According to Think Stats by Allen B Downey "Do first babies arrive late?"- it is true.

We can analyze the information from National Survey of Family Growth, conducted by the US. Centers for Disease Control and Prevention. Data was collected from a sample representing the population, at a selected point in time.

We find that the difference in average pregnancy duration, between first and not-first babies, is 13 hours.

First born babies are born, on average, 13 hours later than other babies

Descriptive stats

Standard Deviation

The standard deviation of the duration for first babies is 2.8 weeks. For not first babies it's 2.6 weeks.

So there appears to be more variation in duration length for first babies.

• First born babies have more variation in pregnancy duration

The difference in variance is 0.2 weeks. The difference in means is 0.08 weeks.

Since the difference in mean is a smaller amount than the quality deviation, this might suggest that the difference in mean isn't statistically significant.

Histogram

The histogram we plot gives an outline of the information. The sample size of first and not first babies isn't equal - so we shouldn't depend upon the histogram much in the least.

Histogram of pregnancy durations

Probability Mass Function

The Probability Mass Function (PMF) shows the probability distribution for every sample. Each distribution adds up to 1.

• First born babies seem less likely to arrive in week 39

• First born babies seem more likely to arrive in weeks 41 and 42

PMF of pregnancy durations

Relative Risk

We define being born:

early - as being born before Week 38

on time - as being born during week 38, 39, 40

late - as being born after week 40

We can calculate the probability for early, on time and late babies. we will find this probability for first and not first-born babies.

For first born babies, the probability of every is as follows: early 18.2%, on time 66.2%, late 15.5%

For not first-born babies, we get: early 16.8%, on time 73.8%, late 9.4%

The relative risk is that the rate of two probabilities. to urge the relative risk of a primary born arriving early, we calculate probability (early first born) / probability (early not first born).

The relative risk of a primary born being early is eighteen.2 / 16.8 = 1.08. The relative risk of a primary born being late is 1.66.

• Early first babies are 8% more likely than other babies

• Late first babies are 66% more likely than other babies

Conditional Probability

We can calculate the probability that a baby are going to be born in week x as long as it had been not born before week x.

Conditional probabilities of pregnancy durations

Summary:

First born babies have more variation in pregnancy duration

First born babies seem less likely to arrive in week 39

First born babies seem more likely to arrive in weeks 41 and 42

Early first babies are 8% more likely than other babies

Late first babies are 66% more likely than other babies