Maximum apparent temperature is associated with lower birth weight in a population exposed to a constant high ambient temperature in Piura, Peru

La temperatura máxima aparente se asocia con un menor peso al nacer, en una población expuesta a una temperatura ambiente alta y constante en Piura, Perú

Statistical power calculation for linear regression

Model 1:

```
. regress pesorn i.ctmaxt2 edad_ma i.work i.educ2 imc_ma i.preec i.diab i.smoke i.sexorn egrn_fur_2, robust

Linear regression                               Number of obs     =     15,287
                                                F(15, 15271)      =     612.54
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3794
                                                Root MSE          =     446.69

. power rsquared 0.3794, n(15287) ntested(10)

Estimated power for multiple linear regression
F test for R2 testing all coefficients
H0: R2_T = 0  versus  Ha: R2_T != 0

Study parameters:

        alpha =    0.0500
            N =    15,287
        delta =    0.6113
         R2_T =    0.3794
      ntested =        10

Estimated power:

        power =    1.0000
```

Model 2:

```
. regress pesorn i.ctmaxiii2 edad_ma i.work i.educ2 imc_ma i.preec i.diab i.smoke i.sexorn egrn_fur_2, robust

Linear regression                               Number of obs     =     15,287
                                                F(15, 15271)      =     614.65
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3805
                                                Root MSE          =     446.26

. power rsquared 0.3805, n(15287) ntested(10)

Estimated power for multiple linear regression
F test for R2 testing all coefficients
H0: R2_T = 0  versus  Ha: R2_T != 0

Study parameters:

        alpha =    0.0500
            N =    15,287
        delta =    0.6142
         R2_T =    0.3805
      ntested =        10

Estimated power:

        power =    1.0000
```

Model 3:

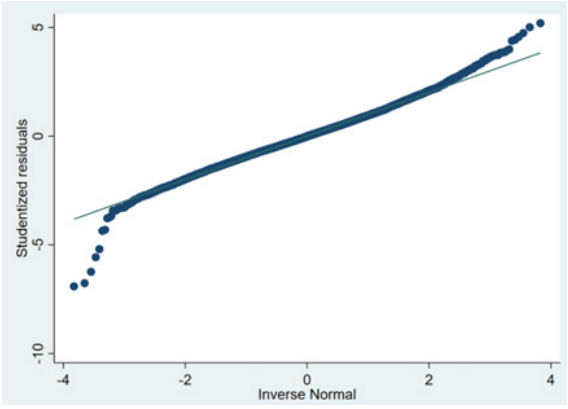
```
. regress pesorn i.ctmaxii2 edad_ma i.work i.educ2 imc_ma i.preec i.diab i.smoke i.sexorn egrn_fur_2, robust

Linear regression                               Number of obs     =     15,287
                                                F(15, 15271)      =     612.32
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3792
                                                Root MSE          =     446.75

. power rsquared 0.3792, n(15287) ntested(10)

Estimated power for multiple linear regression
F test for R2 testing all coefficients
H0: R2_T = 0  versus  Ha: R2_T != 0

Study parameters:

        alpha =    0.0500
            N =    15,287
        delta =    0.6108
         R2_T =    0.3792
      ntested =        10

Estimated power:

        power =    1.0000
```

Model 4:

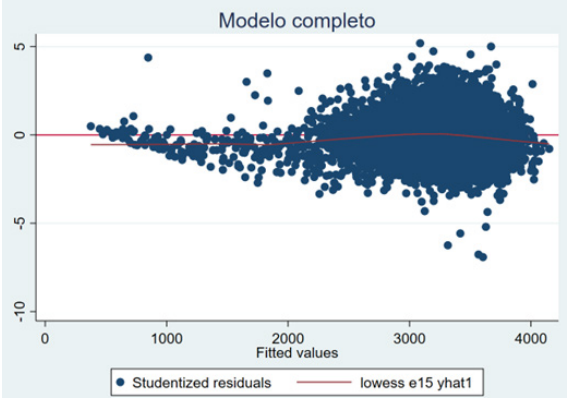
```
. regress pesorn i.ctmaxi2 edad_ma i.work i.educ2 imc_ma i.preec i.diab i.smoke i.sexorn egrn_fur_2, robust

Linear regression                               Number of obs     =     15,287
                                                F(15, 15271)      =     607.85
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3787
                                                Root MSE          =     446.93

. power rsquared 0.3787, n(15287) ntested(10)

Estimated power for multiple linear regression
F test for R2 testing all coefficients
H0: R2_T = 0  versus  Ha: R2_T != 0

Study parameters:

        alpha =    0.0500
            N =    15,287
        delta =    0.6095
         R2_T =    0.3787
      ntested =        10

Estimated power:

        power =    1.0000
```

Supplementary material 2.

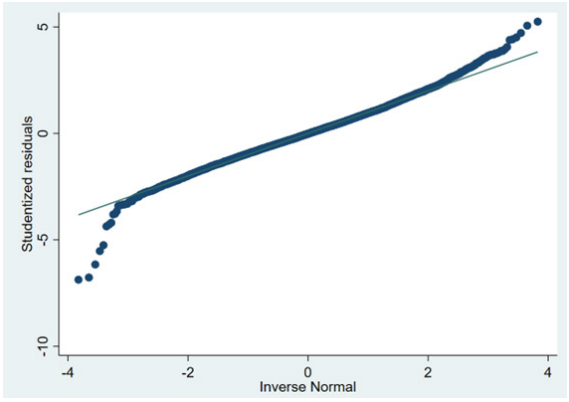
Regression models assumptions evaluation
Linear regression of for complete pregnancy:
Normal distribution of residuals for whole pregnancy model



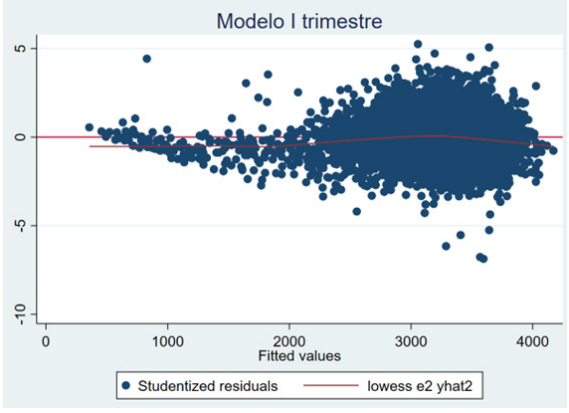
We can say that residuals follow a normal distribution although a slight deviation can be seen in the tails of the distribution, but considering the number of observations, this is not an issue.
Heteroskedasticity



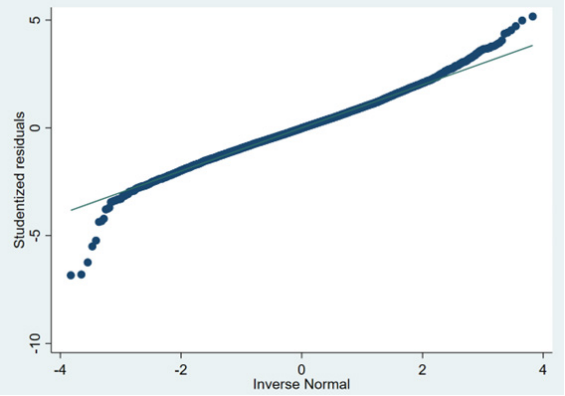
We see that residuals are not homogenously distributed across the predicted values. That is why we decided to opt for a robust linear regression.
Linear regression of for first trimester pregnancy:
Normal distribution of residuals for first trimester pregnancy model



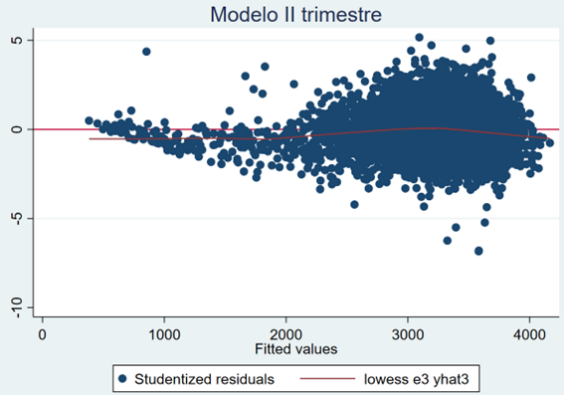
Heteroskedasticity



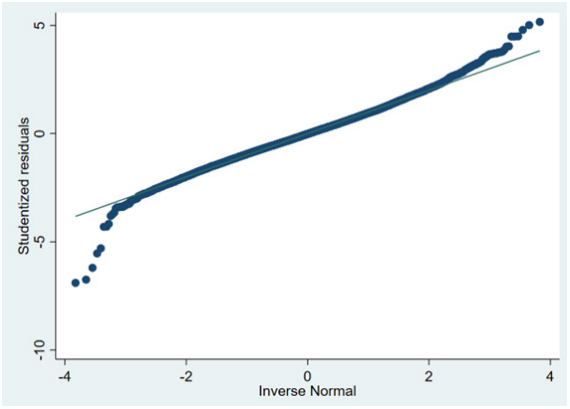
Linear regression of for second trimester pregnancy:
Normal distribution of residuals for second trimester pregnancy model



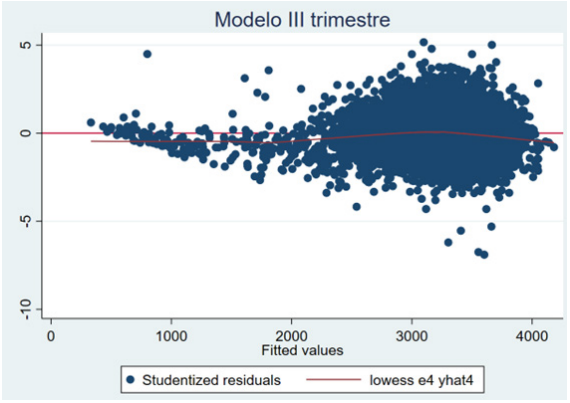
Heteroskedasticity



Linear regression of for third trimester pregnancy:
Normal distribution of residuals for third trimester pregnancy model



Heteroskedasticity



Adjusted linear regression analysis between birth weight and HImax

Variable	Entire pregnancy			Third trimester			Second trimester			First trimester		
	β-coeff	95%CI	*p*	β-coeff	95%CI	*p*	β-coeff	95%CI	*p*	β-coeff	95%CI	*p*
HImax												
Q1	Ref.			Ref.			Ref.			Ref.		
Q2	-3.22	-24.47 , 18.04	0.767	-14.27	-34.86 , 6.32	0.174	-33.62	-54.67 , -12.56	0.002	-15.98	-36.81 , 4.85	0.359
Q3	-29.68	-50.75 , -8.60	0.006	-22.99	-43.69 , -2.31	0.029	-29.25	-49.93 , -8.57	0.006	-2.46	-22.90 , 17.98	0.290
Q4	-36.83	-58.21 , -15.45	0.001	-66.08	-87.53 , -44.63	<0.001	-37.83	-59.52 , -16.14	0.001	-3.06	-24.75 , 18.63	0.782
P95	-38.50	-71.46 , -5.53	0.022	-70.48	-102.69 , -38.28	<0.001	-23.40	-55.68 , 8.88	0.155	-5.02	-37.16 , 27.12	0.759
Mother age	4.35	3.21 , 5.48	<0.001	4.35	3.22 , 5.49	<0.001	4.34	3.21 , 5.48	<0.001	4.35	3.21 , 5.48	0.001
Work status												
Unemployed	Ref.						Ref.			Ref.		
Employed	-18.46	-55.58 , 18.66	0.330	-17.06	-54.22 , 20.09	0.368	-16.74	-53.85 , 20.35	0.376	-14.14	-51.22 , 22.94	0.398
Study level												
No studies	Ref.			Ref.			Ref.			Ref.		
Elementary	2.05	-58.11 , 62.20	0.947	1.29	-58.72 , 61.32	0.966	0.15	-59.87 , 60.18	0.996	-1.52	-61.71 , 58.67	0.658
Secondary	92.08	33.40 , 150.75	0.002	94.03	35.48 , 152.57	0.000	90.03	31.50 , 148.56	0.003	87.84	29.15 , 146.53	0.001
Higher education	129.89	70.15 , 189.63	<0.001	130.85	71.27 , 190.43	<0.001	127.04	67.44 , 186.63	<0.001	124.31	64.54 , 184.09	<0.001
Pregestational BMI	**15.63**	**13.85 , 17.40**	**<0.001**	**15.82**	**14.03 , 17.61**	**<0.001**	**15.61**	**13.83 , 17.39**	**<0.001**	**15.55**	**13.77 , 17.32**	**<0.001**
Preeclampsia												
No	Ref.			Ref.			Ref.			Ref.		
Yes	-164.95	-194.41 , -135.49	<0.001	-171.36	-201.02 , -141.70	<0.001	-164.71	-194.17 , -135.25	<0.001	-166.39	-195.91 , -136.89	<0.001
Gestational diabetes												
No	Ref.						Ref.			Ref.		
Yes	346.14	187.17 , 505.10	<0.001	340.14	180.11 , 500.18	<0.001	344.04	185.12 , 502.96	<0.001	346.42	187.79 , 505.04	<0.001
Smoking												
No	Ref.			Ref.			Ref.			Ref.		
Yes	49.59	14.41 , 84.76	0.006	48.43	13.65 , 83.22	0.006	57.75	22.99 , 92.51	0.001	63.00	28.28 , 97.73	0.004
Newborn sex												
Masculine	Ref.			Ref.			Ref.			Ref.		
Femenine	83.49	69.33 , 97.65	<0.001	83.52	69.32 , 97.72	<0.001	83.79	69.63 , 97.95	<0.001	83.94	69.78 , 98.11	<0.001
Gestational age at birth	**164.33**	**160.25 , 167.96**	**<0.001**	**159.50**	**154.79 , 164.21**	**<0.001**	**164.31**	**160.68 , 167.95**	**<0.001**	**164.68**	**161.04 , 168.32**	**<0.001**

Linear regression model adjusted for maternal age, employment status, educational level, pregestational BMI, preeclampsia, gestational diabetes, smoking and sex of the newborn.