Does the ENAC impact your health ?

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What was our aim ?

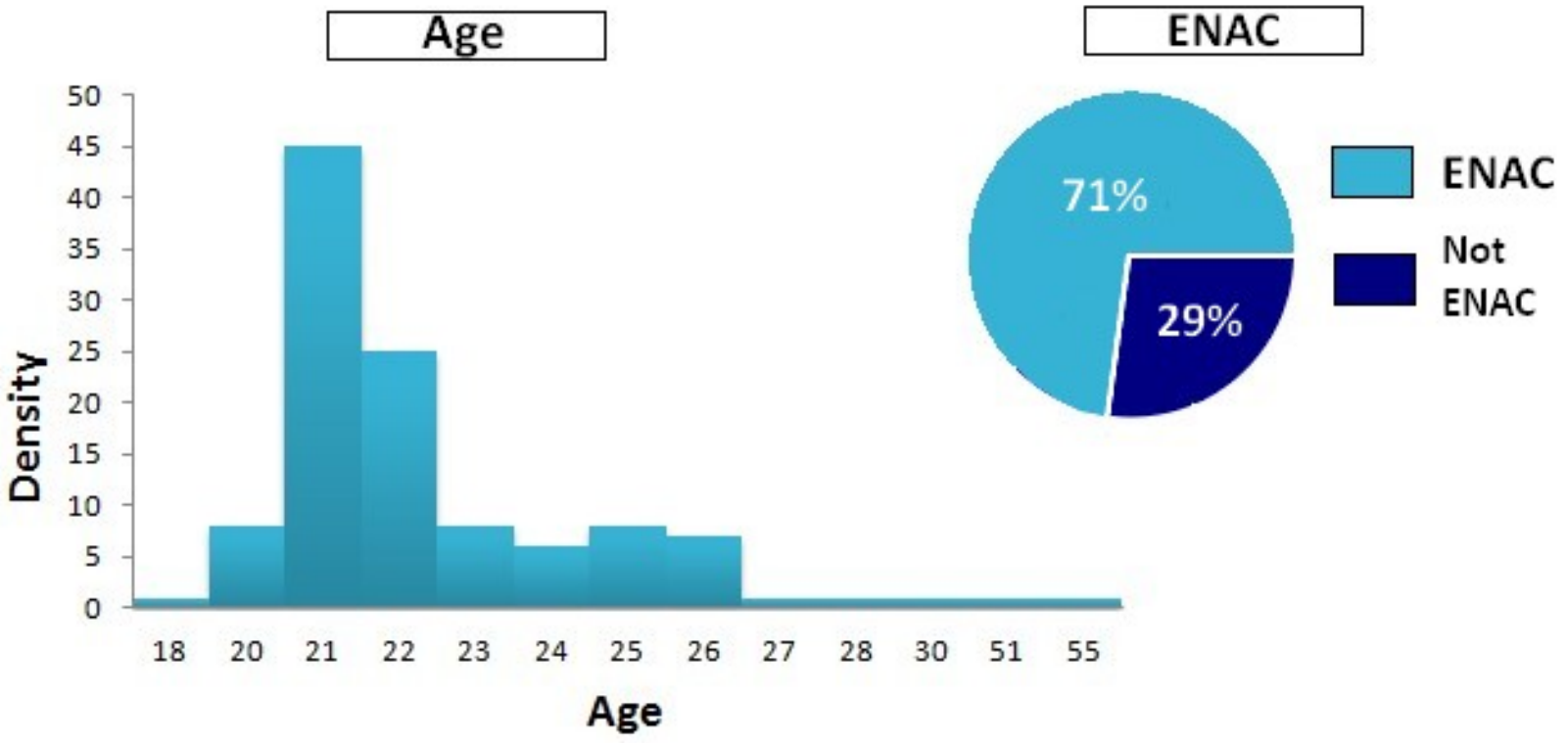
- Create an econometric study
- Collect the appropriate data
- Modelize and interpret results to answer the problem

Measured parameters

- Level of stress
- Number of days of sickness per year
- Average number of hours sleeping per night

Who answered ?

- Our target : ENAC and non-ENAC people
- Our spreading : a Google doc shared via social networks :
  - 113 answers in 10 days



Sleep : Expected effects (1/2)

Parameter	Expected	Real
gender	?	+
age	?	NO
couple	-	+
worker	?	NO
year	-	NO
enac	-	-
home_enac	-	NO
heating	+	-
road	-	NO
parking	=	NO
hour_sport	+	NO
self	?	+
food	+	NO

Sleep : Expected effects (2/2)

Parameter	Expected	Real
expectation	-	-
deadline	-	+
work	-	NO
sick	-	-
stress	-	NO

First model :

$$SLEEP = \beta_0 + \beta_1.GENDER + \beta_2.AGE + \beta_3.COUPLE + \beta_4.WORKER$$

$$+\beta_5.YEAR + \beta_6.ENAC + \beta_7.HOME\_ENAC + \beta_8.HEATING + \beta_9.ROAD$$

$$+\beta_{10}.PARKING + \beta_{11}.HOUR\_SPORTS + \beta_{12}.SELF + \beta_{13}.FOOD$$

$$+\beta_{14}.SICK + \beta_{15}.STRESS + \beta_{16}.EXPECTATION$$

$$+\beta_{17}.DEADLINE + \beta_{18}.WORK + u_i$$

First model : Results

	Coefficient	Std. Error	t-Statistic	Prob.
C	8.143939	0.742300	10.97122	0.0000
GENDER	0.209223	0.179750	1.163968	0.2474
AGE	0.008356	0.020197	0.413724	0.6800
COUPLE	0.234887	0.162044	1.449521	0.1506
WORKER	0.048489	0.255343	0.189896	0.8498
YEAR	0.009053	0.084385	0.107279	0.9148
ENAC	-0.302607	0.345364	-0.876197	0.3832
HOME_ENAC	0.094791	0.248138	0.382011	0.7033
HEATING	-0.629961	0.341168	-1.846484	0.0680
ROAD	-0.080379	0.180788	-0.444606	0.6576
PARKING	0.027680	0.187470	0.147652	0.8829
HOUR_SPORT	-0.007291	0.042763	-0.170491	0.8650
SELF	0.116340	0.210751	0.552024	0.5823
FOOD	-0.078937	0.181116	-0.435834	0.6640
SICK	-0.269961	0.097398	-2.771727	0.0067
STRESS	0.030626	0.070562	0.434027	0.6653
EXPECTATION	-0.303060	0.224452	-1.350226	0.1802
DEADLINE	0.139266	0.216860	0.642194	0.5223
WORK	-0.069850	0.055643	-1.255341	0.2125

Model optimization & Wald test

- Wald test :

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	1.603093	(10, 93)	0.1178
Chi-square	16.03093	10	0.0988

$$Statistic = 1,603 < F(10,112) = 1,83$$

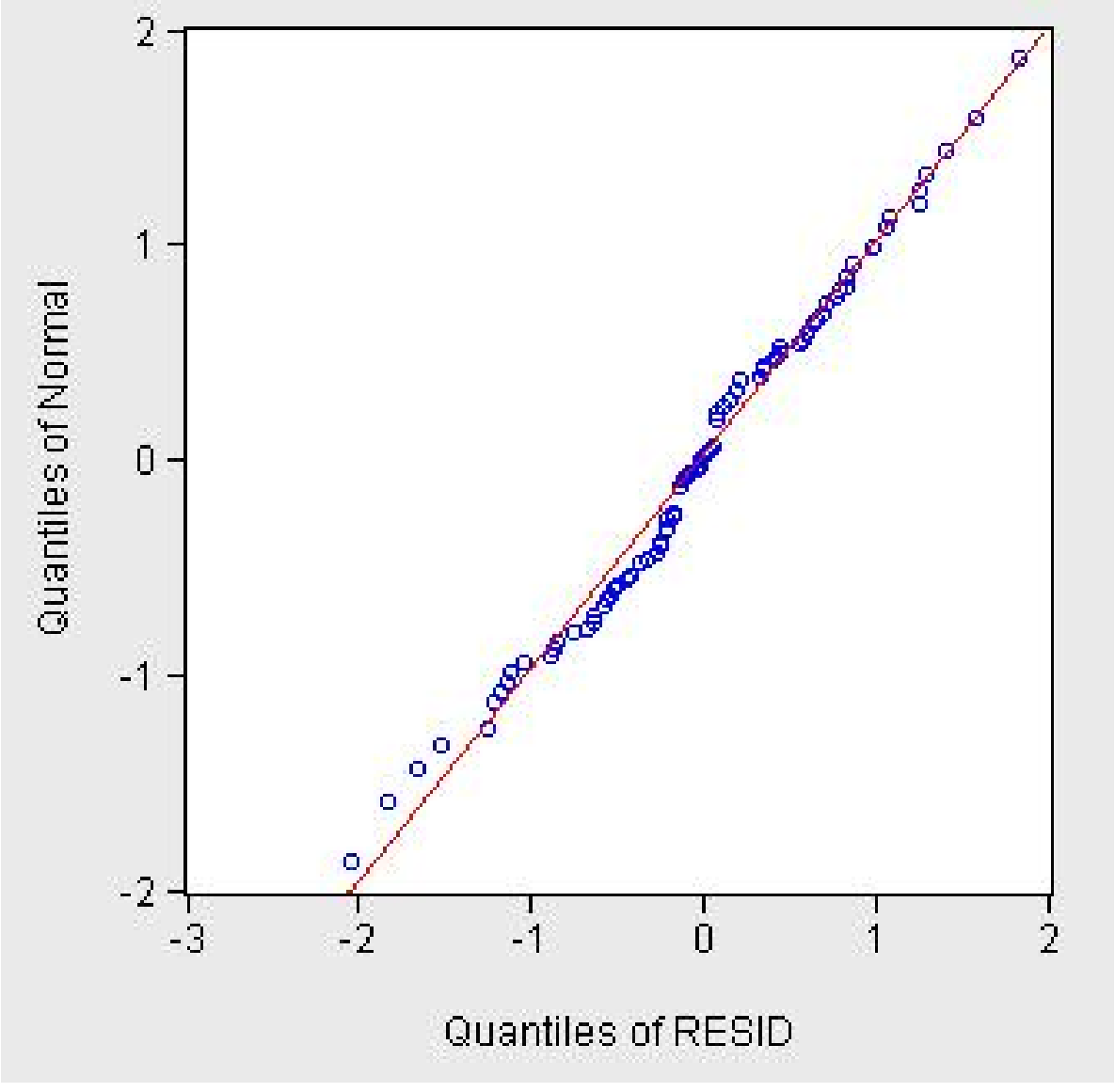
- Null hypothesis at the 95% level **acceptable**
- Rejected variables (equal to zero) :

$$\beta_2, \beta_4, \beta_5, \beta_7, \beta_9, \beta_{10}, \beta_{11}, \beta_{13}, \beta_{15}, \beta_{18}$$

Optimization results

$$SLEEP = 7,911 + 0,237.GENDER + 0,203.COUPLE - 0,212.ENAC$$
$$- 0,711.HEATING + 0,124.SELF - 0,278.SICK$$
$$- 0,342.EXPECTATION + 0,091.DEADLINE + u_i$$

- R-squared = 0,182 : very low ! Weak model


Quantiles of Normal
Quantiles of RESID
2
1
0
-1
-2
-3
-2
-1
0
1
2

Results after otpimization : sickness and stress

$$SICK = 2,04 + 0,604.GENDER + 0,225.COUPLE + 0,424.ENAC$$
$$-0,079.ROAD - 0,090.PARKING - 0,117.OTHER\_OUTSIDE -$$
$$0,346.FOOD - 0,306.SLEEP\_HOUR - 0,462.EXPECTATION + 0,026.$$
$$ALCOHOL + 0,181.STRESS + 0,261.DEADLINE + 0,060.WORK + u_i$$

$$STRESS = 2,68 + 0,202.GENDER + 0,164.COUPLE - 0,305.WORKER$$
$$-0,187.ENAC + 0,205.HOME\_ENAC - 0,850.HEATING - 0,311.ROAD$$
$$-0,237.PARKING - 0,470SELF + 0,390.FOOD + 0,390.SICK$$
$$+0,849.EXPECTATION - 0,273.DEADLINE - 0,115.WORK$$
$$+0,952.INTEREST + u_i$$

- R-squared = 0,322 and 0,31 : also weak model !

Conclusion

- Main relevant parameters :
  - SLEEP : HEATING (-), EXPECTATION (-), SICK (-)
  - SICK : GENDER (+), FOOD (-), SLEEP (-), EXPECTATION (-), STRESS (+), ENAC (+)
  - STRESS : HEATING (-), SICK (+), EXPECTATION (+), INTEREST (+)
- Some illogical results (e.g stress impact on sleep : *positive* ?!)
- Larger sample necessary
- Improvement of the model