statistically significant (95% CI: 0.40-1.09). For both types of gender affirming surgery, the likelihood of discrepancy between EMR and survey responses increased with increasing age. By contrast, no discernable differences were observed with respect to race/ethnicity or level of education. The use of inverse probability weighting did not change the associations between covariates and outcome meaningfully, though the relationship between TM/TF status and discordance for bottom surgery became significant (OR: 0.67, 95%CI: 0.45-0.99).

Discussion

In this study based on a relatively large sample of transgender people, the concordance between EMR and self-reports varied depending on the parameter of interest. The EMR-derived TM/TF status and history of HT receipt were in very good agreement with survey-based information; however, the two data sources were more discordant with respect to history of gender affirming surgeries.

Using survey responses as the "gold standard", both top and bottom surgeries were ascertained from the EMR with reasonably high specificity, but the sensitivity of EMR-based surgical history was low. Thus, the observed data discordances are attributable primarily to the high proportion of false negative surgical histories ascertained from the EMR.

The likelihood of disagreement between EMR and survey data varied across different groups of study participants. For top surgery the disagreement was more evident among TM while history of bottom surgery was more discordant among TF subjects. In addition, the disagreement with respect to both types of surgery was more evident among older study cohort members than in their younger counterparts.

The age-related differences with respect to presence and extent of data discordance are not surprising. As coverage of gender affirming surgeries at KP was implemented relatively recently, it is expected that a substantial proportion of older transgender enrollees underwent gender affirmation procedures elsewhere. The surgery-specific differences between TM and TF study participants are also consistent with expectations. Previous reports indicate that chest surgery is more common among TM relative to TF people while TF individuals are far more likely to seek genital sex reassignment surgery compared to TM subjects.[20, 21] It is important to keep in mind that top surgery is considered an essential step toward improving body image among TM persons [22, 23] whereas TF individuals can achieve visible breast augmentation by HT alone.[24] The differences in bottom surgery may be explained

by the greater technical difficulties and higher rate of complications associated with female-to-male relative to male-to-female genital reconstruction.[25, 26]

We recognize that transgender people enrolled through an integrated health care system will yield a cohort of persons with health insurance and access to specialized care. It is also important to keep in mind that the study survey was only sent to those cohort members whose medical records included both relevant diagnostic codes and keywords and whose transgender care was not limited to mental health visits. These restrictions were necessary to avoid contacting persons who did not want to disclose their transgender status. It is possible that the disagreement between EMR and survey data may be different among those who did not meet criteria for inclusion. Finally, response to the survey was relatively low (33%), which could create a selection bias, though this is controlled for through inverse probability weighting. Complete information regarding survey information can be found elsewhere.[20]

Weighing against these concerns is the demonstrated ability to examine possible extent of misclassification in a cohort of transgender subjects with detailed EMR data. Our findings offer some assurance that EMR based data are unlikely to misclassify cohort participants with respect to their TM/TF status or HT receipt. On the other hand, it is clear that Kaiser Permanente data may not capture the complete history of gender affirmation surgeries. As many transgender patients now initiate and receive gender affirmation therapy exclusively within the KP system, the extent of agreement between EMR and self-report is expected to increase over time.

References

1. Gardner, I.H. and J.D. Safer, *Progress on the road to better medical care for transgender patients.* Curr Opin Endocrinol Diabetes Obes, 2013. **20**(6): p. 553-8.
2. Bockting, W., *From construction to context: Gender through the eyes of the transgendered.* Siecus Report, 1999. **28**: p. 3-7.
3. Giami, A. and E. Beaubatie, *Gender identification and sex reassignment surgery in the trans population: a survey study in France.* Arch Sex Behav, 2014. **43**(8): p. 1491-501.
4. Reisner, S.L., et al., *Female-to-male transmasculine adult health: a mixed-methods community-based needs assessment.* J Am Psychiatr Nurses Assoc, 2013. **19**(5): p. 293-303.
5. Knudson, G., G. De Cuypere, and W. Bockting, *Recommendations for revision of the DSM diagnoses of gender identity disorders: Consensus statement of the World Professional Association for Transgender Health.* Int J Transgenderism, 2010. **12**(2): p. 115-118.
6. Coleman, E., et al., *Standards of care for the health of transsexual, transgender, and gender-nonconforming people, version 7.* Int J Transgenderism, 2012. **13**(4): p. 165-232.
7. Gooren, L.J., *Clinical practice. Care of transsexual persons.* N Engl J Med, 2011. **364**(13): p. 1251-7.
8. Lombardi, E., *Enhancing transgender health care.* Am J Public Health, 2001. **91**(6): p. 869-72.
9. Sineath, R.C., et al., *Determinants of and Barriers to Hormonal and Surgical Treatment Receipt Among Transgender People.* Transgend Health, 2016. **1**(1): p. 129-136.
10. Leinung, M.C., et al., *Endocrine treatment of transsexual persons: extensive personal experience.* Endocr Pract, 2013. **19**(4): p. 644-50.
11. Hembree, W.C., et al., *Endocrine treatment of transsexual persons: an Endocrine Society clinical practice guideline.* J Clin Endocrinol Metab, 2009. **94**(9): p. 3132-54.

12. Feldman, J., et al., *Priorities for transgender medical and healthcare research.* Curr Opin Endocrinol Diabetes Obes, 2016. **23**(2): p. 180-7.

13. Reisner, S.L., et al., *Advancing methods for US transgender health research.* Curr Opin Endocrinol Diabetes Obes, 2016. **23**(2): p. 198-207.

14. Newell, S.A., et al., *The accuracy of self-reported health behaviors and risk factors relating to cancer and cardiovascular disease in the general population: a critical review.* Am J Prev Med, 1999. **17**(3): p. 211-29.

15. Deutsch, M.B. and D. Buchholz, *Electronic health records and transgender patients--practical recommendations for the collection of gender identity data.* J Gen Intern Med, 2015. **30**(6): p. 843-7.

16. Roblin, D., et al., *A novel method for estimating transgender status using electronic medical records.* Ann Epidemiol, 2016. **26**(3): p. 198-203.

17. Quinn, V.P., et al., *Cohort profile: Study of Transition, Outcomes and Gender (STRONG) to assess health status of transgender people.* BMJ Open, 2017. **7**(12): p. e018121.

18. Cahill, S., et al., *Do ask, do tell: high levels of acceptability by patients of routine collection of sexual orientation and gender identity data in four diverse American community health centers.* PLoS One, 2014. **9**(9): p. e107104.

19. Johnson, T.V., M. Goodman, and V.A. Master, *The efficacy of written screening tools in an inner city hospital: literacy based limitations on patient access to appropriate care.* J Urol, 2007. **178**(2): p. 623-9; discussion 629.

20. Owen-Smith, A.A., et al., *Association Between Gender Confirmation Treatments and Perceived Gender Congruence, Body Image Satisfaction, and Mental Health in a Cohort of Transgender Individuals.* J Sex Med, 2018.

21. Sineath, R.C., et al., *Determinants of and Barriers to Hormonal and Surgical Treatment Receipt Among Transgender People.* Transgender Health, 2016. **1**(1): p. 129-136.

22. Berry, M.G., R. Curtis, and D. Davies, *Female-to-male transgender chest reconstruction: a large consecutive, single-surgeon experience.* J Plast Reconstr Aesthet Surg, 2012. **65**(6): p. 711-9.

23. Cregten-Escobar, P., et al., *Subcutaneous mastectomy in female-to-male transsexuals: a retrospective cohort-analysis of 202 patients.* J Sex Med, 2012. **9**(12): p. 3148-53.

24. Spack, N.P., *Management of transgenderism.* JAMA, 2013. **309**(5): p. 478-84.

25. Wroblewski, P., J. Gustafsson, and G. Selvaggi, *Sex reassignment surgery for transsexuals.* Curr Opin Endocrinol Diabetes Obes, 2013. **20**(6): p. 570-4.

26. Zhao, J.J., et al., *Surgical site infections in genital reconstruction surgery for gender reassignment, Detroit: 1984-2008.* Surg Infect (Larchmt), 2014. **15**(2): p. 99-104.

Tables

Table 1. Selected Patient Characteristics

Patient Characteristics	All Subjects n (%)		Trans Masculine n (%)		Trans Feminine n (%)	
Age						
Under 30	202	(31.6)	138	(43.1)	64	(20.0)
30-39	142	(22.2)	95	(29.7)	47	(14.7)
40-54	155	(24.2)	64	(20.0)	91	(28.4)
55 or Older	141	(22.0)	23	(7.2)	118	(36.9)
Race/ethnicity						
Non-Hispanic Whites	380	(59.4)	184	(57.5)	196	(61.3)
Non-Hispanic Blacks	19	(3.0)	13	(4.1)	6	(1.9)
Hispanics	129	(20.2)	65	(20.3)	64	(20.0)
Other	112	(17.5)	58	(18.1)	54	(16.9)
Education						
High School Graduate or Less	74	(11.6)	45	(14.1)	29	(9.1)
At Least Some College	230	(35.9)	97	(30.3)	133	(41.6)
College Graduate	191	(29.8)	101	(31.6)	90	(28.1)
Graduate/Professional School	145	(22.7)	77	(24.1)	68	(21.3)
TOTAL	640	(100.0)	320	(100.0)	320	(100.0)

Table 2. Measures of Agreement and Concordance between EMR and Survey Data

Survey

Natal Sex

EMR		TF	TM	
	TF	318	3	321
	TM	2	317	319
		320	320	640

Sensitivity = 0.99 95% CI: (0.97-1.00)
Specificity = 0.99 95% CI: (0.98-1.00)
Kappa = 0.98 95% CI: (0.97-1.00)

Hormone Therapy

EMR		Yes	No	
	Yes	588	3	591
	No	19	30	49
		607	33	640

Sensitivity = 0.97 95% CI: (0.95-0.98)
Specificity = 0.91 95% CI: (0.76-0.98)
Kappa = 0.71 95% CI: (0.60-0.83)

Survey

Top Surgery

EMR		Yes	No	
	Yes	157	15	172
	No	166	302	468
		323	317	640

Sensitivity = 0.49 95% CI: (0.43-0.54)
Specificity = 0.95 95% CI: (0.92-0.97)
Kappa = 0.44 95% CI: (0.38-0.50)

Bottom Surgery

EMR		Yes	No	
	Yes	154	31	185
	No	73	382	455
		227	413	640

Sensitivity = 0.68 95% CI: (0.61-0.74)
Specificity = 0.93 95% CI: (0.86-0.95)
Kappa = 0.63 95% CI: (0.57-0.69)

Table 3. Odds of EMR and Survey Disagreement for Top Surgery by Demographic Variables

Variable	Category	Discordant (%)		OR	95% CI	aOR	95% CI
Natal Sex	Natal Male	67	(20.9%)	1.00		1.00	
	Natal Female	114	(35.6%)	2.41	(1.60-3.64)	2.41	(1.73-3.53)
Age	Under 30	40	(19.8%)	1.00		1.00	
	30-39	54	(38.0%)	2.37	(1.40-3.99)	2.15	(1.42-3.24)
	40-54	52	(33.5%)	2.42	(1.42-4.12)	2.30	(1.51-3.49)
	55 or Older	35	(24.8%)	1.94	(1.05-3.59)	1.83	(1.12-2.97)
Race	Non-Hispanic White	115	(30.3%)	1.00		1.00	
	Non-Hispanic Black	5	(26.3%)	0.69	(0.23-2.02)	0.72	(0.28-1.84)
	Hispanic	28	(21.7%)	0.74	(0.45-1.21)	0.75	(0.50-1.11)
	Other	33	(29.5%)	0.92	(0.57-1.48)	0.96	(0.66-1.41)
Education	Some College or Less	70	(23.0%)	1.00		1.00	
	College Graduate or More	111	(33.0%)	1.17	(0.79-1.73)	1.19	(0.87-1.63)

Table 4. Odds of EMR and Survey Disagreement for Bottom Surgery by Demographic Variables

Variable	Category	Discordant (%)		OR	95% CI	aOR	95% CI
Natal Sex	Natal Male	68	(21.3%)	1.00		1.00	
	Natal Female	36	(11.3%)	0.66	(0.40-1.09)	0.67	(0.45-0.99)
Age	Under 30	18	(8.9%)	1.00		1.00	
	30-39	14	(9.9%)	0.98	(0.46-2.10)	0.94	(0.52-1.71)
	40-54	32	(20.6%)	2.10	(1.08-4.07)	2.15	(1.29-3.60)
	55 or Older	40	(28.4%)	2.78	(1.37-5.61)	2.57	(1.48-4.46)
Race	Non-Hispanic White	70	(18.4%)	1.00		1.00	
	Non-Hispanic Black	3	(15.8%)	1.04	(0.28-3.84)	1.08	(0.35-3.35)
	Hispanic	18	(14.0%)	0.92	(0.51-1.66)	0.95	(0.59-1.51)
	Other	13	(11.6%)	0.61	(0.32-1.18)	0.67	(0.40-1.12)
Education	Some College or Less	38	(12.5%)	1.00		1.00	
	College Graduate or More	66	(19.6%)	1.47	(0.91-2.38)	1.43	(0.98-2.08)