

# STA 198 Project

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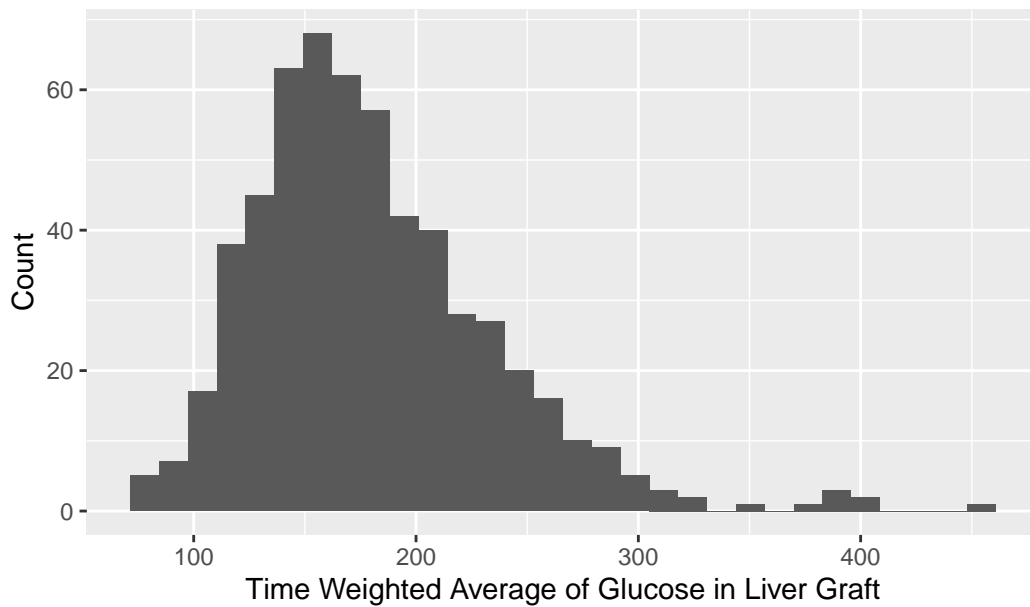
```
-- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
v dplyr      1.1.4      v readr      2.1.5
v forcats    1.0.0      v stringr    1.5.1
v ggplot2     3.5.2      v tibble     3.3.0
v lubridate  1.9.4      v tidyr      1.3.1
v purrr       1.1.0

-- Conflicts ----- tidyverse_conflicts() --
x dplyr::filter() masks stats::filter()
x dplyr::lag()     masks stats::lag()
i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become
Rows: 572 Columns: 24
-- Column specification -----
Delimiter: ","
dbl (24): ID, cold_ischemia, r_height, r_weight, r_bmi, r_age, r_caucasian, ...

i Use `spec()` to retrieve the full column specification for this data.
i Specify the column types or set `show_col_types = FALSE` to quiet this message.

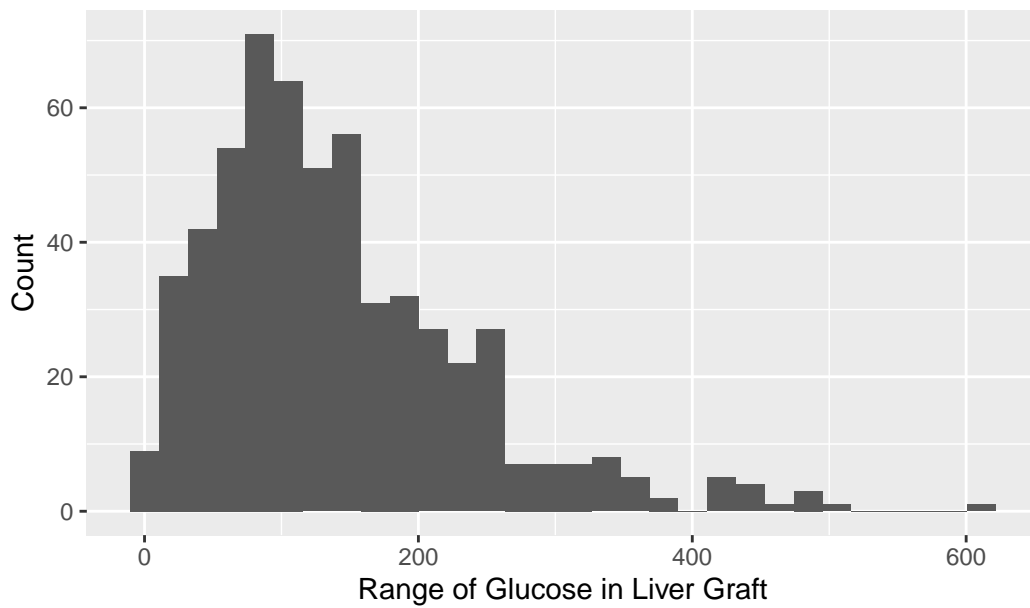
###Exploratory Analysis
```

Distribution of Time Weighted Average of Glucose in Liver Graft



``stat_bin()`` using ``bins = 30``. Pick better value with ``binwidth``.

Distribution of Range of Glucose in Liver Graft of Donors

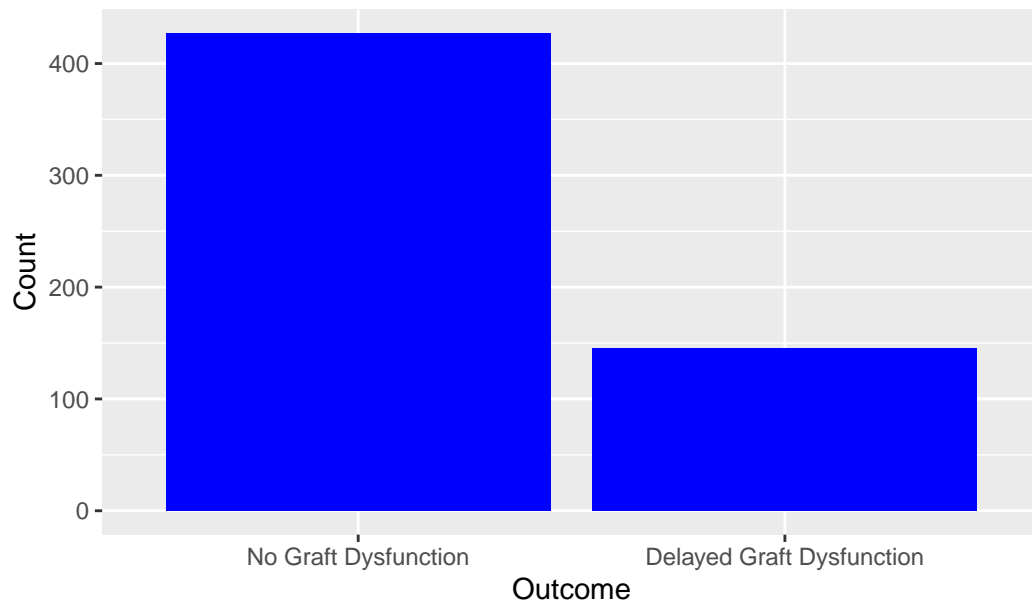


``stat_bin()`` using ``bins = 30``. Pick better value with ``binwidth``.

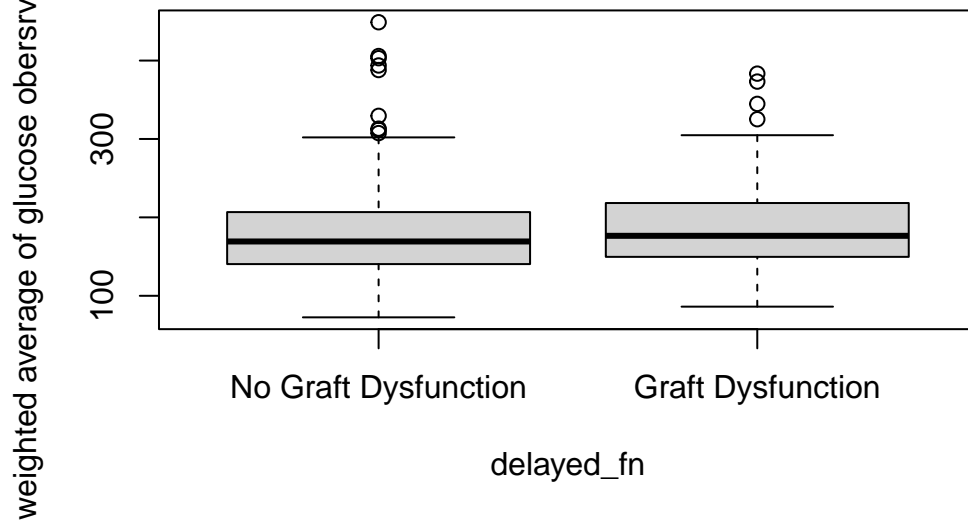
Distribution of Standard Deviations of Glucose in Liver Graft of I



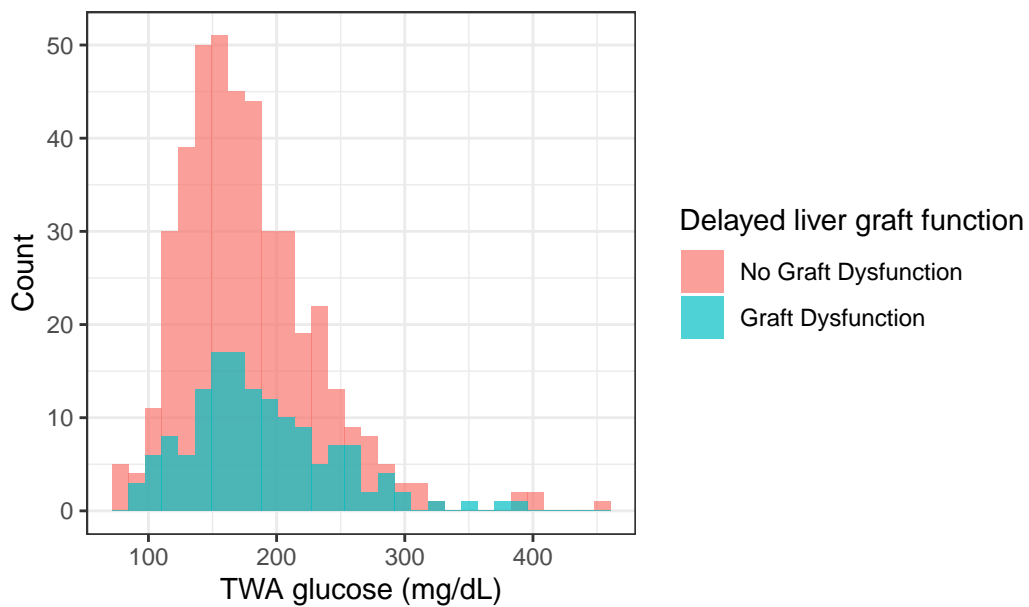
Graft Dysfunction Rate



## MA of glucose observations in liver graft vs delayed liver fu



## Distribution of TWA Glucose by Graft Dysfunction Stat



Call:  
`glm(formula = delayed_fn ~ glutwa, family = binomial, data = data)`

Coefficients:

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	-1.622352	0.330433	-4.910	9.12e-07 ***
glutwa	0.002978	0.001716	1.735	0.0828 .

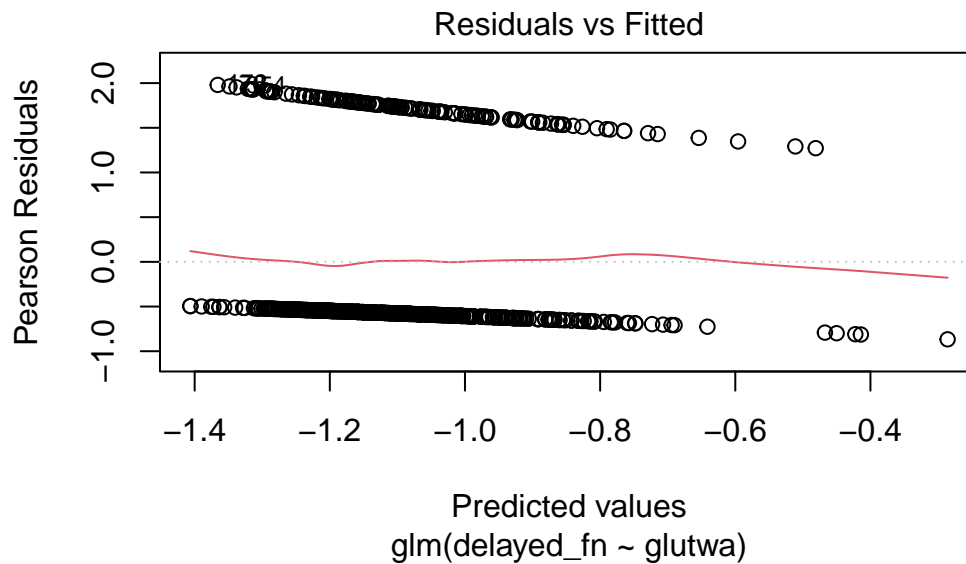
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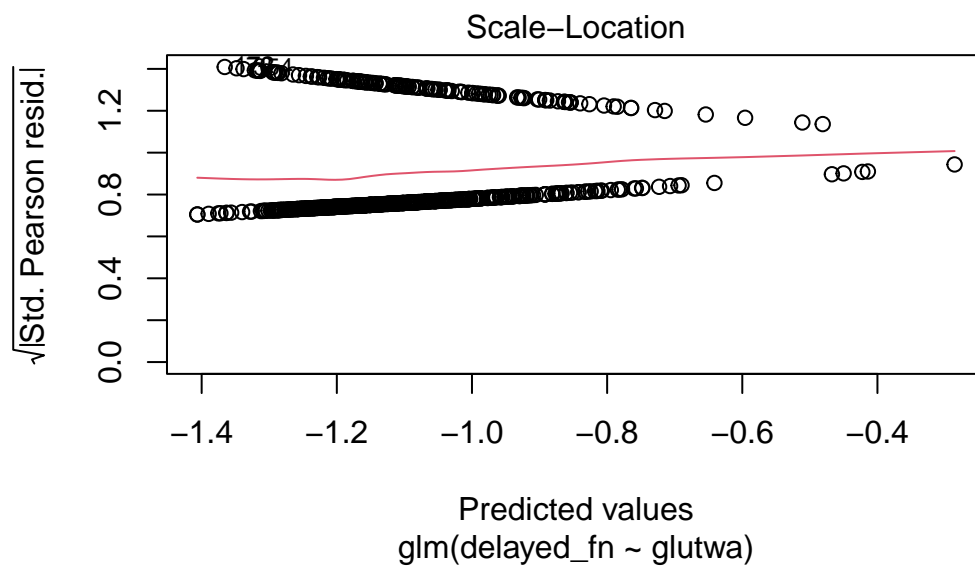
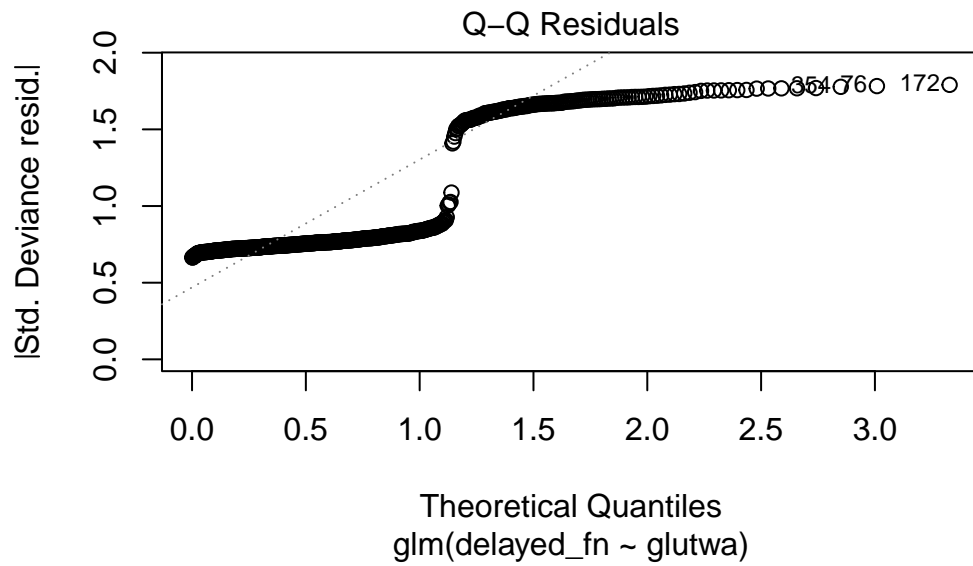
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

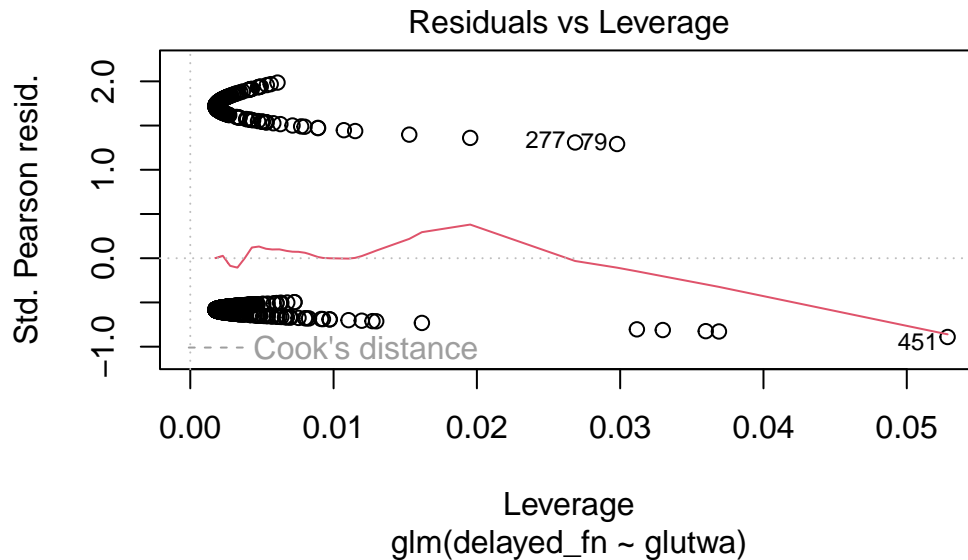
(Dispersion parameter for binomial family taken to be 1)

Null deviance: 647.67 on 571 degrees of freedom  
Residual deviance: 644.71 on 570 degrees of freedom  
AIC: 648.71

Number of Fisher Scoring iterations: 4







In this logistic regression model, donor time-weighted average glucose (TWA glucose) was not a statistically significant predictor of delayed liver graft dysfunction. The estimated coefficient for glutwa was 0.00298 (SE = 0.00172,  $p = 0.083$ ), indicating that higher donor glucose levels were associated with slightly higher odds of delayed graft dysfunction. However, this association did not reach conventional levels of statistical significance at  $\alpha = .05$ . Each 1 mg/dL increase in donor TWA glucose corresponds to an estimated 0.3% increase in the odds of delayed graft dysfunction ( $OR = \exp(0.00298) = 1.003$ ). This effect is very small in magnitude and the  $p$ -value suggests that the data do not provide strong evidence of a meaningful relationship.

Call:

```
glm(formula = delayed_fn ~ log2(glutwa) + log2(glurange) + log2(glusd) +
     d_age + r_bmi + r_age + cold_ischemia + sbp_lt_90 + hemo_instability +
     sodium + steatosis + donorrisk, family = binomial(link = "logit"),
     data = data)
```

Coefficients:

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	-6.5646627	3.1480876	-2.085	0.0370 *
log2(glutwa)	0.2247601	0.3334197	0.674	0.5002
log2(glurange)	-0.7580556	0.3803280	-1.993	0.0462 *
log2(glusd)	0.9598217	0.4266724	2.250	0.0245 *

d_age	0.0004705	0.0088447	0.053	0.9576
r_bmi	-0.0053308	0.0180825	-0.295	0.7681
r_age	-0.0110063	0.0107671	-1.022	0.3067
cold_ischemia	0.0005974	0.0009309	0.642	0.5211
sbp_lt_90	0.0028556	0.0033344	0.856	0.3918
hemo_instability	-0.1509144	0.3375589	-0.447	0.6548
sodium	0.0182010	0.0149026	1.221	0.2220
steatosis	0.5688802	0.3896539	1.460	0.1443
donorrisk	1.0403755	0.4207527	2.473	0.0134 *

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 452.33 on 389 degrees of freedom  
 Residual deviance: 425.38 on 377 degrees of freedom  
 (182 observations deleted due to missingness)  
 AIC: 451.38

Number of Fisher Scoring iterations: 4