

Table 42. Adjusted Odds Ratios and 95% Confidence Intervals for E. Coli by Quintiles and from a Linear Model.†

	Quintile (cfu)					linear model
	1	2	3	4	5	
midpoints:	2.00	7.50	23.00	56.00	310.00	
# exposed:	2122	2096	2141	2052	2082	
<b>Fever</b>	99 1.00	104 1.06 0.80-1.41	85 0.81 0.60-1.09	119 1.21 0.92-1.60	98 0.97 0.72-1.31	0.99 0.94-1.05
<b>Chills</b>	56 1.00	48 0.86 0.58-1.27	48 0.83 0.56-1.22	56 0.99 0.67-1.45	50 0.80 0.54-1.20	0.98 0.90-1.06
<b>Eye discharge</b>	36 1.00	43 1.21 0.77-1.90	41 1.10 0.70-1.74	33 0.97 0.59-1.57	37 1.13 0.70-1.83	1.05 0.99-1.11
<b>Karache</b>	83 1.00	67 0.80 0.57-1.10	71 0.82 0.59-1.13	57 0.64 0.45-0.92	82 0.91 0.66-1.27	1.03 0.98-1.08
<b>Ear discharge</b>	16 1.00	14 0.84 0.41-1.74	16 0.93 0.46-1.87	9 0.48 0.21-1.10	14 0.68 0.33-1.44	0.95 0.79-1.15
<b>Skin rash*</b>	16 1.00	18 1.08 0.55-2.13	25 1.38 0.73-2.60	18 1.11 0.56-2.21	23 1.58 0.81-3.06	1.09 1.02-1.16
<b>Infected cut</b>	11 1.00	13 1.16 0.52-2.60	19 1.67 0.79-3.54	7 0.54 0.21-1.42	14 1.02 0.45-2.31	1.02 0.90-1.15
<b>Nausea</b>	85 1.00	68 0.80 0.58-1.11	72 0.82 0.60-1.13	78 0.88 0.63-1.21	82 0.87 0.63-1.20	1.04 0.99-1.08
<b>Vomiting</b>	47 1.00	30 0.64 0.40-1.02	33 0.68 0.43-1.06	36 0.79 0.51-1.24	36 0.75 0.48-1.19	1.02 0.95-1.10
<b>Diarrhea</b>	109 1.00	125 1.14 0.88-1.49	860 0.75 0.56-1.00	122 1.03 0.79-1.36	115 0.89 0.67-1.17	1.02 0.97-1.06
<b>Diarrhea with blood</b>	2 1.00	1 0.48 0.04-5.27	2 0.84 0.12-6.03	3 1.42 0.23-8.74	3 1.15 0.18-7.38	0.75 0.28-1.99
<b>Stomach pain</b>	141 1.00	119 0.84 0.65-1.09	109 0.75 0.58-0.97	145 1.00 0.78-1.28	135 0.87 0.68-1.12	1.03 0.99-1.07
<b>Cough</b>	150 1.00	157 1.07 0.85-1.35	140 0.91 0.72-1.16	141 0.97 0.76-1.24	149 1.03 0.81-1.32	1.03 0.99-1.07
<b>Cough &amp; phlegm</b>	67 1.00	91 1.38 1.00-1.91	69 1.01 0.71-1.42	61 0.92 0.64-1.31	67 0.98 0.68-1.39	1.03 0.97-1.08

Table 42 (continued)

Runny nose	197 1.00	204 1.04 0.84-1.27	173 0.84 0.68-1.04	189 0.95 0.77-1.18	192 0.94 0.76-1.17	1.02 0.99-1.06
Sore throat	145 1.00	154 1.07 0.84-1.35	131 0.87 0.68-1.11	138 0.94 0.74-1.21	139 0.92 0.72-1.18	1.01 0.97-1.05
HCGI 1	83 1.00	56 0.68 0.48-0.96	48 0.55 0.38-0.79	66 0.79 0.56-1.11	64 0.74 0.52-1.05	1.02 0.97-1.08
HCGI 2	22 1.00	14 0.63 0.32-1.24	14 0.60 0.31-1.18	24 1.04 0.58-1.89	19 0.75 0.40-1.42	1.02 0.92-1.13
Signif. resp. disease	114 1.00	147 1.32 1.03-1.70	113 0.97 0.74-1.26	116 1.03 0.79-1.36	107 0.92 0.69-1.22	1.02 0.98-1.06

\* Statistically significant at  $p < .05$ .

† Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects with each outcome are given on the first line.

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Table 43. Risks For High vs. Low Enterococcus Indicator Counts

SYMPTOMS	Total exposed = 848		Total unexposed = 9561		RR	Lower 95%CI	Upper 95% CI
	Ill	Risk	Ill	Risks			
Fever	45	0.053	455	0.048	1.12	0.83	1.50
Chills	24	0.028	231	0.024	1.17	0.77	1.77
Eye discharge	16	0.019	174	0.018	1.04	0.62	1.72
Earache	31	0.037	327	0.034	1.07	0.74	1.53
Ear discharge	4	0.005	64	0.007	0.70	0.26	1.93
Skin rash	13	0.015	87	0.009	1.68	0.94	3.00
Infected cut	68	0.080	58	0.006	13.22	9.38	18.63
Nausea	40	0.047	344	0.036	1.31	0.95	1.81
Vomiting	18	0.021	164	0.017	1.24	0.76	2.00
Diarrhea	57	0.067	499	0.052	1.29	0.99	1.68
Diarrhea w/ blood *	3	0.004	8	0.001	4.23	1.12	15.91
Stomach pain	59	0.070	590	0.062	1.13	0.87	1.46
Coughing	63	0.074	675	0.071	1.05	0.82	1.35
Phlegm	31	0.037	325	0.034	1.08	0.75	1.54
Nasal congestion	85	0.100	869	0.091	1.10	0.89	1.36
Sore throat	52	0.061	651	0.068	0.90	0.69	1.18
HCGI 1 *	36	0.042	281	0.029	1.44	1.03	2.03
HCGI 2	12	0.014	81	0.008	1.67	0.91	3.05
SRD	45	0.053	481	0.050	1.05	0.78	1.42

\* statistically significant at p < 0.05

Table 44. Risks For High vs. Low Bacterial Indicators  
enterococcus

Symptoms	> 35 cfu		> 106 cfu	
	RR	95% CI	RR	95% CI
Fever	0.97	0.80, 1.18	1.08	0.80, 1.46
Chills	0.81	0.61, 1.08	1.15	0.76, 1.74
Eye discharge	0.77	0.55, 1.09	1.01	0.61, 1.68
Earache	0.91	0.72, 1.16	1.04	0.73, 1.50
Ear discharge	0.85	0.49, 1.48	0.68	0.25, 1.86
Skin rash	0.99	0.63, 1.54	1.65	0.92, 2.94
Infected cut	1.10	0.64, 1.90	1.14	0.49, 2.64
Nausea	1.17	0.94, 1.45	1.28	0.93, 1.76
Vomiting	1.15	0.84, 1.57	1.20	0.74, 1.95
Diarrhea	1.12	0.93, 1.33	1.25	0.96, 1.63
Diarrhea w/ blood*	1.06	0.28, 3.97	4.14	1.10, 15.57
Stomach pain	1.11	0.95, 1.31	1.10	0.85, 1.42
Coughing	0.93	0.79, 1.09	1.05	0.82, 1.34
Phlegm	0.97	0.77, 1.22	1.11	0.78, 1.58
Nasal congestion	1.00	0.87, 1.14	1.10	0.89, 1.35
Sore throat	0.90	0.76, 1.06	0.89	0.68, 1.17
HCGI 1*	1.08	0.85, 1.37	1.41	1.00, 1.98
HCGI 2*	1.10	0.70, 1.72	1.68	1.08, 2.61
SRD	0.92	0.76, 1.12	1.67	0.91, 3.05

\* statistically significant at  $p < 0.05$

Table 45. Crude Odds Ratios and 95% Confidence Intervals for Enterococcus by Quintiles and from a Linear Model.†

	Quintile (cfu)					linear model
	1	2	3	4	5	
midpoints:	2.00	6.50	17.25	27.75	90.25	
# exposed:	2284	1928	2167	2065	1965	
<b>Fever*</b>	111 1.00	80 0.85 0.63-1.14	117 1.12 0.86-1.46	99 0.99 0.75-1.30	93 0.97 0.73-1.29	1.04 1.01-1.06
<b>Chills</b>	62 1.00	44 0.84 0.57-1.24	56 0.95 0.66-1.37	46 0.82 0.55-1.20	47 0.88 0.60-1.29	0.96 0.88-1.06
<b>Eye discharge</b>	41 1.00	38 1.10 0.70-1.72	40 1.03 0.66-1.60	37 1.00 0.64-1.56	34 0.96 0.61-1.52	1.03 0.99-1.07
<b>Earache</b>	79 1.00	75 1.13 0.82-1.56	63 0.84 0.60-1.17	76 1.07 0.77-1.47	65 0.95 0.68-1.33	0.99 0.93-1.04
<b>Ear discharge</b>	22 1.00	10 0.54 0.25-1.13	14 0.67 0.34-1.31	9 0.45 0.21-0.98	13 0.68 0.34-1.36	0.95 0.76-1.18
<b>Skin rash*</b>	20 1.00	9 0.53 0.24-1.17	29 1.54 0.87-2.72	20 1.11 0.59-2.06	22 1.28 0.70-2.36	1.06 1.03-1.09
<b>Infected cut</b>	16 1.00	10 0.74 0.33-1.63	8 0.53 0.22-1.23	15 1.04 0.51-2.10	15 1.09 0.54-2.21	1.00 0.90-1.11
<b>Nausea*</b>	74 1.00	65 1.04 0.74-1.46	83 1.19 0.86-1.64	82 1.23 0.90-1.70	80 1.27 0.92-1.75	1.04 1.02-1.06
<b>Vomiting</b>	35 1.00	30 1.02 0.62-1.66	43 1.30 0.83-2.04	36 1.14 0.71-1.82	38 1.27 0.80-2.01	1.02 0.98-1.07
<b>Diarrhea*</b>	106 1.00	116 1.32 1.00-1.72	113 1.13 0.86-1.48	103 1.08 0.82-1.42	118 1.31 1.00-1.72	1.04 1.02-1.06
<b>Diarrhea with blood</b>	3 1.00	1 0.39 0.04-3.80	2 0.70 0.12-4.21	2 0.74 0.12-4.42	3 1.16 0.23-5.77	1.04 0.92-1.17
<b>Stomach pain*</b>	128 1.00	121 1.13 0.87-1.46	139 1.15 0.90-1.48	119 1.03 0.80-1.33	142 1.31 1.02-1.68	1.02 1.00-1.05
<b>Cough*</b>	145 1.00	128 1.05 0.82-1.34	168 1.24 0.98-1.56	167 1.30 1.03-1.64	130 1.05 0.82-1.33	1.03 1.00-1.05
<b>Cough &amp; phlegm</b>	72 1.00	67 1.11 0.79-1.55	74 1.09 0.78-1.51	77 1.19 0.86-1.65	66 1.07 0.76-1.50	1.02 0.99-1.05

Table 45 (continued)

Runny nose*	198 1.00	175 1.05 0.85-1.30	206 1.11 0.90-1.36	185 1.04 0.84-1.28	190 1.13 0.92-1.39	1.03 1.00-1.05
Sore throat	136 1.00	133 1.17 0.91-1.50	158 1.24 0.98-1.57	161 1.34 1.05-1.69	115 0.98 0.76-1.27	1.01 0.99-1.04
HCGI 1*	70 1.00	52 0.88 0.61-1.26	73 1.10 0.79-1.54	58 0.91 0.64-1.30	64 1.06 0.75-1.50	1.04 1.02-1.07
HCGI 2	15 1.00	11 0.87 0.40-1.90	29 2.05 1.10-3.84	17 1.26 0.63-2.52	21 1.63 0.84-3.18	1.04 0.99-1.08
Signif. resp. disease	128 1.00	106 0.98 0.75-1.28	127 1.05 0.81-1.35	130 1.13 0.88-1.46	103 0.93 0.71-1.22	1.00 0.97-1.04

\* Statistically significant at  $p < .05$ .

† Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects with each outcome are given on the first line.

Table 46. Adjusted Odds Ratios and 95% Confidence Intervals for Enterococcus by Quintiles and from a Linear Model.†

	Quintile (cfu)					linear model
	1	2	3	4	5	
midpoints:	2.00	6.50	17.25	27.75	90.25	
# exposed:	2284	1928	2167	2065	1965	
<b>Fever*</b>	111 1.00	80 0.85 0.63-1.14	117 1.10 0.84-1.44	99 0.93 0.70-1.23	93 0.90 0.67-1.21	1.03 1.01-1.06
<b>Chills</b>	62 1.00	44 0.86 0.58-1.28	56 0.96 0.66-1.39	46 0.78 0.53-1.16	47 0.79 0.53-1.19	0.94 0.83-1.06
<b>Eye discharge</b>	41 1.00	38 1.12 0.71-1.75	40 1.01 0.65-1.57	37 0.99 0.63-1.57	34 1.02 0.63-1.66	1.03 0.99-1.07
<b>Earache</b>	79 1.00	75 1.11 0.80-1.54	63 0.83 0.59-1.16	76 0.98 0.71-1.37	65 0.84 0.59-1.20	0.97 0.90-1.04
<b>Ear discharge</b>	22 1.00	10 0.53 0.25-1.14	14 0.66 0.33-1.29	9 0.39 0.18-0.87	13 0.53 0.26-1.10	0.89 0.66-1.19
<b>Skin rash*</b>	20 1.00	9 0.52 0.23-1.15	29 1.41 0.79-2.50	20 0.99 0.53-1.88	22 1.27 0.66-2.45	1.06 1.03-1.10
<b>Infected cut</b>	16 1.00	10 0.71 0.32-1.59	8 0.53 0.22-1.24	15 0.91 0.44-1.89	15 0.88 0.41-1.85	0.98 0.86-1.12
<b>Nausea*</b>	74 1.00	65 1.06 0.75-1.48	83 1.20 0.87-1.66	82 1.17 0.85-1.63	80 1.14 0.81-1.59	1.04 1.01-1.06
<b>Vomiting</b>	35 1.00	30 1.08 0.66-1.76	43 1.33 0.84-2.08	36 1.18 0.74-1.90	38 1.34 0.82-2.17	1.03 0.99-1.08
<b>Diarrhea*</b>	106 1.00	116 1.26 0.96-1.66	113 1.12 0.85-1.47	103 0.96 0.72-1.28	118 1.05 0.79-1.40	1.03 1.01-1.05
<b>Diarrhea with blood</b>	3 1.00	1 0.42 0.04-4.07	2 0.71 0.12-4.27	2 0.69 0.11-4.24	3 1.01 0.19-5.39	1.05 0.91-1.22
<b>Stomach pain</b>	128 1.00	121 1.13 0.87-1.46	139 1.17 0.91-1.50	119 0.99 0.76-1.28	142 1.18 0.91-1.53	1.02 0.99-1.05
<b>Cough*</b>	145 1.00	128 1.07 0.84-1.38	168 1.25 0.99-1.57	7 1.29 1.02-1.63	130 1.06 0.82-1.38	1.03 1.01-1.05
<b>Cough &amp; phlegm</b>	72 1.00	67 1.15 0.82-1.62	74 1.09 0.79-1.52	77 1.18 0.85-1.65	66 1.08 0.76-1.55	1.02 0.99-1.06

Table 46 (continued)

Runny*	198	175	206	185	190	
Nose	1.00	1.05	1.11	0.99	1.07	1.02
		0.84-1.30	0.90-1.36	0.80-1.23	0.85-1.33	1.00-1.05
Sore	136	133	158	161	115	
Throat	1.00	1.18	1.25	1.29	0.92	1.01
		0.92-1.51	0.98-1.59	1.01-1.64	0.70-1.20	0.98-1.04
HCGI 1*	70	52	73	58	64	
	1.00	0.90	1.11	0.89	1.02	1.04
		0.62-1.29	0.79-1.55	0.62-1.28	0.71-1.46	1.02-1.07
HCGI 2*	15	11	29	17	21	
	1.00	0.93	2.11	1.22	1.49	1.04
		0.42-2.04	1.12-3.96	0.60-2.47	0.74-2.97	1.00-1.09
Signif.	128	106	127	130	103	
resp.	1.00	1.01	1.06	1.11	0.92	1.01
disease		0.77-1.32	0.82-1.36	0.86-1.44	0.70-1.22	0.97-1.04

\* Statistically significant at  $p < .05$ .

† Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects with each outcome are given on the first line.



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Table 47. Risks For High vs. Low Total Coliform Indicator Counts

SYMPTOMS	Total Exposed = 847		Total Unexposed = 9562		RR	Lower 95% CI	Upper 95% CI
	Ill	Risk	Ill	Risks			
Fever	44	0.052	456	0.048	1.09	0.81	1.47
Chills	11	0.013	244	0.026	0.51	0.28	0.93
Eye discharge	18	0.021	172	0.018	1.18	0.73	1.91
Earache	22	0.026	336	0.035	0.74	0.48	1.13
Ear discharge	2	0.002	66	0.007	0.34	0.08	1.39
Skin rash*	21	0.025	79	0.008	3.00	1.86	4.83
Infected cut	4	0.005	60	0.006	0.75	0.27	2.07
Nausea	23	0.027	361	0.038	0.72	0.47	1.09
Vomiting	11	0.013	171	0.018	0.73	0.40	1.33
Diarrhea	37	0.044	519	0.054	0.80	0.58	1.12
Diarrhea w/ blood	1	0.001	10	0.001	1.13	0.14	8.81
Stomach pain	37	0.044	612	0.064	0.68	0.49	0.94
Coughing	59	0.070	679	0.071	0.98	0.76	1.27
Phlegm	31	0.037	325	0.034	1.08	0.75	1.55
Nasal congestion	81	0.096	873	0.091	1.05	0.84	1.30
Sore throat	53	0.063	650	0.068	0.92	0.70	1.21
HCGI 1	21	0.025	296	0.031	0.80	0.52	1.24
HCGI 2	5	0.006	88	0.009	0.64	0.26	1.58
SRD	46	0.054	480	0.050	1.08	0.81	1.45

\* statistically significant at p < 0.05

Table 48. Risks For High vs. Low Bacterial Indicators

total coliforms

Symptoms	> 1000 cfu		> 10,000 cfu	
	RR	95% CI	RR	95% CI
Fever	0.97	0.80, 1.17	1.11	0.82, 1.49
Chills	0.86	0.65, 1.14	0.51	0.28, 0.93
Eye discharge	0.69	0.49, 0.98	1.18	0.73, 1.91
Earache	0.87	0.69, 1.10	0.74	0.48, 1.13
Ear discharge	0.87	0.51, 1.51	0.34	0.08, 1.37
Skin rash*	1.44	0.96, 2.17	3.00	1.87, 4.84
Infected cut	0.82	0.46, 1.46	0.75	0.27, 2.07
Nausea	0.84	0.67, 1.06	0.72	0.47, 1.09
Vomiting	0.87	0.62, 1.22	0.72	0.39, 1.32
Diarrhea	0.75	0.62, 0.92	0.80	0.58, 1.11
Diarrhea w/ blood	1.00	0.27, 3.78	1.13	0.14, 8.82
Stomach pain	0.88	0.74, 1.05	0.68	0.49, 0.94
Coughing	0.95	0.82, 1.12	0.98	0.76, 1.27
Phlegm	0.88	0.69, 1.11	1.06	0.74, 1.53
Nasal congestion	0.96	0.84, 1.10	1.04	0.84, 1.29
Sore throat	0.84	0.71, 1.00	0.91	0.70, 1.20
HCGI 1	0.83	0.64, 1.07	0.80	0.52, 1.24
HCGI 2	0.78	0.48, 1.26	0.64	0.26, 1.58
SRD	0.88	0.72, 1.06	1.07	0.80, 1.43

\* statistically significant at  $p < 0.05$

Table 49. Crude Odds Ratios and 95% Confidence Intervals for Total Coliform by Quintiles and From a Linear Model.

	Quintile					linear model*
	1	2	3	4	5	
midpoints:	22.75	86.00	259.75	834.25	6680.00	
# exposed:	2108	2102	2059	2062	2078	
Fever	96.00 1.00	103.00 1.08 0.81-1.44	115.00 1.24 0.94-1.64	84.00 0.89 0.66-1.20	102.00 1.08 0.81-1.44	0.99 0.96-1.02
Chills	53.00 1.00	62.00 1.18 0.81-1.71	52.00 1.00 0.68-1.48	46.00 0.88 0.59-1.32	42.00 0.80 0.53-1.20	0.98 0.94-1.03
Eye discharge	24.00 1.00	55.00 2.33 1.44-3.78	51.00 2.21 1.35-3.60	28.00 1.20 0.69-2.07	32.00 1.36 0.80-2.31	1.01 0.98-1.04
Earache	77.00 1.00	73.00 0.95 0.68-1.31	82.00 1.09 0.80-1.50	64.00 0.84 0.60-1.18	62.00 0.81 0.58-1.14	0.96 0.90-1.01
Ear discharge	16.00 1.00	13.00 0.81 0.39-1.70	18.00 1.15 0.59-2.27	9.00 0.57 0.25-1.30	12.00 0.76 0.36-1.61	0.76 0.51-1.13
Skin rash*	13.00 1.00	14.00 1.08 0.51-2.30	30.00 2.38 1.24-4.58	14.00 1.10 0.52-2.35	29.00 2.28 1.18-4.40	1.01 0.97-1.05
Infected cut	18.00 1.00	10.00 0.56 0.26-1.21	12.00 0.68 0.33-1.42	12.00 0.68 0.33-1.41	12.00 0.67 0.32-1.40	1.02 0.98-1.05
Nausea	69.00 1.00	93.00 1.37 1.00-1.88	92.00 1.38 1.01-1.90	65.00 0.96 0.68-1.36	65.00 0.95 0.68-1.35	1.00 0.98-1.03
Vomiting	31.00 1.00	37.00 1.20 0.74-1.94	45.00 1.50 0.94-2.38	36.00 1.19 0.73-1.93	33.00 1.08 0.66-1.77	1.01 0.98-1.04
Diarrhea	110.00 1.00	130.00 1.20 0.92-1.56	139.00 1.31 1.02-1.70	92.00 0.85 0.64-1.13	85.00 0.77 0.58-1.04	0.99 0.97-1.02
Diarrhea with blood	2.00 1.00	2.00 1.00 0.14-7.13	3.00 1.54 0.26-9.21	2.00 1.02 0.14-7.26	2.00 1.01 0.14-7.21	0.88 0.47-1.64
Stomach pain	134.00 1.00	132.00 0.99 0.77-1.27	139.00 1.07 0.83-1.36	131.00 1.00 0.78-1.28	113.00 0.85 0.65-1.10	1.00 0.99-1.02
Cough	142.00 1.00	150.00 1.06 0.84-1.35	177.00 1.30 1.03-1.64	121.00 0.86 0.67-1.11	148.00 1.06 0.84-1.35	1.01 0.99-1.02
Cough & phlegm	72.00 1.00	74.00 1.03 0.74-1.44	83.00 1.19 0.86-1.64	53.00 0.75 0.52-1.07	74.00 1.04 0.75-1.45	1.00 0.98-1.03

Table 49 (continued)

Runny nose	196.00 1.00	191.00 0.97 0.79-1.20	207.00 1.09 0.89-1.34	167.00 0.86 0.69-1.07	193.00 1.00 0.81-1.23	1.01 1.00-1.02
Sore throat	134.00 1.00	159.00 1.21 0.95-1.53	157.00 1.22 0.96-1.54	129.00 0.98 0.77-1.26	124.00 0.93 0.73-1.20	1.00 0.98-1.02
HCGI 1	63.00 1.00	67.00 1.07 0.75-1.52	73.00 1.19 0.85-1.68	59.00 0.96 0.67-1.37	55.00 0.88 0.61-1.27	1.01 0.99-1.03
HCGI 2	12.00 1.00	20.00 1.68 0.82-3.44	30.00 2.58 1.32-5.06	15.00 1.28 0.60-2.74	16.00 1.36 0.64-2.87	0.90 0.75-1.09
Signif. resp. disease	117.00 1.00	131.00 1.13 0.87-1.46	137.00 1.21 0.94-1.56	91.00 0.79 0.59-1.04	118.00 1.02 0.79-1.33	1.00 0.98-1.02

\* Noteworthy results.

Table 50. Adjusted odds ratios and 95% confidence intervals for total coliform by quintiles and from a linear model. Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects with each outcome are given on the first line.

	Quintile					linear model*
	1	2	3	4	5	
midpoints:	22.75	86.00	259.75	834.25	6680.00	
# exposed:	2108	2102	2059	2062	2078	
Fever	96.00 1.00	103.00 1.08 0.81-1.44	115.00 1.26 0.95-1.67	84.00 0.91 0.67-1.23	102.00 1.11 0.82-1.50	0.99 0.96-1.02
Chills	53.00 1.00	62.00 1.20 0.82-1.74	52.00 1.07 0.72-1.59	46.00 0.94 0.63-1.40	42.00 0.86 0.56-1.32	0.99 0.95-1.03
Eye discharge	24.00 1.00	55.00 2.24 1.38-3.64	51.00 2.15 1.31-3.54	28.00 1.19 0.68-2.06	32.00 1.20 0.69-2.08	1.01 0.98-1.03
Earache	77.00 1.00	73.00 0.94 0.68-1.31	82.00 1.08 0.78-1.49	64.00 0.85 0.60-1.19	62.00 0.84 0.59-1.21	0.96 0.91-1.02
Ear discharge	16.00 1.00	13.00 0.84 0.40-1.76	18.00 1.26 0.63-2.52	9.00 0.63 0.27-1.43	12.00 0.91 0.41-2.04	0.80 0.54-1.17
Skin rash*	13.00 1.00	14.00 1.07 0.50-2.29	30.00 2.32 1.19-4.53	14.00 1.10 0.51-2.36	29.00 2.10 1.05-4.21	1.01 0.97-1.04
Infected cut	18.00 1.00	10.00 0.57 0.26-1.23	12.00 0.66 0.31-1.40	12.00 0.70 0.33-1.46	12.00 0.81 0.37-1.76	1.03 0.99-1.06
Nausea	69.00 1.00	93.00 1.38 1.00-1.90	92.00 1.43 1.04-1.98	65.00 1.00 0.71-1.41	65.00 1.06 0.74-1.52	1.01 0.99-1.03
Vomiting	31.00 1.00	37.00 1.20 0.74-1.95	45.00 1.61 1.01-2.58	36.00 1.26 0.77-2.05	33.00 1.08 0.64-1.81	1.01 0.99-1.04
Diarrhea	110.00 1.00	130.00 1.23 0.94-1.60	139.00 1.33 1.03-1.74	92.00 0.86 0.65-1.15	85.00 0.90 0.66-1.22	1.00 0.98-1.03
Diarrhea with blood	2.00 1.00	2.00 1.13 0.16-8.09	3.00 2.10 0.34-13.00	2.00 1.21 0.17-8.68	2.00 1.42 0.18-11.37	0.92 0.51-1.65
Stomach pain	134.00 1.00	132.00 1.00 0.78-1.28	139.00 1.10 0.86-1.41	131.00 1.03 0.80-1.32	113.00 0.94 0.72-1.23	1.01 0.99-1.03
Cough	142.00 1.00	150.00 1.04 0.82-1.33	177.00 1.30 1.03-1.64	121.00 0.87 0.68-1.12	148.00 1.03 0.80-1.32	1.01 0.99-1.02

Table 50 (continued)

Cough & phlegm	72.00 1.00	74.00 1.04 0.74-1.45	83.00 1.21 0.87-1.68	53.00 0.78 0.54-1.12	74.00 1.06 0.74-1.50	1.00 0.98-1.03
Runny nose	196.00 1.00	191.00 0.97 0.78-1.19	207.00 1.08 0.87-1.33	167.00 0.86 0.69-1.07	193.00 1.02 0.82-1.27	1.02 1.00-1.03
Sore throat	134.00 1.00	159.00 1.20 0.94-1.53	157.00 1.22 0.96-1.56	129.00 1.00 0.77-1.28	124.00 0.95 0.73-1.24	1.00 0.99-1.02
HCGI 1	63.00 1.00	67.00 1.06 0.75-1.51	73.00 1.23 0.87-1.75	59.00 0.99 0.69-1.42	55.00 0.90 0.61-1.32	1.01 0.99-1.03
HCGI 2	12.00 1.00	20.00 1.80 0.87-3.71	30.00 3.02 1.52-5.99	15.00 1.45 0.67-3.11	16.00 1.68 0.76-3.69	0.93 0.77-1.11
Signif. resp. disease	117.00 1.00	131.00 1.13 0.87-1.46	137.00 1.24 0.95-1.60	91.00 0.81 0.61-1.07	118.00 1.03 0.78-1.37	1.00 0.99-1.02

\* Noteworthy results.

ALL BEACHES

Table 51. Risks For High vs. Low Fecal Coliform Indicator Counts

SYMPTOMS	Total Exposed = 1636		Total Unexposed = 8773		RR	Lower 95% CI	Upper 95% CI
	Ill	Risks > 400 cfu	Ill	Risks ≤ 400 cfu			
Fever	80	0.049	420	0.048	1.02	0.81	1.29
Chills	34	0.021	221	0.025	0.82	0.58	1.18
Eye discharge	30	0.018	160	0.018	1.01	0.68	1.48
Earache	57	0.035	301	0.034	1.02	0.77	1.34
Ear discharge	7	0.004	61	0.007	0.62	0.28	1.34
Skin rash*	26	0.016	74	0.008	1.88	1.21	2.94
Infected cut	15	0.009	49	0.006	1.64	0.92	2.92
Nausea	57	0.035	327	0.037	0.93	0.71	1.23
Vomiting	31	0.019	151	0.017	1.10	0.75	1.61
Diarrhea	81	0.050	475	0.054	0.91	0.73	1.15
Diarrhea w/ blood	3	0.002	8	0.001	2.01	0.53	7.57
Stomach pain	103	0.063	546	0.062	1.01	0.83	1.24
Coughing	117	0.072	621	0.071	1.01	0.84	1.22
Phlegm	60	0.037	296	0.034	1.09	0.83	1.43
Nasal congestion	160	0.098	794	0.091	1.08	0.92	1.27
Sore throat	106	0.065	597	0.068	0.95	0.78	1.16
HCGI 1	50	0.031	267	0.030	1.00	0.75	1.35
HCGI 2	17	0.010	76	0.009	1.20	0.71	2.02
SRD	85	0.052	441	0.050	1.03	0.82	1.30

\* statistically significant at p < 0.05

Table 52. Risks For High vs. Low Bacterial Indicators

fecal coliforms

Symptoms	> 200 cfu		> 400 cfu	
	RR	95% CI	RR	95% CI
Fever	1.04	0.85, 1.26	1.02	0.81, 1.29
Chills	0.98	0.73, 1.30	0.82	0.57, 1.17
Eye discharge	0.91	0.65, 1.28	1.00	0.68, 1.47
Earache	1.00	0.78, 1.27	1.01	0.76, 1.33
Ear discharge	0.92	0.52, 1.63	0.60	0.28, 1.31
Skin rash*	1.49	0.98, 2.27	1.87	1.20, 2.92
Infected cut	1.20	0.69, 2.08	1.63	0.92, 2.91
Nausea	1.09	0.86, 1.36	0.93	0.70, 1.22
Vomiting	1.21	0.88, 1.68	1.09	0.74, 1.60
Diarrhea	1.01	0.84, 1.22	0.90	0.72, 1.14
Diarrhea w/ blood	1.89	0.55, 6.46	2.00	0.53, 7.53
Stomach pain	1.02	0.86, 1.22	1.00	0.82, 1.23
Coughing	1.13	0.97, 1.33	1.02	0.84, 1.23
Phlegm	1.15	0.92, 1.46	1.11	0.85, 1.45
Nasal congestion	1.07	0.93, 1.23	1.08	0.92, 1.27
Sore throat	1.10	0.94, 1.30	0.94	0.77, 1.15
HCGI 1	1.08	0.84, 1.38	1.00	0.74, 1.34
HCGI 2	1.43	0.92, 2.23	1.20	0.71, 2.02
SRD	1.06	0.88, 1.29	1.05	0.84, 1.31

\* statistically significant at  $p < 0.05$



Table 53. Crude Odds Ratios and 95% Confidence Intervals for Fecal Coliform by Quintiles and from a Linear Model.†

	Quintile (cfu)					linear model
	1	2	3	4	5	
midpoints:	5.00	20.25	51.25	130.00	642.25	
# exposed:	2093	2075	2106	2133	2002	
Fever*	105 1.00	82 0.78 0.58-1.05	107 1.01 0.77-1.34	110 1.03 0.78-1.35	96 0.95 0.72-1.27	1.05 1.00-1.10
Chills	63 1.00	47 0.75 0.51-1.09	46 0.72 0.49-1.06	57 0.88 0.62-1.27	42 0.69 0.47-1.03	0.91 0.80-1.04
Eye discharge	46 1.00	27 0.59 0.36-0.95	42 0.91 0.59-1.38	40 0.85 0.55-1.30	35 0.79 0.51-1.23	1.04 0.96-1.12
Earache	90 1.00	64 0.71 0.51-0.98	67 0.73 0.53-1.01	69 0.74 0.54-1.02	68 0.78 0.57-1.08	0.89 0.79-1.00
Ear discharge	20 1.00	11 0.55 0.26-1.16	17 0.84 0.44-1.61	10 0.49 0.23-1.05	10 0.52 0.24-1.11	0.90 0.69-1.17
Skin rash*	15 1.00	13 0.87 0.41-1.84	30 2.00 1.07-3.73	13 0.85 0.40-1.79	29 2.04 1.09-3.81	1.10 1.03-1.17
Infected cut	11 1.00	18 1.66 0.78-3.52	13 1.18 0.53-2.63	5 0.44 0.15-1.28	17 1.62 0.76-3.47	1.01 0.85-1.19
Nausea	82 1.00	79 0.97 0.71-1.33	68 0.82 0.59-1.14	82 0.98 0.72-1.34	73 0.93 0.67-1.28	1.04 0.98-1.10
Vomiting	35 1.00	32 0.92 0.57-1.49	39 1.11 0.70-1.76	35 0.98 0.61-1.57	41 1.23 0.78-1.94	1.05 0.98-1.13
Diarrhea	120 1.00	105 0.88 0.67-1.15	109 0.90 0.69-1.17	125 1.02 0.79-1.32	97 0.84 0.64-1.10	1.04 0.99-1.09
Diarrhea with blood	2 1.00	0 0.00 0.00-+INF	2 0.99 0.14-7.06	4 1.96 0.36-10.74	3 1.57 0.26-9.40	0.94 0.54-1.65
Stomach pain	145 1.00	118 0.81 0.63-1.04	122 0.83 0.64-1.06	137 0.92 0.72-1.17	127 0.91 0.71-1.16	1.01 0.96-1.07
Cough	134 1.00	146 1.11 0.87-1.41	142 1.06 0.83-1.35	172 1.28 1.01-1.62	144 1.13 0.89-1.45	1.03 0.99-1.08
Cough & phlegm	63 1.00	78 1.26 0.90-1.76	69 1.09 0.77-1.54	76 1.19 0.85-1.67	70 1.17 0.83-1.65	1.01 0.94-1.08

Table 53 (continued)

Runny nose	199 1.00	192 0.97 0.79-1.20	170 0.84 0.67-1.04	206 1.02 0.83-1.25	187 0.98 0.80-1.21	1.03 0.99-1.08
Sore throat	138 1.00	143 1.05 0.82-1.34	143 1.03 0.81-1.31	145 1.03 0.81-1.32	134 1.02 0.79-1.30	1.01 0.96-1.06
HCGI 1*	72 1.00	59 0.82 0.58-1.17	59 0.81 0.57-1.15	61 0.83 0.58-1.17	66 0.96 0.68-1.34	1.06 1.00-1.12
HCGI 2	16 1.00	12 0.76 0.36-1.60	21 1.31 0.68-2.51	23 1.42 0.75-2.69	21 1.38 0.72-2.64	1.06 0.97-1.16
Signif. resp. disease	114 1.00	120 1.07 0.82-1.39	124 1.09 0.84-1.41	127 1.10 0.85-1.43	109 1.00 0.76-1.31	1.00 0.95-1.06

\* Statistically significant at  $p < .05$ .

† Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects with each outcome are given on the first line.

Table 54. Adjusted Odds Ratios and 95% Confidence Intervals for Fecal Coliform by Quintiles and from a Linear Model.†

	Quintile (cfu)					linear model
	1	2	3	4	5	
midpoints:	5.00	20.25	51.25	130.00	642.25	
# exposed:	2093	2075	2106	2133	2002	
<b>Fever</b>	105 1.00	82 0.78 0.58-1.04	107 1.00 0.76-1.32	110 1.03 0.78-1.35	96 0.91 0.68-1.22	1.05 1.00-1.10
<b>Chills</b>	63 1.00	47 0.73 0.50-1.07	46 0.72 0.49-1.05	57 0.88 0.61-1.27	42 0.62 0.42-0.93	0.90 0.79-1.04
<b>Eye discharge</b>	46 1.00	27 0.60 0.37-0.98	42 0.90 0.59-1.38	40 0.86 0.56-1.32	35 0.80 0.51-1.25	1.03 0.95-1.12
<b>Earache</b>	90 1.00	64 0.69 0.50-0.96	67 0.72 0.52-1.00	69 0.72 0.52-0.99	68 0.74 0.54-1.03	0.89 0.79-1.01
<b>Ear discharge</b>	20 1.00	11 0.52 0.25-1.08	17 0.81 0.42-1.56	10 0.46 0.22-0.99	10 0.44 0.20-0.95	0.89 0.67-1.18
<b>Skin rash*</b>	15 1.00	13 0.90 0.43-1.91	30 1.94 1.04-3.63	13 0.83 0.39-1.76	29 2.02 1.07-3.81	1.11 1.04-1.19
<b>Infected cut</b>	11 1.00	18 1.58 0.74-3.37	13 1.16 0.52-2.60	5 0.41 0.14-1.19	17 1.51 0.70-3.26	1.01 0.86-1.19
<b>Nausea</b>	82 1.00	79 0.95 0.69-1.30	68 0.81 0.58-1.12	82 0.95 0.70-1.31	73 0.86 0.62-1.19	1.04 0.98-1.10
<b>Vomiting</b>	35 1.00	32 0.93 0.57-1.51	39 1.11 0.70-1.77	35 1.01 0.63-1.62	41 1.17 0.74-1.85	1.06 0.98-1.14
<b>Diarrhea</b>	120 1.00	105 0.83 0.63-1.09	109 0.87 0.67-1.14	125 0.97 0.75-1.26	97 0.75 0.57-0.99	1.04 0.99-1.09
<b>Diarrhea with blood</b>	2 1.00	0 0.00 0.00-+INF	2 0.92 0.13-6.61	4 2.09 0.38-11.48	3 1.22 0.20-7.44	0.92 0.49-1.75
<b>Stomach pain</b>	145 1.00	118 0.78 0.61-1.01	122 0.81 0.63-1.05	137 0.90 0.70-1.14	127 0.84 0.65-1.08	1.01 0.96-1.07
<b>Cough</b>	134 1.00	146 1.13 0.88-1.44	142 1.07 0.84-1.36	172 1.29 1.02-1.64	144 1.14 0.89-1.46	1.03 0.99-1.08
<b>Cough &amp; phlegm</b>	63 1.00	78 1.27 0.91-1.79	69 1.11 0.78-1.57	76 1.20 0.85-1.69	70 1.15 0.81-1.63	1.01 0.94-1.09

Table 54 (continued)

Runny nose	199 1.00	192 0.97 0.78-1.19	170 0.83 0.67-1.03	206 1.00 0.81-1.23	187 0.96 0.77-1.18	1.04 1.00-1.08
Sore throat	138 1.00	143 1.05 0.82-1.34	143 1.03 0.81-1.31	145 1.02 0.80-1.30	134 0.99 0.77-1.27	1.01 0.96-1.06
HCGI 1*	72 1.00	59 0.82 0.57-1.16	59 0.80 0.57-1.14	61 0.83 0.58-1.17	66 0.91 0.64-1.28	1.06 1.01-1.12
HCGI 2	16 1.00	12 0.73 0.34-1.55	21 1.30 0.67-2.50	23 1.43 0.75-2.72	21 1.22 0.63-2.35	1.07 0.97-1.18
Signif. resp. disease	114 1.00	120 1.08 0.83-1.40	124 1.09 0.84-1.42	127 1.10 0.85-1.43	109 0.98 0.75-1.29	1.00 0.94-1.06

\* Statistically significant at  $p < .05$ .

† Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects with each outcome are given on the first line.

ALL BEACHES

Table 55. Risks For Total/Fecal Coliform Ratios < 5 vs. Ratios ≥ 5

SYMPTOMS	Total exposed = 5769		Total unexposed = 4640		RR	Lower 95% CI	Upper 95% CI
	Ill	Risk	Ill	Risks			
Fever	289	0.050	211	0.045	1.10	0.93	1.31
Chills	153	0.027	102	0.022	1.21	0.94	1.55
Eye discharge	103	0.018	87	0.019	0.95	0.72	1.26
Earache	211	0.037	147	0.032	1.15	0.94	1.42
Ear discharge	40	0.007	28	0.006	1.15	0.71	1.86
Skin rash	54	0.009	46	0.010	0.94	0.64	1.40
Infected cut	40	0.007	24	0.005	1.34	0.81	2.22
Nausea	216	0.037	168	0.036	1.03	0.85	1.26
Vomiting	107	0.019	75	0.016	1.15	0.86	1.54
Diarrhea*	341	0.059	215	0.046	1.28	1.08	1.51
Diarrhea w/ blood	8	0.001	3	0.001	2.14	0.57	8.08
Stomach pain	369	0.064	280	0.060	1.06	0.91	1.23
Coughing	427	0.074	311	0.067	1.10	0.96	1.27
Phlegm	200	0.035	156	0.034	1.03	0.84	1.27
Nasal congestion	538	0.093	416	0.090	1.04	0.92	1.18
Sore throat	409	0.071	294	0.063	1.12	0.97	1.29
HCGI 1	185	0.032	132	0.028	1.13	0.90	1.40
HCGI 2*	65	0.011	28	0.006	1.87	1.20	2.90
SRD	299	0.052	227	0.049	1.06	0.90	1.25

\* statistically significant at p < 0.05

TOTAL COLIFORMS > 5000

Table 56. Risks For Total/Fecal Coliform Ratios < 5 vs. Ratios ≥ 5

SYMPTOMS	Total exposed		Total unexposed		RR	Lower 95% CI	Upper 95% CI
	Ill	T/F ratio < 5	Ill	T/F ratio ≥ 5			
Fever *	5	0.147	71	0.052	2.82	1.22	6.54
Chills	0	0.000	25	0.018	0.00	--	--
Eye discharge *	3	0.088	24	0.018	5.01	1.58	15.83
Earache	0	0.000	35	0.026	0.00	--	--
Ear discharge	1	0.029	6	0.004	6.68	0.83	53.95
Skin rash *	3	0.088	22	0.016	5.46	1.72	17.38
Infected cut	0	0.000	7	0.005	0.00	--	--
Nausea *	4	0.118	34	0.025	4.71	1.77	12.54
Vomiting	1	0.029	19	0.014	2.11	0.29	15.30
Diarrhea *	4	0.118	53	0.039	3.02	1.16	7.88
Diarrhea w/ blood	0	0.000	2	0.001	0.00	--	--
Stomach pain *	5	0.147	72	0.053	2.78	1.20	6.44
Coughing	5	0.147	112	0.082	1.79	0.78	4.10
Phlegm	3	0.088	54	0.040	2.23	0.73	6.76
Nasal congestion *	7	0.206	132	0.097	2.12	1.08	4.19
Sore throat	3	0.088	88	0.065	1.37	0.45	4.10
HCGI 1 *	3	0.088	33	0.024	3.64	1.17	11.29
HCGI 2	1	0.029	6	0.004	6.68	0.83	53.95
SRD *	5	0.147	74	0.054	2.71	1.17	6.27

\* statistically significant at p < 0.05

Table 57. Risks For Total/Fecal Coliform Ratios < 5 vs. Ratios ≥ 5

TOTAL COLIFORMS > 10,000

SYMPTOMS	Total exposed		Total unexposed		RR	Lower 95%CI	Upper 95% CI
	Ill	T/F ratio < 5	Ill	T/F ratio ≥ 5			
Fever	3	0.143	41	0.050	2.88	0.97	8.55
Chills	0	0.000	11	0.013	0.00	--	--
Eye discharge *	3	0.143	15	0.018	7.87	2.46	25.13
Earache	0	0.000	22	0.027	0.00	--	--
Ear discharge *	1	0.048	1	0.001	39.33	2.55	607.82
Skin rash *	3	0.143	18	0.022	6.56	2.09	20.56
Infected cut	0	0.000	4	0.005	0.00	--	--
Nausea *	3	0.143	20	0.024	5.90	1.90	18.33
Vomiting	1	0.048	10	0.012	3.93	0.53	29.34
Diarrhea *	4	0.190	33	0.040	4.77	1.86	12.24
Diarrhea w/ blood	0	0.000	1	0.001	0.00	--	--
Stomach pain *	4	0.190	33	0.040	4.77	1.86	12.24
Coughing	3	0.143	56	0.068	2.11	0.72	6.19
Phlegm	1	0.048	30	0.036	1.31	0.19	9.17
Nasal congestion *	5	0.238	76	0.092	2.59	1.17	5.73
Sore throat	1	0.048	52	0.063	0.76	0.11	5.22
HCGI 1 *	3	0.143	18	0.022	6.56	2.09	20.56
HCGI 2 *	1	0.048	4	0.005	9.83	1.15	84.26
SRD	3	0.143	43	0.052	2.74	0.93	8.14

\* statistically significant at p < 0.05

ALL BEACHES

Table 58. Risks For Total/Fecal Indicator Ratios < 5 vs. Ratios ≥ 5

Symptoms	all total coliforms		total coliforms > 5000		total coliforms > 10,000	
	RR	95% CI	RR	95% CI	RR	95% CI
Fever*	1.09	0.92, 1.29	2.64	1.14, 6.15	2.83	0.95, 8.41
Chills	1.12	0.94, 1.54	0.00	--	0.00	--
Eye discharge*	0.95	0.72, 1.26	4.76	1.50, 15.1	7.93	2.48, 25.3
Earache	1.16	0.94, 1.43	0.00	--	0.00	--
Ear discharge*	1.18	0.73, 1.90	6.35	0.78, 51.4	39.67	2.57, 612
Skin rash*	0.94	0.64, 1.40	5.19	1.63, 16.6	6.61	2.11, 20.7
Infected cut	1.34	0.81, 2.22	0.00	--	0.00	--
Nausea*	1.03	0.84, 1.25	4.48	1.68, 12.0	5.95	1.92, 18.5
Vomiting	1.16	0.86, 1.55	2.00	0.28, 14.6	3.97	0.53, 29.6
Diarrhea*	1.28	1.08, 1.51	2.87	1.10, 7.51	4.81	1.87, 12.4
Diarrhea w/ blood	2.14	0.57, 8.08	0.00	--	0.00	--
Stomach pain*	1.07	0.92, 1.24	2.64	1.14, 6.15	4.81	1.87, 12.4
Coughing	1.09	0.95, 1.25	1.69	0.73, 3.87	2.09	0.71, 6.13
Phlegm	1.03	0.84, 1.26	2.12	0.69, 6.45	1.32	0.19, 9.24
Nasal congestion*	1.04	0.92, 1.17	2.02	1.02, 4.00	2.61	1.18, 5.78
Sore throat	1.11	0.96, 1.29	1.30	0.43, 3.91	0.76	0.11, 5.26
HCGI 1*	1.13	0.91, 1.41	3.46	1.11, 10.8	6.61	2.11, 20.7
HCGI 2*	1.87	1.20, 2.90	6.68	0.83, 54.0	9.83	1.15, 84.3
SRD*	1.05	0.89, 1.24	2.57	1.11, 5.98	2.77	0.93, 8.21

\* statistically significant at p < 0.05 in at least one set of results



Table 59a. Odds Ratios and 95% Confidence Intervals for Ratio of Total to Fecal Coliform, Dichotomizing by Cutpoints at 2, 4, 6, and 8. The Number of Diseased Subjects are Given on the First Line for Each Outcome.

	Cutpoint			
	2 3450	4 5425	6 6267	8 6783
Fever	168.00 1.02 9.84-1.24	272.00 1.10 0.92-1.32	315.00 1.13 0.94-1.36	337.00 1.11 0.92-1.35
Chills	80.00 0.92 0.70-1.20	144.00 1.20 0.93-1.54	163.00 1.18 0.91-1.52	173.00 1.13 0.87-1.48
Eye discharge	64.00 1.03 0.76-1.39	97.00 0.96 0.72-1.28	108.00 0.87 0.65-1.16	125.00 1.03 0.76-1.39
Earache	124.00 1.07 0.86-1.34	197.00 1.13 0.91-1.40	228.00 1.17 0.94-1.45	245.00 1.16 0.93-1.46
Ear discharge	26.00 1.25 0.77-2.04	37.00 1.10 0.68-1.77	42.00 1.07 0.65-1.74	45.00 1.05 0.63-1.73
Skinrash	29.00 0.82 0.53-1.27	50.00 0.92 0.62-1.36	60.00 0.99 0.66-1.48	65.00 0.99 0.66-1.50
Infected cut	23.00 1.13 0.68-1.89	36.00 1.18 0.72-1.94	43.00 1.36 0.80-2.29	47.00 1.48 0.85-2.58
Nausea	129.00 1.02 0.82-1.27	209.00 1.10 0.90-1.35	243.00 1.14 0.93-1.41	266.00 1.21 0.97-1.51
Vomiting	63.00 1.07 0.79-1.45	100.00 1.12 0.84-1.51	119.00 1.25 0.92-1.71	123.00 1.12 0.82-1.53
Diarrhea*	200.00 1.14 0.96-1.36	321.00 1.27 1.07-1.51*	367.00 1.30 1.09-1.56*	400.00 1.39* 1.15-1.68*
Diarrhea with blood*	7.00 3.54 1.03-12.08*	8.00 2.45 0.65-9.25	8.00 1.76 0.47-6.65	8.00 1.43 0.38-5.38*
Stomach pain	232.00 1.13 0.96-1.34	347.00 1.06 0.90-1.24	394.00 1.02 0.87-1.20	426.00 1.02 0.87-1.21
Cough	269.00 1.17 1.00-1.37	403.00 1.11 0.96-1.29	461.00 1.11 0.95-1.29	496.00 1.10 0.94-1.29
Cough & phlegm	132.00 1.20 0.96-1.49	193.00 1.09 0.88-1.35	222.00 1.10 0.88-1.37	235.00 1.04 0.83-1.30

Table 59A (continued)

Runny nose	322.00 1.03 0.90-1.19	501.00 1.02 0.89-1.16	576.00 1.01 0.88-1.15	628.00 1.03 0.90-1.19
Sorethroat	257.00 1.18 1.00-1.38	386.00 1.13 0.97-1.32	441.00 1.12 0.96-1.31	476.00 1.13 0.96-1.33
HCGI-1	111.00 1.09 0.86-1.38	173.00 1.11 0.88-1.39	201.00 1.15 0.91-1.45	215.00 1.13 0.89-1.44
HCGI-2*	36.00 1.28 0.84-1.94	61.00 1.76 1.15-2.70*	70.00 2.02 1.26-3.25*	70.00 1.63 1.02-2.62*
Signif. resp disease	207.00 1.08 0.91-1.29	320.00 1.08 0.91-1.27	368.00 1.08 0.91-1.28	391.00 1.03 0.87-1.23

\* Statistically significant at  $p < .05$ .

Table 59b. Crude Odds Ratios and 95% CIs for the Ratio of Total to Fecal Coliform, Restricted to Days When Total Coliform was > 1,000 cfu, and Using Cutpoints of 2, 4, 5, 6, and 8.

Outcome*	Cutpoint				
	2	4	5	6	8
# exposed:	710	1370	1503	1724	1941
Fever*	45.00 1.44 1.03-2.03	78.00 1.32 0.99-1.76	84.00 1.30 0.98-1.73	91.00 1.19 0.90-1.58	102.00 1.20 0.91-1.59
Chills*	13.00 0.88 0.49-1.59	37.00 1.58 1.03-2.42	39.00 1.51 0.99-2.31	42.00 1.39 0.91-2.12	44.00 1.23 0.81-1.88
Eye discharge	16.00 1.58 0.90-2.78	26.00 1.34 0.82-2.20	29.00 1.40 0.86-2.28	32.00 1.35 0.83-2.18	35.00 1.31 0.81-2.11
Earache	28.00 1.28 0.84-1.96	52.00 1.28 0.91-1.82	55.00 1.22 0.87-1.73	63.00 1.24 0.89-1.74	73.00 1.35 0.96-1.89
Ear discharge	3.00 0.73 0.22-2.44	9.00 1.30 0.57-2.97	9.00 1.13 0.49-2.58	11.00 1.28 0.57-2.86	13.00 1.45 0.65-3.25
Skin rash	6.00 0.80 0.34-1.90	13.00 0.90 0.47-1.73	14.00 0.87 0.46-1.65	18.00 1.04 0.57-1.91	22.00 1.23 0.68-2.23
Infected cut	5.00 1.34 0.50-3.61	9.00 1.30 0.57-2.97	9.00 1.13 0.49-2.58	10.00 1.08 0.48-2.43	13.00 1.45 0.65-3.25
Nausea*	30.00 1.18 0.79-1.77	67.00 1.58 1.15-2.18	70.00 1.48 1.08-2.04	79.00 1.49 1.09-2.05	86.00 1.45 1.05-1.99
Vomiting*	21.00 1.90 1.15-3.16	33.00 1.60 1.01-2.51	34.00 1.46 0.93-2.30	38.00 1.44 0.92-2.26	39.00 1.23 0.79-1.93
Diarrhea*	49.00 1.47 1.06-2.05	87.00 1.42 1.07-1.87	94.00 1.40 1.07-1.85	105.00 1.38 1.05-1.80	119.00 1.45 1.10-1.90
Diarrhea with blood	1.00 1.27 0.14-11.41	2.00 1.44 0.24-8.62	2.00 1.25 0.21-7.50	2.00 1.01 0.17-6.02	2.00 0.82 0.14-4.90
Stomach pain	45.00 1.11 0.80-1.55	83.00 1.06 0.81-1.39	90.00 1.05 0.80-1.36	100.00 0.99 0.76-1.29	115.00 1.03 0.80-1.33
Cough*	62.00 1.37 1.02-1.83	106.00 1.21 0.94-1.54	115.00 1.19 0.94-1.52	128.00 1.15 0.90-1.45	147.00 1.21 0.96-1.53
Cough & phlegm*	32.00 1.58 1.05-2.36	47.00 1.13 0.79-1.62	51.00 1.12 0.79-1.59	58.00 1.11 0.79-1.57	64.00 1.08 0.77-1.52

Table 59b (continued)

Runny nose*	93.00 1.60 1.25-2.05	140.00 1.16 0.93-1.44	155.00 1.19 0.96-1.47	171.00 1.12 0.91-1.38	198.00 1.20 0.98-1.47
Sore throat*	57.00 1.44 1.06-1.96	94.00 1.21 0.94-1.58	100.00 1.16 0.90-1.50	115.00 1.18 0.92-1.52	131.00 1.23 0.96-1.58
HCGI 1*	30.00 1.65 1.09-2.51	48.00 1.37 0.95-1.98	51.00 1.32 0.92-1.90	55.00 1.21 0.84-1.73	60.00 1.16 0.81-1.65
HCGI 2*	13.00 2.79 1.41-5.51	22.00 3.20 1.65-6.18	23.00 3.12 1.60-6.07	25.00 3.17 1.59-6.33	25.00 2.58 1.29-5.14
Signif. resp. disease	50.00 1.45 1.05-2.01	80.00 1.17 0.88-1.54	86.00 1.14 0.86-1.50	98.00 1.14 0.87-1.49	110.00 1.14 0.88-1.49

\* Statistically significant ( $P < 0.05$  for at least one of the cutpoints).

Table 59c. Odds Ratios and 95% Confidence Intervals for Ratio of Total to Fecal Coliform, Dichotomizing by Cutpoints at 2, 4, 6, and 8, and Restricting Subjects to Those Swimming on Days When the Total Coliform Level at the Drain > 5,000 CFU. The Number of Diseased Subjects are Given on the First Line for Each Outcome.

	Cutpoint			
	2	4	6	8
# exposed:	189	318	457	543
Fever*	18.00 2.21 1.30-3.73*	23.00 1.62 1.01-2.60*	28.00 1.33 0.86-2.06	34.00 1.40 0.93-2.11
Chills	6.00 1.95 0.81-4.68	8.00 1.53 0.70-3.33	10.00 1.31 0.64-2.69	10.00 1.05 0.51-2.15
Eye discharge	5.00 1.76 0.68-4.57	8.00 1.73 0.79-3.82	9.00 1.30 0.61-2.77	12.00 1.56 0.78-3.11
Karache*	9.00 1.68 0.82-3.43	17.00 2.04 1.17-3.57*	20.00 1.63 0.96-2.76	22.00 1.50 0.90-2.49
Ear discharge	2.00 1.78 0.40-7.94	3.00 1.61 0.45-5.75	4.00 1.52 0.48-4.80	6.00 2.25 0.80-6.35
Skinrash	3.00 1.28 0.39-4.27	5.00 1.29 0.49-3.40	5.00 0.83 0.32-2.19	8.00 1.22 0.54-2.76
Infected cut	1.00 1.28 0.16-10.16	1.00 0.71 0.09-5.65	1.00 0.46 0.06-3.66	1.00 0.37 0.05-2.90
Nausea*	12.00 2.35 1.24-4.45*	19.00 2.34 1.37-4.01*	23.00 1.97 1.19-3.26*	25.00 1.78 1.09-2.92*
Vomiting*	10.00 3.23 1.58-6.60*	14.00 2.81 1.49-5.31*	16.00 2.20 1.19-4.05*	16.00 1.75 0.95-3.23
Diarrhea*	22.00 3.20 1.95-5.24*	28.00 2.37 1.52-3.71*	33.00 1.90 1.25-2.90*	40.00 2.05 1.37-3.07*
Diarrhea with blood	1.00 3.85 0.40-37.20	2.00 6.47 0.91-46.08	2.00 4.19 0.59-29.80	2.00 3.36 0.47-23.90
Stomach pain	10.00 0.97 0.50-1.89	19.00 1.13 0.68-1.87	26.00 1.07 0.69-1.66	33.00 1.18 0.78-1.77
Cough*	28.00 2.31 1.50-3.57*	41.00 2.03 1.40-2.94*	48.00 1.58 1.11-2.23*	57.00 1.62 1.16-2.25*

Table 59c (continued)

Cough & phlegm	13.00 2.36 1.28-4.36*	17.00 1.81 1.04-3.13*	19.00 1.34 0.79-2.26	21.00 1.22 0.74-2.03
Runny nose	27.00 1.67 1.09-2.58*	43.00 1.61 1.13-2.30*	49.00 1.19 0.85-1.66	63.00 1.35 0.99-1.84
Sorethroat*	21.00 2.02 1.24-3.28*	28.00 1.55 1.01-2.38*	35.00 1.32 0.89-1.95	41.00 1.31 0.90-1.90
HCGI-1*	14.00 2.97 1.62-5.44*	18.00 2.26 1.30-3.90*	20.00 1.67 0.98-2.82	23.00 1.63 0.98-2.71
HCGI-2*	7.00 6.93 2.70-17.82*	9.00 5.93 2.39-14.71*	9.00 3.81 1.54-9.43*	9.00 3.05 1.23-7.55*
Signif. resp disease	18.00 1.92* 1.14-3.24*	28.00 1.82* 1.18-2.82*	33.00 1.44 0.95-2.16	37.00 1.34 0.91-1.99

\* Statistically significant at  $p < .05$ .

Table 60. Crude odds ratios and 95% confidence intervals for the ratio of total to fecal coliform by quintiles and from a linear model. Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects in the quintiles are given on the first line for each exposure.

	Quintile					linear model*
	1	2	3	4	5	
midpoints:	57.07	12.19	3.64	1.83	1.20	
# exposed:	2085	2082	2081	2080	2081	
Fever	101.00 1.00	85.00 0.84 0.62-1.12	119.00 1.19 0.91-1.56	84.00 0.83 0.61-1.11	111.00 1.11 0.84-1.46	0.98 0.90-1.07
Chills	51.00 1.00	41.00 0.80 0.53-1.21	68.00 1.35 0.93-1.95	44.00 0.86 0.57-1.30	51.00 1.00 0.68-1.48	1.02 0.90-1.16
Eye discharge	45.00 1.00	38.00 0.84 0.54-1.30	30.00 0.66 0.42-1.06	38.00 0.84 0.55-1.30	39.00 0.87 0.56-1.34	1.09 0.92-1.30
Earache	80.00 1.00	51.00 0.63 0.44-0.90	76.00 0.95 0.69-1.31	79.00 0.99 0.72-1.36	72.00 0.90 0.65-1.24	1.01 0.91-1.12
Ear discharge	17.00 1.00	10.00 0.59 0.27-1.29	9.00 0.53 0.23-1.19	14.00 0.82 0.41-1.68	18.00 1.06 0.55-2.07	0.91 0.75-1.11
Skin rash	26.00 1.00	14.00 0.54 0.28-1.03	25.00 0.96 0.55-1.67	16.00 0.61 0.33-1.15	19.00 0.73 0.40-1.32	0.88 0.76-1.01
Infected cut	10.00 1.00	11.00 1.10 0.47-2.60	13.00 1.30 0.57-2.98	16.00 1.61 0.73-3.55	14.00 1.41 0.62-3.17	1.39 0.88-2.21
Nausea	77.00 1.00	65.00 0.84 0.60-1.18	87.00 1.14 0.83-1.56	71.00 0.92 0.66-1.28	84.00 1.10 0.80-1.50	1.08 0.96-1.22
Vomiting	39.00 1.00	25.00 0.64 0.38-1.06	44.00 1.13 0.73-1.75	31.00 0.79 0.49-1.28	43.00 1.11 0.71-1.71	1.12 0.93-1.35
Diarrhea	91.00 1.00	98.00 1.08 0.81-1.45	122.00 1.36 1.03-1.80	111.00 1.24 0.93-1.64	134.00 1.51 1.15-1.98	1.19 1.05-1.34
Diarrhea with blood	1.00 1.00	2.00 2.00 0.18-22.12	1.00 1.00 0.06-16.03	1.00 1.00 0.06-16.04	6.00 6.03 0.72-50.09	3.15 0.29-33.74
Stomach pain	137.00 1.00	118.00 0.85 0.66-1.10	123.00 0.89 0.69-1.15	138.00 1.01 0.79-1.29	133.00 0.97 0.76-1.24	1.10 1.00-1.21
Cough	127.00 1.00	151.00 1.21 0.94-1.54	145.00 1.15 0.90-1.48	150.00 1.20 0.94-1.53	165.00 1.33 1.04-1.69	1.15 1.04-1.27

Table 60 (continued)

Cough & phlegm	58.00 1.00	77.00 1.34 0.95-1.90	71.00 1.23 0.87-1.76	59.00 1.02 0.71-1.47	91.00 1.60 1.14-2.23	1.22 1.04-1.43	*
Runny nose	190.00 1.00	190.00 1.00 0.81-1.24	182.00 0.96 0.77-1.18	201.00 1.07 0.87-1.31	191.00 1.01 0.82-1.24	1.04 0.97-1.12	
Sore throat	127.00 1.00	136.00 1.08 0.84-1.38	141.00 1.12 0.87-1.44	141.00 1.12 0.87-1.44	158.00 1.27 0.99-1.61	1.09 1.00-1.20	
HCGI 1	63.00 1.00	54.00 0.85 0.59-1.24	72.00 1.15 0.82-1.62	54.00 0.86 0.59-1.24	74.00 1.18 0.84-1.67	1.06 0.93-1.20	
HCGI 2	17.00 1.00	7.00 0.41 0.17-0.99	28.00 1.66 0.91-3.04	16.00 0.94 0.48-1.87	25.00 1.48 0.80-2.75	1.13 0.87-1.46	
Signif. resp disease	103.00 1.00	124.00 1.22 0.93-1.59	123.00 1.21 0.92-1.58	115.00 1.13 0.86-1.48	129.00 1.27 0.97-1.66	1.09 0.99-1.20	

\* Noteworthy results.



Table 61. Adjusted odds ratios and 95% confidence intervals for the ratio of total to fecal coliform by quintiles and from a linear model. Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. Number of diseased subjects are given on the first line for each exposure.

	Quintile					linear model*
	1	2	3	4	5	
midpoints:	57.07	12.19	3.64	1.83	1.20	
# exposed:	2085	2082	2081	2080	2081	
<b>Fever</b>	101.00 1.00	85.00 0.82 0.61-1.10	119.00 1.17 0.85-1.59	84.00 0.80 0.57-1.12	111.00 1.05 0.75-1.46	0.96 0.88-1.05
<b>Chills</b>	51.00 1.00	41.00 0.80 0.53-1.22	68.00 1.34 0.88-2.03	44.00 0.67 0.42-1.07	51.00 0.71 0.44-1.14	0.98 0.86-1.11
<b>Eye discharge</b>	45.00 1.00	38.00 0.83 0.54-1.30	30.00 0.69 0.41-1.16	38.00 0.97 0.59-1.59	39.00 1.01 0.61-1.68	1.16 0.95-1.40
<b>Earache</b>	80.00 1.00	51.00 0.60 0.42-0.86	76.00 0.84 0.58-1.21	79.00 0.90 0.62-1.30	72.00 0.80 0.54-1.17	0.97 0.87-1.09
<b>Ear discharge</b>	17.00 1.00	10.00 0.51 0.23-1.15	9.00 0.34 0.13-0.85	14.00 0.48 0.20-1.15	18.00 0.59 0.25-1.38	0.83 0.69-1.01
<b>Skin rash</b>	26.00 1.00	14.00 0.52 0.27-1.00	25.00 0.98 0.52-1.86	16.00 0.76 0.38-1.54	19.00 0.94 0.46-1.89	0.89 0.76-1.04
<b>Infected cut</b>	10.00 1.00	11.00 1.02 0.42-2.44	13.00 1.01 0.40-2.55	16.00 1.26 0.50-3.15	14.00 1.06 0.41-2.74	1.25 0.79-1.96
<b>Nausea</b>	77.00 1.00	65.00 0.81 0.58-1.14	87.00 1.00 0.70-1.43	71.00 0.72 0.49-1.06	84.00 0.81 0.56-1.19	1.03 0.91-1.16
<b>Vomiting</b>	39.00 1.00	25.00 0.66 0.40-1.10	44.00 1.36 0.84-2.21	31.00 0.80 0.47-1.38	43.00 1.06 0.63-1.78	1.13 0.93-1.38
<b>Diarrhea</b>	91.00 1.00	98.00 1.01 0.75-1.36	122.00 1.13 0.82-1.55	111.00 0.99 0.72-1.38	134.00 1.16 0.84-1.60	1.09 0.97-1.23
<b>Diarrhea with blood</b>	1.00 1.00	2.00 1.96 0.18-21.98	1.00 0.98 0.05-19.17	1.00 0.86 0.04-17.14	6.00 4.79 0.41-55.59	2.45 0.23-25.92
<b>Stomach pain</b>	137.00 1.00	118.00 0.81 0.62-1.05	123.00 0.74 0.55-0.98	138.00 0.76 0.57-1.02	133.00 0.70 0.52-0.94	1.05 0.95-1.16
<b>Cough</b>	127.00 1.00	151.00 1.23 0.96-1.57	145.00 1.27 0.97-1.67	150.00 1.36 1.04-1.79	165.00 1.51 1.14-1.99	1.19 1.06-1.32

Table 61 (continued)

Cough & phlegm	58.00 1.00	77.00 1.37 0.97-1.94	71.00 1.33 0.90-1.96	59.00 1.07 0.71-1.61	91.00 1.65 1.12-2.44	1.25 1.05-1.408	*
Runny nose	190.00 1.00	190.00 0.99 0.80-1.22	182.00 0.90 0.71-1.15	201.00 1.01 0.80-1.29	191.00 0.93 0.72-1.19	1.03 0.96-1.11	
Sore throat	127.00 1.00	136.00 1.07 0.83-1.38	141.00 1.10 0.84-1.45	141.00 1.11 0.84-1.47	158.00 1.23 0.92-1.63	1.08 0.98-1.19	
HCGI 1	63.00 1.00	54.00 0.85 0.59-1.24	72.00 1.19 0.80-1.75	54.00 0.80 0.52-1.22	74.00 1.06 0.71-1.59	1.04 0.91-1.18	
HCGI 2	17.00 1.00	7.00 0.42 0.17-1.01	28.00 1.77 0.89-3.50	16.00 0.82 0.38-1.80	25.00 1.21 0.58-2.54	1.05 0.81-1.36	
Signif. resp. disease	103.00 1.00	124.00 1.24 0.94-1.62	123.00 1.27 0.94-1.71	115.00 1.14 0.83-1.55	129.00 1.25 0.92-1.71	1.09 0.98-1.21	

\* Noteworthy results.

Table 62. Odds Ratios and 95% Confidence intervals for Ratio of Total Coliform to Enterococcus, Dichotomizing by Cutpoints at 4, 7, 10, and 13. The Number of Diseased Subjects are Given on the First Line for Each Outcome.

	Cutpoint			
	4 1952	7 3326	10 4412	13 5304
Fever*	103.00 1.13 0.91-1.41	165.00 1.05 0.87-1.27	225.00 1.12 0.93-1.34	277.00 1.21 1.01-1.45*
Chills	44.00 0.90 0.65-1.25	78.00 0.94 0.72-1.23	112.00 1.07 0.83-1.37	144.00 1.26 0.98-1.61
Eye discharge	28.00 0.75 0.50-1.12	59.00 0.96 0.70-1.31	78.00 0.95 0.71-1.27	91.00 0.88 0.66-1.18
Earache	76.00 1.17 0.91-1.52	127.00 1.18 0.94-1.47	163.00 1.14 0.92-1.41	198.00 1.20 0.97-1.48
Ear discharge	16.00 1.34 0.76-2.34	29.00 1.59 0.98-2.57	31.00 1.14 0.71-1.84	38.00 1.22 0.76-1.97
Skinrash	16.00 0.82 0.48-1.41	26.00 0.75 0.48-1.17	35.00 0.73 0.48-1.10	53.00 1.09 0.73-1.61
Infected cut	16.00 1.45 0.82-2.55	22.00 1.12 0.67-1.87	33.00 1.45 0.89-2.37	40.00 1.61 0.97-2.67
Nausea*	79.00 1.13 0.88-1.45	136.00 1.17 0.95-1.45	181.00 1.22 1.00-1.50*	221.00 1.32 1.07-1.62*
Vomiting	38.00 1.15 0.80-1.64	52.00 0.85 0.61-1.17	75.00 0.95 0.71-1.28	96.00 1.08 0.80-1.44
Diarrhea	135.00 1.42 1.16-1.73*	223.00 1.46 1.22-1.74*	280.00 1.40 1.18-1.67*	339.00 1.54 1.29-1.83*
Diarrhea with blood	4.00 2.48 0.72-8.48	4.00 1.22 0.36-4.16	4.00 0.78 0.23-2.65	4.00 0.55 0.16-1.88
Stomach pain*	131.00 1.10 0.90-1.34	224.00 1.13 0.96-1.34	310.00 1.26 1.08-1.48*	366.00 1.26 1.08-1.48*
Cough	137.00 0.99 0.81-1.20	237.00 1.01 0.86-1.18	311.00 0.99 0.85-1.15	385.00 1.05 0.91-1.22
Cough & phlegm	63.00 0.93 0.70-1.23	119.00 1.07 0.86-1.34	154.00 1.04 0.84-1.28	193.00 1.14 0.93-1.42

Table 62 (continued)

Runny nose	166.00 0.90 0.76-1.08	313.00 1.04 0.91-1.20	429.00 1.12 0.98-1.28	504.00 1.09 0.95-1.24
Sorethroat	130.00 0.98 0.81-1.20	233.00 1.06 0.90-1.25	308.00 1.06 0.91-1.24	366.00 1.05 0.90-1.22
HCGI-1	67.00 1.17 0.89-1.53	103.00 1.03 0.81-1.30	148.00 1.20 0.96-1.50	185.00 1.36* 1.09-1.71*
HCGI-2	20.00 1.19 0.72-1.95	25.00 0.78 0.49-1.24	41.00 1.07 0.71-1.62	55.00 1.40 0.92-2.12
Signif. resp disease	97.00 0.84 0.67-1.05	191.00 1.01 0.85-1.21	256.00 1.03 0.87-1.22	311.00 1.06 0.90-1.25

\* Statistically significant at  $p < .05$ .

Table 63. Crude odds ratios and 95% confidence intervals for the ratio of total coliform to enterococcus by quintiles and from a linear model. Linear results correspond to an increase in the exposure equal to the difference between the 90th and 10th percentiles. The number of subjects with each outcome are given on the first line.

	Quintile					linear model*
	1	2	3	4	5	
midpoints:	289.47	39.00	12.77	6.55	2.59	
# exposed:	2087	2081	2081	2098	2062	
<b>Fever</b>	97.00 1.00	91.00 0.94 0.70-1.26	97.00 1.00 0.75-1.34	106.00 1.09 0.82-1.45	109.00 1.15 0.86-1.52	1.01 0.96-1.07
<b>Chills</b>	39.00 1.00	49.00 1.27 0.83-1.94	59.00 1.53 1.02-2.31	61.00 1.57 1.05-2.36	47.00 1.22 0.80-1.88	1.04 0.95-1.13
<b>Eye discharge</b>	29.00 1.00	35.00 1.21 0.74-1.99	50.00 1.75 1.10-2.77	45.00 1.56 0.97-2.49	31.00 1.08 0.65-1.80	0.97 0.91-1.04
<b>Earache</b>	63.00 1.00	62.00 0.99 0.69-1.41	80.00 1.28 0.92-1.80	74.00 1.17 0.83-1.65	79.00 1.28 0.91-1.79	1.05 0.97-1.14
<b>Ear discharge</b>	14.00 1.00	12.00 0.86 0.40-1.86	11.00 0.79 0.36-1.74	14.00 0.99 0.47-2.09	17.00 1.23 0.61-2.50	1.20 0.87-1.65
<b>Skin rash</b>	21.00 1.00	23.00 1.10 0.61-1.99	21.00 1.00 0.55-1.84	18.00 0.85 0.45-1.60	17.00 0.82 0.43-1.55	0.94 0.87-1.00
<b>Infected cut</b>	10.00 1.00	10.00 1.00 0.42-2.41	15.00 1.51 0.68-3.36	13.00 1.30 0.57-2.96	16.00 1.62 0.74-3.59	0.98 0.87-1.10
<b>Nausea</b>	51.00 1.00	79.00 1.58 1.10-2.25	79.00 1.58 1.10-2.25	94.00 1.87 1.32-2.65	81.00 1.63 1.14-2.33	1.02 0.95-1.08
<b>Vomiting</b>	25.00 1.00	47.00 1.91 1.17-3.11	38.00 1.53 0.92-2.55	34.00 1.36 0.81-2.29	38.00 1.55 0.93-2.57	1.00 0.92-1.09
<b>Diarrhea</b>	75.00 1.00	109.00 1.48 1.10-2.00	107.00 1.45 1.08-1.97	125.00 1.70 1.27-2.28	140.00 1.95 1.47-2.60	1.05 0.99-1.13
<b>Diarrhea with blood</b>	1.00 1.00	4.00 4.02 0.45-35.97	2.00 2.01 0.18-22.15	0.00 0.00 0.00-+INF	4.00 4.05 0.45-36.31	1.96 0.36-10.77
<b>Stomach pain</b>	109.00 1.00	127.00 1.18 0.91-1.53	123.00 1.14 0.87-1.49	155.00 1.45 1.12-1.86	135.00 1.27 0.98-1.65	1.01 0.96-1.06
<b>Cough</b>	137.00 1.00	149.00 1.10 0.86-1.40	157.00 1.16 0.92-1.47	143.00 1.04 0.82-1.33	152.00 1.13 0.89-1.44	0.99 0.96-1.03

Table 63 (continued)

Cough & phlegm	67.00 1.00	70.00 1.05 0.75-1.48	73.00 1.10 0.78-1.54	74.00 1.10 0.79-1.54	72.00 1.09 0.78-1.53	0.99 0.94-1.05	
Runny nose	188.00 1.00	176.00 0.93 0.75-1.16	192.00 1.03 0.83-1.27	215.00 1.15 0.94-1.42	183.00 0.98 0.79-1.22	0.97 0.94-1.00	
Sore throat	128.00 1.00	146.00 1.15 0.90-1.48	143.00 1.13 0.88-1.45	147.00 1.15 0.90-1.47	139.00 1.11 0.86-1.42	1.01 0.97-1.05	
HCGI 1	45.00 1.00	64.00 1.44 0.98-2.12	69.00 1.56 1.06-2.28	71.00 1.59 1.09-2.32	68.00 1.55 1.06-2.27	1.00 0.94-1.07	*
HCGI 2	9.00 1.00	25.00 2.81 1.31-6.03	18.00 2.01 0.90-4.49	21.00 2.33 1.07-5.11	20.00 2.26 1.03-4.98	1.16 0.91-1.49	*
Signif. resp. disease	113.00 1.00	117.00 1.04 0.80-1.36	124.00 1.11 0.85-1.44	131.00 1.16 0.90-1.51	109.00 0.97 0.74-1.28	0.99 0.95-1.04	

\* Noteworthy results.

Table 64. Adjusted odds ratios and 95% confidence intervals for the ratio of total coliform to enterococcus by quintiles and from a linear model. Linear results correspond to an increase in the exposure equal to the difference between the 90<sup>th</sup> and 10<sup>th</sup> percentiles. The number of subjects with each outcome are given on the first line.

	Quintile					linear model
	1	2	3	4	5	
midpoints:	289.47	39.00	12.77	6.55	2.59	
# exposed:	2087	2081	2081	2098	2062	
<b>Fever</b>	97.00 1.00	91.00 0.96 0.71-1.29	97.00 1.02 0.75-1.39	106.00 1.09 0.79-1.51	109.00 1.14 0.81-1.60	1.00 0.95-1.06
<b>Chills</b>	39.00 1.00	49.00 1.27 0.83-1.94	59.00 1.49 0.96-2.31	61.00 1.48 0.93-2.35	47.00 1.10 0.67-1.82	1.02 0.94-1.11
<b>Eye discharge</b>	29.00 1.00	35.00 1.30 0.79-2.14	50.00 2.19 1.35-3.56	45.00 2.11 1.25-3.57	31.00 1.57 0.88-2.82	0.98 0.92-1.05
<b>Karache</b>	63.00 1.00	62.00 0.96 0.67-1.38	80.00 1.26 0.87-1.81	74.00 1.09 0.74-1.61	79.00 1.18 0.79-1.77	1.03 0.96-1.12
<b>Ear discharge</b>	14.00 1.00	12.00 0.82 0.38-1.79	11.00 0.59 0.24-1.41	14.00 0.68 0.28-1.63	17.00 0.75 0.31-1.83	1.13 0.84-1.53
<b>Skin rash</b>	21.00 1.00	23.00 1.21 0.66-2.20	21.00 1.10 0.57-2.11	18.00 0.93 0.45-1.93	17.00 0.90 0.41-1.95	0.94 0.88-1.01
<b>Infected cut</b>	10.00 1.00	10.00 0.91 0.38-2.20	15.00 1.25 0.52-3.01	13.00 0.96 0.37-2.47	16.00 1.15 0.44-2.96	0.94 0.84-1.05
<b>Nausea</b>	51.00 1.00	79.00 1.55 1.08-2.22	79.00 1.53 1.04-2.24	94.00 1.72 1.16-2.55	81.00 1.47 0.97-2.22	0.99 0.93-1.05
<b>Vomiting</b>	25.00 1.00	47.00 1.98 1.21-3.23	38.00 1.63 0.95-2.79	34.00 1.48 0.83-2.64	38.00 1.65 0.91-2.99	1.00 0.92-1.09
<b>Diarrhea*</b>	75.00 1.00	109.00 1.39 1.03-1.89*	107.00 1.29 0.93-1.79	125.00 1.36 0.97-1.90	140.00 1.54 1.09-2.16*	1.01 0.95-1.08
<b>Diarrhea with blood</b>	1.00 1.00	4.00 3.93 0.43-36.15	2.00 1.31 0.10-17.14	0.00 0.00 0.00-+INF	4.00 2.00 0.16-24.94	1.76 0.33-9.44
<b>Stomach pain</b>	109.00 1.00	127.00 1.13 0.87-1.48	123.00 1.03 0.77-1.37	155.00 1.23 0.91-1.64	135.00 1.05 0.77-1.43	0.99 0.94-1.03
<b>Cough</b>	137.00 1.00	149.00 1.11 0.87-1.42	157.00 1.25 0.97-1.62	143.00 1.14 0.86-1.50	152.00 1.25 0.94-1.66	0.99 0.95-1.04
<b>Cough &amp; phlegm</b>	67.00 1.00	70.00 1.07 0.76-1.51	73.00 1.13 0.79-1.63	74.00 1.17 0.80-1.72	72.00 1.13 0.76-1.70	0.99 0.94-1.05

Table 64 (continued)

Runny nose	188.00 1.00	176.00 0.91 0.73-1.13	192.00 1.02 0.81-1.28	215.00 1.10 0.87-1.40	183.00 0.93 0.72-1.20	0.96 0.93-0.99
Sore throat	128.00 1.00	146.00 1.14 0.89-1.46	143.00 1.09 0.84-1.43	147.00 1.08 0.82-1.43	139.00 1.01 0.75-1.36	1.00 0.95-1.05
HCGI 1*	45.00 1.00	64.00 1.47 1.00-2.17*	69.00 1.67 1.11-2.51*	71.00 1.71 1.12-2.62*	68.00 1.68 1.07-2.62*	0.99 0.93-1.06
HCGI 2	9.00 1.00	25.00 2.83 1.31-6.10	18.00 1.75 0.75-4.10	21.00 1.97 0.83-4.69	20.00 1.75 0.71-4.29	1.12 0.88-1.43
Signif. resp. disease	113.00 1.00	117.00 1.05 0.81-1.38	124.00 1.12 0.85-1.49	131.00 1.18 0.88-1.60	109.00 0.97 0.70-1.34	0.99 0.95-1.04

\* Noteworthy results.



Table 65. Summary of Noteworthy Stratified Results Comparing Subjects who Swam at the Drain with those Swimming 400+ Yards from the Drain.†

Outcome	Relative Risk	Attributable Number*
Fever	1.57	259
Chills	1.58	138
Ear discharge	2.27	88
Vomiting	1.61	115
Coughing with phlegm	1.59	175
HCGI 2	2.11	95
SRD	1.66	303

\* The attributable number estimates the number of new occurrences of the specified outcome attributable to swimming at the drain (for every 10,000 people swimming there) versus swimming 400 yards from the drain.

† Results presented in terms of relative risks and attributable numbers.

Table 66. Summary of Noteworthy Results (in the Entire Dataset) Comparing Subjects Who Swam When the Bacterial Indicator was Above the Highest Cutpoint (as Defined in the Text) with Those Who Swam When the Same Bacterial Indicator was Below the Cutpoint.‡

Indicator	Outcome	OR	Attributable Number*
<i>E. coli</i>	Earache	1.46	149
	Nasal Congestion	1.24	211
Enterococcus	Diarrhea w/ bld.	4.23	27
	HCGI 1	1.44	130
Total coliform	Skin rash	3.00	165
Fecal coliform	Skin rash	1.88	74
Total:fecal ratio**	Diarrhea	1.28	125
	HCGI 2	1.87	48
Total:entero ratio†	Nausea	1.63	147
	Diarrhea	1.95	262
	HCGI 1	1.55	111
	HCGI-2	2.26	53

\* The attributable number estimates the number of new occurrences of the specified outcome attributable to swimming when the corresponding bacterial indicator was above the highest cutpoint (for every 10,000 swimmers) versus swimming when the bacterial indicator was below the cutpoint.

† From the crude categorical model, comparing the fifth to first quintile.

‡ Results are Presented in Terms of Relative Risks and Attributable Numbers.

\*\* Using the cutpoint of 5.0.

Table 67. Summary of Noteworthy Results from the Crude Linear Models Corresponding to Unit Increases Equal to the Difference Between the 90<sup>th</sup> and 10<sup>th</sup> Percentiles.†

Indicator	Outcome	OR	Attributable Number*
E-coli	Skin rash	1.07	5
	Nausea	1.04	14
	Stomach pain	1.04	23
Enterococcus	Fever	1.04	21
	Skin rash	1.06	5
	Nausea	1.04	14
	Diarrhea	1.04	23
	Stomach pain	1.02	12
	Cough	1.03	25
	Runny nose	1.03	27
	HCGI 1	1.04	19
Fecal coliform	Fever	1.05	23
	Skin rash	1.10	8
	HCGI 1	1.06	17
Total:fecal ratio	Diarrhea	1.19	85
	Stomach pain	1.10	56
	Cough	1.15	93
	Cough & phlegm	1.22	61
	Sore throat	1.09	56

\* The attributable number estimates the number of new occurrences of the specified outcome attributable to swimming when the corresponding bacterial indicator was equal to the 90<sup>th</sup> percentile (for every 10,000 swimmers) versus swimming when the bacterial indicator was equal to the 10<sup>th</sup> percentiles (where these percentiles are given in previous tables).

† Results are presented in terms of odds ratios (i.e., approximate relative risks) and attributable numbers.

Table 68. Attributable number of cases per every 10,000 swimmers who are exposed to ratios of total to fecal coliform of 2, 4, 5, 6, and 8.

Outcome*	Cutpoint				
	2	4	5	6	8
Diarrhea	72	126	125	167	135
Diarrhea with blood	15	9	8	4	6
Cough	113	76	76	68	72
Sore throat	111	81	81	81	76
HCGI-2	23	49	48	40	56

\* We only include outcomes with statistically significant increases in risk for at least one of the cutpoints.

Table 69a. Attributable Number of Cases Per Every 10,000 Swimmers Who are Exposed to Ratios of Total to Fecal Coliform of 2, 4, 5, 6, and 8, and Who Swim on Days When the Total Coliform Level at the Drain > 5,000 cfu.

Outcome*	Cutpoint				
	2	4	5	6	8
Fever	521	276	206	152	179
Earache	193	273	224	169	135
Nausea	365	342	288	248	202
Vomiting	365	284	244	191	126
Diarrhea	800	509	463	342	377
Diarrhea with blood	39	53	48	33	26
Cough	840	654	563	386	402
Cough with phlegm	396	344	187	105	70
Runny nose	573	512	411	171	301
Sore throat	561	312	226	186	179
HCGI 1	491	316	263	176	164
HCGI 2	317	235	211	145	111

\* We only include outcomes with statistically significant increases in risk for at least one of the cutpoints.

Table 69b. Attributable Number of Cases Per Every 10,000 swimmers Who are Exposed to Ratios of Total to Fecal Coliform of 2, 4, 5, 6, and 8, Restricted to Individuals Who Swam on Days When Total Coliform > 1,000 cfu.

Outcome*	Cutpoint				
	2	4	5	6	8
Fever	194	139	128	86	89
Chills	-25	99	87	68	43
Nausea	65	180	152	151	137
Vomiting	140	90	71	68	38
Diarrhea	222	187	180	167	189
Cough	236	132	125	95	132
Cough+phlegm	165	40	36	34	24
Runny nose	492	141	163	105	170
Sore throat	247	121	93	104	128
HCGI 1	167	96	83	55	42
HCGI 2	117	110	104	99	79
Sig Resp Dis	220	84	69	68	71

\* Only including outcomes with statistically significant associations

Table 70. Attributable Number of Cases Per Every 10,000 Swimmers Who are Exposed to Ratios of Total Coliform to Enterococcus of 4, 7, 10, and 13.

Outcome	Cutpoint			
	4	7	10	13
Fever	61	24	54	89
Nausea	46	61	74	101
Diarrhea	204	210	183	224
Stomach pain	62	78	146	144
HSGI 1	69	8	55	93

\* We only include outcomes with statistically significant increases in risk for at least one of the cutpoints.

TABLE 71

SANTA MONICA BAY RESTORATION PROJECT  
POLIOVIRUS SEED EXPERIMENTS

Water Source	Date of Collection	Volume Used	% Recovery
Santa Monica Canyon	July 3, 1995	38	Toxic
	July 17, 1995	24	42.58
	Aug. 7, 1995	20	35.08
	Aug. 21, 1995	20	35.18
	Sept. 5, 1995	20	48.04
	Oct. 17, 1995	20	83.31
Malibu	July 3, 1995	24	Toxic
	July 17, 1995	24	50.04
	Aug. 7, 1995	20	50.00
	Aug. 21, 1995	18	51.43
	Sept 5, 1995	19	50.88
	Sept 18, 1995	21	32.55
	Sept 26, 1995	20	64.50
Ashland	July 24, 1995	32	Toxic
	Aug. 2, 1995	30	13.05
	Aug. 7, 1995	20	23.07
	Aug. 21, 1995	20	21.60
	Sept 5, 1995	21	<10.00
	Sept 18, 1995	20	Toxic
	Sept 26, 1995	20	54.60



Table 72

## SANTA MONICA RESTORATION PROJECT

CSDOCMIROLOGY

15-Nov-95

SAMPLE ID	WATER QUALITY ANALYSIS				SAMPLE VOLUME	
	pH	TEMPERATURE Deg. Celcius	CONDUCTIVITY mS/cm	TDS g/L	FILTERED Gal	FINAL mL
950623SMCyn	6.8	19.2	1.30	NT	73	16.0
950623Ashland	6.8	20.2	3.00	NT	32.5	23.0
950623Malibu	7.8	21.5	1.90	NT	119	24.0
950624Malibu	7.9	20.5	2.19	1.08	100	10.3
950624Ashland	8.0	21.5	12.18	5.99	18	12.8
950625Malibu	7.7	NT	2.3	NT	100	14.5
950625Ashland	7.9	NT	2.3	19.73	76	13.8
950630Ashland	3.4	NT	2.3	14.49	52	12.2
950630SMCyn	NT	NT	1.33	0.68	55	7.5
950630Malibu	7.9	22.3	20.3	NT	100	9.3
950701Malibu	7.7	22.3	164.5	NT	100	14.6
950701SMCyn	NT	NT	NT	NT	100	9.0
950702Malibu	8.1	22.3	14.2	NT	100	25.8
950702Ashland	8.2	NT	1	1	100	11.0
950702SMCyn	8.4	NT	1.62	0.66	100	12.6
950703SMCyn seeded	8.5	NT	1.59	0.74	38	10.7
950703Malibu seeded	7.8	NT	1.33	0.962	24	16.9
950706SMCyn blank	NT	NT	0.496	0.233	100	11.2
950706Malibu blank	NT	NT	0.496	0.233	100	12.9
950707Ashland	8.1	23.1	2.22	1.11	12	12.1
950707SMCyn	8.5	19.6	1.36	0.63	100	10.3
950707Malibu	8.4	20.5	20.4	NT	100	11.9
950708Malibu	8.0	20.5	1.92	NT	100	9.4
950708Ashland	7.9	20.6	1	1	100	11.6
950708SMCyn	8.4	19.1	1.37	0.68	100	20.0
950709SMCyn	8.5	18.5	1.19	0.66	100	11.1
950709Ashland	7.9	20.9	16.12	8.09	100	20.0
950709Malibu	7.8	22.3	18.4	NT	100	9.3
950714SMCyn	8.3	20.6	1.33	0.66	100	14.0
950714Ashland	7.9	22.0	1	1	85	14.0
950714Malibu	7.8	20.5	19.8	NT	100	14.5
950715SMCyn	8.7	19.3	1.54	0.77	101	17.0
950715Ashland	8.3	21.3	13.66	6.83	26	15.0
950715Malibu	8.8	20.3	1.9	NT	100	12.0
950716Malibu	7.8	20.5	7.12	NT	100	10.5
950716SMCyn	8.5	19.3	1.37	0.72	100	18.0
950717Malibu-Seeded	NT	NT	NT	NT	24	10.8
950717SMCyn-Seeded	NT	NT	NT	NT	24	9.5
950720Malibu-Blank	7.8	NT	NT	NT	100	10.0
950720SMCyn-Blank	7.8	NT	NT	NT	100	10.4
950721Malibu	7.6	25.0	13.96	6.97	100	12.2
950721SMCyn	8.3	20.4	1.35	0.67	85	12.4
950722Malibu	7.6	22.5	3.2	NT	100	11.4
950722SMCyn	7.7	20.1	1.38	0.69	100	11.6

# SANTA MONICA RESTORATION PROJECT

CSDOCMIROLOGY

15-Nov-95

SAMPLE ID	WATER QUALITY ANALYSIS				SAMPLE VOLUME	
	pH	TEMPERATURE Deg. Celcius	CONDUCTIVITY mS/cm	TDS g/L	FILTERED Gal	FINAL mL
950722Ashland	6.3	22.2	10.18	5.09	12	16.1
950723Malibu	7.8	22.4	8.8	NT	100	25.9
950723SMCyn	8.5	22.9	1.47	0.73	100	17.2
950723Ashland	7.8	22.1	1	10.90	100	19.4
950724Ashland-Seeded	NT	24.0	NT	NT	32	10.7
950727Ashland-Blank	NT	NT	NT	NT	100	5.7
950728Malibu	8.4	22.9	1.04	NT	100	10.7
950728SMCyn	7.5	22.5	1.51	0.75	100	11.7
950728Ashland	7.2	22.3	1	1.80	100	16.2
950729Malibu	7.7	22.6	3.5	NT	100	17.2
950729SMCyn	8.0	20.9	1.63	0.82	100	9.6
950729Ashland	7.9	22.1	11.30	5.63	60	27.2
950730SMCyn	8.5	21.1	1.431	0.716	72	14.0
950730Ashland	7.7	23.2	6.35	0.48	100	12.3
950730Malibu	7.6	25.3	NT	NT	85	15.4
950802Ashland-Seeded	NT	NT	NT	NT	30	15.6
950803Ashland-Blank	NT	NT	NT	NT	100	12.2
950804SMCyn	8.4	19.8	1.85	0.77	62	12.5
950804Ashland	7.4	21.6	1	1	89	12.0
950804Malibu	7.9	20.9	3.78	NT	100	10.7
950806Malibu	7.8	22.6	27.9	NT	100	7.1
950806SMCyn	8.4	18.7	1.49	0.74	100	9.4
950806Ashland	NT	20.2	1	1	80	8.9
950806SMCyn	8.4	NT	1.55	0.783	100	10.4
950806Ashland	7.8	21.4	1	1	100	13.4
950806Malibu	8.1	21.7	47.6	NT	100	10.0
950807SMCyn-Seeded	NT	NT	NT	NT	20	15.2
950807Ashland-Seeded	NT	NT	NT	NT	20	11.1
950807Malibu-Seeded	NT	NT	NT	NT	20	9.5
950810Malibu-Blank	7.8	NT	NT	NT	100	13.1
950810SMCyn-Blank	7.8	NT	NT	NT	100	7.2
950811Malibu	7.7	19.8	0.90	1	100	12.7
950811SMCyn	8.4	22.2	1.39	0.690	89	26.9
950811Ashland	7.9	22.5	1	1	100	10.3
950812Malibu	8.2	20.0	NT	NT	100	11.1
950812SMCyn	8.4	21.7	1.44	0.72	100	12.9
950812Ashland	7.9	21.5	1	1	100	18.8
950813Malibu	7.8	21.1	29.1	NT	100	15.0
950813SMCyn	8.7	20.0	2.05	0.80	110	12.9
950813Ashland	8.1	21.4	1	1	100	26.6
950818SMCyn	8.5	21.9	1.45	0.72	52	10.8
950818Ashland	7.9	24.2	1	1	100	10.9
950818Malibu	8.3	21.8	34.6	NT	100	9.4
950819SMCyn	8.4	19.9	0.432	0.71	52	15.1

# SANTA MONICA RESTORATION PROJECT

CSDOC/MIROLOGY

15-Nov-95

SAMPLE ID	WATER QUALITY ANALYSIS				SAMPLE VOLUME	
	pH	TEMPERATURE Deg. Celcius	CONDUCTIVITY mS/cm	TDS g/L	FILTERED Gal	FINAL mL
950819Ashland	8.0	22.3	1	1	100	11.0
950819Malibu	7.6	20.9	>20	18.30	90	9.6
950820SMCyn	8.6	20.4	1.50	0.754	100	11.3
950820Ashland	8.0	22.9	1.0	1.0	100	7.5
950820Malibu	7.5	22.6	> 20	NT	100	9.7
950821Malibu-Seeded	NT	NT	NT	NT	15.9	7.8
950821SMCyn-Seeded	NT	NT	NT	NT	20	12.7
950821Ashland-Seeded	NT	NT	NT	NT	20	10.9
950824SMCyn-Blank	7.5	NT	0.08	0.53	100	9.6
950824Ashland-Blank	7.5	NT	1.08	0.53	100	8.1
950824Malibu-Blank	7.5	NT	1.08	0.53	100	10.4
950825Malibu	8.0	23.6	1.0	19.37	58	10.7
950825Ashland	7.8	21.3	1	1	100	14.8
950825SMCyn	8.4	18.5	1.5	0.75	100	11.1
950825Ashland	8.0	22.9	1	1	100	15.4
950825Malibu	7.9	22.3	NT	NT	100	8.2
950827SMCyn	8.6	19.6	1.57	0.37	100	8.5
950827Ashland	7.8	23.6	1	1	100	11.5
950827Malibu	9.4	NT	NT	NT	51	7.8
950901Malibu	7.1	22.3	15.63	7.79	100	15.8
950901Ashland	8.3	22.7	1	1	100	11.8
950902Ashland	8.0	23.1	NT	NT	100	12.1
950902Malibu	7.7	NT	NT	NT	100	11.1
950902SMCyn	8.7	27.8	1.35	0.67	100	13.1
950903SMCyn	8.2	20.5	1.41	0.71	100	9.3
950903Ashland	7.9	27.3	1	1	100	7.0
950903Malibu	7.8	NT	NT	NT	100	7.8
950905SMCyn-Seeded	NT	NT	NT	NT	20	11.9
950905Ashland-Seeded	NT	NT	NT	NT	21	9.0
950905Malibu-Seeded	NT	NT	NT	NT	19	15.0
950907Malibu-Blank	7.9	23.8	0.123	0.612	100	6.7
950907SMCyn-Blank	7.9	23.8	0.123	0.612	100	7.1
950907Ashland-Blank	7.9	23.8	0.123	0.612	100	10.8
950909Malibu	7.3	NT	NT	NT	100	9.3
950909Ashland	7.7	21.8	NT	NT	100	14.0
950910Malibu	7.1	20.0	NT	NT	100	7.2
950910Ashland	7.8	21.1	NT	NT	100	12.8
950918Malibu	7.7	20.5	6.36	3.19	100	10.8
950916Ashland	7.9	22.3	19.74	9.88	100	13.5
950917Ashland	8.0	20.8	NT	NT	100	10.1
950917Malibu	7.4	22.0	NT	6.41	100	8.1
950918Malibu-Seeded	NT	NT	NT	NT	21	17.3
950918Ashland-Seeded	NT	NT	NT	NT	20	11.0
950921Malibu-Blank	7.4	23.1	1.56	0.78	100	9.2

# SANTA MONICA RESTORATION PROJECT

CSDOC/VIROLOGY

15-Nov-85

SAMPLE ID	WATER QUALITY ANALYSIS				SAMPLE VOLUME	
	pH	TEMPERATURE Deg. Celsius	CONDUCTIVITY mS/cm	TDS g/L	FILTERED Gal	FINAL mL
950921 Ashland-Blank	7.4	23.1	1.56	0.78	100	6.1
950923 Malibu	8.2	22.0	NT	NT	100	11.8
950923 Ashland	8.1	21.3	NT	NT	104	15.1
950924 Malibu	8.6	22.0	NT	NT	100	11.1
950924 Ashland	7.8	21.8	NT	NT	100	9.4
950926 Malibu-Seeded	NT	NT	NT	NT	20	7.7
950926 Ashland-Seeded	NT	NT	NT	NT	20	9.3
951017 SMCyn-Seeded	8.3	22.1	NT	NT	23	10.1

Confidential  
 Not Circulate

Table 73. Crude odds ratios and 95% confidence intervals for outcomes of interest by whether virus was isolated. The number of diseased subjects are given on the first line for each outcome.

# exposed:	Virus		P value
	No 3168	Yes 386	
Fever	126.00 1.00	23.00 1.53 0.97-2.42	0.07
Chills	65.00 1.00	10.00 1.27 0.65-2.49	0.49
Eye discharge	36.00 1.00	8.00 1.84 0.85-3.99	0.12
Earache	93.00 1.00	10.00 0.88 0.45-1.70	0.70
Ear discharge	15.00 1.00	0.00 0.00 0.00-+INF	1.00
Skinrash	32.00 1.00	4.00 1.03 0.36-2.92	0.96
Infected cut	31.00 1.00	2.00 0.53 0.13-2.21	0.38
Nausea	101.00 1.00	12.00 0.97 0.53-1.79	0.93
Vomiting	44.00 1.00	10.00 1.89 0.94-3.78	0.07
Diarrhea	130.00 1.00	21.00 1.34 0.84-2.16	0.22
Diarrhea with blood	2.00 1.00	1.00 4.11 0.37-45.45	0.25
Stomach pain	191.00 1.00	23.00 0.99 0.63-1.54	0.96
Cough	181.00 1.00	28.00 1.29 0.85-1.95	0.23
Cough & phlegm	92.00 1.00	13.00 1.17 0.65-2.10	0.61

Table 73 (continued)

Runny nose	246.00 1.00	32.00 1.07 0.73-1.58	0.72
Sorethroat	198.00 1.00	32.00 1.36 0.92-2.00	0.13
HCGI-1	72.00 1.00	15.00 1.74 0.99-3.06	0.06
HCGI-2	22.00 1.00	6.00 2.26 0.91-5.60	0.08
Signif. resp. disease	160.00 1.00	26.00 1.36 0.88-2.08	0.16

Table 74. Adjusted odds ratios and 95% confidence intervals for outcomes of interest by whether virus was isolated. The number of diseased subjects are given on the first line for each outcome.

# exposed:	Virus		P value
	No 3168	Yes 386	
Fever	126.00 1.00	23.00 1.56 0.98-2.50	0.06
Chills	65.00 1.00	10.00 1.24 0.62-2.47	0.54
Eye discharge	36.00 1.00	8.00 1.80 0.82-3.95	0.14
Earache	93.00 1.00	10.00 0.93 0.47-1.81	0.82
Ear discharge	15.00 1.00	0.00 0.00 0.00-+INF	1.00
Skin rash	32.00 1.00	4.00 0.95 0.33-2.75	0.93
Infected cut	31.00 1.00	2.00 0.55 0.13-2.34	0.42
Nausea	101.00 1.00	12.00 0.96 0.52-1.78	0.90
Vomiting	44.00 1.00	10.00 1.84 0.91-3.74	0.09
Diarrhea	130.00 1.00	21.00 1.33 0.82-2.15	0.25
Diarrhea with blood	2.00 1.00	1.00 5.43 0.42-69.49	0.19
Stomach pain	191.00 1.00	23.00 0.94 0.60-1.48	0.79
Cough	181.00 1.00	28.00 1.22 0.80-1.85	0.35
Cough & phlegm	92.00 1.00	13.00 1.14 0.63-2.08	0.66

Table 74 (continued)

Runny nose	246.00 1.00	32.00 1.05 0.71-1.54	0.82
Sore throat	198.00 1.00	32.00 1.40 0.94-2.08	0.10
HCGI 1	72.00 1.00	15.00 1.71 0.96-3.04	0.07
HCGI 2	22.00 1.00	6.00 2.27 0.89-5.77	0.09
Signif. resp disease	160.00 1.00	26.00 1.32 0.85-2.04	0.21





APPENDIX A

QUESTIONNAIRES



Last Date for Phone Appt. \_\_\_\_\_

ID# \_\_\_\_\_

Date (MM/DD/YY) \_\_\_\_\_

| A | B | C | D | E | F | G |

### CONFIDENTIAL (ASHLAND BEACH ONLY)

Interviewer (include #) \_\_\_\_\_ Date (MM/DD/YY) \_\_\_\_\_ (Day of week) \_\_\_\_\_

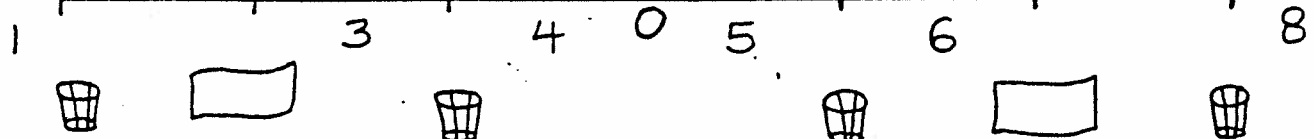
Phone Appt. \_\_\_\_\_ Ethnicity: W | B | L | A | O English / Spanish  
Day of week \_\_\_\_\_ Date (MM/DD/YY) \_\_\_\_\_ Time \_\_\_\_\_

Name – in water today	Relation (S/M/F/C)	Age	Age Cat	Gender (M/F)	Face Wet? (Y/N)		Map Code	Study Eligible (Y/N) T*
					B*	T*		
A.) Returned to the Beach? Yes / No								
B.) Returned to the Beach? Yes / No								
C.) Returned to the Beach? Yes / No								
D.) Returned to the Beach? Yes / No								
E.) Returned to the Beach? Yes / No								
F.) Returned to the Beach? Yes / No								
G.) Returned to the Beach? Yes / No								

B\* – Determined during Beach Interview

T\* – Determined during Telephone Interview

OCEAN





ID Number						
A	0	0	0	0	0	A
M	1	1	1	1	1	B
W	2	2	2	2	2	C
	3	3	3	3	3	D
	4	4	4	4	4	E
	5	5	5	5	5	F
	6	6	6	6	6	G
	7	7	7	7	7	H
	8	8	8	8	8	I
	9	9	9	9	9	J

Beach Interview Date	
Month	Day
<input type="radio"/> June	① 17
<input type="radio"/> July	② 18
<input type="radio"/> Aug	③ 19
<input type="radio"/> Sept	④ 20
<input type="radio"/> Oct	⑤ 21
	⑥ 22
	⑦ 23
	⑧ 24
	⑨ 25
	⑩ 26
	⑪ 27
	⑫ 28
	⑬ 29
	⑭ 30
	⑮ 31
	15
	16

Phone Interview Date	
Month	Day
<input type="radio"/> June	① 17
<input type="radio"/> July	② 18
<input type="radio"/> Aug	③ 19
<input type="radio"/> Sept	④ 20
<input type="radio"/> Oct	⑤ 21
<input type="radio"/> Nov	⑥ 22
	⑦ 23
	⑧ 24
	⑨ 25
	⑩ 26
	⑪ 27
	⑫ 28
	⑬ 29
	⑭ 30
	⑮ 31
	15
	16

Water clean?  
 Yes  
 No

Gender  
 Female  
 Male

Age - Code from beach questionnaire.  
 0 to 12  
 13 to 18  
 19 to 25  
 26 to 35  
 36 to 45  
 46 to 55  
 56 to 65  
 66 to 75  
 > 75

Map Code  
 ①  
 ②  
 ③  
 ④  
 ⑤  
 ⑥  
 ⑦  
 ⑧  
 ⑨

Beach Interviewer's Number		
①	①	①
②	②	②
③	③	③
④	④	④
⑤	⑤	⑤
⑥	⑥	⑥
⑦	⑦	⑦
⑧	⑧	⑧
⑨	⑨	⑨

Phone Interviewer's Number		
①	①	①
②	②	②
③	③	③
④	④	④
⑤	⑤	⑤
⑥	⑥	⑥
⑦	⑦	⑦
⑧	⑧	⑧
⑨	⑨	⑨

1. (Refer to the Beach Questionnaire) Did respondent get her/his face wet?

- No, face did not get wet       Yes, face got wet



2. Did you (child's name) get your (her/his) face wet while you (she/he) were (was) in the water on (DAY)?

No  
 Yes  
 Don't know/don't remember

3. I'm going to go through a list of symptoms to find out about your (child's) health since you (she/he) were (was) at the beach on (DAY). Since your (her/his) visit to the beach on (DAY), have (has) you (child's name) had any of the following problems or symptoms?

a) How about (EACH)? Did you (child's name) have that at any time since your (her/his) visit to the beach on (DAY)?

b) Was this a problem that you (child's name) had during the week before you went to the beach on (DAY)?

c) IF YES to b, Please describe how often you experienced this symptom when you had it before.

Problem or Symptom

For each "Yes" in a, ask b, and c.

1. Fever

No Yes DK      No Yes DK  
       

2. Chills

3. Redness and discharge from the eyes

4. Earache

5. Discharge/draining from the ear

6. Skin rash

(If yes to a, describe site.)

PLEASE DO NOT WRITE IN THIS AREA



12501

**Problem or Symptom**  
For each "Yes" in a, ask b, and c.

a) How about (EACH)? Did you (child's name) have that at any time since your (her/his) visit to the beach on (DAY)?  
No Yes DK  
○○○ ○○○

b) Was this a problem that you (child's name) had during the week before you went to the beach on (DAY)?  
No Yes DK  
○○○ ○○○

c) IF YES TO B, Please describe how often you experienced this symptom when you had it before.

- 7. Cuts or scrapes that became infected ○○○ ○○○

---

- 8. Nausea (ask a woman who says "yes" if she's pregnant) ○○○ ○○○ (Exclude nausea caused by pregnancy in a.)

---

- 9. Vomiting ○○○ ○○○

---

- 10. Diarrhea (If 11a is no, 12a is no. Skip to 13.) ○○○ ○○○

---

- 11. Diarrhea with blood ○○○ ○○○

---

- 12. Stomach pain or cramps ○○○ ○○○ (Exclude menstrual periods in a.)

---

- 13. Coughing (If 14a is no, 15a is no. Skip to 16.) ○○○ ○○○

---

- 14. Coughing accompanied by phlegm ○○○ ○○○

---

- 15. Nasal congestion or runny nose ○○○ ○○○

---

- 16. Sore throat ○○○ ○○○

4. How worried or concerned are you about environmental hazards at the beach? Would you say you are...

- Not at all worried or concerned
- Somewhat worried or concerned
- A little worried or concerned
- Very worried or concerned

5. What is your ethnic background? (Read choices if necessary.)

- White
- Black
- Latino
- Asian
- Multi-ethnic
- Other, \_\_\_\_\_

6. What is your 5-digit postal zip code? (Code "99999" for foreign respondents.)

Zip Code				
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

(If there are other household members to interview, use another phone questionnaire, otherwise...)

**THANK YOU VERY MUCH. I REALLY APPRECIATE THAT YOU HAVE TAKEN THE TIME TO ANSWER THESE QUESTIONS.**

## APPENDIX B

### FORMS USED ON THE BEACH AND IN THE OFFICE

Information Pamphlet  
Log of Non-participants  
Age Categories  
Beach Interview: Daily Tally Sheet  
Phone Interviewer Daily Tally Sheet  
Update: Phone Calls to Make  
Repondent Callbacks  
Log of Weekly Loss-to-Follow-up  
Timesheet



# IS IT SAFE FOR YOU TO SWIM IN SANTA MONICA BAY?

A few minutes of your time will help us find out.

## HERE'S WHAT YOU DO

Answer a few questions such as:

"Did you go in the water?" "Did you get your face wet?" Then, when we call you in about ten days, answer a few questions about your health since you were at the beach.

## HERE'S WHAT WE DO

We sample the water you swim in. We compare our analyses of the water with your answers...along with those of 9,999 other participating swimmers. Then, we will use the results to determine what action, if any, is needed to protect your health while swimming in the bay.

## WHO WE ARE

We are a group of Southern California scientists requested to study the health effects of swimming in the bay by the Santa Monica Bay Restoration Project... a coalition of Federal, State and Local agencies, environmental and industry groups and the general public, dedicated to enhancing the quality of Santa Monica Bay.

## THANK YOU FOR YOUR PARTICIPATION

We will be calling you on \_\_\_\_\_ at \_\_\_\_\_

### Santa Monica Bay Beach Study

3107 Santa Monica Boulevard, Santa Monica, CA 1-800-992-8395

This project is funded by: California State Water Resources Control Board,  
Cities of Los Angeles and Santa Monica, Los Angeles County Department of Public Works,  
Beach Cities Health District, Los Angeles Regional Water Quality Control Board,  
Topanga Las Virgenes Municipal Water District, Heal The Bay and Chevron.



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# ¿ES SANO NADAR EN LA BAHÍA DE SANTA MONICA?

Unos minutos de su tiempo nos ayudará.

## ESTO ES LO QUE SE PUEDE HACER

Conteste algunas preguntas:

"¿Estuvo Ud. en el agua?" "¿Se mojó Ud. la cara?" Entonces, cuando lo llamemos en diez días, conteste algunas preguntas acerca de su salud.

## ESTO SERÁ LO QUE NOSOTROS HAREMOS POR UD.

Nosotros vamos a analizar el agua en la que Ud. está nadando. Entonces, vamos a comparar nuestro análisis del agua con sus repuestas...y con los otros participantes. Después vamos a usar los resultados para determinar que acción tomaremos, si es necesario, para su protección.

## ¿QUIENES SOMOS NOSOTROS?

Nosotros somos un grupo de investigadores del proyecto de la Restauración de La Bahía de Santa Monica. Nosotros nos dedicamos a mejorar la calidad del agua de la Bahía de Santa Monica.

## GRACIAS POR SU PARTICIPACIÓN

Nosotros vamos a llamarle en \_\_\_\_\_ el \_\_\_\_\_

### Santa Monica Bay Beach Study

3107 Santa Monica Boulevard, Santa Monica, CA 1-800-992-8395

Este proyecto es patrocinado por: California State Water Resources Control Board, Cities of Los Angeles and Santa Monica, Los Angeles County Department of Public Works, Beach Cities Health District, Los Angeles Regional Water Quality Control Board, Topanga Las Virgenes Municipal Water District, Heal The Bay and Chevron.

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Beach (Circle one): A | M | W

Interviewer # \_\_\_\_\_

Date \_\_\_\_\_

## LOG OF NON-PARTICIPANTS

**Instruction:** Tally each non-participant (i.e., *||||*) in each of the following categories: **A) Reason for non-participation;** **B) Gender;** and **C) Ethnicity.** **Note: Ineligibles** in this case are only **1)** those persons who have gotten their faces wet during the past week at any of the study beaches or at Mother's Beach (Marina Del Rey) or Santa Monica Pier, or **2)** those persons who tell you they are planning to return to any of these beaches (and get their faces wet) during the upcoming week.

A) Reason for non-participation	B) Gender	C) Ethnicity					
---------------------------------	-----------	--------------	--	--	--	--	--

Reason	Female	Male	White	Black	Latino	Asian	Other
Refusal							
Language Difficulty							
No telephone							
Ineligible							



# AGE CATEGORIES

A.) 0 to 12

B.) 13 to 18

C.) 19 to 25

D.) 26 to 35

E.) 36 to 45

F.) 46 to 55

G.) 56 to 65

H.) 66 to 75

I.) over 75



# BEACH INTERVIEW : DAILY TALLY SHEET

DATE: \_\_\_\_\_ BEACH: MALIBU SUPERVISOR: \_\_\_\_\_

## PART I

STAFF NAME	ZONE Assignment		HOURS Interviewed		INELIGIBLE Sheet (completed)	# of Completed Interviews
			from	to		
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
TOTAL						

## PART II : INDIVIDUALS

STUDY AREA I				
# of Interviews	ADULTS	CHILDREN	FAMILIES	SINGLES
TOTAL	TOTAL	TOTAL		

STUDY AREA II				
# of Interviews	ADULTS	CHILDREN	FAMILIES	SINGLES
TOTAL	TOTAL	TOTAL		

TOTALS PART I : \_\_\_\_\_ PART II : \_\_\_\_\_ (part I and part II (column I) totals should match)



# PHONE INTERVIEWER DAILY TALLY SHEET

INT. NAME : \_\_\_\_\_ DATE: \_\_\_\_\_

INT. # : \_\_\_\_\_

TIME IN: \_\_\_\_\_ TIME OUT: \_\_\_\_\_

## # OF INTERVIEWS

HOUSEHOLD : \_\_\_\_\_

INDIVIDUALS : \_\_\_\_\_

BUSY	NO ANSWER	ANSWER MACHINE	CALL BACKS

# OF ATTEMPTS TO COMPLETE INTERVIEW (household)				
1	2	3	4	> 4

COMMENTS :

# UPDATE: PHONE CALLS TO MAKE

MORNING ENGLISH		AFTERNOON ENGLISH		EVENING ENGLISH		O.S.C. (out of state calls)	
DATE	#	DATE	#	DATE	#	DATE	#
TOTAL		TOTAL		TOTAL		TOTAL	

MORNING SPANISH		AFTERNOON SPANISH		EVENING SPANISH		O.S.C. (out of state calls)	
DATE	#	DATE	#	DATE	#	DATE	#
TOTAL		TOTAL		TOTAL		TOTAL	

## INDIVIDUAL CALLS

NAME	DATE	LANG	#	NAME	DATE	LANG	#
TOTAL				TOTAL			

## PROBLEM CALLS

DATE	LANG	TIME	#	DATE	LANG	TIME	#
TOTAL				TOTAL			





# SANTA MONICA BAY BEACH STUDY TIMESHEET

EMPLOYEE NAME \_\_\_\_\_

PERIOD COVERED FROM \_\_\_\_\_ TO \_\_\_\_\_

DAY	DATE	IN FOR DAY	OUT	IN	OUT FOR DAY	TOTAL OF HOURS WORKED
SAT	/	:	:	:	:	.
SUN	/	:	:	:	:	.
MON	/	:	:	:	:	.
TUES	/	:	:	:	:	.
WED	/	:	:	:	:	.
THUR	/	:	:	:	:	.
FRI	/	:	:	:	:	.
SAT	/	:	:	:	:	.
SUN	/	:	:	:	:	.
MON	/	:	:	:	:	.
TUES	/	:	:	:	:	.
WED	/	:	:	:	:	.
THUR	/	:	:	:	:	.
FRI	/	:	:	:	:	.
<b>TOTAL HOURS</b>						

EMPLOYEE SIGNATURE \_\_\_\_\_

I hereby certify that this time is a true statement of hours worked by this employee and that the assigned work has performed in a satisfactory manner.

Supervisor \_\_\_\_\_ Date \_\_\_\_\_

FOR OFFICE USE ONLY			
HOURLY RATE	\$ . .	\$ . .	\$ . .
<b>TOTALS</b>	\$ . .	\$ . .	\$ . .

APPENDIX C

TYPICAL BEACH INTERVIEW  
TYPICAL PHONE INTERVIEW



## Example of a Typical Beach Interview

Interviewer: "Hello, my name is (*Name*) and I am here with the Santa Monica Bay Restoration Project. We are down here this summer doing a research study on the quality of the water in the Santa Monica Bay. Do you have a minute to answer a few quick questions?"

Beachgoer: "Sure." (If the response had been "no", the response would be politely acknowledged.)

I: "Have you been or do you plan on swimming in the water today?"

B: "Yes, I went in swimming earlier today."

I: "Have you been to the beach in the past week?"

B: "No, this is my first time this summer." (If the respondent had been to any of the 3 study beaches or any other "ineligible" beach in the last week (7 days) and gone swimming, the interview would have been politely terminated.)

I: "All right. If it is OK with you I am going to take down the names and ages of anyone in your family who has been in the water today. (Last names were required from adults who only gave work telephone numbers.) Then what we do is, in nine days, give you a brief phone call. It is completely confidential and we will ask you some general health questions. Would that be OK?"

B: "I guess so."

I: "OK, your name and age?" (Respondents were allowed to point to an age category on a laminated chart. Names and ages of every eligible participant were recorded on the field sheet.)

I: "Where did you (and other household members) go swimming today?" (The location was recorded.)

"OK, a phone number, either work or home, and a time that it is convenient to reach you?" (The information was recorded along with comments which might be helpful to the telephone interviewer during the follow-up interview.)

"Here is a flier which tells you a little more about the study and there is a phone number on there that you can call if you have any further questions. I want to thank you very much for your time and, for your participation. We have a frisbee or pail for you (and/or for the children)."

B: "OK, thank you."

I: "Have a nice day."



## Example of a Typical Telephone Interview

Interviewer: "Hello, my name is (*Name*) and I am calling from the Santa Monica Bay Beach Study."

Participant: "Hello."

I: "I understand that you attended Ashland beach on (*Date*) and you spoke with (*Name*), one of our interviewers."

P: "Yes, I remember (*Name*)."

I: "Have you been back to the beach since that day?"

P: "No, I have not had the chance to return to the beach. I was on vacation that week and that was the only chance I've had all summer to go."

I: "Were you swimming that day?"

P: "Yes I was."

I: "Did you get your face wet?"

P: "Yes I did."

I: "Was anyone else swimming with you that day?"

P: "No."

I: "Since that day at the beach, have you had either a fever or chills?"

P: "No."

I: "Have you experienced any redness or discharge from the eyes?"

P: "No."

I: "What about an earache or any substance draining from the ear?"

P: "No."

I: "Have you noticed a skin rash or any infected cuts or scrapes?"

P: "No, but should I expect to contract any of these illnesses in the future?"

I: "No. We're not saying that you will be experiencing any of these symptoms."

P: "All right."

I: "Have you been nauseous or vomiting?"

P: "No."

I: "Have you had diarrhea since your visit to Ashland beach?"

P: "I had a little diarrhea for two days following the beach but I don't think that had anything to do with the beach or the water."

I: "Why do think so?"

P: "It just seems highly unlikely that this could have been the cause."

I: "Did you experience diarrhea in the week prior to your beach visit?"

P: "No. It wasn't a problem the week before."

I: "For the two days you did have diarrhea, did you see blood in the diarrhea?"

P: "No."

I: "Have you had stomach pain or cramps?"

P: "Yes, a little stomach cramping when I had the diarrhea."

I: "Was the cramping a problem before your visit to the beach?"

P: "No."

I: "All right, have you been coughing since that day?"

P: "No."

I: "Have experienced nasal congestion or a runny nose?"

P: "No."

I: "Have you had a sore throat?"

P: "No."

I: "How concerned are you about the environmental hazards at the beach? Would you say you are not at all concerned, somewhat concerned, a little concerned or very concerned?"

P: "Well I'm very concerned, of course."

I: "And your ethnic background?"

P: "I am white."

I: "And your zip code?"

P: "90405."

I: "Well, I think that is all the information I need. Do you have any questions for me?"

P: "No, but I just want to say that you and your organization are doing a wonderful job. Keep up the good work."

I: "I thank you for your interest and support in our study. Your cooperation is much appreciated."

P: "You're welcome. Good-bye."

I: "Good-bye."

APPENDIX D

TRAINING MANUAL



**SANTA MONICA BAY BEACH STUDY**

**TRAINING MANUAL**



# 1995 Santa Monica Bay Beach Study

## TRAINING MANUAL

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Mileage and Expenses

Employee Confidentiality Pledge





## ABOUT THE STUDY

The Santa Monica Bay Beach Study is being conducted by scientists commissioned by the Santa Monica Bay Restoration Project (SMBRP) -- a coalition of Federal, State and Local agencies, environmental and industry groups, and the general public, all dedicated to enhancing the quality of the Santa Monica Bay.

SMBRP was formed in 1988 to address such concerns as preserving the Bay's ecosystem and living resources, Bay water quality, and public health issues associated with swimming in the Bay and consuming Bay seafood. The Santa Monica Bay extends from the Ventura County line to Point Fermin on the Palos Verdes Peninsula.

The major purpose of the study is to characterize the health effects of swimming at beaches in the Santa Monica Bay, which have never before been studied. The health outcomes of interest include skin rashes and infections, eye infections, ear infections, upper respiratory infections (cold- and flu-like symptoms), and gastroenteritis (including diarrhea and vomiting).

Approximately 12,000 subjects, adults and children, will be recruited from 3 beaches [Santa Monica Beach (Ashland), Will Rogers' State Beach, and Malibu Lagoon State Beach] once it is determined that they have met certain eligibility criteria (see *BEACH QUESTIONNAIRE SUPPLEMENT*). Approximately 10 days later, we will re-contact these same subjects to ascertain the health outcomes of interest. On the same days that beach interviews are being conducted, water samples will be collected at various points nearby and tested for selected measures of water quality.

We want to determine whether the frequency of each health outcome is correlated with measures of water quality.

It is our hope that 12,000 completed beach interviews will result in 10,000 completed telephone interviews.

In spite of the large number of beach visitors, as well as the time, money and effort spent by the County of Los Angeles, we still do not know the health effects of swimming at these beaches. We do not know under what conditions parts of beaches or entire beaches should be closed or posted with warning signs. For the first time, we have a study designed to answer these questions.

The results will be relevant, not only for the Santa Monica Bay, but for beaches throughout the county (and other countries) that are located within or near large urban areas.

## INTERVIEWING TECHNIQUES

### Data Collection

The data collection stage is a key element of any research study. During the interviewing phase, the success of the study rests in the hands of the interviewers. THE BEST QUESTIONNAIRE IS ONLY AS GOOD AS THE INTERVIEWER'S SKILL AT USING IT. Throughout the data collection period, the beach or office supervisor keeps in close touch with each interviewer. The supervisor prepares the interviewing materials and works to maintain the quality of the interviewing. Interviews completed at the beach will be counted there before they are transported to the study office where they will be counted again.

### Editing the Interviews

Completed interviews should be edited first by the interviewer and then reviewed by the supervisor to be sure they are complete and clear. Missing information is provided by the interviewer, if possible, or later by the Respondent during the telephone interview.

### Reporting the Results

Using statistical analysis, conclusions about the questions being studied are derived. Reports are written which contain the conclusions and a description of the findings.

### Your Role as an Interviewer

As a survey research interviewer, you are involved in the very important act of data collection. The information given and recorded during the interview must be accurate and complete, so as not to bias or distort the study results.

### Ethics of Survey Interviewing

People who work in professions which deal with the experiences, thoughts, and health of others have an ethical responsibility to these people. Just as doctors and lawyers must respect the information about their patients and clients as privileged, so must study interviewers.

The research team promises Respondents that the information they provide will never be reported or revealed in any way which would allow the information to be connected with their names. A Respondent's answers are combined with those of other Respondents in the study, and the results are reported in percentages and totals in such a way that no individual Respondent's answers can be identified. Information collected or seen during an interview can be shared only with other members of the research team.

## PREPARING FOR THE INTERVIEW

### Review Your Study Manual and Materials

Review this manual and any other study materials until you are sure you understand all aspects of your job. Go over the general principles of interviewing, learn the field procedures, and understand the intent of each question included in the interview.

### Review the Questionnaire

Before you begin interviewing, practice using the questionnaire until you feel confident.

A successful interview requires you to fully understand and easily and correctly use the questionnaire. Maintaining an even interview flow (knowing the skip patterns, having flash cards handy) will greatly facilitate the interview process.

### Organize Your Materials

Be sure you know what materials you need and have them organized before you begin the interview. Be accustomed to handling them so that you don't find yourself fumbling for what you need.

## MECHANICS OF RECORDING AND EDITING BEACH INTERVIEWS

It will be easier for the phone interviewers as well as the supervisors and the analyst when these procedures are followed:

- 1) Writing must be legible. Regardless of how good the interview may have been it is worthless if the record of it cannot be read. In editing your interview check to be sure that all writing can be read easily.
- 2) Use a pencil to record. Carry several pencils with you when you start your interviewing day so you will always have a sharp one.
- 3) Account for each question in the questionnaire. Each question must be answered or it must have some explanation from the interviewer as to why it wasn't answered.
- 4) Identify each interview. Proper identification of the interviewer must appear on each interview.

With practice (try recording radio newscasts, practice on friends, etc.) you will be able to record the interview with little difficulty. You can become adept at speedy recording by beginning to write immediately when the respondent starts to talk. Any comment that may help us in the phone interview (i.e., is concerned about confidentiality, is unsure about going back to the beach, very concerned about the environment, etc.) may be

written in the margins or on the back of the interview.

We know how difficult it is to record information at the beach. Do not be concerned about the overall neatness of the interview but rather be concerned about the understandability and legibility. Feel free to cross out information, and make notes in free spaces. The field interview is a tool and should be thought of as such.

When you edit your questionnaire, remember that they will be seen and used by someone who was not present when you conducted the interview. The best time to edit an interview is right after you complete it, when recollections are clearest. Also, if you find you are missing information you can return to your Respondents if necessary.

## BEGINNING THE INTERVIEW

### Gaining Cooperation

- 1) The Respondent and interviewer need to establish good rapport. Rapport provides the foundation of good interviewing. The Respondent's impression of you during your introduction and early remarks will determine the nature of the rapport that develops. Be sure that your tone is pleasing and friendly, that you speak clearly, and that you know what you are going to say.
- 2) The Respondent needs to perceive the study as being important and worthwhile. Some Respondents may be doubtful about the study's value. You must be prepared to interest the Respondent in the study. The Respondent should see the interview as an opportunity to contribute important information and to have that information used meaningfully.
- 3) Any barriers the Respondent feels about the interview need to be overcome. You must use your initial time with the Respondent to your advantage and be alert to any doubts they may have, even if they are not expressed verbally. Your professional and friendly manner, your introductory statements, and the success with which you answer the Respondent's questions are the things that will sell both you and the study to the Respondent.

Your own state of mind has a large impact on the Respondent's willingness to participate in the interview. Your conviction that the interview is important strongly influences the Respondent's cooperation. Your belief that the information you obtain is significant and useful motivates the Respondent to answer accurately. Although people are sometimes reluctant to give specific information, they

will often give that information if they are convinced that good use will be made of it and that their privacy will be maintained.

### Conducting the Interview

- 1) Tell the Respondent who you are and who you represent.
- 2) Have information about the study clearly in mind so you can explain it readily.
- 3) Mention that the Respondent's answers are confidential. The questionnaire provides an introduction, but additional introductory remarks may be required to answer the Respondent's questions.
- 4) Keep the introduction brief. Listen to the Respondent carefully and answer only what is asked. You must be able to provide answers to most common questions that will be asked about the study. If there is a question about which you simply have too little information to answer, you can show them the number of the study office which is printed on the brochure.
- 5) Always remain neutral while asking the questions. You must maintain a neutral attitude with Respondents. You must be careful that nothing in your words or manner implies criticism, surprise, approval or disapproval of either the questions asked or the Respondent's answers. The answers should not be influenced by your behavior or attitudes.
- 6) Ask all questions in the order presented in the questionnaire and do not skip over any of the questions, even though you think there may be some repetition. Never change the order of the questions even though you may feel that the Respondent has already answered some of the questions before you get to them.

### **PROBING**

#### What is Probing and Why is it Necessary?

Probing is a technique used to stimulate discussion and to obtain more information. Probing is necessary if a Respondent's answer is unclear, irrelevant or incomplete. Probing motivates the Respondent to enlarge or clarify their answers.

#### Know the Objective or Intent of the Question

You will be best able to determine the adequacy of an answer if you fully understand the purpose and meaning of each question. Once you know the purpose of a question, you will find it much

easier to decide if you have a satisfactory answer or whether you should try to probe to obtain a clearer and fuller one.

### The Importance of Keeping Probes Neutral

It is very important to use neutral probes. You should not imply that you expect a specific answer or that you are dissatisfied with an answer.

Remember that the reason for probing is to motivate the Respondent to respond more fully or to focus the answer, without introducing bias.

### Kinds of Probes

There are several different kinds of neutral probes which appear to be part of a normal conversation and can be used to stimulate a fuller, clearer response:

- 1) An expression of interest and understanding. By saying such things as "uh-huh" or "I see" or "yes," you indicate that the response has been heard, that it is interesting, and that more is expected.
- 2) An expectant pause. The easiest way to convey to a Respondent that you know he or she has begun to answer the question but has more to say, is to be silent. A pause, often accompanied by an expectant look or nod of the head, allows the Respondent time to gather his or her thoughts and then continue.
- 3) Repetition of the question. When the Respondent does not seem to understand the question, misinterprets it, or strays from the subject, repeat the question.
- 4) Repetition of the Respondent's reply. Your repetition of what the Respondent has said is often an excellent probe.
- 5) A neutral question or comment. Neutral questions or comments are often used to obtain clearer and fuller responses. Following are some suggested probes:

#### PROBES TO CLARIFY

"What do you mean exactly?"

"What do you mean by...?"

"I don't understand. Could you please explain that a little more?"

## PROBES FOR SPECIFICITY

"What in particular do you have in mind?"

"Could you be more specific about that?"

"Tell me about that. What/who/how/why...?"

"Would that have been closer to \_\_\_\_ or to \_\_\_\_?"

## PROBES FOR RELEVANCE

"I see. Well, let me ask you again, (REPEAT QUESTION EXACTLY)."

"Would you tell me how you mean that?"

## PROBES FOR COMPLETENESS

"What else?"

"What other (reasons/things/examples) can you think of?"

## Probing a Don't Know (DK) Response

The "I don't know" answer can mean a number of things. The Respondent may not understand the question and answers with "don't know" to avoid saying that he or she doesn't understand. The Respondent may be thinking the question over and says, "I don't know" to fill the silence but also to have time to think. The Respondent may be trying to evade the question, or may really not know or have any opinion on the question.

Don't be in too big a rush to settle for a "don't know" reply. An expectant pause will usually give the Respondent time to think of something further to say. Always try at least once to obtain a reply to a "don't know" response, before accepting it as the final answer. But be careful not to antagonize the Respondent or force an answer.

## Examples of Probing

Q: When you used a thermometer to take your child's temperature, what did it read?

A: Oh, about 98°-102°.



Improper probe: So, you'd say 100°?

Proper probe: Can you be more specific?

Proper probe: Would it be closer to 98° or to 102°?

Q: What has been your usual occupation?

A: I assisted the manager in the office.

Improper probe: Oh, you did supervisory work?

Proper probe: Assisted the manager? Could you be a little bit more specific?

### When to Stop Probing

When you have obtained as much information from the Respondent as possible and when you have encouraged the Respondent to clarify when necessary, you should stop probing. However, if at any time the Respondent becomes irritated or annoyed, stop probing. It is important to gain the information, but not at the expense of discontinuing the interview.

### **TELEPHONE INTERVIEWING**

The basic procedures and techniques employed in face-to-face interviewing are applicable to telephone interviewing as well. There are obvious differences and unique problems in a telephone survey. Communication in any interviewing situation is not simple, and in telephone interviewing communication is complicated by the elimination of normal face-to-face contact.

In the telephone interview the Respondent reacts to the interviewer's voice rather than to a beheld personality. This emphasizes a need for the interviewer to be courteous, to sound pleasant and to speak slowly and clearly. It is important that the interviewer identifies himself immediately and addresses the Respondent (or whomever answers the phone) by name whenever possible. The interviewer must establish friendly relations with the person on the other end of the line by concisely stating the purpose of the call and expressing enthusiasm for the project with sincerity. Introductions should be brief, however, so that the interest of the Respondent is not lost.

If there seems to be suspicion or wariness on the part of the Respondent, stress the confidentiality of the information that is sought. It is important to remind the Respondent that their name is in no way connected to the data being analyzed.

The instructions for recording responses in a telephone interview are the same as in a face-to-face interview: all responses are recorded. However, in a telephone interview it is more imperative

to be completely familiar with the questionnaire to avoid embarrassing pauses. A constant flow is essential; otherwise, the Respondent will lose interest, resulting in premature termination of the interview.

All probes must be verbal and nondirective. The telephone interviewer cannot rely on a facial expression or a raised eyebrow to gauge whether or not the Respondent understands the questions, and may fall into the pitfall of prodding, suggesting, or rushing the respondent. A pleasant, nicely modulated and interested voice is the most effective technique, coupled with the know-how of probing effectively.

#### **ENDING THE INTERVIEW**

Respondents must be treated courteously and tactfully. Try to leave them with the impression that they have taken part in an interesting and worthwhile experience -- one they would be willing to repeat.

After all the questions have been asked, thank the Respondent. Also mention that their contribution has been very helpful in providing important information to the study. You may spend a few minutes answering any additional questions the Respondent may have.

#### **BEACH INTERVIEW GUIDELINES**

Though people at the beach will be engaged in a variety of activities, the most convenient way to approach them about the study is while they are lounging or sunbaking. This approach is usually less disruptive and allows the interviewer a chance to collect information away from the activity at the shoreline or at the water. Nevertheless, people who are simply wading or just getting their feet wet should be approached as well.

Single adults or any adult member of a family can be the source of information on themselves or any family member. That same adult can be the source for children who are not part of the family but have come to the beach under their supervision.

We will contact the adult who we spoke to on the beach by telephone at the time of the followup and get permission to telephone the parent of the non-family member who was at the beach that day.

Children 12 years or older may be questioned directly by the beach surveyor. It is important that the surveyor take the time to make any accompanying adult aware of the purpose of the study. Teenagers at the beach who are not accompanied by an adult can be recruited, but should be told to inform their parents that a followup telephone interview will occur.

Most people we will encounter on the beach will not be surprised

to know that this type of survey is being done. For years, discussion in the news media has focused on the condition of the water in the Santa Monica Bay.

Most people will be helpful and willing to participate. To establish good rapport, surveyors should be friendly and encourage questions and comments but try to limit the amount of information they give about the study.

Beachgoers should be reminded that the results of the study will provide answers to the some of the most important questions regarding the safety of swimming in the Bay.

Many people will express strong opinions about the pollution in the water, who causes it, what should be done about it, and other aspects of the study. Please do not attempt to persuade those with strong preconceptions that their opinions are wrong. Avoiding arguments and long discussions will insure that the work is accomplished in a timely and friendly manner.

#### EXPECTED QUESTIONS AND RECOMMENDED ANSWERS

##### QUESTIONS:

- 1) Why do you want to know where I swim? Is there a problem?
- 2) Should I swim near a storm drain? Is it safe?
- 3) Why are you asking health questions? Do a lot of people get sick swimming in the Bay?
- 4) What are the chances of getting sick if I swim in the Bay? Are my children at greater risk?
- 5) Why do you want to know if my face got wet? Does that matter?
- 6) Why do you want to know what beaches I have gone to in order to swim? Are some beaches safer than others?
- 7) Just how polluted is the Santa Monica Bay?
- 8) I went swimming at the beach last week and got a skin rash. Does that mean the water is polluted?
- 9) Why do you want to know if my kids swam in the lagoon? Isn't it safe?
- 10) I surf here every day. Why is someone suddenly asking questions? Have other surfers been having problems?
- 11) What kinds of health questions will you be asking?

**ANSWERS:**

Answers to all questions except 7) and 11) would essentially be the same:

"We don't know. That's why we are doing this study. No one has ever done a scientific study of the question you're asking about."

7) "I don't know. That's the kind of important information we need to have. Watch the newspapers for results of this study in the Fall."

11) "The questions will be a general health review."

It's okay to say, in general, "I'm working for a scientific study and it's important for me to remain impartial and objective so that the results of the study won't be biased."

**DAILY SCHEDULE FOR BEACH INTERVIEWERS**

- 9-10: Meet at study office/gather materials/discuss problems/change strategy(ies)/transportation to beach**
  
- 10-12: Interviewing (with break)**
  
- 12-12:30 Lunch**
  
- 12:30-3:30 Interviewing (with break)**
  
- 3:30-4:00 Count questionnaires/transportation to study office**
  
- 4:00-5:00 Edit questionnaires/participate in daily count/place questionnaires in bins**

## INSTRUCTIONS FOR TELEPHONE INTERVIEWERS

### HEALTH QUESTIONNAIRE

BACKGROUND: The health questionnaire is a simple two-page scannable form that lists the most frequent symptoms of common, acute infectious diseases that could be contracted from swimming in the Santa Monica Bay. The diseases targeted are:

- 1) PINK EYE (Conjunctivitis)-an inflammation of the delicate transparent membrane (covering) that lines the eyes.
- 2) INFECTIONS OF THE MIDDLE AND OUTER EAR (Otitis media and otitis externa)-middle ear infections are mainly characterized by pain while outer ear infections feature painless discharge.
- 3) SKIN PROBLEMS-Rashes or infections pertaining to the skin
- 4) "STOMACH FLU"(Gastroenteritis)-illness identified by sudden onset of crampy abdominal pain, vomiting and/or diarrhea
- 5) COLD SYMPTOMS (Upper respiratory infections)-this category includes congestion, sore throat and cough
- 6) FEVER AND CHILLS-is defined as a temperature equal to or greater than 100° Fahrenheit or 38° centigrade. Could accompany almost any of the above symptoms included on the questionnaire.

THE QUESTIONNAIRE: The goal of the questionnaire is to reliably identify symptoms that meet the criteria for the above diseases.

Since our diagnosis will be based only on "word of mouth" it is crucial that all phone interviewers carefully comply with the following directions so our answers are reliable and reproducible.

### QUESTIONNAIRE INSTRUCTIONS FOR INTERVIEWERS:

Each symptom is divided into three columns a,b, and c. Column a asks if the person (or child) has developed that particular symptom SINCE his visit to the beach. Column b asks if the person had the symptom during the week PRIOR to the beach visit. Column c is for comments. This is how the questions flow for each symptom EXCEPT fever and chills:

-Ask "a". Did you or your child have (symptom) at any time since your visit to the beach? If the answer is no go on to the next symptom.

-If "a" is yes, ask b. Did you or your child have (symptom) during the week before you went to the beach? If this is no, go on to the next symptom.

-If the answer is yes, the interviewer will write the person's

comments in column c (you may need to use a probe) and go on to the next symptom.

-Use probes (SEE BELOW) on most symptoms before marking any "don't know". If the probe does not elicit any more information mark "don't know" and go on to the next symptom.

-For fever and chills only ask "a" since this can only be an acute problem. Note that the scantron does not have a "b" or "c" for these symptoms.

**IMPORTANT NOTE: THE SUPERVISOR, NOT THE INTERVIEWER, WILL DECIDE FROM THE COMMENTS IF WE CAN COUNT THIS AS A SYMPTOM RELATED TO SWIMMING IN THE OCEAN. THEREFORE ANY TIME YOU MARK YES TO A AND YES TO B YOU MUST WRITE COMMENTS IN C SO A PHONE SUPERVISOR CAN DECIDE THE APPROPRIATE ANSWER.**

QUESTIONNAIRE GUIDELINES Many of you have never done health questionnaires before, so the following is a list of the symptoms with appropriate probes if the FIRST answer is "don't know". Remember, the probe is used to help the person being interviewed make a decision, not the interviewer!!! If after the probe the SECOND answer is still "don't know" go on to the next symptom after marking "don't know". If something still isn't clear write it out and have the supervisor check it.

NOTE: Most of these guidelines pertain to COLUMN A ONLY, to help identify the symptom if you get a "don't know." Anytime the answer is NO, go on to the next symptom. If the answer is yes to "a" after probing be sure to ask b and write in c.

1. **FEVER:** If "don't know" ask the probe: "Were you very hot, did you have a fast pulse, aches or chills that caused you discomfort?"

2. **CHILLS:** If "don't know" ask: "Did you have shaking that was hard to control? Did your teeth chatter?" .

3. **REDNESS and DISCHARGE FROM EYES:** If "don't know" ask, "Did you have pink eye?" "Did you have thick yellow discharge from either eye?"

4. **EARACHE:** If "don't know", do not probe.

5. **DISCHARGE/DRAINING FROM EARS:** Again no probe necessary.

6. **SKIN RASH:** If yes, ask where? (A rash from ocean swimming should cover all or most of the body, not just an isolated spot on an arm for example). If "don't know" don't probe.

7. **CUTS OR SCRAPES THAT BECOME INFECTED:** Any cut or scrape can become slightly pinker if exposed to salt water, therefore, if "don't know" ask, "Was there a marked increase in pain, redness, swelling and/or red streaks in the skin around the cut?"

8. NAUSEA: If don't know ask, "Did you feel sick to your stomach so you couldn't eat?" Did you feel like throwing up?" If yes, ask if pregnant.

9. VOMITING. No probe necessary.

10. DIARRHEA: No probe.

11. DIARRHEA WITH BLOOD: No probe.

12. STOMACH PAIN OR CRAMPS: If "don't know" ask, "Did you have any stomach pain that lasted a few minutes, then went away, then returned?"

13. COUGHING: If yes, ask if the person has allergies or is a smoker?" If yes to either of those ask, "Was this cough stronger, and more frequent?" If you get a yes to these answers write this down for a supervisor to check.

14. COUGHING WITH PHLEGM: Same probes apply here as to plain coughing.

15. NASAL CONGESTION/RUNNY NOSE: "Ask the person if they have allergies that give them these symptoms often. If yes ask, "Was this cold more severe?" Write down answers for a supervisor.

16. SORE THROAT: "Ask, did your throat hurt especially when swallowing?"

Final Note: We cannot anticipate all responses that will be elicited. The key to the interviewer becoming comfortable with this questionnaire will be communication with a supervisor. Please feel free to ask ANY question at ANY time. If an interview becomes too complicated or difficult feel free to inform the interviewee that a supervisor will need to call them back. Good Luck!

#### MEDICAL APPENDIX

There are many ways that storm drains can become contaminated with bacteria and viruses that cause disease in humans. Direct dumping of human or animal feces into a catch basin or storm drain is one way while at times an overloaded raw sewage can leach into the storm drain system. Once in the drain some bacteria and viruses can live easily flowing along with the liquids and debris directly into the ocean. When human beings swim near these germs they can be ingested and cause a variety of diseases that affect the skin, eye, respiratory tract and gastrointestinal symptoms. For those of you interested I have listed the common bacteria and viruses that exist in this system and the problems they might cause.

## BACTERIA:

Vibrio family: This is a group of bacteria most famous for causing cholera which can be deadly if untreated but is rare in this country. The most common vibrio species found in our waters only causes a short-lived gastroenteritis.

E. Coli family: This group of bacteria is found in abundance in our storm drains as this is the most common bacteria found in our stool. Many types of E.Coli do not cause any disease but some can cause gastroenteritis. The most well-known of this group is E. coli 0157 which had a lot of media attention because it has been found in fast food chains when hamburger meat was not cooked well enough. This strain can cause bloody diarrhea.

Salmonella/Shigella family: These groups of bacteria are not common anymore but can cause serious illness of the intestinal tract.

Campylobacter: This bacteria accounts for up to 11% of all diarrhea cases. It has a wide spectrum of disease with not only diarrhea but bloody diarrhea, fatigue, fever and severe chills. It can last up to two weeks and there is no good drug to cure it.

Strep and Staph families: can cause conjunctivitis and wound infections if someone swims with a cut. Certain strains of staph cause diarrhea but salt water is not an important way this is transmitted.

VIRUSES: Account for up to 40% of all diarrhea cases.

Rotavirus family: This virus attacks kids more than adults causing a lot of vomiting and some diarrhea. It is a very common virus and a vaccine is in the works.

Norwalk: 40% of non-bacterial epidemics of diarrhea are caused by this virus. It is usually a mild illness lasting one to two days.

Enterovirus family: Enterovirus are known to occur in summer and express themselves in a variety of diseases, the most famous being polio which is now eradicated in the Americas. They can cause sore throats, colds, heart and respiratory problems, skin eruptions and possibly diarrhea.

Adenovirus: This is a virus renowned for causing epidemic conjunctivitis but is more commonly spread through direct contact or freshwater contact.



## HOW TO PROTECT YOURSELF FROM SUNBURN

All one has to do to figure out that sun protection is a big issue is go to any drugstore and note virtually dozens of preparations available for sun protection. But how do you know which one is best for your skin? Understanding the science of sunburn is a good place to start before answering that question.

Everyone knows that sunlight can damage skin and increase the risk of getting skin cancer. What everyone doesn't know is that it ONLY takes three or more sunburns before the age of 20 to significantly increase your risk of getting skin cancer. This is not a lot of sun exposure!

The sun damages the skin by emitting two types of light, Ultraviolet A (UVA) and Ultraviolet B (UVB). UVA penetrates the skin more deeply more than UVB and is more responsible for deeper skin damage that leads to cancer. UVB is captured at the surface and is responsible for what we call sunburn. Now, most sunscreens which say UVA protection ONLY block about 10-20% of UVA light! Thus even though they are preventing sunburn by blocking UVB light they are NOT working effectively to decrease your risk of getting skin cancer since UVA light is still penetrating your skin! Therefore it is important to use a product that blocks UVB and at least 90% of UVA light!

There are two products on the market now that work well for total UVA and UVB block. The first one uses an ingredient called Parsol 17 and is called UVAGUARD by Shade. There is also a second ingredient called titanium dioxide that completely blocks both kinds of light. I am not sure which products are yet using this so you need to read labels. One other note, SPF factor of 15 blocks 95% of UVB light and is all that is necessary.

Other measures should be taken as well. Wearing your hat and shirt at all times is not only good protection but looks professional as well. Lip balm with SPF 15 is also helpful. Or you can coat your lips with sunscreen. Remember to re-apply sunscreen after four hours if sun exposure is to continue. If you forget to sunscreen or need more all beach supervisors will have sunscreen with them at the beach.

Finally, if you should get sunburned there is no product that can heal you faster. Any drug store will have medicated creams or sprays to help alleviate the discomfort. However sunburn is avoidable and we expect our workers to follow our guidelines and keep protected from the sun! Remember, we are thinking of your best interest!

**THE BIG QUESTION:** Won't tanning protect me from the sun, i.e., is a tan healthy?

**THE EVEN BIGGER ANSWER:** Dermatologists believe that even though tanning is a way to increase a natural pigment called melanin in the skin this is only partially protective against UVB and UVA light. Therefore allowing your skin to tan, especially heavily, cannot be called healthy.

**ADDENDA**

# QUESTIONNAIRES

Last Date for Phone Appt. \_\_\_\_\_

ID# \_\_\_\_\_

Date (MM/DD/YY) \_\_\_\_\_

|A|B|C|D|E|F|G|

### CONFIDENTIAL (ASHLAND BEACH ONLY)

Interviewer (include #) \_\_\_\_\_ Date (MM/DD/YY) \_\_\_\_\_ (Day of week) \_\_\_\_\_

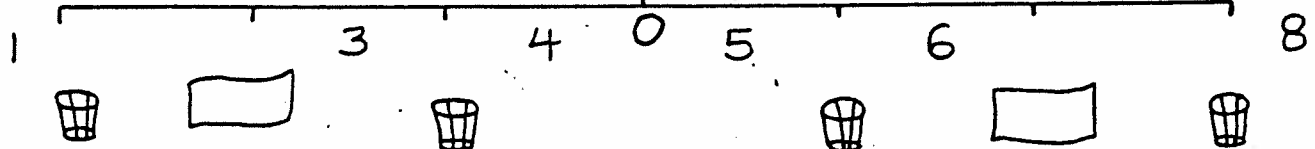
Phone Appt. \_\_\_\_\_ Ethnicity: W | B | L | A | O English / Spanish  
Day of week \_\_\_\_\_ Date (MM/DD/YY) \_\_\_\_\_ Time \_\_\_\_\_

Name – in water today	Relation (S/M/F/C)	Age	Age Cat	Gender (M/F)	Face Wet? (Y/N)		Map Code	Study Eligible (Y/N) T*
					B*	T*		
A.) Returned to the Beach? Yes / No								
B.) Returned to the Beach? Yes / No								
C.) Returned to the Beach? Yes / No								
D.) Returned to the Beach? Yes / No								
E.) Returned to the Beach? Yes / No								
F.) Returned to the Beach? Yes / No								
G.) Returned to the Beach? Yes / No								

B\* – Determined during Beach Interview

T\* – Determined during Telephone Interview

OCEAN



name of contact person (relation)

Where would you like to be called?

work / home ( ) number time

work / home ( ) number time

name of contact person (relation)

Where would you like to be called?

work / home ( ) number time

work / home ( ) number time

### Beach Interviewer's Comments

### Phone Interviewer's Comments

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# BEACH QUESTIONNAIRE SUPPLEMENT

## 1995 SANTA MONICA BAY BEACH STUDY MALIBU BEACH ONLY

### Participant Eligibility

**First Eligibility Requirement** -- Eligible people are those who have not been in the water within the exposure area at this beach (Malibu beach) before today over the past week, or anywhere in the water at either Will Rogers, Ashland Beach, Mothers' Beach (Marina Del Rey), or Santa Monica Pier before today over the past week. The exposure area at this beach is within the area between the two supervisor blankets.

Once the first eligibility requirement has been met, the eligibility of adults and children is determined differently.

#### **Eligible Adults**

**Adults *With* Children** -- Adults who are at the beach today with children are automatically eligible for this study if they have submerged their heads (or gotten their faces/hair wet). They are also eligible if they have been in the water without submerging their heads and at least one of their accompanying children has been in the water.

**Adults *Without* Children** -- Adults who are at the beach today without children are eligible for this study only if they submerged their heads while in the water.

**Eligible Children** -- Children are eligible if they have been in the water today, whether they submerged their heads or not.

1995 SANTA MONICA BAY BEACH STUDY  
INSTRUCTIONS FOR BEACH QUESTIONNAIRE

**INTRODUCTION:**

Hi! I'm from the Santa Monica Bay Beach Study. Have you or any of your family been in the water today?

My name is \_\_\_\_\_. We're doing a survey to determine whether the measures of water quality for this beach are useful. We're interested in the health of adults and children who swim here. Can I have a few minutes of your time to ask you some questions? Your answers will be confidential.

---

**EXPLANATION OF STUDY:**

This interview has 2 parts. During the first part, here, I am going to ask you where you (*your children*) were when you (*your children*) were in the water today. During the second part of the interview, someone will be telephoning you in about 9 days to ask you some health questions. That call should take about 5 minutes. Will that be all right?

**USE OF TABLE AND MAP ON BEACH QUESTIONNAIRE:**

Record all **ELIGIBLE** household participants in the table (refer to the **FLOW CHART** to determine eligibility.) Include the ages of minors, and include only the age category (Age Cat) of adults (use "**Age Categories**" flashcard). Code relations as follows: **S = Self; M = Mother; F = Father; C = Child**. Describe other relations to the respondent fully, i.e., aunt, cousin, friend, etc.

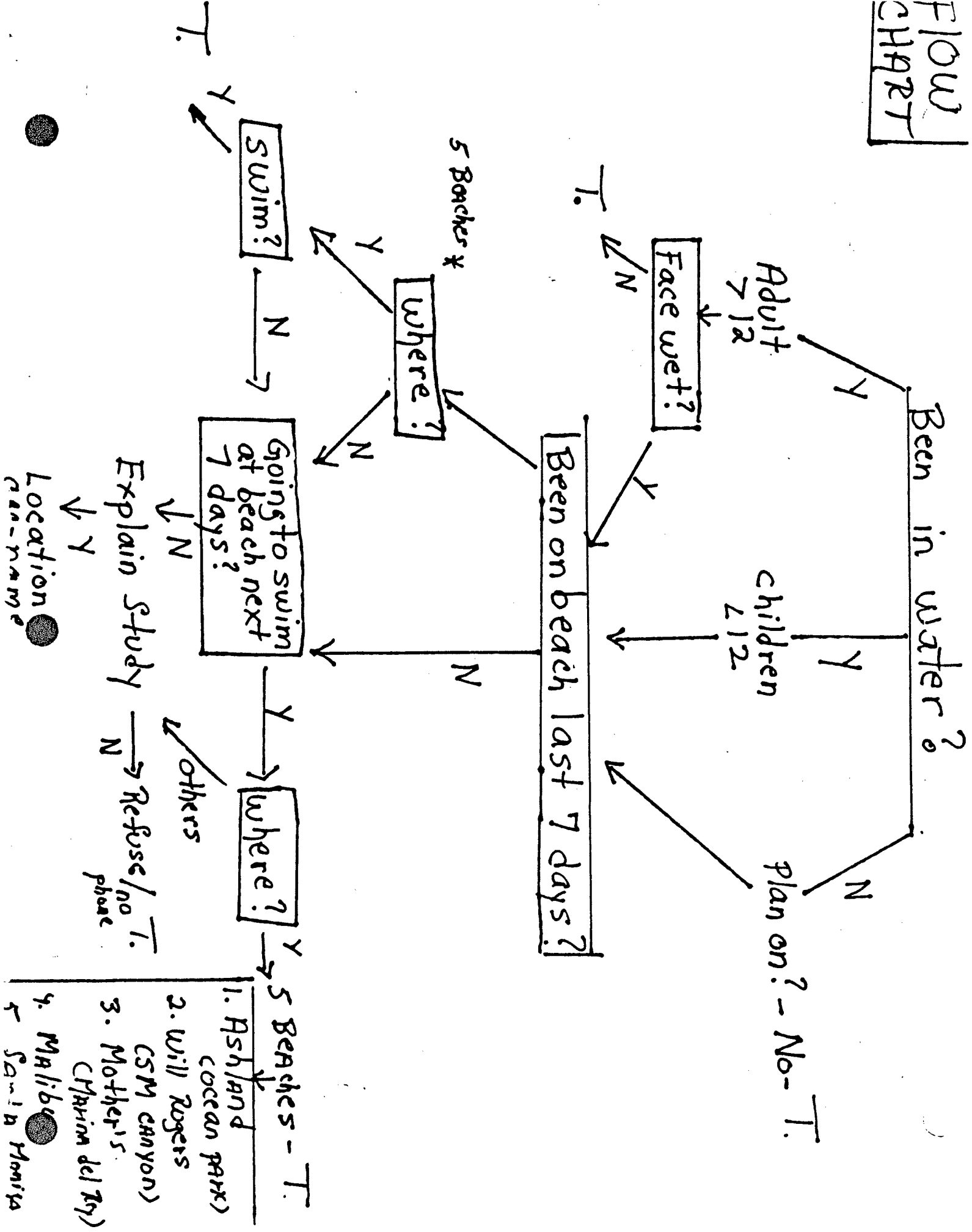
Use the letter corresponding to each eligible household participant to indicate their location on the map. Then mark the appropriate number from the map in the "Map Code" section of the table.

---

**ETHNICITY CODES:**

**W: White      B: Black      L: Latino      A: Asian      O: Other**

# FLOW CHART



Location name

- 5 Beaches - T.
1. Ashland  
Coccon Park
  2. Will Rogers  
CSM Canyon
  3. Mother's  
Cynthia del Rey
  4. Malibu  
Santitas Monica



ID Number									
A	0	0	0	0	0	0	0	0	A
M	1	1	1	1	1	1	1	1	B
W	2	2	2	2	2	2	2	2	C
	3	3	3	3	3	3	3	3	D
	4	4	4	4	4	4	4	4	E
	5	5	5	5	5	5	5	5	F
	6	6	6	6	6	6	6	6	G
	7	7	7	7	7	7	7	7	H
	8	8	8	8	8	8	8	8	I
	9	9	9	9	9	9	9	9	J

Beach Interview Date	
Month	Day
<input type="radio"/> June	1 17
<input type="radio"/> July	2 18
<input type="radio"/> Aug	2 19
<input type="radio"/> Sept	3 20
<input type="radio"/> Oct	4 21
	5 22
	6 23
	7 24
	8 25
	9 26
	10 27
	11 28
	12 29
	13 30
	14 31
	15
	16

Phone Interview Date	
Month	Day
<input type="radio"/> June	1 17
<input type="radio"/> July	2 18
<input type="radio"/> Aug	2 19
<input type="radio"/> Sept	3 20
<input type="radio"/> Oct	4 21
<input type="radio"/> Nov	5 22
	6 23
	7 24
	8 25
	9 26
	10 27
	11 28
	12 29
	13 30
	14 31
	15
	16

Water clean?  
 Yes  
 No

Gender  
 Female  
 Male

Age - Code from beach questionnaire

0 to 12  
 13 to 18  
 19 to 25  
 26 to 35  
 36 to 45  
 46 to 55  
 56 to 65  
 66 to 75  
 > 75

Map Code

0  
1  
2  
3  
4  
5  
6  
7  
8  
9

Beach Interviewer's Number

0 0 0  
1 1 1  
2 2 2  
3 3 3  
4 4 4  
5 5 5  
6 6 6  
7 7 7  
8 8 8  
9 9 9

Phone Interviewer's Number

0 0 0  
1 1 1  
2 2 2  
3 3 3  
4 4 4  
5 5 5  
6 6 6  
7 7 7  
8 8 8  
9 9 9

1. (Refer to the Beach Questionnaire) Did respondent get her/his face wet?

- No, face did not get wet       Yes, face got wet



2. Did you (child's name) get your (her/his) face wet while you (she/he) were (was) in the water on (DAY)?

- No  
 Yes  
 Don't know/don't remember

3. I'm going to go through a list of symptoms to find out about your (child's) health since you (she/he) were (was) at the beach on (DAY). Since your (her/his) visit to the beach on (DAY), have (has) you (child's name) had any of the following problems or symptoms?

a) How about (EACH)? Did you (child's name) have that at any time since your (her/his) visit to the beach on (DAY)?

b) Was this a problem that you (child's name) had during the week before you went to the beach on (DAY)?

c) IF YES to b, Please describe how often you experienced this symptom when you had it before.

Problem or Symptom

For each "Yes" in a, ask b, and c.

1. Fever

No Yes DK

No Yes DK

2. Chills

3. Redness and discharge from the eyes

4. Earache

5. Discharge/draining from the ear

6. Skin rash

(If yes to a, describe site.)

PLEASE DO NOT WRITE IN THIS AREA



12501

**Problem or Symptom**  
For each "Yes" in a, ask b, and c.

a) How about (EACH)? Did you (child's name) have that at any time since your (her/his) visit to the beach on (DAY)?

b) Was this a problem that you (child's name) had during the week before you went to the beach on (DAY)?

c) IF YES to b, Please describe how often you experienced this symptom when you had it before.

7. Cuts or scrapes that became infected	No Yes DK ○ ○ ○	No Yes DK ○ ○ ○	<input type="radio"/>
8. Nausea (ask a woman who says "yes" if she's pregnant)	○ ○ ○	○ ○ ○	<input type="radio"/> (Exclude nausea caused by pregnancy in a.)
9. Vomiting	○ ○ ○	○ ○ ○	<input type="radio"/>
10. Diarrhea (If 11a is no, 12a is no. Skip to 13.)	○ ○ ○	○ ○ ○	<input type="radio"/>
11. Diarrhea with blood	○ ○ ○	○ ○ ○	<input type="radio"/>
12. Stomach pain or cramps	○ ○ ○	○ ○ ○	<input type="radio"/> (Exclude menstrual periods in a.)
13. Coughing (If 14a is no, 15a is no. Skip to 16.)	○ ○ ○	○ ○ ○	<input type="radio"/>
14. Coughing accompanied by phlegm	○ ○ ○	○ ○ ○	<input type="radio"/>
15. Nasal congestion or runny nose	○ ○ ○	○ ○ ○	<input type="radio"/>
16. Sore throat	○ ○ ○	○ ○ ○	<input type="radio"/>

**4. How worried or concerned are you about environmental hazards at the beach? Would you say you are...**

- Not at all worried or concerned
- Somewhat worried or concerned
- A little worried or concerned
- Very worried or concerned

**5. What is your ethnic background?**  
(Read choices if necessary.)

- White
- Black
- Latino
- Asian
- Multi-ethnic
- Other, \_\_\_\_\_

**6. What is your 5-digit postal zip code? (Code "99999" for foreign respondents.)**

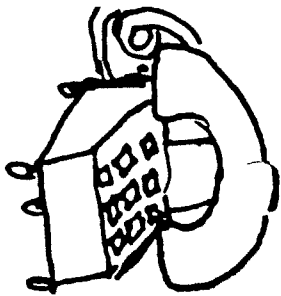
Zip Code				
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

(If there are other household members to interview, use another phone questionnaire, otherwise...)

**THANK YOU VERY MUCH. I REALLY APPRECIATE THAT YOU HAVE TAKEN THE TIME TO ANSWER THESE QUESTIONS.**

# TELEPHONE INTERVIEW CHECKLIST

1. Ask respondent if there were other individuals that may have accompanied them to the beach.
2. Make sure "ID" control number on the Scan-tron corresponds with the "Interview sheet" at the top of the page.
3. If eligible for the study, don't forget to write "Y" in the proper box on the interview sheet.
4. If beach patron did not get wet at the beach, ask again. If yes, place a "Y" in the "Face Wet" column.
5. If the respondent is ineligible, write "INELIGIBLE" in the ID section of the interview sheet.
6. When interview is eligible and completed, write your initials, date, time, and "CI" for completed interview in the phone interviewer comments section of the interview sheet.
7. Appropriate map code must be transferred from interview sheet to the scan-tron.
8. The letter in the ID number section of the Scan-tron should correspond with the appropriate person on the interview sheet.
9. If "A" is yes, remember to bubble in "B"!
10. Bubble in zip code.
11. Write our probe - don't just list P<sub>1</sub> and P<sub>2</sub>. Don't know answer? Probe for more information.
12. Water clean field refers to whether or not people returned to the SAME BEACH WITHIN 24 hours of the interview. If yes, bubble "yes," of no, bubble "no".



# PHONE INTERVIEW

Introduction



CHECK ELISIBILITY

? Adults

T. ← N → Face wet? → Y →

Elisible Adults/Kids

Been Back to the Beach in the last 7 days?  
Y Beaches

Y ↓ T.

? Children

Y → Hands wet → N → T.  
Body

↓ N  
Proceed with phone questionnaire.

Beaches  
Island (SM)  
Will Rogers  
Malibu  
S.M. Pier  
Mother's  
(Marinick/Ry)

Adults 712  
Children  
212 yr.

# SANTA MONICA BAY BEACH STUDY

## TIMESHEET

EMPLOYEE NAME SANDY BEACH PERIOD COVERED FROM 6/2/95 TO 6/15/95

DAY	DATE	IN FOR DAY	OUT	IN	OUT FOR DAY	TOTAL OF HOURS WORKED
SAT	6/1	9:30	12:30	1:00	4:30	6.5
SUN	6/3	9:30	12:30	1:00	4:30	6.5
MON	6/5	9:30	12:30	1:00	4:30	6.5
TUES	6/6	9:30	12:30	1:00	4:30	6.5
WED	6/7	9:30	12:30	1:00	4:30	6.5
THUR	6/8	9:30	12:30	1:00	4:30	6.5
FRI	6/9	9:30	12:30	1:00	4:30	6.5
SAT	6/10	9:30	12:30	1:00	4:30	6.5
SUN	6/11	9:30	12:30	1:00	4:30	6.5
MON	6/12	9:45	1:00	5:00	8:00	6.25
TUES	6/13	9:45	1:00	5:00	8:00	6.25
WED	6/14	9:45	1:00	5:00	8:00	6.25
THUR	6/15	9:45	1:00	5:00	8:00	6.25
FRI	6/16	9:45	1:00	5:00	8:00	6.25
<b>TOTAL HOURS</b>						<b>24.5</b>

EMPLOYEE SIGNATURE Ms. Sandy Beach

I hereby certify that this time is a true statement of hours worked by this employee and that the assigned work has performed in a satisfactory manner.

Supervisor \_\_\_\_\_ Date \_\_\_\_\_

FOR OFFICE USE ONLY	
HOURLY RATE	TOTALS
\$ <u>11.25</u>	\$ <u>275.625</u>
\$ <u>0.00</u>	\$ <u>0.00</u>
<b>TOTALS</b>	<b>\$ <u>275.625</u></b>

SANTA MONICA BAY BEACH STUDY

MILEAGE AND EXPENSES

Mileage, at 25¢ a mile, will be reimbursed for the following:

1. Using your car to transport field workers from the office to the beach and back.
2. Any mileage incurred in obtaining information or equipment requested by supervisors.
3. Hopefully, we will have some free spaces at each beach. Any parking fees that are not covered, but requested by the supervisor will be reimbursed.

SANTA MONICA BAY BEACH STUDY  
Employee Confidentiality Pledge

I recognize the importance of maintaining the confidentiality of all data collected by the Santa Monica Bay Beach Study and of assuring the right to privacy of persons we interview in the field and on the phone. I also understand that my employer has agreed to uphold its obligation to protect the privacy of these persons. I therefore agree to protect the confidentiality of the data in accordance with the following requirements:

I will avoid any action that will provide confidential information to any unauthorized individual or agency.

I will not make copies of any data except as specifically authorized.

I will not remove confidential identifying information from the office except as authorized in the performance of my duties.

I will not discuss in any manner, with any unauthorized person, information that would lead to identification of individuals interviewed in the Santa Monica Bay Beach Study.

I will use confidential files and data only for purposes for which I have been specifically authorized.

I understand that confidential information or data is defined as any information where the individual is identifiable. As an employee, breach of confidentiality may be cause for immediate termination of my employment.

I therefore pledge that I will not divulge to any unauthorized person any confidential information or data.

EMPLOYEE: \_\_\_\_\_  
(print)

(signature) \_\_\_\_\_

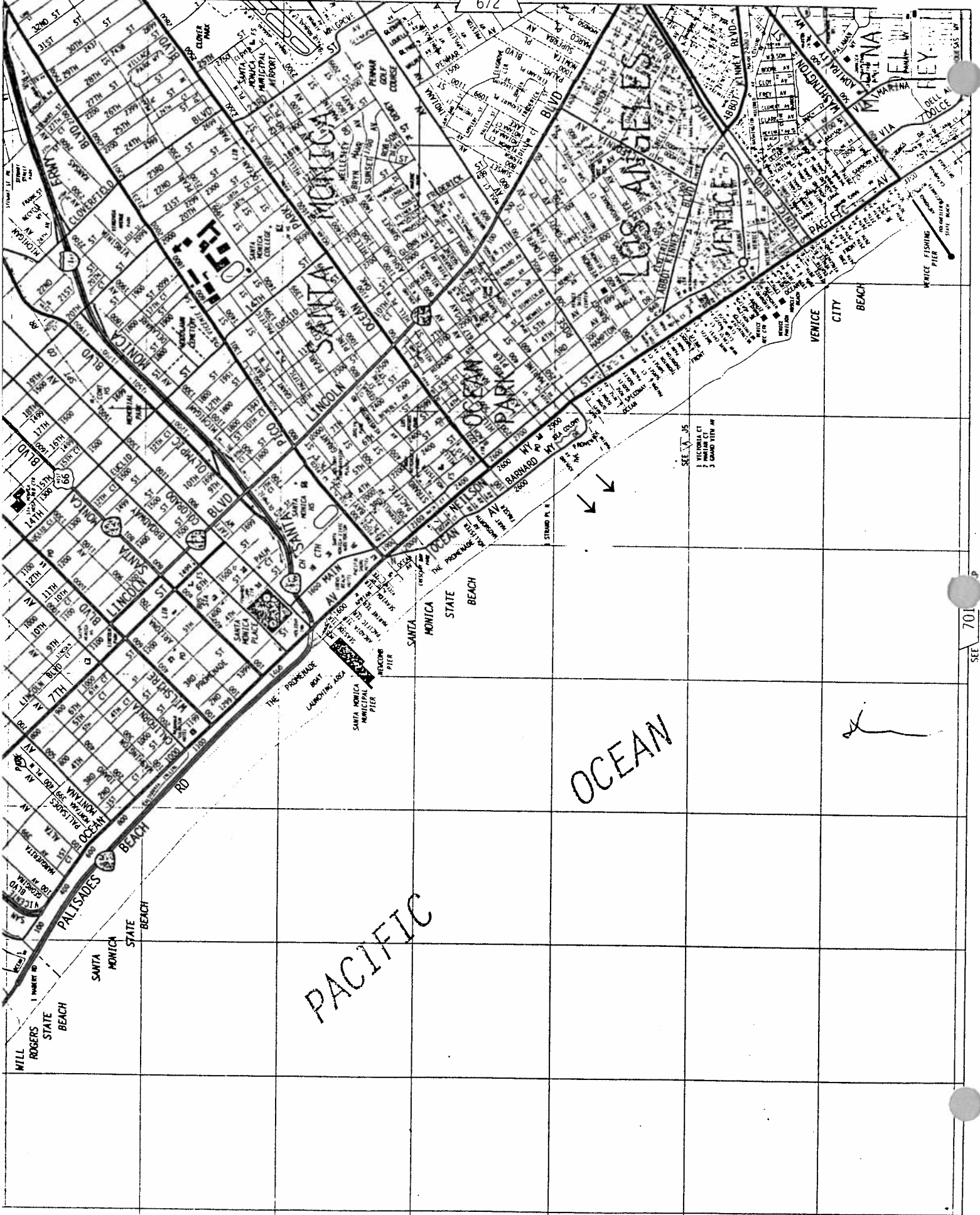
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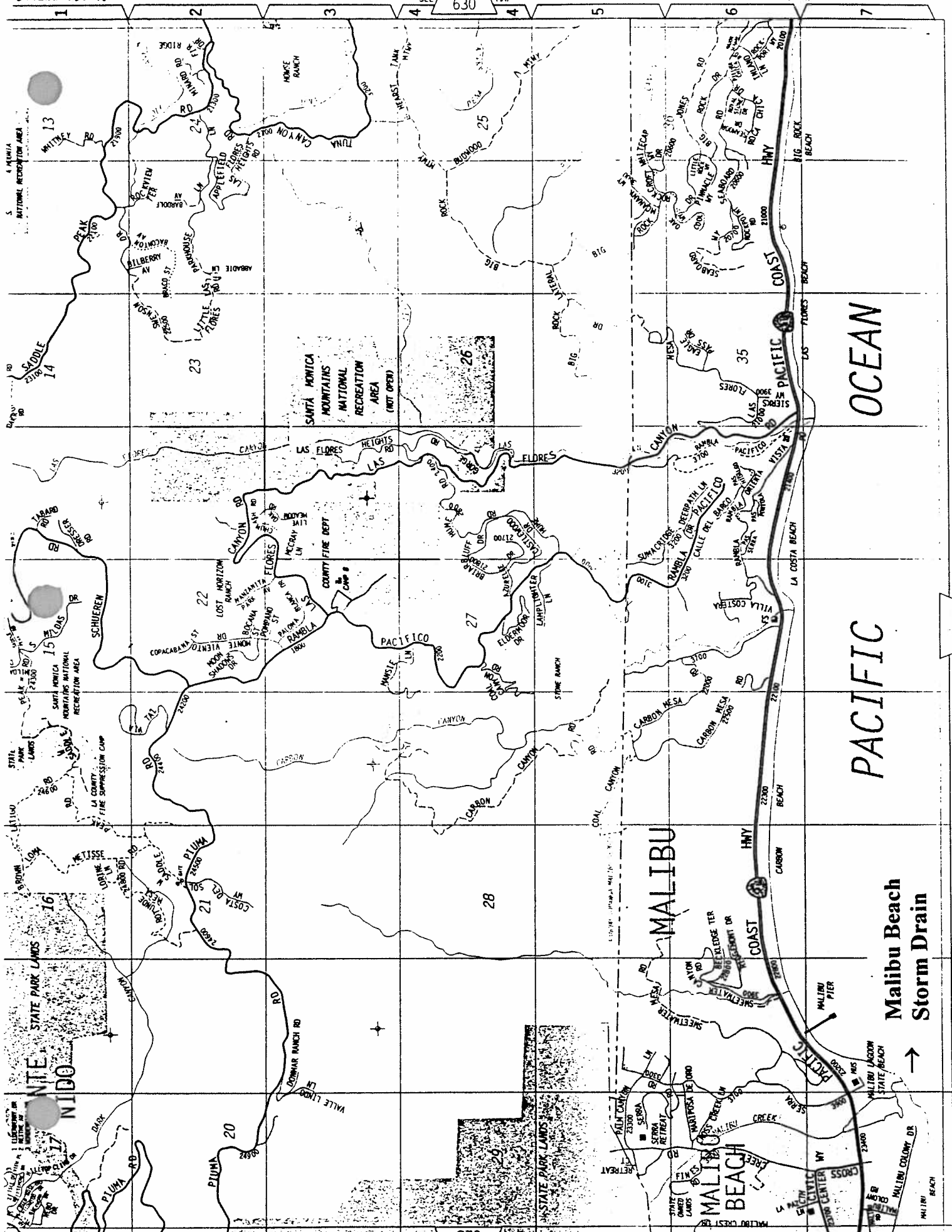
Date: \_\_\_\_\_

APPENDIX E

MAPS







SEE MAP

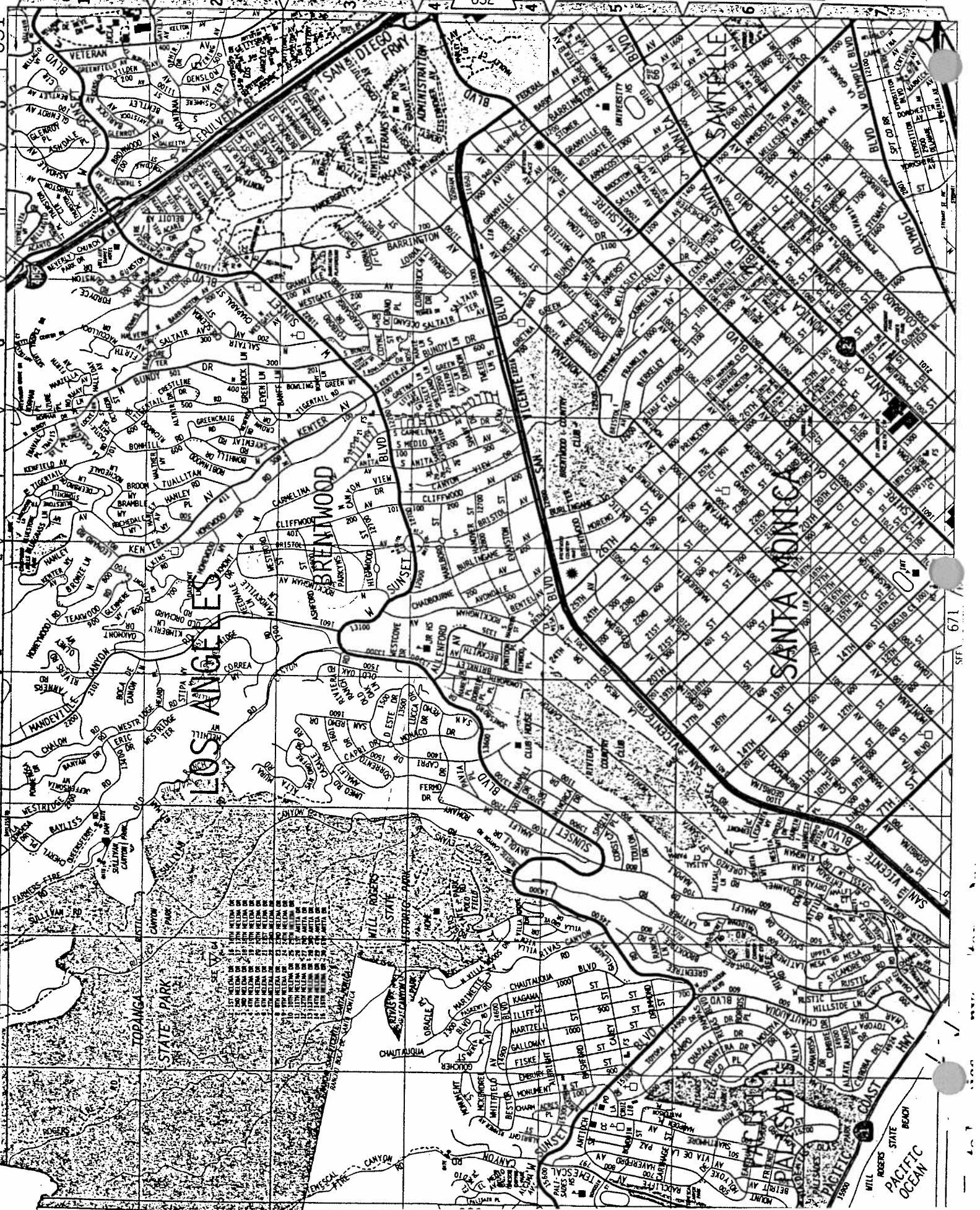
OCEAN

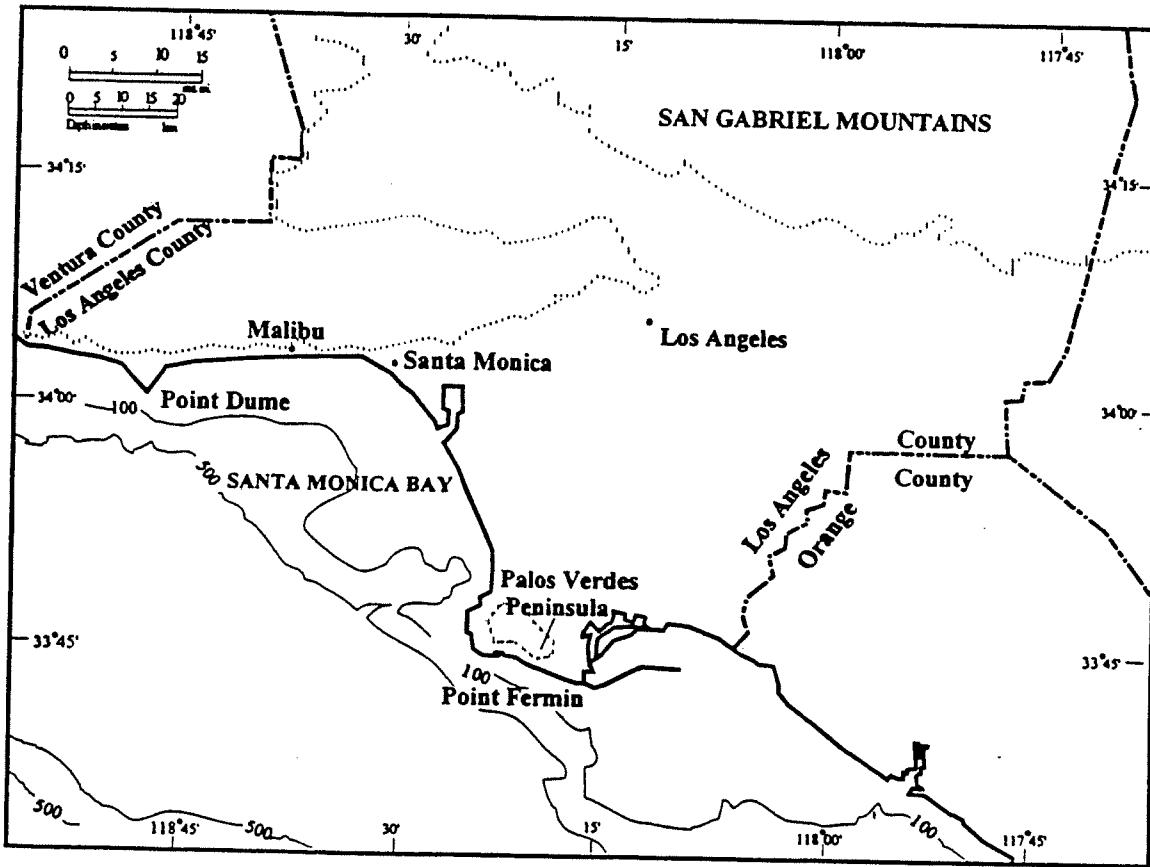
PACIFIC

MALIBU

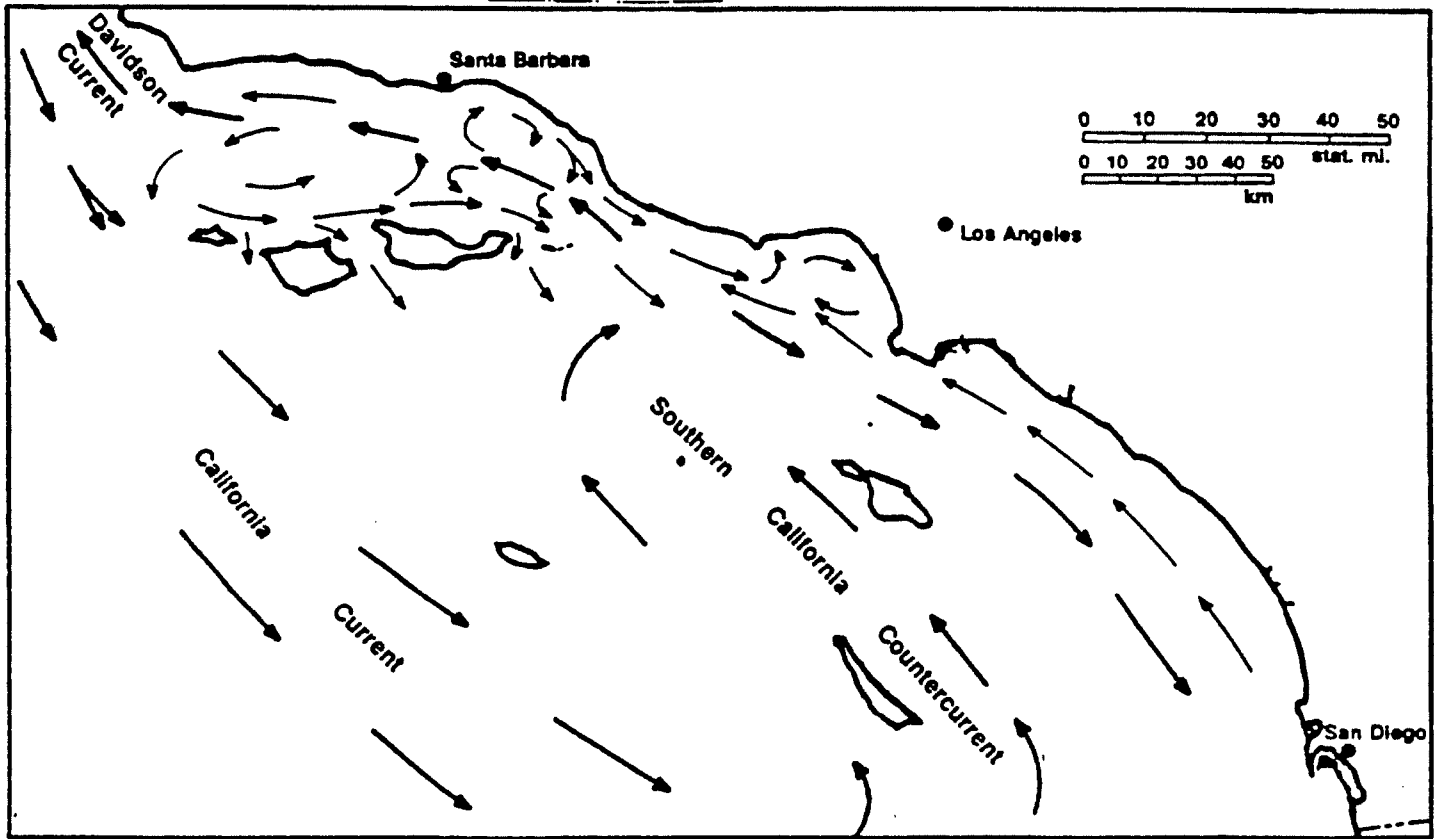
Malibu Beach Storm Drain

MALIBU BEACH





Los Angeles Basin.



General ocean circulation of the Southern California Bight (modified from CLA,DWP and USEPA 1977).