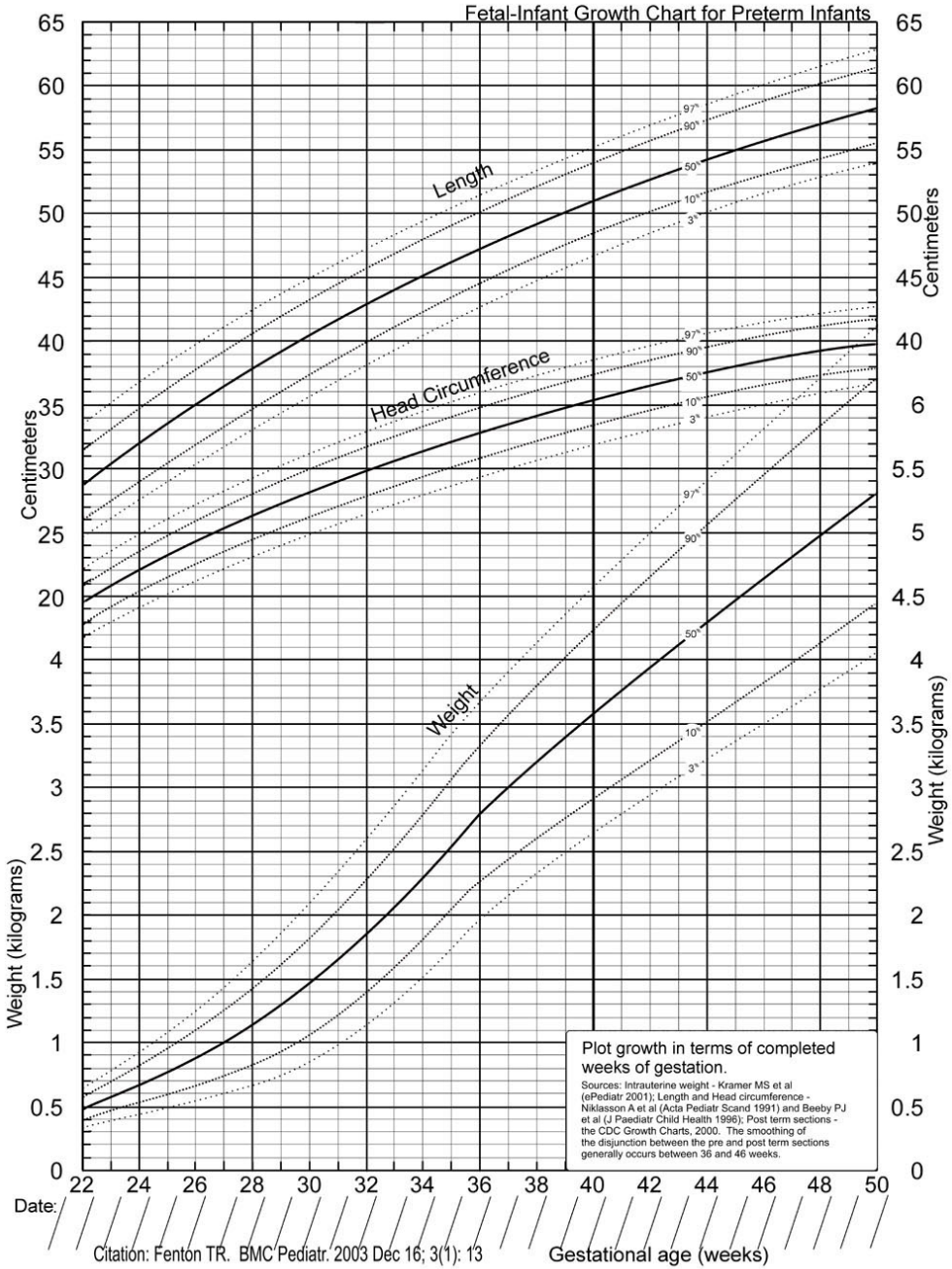
Case Study C
Influence of Smoking on Birthweight

Background

- The influence of different substances such as alcohol, nicotine and drugs on the development of a fetus needed to be studied
- This study focuses on the influence of smoking on the fetal development measured by gestation time and birth weight
- Data collecting interview was conducted early in the pregnancy to avoid bias
- Subset of 1,236 male, single births, surviving at least 28 days



Goals of Study

- Check quality of the data
- Look for patterns in descriptive and demographic data
- Assess the effects of various factors on the birthweight

Description of Data

- *Child-related variables:*
- Id Number - identification number
- Date - date of birth
- Gestation
  - length of the gestation (in weeks, fractions represent days)
- Birthweight - weight (in grams)

Mother-related variables:

- Race
- Age (in years)
- Education - education (7 levels)
- Height (in inches)
- Weight (in pounds)
- Smoking
  - never, until pregnancy, etc.
- Smoking Amount
  - number of cigarettes smoked
- Quit
  - history of smoking (if quit, when)

Description of Data (cont.)

Father-related variables:

- Father Race
- Father Age (in years)
- Father Education - education (7 levels)
- Father Height (in inches)
- Father Weight (in pounds)

Family-related variables:

- Marital Status
- Income (in categories)

Analysis

- Check variables
  - univariate plots (histograms, barcharts)
  - scatterplot Birthweight vs Gestation
- Patterns in the data
  - compare attributes of the father and the mother (scatterplots and FDs)
- Factors influencing Birthweight
  - boxplots Birthweight by categorical attributes
  - subsequently use highlighting of various smoking behavior
  - scatterplot Birthweight vs Mother's weight
  - spinograms with CD overlays for Birthweight and Gestation
  - spineplots of Education, Smoking Amount

Further Analysis

- Student's t-test of Birthweight for smokers vs non-smokers

```
> Smokes.Now <- Smoking == 'now'
> t.test(Birth.Weight ~ Smokes.Now, var=TRUE)

        Two Sample t-test

data:  Birth.Weight by Smokes.Now
t = 8.67, df = 1222, p-value < 2.2e-16
alternative hypothesis:
               true difference in means is not equal to 0
95 percent confidence interval:
 196.6378 311.6589
sample estimates:
mean in group FALSE  mean in group TRUE
           3489.098            3234.950
```