

Louisiana's Uninsured Population: December 2010 Parish-level Forecast

A Report from the 2009 Louisiana Health Insurance Survey

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The Louisiana Health Insurance Survey (LHIS) represents the most comprehensive data collection effort in assessing health insurance coverage in Louisiana. The survey has been conducted every two years since 2003 with analysis from the 2009 LHIS providing the most recent estimates of insurance coverage in the state. As summarized in the 2009 LHIS Report, overall uninsured rates at the time of the survey had fallen slightly for both children and adults relative to estimates from the 2007 LHIS. Statewide, approximately 5 percent of children and 20 percent of adults were uninsured. Estimates of the percent of adults and children who were uninsured in each parish at the time of the survey were published in a separate report in February 2010.

The purpose of this report is to present updated estimates of the uninsured rates for children and adults in each of Louisiana's 64 parishes for December 2010. The basic approach is to build a statistical model to predict the number of uninsured based on socioeconomic characteristics of households using data from the 2007 and 2009 LHIS surveys. We then apply this model to predict the impact of changes in socioeconomic characteristics for each parish during the most recent period, June 2010 to December 2010, to predict the change in uninsured rates for children and adults in each parish.

Three key changes occurred after the 2009 survey. First, the Louisiana unemployment rate increased from 6.8% to 7.7% during this period. Holding other things constant, this deterioration in economic conditions would increase the number of uninsured. Second, the population of Louisiana, particularly in New Orleans, continued to increase. Finally, the Louisiana Department of Health and Hospitals automatically enrolled 10,545 children from SNAP (the Supplemental Nutrition Assistance Program, formerly called Food Stamps) into Medicaid in February 2010. This serves to reduce the number of uninsured children, offsetting worsening economic conditions.

Table 1 contains the detailed parish level estimates of the percentage of uninsured children. In general, they indicate slight increases in the number of uninsured children. After a decline in the number of uninsured children between December 2009 and June 2010 due to the SNAP enrollment, these results suggest that the slight increase in uninsured rates is due to weaker economic conditions in the second half of the year.

Table 2 contains similar estimates of the percent uninsured for non-elderly adults. The results suggest very modest changes in the estimated number of uninsured adults.

**Table 1: Comparison of December 2010 Forecasts
to Past Estimates of Uninsured Children**

Parish	Region	Jul-09	Dec-09	Jun-10	Dec-10
Jefferson	1	5.1%	6.2%	5.9%	6.0%
Orleans	1	7.9%	8.7%	9.0%	9.5%
Plaquemines	1	7.5%	8.7%	7.4%	11.6%
St. Bernard	1	5.5%	8.1%	8.7%	3.5%
Ascension	2	3.4%	3.8%	3.8%	3.8%
East Baton Rouge	2	4.7%	4.9%	4.8%	4.8%
East Feliciana	2	5.6%	6.2%	5.6%	7.5%
Iberville	2	4.0%	4.7%	4.6%	5.1%
Pointe Coupee	2	3.0%	4.3%	4.3%	5.0%
West Baton Rouge	2	4.6%	4.9%	5.0%	4.9%
West Feliciana	2	5.1%	4.5%	4.3%	4.8%
Assumption	3	3.3%	3.8%	3.6%	4.7%
Lafourche	3	3.7%	3.9%	3.8%	4.0%
St. Charles	3	1.8%	2.6%	2.4%	2.7%
St. James	3	4.5%	4.4%	4.4%	5.0%
St. John The Baptist	3	5.6%	5.9%	5.7%	6.4%
St. Mary	3	5.8%	5.0%	4.5%	5.3%
Terrebonne	3	6.3%	5.9%	5.5%	5.9%
Acadia	4	3.7%	4.0%	3.8%	4.1%
Evangeline	4	3.4%	4.0%	3.9%	4.4%
Iberia	4	4.0%	4.2%	3.9%	4.2%
Lafayette	4	3.7%	4.1%	3.9%	4.1%
St. Landry	4	3.6%	4.1%	4.2%	4.1%
St. Martin	4	5.3%	5.0%	5.0%	5.4%
Vermilion	4	4.9%	4.6%	4.2%	4.6%
Allen	5	6.7%	6.8%	6.4%	6.4%
Beauregard	5	5.3%	5.9%	5.4%	5.5%
Calcasieu	5	5.0%	5.4%	5.0%	5.2%
Cameron	5	7.0%	7.7%	7.4%	8.5%
Jefferson Davis	5	10.5%	9.1%	8.6%	12.2%
Avoyelles	6	7.9%	7.1%	6.7%	6.5%
Catahoula	6	5.2%	5.2%	4.9%	5.5%
Concordia	6	7.9%	6.4%	5.4%	7.1%
Grant	6	9.0%	7.4%	7.1%	7.7%
La Salle	6	3.9%	4.2%	3.8%	4.4%
Rapides	6	5.0%	5.1%	4.8%	4.7%
Vernon	6	4.0%	5.0%	4.5%	5.4%
Winn	6	11.5%	8.4%	7.5%	9.9%

Table 1 (continued): Comparison of December 2010 Forecasts to Past Estimates of Uninsured Children

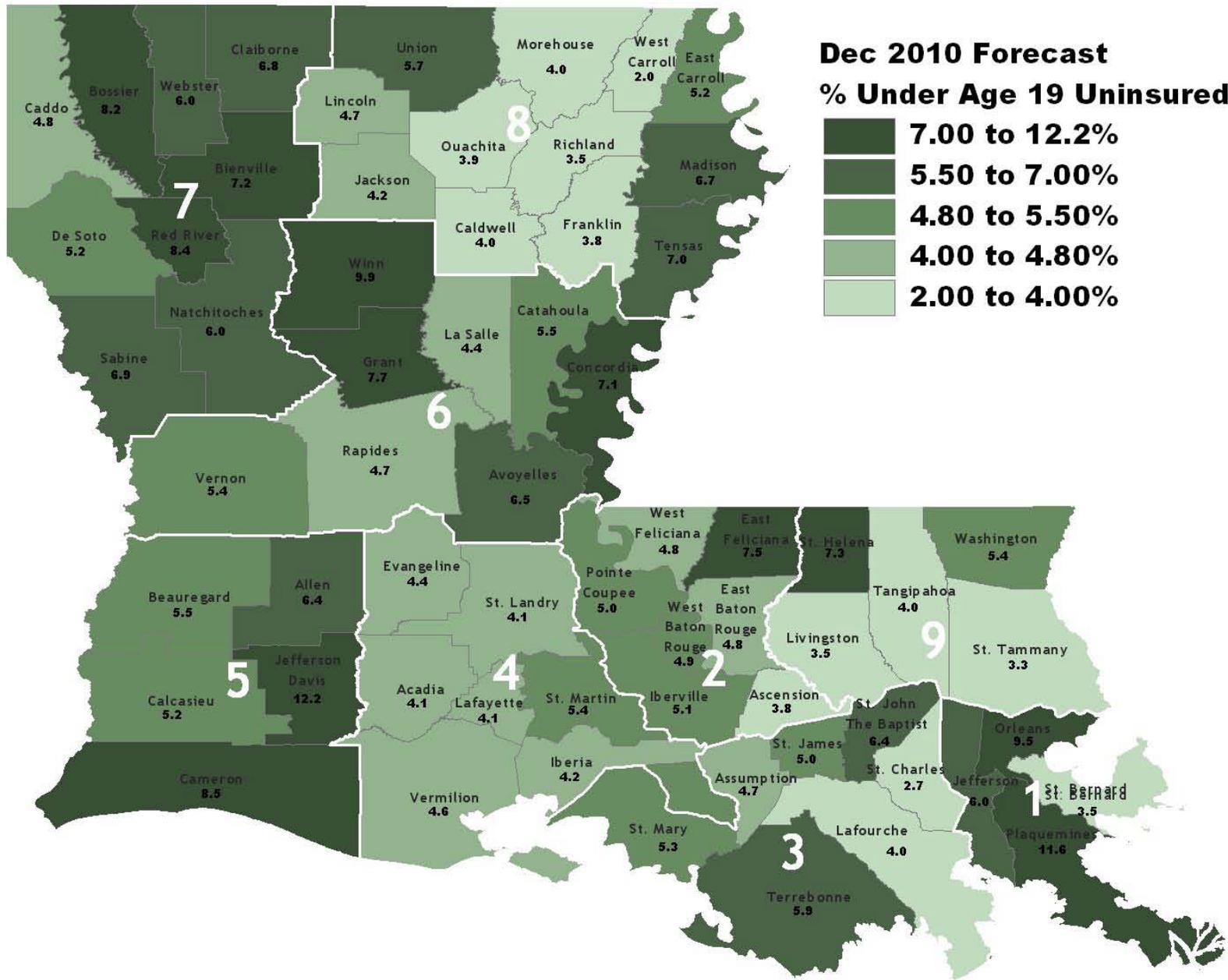
Parish	Region	Jul-09	Dec-09	Jun-10	Dec-10
Bienville	7	5.8%	5.6%	4.9%	7.2%
Bossier	7	9.3%	8.1%	7.6%	8.2%
Caddo	7	4.8%	4.9%	4.6%	4.8%
Claiborne	7	5.8%	5.8%	5.4%	6.8%
De Soto	7	4.7%	5.1%	4.6%	5.2%
Natchitoches	7	5.5%	5.7%	5.3%	6.0%
Red River	7	7.3%	7.1%	6.2%	8.4%
Sabine	7	8.9%	7.7%	6.9%	6.9%
Webster	7	6.5%	5.7%	4.8%	6.0%
Caldwell	8	4.1%	4.0%	3.5%	4.0%
East Carroll	8	3.3%	3.4%	3.0%	5.2%
Franklin	8	2.4%	3.1%	2.7%	3.8%
Jackson	8	3.7%	3.8%	3.4%	4.2%
Lincoln	8	6.2%	5.4%	5.4%	4.7%
Madison	8	2.7%	3.5%	3.2%	6.7%
Morehouse	8	2.6%	3.1%	2.9%	4.0%
Ouachita	8	4.3%	4.1%	4.0%	3.9%
Richland	8	2.7%	3.3%	3.0%	3.5%
Tensas	8	6.7%	5.5%	4.4%	7.0%
Union	8	5.1%	5.0%	4.4%	5.7%
West Carroll	8	2.2%	2.4%	2.3%	2.0%
Livingston	9	3.4%	3.7%	3.6%	3.5%
St. Helena	9	5.1%	6.3%	6.1%	7.3%
St. Tammany	9	2.8%	3.2%	3.1%	3.3%
Tangipahoa	9	3.5%	3.9%	3.8%	4.0%
Washington	9	5.2%	5.6%	5.2%	5.4%

**Table 2: Comparison of December 2010 Forecasts
to Past Estimates of Uninsured Adults**

Parish	Region	Jul-09	Dec-09	Jun-10	Dec-10
Jefferson	1	17.1%	17.9%	18.0%	17.8%
Orleans	1	21.4%	22.5%	22.6%	22.5%
Plaquemines	1	26.8%	25.8%	25.5%	26.4%
St. Bernard	1	29.9%	28.2%	28.3%	27.9%
Ascension	2	16.8%	16.4%	16.8%	16.3%
East Baton Rouge	2	16.4%	16.9%	17.0%	16.8%
East Feliciana	2	22.1%	23.1%	23.3%	23.1%
Iberville	2	18.5%	20.6%	20.7%	20.3%
Pointe Coupee	2	17.5%	19.5%	19.8%	20.0%
West Baton Rouge	2	15.3%	16.8%	17.2%	16.7%
West Feliciana	2	17.5%	17.8%	18.1%	17.7%
Assumption	3	21.3%	22.2%	22.6%	22.3%
Lafourche	3	14.3%	15.7%	15.7%	15.5%
St. Charles	3	13.3%	14.8%	14.9%	14.6%
St. James	3	24.8%	25.2%	25.9%	25.1%
St. John The Baptist	3	22.0%	24.3%	24.6%	24.0%
St. Mary	3	25.5%	25.5%	25.7%	25.2%
Terrebonne	3	17.8%	18.7%	18.8%	18.6%
Acadia	4	25.0%	25.1%	25.3%	24.7%
Evangeline	4	22.6%	24.2%	24.4%	23.8%
Iberia	4	20.3%	21.6%	21.7%	21.3%
Lafayette	4	14.9%	15.9%	16.0%	15.8%
St. Landry	4	20.0%	22.0%	22.4%	22.0%
St. Martin	4	22.6%	23.5%	23.7%	23.3%
Vermilion	4	18.7%	19.8%	19.8%	19.4%
Allen	5	21.4%	23.8%	23.7%	23.4%
Beauregard	5	18.9%	20.4%	20.3%	20.3%
Calcasieu	5	19.9%	20.6%	20.7%	20.5%
Cameron	5	18.7%	20.2%	20.1%	19.7%
Jefferson Davis	5	21.7%	22.8%	23.1%	24.9%
Avoyelles	6	23.6%	25.4%	25.5%	25.0%
Catahoula	6	30.5%	30.3%	30.0%	29.9%
Concordia	6	29.4%	29.6%	29.8%	29.3%
Grant	6	26.3%	26.4%	26.6%	26.1%
La Salle	6	20.6%	21.6%	21.6%	21.6%
Rapides	6	21.3%	22.3%	22.1%	21.9%
Vernon	6	14.9%	17.9%	17.9%	18.3%
Winn	6	28.7%	28.9%	29.1%	28.6%

**Table 2 (continued): Comparison of December 2010 Forecasts
to Past Estimates of Uninsured Adults**

Parish	Region	Jul-09	Dec-09	Jun-10	Dec-10
Bienville	7	32.6%	31.8%	31.8%	31.1%
Bossier	7	20.3%	21.0%	20.9%	20.6%
Caddo	7	25.0%	25.6%	25.6%	25.2%
Claiborne	7	24.0%	26.7%	26.6%	25.8%
De Soto	7	26.9%	27.6%	27.6%	27.2%
Natchitoches	7	24.6%	26.4%	26.5%	26.1%
Red River	7	34.0%	34.0%	34.2%	33.6%
Sabine	7	27.6%	28.1%	27.8%	27.5%
Webster	7	28.2%	28.0%	28.0%	27.4%
Caldwell	8	32.4%	32.2%	32.2%	31.7%
East Carroll	8	41.4%	41.2%	41.7%	41.0%
Franklin	8	31.7%	32.9%	33.3%	32.9%
Jackson	8	27.8%	28.4%	28.2%	28.2%
Lincoln	8	30.7%	30.6%	31.2%	29.9%
Madison	8	35.7%	36.5%	36.8%	36.1%
Morehouse	8	34.4%	34.9%	35.3%	34.9%
Ouachita	8	25.6%	26.8%	27.1%	26.5%
Richland	8	29.8%	31.1%	31.2%	30.9%
Tensas	8	36.9%	37.6%	38.6%	37.6%
Union	8	27.8%	29.5%	29.5%	29.0%
West Carroll	8	35.9%	35.2%	34.9%	35.1%
Livingston	9	14.6%	16.1%	16.3%	15.9%
St. Helena	9	32.0%	33.5%	34.2%	33.3%
St. Tammany	9	10.4%	11.6%	11.7%	11.5%
Tangipahoa	9	20.8%	22.4%	22.7%	22.1%
Washington	9	26.7%	28.3%	28.5%	27.7%



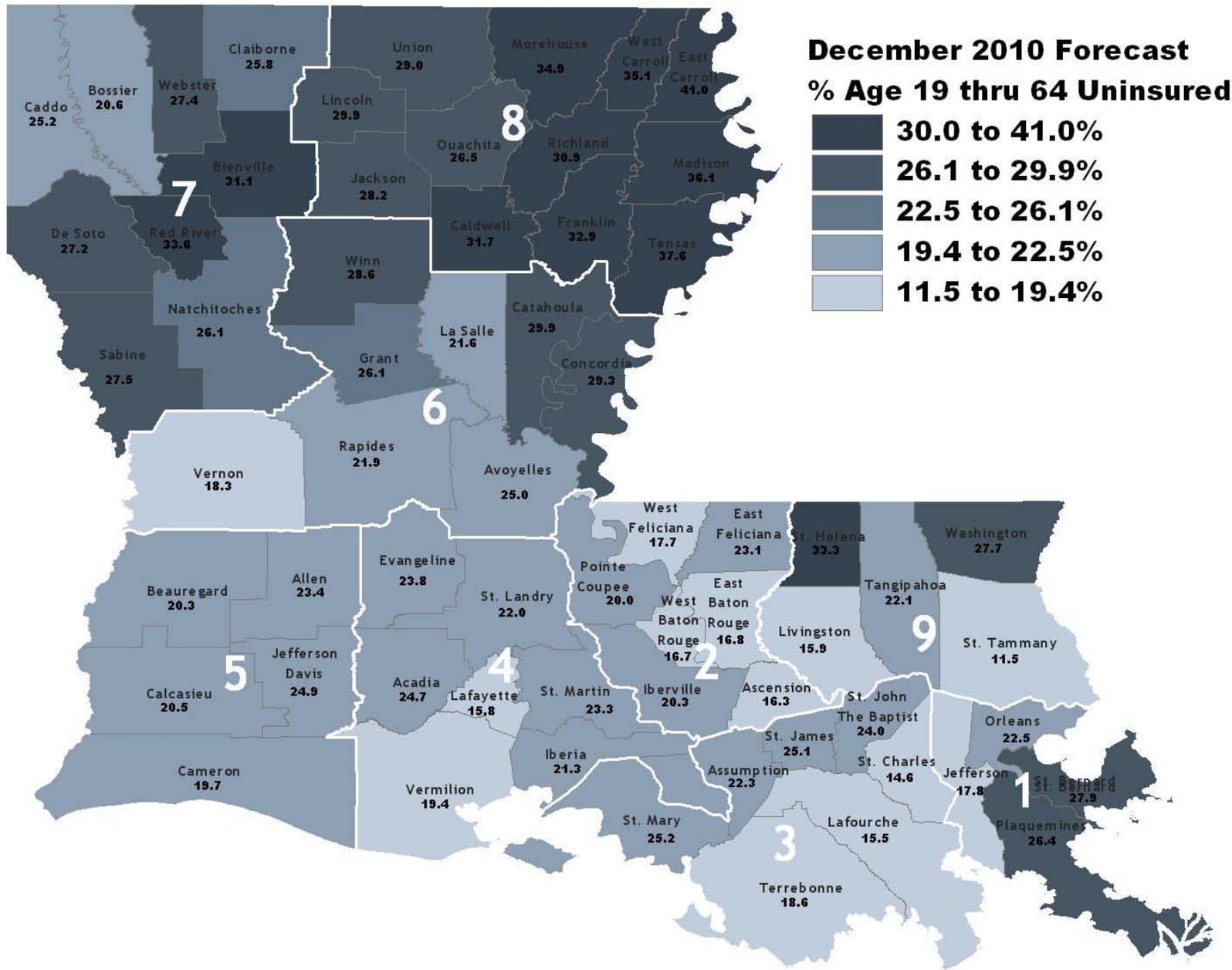


Table 3: December 2010 Forecast—Estimated Number of Uninsured Individuals

Parish	Region	Children (Under 19)			Adults (19-64)		
		Estimated 2010 Q4 Population	Dec 2010 Percent Uninsured	Estimated Number Uninsured	Estimated 2010 Q4 Population	Dec 2010 Percent Uninsured	Estimated Number Uninsured
Jefferson	1	107,087	6.0%	6,460	269,913	17.8%	47,929
Orleans	1	92,781	9.5%	8,807	220,100	22.5%	49,479
Plaquemines	1	7,177	11.6%	836	15,229	26.4%	4,019
St. Bernard	1	9,168	3.5%	318	23,751	27.9%	6,634
Ascension	2	32,305	3.8%	1,225	67,205	16.3%	10,959
East Baton Rouge	2	116,708	4.8%	5,614	267,758	16.8%	44,902
East Feliciana	2	5,134	7.5%	384	13,022	23.1%	3,004
Iberville	2	8,340	5.1%	429	20,871	20.3%	4,244
Pointe Coupee	2	5,913	5.0%	298	13,581	20.0%	2,714
West Baton Rouge	2	6,177	4.9%	305	14,577	16.7%	2,439
West Feliciana	2	2,777	4.8%	133	11,277	17.7%	1,999
Assumption	3	6,258	4.7%	293	14,116	22.3%	3,152
Lafourche	3	25,083	4.0%	1,007	57,657	15.5%	8,931
St. Charles	3	15,136	2.7%	403	32,538	14.6%	4,738
St. James	3	6,014	5.0%	298	12,894	25.1%	3,236
St. John The Baptist	3	14,415	6.4%	929	28,843	24.0%	6,936
St. Mary	3	14,694	5.3%	774	30,058	25.2%	7,589
Terrebonne	3	30,906	5.9%	1,833	67,409	18.6%	12,525
Acadia	4	17,737	4.1%	734	35,577	24.7%	8,805
Evangeline	4	10,437	4.4%	459	20,757	23.8%	4,942
Iberia	4	22,024	4.2%	929	44,505	21.3%	9,495
Lafayette	4	57,057	4.1%	2,340	132,753	15.8%	20,932
St. Landry	4	26,801	4.1%	1,110	53,746	22.0%	11,814
St. Martin	4	15,139	5.4%	814	31,677	23.3%	7,380
Vermilion	4	15,478	4.6%	705	33,830	19.4%	6,564

Table 3 (continued): December 2010 Forecast—Estimated Number of Uninsured Individuals

Parish	Region	Children (Under 19)			Adults (19-64)		
		Estimated 2010 Q4 Population	Dec 2010 Percent Uninsured	Estimated Number Uninsured	Estimated 2010 Q4 Population	Dec 2010 Percent Uninsured	Estimated Number Uninsured
Allen	5	6,296	6.4%	403	16,216	23.4%	3,792
Beauregard	5	9,344	5.5%	512	21,099	20.3%	4,277
Calcasieu	5	49,899	5.2%	2,597	114,172	20.5%	23,442
Cameron	5	1,963	8.5%	167	4,473	19.7%	
Jefferson Davis	5	8,910	12.2%	1,088	18,181	24.9%	4,527
Avoyelles	6	11,033	6.5%	712	25,324	25.0%	6,324
Catahoula	6	2,677	5.5%	147	6,412	29.9%	1,920
Concordia	6	5,144	7.1%	365	11,202	29.3%	3,278
Grant	6	5,595	7.7%	433	13,458	26.1%	3,514
La Salle	6	3,629	4.4%	161	8,369	21.6%	1,812
Rapides	6	35,792	4.7%	1,665	79,315	21.9%	17,366
Vernon	6	13,124	5.4%	706	27,751	18.3%	5,092
Winn	6	3,648	9.9%	361	9,521	28.6%	2,724
Bienville	7	3,859	7.2%	276	8,351	31.1%	2,597
Bossier	7	31,419	8.2%	2,590	69,461	20.6%	14,304
Caddo	7	66,511	4.8%	3,164	152,427	25.2%	38,461
Claiborne	7	3,851	6.8%	262	9,639	25.8%	2,490
De Soto	7	7,074	5.2%	368	15,652	27.2%	4,250
Natchitoches	7	11,515	6.0%	694	23,509	26.1%	6,131
Red River	7	2,674	8.4%	224	5,211	33.6%	1,749
Sabine	7	5,920	6.9%	411	13,417	27.5%	3,695
Webster	7	10,173	6.0%	606	23,950	27.4%	6,564

Table 3 (continued): December 2010 Forecast—Estimated Number of Uninsured Individuals

Parish	Region	Children (Under 19)			Adults (19-64)		
		Estimated 2010 Q4 Population	Dec 2010 Percent Uninsured	Estimated Number Uninsured	Estimated 2010 Q4 Population	Dec 2010 Percent Uninsured	Estimated Number Uninsured
Caldwell	8	2,522	4.0%	101	6,287	31.7%	1,993
East Carroll	8	2,424	5.2%	125	4,691	41.0%	1,922
Franklin	8	5,343	3.8%	203	11,418	32.9%	3,756
Jackson	8	3,745	4.2%	158	8,830	28.2%	2,489
Lincoln	8	11,227	4.7%	528	26,488	29.9%	7,911
Madison	8	3,959	6.7%	265	6,710	36.1%	2,423
Morehouse	8	7,669	4.0%	309	16,741	34.9%	5,845
Ouachita	8	42,278	3.9%	1,648	90,517	26.5%	24,001
Richland	8	5,658	3.5%	199	11,896	30.9%	3,678
Tensas	8	1,415	7.0%	99	3,254	37.6%	1,225
Union	8	5,777	5.7%	330	13,295	29.0%	3,861
West Carroll	8	2,751	2.0%	55	6,816	35.1%	2,394
Livingston	9	35,336	3.5%	1,226	78,870	15.9%	12,534
St. Helena	9	2,838	7.3%	206	6,104	33.3%	2,035
St. Tammany	9	65,216	3.3%	2,152	146,642	11.5%	16,871
Tangipahoa	9	33,063	4.0%	1,329	73,449	22.1%	16,242
Washington	9	12,043	5.4%	648	26,542	27.7%	7,353

Appendix B: Technical Appendix

Two key algorithms were attempted in this update of the parish level model. Both statistical models are described in detail in Rao's (2003) book *Small Area Estimation*. Both were based on a statistical model with individual data modeled as:

$$y_{ij} = x_{ij}^T \beta + v_i + e_{ij},$$

where $j = 1, \dots, 64$ is a subscript representing the parishes and $i = 1, \dots, m$ is a subscript over individuals.

Before turning to the statistical model, consider first the explanatory variables (x_{ij}) underlying the model. For the children's model, the dependent variable (y_{ij}) is equal to the child's probability of being uninsured. For many children, this is simply zero or one depending on the survey response. But, for children who are eligible for Medicaid, the bias correction model was used to assign a probability of being on Medicaid based on the individual and family characteristics. The explanatory variables are the percent of working age adults in the house who are unemployed, an indicator equal to one if the child lives in a family below 185% of the federal poverty line, household income, an indicator equal to one if the child is black, an indicator equal to one if the child is female, an indicator equal to one if the child is on Medicaid or LaCHIP, three indicator variables for age category, and indicator variables for DHH region. Note that we constrain the coefficients of the 185% of poverty indicator and Medicaid control to sum to zero. For the December 2009 forecast, multiple years of the LHIS were used for the first time in order to better estimate the relationships between these explanatory variables and insurance coverage. Therefore, controls for year of LHIS were added as were interactions between the year controls and labor market characteristics. This assumes that the relationship between demographics and insurance doesn't change over time, but the relationship between employment and insurance does. This additional flexibility relative to the labor market was allowed because of the dramatic changes in the labor market over this period due the effects of hurricane Katrina. In addition, population was estimated using ESRI data during this iteration of the model to allow for more accurate

The adult model is similar in spirit to the child model, but with some notable differences. As in 2007, the adult equation deletes the Medicaid indicator. However, several new controls have been added to allow for more flexible relationships between the explanatory variables and the probability of being uninsured. New variables include squared terms of the unemployment rate and income and interactions of those terms as well as interactions of the income terms and the 185 percent poverty indicator. In addition, an interaction was introduced between the unemployment rate and the female indicator variable because insurance coverage may be less closely tied to employment for women than for men. Finally, interactions between age and gender were added to allow the effects of age to differ by gender.

The first statistical model considered is the basic Hierarchical Bayes model described on pages 237-241 of Rao. The Hierarchical Bayes model has the advantage of providing exact small sample posterior moments. Unfortunately, the Gibbs Sampler failed to converge using this approach even with a very large number of iterations.

The alternative approach used in this study is the classic multivariate Fay-Herriot Model described in detail in Rao's text. We estimate the individual level model using a random effects model and insert parish means to construct parish level models.

Overall results appear as expected. Uninsured rates are higher among poorer individuals and among the unemployed. Given the sample sizes, December 2009 estimates were scaled the parish-level estimates so that the regional totals match those from the full report. This process of scaling the parish estimates to equal regional estimates is called raking the estimates and ensures consistency across reports. For the purposes of forecasting, this study applied an identical statistical approach for December 2009, June 2010, and December 2010. Changes in the predicted uninsured rate during that period for each parish were used to create the final estimates.

References

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