week-5

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```r
#probability X is less than (or equal to) 105
pnorm(105, 100, 5)
```

```
## [1] 0.8413447
```

```r
#probability X is greater than 105
pnorm(105, 100, 5, lower.tail = FALSE)
```

```
## [1] 0.1586553
```

```r
#probability Z is less than (or equal to) 1
pnorm(1)
```

```
## [1] 0.8413447
```

```r
#probability Z is greater than 1
pnorm(1, lower.tail = FALSE)
```

```
## [1] 0.1586553
```

```r
#identify X value
qnorm(0.841, 100, 5)
```

```
## [1] 104.9929
```

```r
qnorm(0.159, 100, 5, lower.tail = FALSE)
```

```
## [1] 104.9929
```

```r
#identify Z value
qnorm(0.841)
```

```
## [1] 0.9985763
```

```r
qnorm(0.159, lower.tail = FALSE)
```

```
## [1] 0.9985763
```

```r
qnorm(0.975, mean = 26.4, sd = 5.8)
```

```
## [1] 37.76779
```

```r
pnorm(21, mean = 26.4, sd = 5.8, lower.tail = FALSE)
```

```
## [1] 0.8240821
```

```r
pnorm(100, mean = 80, sd = 12) - pnorm(90, mean = 80, sd = 12)
```

```
## [1] 0.154538

pnorm(115, mean = 105, sd = 5, lower.tail = FALSE)

## [1] 0.02275013

pnorm(140, mean = 125, sd = 10, lower.tail = FALSE)

## [1] 0.0668072

pbinom(0, 2, 0.0228, lower.tail = FALSE) * pbinom(0, 2, 0.0668, lower.tail =
FALSE)

## [1] 0.005821551

pbinom(5, 1000, 0.0058) - dbinom(0, 1000, 0.0058)

## [1] 0.4749525

#probability X equals 5
dpois(5, 3)

## [1] 0.1008188

#probability X is less than or equal to 5
ppois(5, 3)

## [1] 0.9160821

#probability X is greater than 5
ppois(5, 3, lower.tail = FALSE)

## [1] 0.08391794

lambda = 1/800; n = 8011
n*lambda

## [1] 10.01375

ppois(11, lambda = 10.01, lower.tail = FALSE)

## [1] 0.3043618
```

#No, this is not enough information because it is not enough just to control for the few births from women who are 35 years old or older. Women in this age group are more likely to have a Down syndrome birth; rather, it is not reasonable for the rate. In this age group, the birth incidence of trisomy 21 birth defects is 1/800 live births per year. Hypothetically, the statement could be true as much as the rates of births to Black and Latino women are microscopic. more than the average rate and this implies that the rate of birth in other groups is lower than the #recommended rate.
Of all female patients like Caucasian or Asian women, the given rate is even lower. of 44.5 births per 1,000 female populace of the 15-44 years age group.

```r
rate = (1/5000)*(4000000/2)
ppois(380, lambda = rate)
```

```
## [1] 0.164859
```

```r
ppois(449, lambda = rate, lower.tail = FALSE)
```

```
## [1] 0.007454327
```

```r
#The yearly male birth cohort in the hypothetical nation is (1/2)(1500000) =
750,000. If the incidence of #hemophilia in male births in this fictitious co
untry is $5 million annually, or 1 in 5,000, then the #anticipated number of
male newborns with hemophilia in a year would become (1/5,000)(750,000) = 150
; #this situation's annual rate of change is 150. That is 150 times 5 or 750
hemophilia births over a five-year #period. The number of newborns affected b
y hemophilia within five years can be predicted using the rate λ #for a Poiss
on distribution, which is both the mean and the variance (750 with a standard
deviation of square #750 = 27.39).
new.yearly.rate = (1/5000)*(1500000/2); new.yearly.rate
```

```
## [1] 150
```

```r
years = 5
five.year.rate = new.yearly.rate*years; five.year.rate
```

```
## [1] 750
```

```r
sqrt(five.year.rate)
```

```
## [1] 27.38613
```

```r
non.hispanic.whites = 769000 * 0.73
lambda.essex = (6.8/100000) * non.hispanic.whites
ppois(145, lambda.essex, lower.tail = FALSE)
```

```
## [1] 2.621073e-40
```

```r
non.hispanic.whites = 769000 * 0.73
obs.rate = (146/non.hispanic.whites) * 100000
obs.rate
```

```
## [1] 26.0078
```

```r
#show that the observed rate lambda is 146
obs.lambda.essex = (146/non.hispanic.whites) * non.hispanic.whites
obs.lambda.essex
```

```
## [1] 146
```

```r
ppois(164, obs.lambda.essex, lower.tail = FALSE)
```

```
## [1] 0.0650307
```

#The odds of having 165 or more opioid-related deaths in Essex County in 2015 is still small, even when it has been possible to adjust the rate by observed overdose. fatalities in 2014. The overdose death rate in 2014 for Essex County was already two and a half times the national average, and many more opioid-related deaths occurred in 2015. The findings suggest that the rates of opioid misuse are on the rise in Essex County to a degree that is extreme compared to the national averages.