

Gestational Age Measures in New Mexico Birth Data

The national standard for estimating gestational age of newborns, until recently, relied on the interval between the first day of the mother's last normal menstrual period and the date of birth (LMP). Beginning with 2014 national birth data released in December 2015, the National Center for Health Statistics (NCHS) transitioned to the obstetric estimate of gestation (OE) defined as the birth attendant's final estimate of gestation at delivery "because of increasing evidence of the greater validity of the OE compared with the LMP-based measure," according to NCHS.¹

In line with NCHS, the New Mexico Department of Health adopted the obstetric estimate standard with the release of 2015 birth data, although the LMP-based measure will still be available as an optional measure. In anticipation of this shift, the Bureau of Vital Records and Health Statistics (BVRHS) analyzed New Mexico births from 2008 to 2014 to describe the relationship between the two measures of gestational age in New Mexico, specifically, the LMP estimate and the obstetric estimate (OE) of gestational age. References to national data throughout this report rely on National Vital Statistics Report, Vol 64 No. 5, June 2015, which referenced 2007-2013 national natality data, the latest available at that time.²

Methods

Data were derived from New Mexico birth certificates for all births from 2008 through 2014. Quality control edits are built into the electronic registration of birth, and quality improvement is coordinated with partners in the registration process prior to the production of annual statistical files.³ New Mexico BVRHS participates in the interjurisdictional exchange of birth records with other states and territories which facilitates complete enumeration of birth events. Data from BVRHS annual statistical files were limited to New Mexico resident mothers.

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New Mexico BVRHS has applied data quality edits for LMP-based gestation that are recommended by NCHS since the release of the 2008 annual statistical birth file. Where values of LMP are missing, outside the allowable range (17-47 completed weeks of gestation), or are inconsistent with birthweight, the obstetric estimate of gestation is substituted. Nationally, 3.1% of 2013 birth records were either imputed or OE was substituted, compared to 7.5% of 2013 New Mexico birth records. Results in this report are based on a comparison of the obstetric estimate of gestation at delivery (OE) and the LMP-based estimate of gestation (LMP-based) after the application of the data quality edits.

Results

In national data less than one percent (0.02%) of the OE in 2013 birth records were either missing or outside the allowable NCHS range of 17 to 47 completed weeks of gestation. The proportion of birth records missing the OE or with values of OE outside of this range in New Mexico in 2013 and 2014 was also below one percent (0.68% and 0.66%, respectively). Although New Mexico had a higher proportion of unknown values for OE than the nation, this represented a small number of births: 175 or fewer records each year. Comparing unknown values for the two measures, the OE was missing in 0.4% of 2008-2014 New Mexico birth records, while LMP-based gestation was unknown in 0.1% of records (Table 1).

For 53.4% of New Mexico 2013 records and for 55.1% of 2014 records, OE estimates equaled LMP-based estimates. This compares with 62.1% of identical values in national 2013 data. In NM, OE was within one week of the LMP-based measure for 78.6% of 2013 records and 79.3% of 2014 records compared to national 2013

records where OE was within one week of the LMP-based measure 83.4% of the time.

The differences between the two measures of gestational age in NM are substantial for births at full term (39-40 weeks) or later term (41 weeks or more). The percent of 2014 New Mexico births by single week of OE and LMP-based gestation diverge the most above 38 weeks of gestation (Figure 1). The largest differences between OE and LMP estimates in 2014 were at full term for which OE accounted for 19.8% more births and at later term for which there were 53.8% fewer OE births (Table 2). The percent distributions of births for each of the two measures was remarkably similar to the national distributions (inset, Figure 1).

When comparing the measures by gestational weeks and year over the period 2008 to 2014, the proportion of preterm births (defined as births under 37 weeks of gestation) was found to be lower each year using the OE measure than the LMP-based estimate. The difference ranged from 20% lower in 2012 (OE: 9.5%, LMP-based: 11.9%) to 26% lower in 2010 (OE: 9.1%, LMP-based: 12.3%). The relationship of proportionally fewer premature births based on OE versus LMP estimates was also evident in all preterm sub-categories with the exception of the 27 week and under category (Table 2). For New Mexico birth data in 2014, the OE percentage of preterm births was 9.0% or 2.8 percentage points lower than the LMP-based result of 11.8%. This translates into 727 fewer preterm births in 2014 according to the OE measure (Table 2).

Births at gestational ages of 42 weeks and over are considered postterm deliveries. In 2014, according to

the LMP-based estimate, 5.9% of New Mexican resident births were defined as postterm compared to 0.4% of births using the OE measure, a 93% decrease (Table 2). This difference was similar to 2013 national birth data in which there were 93% fewer OE postterm than LMP-based postterm births.

Discussion

The relationship between measurements of LMP-based and OE gestational age in New Mexico birth data is in the same direction and comparable to the relationship in national data. The obstetric estimate of gestational age identified a higher percentage of births from 38 to 40 weeks than LMP-based gestational age, and, at the same time, a lower percentage of births than LMP-based from 41 weeks on. New Mexico 2014 births and U.S. 2013 births both had proportionally fewer post-term births using OE measures. The largest difference between the two distributions of the measures in both New Mexico and U.S. data was at 39 weeks of gestation (Figure 1).

An important finding of this New Mexico-focused report is that the OE measure consistently categorized fewer births as preterm (under 37 week gestation) than the LMP-based estimate. This finding is consistent with national data in which a lower percent of births were also classified as preterm by the OE measure compared to LMP-based. Serious short-term and long-term health complications for the infant can be associated with premature birth, some of which include an immature respiratory system, temperature control problems, hearing impairment, moderate to severe learning problems, and chronic health issues as documented by the Born Too Soon Preterm Action Group.⁴ Improving the measurement and identification of preterm gestation is critical due to the potential health, intervention, and life-long implications of prematurity.

Conclusion

The New Mexico transition to the obstetric estimate of gestation at delivery aligns New Mexico with the U.S. approach. The transition will take some adjustment for those who use LMP-based gestational age estimates, but it is expected to improve public health surveillance related to gestational age and, in particular, categorization of preterm risk. As in the release of previous data years, both measures of gestational age will be available in future BVRHS annual statistical birth files.

Table 1. Resident Births by OE and LMP-based gestational age, New Mexico, 2008-2014

Weeks Gestation	Obstetric Estimate (OE)		LMP-based Estimate	
	Count	Percent	Count	Percent
Under 28	1413	0.7	1148	0.6
28-31	1336	0.7	2068	1.1
32-33	2150	1.1	3043	1.6
34-36	13201	6.8	17348	9.0
37-38	52513	27.2	50347	26.1
39-40	107851	55.8	89659	46.4
41	13136	6.8	17422	9.0
42 and over	922	0.5	12091	6.3
Unknown	772	0.4	168	0.1

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Table 2. New Mexico Resident Births by Last Normal Menses (LMP-based) and Obstetric Estimates of Gestational Age by Year, 2008-2014

Year	Births	Preterm					Early term	Full term	Late term	Postterm	Not stated
		Total under 37 weeks	27 weeks and under	28 to 31 weeks	32 to 33 weeks	34 to 36 weeks	37 to 38 weeks	39 to 40 weeks	41 weeks	42 weeks and over	
	Number	Percent - LMP-based estimate									Number
2008	30,156	12.58	0.55	1.17	1.64	9.21	25.28	46.20	9.28	6.54	40
2009	28,873	12.34	0.54	1.23	1.76	8.81	26.06	46.42	8.97	6.19	6
2010	27,795	12.29	0.71	1.01	1.59	8.98	26.89	44.75	9.42	6.56	28
2011	27,251	12.27	0.61	1.04	1.49	9.13	26.86	45.44	8.77	6.62	12
2012	26,992	11.90	0.62	0.96	1.51	8.81	25.73	47.30	8.65	6.33	24
2013	26,242	12.20	0.54	1.05	1.59	9.02	25.79	47.44	8.84	5.63	23
2014	25,985	11.84	0.58	1.00	1.42	8.83	25.76	47.28	9.12	5.86	35
	Number	Percent - Obstetric estimate									Number
2008	30,156	9.76	0.60	0.63	1.13	7.39	27.68	54.07	7.42	0.66	124
2009	28,873	9.20	0.67	0.78	1.16	6.58	28.04	54.82	7.16	0.61	52
2010	27,795	9.07	0.81	0.63	1.09	6.54	26.89	56.03	7.16	0.47	103
2011	27,251	9.70	0.78	0.72	1.09	7.11	26.79	55.95	6.90	0.43	64
2012	26,992	9.52	0.75	0.68	1.09	6.99	26.80	56.85	6.12	0.40	84
2013	26,242	9.22	0.75	0.67	1.24	6.55	27.11	56.52	6.12	0.36	175
2014	25,985	9.04	0.77	0.72	0.97	6.58	26.74	56.65	6.55	0.37	170

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Figure 1. Percent Resident Births by OE and LMP-based Estimates of Gestational Age, New Mexico 2014 (Inset: United States, 2013)

