

Describing the Birth Weight Data with SAS

```
/* bweight1.sas */
options linesize=79 noovp formdlim='-';
title 'Low Birth Weight Data';
title2 'Basic Descriptive Statistics and Consistency Checks';

proc format; /* Value labels used in data step below */
  value lowfmt 0 = '2500 g +' 1 = 'Under 2500 g';
  value racefmt 1 = 'White'
              2 = 'Black'
              3 = 'Other';
  value ynfmt 0 = 'No' 1 = 'Yes';

data bigbaby;
  infile 'bweight.data' firstobs=2; /* Skip the first line that R uses */
  input id low age lwt race smoke ptl ht ui ftv bwt;
  if race = 2 then r2 = 1; else r2=0;
  if race = 3 then r3 = 1; else r3=0;
  label id      = 'Identification Code'
        low     = 'Low Birth Weight'
        lwt     = 'Weight at Last Period'
        smoke   = 'Smoke during Pregnancy'
        ptl     = 'History of Premature Labour (# of times)'
        ht      = 'History of Hypertension'
        ui      = 'Presence of Uterine Irritability'
        ftv     = 'Visits to Doctor During 1st trimester'
        bwt     = 'Birth Weight in Grams'
        r2      = 'Black vs White'
        r3      = 'Other vs White';
  /***** Value labels defined above in proc format *****/
  format low lowfmt.;
  format race racefmt.;
  format ht ui smoke ynfmt.;

proc freq;
  tables low smoke -- ftv;
proc means;
  var age lwt bwt;
proc freq;
  title3 'Some chisquare tests';
  tables low*race / chisq;
  tables race*smoke*low / nocol nopercent chisq;
  /* smoke by low for each race */

proc freq;
  title3 'Consistency Checks';
  tables race * (r2 r3) / norow nocol nopercent;
  tables bwt*low/norow nocol nopercent;
```

The FREQ Procedure

Low Birth Weight

low	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2500 g +	130	68.78	130	68.78
Under 2500 g	59	31.22	189	100.00

Smoke during Pregnancy

smoke	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	115	60.85	115	60.85
Yes	74	39.15	189	100.00

History of Premature Labour (# of times)

ptl	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	159	84.13	159	84.13
1	24	12.70	183	96.83
2	5	2.65	188	99.47
3	1	0.53	189	100.00

History of Hypertension

ht	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	177	93.65	177	93.65
Yes	12	6.35	189	100.00

Presence of Uterine Irritability

ui	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	161	85.19	161	85.19
Yes	28	14.81	189	100.00

Visits to Doctor During 1st trimester

ftv	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	100	52.91	100	52.91
1	47	24.87	147	77.78
2	30	15.87	177	93.65
3	7	3.70	184	97.35
4	4	2.12	188	99.47
6	1	0.53	189	100.00

Low Birth Weight Data 2
 Basic Descriptive Statistics and Consistency Checks
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The MEANS Procedure

Variable	Label	N	Mean	Std Dev	Minimum
age		189	23.2380952	5.2986779	14.0000000
lwt	Weight at Last Period	189	129.8148148	30.5793804	80.0000000
bwt	Birth Weight in Grams	189	2944.66	729.0269977	709.0000000

Variable	Label	Maximum
age		45.0000000
lwt	Weight at Last Period	250.0000000
bwt	Birth Weight in Grams	4990.00

Low Birth Weight Data
 Basic Descriptive Statistics and Consistency Checks
 Some chisquare tests

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The FREQ Procedure

Table of low by race

low(Low Birth Weight)	race			
Frequency	White	Black	Other	Total
Percent				
Row Pct				
Col Pct				
2500 g +	73	15	42	130
	38.62	7.94	22.22	68.78
	56.15	11.54	32.31	
	76.04	57.69	62.69	
Under 2500 g	23	11	25	59
	12.17	5.82	13.23	31.22
	38.98	18.64	42.37	
	23.96	42.31	37.31	
Total	96	26	67	189
	50.79	13.76	35.45	100.00

Statistics for Table of low by race

Statistic	DF	Value	Prob
Chi-Square	2	5.0048	0.0819
Likelihood Ratio Chi-Square	2	5.0104	0.0817
Mantel-Haenszel Chi-Square	1	3.5695	0.0588
Phi Coefficient		0.1627	
Contingency Coefficient		0.1606	
Cramer's V		0.1627	

Sample Size = 189

Table 1 of smoke by low
Controlling for race=White

		smoke(Smoke during Pregnancy) low(Low Birth Weight)		
Frequency	Row Pct	2500 g +	Under 25 00 g	Total
No		40 90.91	4 9.09	44
Yes		33 63.46	19 36.54	52
Total		73	23	96

Statistics for Table 1 of smoke by low
Controlling for race=White

Statistic	DF	Value	Prob
Chi-Square	1	9.8556	0.0017
Likelihood Ratio Chi-Square	1	10.6359	0.0011
Continuity Adj. Chi-Square	1	8.4066	0.0037
Mantel-Haenszel Chi-Square	1	9.7530	0.0018
Phi Coefficient		0.3204	
Contingency Coefficient		0.3051	
Cramer's V		0.3204	

Fisher's Exact Test

Cell (1,1) Frequency (F)	40
Left-sided Pr <= F	0.9998
Right-sided Pr >= F	0.0014
Table Probability (P)	0.0012
Two-sided Pr <= P	0.0018

Sample Size = 96

Table 2 of smoke by low
Controlling for race=Black

		smoke(Smoke during Pregnancy) low(Low Birth Weight)		
Frequency	Row Pct	2500 g +	Under 25 00 g	Total
No		11 68.75	5 31.25	16
Yes		4 40.00	6 60.00	10
Total		15	11	26

Statistics for Table 2 of smoke by low

Controlling for race=Black

Statistic	DF	Value	Prob
Chi-Square	1	2.0839	0.1489
Likelihood Ratio Chi-Square	1	2.0908	0.1482
Continuity Adj. Chi-Square	1	1.0725	0.3004
Mantel-Haenszel Chi-Square	1	2.0038	0.1569
Phi Coefficient		0.2831	
Contingency Coefficient		0.2724	
Cramer's V		0.2831	

WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Fisher's Exact Test

Cell (1,1) Frequency (F)	11
Left-sided Pr <= F	0.9683
Right-sided Pr >= F	0.1504
Table Probability (P)	0.1187
Two-sided Pr <= P	0.2280

Sample Size = 26

Table 3 of smoke by low
Controlling for race=Other

Frequency Row Pct	smoke(Smoke during Pregnancy) low(Low Birth Weight)		Total
	2500 g +	Under 25 00 g	
No	35 63.64	20 36.36	55
Yes	7 58.33	5 41.67	12
Total	42	25	67

Statistics for Table 3 of smoke by low
Controlling for race=Other

Statistic	DF	Value	Prob
Chi-Square	1	0.1184	0.7307
Likelihood Ratio Chi-Square	1	0.1171	0.7322
Continuity Adj. Chi-Square	1	0.0002	0.9882
Mantel-Haenszel Chi-Square	1	0.1167	0.7327
Phi Coefficient		0.0420	
Contingency Coefficient		0.0420	
Cramer's V		0.0420	

WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Fisher's Exact Test

Cell (1,1) Frequency (F)	35
Left-sided Pr <= F	0.7523
Right-sided Pr >= F	0.4867
Table Probability (P)	0.2390
Two-sided Pr <= P	0.7510

Sample Size = 67

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Low Birth Weight Data
 Basic Descriptive Statistics and Consistency Checks
 Consistency Checks
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The FREQ Procedure

Table of race by r2

race	r2(Black vs White)		
Frequency	0	1	Total
White	96	0	96
Black	0	26	26
Other	67	0	67
Total	163	26	189

Table of race by r3

race	r3(Other vs White)		
Frequency	0	1	Total
White	96	0	96
Black	26	0	26
Other	0	67	67
Total	122	67	189

Table of bwt by low

bwt(Birth Weight in Grams)			
low(Low Birth Weight)			
Frequency	2500 g +	Under 2500 g	Total
709	0	1	1
1021	0	1	1
1135	0	1	1
1330	0	1	1
1474	0	1	1
1588	0	2	2
1701	0	1	1
1729	0	1	1
1790	0	1	1
1818	0	1	1
1885	0	1	1
1893	0	1	1
1899	0	1	1
1928	0	3	3
1936	0	1	1
1970	0	1	1
2055	0	2	2
2082	0	1	1
2084	0	2	2
2100	0	1	1
2125	0	1	1
2126	0	1	1
2187	0	2	2
2211	0	1	1
2225	0	1	1
2240	0	2	2
2282	0	1	1
2296	0	2	2
2301	0	1	1

2325	0	1	1
2353	0	2	2
2367	0	1	1
2381	0	3	3
2395	0	1	1
2410	0	2	2
2414	0	1	1
2424	0	1	1
2438	0	1	1
2442	0	1	1
2450	0	1	1
2466	0	3	3
2495	0	4	4
2523	1	0	1
2551	1	0	1
2557	1	0	1
2594	1	0	1
2600	1	0	1
2622	1	0	1
2637	2	0	2
2663	1	0	1
2665	1	0	1
2722	1	0	1
2733	1	0	1
2750	2	0	2
2769	2	0	2
2778	1	0	1
2782	1	0	1
2807	1	0	1
2821	1	0	1
2835	2	0	2
2836	1	0	1

2863	1	0	1
2877	2	0	2
2906	1	0	1
2920	4	0	4
2948	2	0	2
2977	4	0	4
2992	1	0	1
3005	1	0	1
3033	1	0	1
3042	1	0	1
3062	3	0	3
3076	2	0	2
3080	1	0	1
3090	3	0	3
3100	1	0	1
3104	1	0	1
3132	1	0	1
3147	1	0	1
3175	2	0	2
3203	3	0	3
3225	2	0	2
3232	2	0	2
3234	1	0	1
3260	1	0	1
3274	2	0	2
3303	1	0	1
3317	3	0	3
3321	1	0	1
3331	1	0	1
3374	2	0	2
3402	1	0	1
3416	1	0	1
3430	1	0	1

3444	1	0	1
3459	1	0	1
3460	1	0	1
3473	1	0	1
3475	1	0	1
3487	1	0	1
3544	1	0	1
3572	1	0	1
3573	1	0	1
3586	1	0	1
3600	1	0	1
3614	2	0	2
3629	2	0	2
3637	1	0	1
3643	1	0	1
3651	4	0	4
3699	1	0	1
3728	1	0	1
3756	1	0	1
3770	3	0	3
3790	1	0	1
3799	1	0	1
3827	1	0	1
3856	1	0	1
3860	2	0	2
3884	2	0	2
3912	1	0	1
3940	1	0	1
3941	2	0	2
3969	1	0	1
3983	1	0	1
3997	2	0	2

4054	2	0	2
4111	1	0	1
4153	1	0	1
4167	1	0	1
4174	1	0	1
4238	1	0	1
4593	1	0	1
4990	1	0	1
Total	130	59	189