Public Health *Reports*

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Public Health Reports
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Public Health Reports one-year subscription price is $15 domestic and $18.75 for foreign subscribers.

A subscription form and other information appears on the back cover.

PUBLIC HEALTH REPORTS
USPS 324-990
ISBN 0033-3549

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Second class postage paid at Washington, DC and additional mailing offices. POSTMASTER: Send address changes to *Public Health Reports*, Room 1875, John F. Kennedy Federal Building, Boston, MA 02203.

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LETTER TO THE EDITOR

A Warning on Gestational Age at Delivery

Gestational age at delivery is one of the few quantitative clinical variables collected in our national vital statistics system and has been widely used by numerous researchers as an outcome measure *(1–3)*, an integral component of most prenatal care adequacy measures *(4–6)*, and as a risk factor for infant mortality and developmental outcomes *(7–10)*.

That gestational age is subject to measurement error is obvious; Alexander and colleagues have published widely on the statistical variability inherent in different methods for assessing gestational age *(11–13)*. In the July–August 1995 issue of *Public Health Reports*, they raise a warning signal to the public health community as we move toward adoption of the clinical estimate of gestation or composite measures in statistical analyses and reports based on vital statistics data *(14)*. This warning is well timed.

In the recently published annual national compendium of natality data for 1991 *(15)*, the only data tabulated by gestational age are based on a composite measure. Although well described, the composite variable is difficult for readers to interpret, especially in relation to the concerns raised by Alexander and colleagues.

There are additional areas for concern. The National Center for Health Statistics (NCHS) failed to specify reporting criteria for the clinical estimate of gestation; doubtless a few States have provided criteria or guidelines, but these are unlikely to clarify the matter for clinical staffs at birthing hospitals. The instructions given in Missouri read: "Enter the length of gestation as estimated by the physician. Do not compute this information yourself from the date last normal menses began and date of birth. If the physician has not done a clinical estimate of gestation, enter 'None'. Do not leave this item blank" *(16)*. These instructions are similar to those used in many States and fail to indicate whether an estimate based on ultrasonography is preferred to a newborn assessment or which specific measurements should be used as a basis for gestational age determination.

The South Carolina data reported by Alexander and colleagues in table 1 on page 396 show an unusually large proportion of records with missing or incomplete clinical estimates. In my experience with natality data from a number of States, the proportion of records with incomplete or missing LMP-based estimates has always been larger. To confirm this, I obtained resident data for calendar year 1993 from Arkansas, Missouri, and Wisconsin thanks to prompt provision of State level gestational age data by Joyce Eatmon, Arkansas Center for Health Statistics, Vicky Howell, Missouri Center for Health Statistics, and Michael Soref, Wisconsin Center for Health Statistics. These data are for all births without respect to plurality but serve as an appropriate basis for comparison

to South Carolina. The proportion of records with missing or incomplete data for each type of gestational age assessment were

State	LMP-based percent	Clinical estimate percent
Arkansas (1993)	19.5	1.0
Missouri (1993)	2.3	0.7
Wisconsin (1993)	7.7	0.1
South Carolina (1989–91)	2.9	6.5

In Missouri and Wisconsin, the proportion of live births with out-of-range values were similar to those reported for South Carolina; Arkansas data with out-of-range LMP-based values were classified as missing. Vital statisticians wishing to create a composite measure may be tempted to use the clinical estimate as the base value, because it is provided for more than 99 percent of all births, and impute a clinical estimate for those with missing data by dates when available. Such a composite would use a different logic from that employed by NCHS and make comparisons among States even more difficult to evaluate.

The work of Alexander and colleagues (*14*) clarifies several issues in the interpretation of gestational age data from vital statistics. However, it fails to resolve the central dilemma facing our national perinatal data system. What we seek are reliable and valid clinical measures of the status of the newborn at birth, for evaluation of the outcome of the pregnancy and for the calibration of the risks for morbidity and mortality which the infant will face.

The national vital statistics system must be changed in two ways to address our needs. First, specific definitions for all clinical entities must be developed and implemented nationwide, together with a quality assurance component to ensure that reporting is carried out uniformly. Second, a broader set of clinical measures are needed. The issue of intrauterine growth retardation and small-for-gestational-age is a three-dimensional one, involving not only duration of gestation and birth weight but also clinical assesssment of the biparietal head circumference and the crown-heel or crown-rump length, or both (*17*). Missouri and Wisconsin are the only States that collect crown-heel length on the birth certificate (*18*); to my knowledge, head circumference is not collected in any State.

In this era of relational databases, clinical information systems, and electronic claims processing, surely as a nation it is possible to expand the set of clinical data routinely collected through our vital statistics registration system while improving its scientific reliability and validity. This broader challenge is the one we must meet if we are to put the elegant lessons of Alexander and colleagues to their most efffective use.

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