

Szakdolgozat (FL)

Statisztika (GE)

December, 2017

Hipotézisek

1. Hüvelyi szülés után a medencefenék izmai megnyúlnak a császármetszéshez képest.
 2. Az újszülött súlya szignifikáns összefüggést mutat a medencefenék izmainak megnyúlásával. A nagyobb születési súllyal megnő a medencefenék izmainak megnyúlása.
 3. A szülések számával arányosan nő a medencefenék izmainak megnyúlása.
 4. Az anyai BMI-vel arányosan nő a medencefenék izmainak megnyúlása.
 5. A terhességi korról arányosan növekszik a medencefenék izmainak megnyúlása (mondjuk az első trimeszterbeli értékeket kellene összevetni a szülés előttivel).
 6. A szülés előtti medencefenék (36. hetes UH) megnyúlása nagyobb a szülés utáni 6 hetes kontrollhoz képest.
 7. Fiatalabb várandósoknál kisebb mértékű az izmok megnyúlása, mint az idősebbeknél
 8. Fiatal várandósoknál nagyobb a szülés előtt és a szülés után mért izomnyúlás közötti különbség, mint az idősebb várandósoknál. (jobb a regenerációs hajlam fiatalabb korban)
 9. Az izommegnyúlás mértéke korrelál a testmagassággal.
 10. Szülés módja alapján a dL_9-dL_8 értékek nőnek hüvelyi szülés esetén
- „Megnyúlnak” = delták. Abszolút érték számít. TODO

Magyarázat

Mag	Anyai magasság (cm)
Gr	Terhességek száma
Pa	Hüvelyi szülések száma
Cae	Császármetszések száma
Sz_mod	Szülés módja: PVN=hüvelyi, SC=császár
Sz_het	Szüléskor betöltött terhességi hetek száma
Sz_suly	Újszülött tömege
Tkor_	Terhességi kor napban kifejezve *-dik méréskor
CRL_	Ülőméret *-dik méréskor
BPD_	Biparietalis distance *-dik megjelenéskor
L1_ ; H1_...	Méretetek nyugalomban (mm)
L2_ ; H2_...	Méretetek hasprésre (mm)
Ttkg_	Anyai testtömeg *-dik méréskor (kg)
dL_ ; dH_*	L1_ - L2_ ; H1_ - H2_...
Suly_	Magzat becsült tömege *-dik megjelenéskor

```
d = read.csv("~/Work/Education/Statisztikai_elemzesek/FarkasLajos_noi_klinika/STAT_DB.csv")
attach(d)
summary(d)
```

```

##      BetegID      BMI      Ék      MagM
## Beteg001: 1  Min.   :16.5  Min.   :21.00  Min.   :1.470
## Beteg002: 1  1st Qu.:21.5  1st Qu.:30.00  1st Qu.:1.630
## Beteg003: 1  Median :23.6  Median :33.00  Median :1.670
## Beteg004: 1  Mean    :24.5  Mean    :32.68  Mean    :1.667
## Beteg005: 1  3rd Qu.:27.0  3rd Qu.:36.00  3rd Qu.:1.700
## Beteg006: 1  Max.     :44.5  Max.     :43.00  Max.     :1.840
## (Other) :213  NA's     :4      NA's     :4
##      Mag      Gr      Pa      Cae
## Min.   :147.0  Min.   :1.00  Min.   :0.0000  Min.   :0.0000
## 1st Qu.:163.0  1st Qu.:1.00  1st Qu.:0.0000  1st Qu.:0.0000
## Median :167.0  Median :2.00  Median :1.0000  Median :0.0000
## Mean    :166.7  Mean    :2.02  Mean    :0.9085  Mean    :0.7386
## 3rd Qu.:170.0  3rd Qu.:3.00  3rd Qu.:1.0000  3rd Qu.:1.0000
## Max.     :184.0  Max.     :6.00  Max.     :4.0000  Max.     :3.0000
## NA's     :4      NA's     :66  NA's     :66  NA's     :66
## Sz_mod      Sz_het      Sz_suly      Tkor_1      CRL_1
##      : 4  Min.   :32.00  Min.   :1900  Min.   :37.00  Min.   : 1.00
## PVN:108  1st Qu.:39.00  1st Qu.:3140  1st Qu.:44.00  1st Qu.: 6.25
## SC :107  Median :39.00  Median :3455  Median :48.00  Median :10.10
##      Mean    :39.11  Mean    :3441  Mean    :50.61  Mean    :12.91
##      3rd Qu.:40.00  3rd Qu.:3700  3rd Qu.:57.00  3rd Qu.:18.20
##      Max.     :41.00  Max.     :4500  Max.     :76.00  Max.     :40.10
##      NA's     :6      NA's     :7      NA's     :60  NA's     :60
##      L1_1      H1_1      B1_1      C1_1
## Min.   :18.00  Min.   : 2.30  Min.   : 9.80  Min.   :12.90
## 1st Qu.:23.80  1st Qu.: 8.15  1st Qu.:20.45  1st Qu.:18.40
## Median :26.40  Median :11.40  Median :23.43  Median :21.70
## Mean    :26.56  Mean    :11.73  Mean    :23.83  Mean    :22.46
## 3rd Qu.:29.15  3rd Qu.:14.40  3rd Qu.:27.82  3rd Qu.:25.70
## Max.     :38.00  Max.     :30.50  Max.     :34.90  Max.     :36.10
## NA's     :92  NA's     :92  NA's     :99  NA's     :126
##      L2_1      H2_1      B2_1      C2_1
## Min.   : 0.00  Min.   : 3.70  Min.   : -6.50  Min.   : 7.80
## 1st Qu.:20.40  1st Qu.:10.30  1st Qu.:11.45  1st Qu.:17.15
## Median :24.30  Median :14.30  Median :18.15  Median :20.60
## Mean    :24.39  Mean    :15.47  Mean    :17.12  Mean    :20.76
## 3rd Qu.:28.60  3rd Qu.:19.05  3rd Qu.:23.35  3rd Qu.:24.45
## Max.     :39.40  Max.     :43.80  Max.     :31.10  Max.     :34.90
## NA's     :92  NA's     :92  NA's     :99  NA's     :124
##      Ttkg_1      dL_1      dH_1      dB_1
## Min.   : 45.00  Min.   : -8.000  Min.   : -28.700  Min.   : -9.000
## 1st Qu.: 57.75  1st Qu.: -0.475  1st Qu.: -5.200  1st Qu.: 3.375
## Median : 63.75  Median : 2.400  Median : -2.750  Median : 5.600
## Mean    : 65.68  Mean    : 2.155  Mean    : -3.725  Mean    : 6.659
## 3rd Qu.: 72.00  3rd Qu.: 4.300  3rd Qu.: -1.300  3rd Qu.:10.500
## Max.     :108.00  Max.     :25.900  Max.     : 12.900  Max.     :25.400
## NA's     :151  NA's     :93  NA's     :93  NA's     :99
##      dC_1      Tkor_2      CRL_2      L1_2
## Min.   : -10.900  Min.   : 44.00  Min.   : 6.47  Min.   :14.50
## 1st Qu.: -1.300  1st Qu.: 81.00  1st Qu.:54.70  1st Qu.:23.40
## Median : 0.900  Median : 86.00  Median :60.10  Median :25.20
## Mean    : 1.334  Mean    : 85.34  Mean    :59.69  Mean    :25.40
## 3rd Qu.: 4.200  3rd Qu.: 90.00  3rd Qu.:65.50  3rd Qu.:27.68

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##	Max. : 12.300	Max. :102.00	Max. :93.20	Max. :36.10
##	NA's :126	NA's :22	NA's :22	NA's :33
##	H1_2	B1_2	C1_2	L2_2
##	Min. :-4.6	Min. : 5.9	Min. :-4.60	Min. : 0.10
##	1st Qu.:10.0	1st Qu.:19.0	1st Qu.:17.95	1st Qu.:20.25
##	Median :12.4	Median :22.8	Median :20.40	Median :23.50
##	Mean :13.1	Mean :22.5	Mean :20.73	Mean :23.06
##	3rd Qu.:15.4	3rd Qu.:26.0	3rd Qu.:24.25	3rd Qu.:26.10
##	Max. :52.2	Max. :36.1	Max. :35.30	Max. :39.70
##	NA's :34	NA's :50	NA's :92	NA's :35
##	H2_2	B2_2	C2_2	Ttkg_2
##	Min. : 2.70	Min. :-7.90	Min. : 7.70	Min. : 45.00
##	1st Qu.:11.70	1st Qu.:10.55	1st Qu.:15.50	1st Qu.: 59.00
##	Median :14.30	Median :15.85	Median :19.30	Median : 65.00
##	Mean :16.06	Mean :15.48	Mean :19.68	Mean : 67.98
##	3rd Qu.:18.60	3rd Qu.:21.50	3rd Qu.:22.60	3rd Qu.: 74.00
##	Max. :53.90	Max. :34.20	Max. :32.60	Max. :132.00
##	NA's :34	NA's :49	NA's :92	NA's :69
##	dL_2	dH_2	dB_2	dC_2
##	Min. :-14.000	Min. :-26.600	Min. :-10.900	Min. :-17.600
##	1st Qu.: -0.200	1st Qu.: -4.800	1st Qu.: 2.900	1st Qu.: -0.850
##	Median : 2.000	Median : -2.200	Median : 6.850	Median : 1.200
##	Mean : 2.592	Mean : -2.966	Mean : 6.891	Mean : 1.046
##	3rd Qu.: 4.075	3rd Qu.: -0.600	3rd Qu.: 10.175	3rd Qu.: 3.850
##	Max. : 26.900	Max. : 10.000	Max. : 28.000	Max. : 12.700
##	NA's :33	NA's :34	NA's :49	NA's :92
##	Tkor_3	Suly_3	BPD_3	FRO_3
##	Min. : 91.0	Min. :103.0	Min. :27.30	Min. :33.90
##	1st Qu.:105.0	1st Qu.:141.0	1st Qu.:34.00	1st Qu.:42.15
##	Median :105.0	Median :155.0	Median :35.70	Median :44.10
##	Mean :108.9	Mean :160.3	Mean :35.86	Mean :44.49
##	3rd Qu.:112.0	3rd Qu.:169.5	3rd Qu.:37.60	3rd Qu.:46.28
##	Max. :147.0	Max. :275.0	Max. :49.70	Max. :63.00
##	NA's :8	NA's :132	NA's :8	NA's :8
##	HC_3	AC_3	FEM_3	L1_3
##	Min. : 13.1	Min. : 11.6	Min. :13.60	Min. :16.40
##	1st Qu.:121.8	1st Qu.:103.2	1st Qu.:19.05	1st Qu.:22.93
##	Median :127.4	Median :109.1	Median :20.30	Median :25.50
##	Mean :127.6	Mean :109.6	Mean :20.70	Mean :25.66
##	3rd Qu.:133.8	3rd Qu.:116.0	3rd Qu.:22.05	3rd Qu.:28.40
##	Max. :178.5	Max. :163.3	Max. :34.40	Max. :38.00
##	NA's :8	NA's :8	NA's :8	NA's :13
##	H1_3	B1_3	C1_3	L2_3
##	Min. : 0.200	Min. : 6.90	Min. : 8.70	Min. : 1.60
##	1st Qu.: 9.325	1st Qu.:18.60	1st Qu.:17.77	1st Qu.:19.43
##	Median :12.300	Median :22.00	Median :21.55	Median :23.00
##	Mean :13.058	Mean :22.14	Mean :21.75	Mean :22.87
##	3rd Qu.:15.600	3rd Qu.:25.52	3rd Qu.:25.10	3rd Qu.:26.98
##	Max. :45.000	Max. :34.00	Max. :42.40	Max. :34.70
##	NA's :13	NA's :27	NA's :63	NA's :13
##	H2_3	B2_3	C2_3	Ttkg_3
##	Min. : 6.30	Min. :-10.60	Min. : 8.80	Min. : 44.00
##	1st Qu.:12.72	1st Qu.: 9.25	1st Qu.:16.68	1st Qu.: 59.00
##	Median :15.50	Median : 15.70	Median :19.65	Median : 66.50

## Mean	:16.73	Mean	: 14.56	Mean	:20.23	Mean	: 68.72
## 3rd Qu.	:19.57	3rd Qu.	: 19.65	3rd Qu.	:22.60	3rd Qu.	: 74.25
## Max.	:39.90	Max.	: 30.10	Max.	:42.10	Max.	:145.00
## NA's	:13	NA's	:27	NA's	:63	NA's	:39
## dL_3		dH_3		dB_3		dC_3	
## Min.	:-6.800	Min.	:-22.000	Min.	:-10.300	Min.	:-14.900
## 1st Qu.	: 0.400	1st Qu.	:-5.475	1st Qu.	: 4.600	1st Qu.	:-0.325
## Median	: 2.250	Median	:-3.100	Median	: 7.150	Median	: 1.400
## Mean	: 2.793	Mean	:-3.675	Mean	: 7.585	Mean	: 1.524
## 3rd Qu.	: 4.500	3rd Qu.	:-1.525	3rd Qu.	:10.525	3rd Qu.	: 3.900
## Max.	:23.300	Max.	: 5.900	Max.	: 32.200	Max.	: 12.700
## NA's	:13	NA's	:13	NA's	:27	NA's	:63
## Tkor_4		Suly_4		BPD_4		FRO_4	
## Min.	: 84.0	Min.	:250.0	Min.	:20.17	Min.	:50.60
## 1st Qu.	:133.0	1st Qu.	:317.5	1st Qu.	:46.20	1st Qu.	:59.77
## Median	:140.0	Median	:353.0	Median	:48.60	Median	:62.55
## Mean	:140.5	Mean	:364.8	Mean	:48.40	Mean	:62.40
## 3rd Qu.	:147.0	3rd Qu.	:396.5	3rd Qu.	:50.90	3rd Qu.	:64.80
## Max.	:168.0	Max.	:539.0	Max.	:62.20	Max.	:78.40
## NA's	:2	NA's	:128	NA's	:2	NA's	:3
## HC_4		AC_4		FEMU_4		L1_4	
## Min.	: 39.3	Min.	: 64.0	Min.	:23.90	Min.	:15.50
## 1st Qu.	:169.7	1st Qu.	:148.2	1st Qu.	:31.31	1st Qu.	:22.90
## Median	:177.1	Median	:156.9	Median	:33.10	Median	:26.05
## Mean	:176.9	Mean	:157.0	Mean	:33.37	Mean	:25.65
## 3rd Qu.	:184.3	3rd Qu.	:164.8	3rd Qu.	:35.16	3rd Qu.	:28.20
## Max.	:219.6	Max.	:209.3	Max.	:46.60	Max.	:37.10
## NA's	:2	NA's	:2	NA's	:2	NA's	:7
## H1_4		B1_4		C1_4		L2_4	
## Min.	: 3.20	Min.	: 2.50	Min.	:10.70	Min.	:-6.20
## 1st Qu.	: 9.70	1st Qu.	:17.80	1st Qu.	:18.86	1st Qu.	:18.85
## Median	:12.55	Median	:21.30	Median	:21.17	Median	:23.00
## Mean	:12.88	Mean	:21.19	Mean	:21.65	Mean	:22.55
## 3rd Qu.	:15.50	3rd Qu.	:25.15	3rd Qu.	:23.48	3rd Qu.	:26.50
## Max.	:26.50	Max.	:34.00	Max.	:40.70	Max.	:38.90
## NA's	:7	NA's	:12	NA's	:49	NA's	:7
## H2_4		B2_4		C2_4		Ttkg_4	
## Min.	: 3.50	Min.	:-11.600	Min.	:11.30	Min.	: 45.00
## 1st Qu.	:13.30	1st Qu.	: 7.825	1st Qu.	:17.82	1st Qu.	: 61.00
## Median	:15.90	Median	: 13.100	Median	:20.10	Median	: 68.00
## Mean	:16.83	Mean	: 12.614	Mean	:20.49	Mean	: 71.06
## 3rd Qu.	:19.80	3rd Qu.	: 18.200	3rd Qu.	:22.77	3rd Qu.	: 78.00
## Max.	:36.50	Max.	: 31.700	Max.	:30.50	Max.	:148.00
## NA's	:7	NA's	:13	NA's	:49	NA's	:21
## dL_4		dH_4		dB_4		dC_4	
## Min.	:-10.600	Min.	:-19.300	Min.	:-8.200	Min.	:-11.10
## 1st Qu.	: 0.900	1st Qu.	:-6.000	1st Qu.	: 5.100	1st Qu.	:-1.00
## Median	: 2.800	Median	:-3.800	Median	: 8.000	Median	: 0.90
## Mean	: 3.079	Mean	:-3.926	Mean	: 8.598	Mean	: 1.16
## 3rd Qu.	: 5.000	3rd Qu.	:-1.500	3rd Qu.	:11.000	3rd Qu.	: 2.65
## Max.	: 28.400	Max.	: 10.100	Max.	:32.200	Max.	: 18.70
## NA's	:6	NA's	:6	NA's	:11	NA's	:48
## Tkor_5		Suly_5		BPD_5		FRO_5	
## Min.	: 98.0	Min.	: 516.0	Min.	:29.60	Min.	: 58.0

##	1st Qu.:	161.0	1st Qu.:	642.0	1st Qu.:	58.80	1st Qu.:	76.3
##	Median :	168.0	Median :	698.0	Median :	61.60	Median :	79.0
##	Mean :	167.1	Mean :	722.3	Mean :	61.41	Mean :	113.8
##	3rd Qu.:	168.0	3rd Qu.:	795.0	3rd Qu.:	63.90	3rd Qu.:	81.6
##	Max. :	196.0	Max. :	1122.0	Max. :	74.53	Max. :	7608.0
##	NA's :	2	NA's :	130	NA's :	2	NA's :	2
##	HC_5		AC_5		FEMU_5		L1_5	
##	Min. :	115.2	Min. :	22.3	Min. :	34.30	Min. :	13.10
##	1st Qu.:	215.9	1st Qu.:	192.7	1st Qu.:	42.50	1st Qu.:	22.62
##	Median :	223.4	Median :	201.2	Median :	44.36	Median :	25.60
##	Mean :	223.3	Mean :	200.3	Mean :	44.62	Mean :	25.89
##	3rd Qu.:	232.0	3rd Qu.:	208.5	3rd Qu.:	46.50	3rd Qu.:	28.55
##	Max. :	267.2	Max. :	245.2	Max. :	54.60	Max. :	39.60
##	NA's :	2	NA's :	2	NA's :	2	NA's :	13
##	H1_5		B1_5		C1_5		L2_5	
##	Min. :	3.20	Min. :	3.80	Min. :	11.20	Min. :	-4.40
##	1st Qu.:	10.00	1st Qu.:	17.70	1st Qu.:	17.70	1st Qu.:	18.43
##	Median :	12.50	Median :	21.50	Median :	20.35	Median :	22.05
##	Mean :	12.58	Mean :	21.44	Mean :	21.00	Mean :	22.22
##	3rd Qu.:	15.18	3rd Qu.:	25.30	3rd Qu.:	23.70	3rd Qu.:	25.80
##	Max. :	24.00	Max. :	37.90	Max. :	39.30	Max. :	44.20
##	NA's :	13	NA's :	14	NA's :	41	NA's :	13
##	H2_5		B2_5		C2_5		Ttkg_5	
##	Min. :	2.70	Min. :	-17.30	Min. :	9.00	Min. :	49.00
##	1st Qu.:	13.47	1st Qu.:	8.00	1st Qu.:	17.73	1st Qu.:	63.00
##	Median :	16.80	Median :	13.20	Median :	20.45	Median :	70.00
##	Mean :	17.00	Mean :	12.83	Mean :	20.81	Mean :	73.07
##	3rd Qu.:	19.60	3rd Qu.:	17.80	3rd Qu.:	22.98	3rd Qu.:	80.00
##	Max. :	31.10	Max. :	35.10	Max. :	35.30	Max. :	150.00
##	NA's :	13	NA's :	14	NA's :	41	NA's :	31
##	dL_5		dH_5		dB_5		dC_5	
##	Min. :	-16.200	Min. :	-15.700	Min. :	-11.200	Min. :	-11.0000
##	1st Qu.:	1.600	1st Qu.:	-6.975	1st Qu.:	5.900	1st Qu.:	-2.5000
##	Median :	3.400	Median :	-4.350	Median :	8.300	Median :	0.2000
##	Mean :	3.672	Mean :	-4.416	Mean :	8.605	Mean :	0.1977
##	3rd Qu.:	5.550	3rd Qu.:	-2.225	3rd Qu.:	11.000	3rd Qu.:	2.6000
##	Max. :	31.200	Max. :	10.500	Max. :	35.800	Max. :	13.7000
##	NA's :	13	NA's :	13	NA's :	14	NA's :	42
##	Tkor_6		Suly_6		BPD_6		FRO_6	
##	Min. :	161	Min. :	920	Min. :	57.20	Min. :	78.00
##	1st Qu.:	196	1st Qu.:	1212	1st Qu.:	72.20	1st Qu.:	92.30
##	Median :	203	Median :	1326	Median :	75.29	Median :	94.50
##	Mean :	202	Mean :	1365	Mean :	75.02	Mean :	94.55
##	3rd Qu.:	210	3rd Qu.:	1473	3rd Qu.:	77.90	3rd Qu.:	97.30
##	Max. :	287	Max. :	2532	Max. :	98.20	Max. :	108.20
##	NA's :	4	NA's :	131	NA's :	4	NA's :	4
##	HC_6		AC_6		FEMU_6		L1_6	
##	Min. :	26.4	Min. :	32.5	Min. :	41.60	Min. :	15.00
##	1st Qu.:	263.5	1st Qu.:	236.8	1st Qu.:	53.00	1st Qu.:	23.30
##	Median :	270.5	Median :	247.2	Median :	55.00	Median :	25.80
##	Mean :	269.7	Mean :	246.7	Mean :	56.03	Mean :	25.88
##	3rd Qu.:	278.9	3rd Qu.:	257.5	3rd Qu.:	56.78	3rd Qu.:	28.70
##	Max. :	311.0	Max. :	323.4	Max. :	263.10	Max. :	38.90
##	NA's :	4	NA's :	4	NA's :	4	NA's :	18

##	H1_6	B1_6	C1_6	L2_6
##	Min. : 4.6	Min. : 9.2	Min. :10.20	Min. : 9.70
##	1st Qu.:10.2	1st Qu.:17.3	1st Qu.:17.55	1st Qu.:19.50
##	Median :12.3	Median :21.3	Median :20.40	Median :22.55
##	Mean :12.6	Mean :21.0	Mean :20.84	Mean :22.65
##	3rd Qu.:14.9	3rd Qu.:25.2	3rd Qu.:23.20	3rd Qu.:26.15
##	Max. :24.9	Max. :34.2	Max. :36.60	Max. :39.80
##	NA's :18	NA's :18	NA's :28	NA's :19
##	H2_6	B2_6	C2_6	Ttkg_6
##	Min. : 6.30	Min. : -9.60	Min. : 9.20	Min. : 51.00
##	1st Qu.:13.30	1st Qu.: 7.30	1st Qu.:17.10	1st Qu.: 65.00
##	Median :16.20	Median :12.50	Median :19.80	Median : 73.00
##	Mean :16.84	Mean :11.96	Mean :20.13	Mean : 75.17
##	3rd Qu.:19.52	3rd Qu.:16.95	3rd Qu.:22.77	3rd Qu.: 82.00
##	Max. :31.50	Max. :29.20	Max. :37.70	Max. :153.00
##	NA's :19	NA's :19	NA's :29	NA's :25
##	dL_6	dH_6	dB_6	dC_6
##	Min. : -6.700	Min. : -15.000	Min. : -3.700	Min. : -15.8000
##	1st Qu.: 1.200	1st Qu.: -6.600	1st Qu.: 6.300	1st Qu.: -1.6500
##	Median : 3.000	Median : -4.000	Median : 8.800	Median : 0.8000
##	Mean : 3.218	Mean : -4.235	Mean : 9.011	Mean : 0.7005
##	3rd Qu.: 5.000	3rd Qu.: -2.200	3rd Qu.:11.400	3rd Qu.: 3.1000
##	Max. :19.800	Max. : 4.900	Max. :27.000	Max. : 10.9000
##	NA's :18	NA's :18	NA's :18	NA's :28
##	Tkor_7	Suly_7	BPD_7	FRO_7
##	Min. :189.0	Min. :1567	Min. :69.50	Min. : 11.3
##	1st Qu.:224.0	1st Qu.:1903	1st Qu.:82.15	1st Qu.:103.0
##	Median :231.0	Median :2052	Median :85.60	Median :106.3
##	Mean :233.2	Mean :2104	Mean :85.24	Mean :105.6
##	3rd Qu.:238.0	3rd Qu.:2267	3rd Qu.:87.82	3rd Qu.:109.3
##	Max. :287.0	Max. :3100	Max. :98.30	Max. :119.1
##	NA's :8	NA's :134	NA's :8	NA's :8
##	HC_7	AC_7	FEMU_7	L1_7
##	Min. : 9.39	Min. :179.4	Min. :51.20	Min. :16.90
##	1st Qu.:297.15	1st Qu.:278.6	1st Qu.:60.80	1st Qu.:22.90
##	Median :304.30	Median :289.4	Median :63.10	Median :26.00
##	Mean :302.62	Mean :289.6	Mean :63.31	Mean :26.29
##	3rd Qu.:312.50	3rd Qu.:302.6	3rd Qu.:65.55	3rd Qu.:29.20
##	Max. :345.30	Max. :363.6	Max. :74.96	Max. :42.10
##	NA's :8	NA's :8	NA's :8	NA's :17
##	H1_7	B1_7	C1_7	L2_7
##	Min. : 4.10	Min. : 4.10	Min. :11.2	Min. : 5.30
##	1st Qu.:10.70	1st Qu.:16.80	1st Qu.:17.7	1st Qu.:19.10
##	Median :12.50	Median :20.30	Median :20.2	Median :22.30
##	Mean :13.42	Mean :20.31	Mean :20.9	Mean :22.81
##	3rd Qu.:16.50	3rd Qu.:23.98	3rd Qu.:23.9	3rd Qu.:25.98
##	Max. :23.30	Max. :39.00	Max. :34.8	Max. :38.50
##	NA's :17	NA's :17	NA's :29	NA's :17
##	H2_7	B2_7	C2_7	Ttkg_7
##	Min. : 6.80	Min. : -8.100	Min. : 8.00	Min. : 55.00
##	1st Qu.:14.43	1st Qu.: 6.625	1st Qu.:17.30	1st Qu.: 67.00
##	Median :17.30	Median :12.300	Median :19.95	Median : 75.00
##	Mean :17.57	Mean :11.497	Mean :20.41	Mean : 77.35
##	3rd Qu.:20.30	3rd Qu.:16.875	3rd Qu.:22.95	3rd Qu.: 85.00

##	Max.	:33.00	Max.	:31.200	Max.	:34.80	Max.	:155.00	
##	NA's	:17	NA's	:17	NA's	:29	NA's	:24	
##	dL_7		dH_7		dB_7		dC_7		
##	Min.	:-6.500	Min.	:-14.400	Min.	:-7.300	Min.	:-8.8000	
##	1st Qu.:	1.500	1st Qu.:	-6.275	1st Qu.:	5.325	1st Qu.:	-1.4500	
##	Median :	3.450	Median :	-3.700	Median :	8.350	Median :	0.8000	
##	Mean :	3.483	Mean :	-4.148	Mean :	8.816	Mean :	0.4853	
##	3rd Qu.:	5.175	3rd Qu.:	-2.100	3rd Qu.:	12.125	3rd Qu.:	2.5000	
##	Max.	:21.100	Max.	: 3.700	Max.	:28.400	Max.	:11.9000	
##	NA's	:17	NA's	:17	NA's	:17	NA's	:28	
##	Tkor_8		Súly_8		BPD_8		FRO_8		
##	Min.	:147.0	Min.	:2314	Min.	: 49.40	Min.	: 11.2	
##	1st Qu.:	245.0	1st Qu.:	2776	1st Qu.:	89.60	1st Qu.:	110.0	
##	Median :	252.0	Median :	2990	Median :	91.80	Median :	113.1	
##	Mean :	257.9	Mean :	2991	Mean :	92.00	Mean :	112.1	
##	3rd Qu.:	266.0	3rd Qu.:	3147	3rd Qu.:	94.96	3rd Qu.:	116.7	
##	Max.	:287.0	Max.	:3804	Max.	:105.90	Max.	:219.4	
##	NA's	:12	NA's	:133	NA's	:12	NA's	:12	
##	HC_8		AC_8		FEMU_8		L1_8		
##	Min.	: 43.6	Min.	: 11.3	Min.	: 30.70	Min.	:16.20	
##	1st Qu.:	319.1	1st Qu.:	317.5	1st Qu.:	68.80	1st Qu.:	23.80	
##	Median :	327.5	Median :	326.0	Median :	70.90	Median :	26.60	
##	Mean :	325.5	Mean :	320.4	Mean :	71.98	Mean :	26.85	
##	3rd Qu.:	336.4	3rd Qu.:	338.3	3rd Qu.:	73.30	3rd Qu.:	29.70	
##	Max.	:356.8	Max.	:371.5	Max.	:298.80	Max.	:43.20	
##	NA's	:12	NA's	:12	NA's	:13	NA's	:19	
##	H1_8		B1_8		C1_8		L2_8		
##	Min.	: 2.30	Min.	:-1.30	Min.	: 8.90	Min.	:11.40	
##	1st Qu.:	11.75	1st Qu.:	15.57	1st Qu.:	17.60	1st Qu.:	20.30	
##	Median :	14.00	Median :	18.95	Median :	20.00	Median :	24.10	
##	Mean :	14.53	Mean :	19.24	Mean :	20.79	Mean :	23.86	
##	3rd Qu.:	17.12	3rd Qu.:	22.80	3rd Qu.:	23.90	3rd Qu.:	27.15	
##	Max.	:28.20	Max.	:45.10	Max.	:39.00	Max.	:44.90	
##	NA's	:19	NA's	:19	NA's	:23	NA's	:19	
##	H2_8		B2_8		C2_8		Ttkg_8		
##	Min.	: 8.10	Min.	:-9.000	Min.	: 9.30	Min.	: 54.00	
##	1st Qu.:	14.10	1st Qu.:	6.125	1st Qu.:	17.12	1st Qu.:	70.00	
##	Median :	17.10	Median :	10.750	Median :	19.80	Median :	77.50	
##	Mean :	17.48	Mean :	10.467	Mean :	19.95	Mean :	78.88	
##	3rd Qu.:	20.20	3rd Qu.:	15.650	3rd Qu.:	22.43	3rd Qu.:	86.00	
##	Max.	:33.30	Max.	:36.800	Max.	:35.50	Max.	:156.00	
##	NA's	:19	NA's	:19	NA's	:23	NA's	:32	
##	dL_8		dH_8		dB_8		dC_8		
##	Min.	:-6.000	Min.	:-13.300	Min.	:-3.700	Min.	:-11.1000	
##	1st Qu.:	1.100	1st Qu.:	-4.925	1st Qu.:	5.950	1st Qu.:	-1.4000	
##	Median :	2.600	Median :	-2.650	Median :	8.400	Median :	0.9000	
##	Mean :	2.993	Mean :	-2.950	Mean :	8.772	Mean :	0.8434	
##	3rd Qu.:	4.800	3rd Qu.:	-1.175	3rd Qu.:	10.625	3rd Qu.:	3.0000	
##	Max.	:14.500	Max.	: 11.600	Max.	:23.800	Max.	: 14.4000	
##	NA's	:19	NA's	:19	NA's	:19	NA's	:23	
##	X		L1_9		H1_9		B1_9		
##	:218	Min.	:13.30	Min.	: 3.60	Min.	:-0.8	Min.	: 3.90
##	---: 1	1st Qu.:	21.60	1st Qu.:	10.70	1st Qu.:	17.8	1st Qu.:	18.38
##		Median :	24.80	Median :	13.40	Median :	20.8	Median :	21.30

```

##          Mean    :24.59    Mean    :13.57    Mean    :20.6    Mean    :21.26
##          3rd Qu.:27.40    3rd Qu.:16.40    3rd Qu.:24.5    3rd Qu.:23.85
##          Max.    :40.60    Max.    :23.90    Max.    :37.3    Max.    :35.80
##          NA's     :66      NA's     :66      NA's     :66      NA's     :71
##          L2_9      H2_9      B2_9      C2_9
## Min.    : 9.10    Min.    : 6.30    Min.    : -18.2    Min.    : -0.50
## 1st Qu.:17.20    1st Qu.:13.30    1st Qu.: 6.4     1st Qu.:16.77
## Median :21.70    Median :15.90    Median : 13.6     Median :18.85
## Mean    :21.72    Mean    :16.74    Mean    : 11.6     Mean    :19.34
## 3rd Qu.:25.80    3rd Qu.:20.30    3rd Qu.: 17.6     3rd Qu.:23.10
## Max.    :40.80    Max.    :29.30    Max.    : 28.9     Max.    :31.00
## NA's     :66      NA's     :66      NA's     :66      NA's     :67
##          Ttkg_9      dL_9      dH_9      dB_9
## Min.    : 48.00    Min.    : -5.800    Min.    : -14.000    Min.    : -5.500
## 1st Qu.: 61.00    1st Qu.: 0.600     1st Qu.: -6.000     1st Qu.: 5.700
## Median : 70.00    Median : 2.800     Median : -2.800     Median : 8.500
## Mean    : 72.94    Mean    : 2.875     Mean    : -3.167     Mean    : 9.004
## 3rd Qu.: 83.00    3rd Qu.: 5.100     3rd Qu.: -0.400     3rd Qu.:11.900
## Max.    :122.00    Max.    :11.600     Max.    : 6.000     Max.    :32.300
## NA's     :131      NA's     :66      NA's     :66      NA's     :66
##          dC_9
## Min.    : -13.800
## 1st Qu.: -1.025
## Median : 1.800
## Mean    : 1.720
## 3rd Qu.: 3.850
## Max.    : 17.000
## NA's     :71

```


1. Hüvelyi szülés után a medencefenék izmai megnyúlnak a császármetszéshez képest.

TODO: abszolút érték vagy sem?

```
csoport = Sz_mod  
valt = dL_9  
valt_PVN = valt[csoport=="PVN"]  
valt_SC = valt[csoport=="SC"]
```

Leíró statisztikák

```
table(csoport)
```

```
## csoport  
##      PVN  SC  
##    4 108 107
```

```
summary(valt_PVN)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's  
## -3.700   2.375   4.300   4.303   6.600  11.300     32
```

```
summary(valt_SC)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's  
## -5.800  -0.100   1.500   1.465   3.200  11.600     30
```

```
sd(valt,na.rm=TRUE)
```

```
## [1] 3.561687
```

```
sd(valt_PVN,na.rm=T)
```

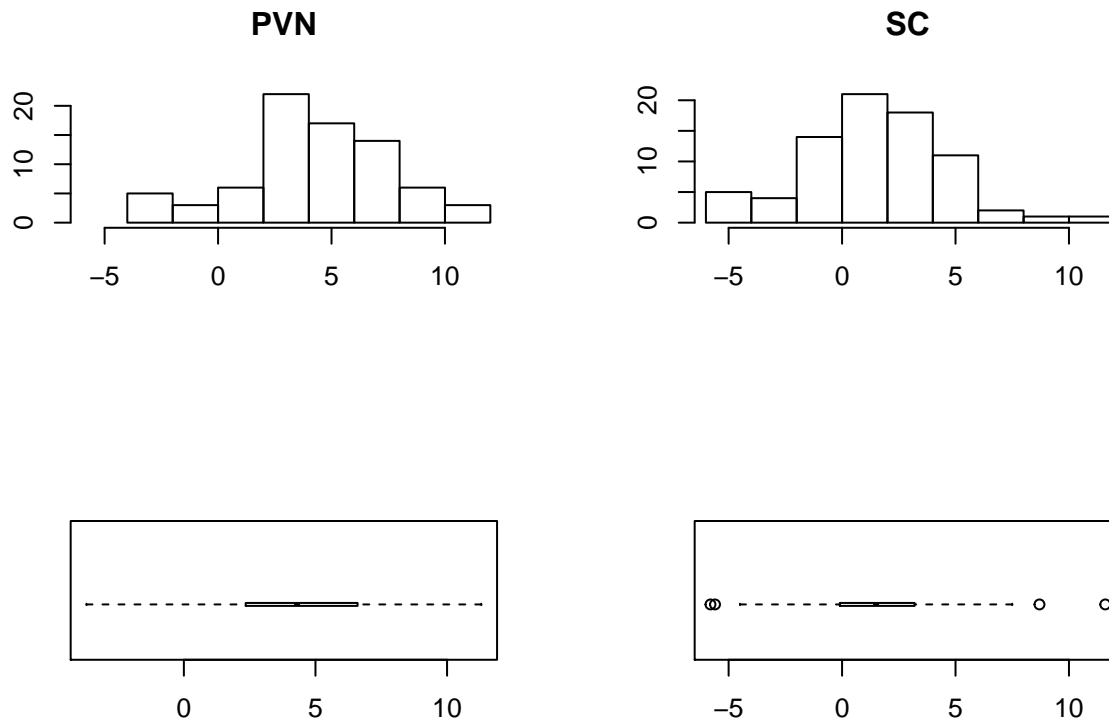
```
## [1] 3.361489
```

```
sd(valt_SC,na.rm=T)
```

```
## [1] 3.188333
```

Grafikonok

```
par(mfrow=c(2,2))  
lim=c(min(min(valt_PVN,na.rm=T),min(valt_SC,na.rm=T)),max(max(valt_PVN,na.rm=T),max(valt_SC,na.rm=T)))  
hist(valt_PVN,xlab="",ylab="",main="PVN",xlim=lim);hist(valt_SC,xlab="",ylab="",main="SC",xlim=lim)  
boxplot(valt_PVN,horizontal=T,xlim=lim); boxplot(valt_SC,horizontal=T,xlim=lim)
```



```
par(mfrow=c(1,1))
```

Egyoldalas páros t-próba

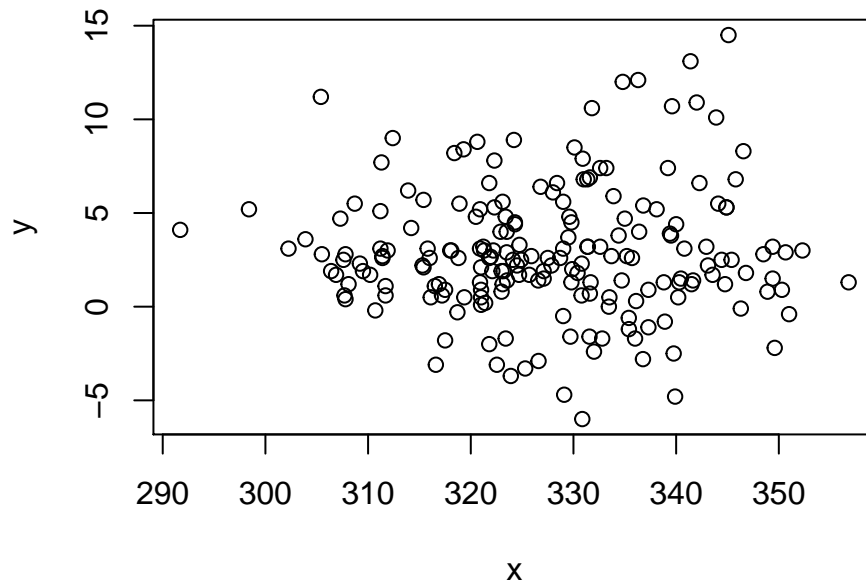
```
t.test(valt~csoport,alternative = "greater")
```

```
##
##  Welch Two Sample t-test
##
## data:  valt by csoport
## t = 5.3576, df = 150.346, p-value = 1.553e-07
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  1.961624      Inf
## sample estimates:
## mean in group PVN  mean in group SC
##      4.303421      1.464935
```

2. Az újszülött súlya szignifikáns összefüggést mutat a medencefenék izmainak megnyúlásával. A nagyobb születési súllyal megnő a medencefenék izmainak megnyúlása.

TODO túl alacsony HC_8 értékek?

```
x = HC_8[HC_8>200]
y = dL_8[HC_8>200]
plot(x,y)
```



```
cor.test(x,y)
```

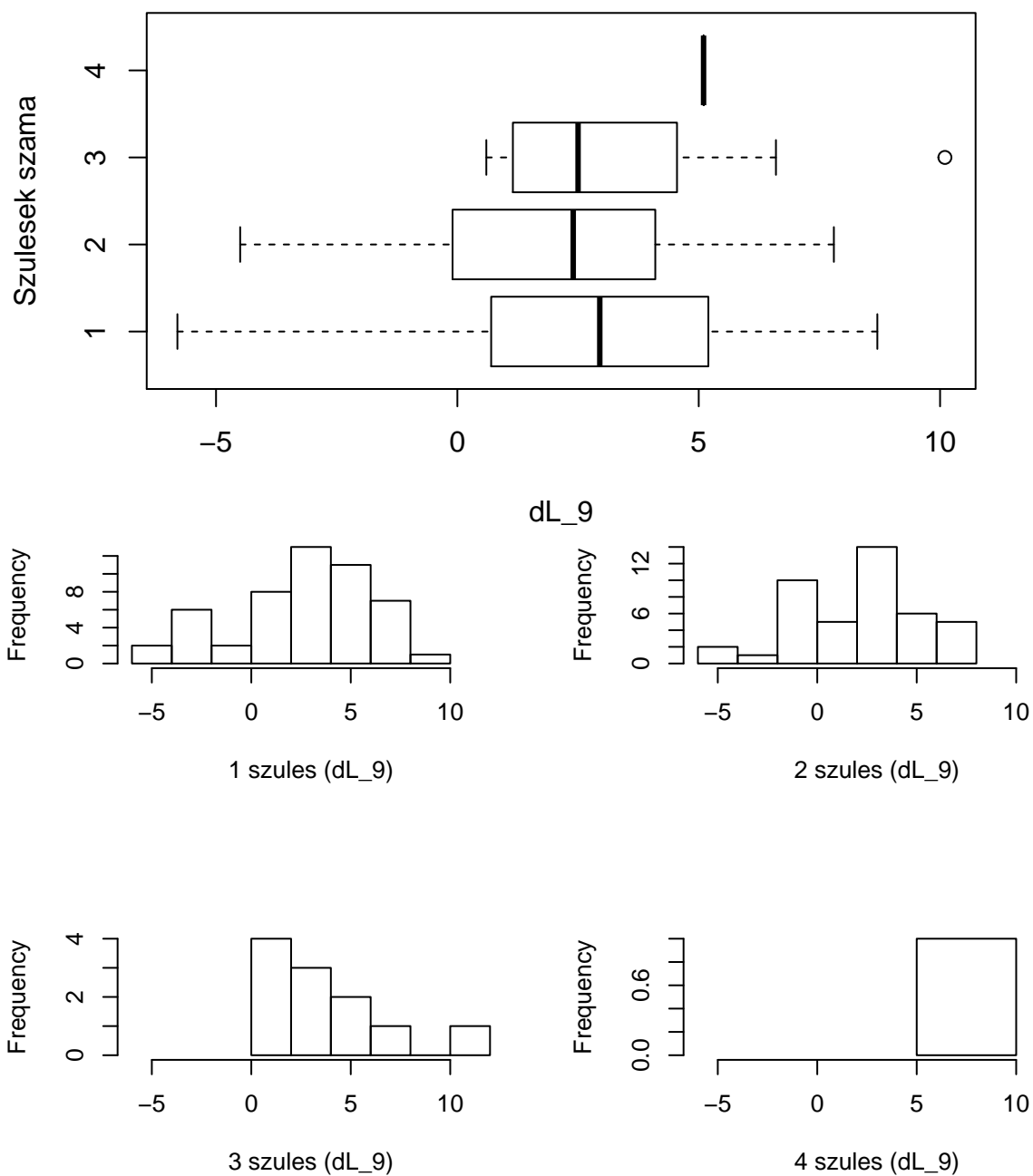
```
##
## Pearson's product-moment correlation
##
## data:  x and y
## t = 0.274, df = 196, p-value = 0.7844
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.1202007  0.1585775
## sample estimates:
##      cor
## 0.01956877
```

3. A szülések számával arányosan nő a medencefenék izmainak megnyúlása.

```
csoport = Pa + Cae; x = dL_9; table(csoport)
```

```
## csoport  
## 1 2 3 4  
## 73 62 17 1
```

Ábrák



Egyszempontos ANOVA

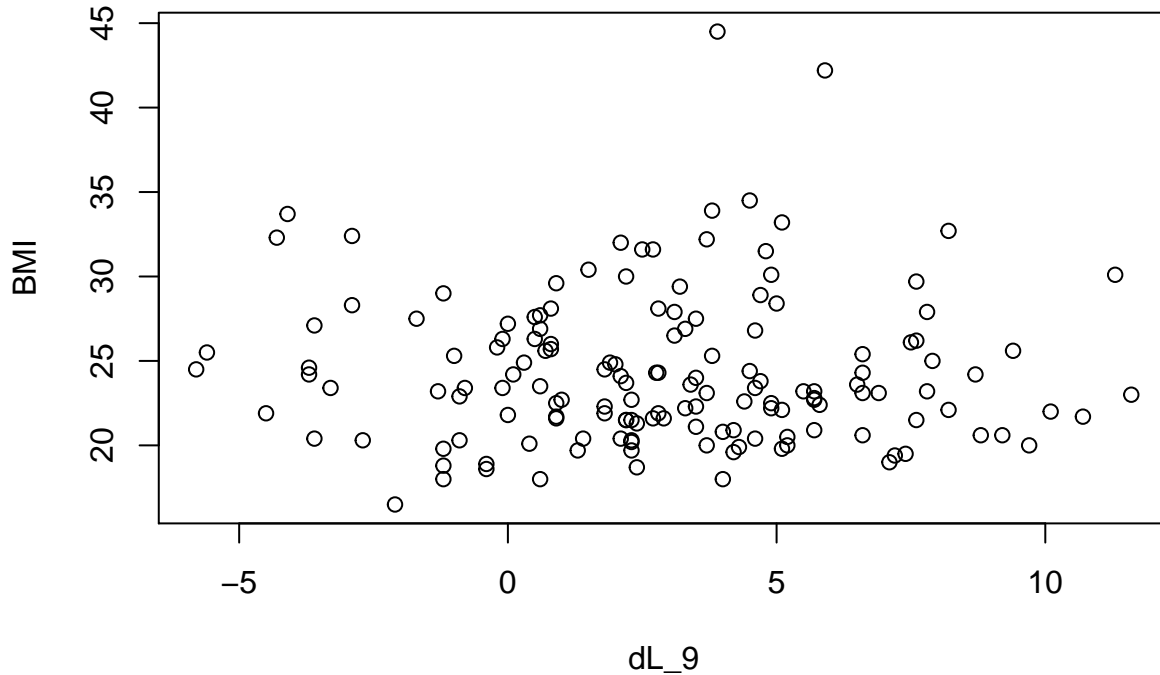
```
fit = aov(x~csoport)
summary(fit)
```

```
##              Df Sum Sq Mean Sq F value Pr(>F)
## csoport      1    3.8   3.775   0.335  0.564
## Residuals    103 1162.0  11.281
## 114 observations deleted due to missingness
```

4. Az anyai BMI-vel arányosan nő a medencefenék izmainak megnyúlása.

TODO adatok tisztítása! Van egy 44.5-ös BMI, az reális?

```
x = dL_9
y = BMI
plot(x,y,xlab="dL_9",ylab="BMI")
```

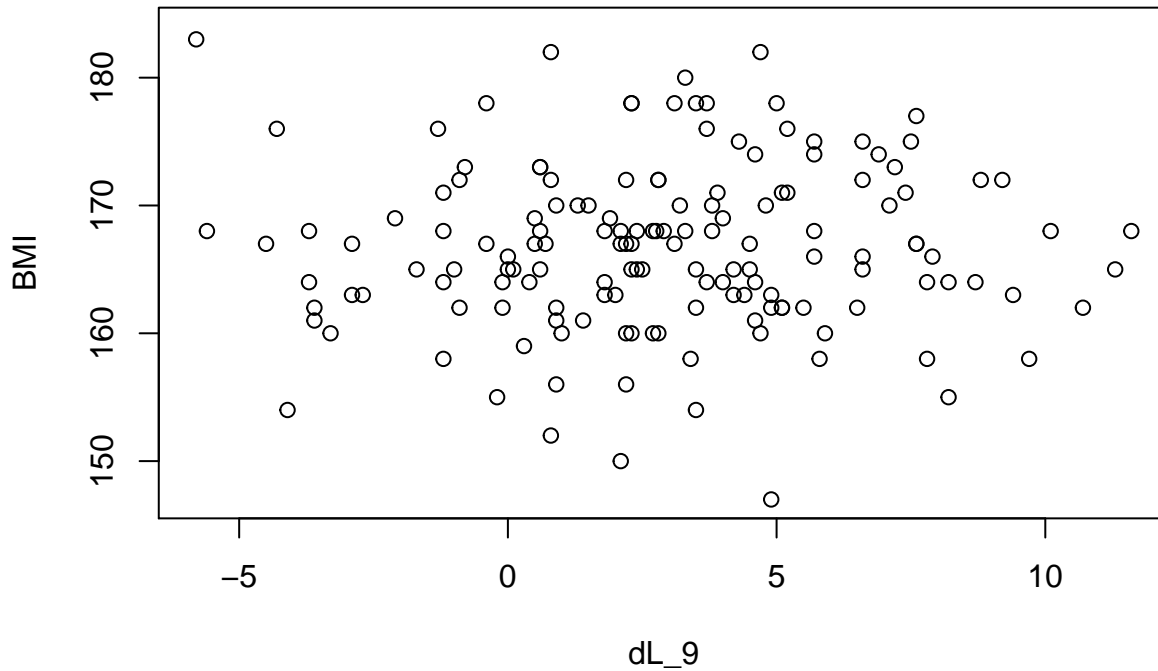


```
cor.test(x,y)
```

```
##
## Pearson's product-moment correlation
##
## data: x and y
## t = -0.2052, df = 150, p-value = 0.8377
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.1754861 0.1428282
## sample estimates:
## cor
## -0.01675341
```

9. Az izommegnyúlás mértéke korrelál a testmagassággal.

```
x = dL_9
y = Mag
plot(x,y,xlab="dL_9",ylab="BMI")
```



```
cor.test(x,y)

##
## Pearson's product-moment correlation
##
## data:  x and y
## t = 0.2915, df = 150, p-value = 0.771
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.1359186  0.1823070
## sample estimates:
##      cor
## 0.02379702
```

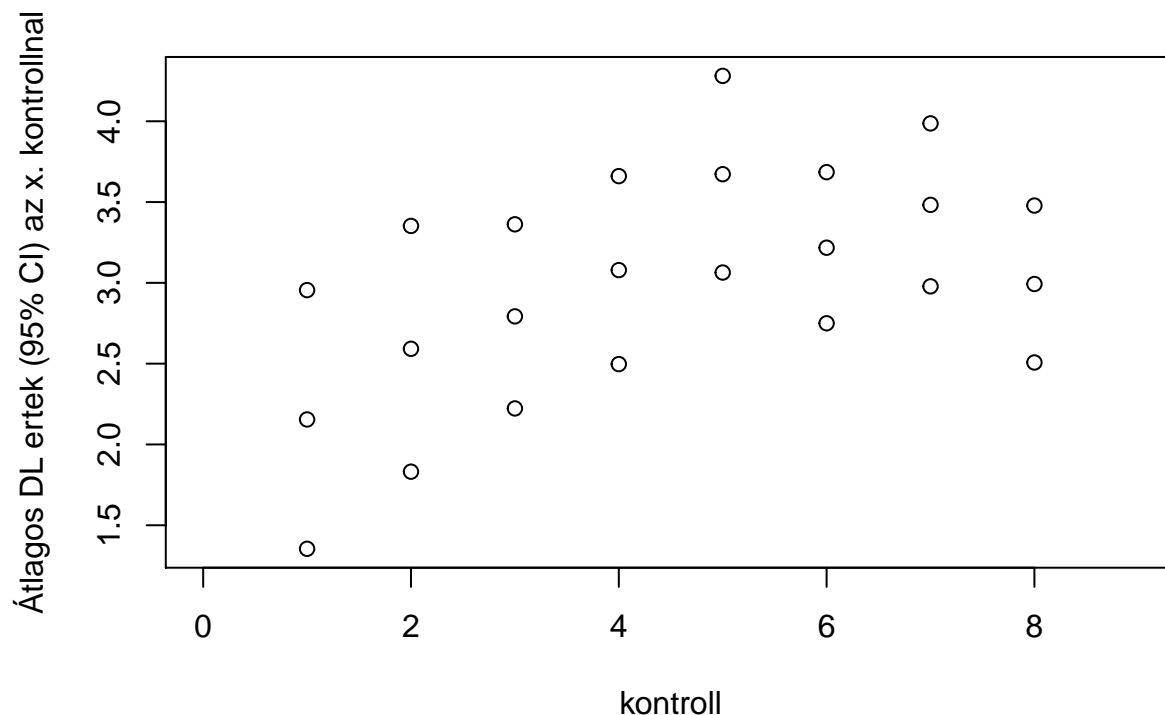
5. A terhességi korrall arányosan növekszig a medencefenék izmainak megnyúlása (mondjuk az első trimeszterbeli értékeket kel-lene összevetni a szülés előttivel).

```
df = data.frame(c(Tkor_1,Tkor_2,Tkor_3,Tkor_4,Tkor_5,Tkor_6,Tkor_7,Tkor_8),c(dL_1,dL_2,dL_3,dL_4,dL_5,dL_6,dL_7,dL_8))
xTkor = df$c.Tkor_1..Tkor_2..Tkor_3..Tkor_4..Tkor_5..Tkor_6..Tkor_7..Tkor_8.
yDL = df$c.dL_1..dL_2..dL_3..dL_4..dL_5..dL_6..dL_7..dL_8.
summary(yDL)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
## -16.200   0.775   2.700   3.045   4.900   31.200     212
```

```
time = 1:8
yATLAG = c(mean(dL_1,na.rm=T),mean(dL_2,na.rm=T),mean(dL_3,na.rm=T),mean(dL_4,na.rm=T),mean(dL_5,na.rm=T),mean(dL_6,na.rm=T),mean(dL_7,na.rm=T),mean(dL_8,na.rm=T))
dL1 = t.test(dL_1); dL1_conf=c(dL1$conf.int[1],dL1$conf.int[2])
dL = t.test(dL_2); dL2_conf=c(dL$conf.int[1],dL$conf.int[2])
dL = t.test(dL_3); dL3_conf=c(dL$conf.int[1],dL$conf.int[2])
dL = t.test(dL_4); dL4_conf=c(dL$conf.int[1],dL$conf.int[2])
dL = t.test(dL_5); dL5_conf=c(dL$conf.int[1],dL$conf.int[2])
dL = t.test(dL_6); dL6_conf=c(dL$conf.int[1],dL$conf.int[2])
dL = t.test(dL_7); dL7_conf=c(dL$conf.int[1],dL$conf.int[2])
dL = t.test(dL_8); dL8_conf=c(dL$conf.int[1],dL$conf.int[2])
yConfLower = c(dL1_conf[1],dL2_conf[1],dL3_conf[1],dL4_conf[1],dL5_conf[1],dL6_conf[1],dL7_conf[1],dL8_conf[1])
yConfUpper = c(dL1_conf[2],dL2_conf[2],dL3_conf[2],dL4_conf[2],dL5_conf[2],dL6_conf[2],dL7_conf[2],dL8_conf[2])
yl=c(min(yConfLower),max(yConfUpper))
xl = c(0,9)
```

```
#plot(time,yATLAG,xlab="kontroll",ylab="Átlagos DL ertek az x. kontrollnal",xlim=xl,ylim=yl)
plot(c(time,time,time),c(yConfLower,yATLAG,yConfUpper),xlab="kontroll",ylab="Átlagos DL ertek (95% CI) az x. kontrollnal",ylim=yl)
```

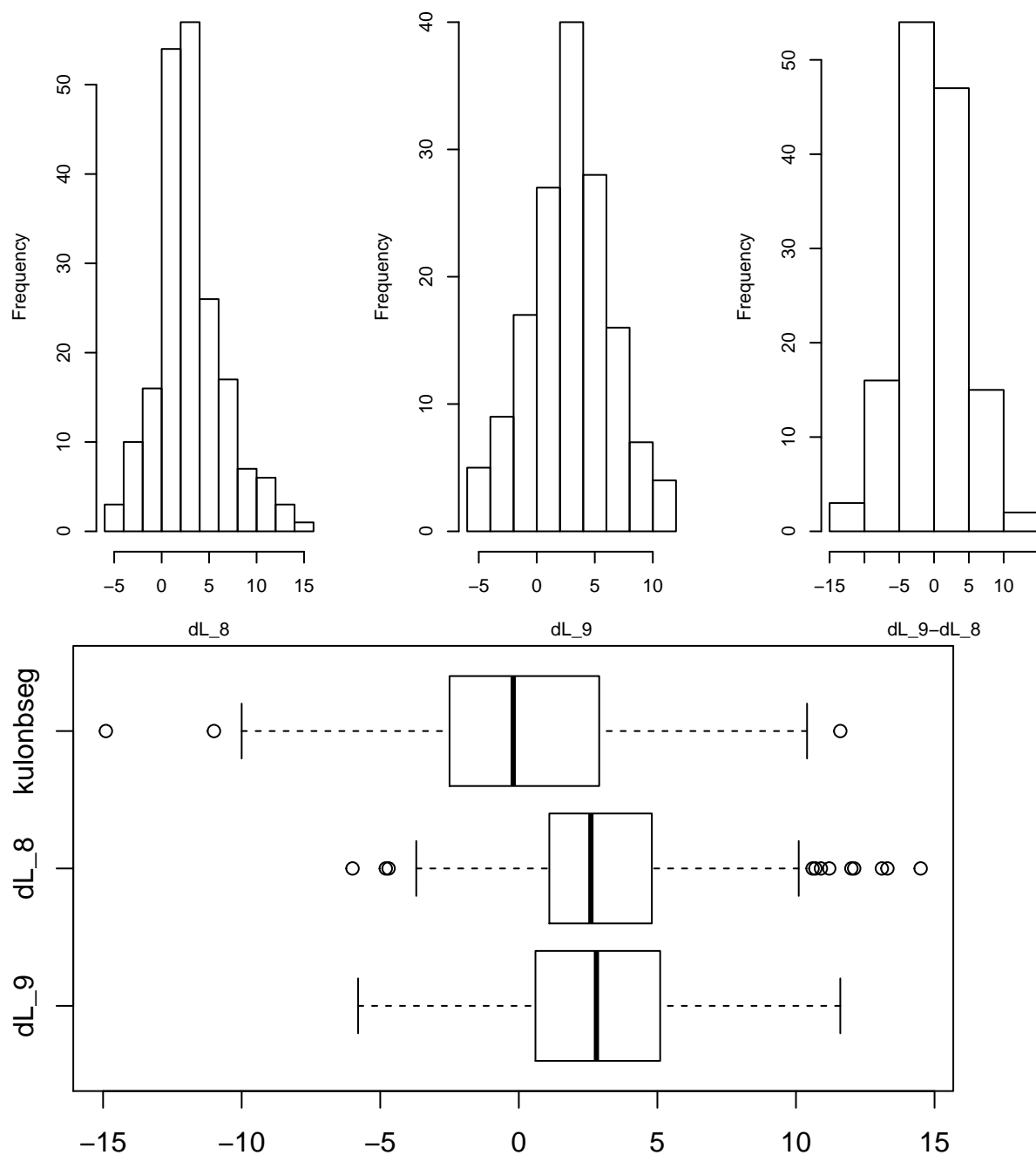



```
#par(new = TRUE);plot(time,yConfLower,col="blue",xlim=xl,ylim=yl, xlab='', ylab='', axes=F);par(new = F)
#plot(x,y,xlab="Tkor",ylab="dL")
#cor.test(x,y)
```

6. A szülés előtti medencefenék (36. hetes UH) megnyúlása nagyobb a szülés utáni 6 hetes kontrollhoz képest.

```
kontroll_6hetes = dL_9  
szules_elott = dL_8  
kul = szules_elott - kontroll_6hetes
```

Ábrák



Páros t-próba

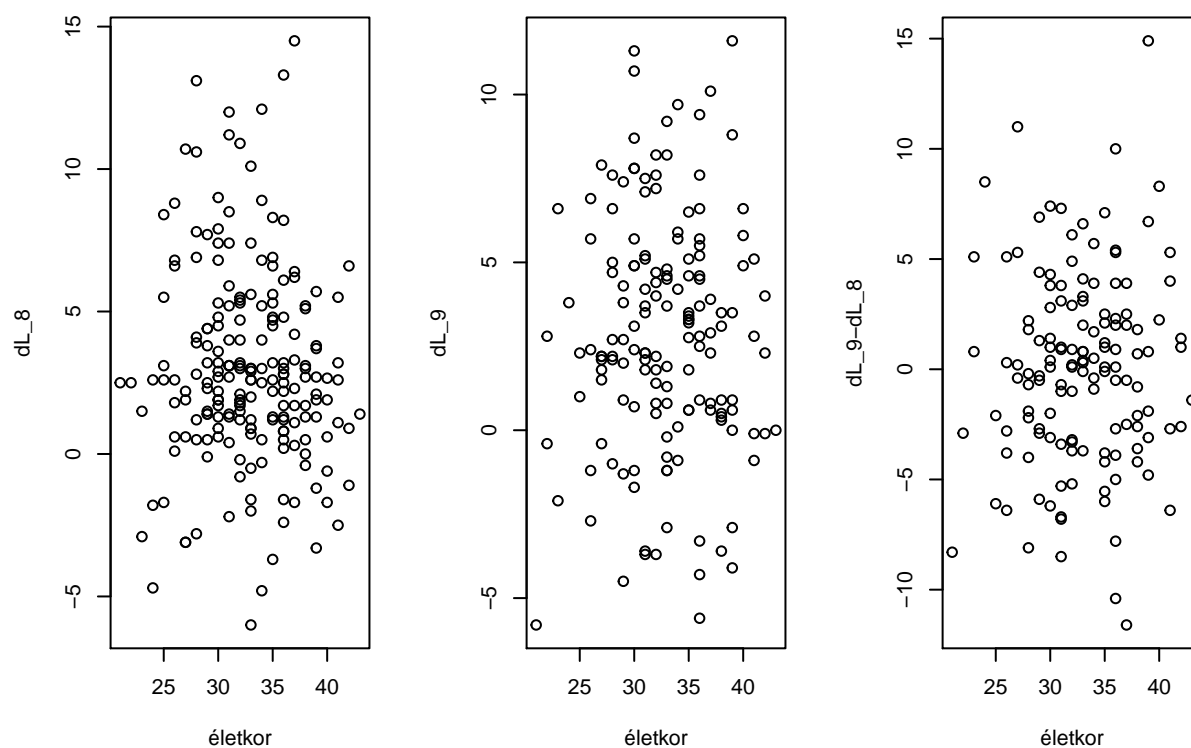
```
t.test(kontroll_6hetes,szules_elott,alternative="greater",paired=TRUE)
```

```
##  
## Paired t-test  
##  
## data: kontroll_6hetes and szules_elott  
## t = 0.1897, df = 136, p-value = 0.4249  
## alternative hypothesis: true difference in means is greater than 0  
## 95 percent confidence interval:  
## -0.5529987 Inf  
## sample estimates:  
## mean of the differences  
## 0.07153285
```

7-8. Fiatalabb várandósoknál kisebb mértékű az izmok megnyúlása, mint az idősebbeknél. Fiatal várandósoknál nagyobb a szülés előtt és a szülés után mért izomnyúlás közötti különbség, mint az idősebb várandósoknál. (jobb a regenerációs hajlam fiatalabb korban)

```
x = Ék  
y1 = dL_8  
y2 = dL_9  
yd = y2-y1
```

Ábrák



Korreláció vizsgálatok

```
cor.test(x,y1)
```

```
##
## Pearson's product-moment correlation
##
## data:  x and y1
## t = -0.9001, df = 198, p-value = 0.3692
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.2007966  0.0755764
## sample estimates:
##          cor
## -0.06383395
```

```
cor.test(x,y2)
```

```
##
## Pearson's product-moment correlation
##
## data:  x and y2
## t = 0.101, df = 151, p-value = 0.9197
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.1506567  0.1666787
## sample estimates:
##          cor
## 0.008217919
```

```
cor.test(x,yd)
```

```
##
## Pearson's product-moment correlation
##
## data:  x and yd
## t = 0.5973, df = 135, p-value = 0.5513
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.1173896  0.2171821
## sample estimates:
##          cor
## 0.05133657
```

10. Szülés módja alapján a dL_9-dL_8 értékek nőnek hüvelyi szülés esetén

Leíró statisztikák

```
csoport = Sz_mod
valt = dL_9-dL_8
valt_PVN = valt[csoport=="PVN"]
valt_SC = valt[csoport=="SC"]
summary(valt);summary(valt_PVN);summary(valt_SC)
```

##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	-11.60000	-2.90000	0.20000	0.07153	2.50000	14.90000	82

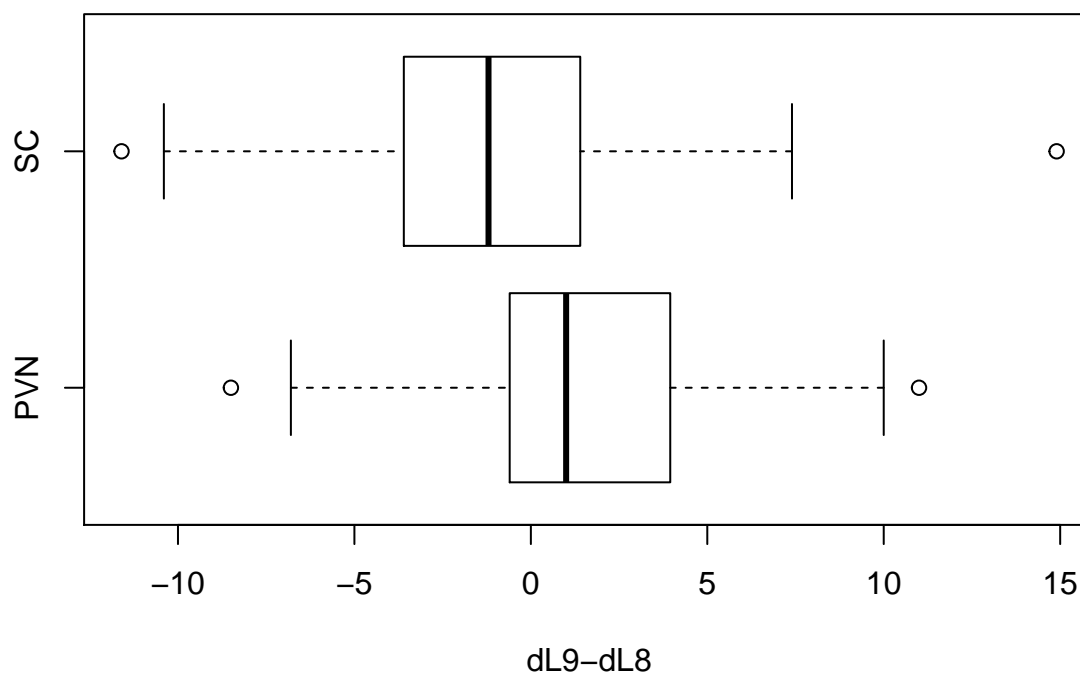
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	-8.500	-0.600	1.000	1.412	3.950	11.000	41

##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	-11.600	-3.550	-1.200	-1.211	1.300	14.900	37

```
sd(valt,na.rm=TRUE);sd(valt_PVN,na.rm=TRUE);sd(valt_SC,na.rm=TRUE)
```

```
## [1] 4.413864
## [1] 4.166042
## [1] 4.287648
```

Ábrák



Kétmintás t-próba

```
t.test(valt_PVN, valt_SC, alternative="greater")
```

```
##  
## Welch Two Sample t-test  
##  
## data: valt_PVN and valt_SC  
## t = 3.6321, df = 134.968, p-value = 0.0001991  
## alternative hypothesis: true difference in means is greater than 0  
## 95 percent confidence interval:  
##  1.427133      Inf  
## sample estimates:  
## mean of x mean of y  
##  1.411940 -1.211429
```