Appendix I

Statistical Outputs

Model 1: Random Effect Regressions on Service Delivery Outputs

VARIABLES	(1) WIC— Prenatal Services	(2) HealthCheck Visits	(3) Lead Screenings Tests$^{\emptyset}$	(4) Immunization Compliance$^{\emptyset}$
Organizational Model				
DHD	-4.11	-3.61*	-0.02	-0.01
	(3.59)	(1.65)	(0.13)	(0.10)
Other LHD Type	-1.15	3.42	0.15	0.09
	(3.00)	(2.23)	(0.20)	(0.18)
Demographic Factors				
Race				
(log) Black	-1.41*	-0.69	-0.04	-0.02
	(0.65)	(0.49)	(0.03)	(0.02)
(log) Hispanic	1.65	-0.30	-0.11	-0.09
	(1.42)	(1.14)	(0.09)	(0.08)
(log) Other Race	-0.39	0.18	-0.01	-0.02
	(0.98)	(0.72)	(0.05)	(0.04)
(log) Median House Income	-6.25	-8.18*	-0.41	-0.24
	(5.21)	(3.84)	(0.39)	(0.32)
Percentage Uninsured (Ages 0–64)	0.54	0.51	-0.03	-0.03
	(0.36)	(0.33)	(0.03)	(0.02)
(log) Population	1.57	-0.34	0.13	0.06
	(1.52)	(1.31)	(0.12)	(0.09)
(log) Population Density	-1.30	2.24	0.02	0.05
	(1.75)	(1.38)	(0.14)	(0.11)
Unemployment Rate	0.16	-0.02	-0.01	-0.00
	(0.14)	(0.11)	(0.01)	(0.01)
Capacity				
(log) Federal & State Expenditures (per capita)	10.70**	2.64	-0.27**	-0.25**
	(2.20)	(1.68)	(0.10)	(0.08)
(log) Local Expenditures (per capita)	2.67	1.27	-0.19*	-0.17**
	(1.85)	(1.52)	(0.07)	(0.06)
(log) FTE (per 1,000)	-2.83	-3.78**	-0.01	0.02
	(2.77)	(1.41)	(0.10)	(0.08)

Model 1: Random Effect Regressions on Service Delivery Outputs (cont'd)

VARIABLES	(1) WIC— Prenatal Services	(2) HealthCheck Visits	(3) Lead Screenings Tests$^{\emptyset}$	(4) Immunization Compliance$^{\emptyset}$
Services				
Percentage of Services Offered	0.01	0.10*	-0.00	-0.00
	(0.07)	(0.05)	(0.00)	(0.00)
Health Assurance—Prenatal Care	-4.21			
	(3.05)			
Prenatal and Postpartum Care	3.84			
	(2.88)			
WIC Services—Mother	1.34			
	(2.75)			
Adolescent Pregnancy Prevention				
Child Services Coordination		-34.05**		-0.24**
		(1.65)		(0.08)
STD Education				
STD Screening				
Adolescent Health Services				
Acute Communicable Disease Ctrl				
Communicable Disease Surveillance				
Immunizations				0.01
				(0.12)
Lead Poisoning Services			-0.03	
			(0.10)	
Lead Abatement			0.16	
			(0.12)	
Child Health—Well-Child Services		-0.70	0.12	0.08
		(1.62)	(0.13)	(0.10)
Primary Care—Pediatrics		-2.02	0.05	0.02
		(1.28)	(0.06)	(0.05)
Tobacco Cessation				
Primary Care—Adult				
Community Health Education				

Model 1: Random Effect Regressions on Service Delivery Outputs (cont'd)

VARIABLES	(1) WIC— Prenatal Services	(2) HealthCheck Visits	(3) Lead Screenings Tests$^\emptyset$	(4) Immunization Compliance$^\emptyset$
Nutrition Counseling				
Comprehensive Comm Hlth Assessmt				
Behavioral Risk Assessment				
SIDS Counseling				
Health Assurance—Health Education				
Health Assurance—Child Health				
Newborn Home Visits				
Outputs				
WIC—Prenatal Services (%)				
HealthCheck Visits (%)				
(log_ng) Lead Screening (%)				
(log_ng) Immunization Compliance (%)				
Constant	74.07	166.15**	7.90*	6.81*
	(53.54)	(38.54)	(3.92)	(3.35)
Observations	169	169	169	169
Number of LHDs	85	85	85	85
R^2	0.251	0.182	0.231	0.236

Robust standard errors in parentheses
** $p<0.01$, * $p<0.05$

‡ = log(variable), traditional logarithmic form
§ = log(variable +1), applied when the variable's minimum value was zero.
∅ = log(constant – variable), applied when the variable's skew was less than negative one. The constant was equal to the variable's maximum value plus one.

Model 2a: Random Effect Regressions on Health Status Outcomes

VARIABLES	(1) Chlamydia (per capita)[‡]	(2) Gonorrhea (per capita)[§]	(3) HIV Disease (per capita)[§]	(4) HIV Deaths (per capita)[§]	(5) Syphilis (per capita)[§]	(6) Tuberculosis (per capita)[§]	(7) Positive Lead Screening Results[§]	(8) Infant Mortality Rate (per 1,000)[§]	(9) Teenage Pregnancy Rate
Organizational Model									
DHD	-0.16	-0.10	0.23	0.08	0.03	-0.40**	0.02	-0.22	-2.60
	(0.33)	(0.64)	(0.28)	(0.31)	(0.21)	(0.14)	(0.07)	(0.28)	(8.61)
Other LHD Type	0.24	0.33	0.43	0.49	-0.07	0.01	-0.15*	0.06	-0.73
	(0.16)	(0.46)	(0.26)	(0.29)	(0.47)	(0.28)	(0.07)	(0.28)	(8.94)
Demographic Factors									
Race									
(log) Black	-0.01	-0.05	0.01	-0.03	0.04	0.11	-0.04*	0.01	-0.30
	(0.03)	(0.06)	(0.07)	(0.10)	(0.05)	(0.06)	(0.02)	(0.05)	(1.20)
(log) Hispanic	0.14	0.26*	0.35	0.08	-0.03	-0.20	0.06	0.04	5.40
	(0.08)	(0.12)	(0.18)	(0.16)	(0.15)	(0.13)	(0.04)	(0.08)	(2.93)
(log) Other Race	0.00	-0.09	-0.02	0.04	-0.04	0.03	-0.01	0.02	-0.27
	(0.05)	(0.09)	(0.11)	(0.08)	(0.09)	(0.11)	(0.02)	(0.06)	(1.48)
(log) Median House Income	-0.46	-0.70	-0.46	0.69	0.36	0.33	-0.29	0.06	-3.05
	(0.32)	(0.43)	(0.50)	(0.53)	(0.45)	(0.50)	(0.18)	(0.43)	(11.42)
Percentage Uninsured (Ages 0–64)	0.14**	0.11*	0.13**	0.15**	0.11**	0.19**	0.05**	0.03	1.54
	(0.02)	(0.05)	(0.05)	(0.04)	(0.03)	(0.03)	(0.01)	(0.03)	(0.85)
(log) Population	-0.01	-0.17	0.21	0.19	-0.11	-0.18	0.06	-0.00	-4.26
	(0.10)	(0.17)	(0.17)	(0.23)	(0.18)	(0.12)	(0.05)	(0.12)	(3.71)
(log) Population Density	0.05	0.21	-0.34	-0.24	0.24	0.15	-0.00	-0.09	2.56
	(0.11)	(0.19)	(0.18)	(0.19)	(0.19)	(0.14)	(0.05)	(0.12)	(3.85)

Model 2a: Random Effect Regressions on Health Status Outcomes (cont'd)

VARIABLES	(1) Chlamydia (per capita)[‡]	(2) Gonorrhea (per capita)[§]	(3) HIV Disease (per capita)[§]	(4) HIV Deaths (per capita)[§]	(5) Syphilis (per capita)[§]	(6) Tuberculosis (per capita)[§]	(7) Positive Lead Screening Results[§]	(8) Infant Mortality Rate (per 1,000)[§]	(9) Teenage Pregnancy Rate
Unemployment Rate	0.01	0.01	-0.01	0.02	0.01	-0.01	-0.00	-0.01	-0.08
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.25)
Capacity									
(log) Federal and State Expenditures (per capita)	-0.13	-0.73*	-0.71*	-0.60**	-0.03	-0.65**	-0.19**	0.05	-14.50**
	(0.15)	(0.30)	(0.32)	(0.21)	(0.23)	(0.20)	(0.07)	(0.22)	(4.81)
(log) Local Expenditures (per capita)	0.14	0.12	0.61*	0.22	0.20	0.14	0.04	0.23	-3.22
	(0.09)	(0.17)	(0.24)	(0.19)	(0.14)	(0.12)	(0.06)	(0.18)	(3.38)
(log) FTE (per 1,000)	-0.16	0.02	-0.57*	-0.13	-0.56**	-0.10	0.19*	-0.25	11.23**
	(0.12)	(0.25)	(0.28)	(0.26)	(0.18)	(0.21)	(0.07)	(0.27)	(3.58)
Services									
Percentage of Services Offered	0.01	0.01*	-0.00	0.00	0.01	0.01*	-0.00	-0.00	-0.20
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.13)
Health Assurance—Prenatal Care								-0.17	
								(0.18)	
Prenatal and Postpartum Care								0.13	
								(0.18)	
WIC Services —Mother									
Adolescent Pregnancy Prevention									4.25
									(4.05)
Child Services Coordination									

Model 2a: Random Effect Regressions on Health Status Outcomes (cont'd)

VARIABLES	(1) Chlamydia (per capita)‡	(2) Gonorrhea (per capita)§	(3) HIV Disease (per capita)§	(4) HIV Deaths (per capita)§	(5) Syphilis (per capita)§	(6) Tuberculosis (per capita)§	(7) Positive Lead Screening Results§	(8) Infant Mortality Rate (per 1,000)§	(9) Teenage Pregnancy Rate
STD Education	0.21	-0.09	0.16	0.17	0.41				
	(0.16)	(0.20)	(0.30)	(0.22)	(0.31)				
STD Screening	0.33	-0.18	-0.42	0.08	-0.00				
	(0.21)	(0.39)	(0.55)	(0.44)	(0.41)				
Adolescent Health Services	-0.17*	-0.38	-0.24	-0.08	-0.26				1.23
	(0.08)	(0.22)	(0.18)	(0.17)	(0.14)				(2.99)
Acute Communicable Disease Ctrl						-0.15			
						(0.21)			
Communicable Disease Surveillance						-0.10			
						(0.14)			
Immunizations						-0.20			
						(0.35)			
Lead Poisoning Services							-0.03		
							(0.07)		
Lead Abatement							0.04		
							(0.04)		
Child Health—Well-Child Services							0.10	0.19	
							(0.07)	(0.19)	
Primary Care—Pediatrics						-0.14	-0.08	0.18	
						(0.13)	(0.05)	(0.13)	
Tobacco Cessation									
Primary Care—Adult	-0.21**	-0.27	-0.23	-0.33*	-0.51**	-0.06			
	(0.08)	(0.16)	(0.15)	(0.13)	(0.16)	(0.14)			

Model 2a: Random Effect Regressions on Health Status Outcomes (cont'd)

VARIABLES	(1) Chlamydia (per capita)[‡]	(2) Gonorrhea (per capita)[§]	(3) HIV Disease (per capita)[§]	(4) HIV Deaths (per capita)[§]	(5) Syphilis (per capita)[§]	(6) Tuberculosis (per capita)[§]	(7) Positive Lead Screening Results[§]	(8) Infant Mortality Rate (per 1,000)[§]	(9) Teenage Pregnancy Rate
Community Health Education	0.11 (0.11)	0.35** (0.13)	0.61** (0.20)	-0.10 (0.41)	0.19 (0.29)	0.48 (0.26)			
Nutrition Counseling									
Comprehensive Comm Hlth Assessmt	0.03 (0.19)	-0.14 (0.18)	0.57 (0.36)	-0.11 (0.26)	-0.72** (0.21)				
Behavioral Risk Assessment	-0.01 (0.07)	0.08 (0.15)	0.13 (0.15)	-0.03 (0.13)	0.12 (0.14)				
SIDS Counseling								0.21 (0.15)	
Health Assurance—Health Education								-0.24 (0.31)	
Health Assurance—Child Health								0.57 (0.48)	
Newborn Home Visits								0.37 (0.24)	
Outputs									
WIC—Prenatal Services (%)	0.01* (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.01 (0.01)	-0.00 (0.01)	-0.01** (0.00)	-0.00 (0.01)	-0.11 (0.14)
HealthCheck Visits (%)	0.01 (0.00)	-0.01 (0.01)	-0.02 (0.01)	-0.02* (0.01)	0.02 (0.01)	-0.02* (0.01)	-0.00 (0.00)	0.00 (0.01)	-0.40 (0.26)
(log_ng) Lead Screening (%)	0.41 (0.34)	-0.06 (0.21)	-0.18 (0.55)	1.38** (0.53)	0.83 (0.59)	0.47 (0.54)	-0.33 (0.22)	0.29 (0.57)	15.13 (9.47)

Model 2a: Random Effect Regressions on Health Status Outcomes (cont'd)

VARIABLES	(1) Chlamydia (per capita)[‡]	(2) Gonorrhea (per capita)[§]	(3) HIV Disease (per capita)[§]	(4) HIV Deaths (per capita)[§]	(5) Syphilis (per capita)[§]	(6) Tuberculosis (per capita)[§]	(7) Positive Lead Screening Results[§]	(8) Infant Mortality Rate (per 1,000)[§]	(9) Teenage Pregnancy Rate
(log_ng) Immunization Compliance (%)	-0.44	0.40	0.26	-1.73*	-1.05	-1.00	0.39	-0.19	-22.54
	(0.48)	(0.30)	(0.77)	(0.70)	(0.76)	(0.69)	(0.28)	(0.67)	(13.31)
Constant	5.18	10.96*	3.20	-6.90	-6.98	-1.03	2.89	-0.80	214.76
	(3.30)	(4.97)	(5.66)	(5.41)	(5.42)	(5.23)	(1.98)	(4.77)	(128.88)
Observations	169	169	169	169	169	169	169	169	169
Number of LHDs	85	85	85	85	85	85	85	85	85
R^2	0.452	0.155	0.298	0.247	0.325	0.346	0.266	0.172	0.0886

Robust standard errors in parentheses
** $p<0.01$, * $p<0.05$

‡ = log(variable), traditional logarithmic form
§ = log(variable +1), applied when the variable's minimum value was zero.
Ø = log(constant – variable), applied when the variable's skew was less than negative one. The constant was equal to the variable's maximum value plus one.

Model 2b: OLS Regressions on Health Status Outcomes

VARIABLES	(1) Smoker$^{\emptyset}$	(2) Obesity
Organizational Model		
DHD	0.07	-0.99
	(0.22)	(1.23)
Other LHD Type	0.35	-2.57*
	(0.24)	(1.02)
Demographic Factors		
Race		
(log) Black	0.06	0.56
	(0.04)	(0.29)
(log) Hispanic	-0.05	-1.75*
	(0.10)	(0.77)
(log) Other Race	-0.11	0.71
	(0.08)	(0.39)
(log) Median House Income	-0.61	6.88**
	(0.44)	(2.22)
Percent Uninsured (Ages 0–64)	0.10*	0.74**
	(0.04)	(0.17)
(log) Population	0.01	0.04
	(0.11)	(0.89)
(log) Population Density	0.09	-0.80
	(0.13)	(0.91)
Unemployment Rate	-0.00	0.05
	(0.02)	(0.11)
Capacity		
(log) Federal and State Expenditures (per capita)	0.05	-0.83
	(0.26)	(1.33)
(log) Local Expenditures (per capita)	0.20	-0.31
	(0.25)	(0.73)
(log) FTE (per 1,000)	-0.32	0.37
	(0.34)	(1.17)
Services		
Tobacco Cessation	-0.05	
	(0.14)	
Primary Care—Adult	-0.04	-0.27
	(0.12)	(0.62)
Community Health Education		2.85
		(2.49)

Model 2b: OLS Regressions on Health Status Outcomes

VARIABLES	(1) Smoker$^\emptyset$	(2) Obesity
Nutrition Counseling		-1.03
		(0.85)
Comprehensive Comm Hlth Assessmt		0.43
		(1.58)
Behavioral Risk Assessment		-0.31
		(0.74)
Outputs		
WIC—Prenatal Services (%)	-0.01	0.12**
	(0.01)	(0.04)
HealthCheck Visits (%)	0.01	0.02
	(0.01)	(0.06)
(log_ng) Lead Screening (%)	0.34	1.93
	(0.47)	(6.28)
(log_ng) Immunization Compliance (%)	-0.55	-3.87
	(0.68)	(7.60)
Constant	6.25	-55.32*
	(4.94)	(24.44)
Observations	85	84
R^2	0.34	0.56

Robust standard errors in parentheses
** $p<0.01$, * $p<0.05$

‡ = log(variable), traditional logarithmic form
§ = log(variable +1), applied when the variable's minimum value was zero.
Ø = log(constant – variable), applied when the variable's skew was less than negative one. The constant was equal to the variable's maximum value plus one.

Indirect Effects

Overall, the LHD organizational model produced few significant results. However, in another set of regressions, not included in this study, LHD model lost its significance in about one-third of the output and outcome variables, after control groups (e.g., demographic variables) were added in subsequent regressions. In future studies, models accounting for indirect effects could provide insight about why the LHD models lose significance.

Descriptive Statistics for Variables

Variable	Mean	Median	Minimum	Maximum
LHD Type				
Single	0.88	1.00	-	1.00
District	0.07	-	-	1.00
Other LHD Type	0.05	-	-	1.00
Consolidated	*0.02*	*-*	*-*	*1.00*
Hospital Authority	*0.01*	*-*	*-*	*1.00*
Public Health Authority	*0.01*	*-*	*-*	*1.00*
Federal–State Expenditures (per capita)‡	20.00	16.67	4.65	89.33
Full-Time Equivalent (FTE) per 1,000‡	1.46	1.12	0.51	7.62
Local Expenditures (per capita)‡	61.59	52.75	7.42	300.87
Median Household Income‡	40,216.66	39,343.50	27,035.00	65,487.00
Percent Uninsured (0–64)	19.48	19.33	14.57	26.84
Population‡	111,994.20	63,333.50	5,621.00	923,427.00
Population Density‡	208.69	115.84	9.17	1,754.63
Race				
Percent White‡	69.98	71.53	26.95	96.40
Percent Black‡	19.61	15.83	0.59	60.64
Percent Hispanic‡	6.31	5.47	1.14	20.53
Percent Other Race‡	4.10	2.42	1.07	40.75
Unemployment Rate	7.59	6.45	3.30	17.40
Year	2008	2008	2005	2010
Services				
Percentage of 93 Services Offered	64.82	65.59	11.83	93.55
Acute Communicable Disease Control	0.93	1.00	-	1.00
Adolescent Health Services	0.71	1.00	-	1.00
Behavioral Risk Assessment	0.46	-	-	1.00
Child Health—Well-Child Services	0.90	1.00	-	1.00
Child Services Coordination	0.98	1.00	-	1.00
Communicable Disease Surveillance	0.58	1.00	-	1.00
Community Health Education	0.97	1.00	-	1.00
Comprehensive Community Health Assessment	0.96	1.00	-	1.00
Health Assurance—Child Health	0.97	1.00	-	1.00
Health Assurance—Prenatal Care	0.86	1.00	-	1.00
Health Assurance—Health Education	0.99	1.00	-	1.00

Immunizations	0.99	1.00	-	1.00
Lead Abatement	0.71	1.00	-	1.00
Lead Poisoning Services	0.92	1.00	-	1.00
Newborn Home Visits	0.91	1.00	-	1.00
Nutrition Counseling	0.88	1.00	-	1.00
Pregnancy Prevention—Adolescent	0.92	1.00	-	1.00
Prenatal and Postpartum Care	0.87	1.00	-	1.00
Primary Care—Adult	0.42	-	-	1.00
Primary Care Pediatrics	0.55	1.00	-	1.00
SIDS Counseling	0.93	1.00	-	1.00
STD Screening	0.98	1.00	-	1.00
STD Training/Education	0.94	1.00	-	1.00
Tobacco Cessation	0.83	1.00	-	1.00
WIC Prenatal Services	0.94	1.00	-	1.00
Service Delivery Outputs				
HealthCheck Visits (%)	75.65	75.88	48.40	96.90
Immunization Compliance (%)Ø	82.56	85.01	11.92	100.00
Lead Screening Tests (%)Ø	79.92	82.97	18.60	96.90
WIC—Prenatal Services (%)	73.02	73.54	31.30	95.80
Health Status Outcomes				
Chlamydia Rate (per capita)‡	355.62	302.85	25.10	1,432.00
Gonorrhea Rate (per capita)§	149.37	123.78	-	720.30
HIV-Disease (per capita)§	3.53	2.70	-	23.20
HIV-Death (per capita)§	12.39	9.92	-	57.60
Infant Death Rate§	8.53	8.00	-	33.30
Obese (%)	29.84	29.90	22.20	38.70
Positive Lead Screening Results (%)§	0.69	0.54	-	5.00
Smoking (%)Ø	23.01	23.60	-	38.20
Syphillis Rate (per capita)§	2.34	1.20	-	33.90
Teenage Pregnancy Rate (per capita)	62.64	62.50	15.80	110.80
Tuberculosis Rate (per capita)§	3.39	2.30	-	59.60

‡ = log(variable), traditional logarithmic form

§ = log(variable +1), applied when the variable's minimum value was zero.

Ø = log(constant – variable), applied when the variable's skew was less than negative one. The constant was equal to the variable's maximum value plus one.