

**Supplementary Document
for
A SPATIAL SCAN STATISTIC FOR COMPOUND
POISSON DATA, USING NEGATIVE BINOMIAL
DISTRIBUTION AND ACCOUNTING FOR
POPULATION STRATIFICATION**

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Supplementary Material

Tables and Figures for Section 4

Table 1: Aboriginal and Welfare Recipient Subregional Population Size

Fiscal Year	sub-RHA									
	1	2	3	4	...	66	67	68	69	70
1999/2000	975	3129	1852	402	...	1312	844	41	3293	1111
2000/2001	977	3089	1791	379	...	1312	823	41	3343	1096
2001/2002	914	3047	1809	378	...	1290	806	50	3369	1125
2002/2003	869	2936	1882	402	...	1424	800	46	3348	1168
2003/2004	888	2910	1945	402	...	1525	780	42	3367	1168
2004/2005	835	2906	1984	337	...	1532	754	31	3382	1210

Table 2: Cases (and Events) by Fiscal Year and sub-RHA

Fiscal Year	sub-RHA									
	1	2	3	4	...	68	69	70		
1999/2000	23(32)	93(136)	52(76)	13(43)	...	0	22(27)	29(34)		
2000/2001	23(29)	79(103)	55(79)	11(17)	...	0	17(23)	27(31)		
2001/2002	20(29)	80(119)	50(68)	–	...	0	29(34)	18(21)		
2002/2003	20(22)	76(111)	60(95)	12(20)	...	0	19(24)	21(27)		
2003/2004	24(33)	85(132)	61(91)	9(11)	...	0	21(25)	22(28)		
2004/2005	27(38)	83(138)	43(63)	18(39)	...	0	18(22)	22(28)		

– denotes suppressed cell case counts (<6) to ensure non-identifiability of individual children and youth

Table 3: Retrospective Analysis, Negative Binomial Model, $\beta = 7$

Fiscal	statistical summary				
Year	most likely cluster	cases (events)	η	ϕ	p-value
1999/2000	{23, 27, 28, 29, 33}	307 (442)	36.319	1.933	<0.001
2000/2001	{36, 39, 51, 52, 58, 62}	155 (251)	10.483	3.097	<0.004
2001/2002	{63, 64}	51 (77)	8.729	3.444	<0.010
2002/2003	{1, 2, 3, 4, 20, 21, 22, 25, 26}	232 (360)	14.013	3.012	<0.002
2003/2004	{1, 2, 3, 4, 20, 21, 22, 25, 26}	247 (375)	12.622	2.342	<0.002
2004/2005	{1, 2, 3, 4, 26}	191 (300)	14.031	3.734	<0.001

Fiscal	statistical summary	
Year	secondary clusters	CT
1999/2000		3.50
2000/2001	{63, 64}	3.60
2001/2002	{27}	3.54
2002/2003	{27}, {7}	3.50
2003/2004		3.55
2004/2005	{41, 42, 43, 45, 48, 56, 57, 60}	3.57

Table 4: Retrospective Analysis, Compound Poisson Model, $\beta = 7$

Fiscal	statistical summary				
Year	most likely cluster	cases (events)	η	ϕ	p-value
1999/2000	{65, 66}	100 (165)	18.167	2.886	<0.001
2000/2001	{36, 62}	138 (210)	8.894	2.186	<0.016
2001/2002	{18, 19, 20, 21, 22, 26}	70 (98)	10.130	2.534	<0.009
2002/2003	{3, 4, 5, 7}	91 (150)	16.282	2.151	<0.001
2003/2004	{2, 3}	146 (223)	10.072	1.613	<0.019
2004/2005	{2, 3, 4}	144 (240)	12.295	1.664	<0.006

Fiscal	statistical summary	
Year	secondary clusters	CT
1999/2000	{4}, {2, 3}	11.46
2000/2001	{63, 64, 67, 68}	11.80
2001/2002	{36, 62}, {27}	10.92
2002/2003	{27}	11.19
2003/2004		12.67
2004/2005		12.31

Table 7: Relative Frequencies

x	Fiscal Years					
	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005
1	75.47%	73.86%	74.61%	75.78%	75.56%	76.86%
2	15.03%	15.08%	16.38%	15.36%	15.94%	14.35%
3	4.52%	5.83%	4.96%	4.36%	3.91%	4.55%
4	2.33%	2.88%	2.13%	2.28%	1.92%	1.96%
5	1.20%	1.01%	0.92%	0.83%	1.12%	1.07%
6	0.73%	0.67%	0.57%	0.62%	0.68%	0.51%
7	0.27%	0.27%	0.14%	0.21%	0.50%	0.19%
8	0.27%	0.27%	0.21%	0.21%	0.12%	0.06%
9	0.00%	0.00%	0.00%	0.07%	0.12%	0.38%
10	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%
11	0.13%	0.07%	0.00%	0.14%	0.06%	0.00%
12	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
14	0.00%	0.00%	0.07%	0.07%	0.00%	0.00%
15	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.06%	0.06%

Table 8: Retrospective Analysis, Negative Binomial Model, No Stratification, $\beta = 7$

Fiscal	statistical summary				
Year	most likely cluster	events	η	ϕ	p-value
1999/2000	{66}	1194	236.084	3.424	<0.001
2000/2001	{36, 62}	1049	111.240	7.302	<0.001
2001/2002	{64, 65, 66}	1365	139.102	2.438	<0.001
2002/2003	{1, 2, 3, 4, 5, 7, 25}	1658	90.139	4.269	<0.001
2003/2004	{1, 2, 3, 4, 5, 7, 25, 26}	1965	68.549	2.349	<0.001
2004/2005	{1, 2, 3, 4, 5, 7, 25, 26}	1868	63.015	2.452	<0.001

Fiscal	statistical summary	
Year	secondary clusters	CT
1999/2000	{36, 62}, {29, 30, 31, 32}, {1, 2, 3, 4, 5, 7, 25}	3.37
2000/2001	{59, 63, 65, 66}, {58}, {29, 30, 31, 32}	3.17
2001/2002	{36}, {1, 2, 3, 4, 5, 7, 25, 26}, {30, 31, 32}, {27}	3.48
2002/2003	{59, 63, 65, 66}, {27}	3.39
2003/2004	{59, 63, 65, 66}, {29, 30, 31, 32}, {36, 62}, {27}	3.49
2004/2005	{59, 63, 65, 66}, {29, 30, 31, 53}, {34, 35}, {36, 62}	3.52

Table 9: Retrospective Analysis, Negative Binomial Model, Sex Stratified, $\beta = 7$

Fiscal	statistical summary					
Year	most likely cluster	events	η	ϕ	p-value	CT
1999/2000	{66}	1194	238.716	3.425	<0.001	6.66
2000/2001	{59, 63, 64, 65, 66}	1912	126.374	1.585	<0.001	6.64
2001/2002	{59, 63, 64, 65, 66}	2004	168.167	2.474	<0.001	6.78
2002/2003	{59, 63, 64, 65, 66}	1697	101.186	1.872	<0.001	6.49
2003/2004	{59, 63, 64, 65, 66}	1580	59.316	2.066	<0.001	6.73
2004/2005	{59, 63, 64, 65, 66}	1582	75.026	2.573	<0.001	6.80

Table 10: Retrospective Analysis, Negative Binomial Model, Age Stratified, $\beta = 7$

Fiscal	statistical summary					
Year	most likely cluster	events	η	ϕ	p-value	CT
1999/2000	{66}	1194	671.518	4.205	<0.001	19.51
2000/2001	{59, 63, 64, 65, 66}	1912	485.073	1.701	<0.001	19.12
2001/2002	{59, 63, 64, 65, 66}	2004	530.151	2.409	<0.001	19.87
2002/2003	{59, 63, 64, 65, 66}	1697	440.489	1.726	<0.001	19.83
2003/2004	{59, 63, 64, 65, 66}	1580	418.572	2.209	<0.001	19.89
2004/2005	{59, 63, 64, 65, 66}	1582	430.706	2.405	<0.001	19.58

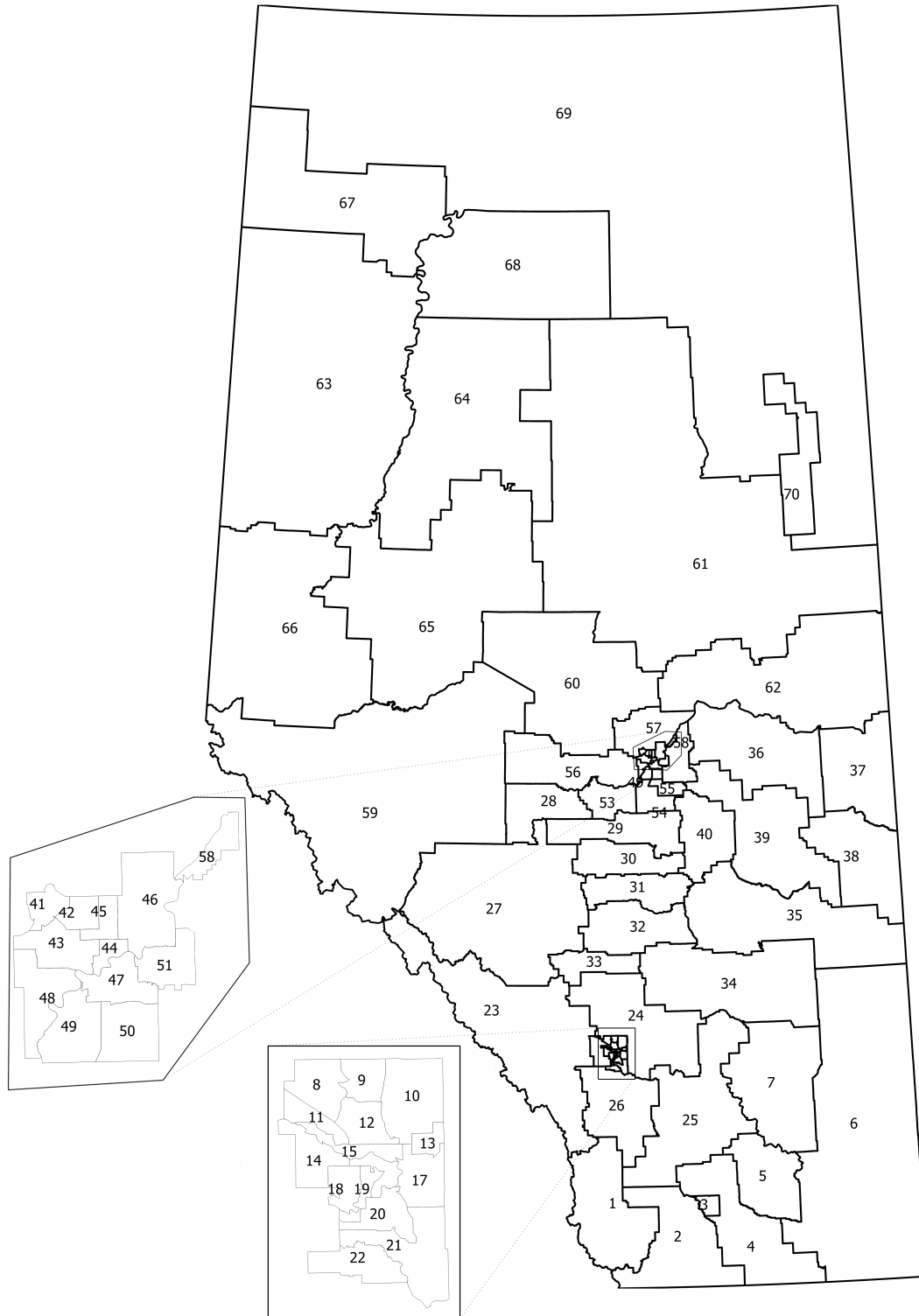


Figure 1: Cells in Alberta.