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Assignment 3 Part 2 - Accidents part of the accident_info data

Obs	accidentid	accident severity	number of vehicles	fatal
1	201001BS70003	3	2	no
2	201001BS70006	3	2	no
3	201001BS70007	3	2	no
4	201001BS70008	3	2	no
5	201001BS70009	3	2	no
6	201001BS70010	3	2	no
7	201001BS70011	3	2	no
8	201001BS70012	3	2	no
9	201001BS70014	3	2	no
10	201001BS70015	3	2	no

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Assignment 3 Part 2 - Accidents part of the accident_info data

	fatal	
	no	ye
	N	N
accident_severity		
1	.	737
2	9,638	.
3	81,495	.

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Assignment 3 Part 2 - Accidents vehicle information data

Obs	accidentid	sex of driver	female
1	201001BS70003	2	1
2	201001BS70003	1	0
3	201001BS70004	1	0
4	201001BS70006	1	0
5	201001BS70006	1	0
6	201001BS70007	2	1
7	201001BS70007	2	1
8	201001BS70008	1	0
9	201001BS70008	1	0
10	201001BS70009	1	0
11	201001BS70009	1	0
12	201001BS70010	1	0
13	201001BS70010	1	0
14	201001BS70011	1	0
15	201001BS70011	1	0
16	201001BS70012	1	0
17	201001BS70012	1	0
18	201001BS70013	1	0
19	201001BS70014	2	1
20	201001BS70014	1	0

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Assignment 3 Part 2 - Accidents vehicle information data

	female		
	.	0	1
	N	N	N
sex_of_driver			
1	.	183,981	.
2	.	.	81,033
3	16,387	.	.

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Assignment 3 Part 2 - Accidents
vehicle_summary dataset

Obs	accidentid	TYPE	FREQ	ndriver	nfemale	nmisssex
1	201001BS70003	0	2	2	1	0
2	201001BS70004	0	1	1	0	0
3	201001BS70006	0	2	2	0	0
4	201001BS70007	0	2	2	2	0
5	201001BS70008	0	2	2	0	0
6	201001BS70009	0	2	2	0	0
7	201001BS70010	0	2	2	0	0
8	201001BS70011	0	2	2	0	0
9	201001BS70012	0	2	2	0	0
10	201001BS70013	0	1	1	0	0

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Assignment 3 Part 2 - Accidents
reduced vehicle_summary dataset

Obs	accidentid	TYPE	FREQ	ndriver	nfemale	nmisssex
1	201001BS70003	0	2	2	1	0
2	201001BS70006	0	2	2	0	0
3	201001BS70007	0	2	2	2	0
4	201001BS70008	0	2	2	0	0
5	201001BS70009	0	2	2	0	0
6	201001BS70010	0	2	2	0	0
7	201001BS70011	0	2	2	0	0
8	201001BS70012	0	2	2	0	0
9	201001BS70014	0	2	2	1	0
10	201001BS70015	0	2	2	0	0

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Merged dataset

Obs	accidentid	accident severity	number of vehicles	fatal	TYPE	FREQ	ndriver	nfemale	nmisssex
1	201001BS70003	3	2	no	0	2	2	1	0
2	201001BS70006	3	2	no	0	2	2	0	0
3	201001BS70007	3	2	no	0	2	2	2	0
4	201001BS70008	3	2	no	0	2	2	0	0
5	201001BS70009	3	2	no	0	2	2	0	0
6	201001BS70010	3	2	no	0	2	2	0	0
7	201001BS70011	3	2	no	0	2	2	0	0
8	201001BS70012	3	2	no	0	2	2	0	0
9	201001BS70014	3	2	no	0	2	2	1	0
10	201001BS70015	3	2	no	0	2	2	0	0
11	201001BS70017	3	2	no	0	2	2	0	0
12	201001BS70018	3	2	no	0	2	2	0	0
13	201001BS70021	3	2	no	0	2	2	0	0
14	201001BS70023	3	2	no	0	2	2	0	0
15	201001BS70027	3	2	no	0	2	2	1	0
16	201001BS70028	3	2	no	.	.	.	.	.
17	201001BS70029	3	2	no	0	2	2	0	0
18	201001BS70031	3	2	no	0	2	2	1	0
19	201001BS70033	2	2	no	0	2	2	0	0
20	201001BS70034	3	2	no	0	2	2	0	0

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Assignment 3 Part 2 - Accidents
Merged dataset

		fatal		fatal	
		no	ye	no	ye
	N	N	N	PctN	PctN
nfemale					
.	8,998	8,974	24	99.7	0.3
0	39,769	39,304	465	98.8	1.2
1	34,815	34,593	222	99.4	0.6
2	8,288	8,262	26	99.7	0.3

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examine if fatality rate is the same across number of females

The GENMOD Procedure

Model Information	
Data Set	WORK.MERGEDDATA
Distribution	Binomial
Link Function	Logit
Dependent Variable	fatal

Number of Observations Read	91870
Number of Observations Used	82872
Number of Events	713
Number of Trials	82872
Missing Values	8998

Class Level Information		
Class	**Levels**	**Values**
nfemale	3	0 1 2

Response Profile		
Ordered Value	**fatal**	**Total Frequency**
1	ye	713
2	no	82159

PROC GENMOD is modeling the probability that fatal='ye'.

Parameter Information		
Parameter	**Effect**	**nfemale**
Prm1	Intercept	
Prm2	nfemale	0
Prm3	nfemale	1
Prm4	nfemale	2

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examine if fatality rate is the same across number of females

The GENMOD Procedure

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-4050.3295	
Full Log Likelihood		-4050.3295	
AIC (smaller is better)		8106.6589	
AICC (smaller is better)		8106.6592	
BIC (smaller is better)		8134.6341	

Algorithm converged.

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-5.7613	0.1964	-6.1463	-5.3763	860.31	<.0001
nfemale	0	1	1.3243	0.2019	0.9286	1.7200	43.03	<.0001
nfemale	1	1	0.7126	0.2076	0.3056	1.1196	11.78	0.0006
nfemale	2	0	0.0000	0.0000	0.0000	0.0000	.	.
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

LR Statistics For Type 3 Analysis			
Source	**DF**	**Chi-Square**	**Pr > ChiSq**
nfemale	2	100.63	<.0001

nfemale Least Squares Means											
nfemale	**Estimate**	**Standard Error**	**z Value**	**Pr > |z|**	**Alpha**	**Lower**	**Upper**	**Mean**	**Standard Error of Mean**	**Lower Mean**	**Upper Mean**
0	-4.4370	0.04665	-95.12	<.0001	0.05	-4.5285	-4.3456	0.01169	0.000539	0.01068	0.01280
1	-5.0487	0.06733	-74.98	<.0001	0.05	-5.1807	-4.9168	0.006377	0.000427	0.005593	0.007270
2	-5.7613	0.1964	-29.33	<.0001	0.05	-6.1463	-5.3763	0.003137	0.000614	0.002137	0.004603

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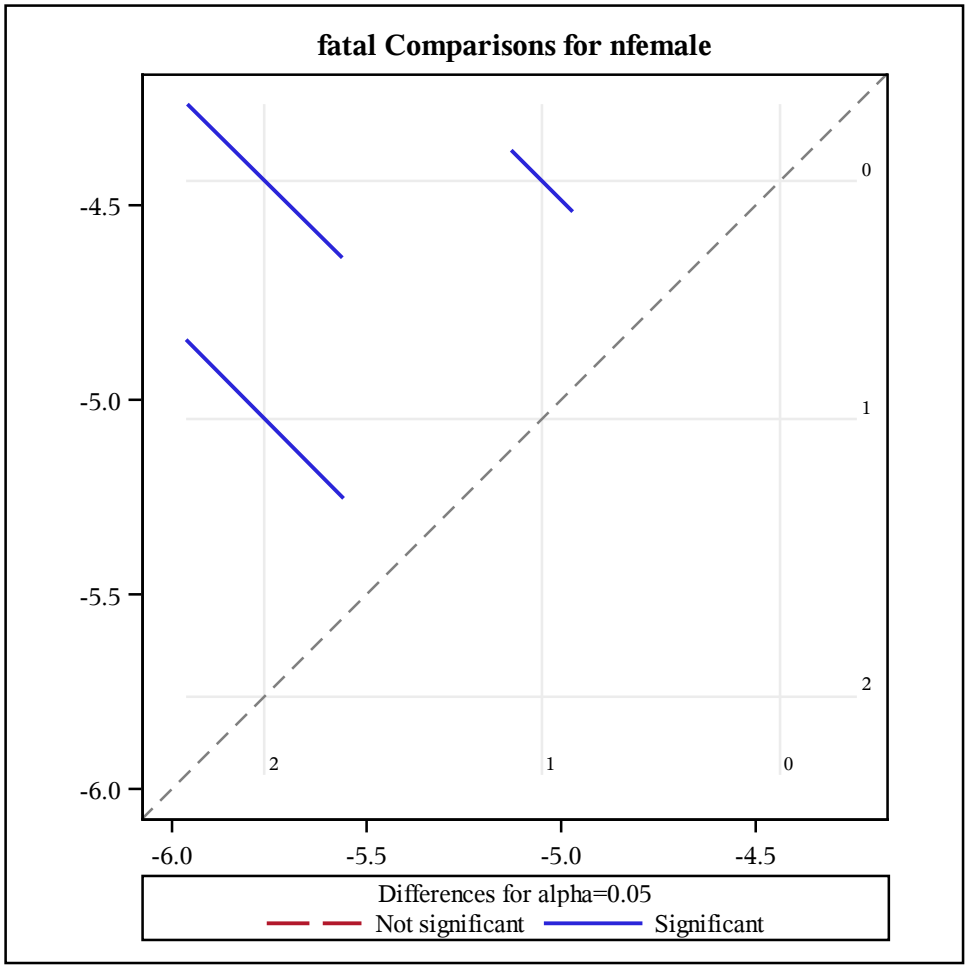
examine if fatality rate is the same across number of females

The GENMOD Procedure

Differences of nfemale Least Squares Means											
nfemale	_nfemale	Estimate	Standard Error	z Value	Pr > |z|	Alpha	Lower	Upper	Odds Ratio	Lower Confidence Limit for Odds Ratio	Upper Confidence Limit for Odds Ratio
0	1	0.6117	0.08191	7.47	<.0001	0.05	0.4511	0.7722	1.844	1.570	2.165
0	2	1.3243	0.2019	6.56	<.0001	0.05	0.9286	1.7200	3.759	2.531	5.584
1	2	0.7126	0.2076	3.43	0.0006	0.05	0.3056	1.1196	2.039	1.357	3.064



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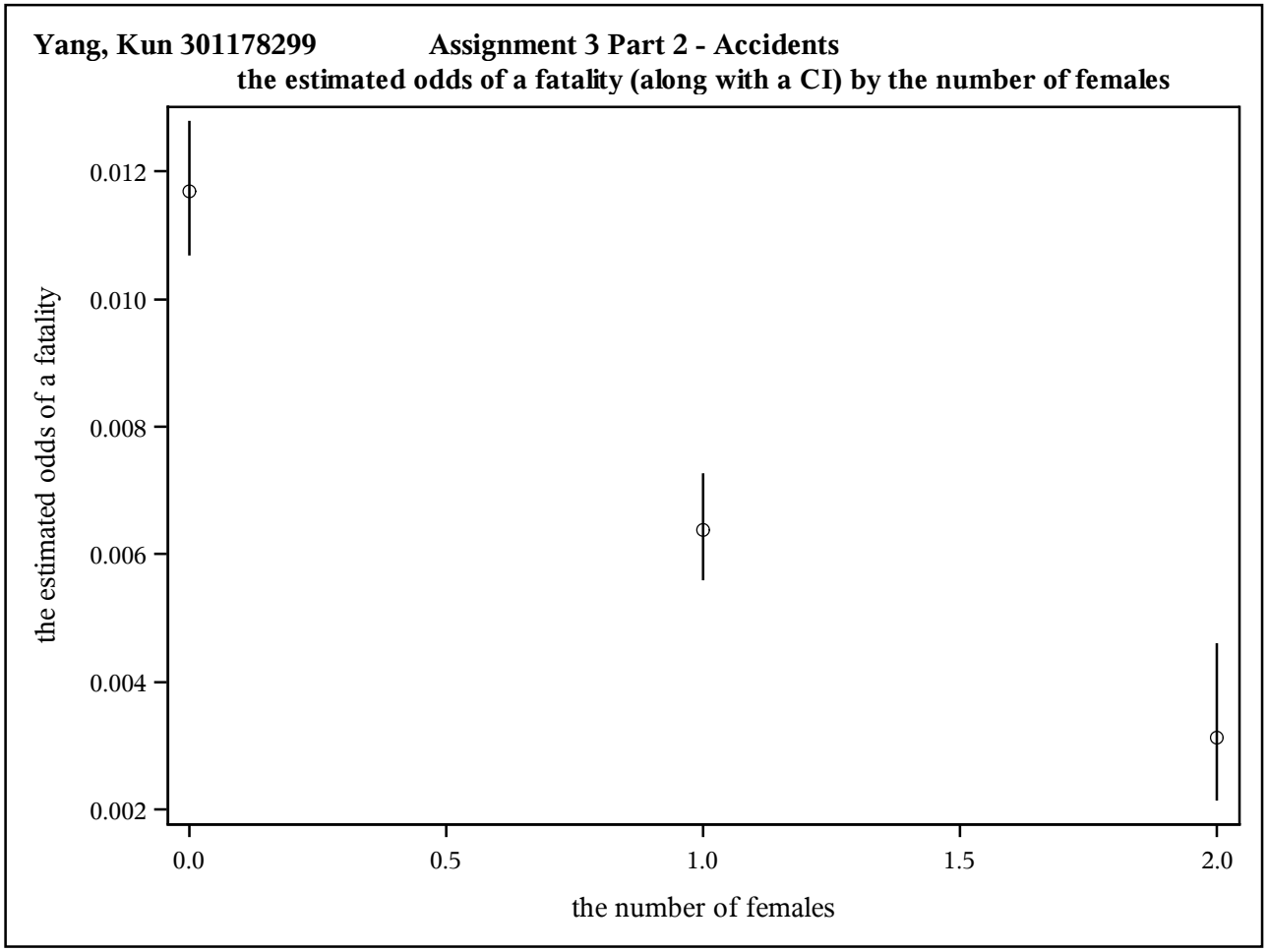
the estimated odds of a fatality by the number of females along with a CI

the number of females	the estimated odds of a fatality	Lower 95% cl	Upper 95% cl
0	0.0	0.0	0.0
1	0.0	0.0	0.0
2	0.0	0.0	0.0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the estimated odds of a fatality (along with a CI) by the number of females
the estimated odds of a fatality
0.012
0.010
0.008
0.006
0.004
0.002
0.0
0.5
1.0
1.5
2.0
the number of females