

How Birth Certificate Data is Used in Public Health

**Maternal, Child and Adolescent Health Program
Center for Family Health
California Department of Public Health**

Birth Data Quality: Tips for Improvement

Regional Perinatal Programs of California

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Public Health



How the information collected on birth certificates is used

The information is used to

- develop statistics on health topics
- understand what is happening in the health of mothers and babies
- help improve the health of mothers and babies
- get better programs
- get more services
- help programs figure out where to spend money
- help prevent birth defects, premature babies, maternal deaths, etc.
- help underserved communities become healthier

Public health indicators based on birth certificate data

- Gestational Age (based on last menstrual period)
 - Fetal Presentation
 - Month Prenatal Care Began
 - Number of Prenatal Care Visits

Why gestational age is important in public health

- Preterm births (gestational age less than 37 weeks) is the leading cause of death among newborn infants.¹
- Preterm infants are at increased risk of serious newborn health complications, such as breathing problems, which require specialized care and weeks or months of hospitalization in neonatal intensive care units.
- Preterm infants face an increased risk of life-long disabilities, such as intellectual disabilities, cerebral palsy, breathing and respiratory problems, vision and hearing loss and feeding and digestive problems.¹
- Two recent studies suggest that preterm infants may be at increased risk of symptoms associated with autism (social, behavioral and speech problems).²
- Studies suggest that babies born very preterm may be at increased risk of certain adult health problems, such as diabetes, high blood pressure and heart disease.²

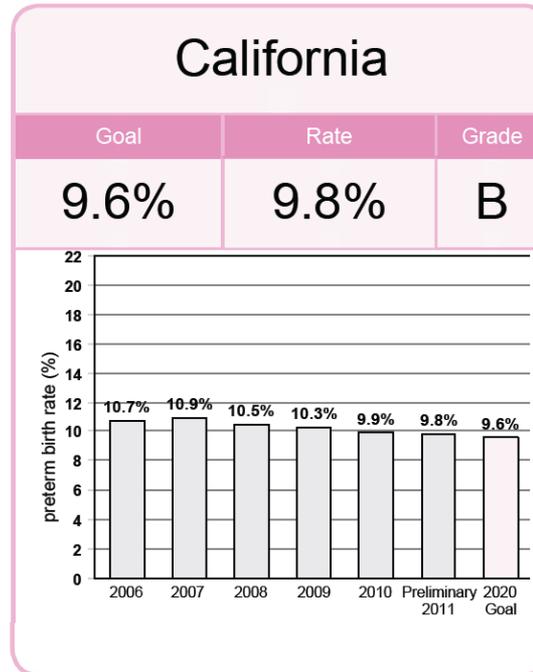
1. <http://www.cdc.gov/Features/PrematureBirth/> accessed July 21, 2011

2. http://www.marchofdimas.com/baby/premature_indepth.html accessed December 29, 2011

March of Dimes Challenge

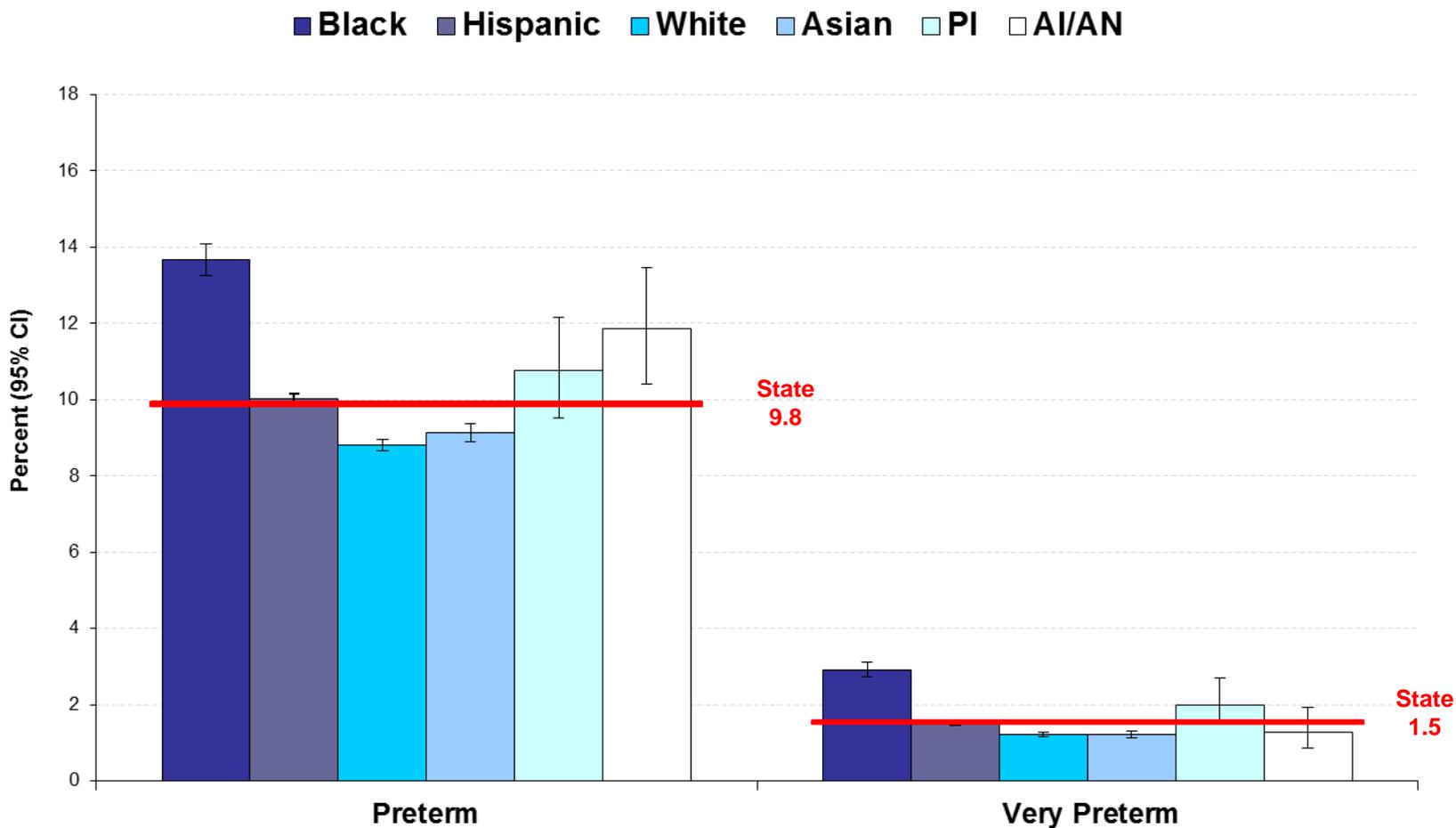
March of Dimes 2012 Premature Birth Report Card

The March of Dimes grades states by comparing each state's rate of preterm birth to the March of Dimes 2020 goal of 9.6 percent. Preterm birth is the leading cause of newborn death in the United States. We don't yet understand all the factors that contribute to preterm birth. The nation must continue to make progress in research to identify causes and prevention strategies, and on interventions and quality improvement initiatives to improve outcomes.



- The March of Dimes and the Association of State and Territorial Health Officers are partnering to prevent preterm births and reduce infant mortality. They have challenged states to reduce their percent of preterm births by 8% by 2014, using 2009 data as the baseline year.
- The California Department of Public Health Director has accepted this challenge, targeting a percent of preterm births of 9.6% by 2014.

Percent PTB* and VPTB** by Race/Ethnicity, 2011



Includes California resident births with valid gestational age range 17-47 weeks; *PTB <37 weeks; **VPTB <32 weeks; gestational age based on last menstrual period; PI = Pacific Islander; AI/AN = American Indian/Alaska Native. Data Source: California Birth Statistical Master Files, 2000-2011

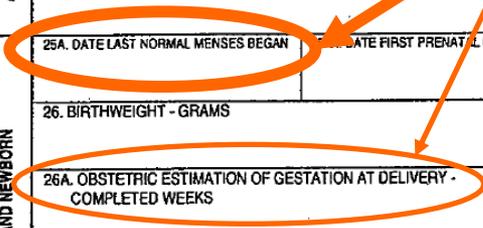
Gestational age based on date last menstrual period (LMP) began



California uses LMP to calculate the infant's gestational age

CONFIDENTIAL INFORMATION FOR PUBLIC HEALTH USE ONLY												
GENETIC FATHER	19. FATHER HISPANIC, LATINO, OR SPANISH?				18. RACE - UP TO THREE RACES/ETHNICITIES MAY BE LISTED. SEE WORKSHEET ON BACK.				20C. EDUCATION - HIGHEST LEVEL OR DEGREE			
	20. DATE LAST WORKED - MM/CCYY		20A. USUAL OCCUPATION				20B. KIND OF BUSINESS OR INDUSTRY					
GENETIC MOTHER	22. MOTHER HISPANIC, LATINA, OR SPANISH?				21. RACE - UP TO THREE RACES/ETHNICITIES MAY BE LISTED. SEE WORKSHEET ON BACK.				23C. EDUCATION - HIGHEST LEVEL OR DEGREE			
	23. DATE LAST WORKED - MM/CCYY		23A. USUAL OCCUPATION									
BIRTH MOTHER ADDRESS	24A. MOTHER'S RESIDENCE STREET AND NUMBER, OR LOCATON - DO NOT INCLUDE APO/FPO ADDRESSES								24D. STATE/FOREIGN COUNTRY		24E. ZIP CODE	
	24C. CITY											
MEDICAL AND HEALTH DATA BIRTH MOTHER AND NEWBORN	25A. DATE LAST NORMAL MENSES BEGAN		25B. DATE FIRST PRENATAL CARE VISIT		25C. MONTH PRENATAL CARE BEGAN		25A. DATE LAST PRENATAL CARE VISIT		25C. NUMBER OF PRENATAL CARE VISITS		25D. PRINCIPAL SOURCE OF PAYMENT FOR PRENATAL CARE	
	26. BIRTHWEIGHT - GRAMS				27. PREGNANCY HISTORY - COMPLETE EACH SECTION							
	26A. OBSTETRIC ESTIMATION OF GESTATION AT DELIVERY - COMPLETED WEEKS				A. NUMBER NOW LIVING		B. NUMBER NOW DEAD		D. NUMBER BEFORE 20 WEEKS		E. NUMBER AFTER 20 WEEKS	
	26B. HEARING SCREENING				C. DATE OF LAST LIVE BIRTH - MM/DD/CCYY				F. DATE OF LAST OTHER TERMINATION - MM/CCYY			
	28A. METHOD OF DELIVERY				28B. EXPECTED SOURCE OF PAYMENT FOR DELIVERY		29. COMPLICATIONS AND PROCEDURES OF PREGNANCY AND CONCURRENT ILLNESSES					
	30. COMPLICATIONS AND PROCEDURES OF LABOR AND DELIVERY						31. ABNORMAL CONDITIONS AND CLINICAL PROCEDURES RELATED TO THE NEWBORN					
A	B	C	D	E	F	CENSUS TRACT		32. FATHER/PARENT SOCIAL SECURITY NUMBER		33. MOTHER/PARENT SOCIAL SECURITY NUMBER		

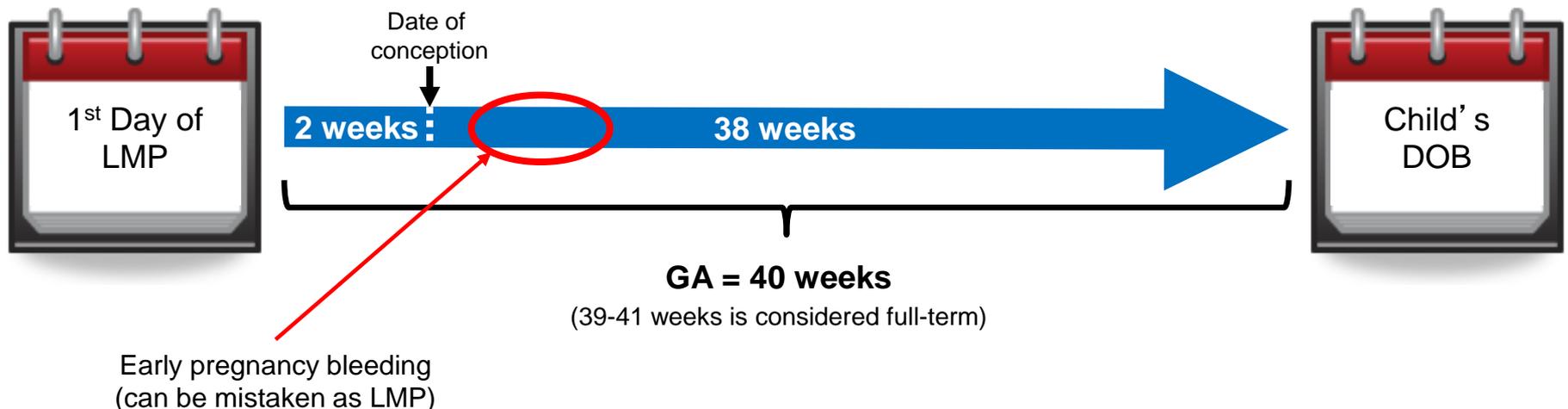
Two fields from the birth certificate can be used to calculate gestational age. In California, we use "25A. Date Last Menses Began."



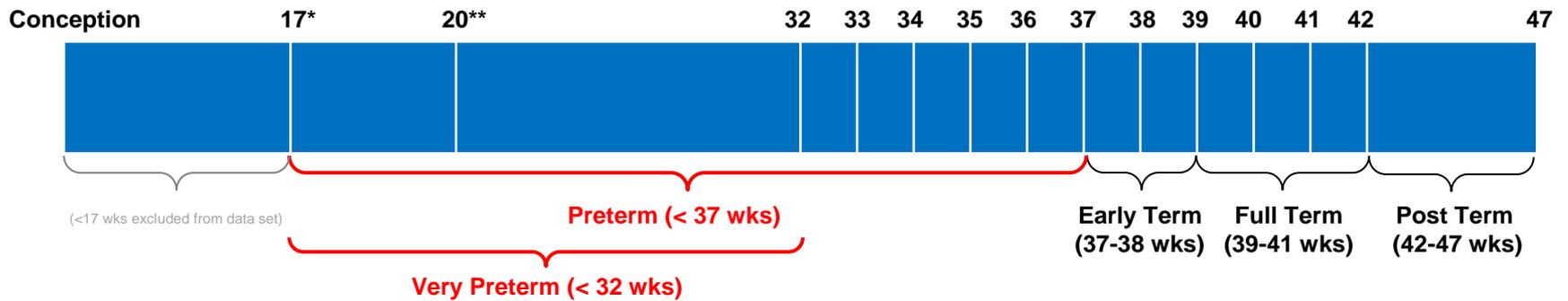
Gestational age based on LMP

- LMP is the only time-based gestational age measure.
- It is the most widely used estimate with a long history of use.
- The LMP has been collected on the U.S. standard certificate of live birth since 1968.
- LMP assumes a 28-day cycle with ovulation occurring mid-cycle.

How LMP is used to estimate gestational age:



Important gestational age time periods



*NCHS data excludes births <17 weeks and >47 weeks gestation. **NCHS uses ≥ 20 weeks gestation as the fetal viability threshold. Data Source: MacDorman MF, Kirmeyer S. Fetal and Perinatal Mortality, United States, 2005. National vital statistics reports; vol 57 no 8. Hyattsville, MD: National Center for Health Statistics. 2009.

Why we need an accurate estimate of gestational age (GA) for public health

- To measure infant maturity at birth
- To make medical decisions for the infant and to predict long-term health concerns
- To determine key MCH indicators, which are compared across populations and time, such as:
 - preterm and very preterm births
 - small- and large-for-gestational-age
 - initiation and adequacy of prenatal care
 - infant and fetal morbidity and mortality
 - delivery method
 - weight gain during pregnancy
 - interpregnancy and interbirth intervals
- To inform clinical quality improvement activities and public health strategies

~~~The birth certificate is the only source of state and national data for GA.<sup>1</sup>~~~

## Well-known problems with LMP

- Variation in menstrual cycle duration
- Non-menstrual vaginal bleeding during early pregnancy
- Conception following pregnancy with no intervening menstrual bleeding
- Imperfect maternal recall
- Missing prenatal record
- Errors in data abstraction, calculation, data entry
- And more.....

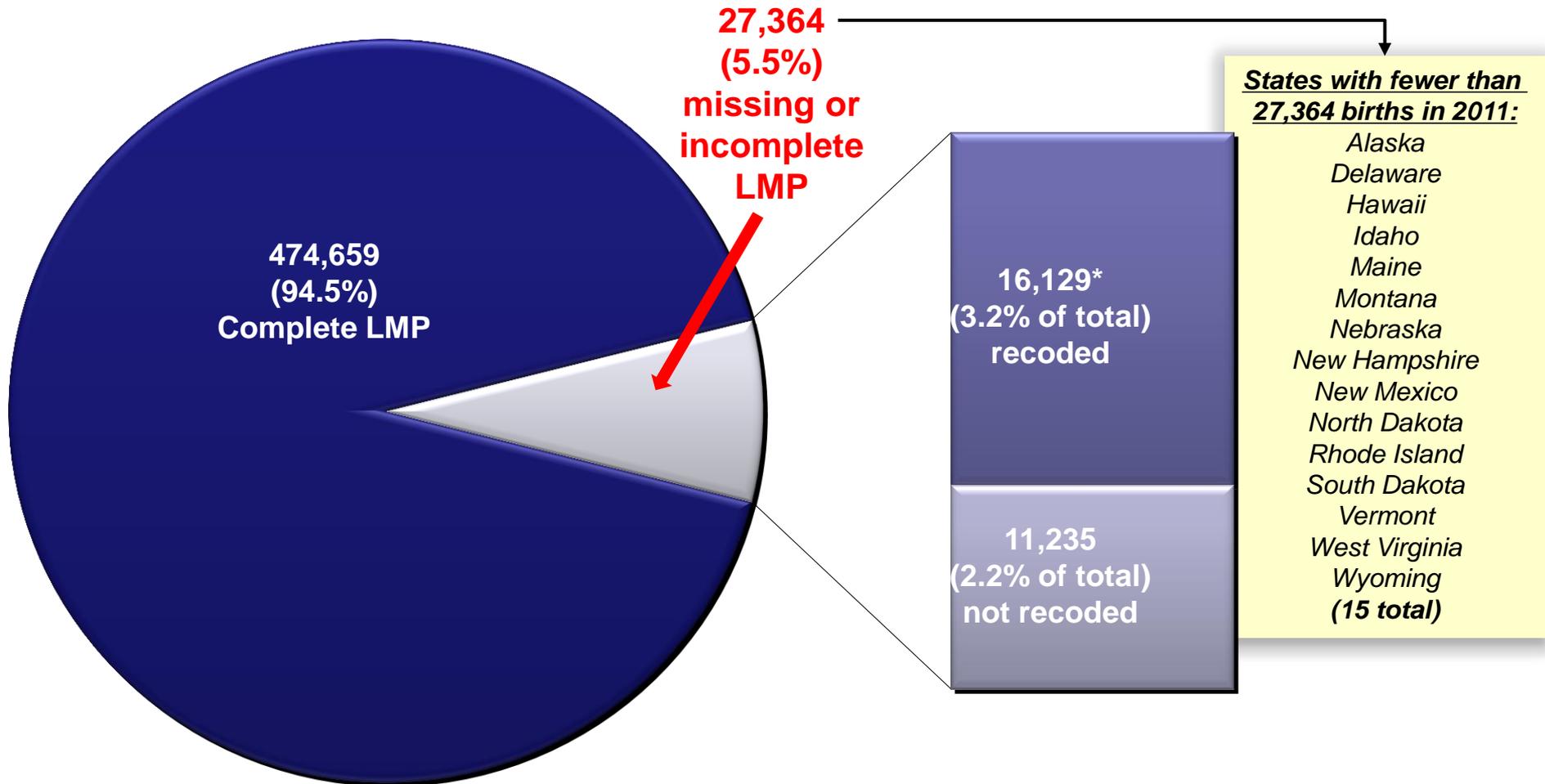
## Tips for Filling In #26A:

- The OB estimate is based on the due date estimated from an ultrasound performed between 16-20 weeks and the date of the last menstrual period (LMP)
- Completed weeks means number of weeks fully completed. For example:

| If chart says:                                  | You enter: |
|-------------------------------------------------|------------|
| 36/0, 36/1, 36/2, 36/3, 36/4, 36/5, 36/6        | 36         |
| 36                                              | 36         |
| 36w0d, 36w1d, 36w2d, 36w3d, 36w4d, 36w5d, 36w6d | 36         |

# Missing or incomplete LMP, 2011

Total number of records: 502,023



\*Almost all (n=16,032) were missing LMP day only

Data source: 2011 Birth Statistical Master File; based on births to California resident moms

## Edits that are made when LMP is incomplete

Date of LMP = MM/DD/YYYY

### Edits

Missing LMP month & day

we use

.....July 1<sup>st</sup>

Missing LMP day only

we use

....the 15<sup>th</sup> of the month

However, this leads to inaccurate data.....

# Fetal Presentation



Cephalic presentation  
(head first;  
most common: vertex)



Breech  
(buttocks or feet first)



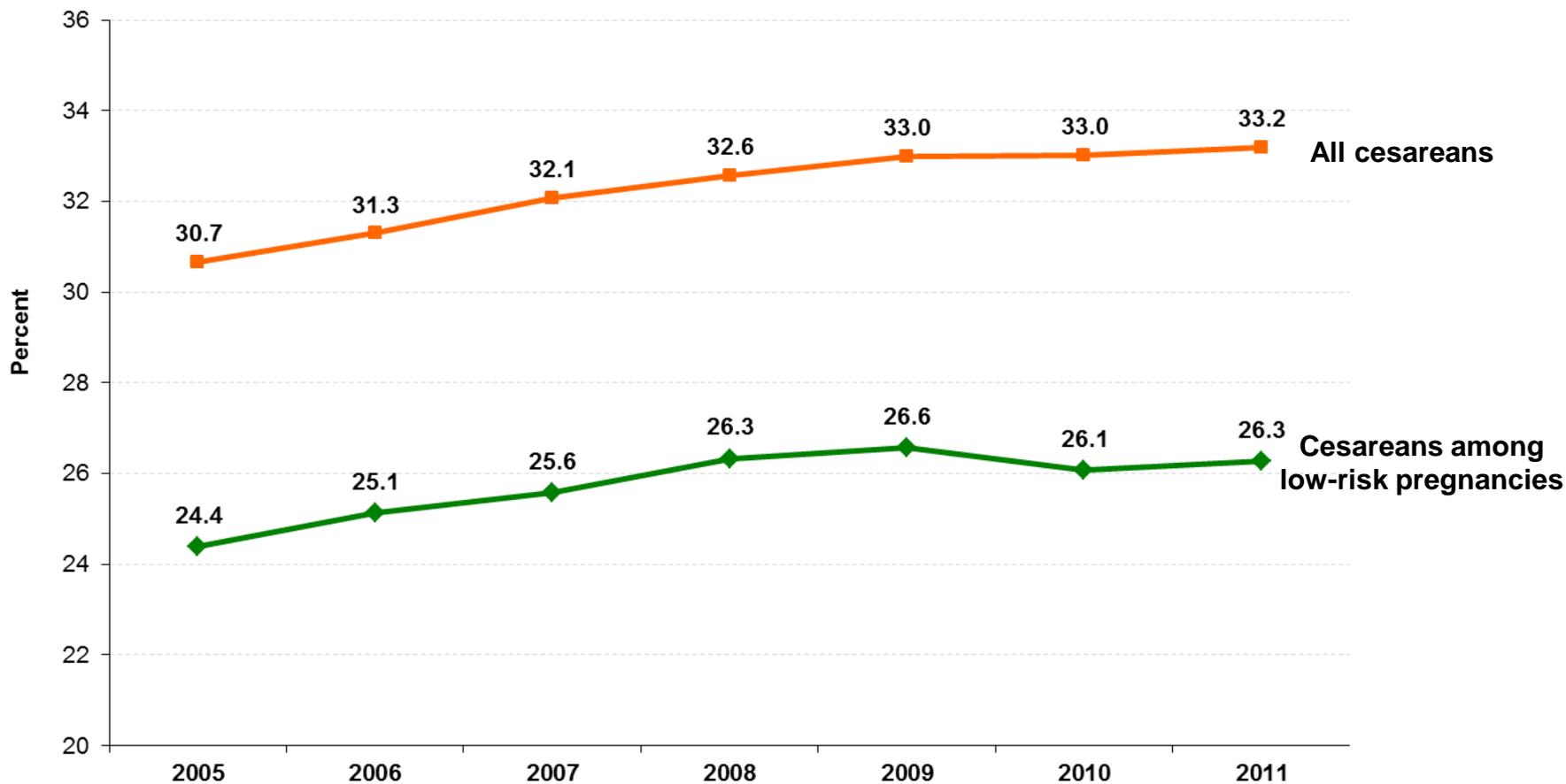
Other

## Fetal presentation is one of the factors used to determine a low-risk pregnancy

### Low-risk pregnancy

- Woman who has never born an offspring
- Term pregnancy (37 weeks or more)
- Singleton birth
- **Vertex or cephalic (normal fetal presentation)**

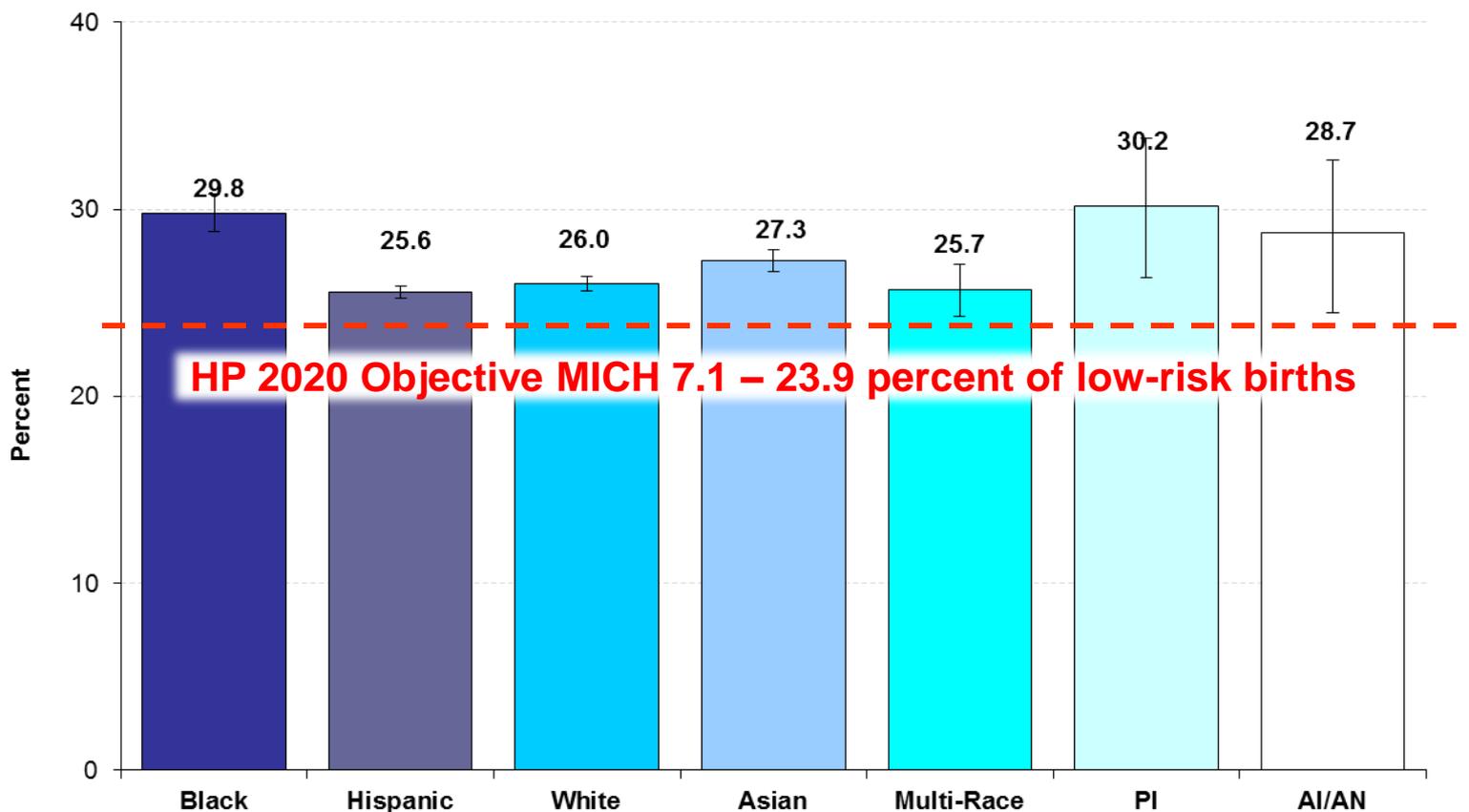
# Cesarean deliveries have been increasing even among low-risk pregnancies, 2005-2011



Data based on CA delivery of live births to nulliparous (women who have never born an offspring) women, who had singleton, term (37 weeks or more), vertex or cephalic (normal presentation) births. Data source: California Birth Statistical Master Files, 2005-2011.

Prepared by the California Department of Public Health, Maternal, Child and Adolescent Health Program

# Cesarean deliveries to low-risk moms by race/ethnicity, 2011



Data based on CA delivery of live births to nulliparous (women who have never born an offspring) women, who had singleton, term (37 weeks or more), vertex or cephalic (normal presentation) births. Data source: California Birth Statistical Master Files, 2011.

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# Prenatal care start & number of prenatal care visits



# Early and adequate prenatal care are important because...

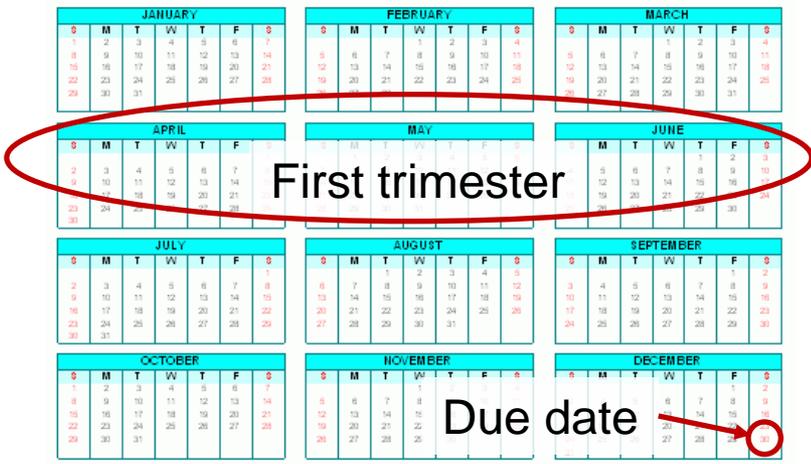
- Prenatal care helps keep moms and babies healthy.
- Babies of mothers who do not get prenatal care are **three times** more likely to have a low birth weight and **five times** more likely to die than those born to mothers who do get care.
- Doctors can spot health problems early when they see mothers regularly. This allows doctors to treat them early. Early treatment can cure many problems and prevent others. Examples are:
  - Gestational diabetes
  - Pre-eclampsia
  - Low birth weight
  - Preterm births
  - Genetic disorders
  - Infant deaths
  - Maternal deaths
- Several researchers have suggested that the beneficial effects of prenatal care are strongest among socially disadvantaged women.

# How birth certificate items are used in public health measures of early and adequate prenatal care

“Early” = prenatal care that begins in first trimester  
 (based on month prenatal care began\*)

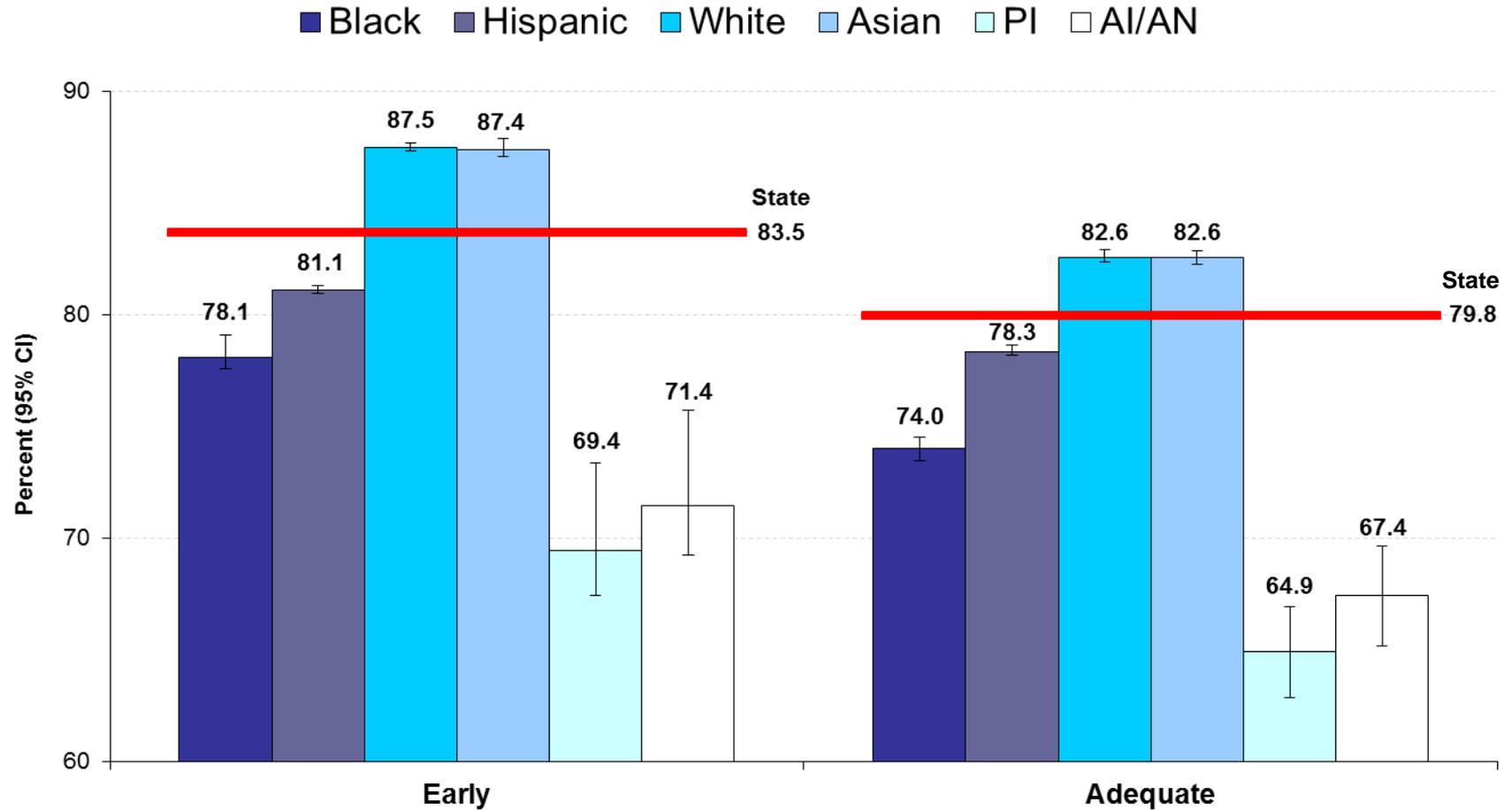
“Adequate” =

Early prenatal care + Number of prenatal care visits\*



\* Birth certificate item

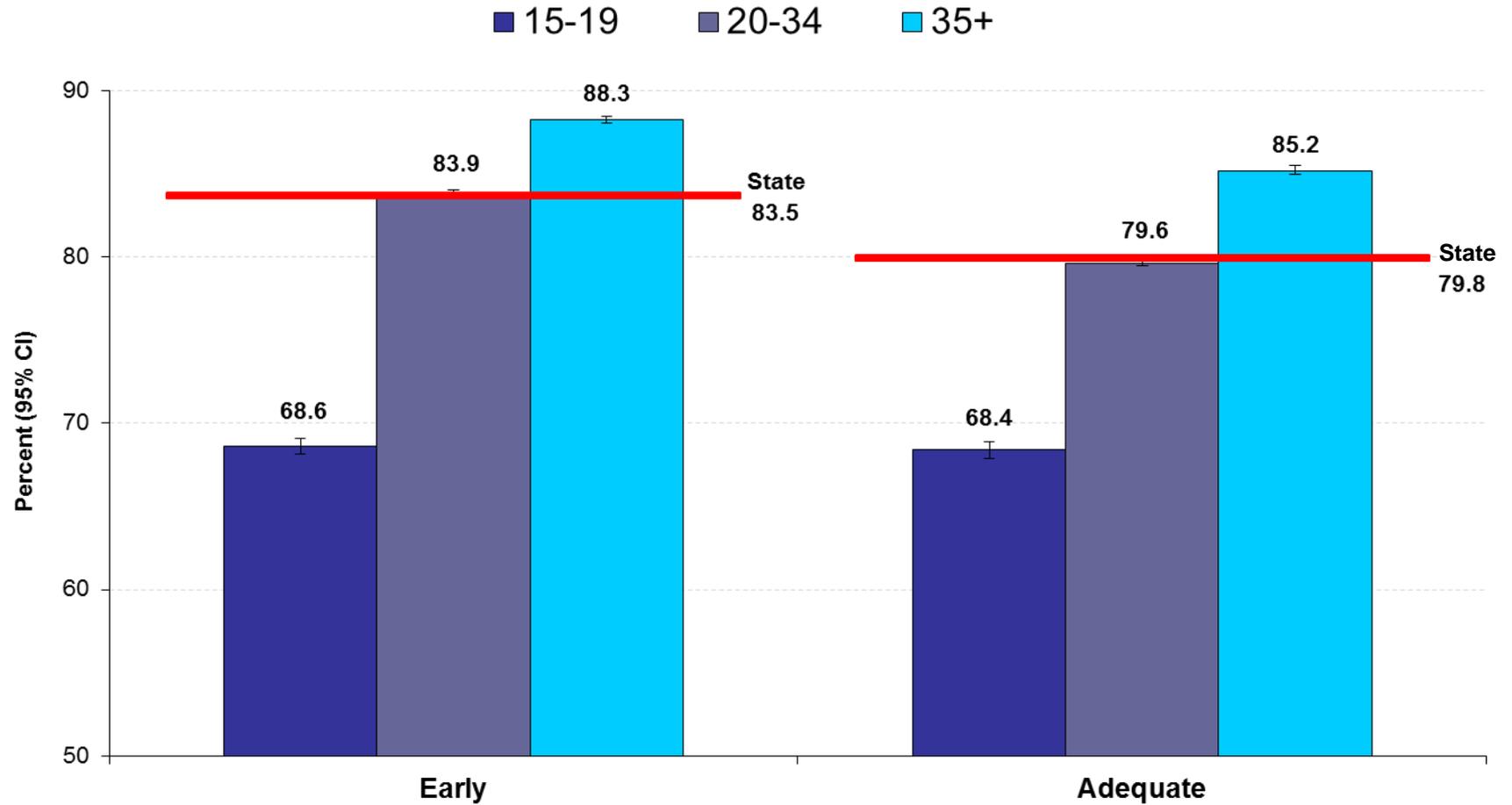
# Racial/ethnic disparities in early & adequate prenatal care, 2011



Excludes non-California residents; Early PNC excludes births with unknown PNC initiation; Adequate PNC excludes births with missing Kotelchuck index; PI = Pacific Islander; AI/AN = American Indian/Alaska Native. Data Source: California Birth Statistical Master File, 2011.

Prepared by the California Department of Public Health, Maternal, Child and Adolescent Health Program, Center for Family Health

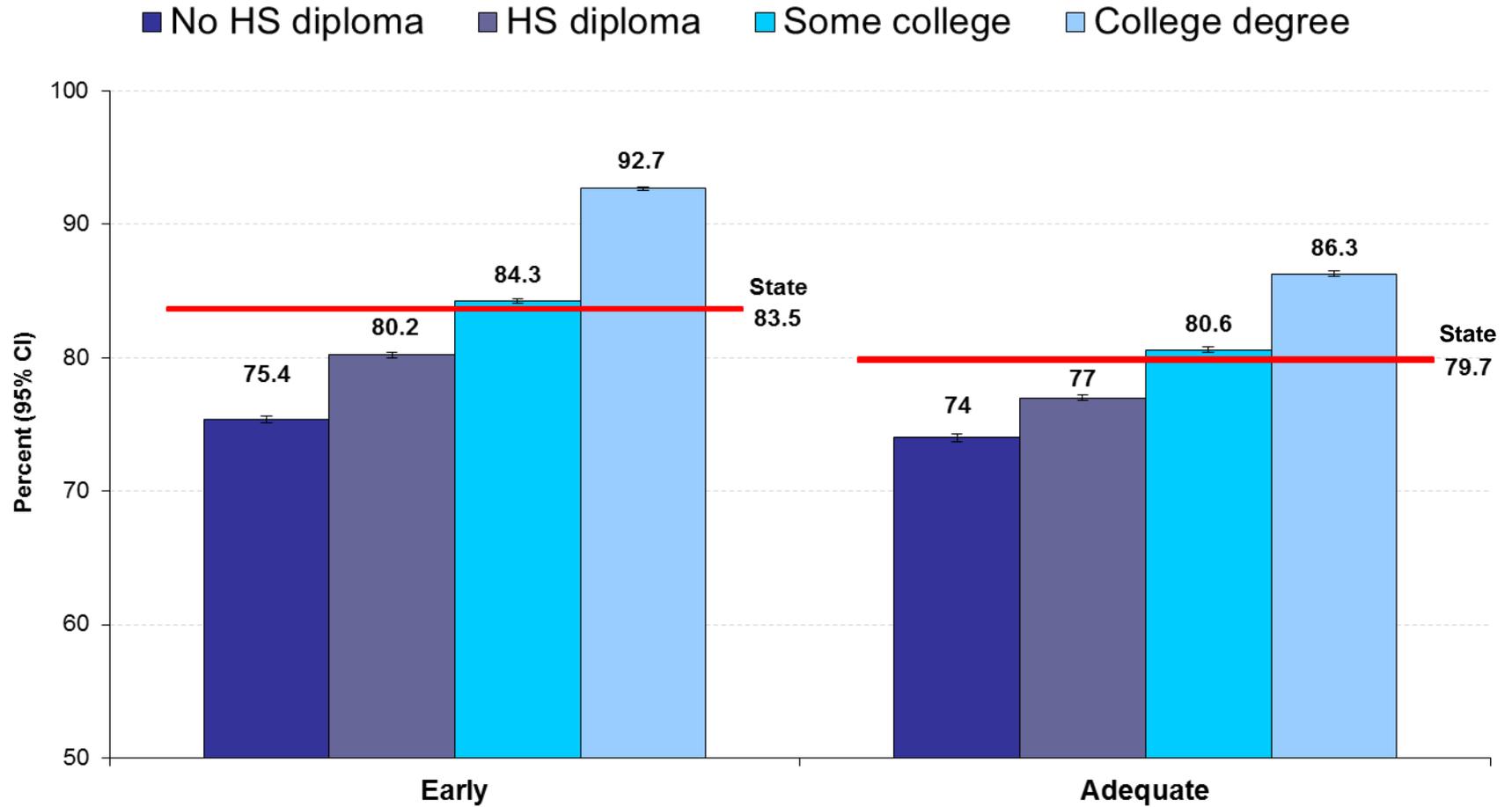
# Early & adequate prenatal care by mom's age, 2011



Excludes non-California residents; Early PNC excludes births with unknown PNC initiation and missing age of mother; Adequate PNC excludes births with missing Kotelchuck index. Data Source: California Birth Statistical Master File, 2011.

Prepared by the California Department of Public Health, Maternal, Child and Adolescent Health Program, Center for Family Health

# Early & adequate prenatal care by mom's education level, 2011



Excludes non-California residents & missing education level; Early PNC excludes births with unknown PNC initiation; Adequate PNC excludes births with missing Kotelchuck index; Data Source: California Birth Statistical Master File, 2011.



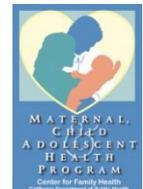
REGIONAL PERINATAL  
PROGRAMS OF CALIFORNIA

## Birth Data Quality: Tips for Improvement

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### Regional Perinatal Programs of California

California Department of  
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# Selected Data Elements

- Date Last Normal Menses Began (25A)
- Month Prenatal Care Began (25B)
- Number of Prenatal Visits (25C)
- Fetal Presentation (28AC)

# Date Last Normal Menses Began (25A)

| EDD CONFIRMATION |                                         | 18-20-WEEK EDD UPDATE: |                                     |
|------------------|-----------------------------------------|------------------------|-------------------------------------|
| INITIAL EDD:     |                                         | QUICKENING             | ___/___/___ +22 WKS = ___/___/___   |
| LMP              | ___/___/___ = EDD ___/___/___           | FUNDAL HT. AT UMBIL.   | ___/___/___ +20 WKS = ___/___/___   |
| INITIAL EXAM     | ___/___/___ = ___ WKS = EDD ___/___/___ | FHT W/FETOSCOPE        | ___/___/___ +20 WKS = ___/___/___   |
| ULTRASOUND       | ___/___/___ = ___ WKS = EDD ___/___/___ | ULTRASOUND             | ___/___/___ = ___ WKS = ___/___/___ |
| INITIAL EDD      | ___/___/___ INITIALED BY _____          | FINAL EDD              | ___/___/___ INITIALED BY _____      |

\*Taken from ACOG prenatal record form

## Tips

- Enter all known parts of the date
- If no parts of the date are known enter “Unknown”

## Sources

- Primary: Prenatal care record under menstrual history or triage form
- Secondary: Admission H&P under Medical History



# Date Last Normal Menses Began (25A)



| IF                                                       | THEN ENTER                                                                                                                                                |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| The day is unknown                                       | Month and year only, e.g., 12/--/2013                                                                                                                     |
| The month and day are unknown                            | Year only, e.g., --/--/2013                                                                                                                               |
| The year is unknown, or if no information is available   | <i>Unknown</i>                                                                                                                                            |
| The exact date is unknown                                | The best estimate. You may also ask the mother for her original due date and then use the pregnancy wheel to go backwards to find the date of last menses |
| The mother has no menses prior to pregnancy confirmation | Date of conception (estimate) and go backwards two weeks. The doctor can also provide an estimate based on an ultrasound                                  |
| The mother had a menses prior to pregnancy confirmation  | The date last normal menses began                                                                                                                         |
| The mother had bleeding or a menses during pregnancy     | Date of conception (estimate) and go backwards two weeks.                                                                                                 |

# Month Prenatal Care Began (25B)

- **Tips**
  - Enter the **month of the pregnancy** in which prenatal care started (e.g., 1 for first month of pregnancy, 4 for fourth month of pregnancy, etc.)
  - Do **NOT** enter the name of the month (e.g., January, etc.)
- **Sources**
  - Primary: Prenatal Care Record *under*
    - Intake information
    - Initial physical exam
    - Prenatal visits flow sheet
    - Current pregnancy
  - Secondary: Initial Physical Examination



# Month Prenatal Care Began (25B)



| IF                                                                   | THEN ENTER                                                                                             |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Prenatal care was received                                           | The month of the pregnancy in which the mother first received prenatal care, e.g., 1st, 2nd, 3rd, etc. |
| No prenatal care was received                                        | 0 (zero)                                                                                               |
| The exact month of pregnancy in which prenatal care began is unknown | The best estimate                                                                                      |
| Absolutely no information is available                               | <i>Unknown</i>                                                                                         |

# Number of Prenatal Visits (25C)

- **Tips**

- Count and enter the estimated number of prenatal care visits to a physician, certified nurse-midwife, nurse practitioner, or physician's assistant
- Acceptable entries include
  - Unknown, when absolutely no information is available
  - 0 (zero), when prenatal care was not received

- **Sources**

- Prenatal Care Record *under*
  - Prenatal Visit Flow Sheet

# Number of Prenatal Visits (25C)

- In determining number of prenatal visits
  - Include visits to a physician, certified nurse-midwife, nurse practitioner, or physician's assistant
    - Do **NOT** include visits to a nutritionist, dietitian, health educator or other health care professional not listed above
  - Do **NOT** include visit to confirm pregnancy
  - Do **NOT** include emergency room visits for non-pregnancy related problems

# Fetal Presentation (28AC)

## Best Data Sources, listed in order of preference

- Delivery room record
- Provider delivery notes
- Labor record: Nursing notes
- Discharge summary
- Ultrasound report (during labor and no version attempted)

## Options are:

20 Cephalic  
Unknown

30 Breech

40 Other

90

# Fetal Presentation: Cephalic 20

Head down – Any part of the head presenting  
(Expected incidence ~95-97%)

## Vertex:

**OA:** Occiput-Anterior

**OP:** Occiput-Posterior

**LOA:** Left Occiput-Anterior

**ROA:** Right Occiput-Anterior

**LOP:** Left Occiput-Posterior

**ROP:** Right Occiput-Posterior

**LO:** Left Occiput  
Transverse

**ROT:** Right Occiput-  
Transverse

## \*Face:

**LMA:** Left Mento-Anterior

**RMA:** Right Mento-Anterior

**LMP:** Left Mento-Posterior

**RMP:** Right Mento-Posterior

**LMT:** Left Mento-Transverse

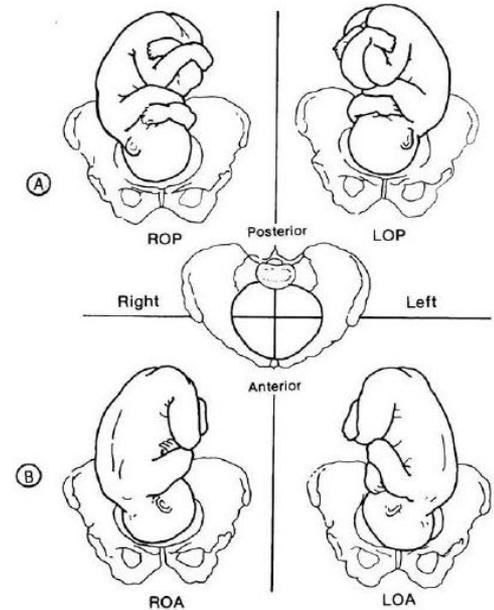
**RMT:** Right Mento-Transverse

## \*Brow:

**Sinciput** or **OP:** Occiput-Posterior

## \*Mentum:

Chin



# Fetal Presentation: Breech 30

## Presenting with below the waist

(Expected incidence ~2.5-5%)

**Frank Breech:** Baby is bottom down with legs up by ears.

**Complete Breech:** Baby is bottom down and sitting cross-legged

**LSA:** Left Sacrum-Anterior

**LST:** Left Sacrum-Transverse

**LSP:** Left Sacrum-Posterior

**RSP:** Right Sacrum-Posterior

**RST:** Right Sacrum-Transverse

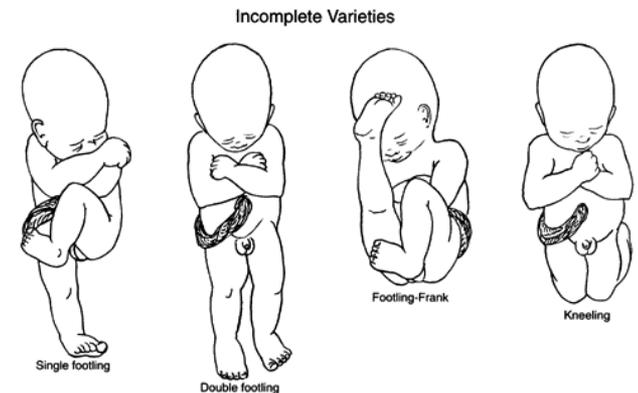
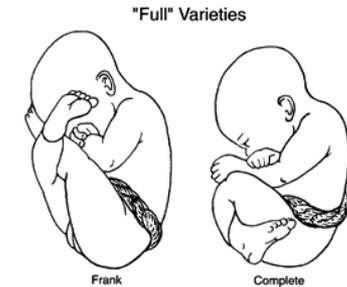
### Buttocks, Sacrum

**Single Footling Breech:** A single foot down

**Double Footling:** Both feet down

**Footling-Frank:** Bottom and one foot down

**Kneeling**



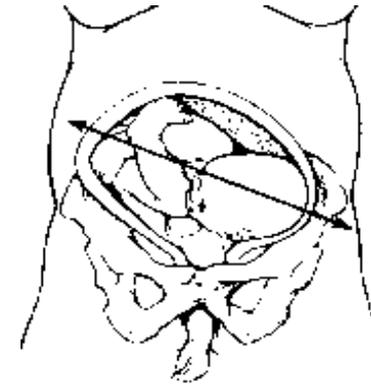
**Transverse**

**Shoulder**

**Arm**

**Funis: Cord prolapses (cord falls out)**

**Compound**



B

Transverse lie

# Remember, YOU are the “Vital Part” of California Vital Statistics Thank you!



## Questions/ Comments?

