Project 6
Making and Using Childhood Growth Charts
Reading Guide for the 2000 CDC Growth Charts Report

The original report on the 2000 CDC Growth Charts can be found at

`http://www.cdc.gov/nchs/data/series/sr_11/sr11_246.pdf.`

Use the following questions to guide your readings.

1 Questions for Pages 1 - 4

1. What curves are included in the new CDC charts?
2. What is *recumbent length*? How easy do you think it is to measure the recumbent length of a baby? How easy do you think it is to be accurate? We will discuss the importance of accurate measurements later in the project.
3. What were some of the limitations of the Stuart/Meredith Growth Charts?
4. You may have answered this in the previous question, but what is the difference between the way the Stuart/Meredith Growth Charts graphs were made and the way the 2000 ones were made? (Note: This is not a question about data collection, but rather about the techniques used to actually draw the final smooth graph.)
5. From what surveys was data used for the 1977 charts? For children ages 2 to 20 years? For infants ages 0 to 3 years?
6. What does *standard deviation* mean (also called a *z-score*) and why is it useful?
7. What were some of the concerns surrounding the 1977 Growth Charts?
8. In the report they say "...differences between the recumbent length measurements for infants from the Fels data and the stature measurements from the NCHS data sets lead to inconsistent percentile estimates from the 1977 charts when the transition is made from the recumbent length to stature between 24 and 36 months of age." You can see a picture of this in one of the PowerPoint slides if you go to

   `www.cdc.gov/nccdphp/dnpa/growthcharts/training/powerpoint/slides/005.htm`

   If the 1977 recumbent length-to-age curves for infants 0 to 3 years of age is joined up with the 1977 stature-to-age curves for children 2 to 20 years of age in the same graph, there is a sudden drop where the curves join. Can you explain this?
9. Can you think of any reasons why it might be difficult to generate accurate curves for the extreme percentiles? You might not be able to answer this now, but keep it in mind.

2 Questions for Other Sections

Below are further questions to guide your reading for the remaining sections of the CDC report. To find the answers, it will be helpful to look on the referenced page number.

1. Why were VLBW infants excluded from the infant data? (page 5)
2. Why was the NHANES III data excluded for children over 6? Does this seem right? (page 5)
3. What sample sizes were needed to achieve the required accuracy of the curves? (page 5)
4. There were two stages of curve smoothing. Can you name them? (page 5)
5. Why was the 85th percentile curve included in the BMI-for-age charts? (page 6)
6. Were all the curves smoothed in the same way? See if you can find the sentence where it says how infant weight curves were smoothed. How about weight-for-stature? (page 6) (Why is it important to have a smooth curve rather than a jagged one?)
7. Did you find any words you know in *The Transformation Stage*? (page 7)
8. In *The Transformation Stage*, what do the variables X, M, S, and L stand for? They give two formulas for X, one in the case when $L \neq 0$ and one in the case where $L = 0$. Why can't you use the first formula if $L = 0$? Where does the $L = 0$ formula come from? (Two hints: (a) $exp(SZ)$ means e^{SZ}; (b) think about when we first talked about e in the January Workshop.) (page 7)
9. In the *Combining length-for-age and stature-for-age* subsection, what issue are they trying to address? (page 8)
10. What function gives the approximate graph of length-for-age for infants? Graph this function with $a = 40, b = 10$, and $c = 5$. Is the shape of this curve like the ones in the length-for-age chart for boys birth to 36 months? Is it exactly one of the percentile curves? If you're feeling adventurous (and you have some time) you can try different values of a, b, and c and see if you can get close to one of the percentile curves. (page 9)