

# Zusammenfassung Neu

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```
df4 <- read.csv("df4.csv", header = TRUE, sep = ",")  
df4_pan<-pdata.frame(df4,index=c("district","week"))  
  
df_pan2<-df4_pan[-(which(df4_pan$week==1)),]  
  
s<-data.frame(c(lag(df_pan2$inzidenz, 1)),c(lag(df_pan2$weightednbins, 1)),  
               c(I(log(df_pan2$density)*lag(df_pan2$inzidenz, 1))),  
               c(I(df_pan2$hotspot*lag(df_pan2$inzidenz,1))),  
               c(I(df_pan2$hotspotnb*lag(df_pan2$weightednbins,1))),  
               c(I(df_pan2$rate_zweitimpf * df_pan2$hotspot)),  
               c(df_pan2$A60.79.Anteil))  
  
colnames(s)<-c("inzidenz1","weightednbins1","density_inzidenz1",  
                "hotspot_inzidenz1", "hotspotnb_wnbins1",  
                "zweitimpf_hotspot","A60.79.Anteil")  
  
pool <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)  
           + I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))  
           +I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)  
           + A60.79.Anteil  
           + factor(week)  
           , data =df4_pan, model = "pooling")  
  
pool.sqrt <- plm(sqrt(inzidenz) ~ sqrt(lag(inzidenz, 1)) + sqrt(lag(weightednbins, 1))  
                  + sqrt(I(log(density)*lag(inzidenz, 1))) + sqrt(I(hotspot * lag(inzidenz, 1)))  
                  + sqrt(I(hotspotnb * lag(weightednbins, 1))) + sqrt(I(rate_zweitimpf * hotspot))  
                  + A60.79.Anteil  
                  + factor(week)  
                  , data =df4_pan, model = "pooling")  
pool.sqrt2 <- plm(sqrt(inzidenz) ~ sqrt(lag(inzidenz, 1)) + sqrt(lag(weightednbins, 1))  
                  + I(log(density)*sqrt(lag(inzidenz, 1))) + sqrt(I(hotspot * lag(inzidenz, 1)))  
                  + sqrt(I(hotspotnb * lag(weightednbins, 1))) + sqrt(I(rate_zweitimpf * hotspot))  
                  + A60.79.Anteil  
                  + factor(week)  
                  , data =df4_pan, model = "pooling")  
pool.sqrt3 <- plm(sqrt(inzidenz) ~ sqrt(lag(inzidenz, 1)) + sqrt(lag(weightednbins, 1))  
                  + sqrt(I(log(density)*lag(inzidenz, 1))) + sqrt(I(hotspot * lag(inzidenz, 1)))  
                  + sqrt(I(hotspotnb * lag(weightednbins, 1))) + sqrt(I(rate_zweitimpf * hotspot))  
                  + sqrt(A60.79.Anteil)  
                  + factor(week)  
                  , data =df4_pan, model = "pooling")
```

```

logLik.plm <- function(object){
  out <- -plm::nobs(object) * log(2 * var(object$residuals) * pi)/2 - deviance(object)/(2 * var(object$)

  attr(out,"df") <- nobs(object) - object$df.residual
  attr(out,"nobs") <- plm::nobs(summary(object))
  return(out)
}

stats::AIC(pool.sqrt)

## [1] 57487.66

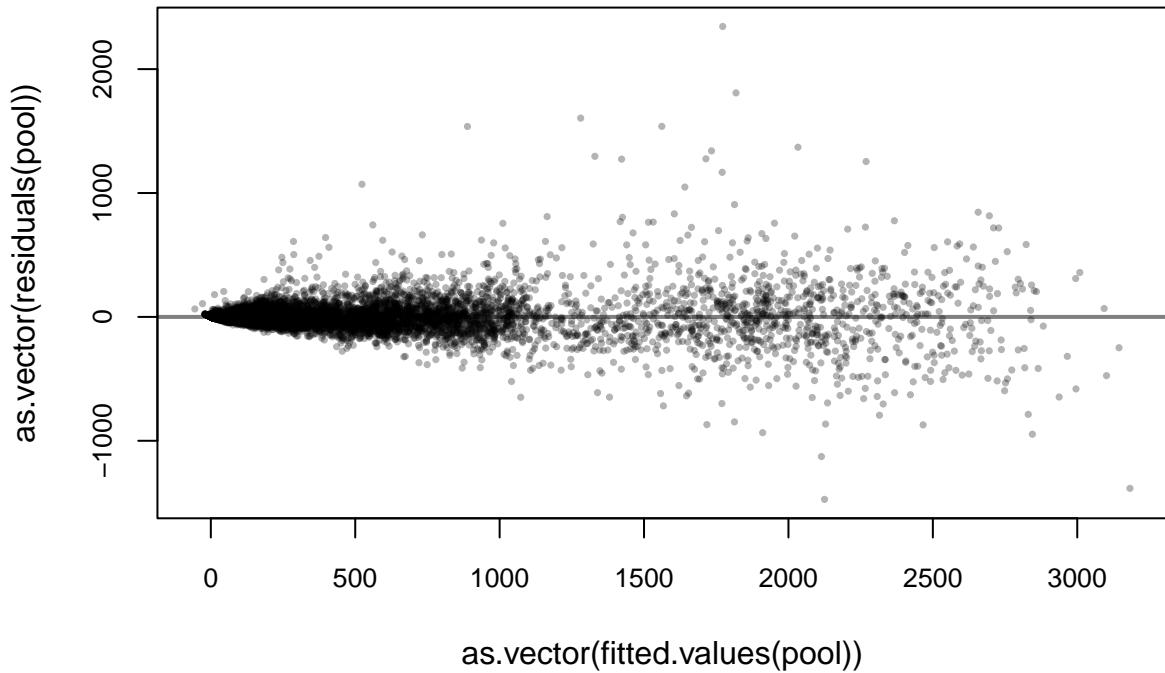
stats::AIC(pool.sqrt2)

## [1] 57488.35

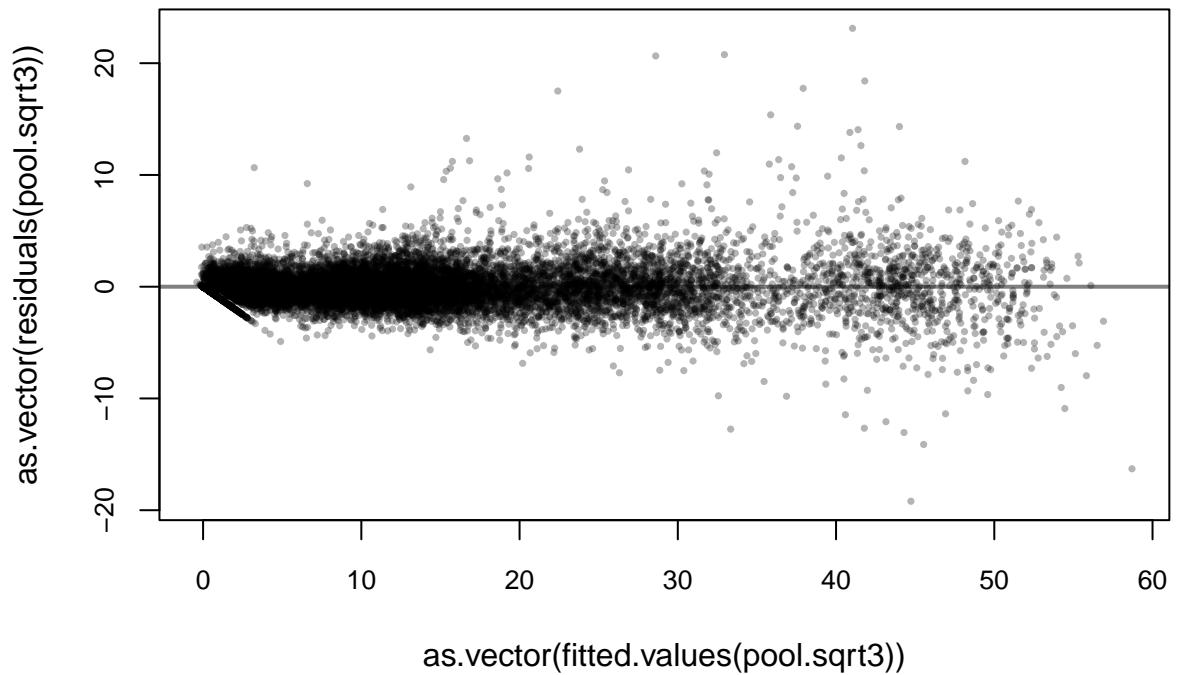
stats::AIC(pool.sqrt3)

## [1] 57486.79

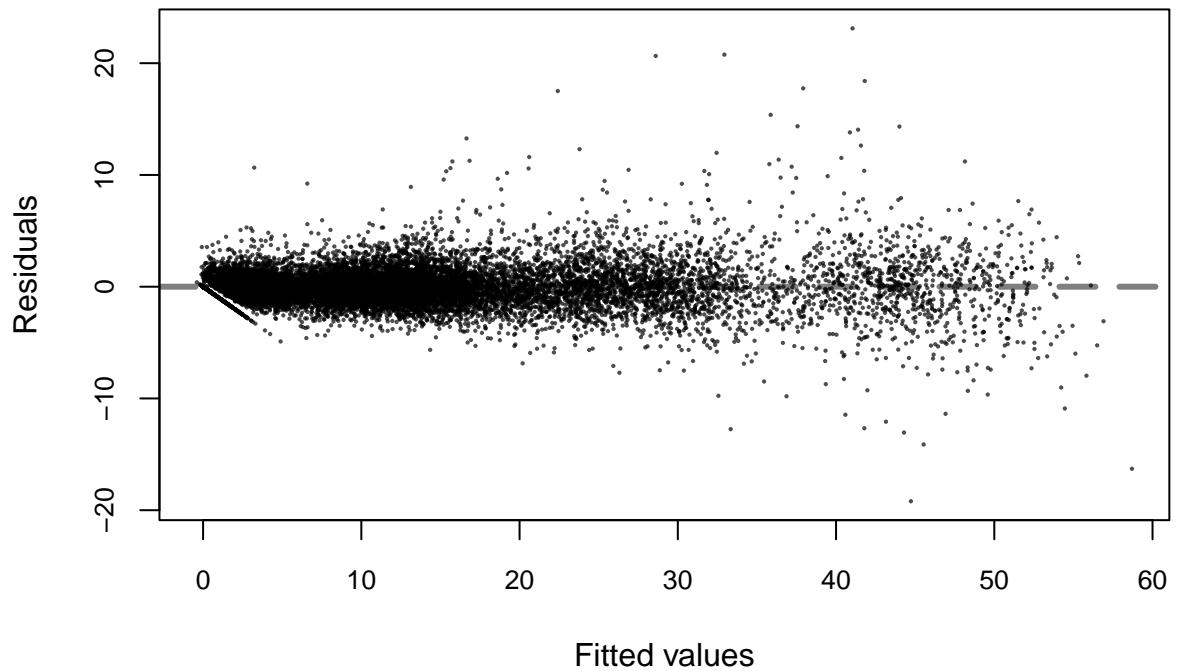
```



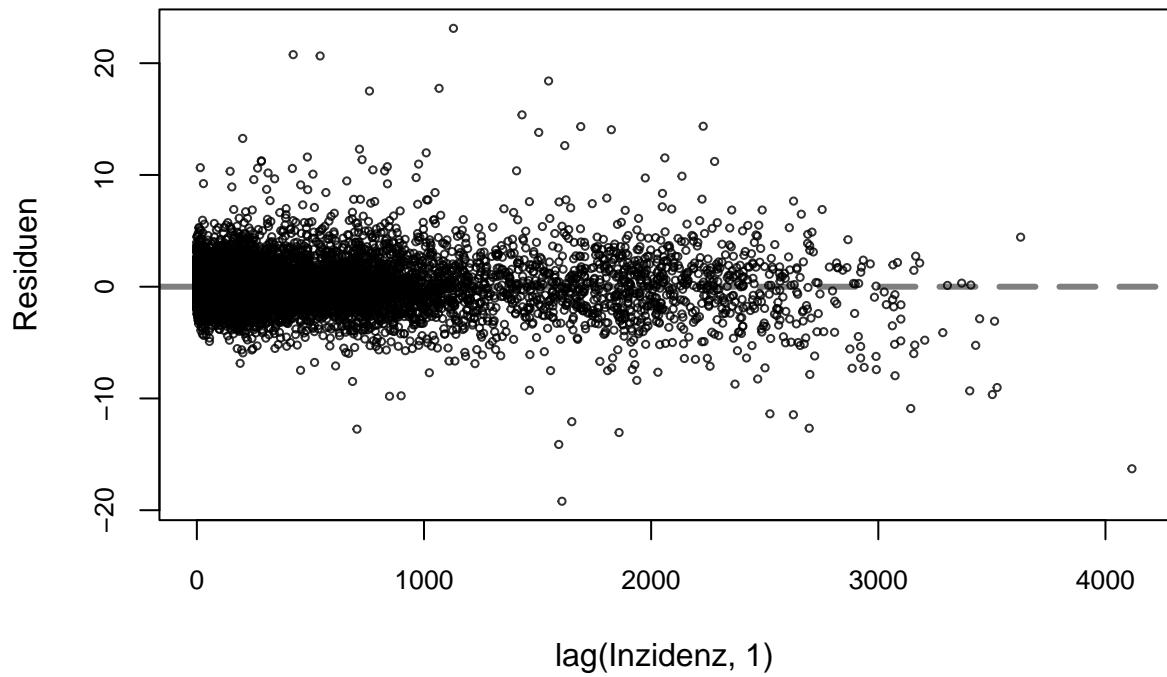
```
## integer(0)
```



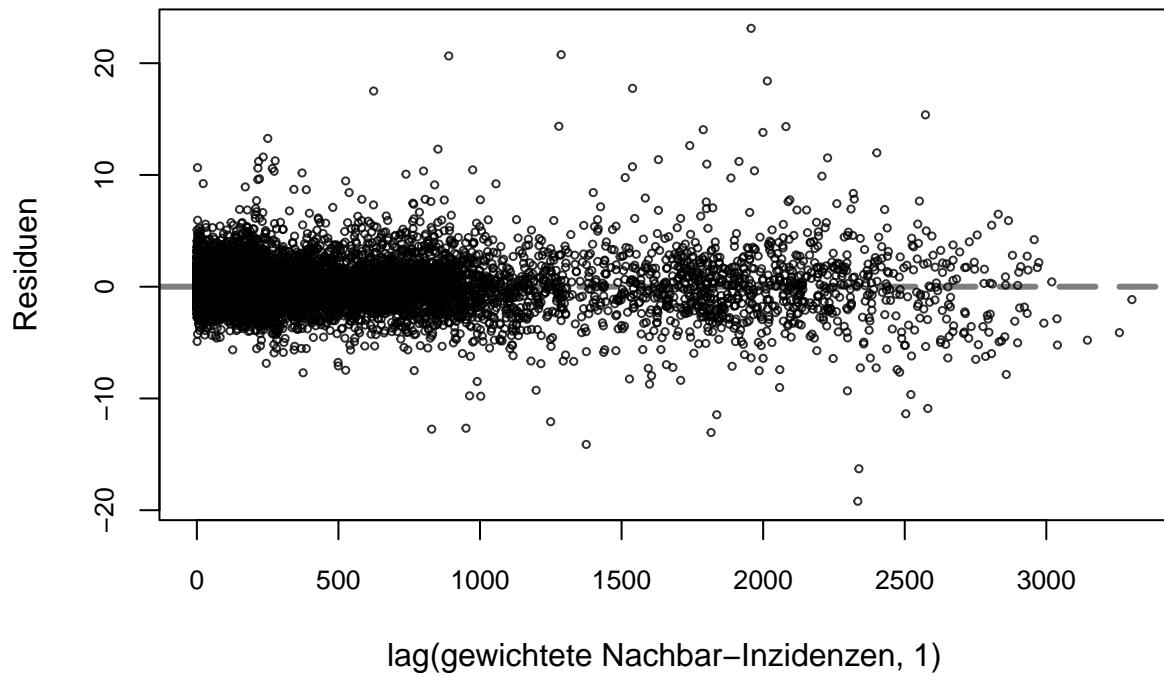
```
## integer(0)
```



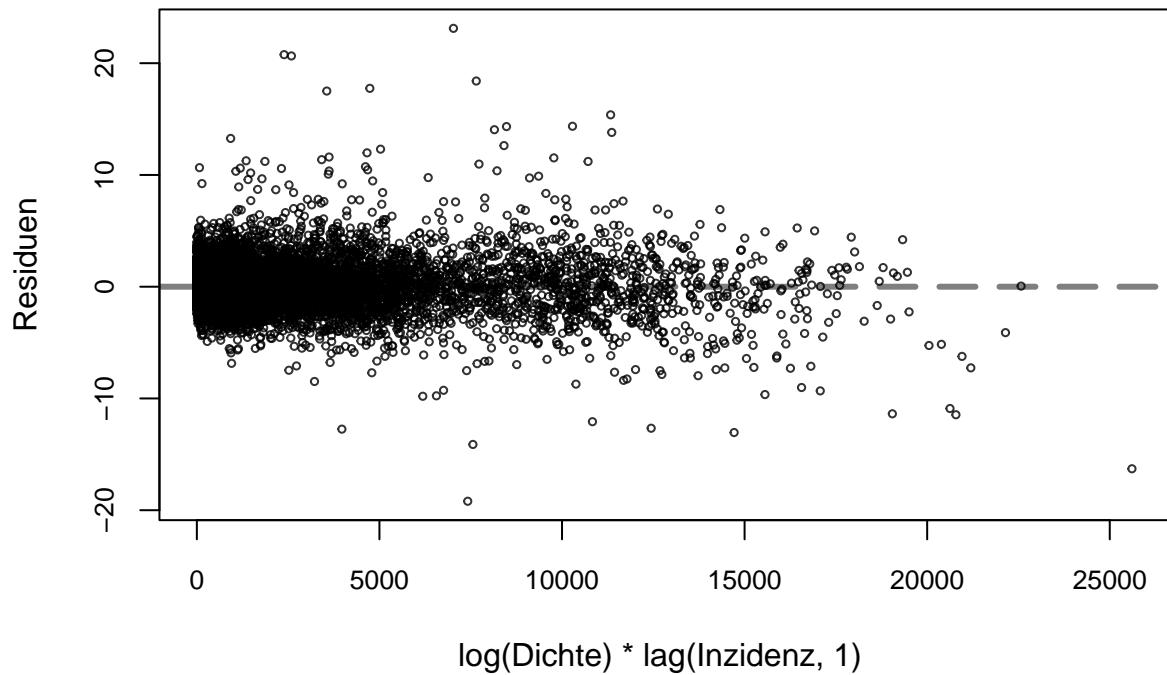
```
## integer(0)
```



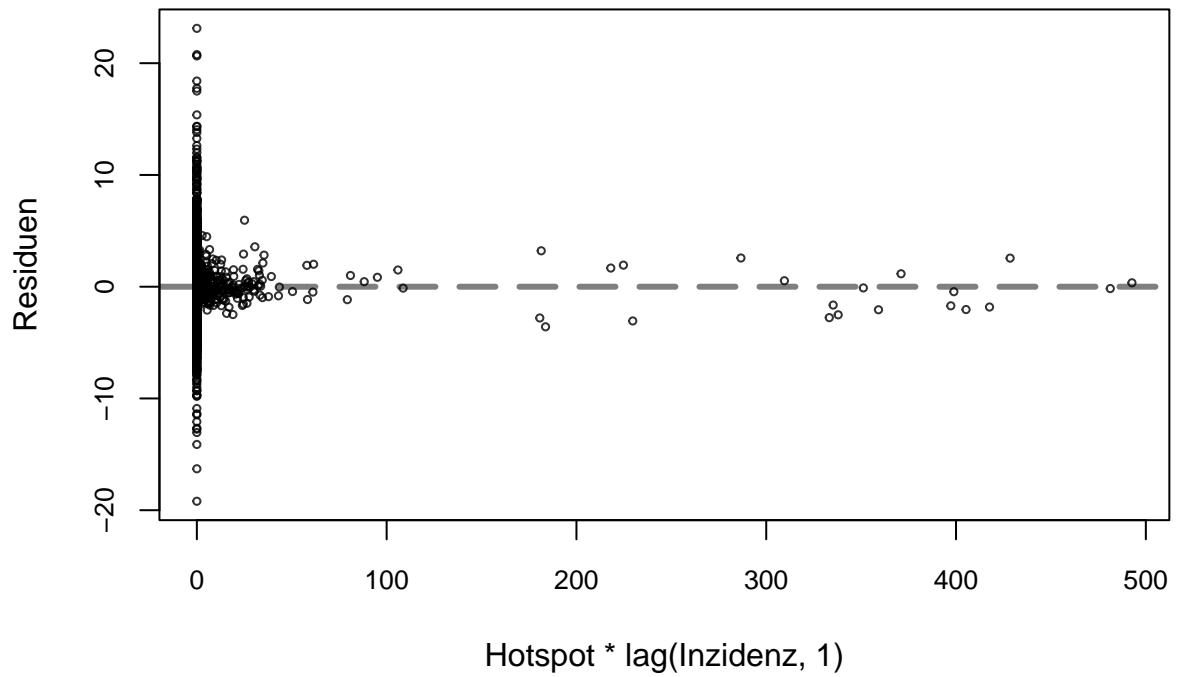
```
## integer(0)
```



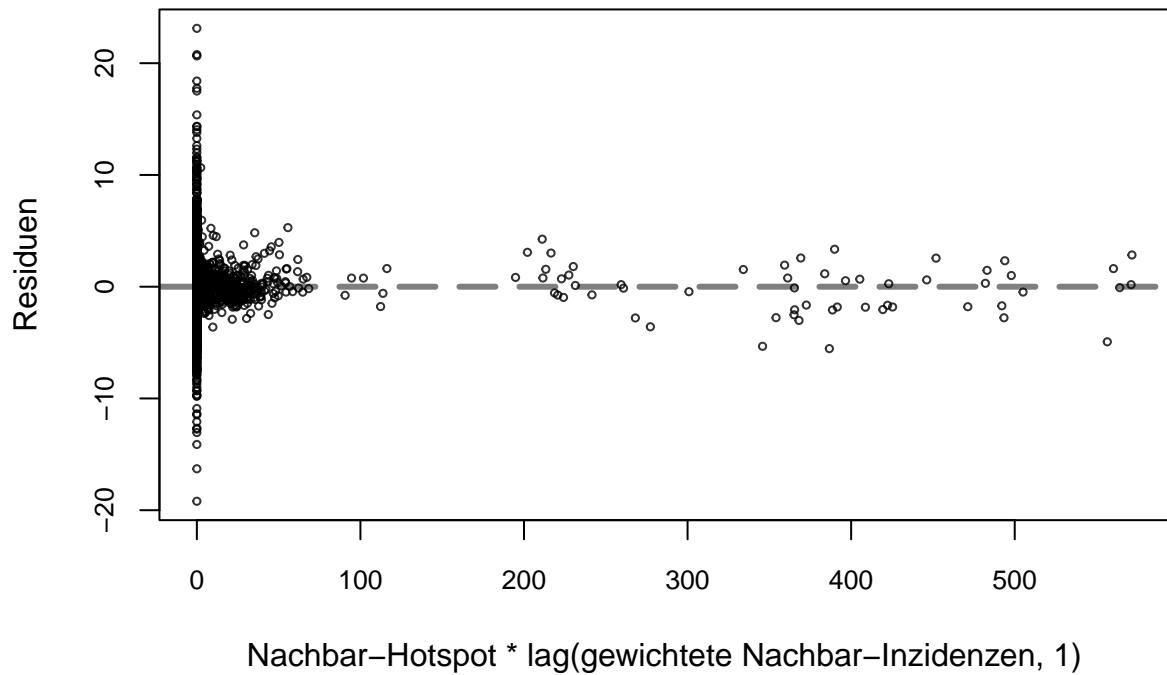
```
## integer(0)
```



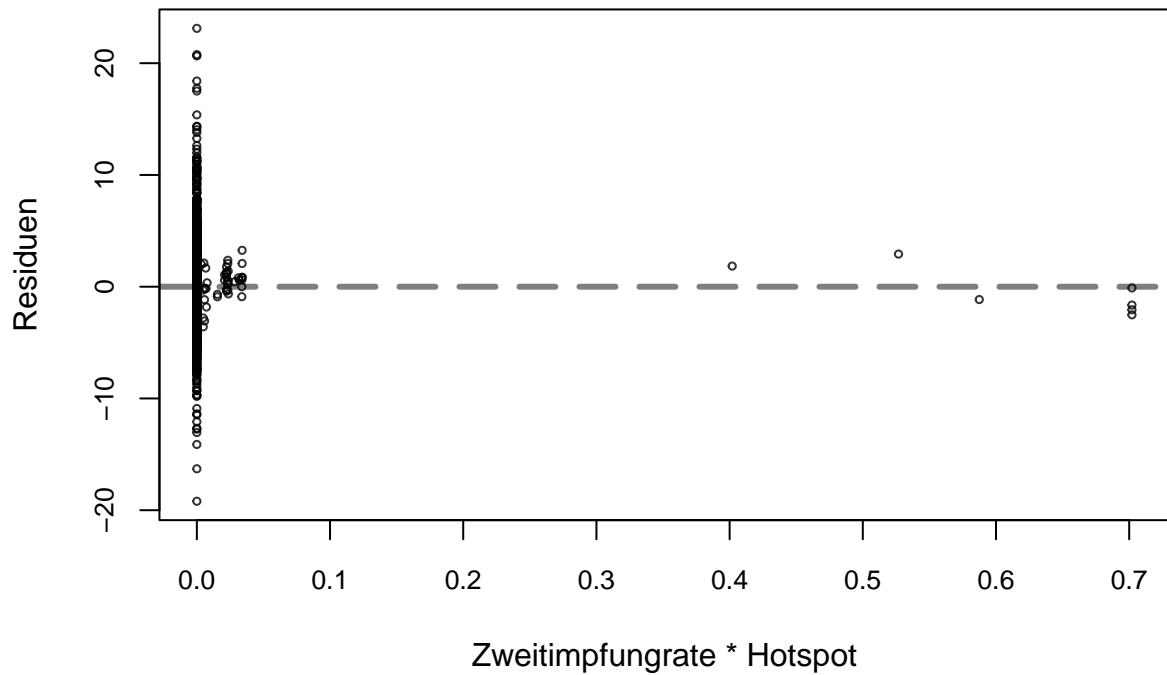
```
## integer(0)
```



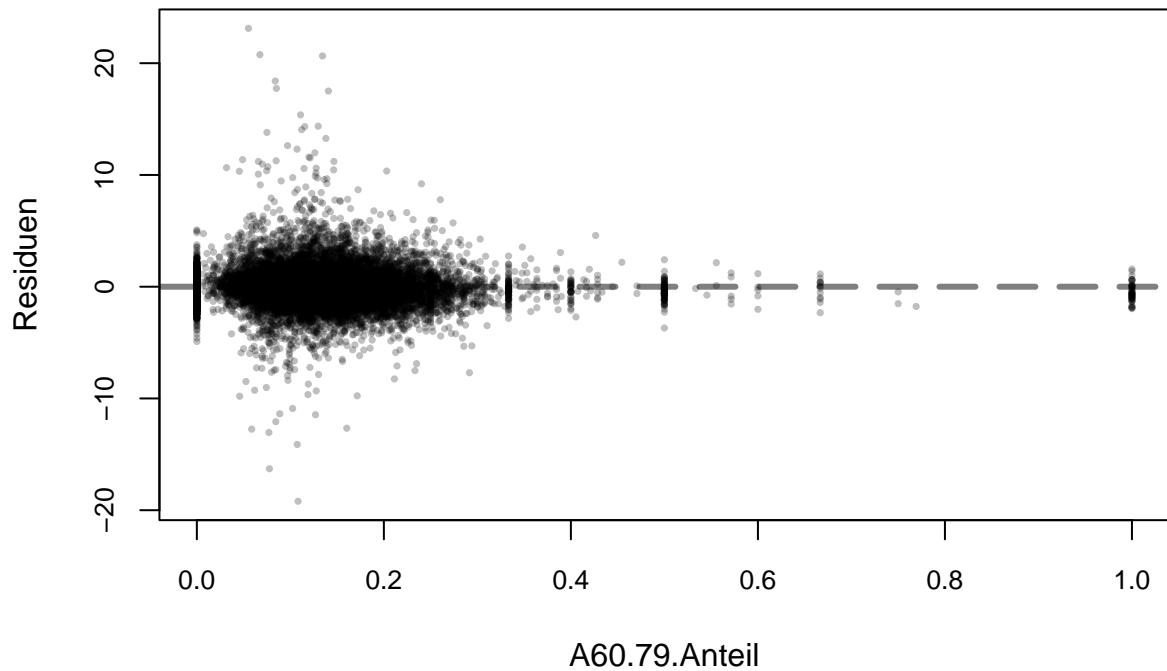
```
## integer(0)
```



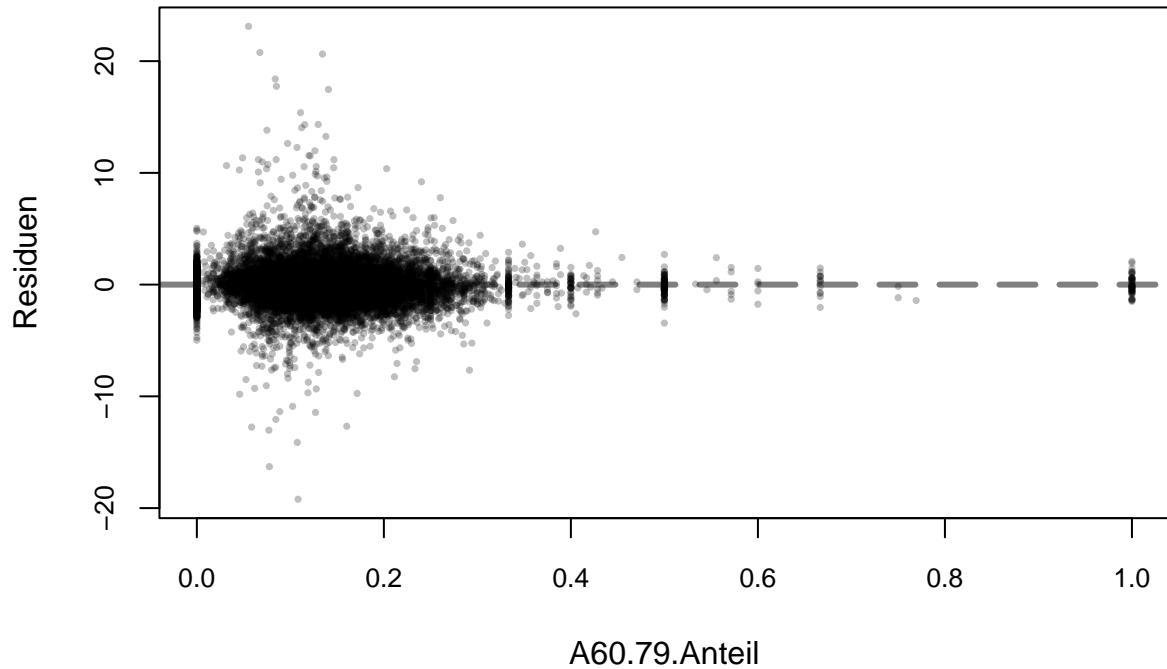
```
## integer(0)
```



```
## integer(0)
```



```
## integer(0)
```



```

## integer(0)

df4 <- df4 %>%
  mutate(Kalenderwoche = df4$week+3)

p<-c(1:9)
nullt<-subset(df4, df4$Kalenderwoche%in%p)

p<-c(9:20)
erst<-subset(df4,df4$Kalenderwoche%in%p)

p<-c(20:39)
zweit<-subset(df4,df4$Kalenderwoche%in%p)

p<-c(39:(52+8))
dritt<-subset(df4,df4$Kalenderwoche%in%p)

p<-c((52+9-1):(52+23))
viert<-subset(df4,df4$Kalenderwoche%in%p)

p<-c((52+24-1):(52+30))
fünft<-subset(df4,df4$Kalenderwoche%in%p)

p<-c((52+31-1):(52+51))

```

```

sechst<-subset(df4,df4$Kalendarwoche%in%p)

p<-c((52+52-1):(52+151))
siebt<-subset(df4,df4$Kalendarwoche%in%p)

p<-c(20:30)
zweit_a<-subset(df4,df4$Kalendarwoche%in%p)

p<-c(30:39)
zweit_b<-subset(df4,df4$Kalendarwoche%in%p)

p<-c((52+31-1):(52+39))
sechst_a<-subset(df4,df4$Kalendarwoche%in%p)

p<-c((52+40-1):(52+51))
sechst_b<-subset(df4,df4$Kalendarwoche%in%p)

df4_pan <- pdata.frame(df4, index = c("district", "week"))

nullt_pan<-pdata.frame(nullt,index=c("district","week"))

pool.nullt<-plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
                  + I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
                  +I(hotspotnb * lag(weightednbins, 1))
                  + A60.79.Anteil
                  + factor(week)
                  , data =nullt_pan, model = "pooling")

summary(pool.nullt)

```

```

## Pooling Model
##
## Call:
## plm(formula = inzidenz ~ lag(inzidenz, 1) + lag(weightednbins,
##           1) + I(log(density) * lag(inzidenz, 1)) + I(hotspot * lag(inzidenz,
##           1)) + I(hotspotnb * lag(weightednbins, 1)) + A60.79.Anteil +
##           factor(week), data = nullt_pan, model = "pooling")
##
## Balanced Panel: n = 96, T = 5, N = 480
##
## Residuals:
##       Min.    1st Qu.     Median    3rd Qu.     Max.
## -5.7212089 -0.0385659 -0.0098661  0.0062437 12.2476522
##
## Coefficients:
##                               Estimate Std. Error t-value Pr(>|t|)
## (Intercept)                0.0098661  0.0904924  0.1090  0.9132283
## lag(inzidenz, 1)            5.3474577  1.2275649  4.3562 1.627e-05
## lag(weightednbins, 1)       0.1286365  0.4084907  0.3149  0.7529725
## I(log(density) * lag(inzidenz, 1)) -0.9066297  0.2097791 -4.3218 1.891e-05
## I(hotspot * lag(inzidenz, 1))   10.1933767  0.7274941 14.0116 < 2.2e-16

```

```

## I(hotspotnb * lag(weightednbins, 1))  0.8150946  1.0664429  0.7643  0.4450660
## A60.79.Anteil                         1.8874738  0.7977027  2.3661  0.0183804
## factor(week)3                          -0.0150087  0.1241213 -0.1209  0.9038063
## factor(week)4                          -0.0161097  0.1250727 -0.1288  0.8975689
## factor(week)5                          0.0286998  0.1256038  0.2285  0.8193612
## factor(week)6                          0.4792564  0.1325589  3.6154  0.0003323
##
## (Intercept)
## lag(inzidenz, 1)                      ***
## lag(weightednbins, 1)
## I(log(density) * lag(inzidenz, 1))    ***
## I(hotspot * lag(inzidenz, 1))          ***
## I(hotspotnb * lag(weightednbins, 1))
## A60.79.Anteil                         *
## factor(week)3
## factor(week)4
## factor(week)5
## factor(week)6                          ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:      561.04
## Residual Sum of Squares:  346.68
## R-Squared:                 0.38208
## Adj. R-Squared:            0.36891
## F-statistic:               28.9998 on 10 and 469 DF, p-value: < 2.22e-16

pool.nullt.adj<-plm(inzidenz ~ lag(inzidenz, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+ A60.79.Anteil + A15.34.Anteil
+ factor(week)
, data =nullt_pan, model = "pooling")
summary(pool.nullt.adj)

```

```

## Pooling Model
##
## Call:
## plm(formula = inzidenz ~ lag(inzidenz, 1) + I(log(density) *
##       lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1)) + A60.79.Anteil +
##       A15.34.Anteil + factor(week), data = nullt_pan, model = "pooling")
##
## Balanced Panel: n = 96, T = 5, N = 480
##
## Residuals:
##       Min.     1st Qu.    Median     3rd Qu.    Max.
## -5.7103090 -0.0279719 -0.0034045  0.0140785 12.2634929
##
## Coefficients:
##                               Estimate Std. Error t-value Pr(>|t|)
## (Intercept)                -0.0027655  0.0872644 -0.0317  0.9747317
## lag(inzidenz, 1)             5.0963406  1.2112636  4.2075 3.094e-05 ***
## I(log(density) * lag(inzidenz, 1)) -0.8698924  0.2069971 -4.2024 3.161e-05 ***
## I(hotspot * lag(inzidenz, 1))      9.8257410  0.7216136 13.6163 < 2.2e-16 ***
## A60.79.Anteil                  2.0818091  0.7771750  2.6787  0.0076502 **

```

```

## A15.34.Anteil          1.0206318  0.2787919  3.6609  0.0002798 ***
## factor(week)3          0.0061700  0.1225160  0.0504  0.9598565
## factor(week)4          -0.0113130  0.1225189 -0.0923  0.9264696
## factor(week)5          0.0307374  0.1229861  0.2499  0.8027538
## factor(week)6          0.4503997  0.1248964  3.6062  0.0003440 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:  561.04
## Residual Sum of Squares: 337.78
## R-Squared:      0.39795
## Adj. R-Squared: 0.38642
## F-statistic: 34.5182 on 9 and 470 DF, p-value: < 2.22e-16

coeftest(pool.nullt.adj, vcovHC(pool.nullt.adj, type = "HCO"))

##
## t test of coefficients:
##
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                -0.0027655  0.0171110 -0.1616 0.8716726
## lag(inzidenz, 1)            5.0963406  3.2489476  1.5686 0.1174112
## I(log(density) * lag(inzidenz, 1)) -0.8698924  0.5837139 -1.4903 0.1368235
## I(hotspot * lag(inzidenz, 1))    9.8257410  5.3848531  1.8247 0.0686810 .
## A60.79.Anteil               2.0818091  1.1578218  1.7980 0.0728124 .
## A15.34.Anteil               1.0206318  0.3961658  2.5763 0.0102913 *
## factor(week)3                0.0061700  0.0248213  0.2486 0.8037978
## factor(week)4                -0.0113130  0.0209738 -0.5394 0.5898736
## factor(week)5                0.0307374  0.0389960  0.7882 0.4309650
## factor(week)6                0.4503997  0.1183211  3.8066 0.0001595 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

nullt_pan<-pdata.frame(nullt,index=c("district","week"))

pool.nullt<-plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
                  + I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
                  +I(hotspotnb * lag(weightednbins, 1))
                  + A60.79.Anteil
                  + factor(week)
                  , data=nullt_pan, model = "pooling")

summary(pool.nullt)

## Pooling Model
##
## Call:
## plm(formula = inzidenz ~ lag(inzidenz, 1) + lag(weightednbins,
##           1) + I(log(density) * lag(inzidenz, 1)) + I(hotspot * lag(inzidenz,
##           1)) + I(hotspotnb * lag(weightednbins, 1)) + A60.79.Anteil +
##           factor(week), data = nullt_pan, model = "pooling")
##
## Balanced Panel: n = 96, T = 5, N = 480

```

```

## 
## Residuals:
##      Min.    1st Qu.     Median    3rd Qu.     Max. 
## -5.7212089 -0.0385659 -0.0098661  0.0062437 12.2476522
## 
## Coefficients:
##                               Estimate Std. Error t-value Pr(>|t|)    
## (Intercept)                0.0098661  0.0904924  0.1090  0.9132283
## lag(inzidenz, 1)            5.3474577  1.2275649  4.3562 1.627e-05
## lag(weightednbinz, 1)       0.1286365  0.4084907  0.3149  0.7529725
## I(log(density) * lag(inzidenz, 1)) -0.9066297  0.2097791 -4.3218 1.891e-05
## I(hotspot * lag(inzidenz, 1))      10.1933767  0.7274941 14.0116 < 2.2e-16
## I(hotspotnb * lag(weightednbinz, 1)) 0.8150946  1.0664429  0.7643  0.4450660
## A60.79.Anteil                 1.8874738  0.7977027  2.3661  0.0183804
## factor(week)3                  -0.0150087  0.1241213 -0.1209  0.9038063
## factor(week)4                  -0.0161097  0.1250727 -0.1288  0.8975689
## factor(week)5                  0.0286998  0.1256038  0.2285  0.8193612
## factor(week)6                  0.4792564  0.1325589  3.6154  0.0003323
## 
## (Intercept)
## lag(inzidenz, 1)          ***
## lag(weightednbinz, 1)       *** 
## I(log(density) * lag(inzidenz, 1)) *** 
## I(hotspot * lag(inzidenz, 1))   *** 
## I(hotspotnb * lag(weightednbinz, 1)) 
## A60.79.Anteil             *
## factor(week)3
## factor(week)4
## factor(week)5
## factor(week)6             ***
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Total Sum of Squares:  561.04
## Residual Sum of Squares: 346.68
## R-Squared: 0.38208
## Adj. R-Squared: 0.36891
## F-statistic: 28.9998 on 10 and 469 DF, p-value: < 2.22e-16

erst_pan<-pdata.frame(erst,index=c("district","week"))

pool.erst<-plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbinz, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+ I(hotspotnb * lag(weightednbinz, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data =erst_pan, model = "pooling")

summary(pool.erst)

## Pooling Model
## 
## Call:
## plm(formula = inzidenz ~ lag(inzidenz, 1) + lag(weightednbinz,

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```

##      1) + I(log(density) * lag(inzidenz, 1)) + I(hotspot * lag(inzidenz,
##      1)) + I(hotspotnb * lag(weightednbinz, 1)) + I(rate_zweitimpf *
##      hotspot) + A60.79.Anteil + factor(week), data = erst_pan,
##      model = "pooling")
##
## Balanced Panel: n = 96, T = 11, N = 1056
##
## Residuals:
##      Min. 1st Qu. Median 3rd Qu. Max.
## -77.1506 -6.9867 -1.2309 4.7492 175.0399
##
## Coefficients:
##                               Estimate Std. Error t-value Pr(>|t|)
## (Intercept)                5.7678435 1.9046491 3.0283 0.0025201
## lag(inzidenz, 1)            0.6811960 0.0585260 11.6392 < 2.2e-16
## lag(weightednbinz, 1)       0.1625975 0.0411724 3.9492 8.370e-05
## I(log(density) * lag(inzidenz, 1)) -0.0036743 0.0110745 -0.3318 0.7401254
## I(hotspot * lag(inzidenz, 1))    1.0282582 0.0841552 12.2186 < 2.2e-16
## I(hotspotnb * lag(weightednbinz, 1)) 0.5087354 0.1065625 4.7741 2.064e-06
## A60.79.Anteil                 1.5679032 3.8533370 0.4069 0.6841690
## factor(week)8                  11.7596603 2.7140836 4.3328 1.615e-05
## factor(week)9                  12.2347122 3.6440416 3.3575 0.0008152
## factor(week)10                 22.7842354 3.4910975 6.5264 1.051e-10
## factor(week)11                 -15.7970278 3.8522406 -4.1007 4.440e-05
## factor(week)12                 -17.6955699 3.3124785 -5.3421 1.129e-07
## factor(week)13                 -12.0979317 2.9025689 -4.1680 3.328e-05
## factor(week)14                 -13.2763126 2.7404727 -4.8445 1.462e-06
## factor(week)15                 -7.2470553 2.6633234 -2.7211 0.0066161
## factor(week)16                 -5.4593064 2.6426679 -2.0658 0.0390919
## factor(week)17                 -6.7186050 2.6366691 -2.5481 0.0109729
##
## (Intercept)                    **
## lag(inzidenz, 1)                  ***
## lag(weightednbinz, 1)                ***
## I(log(density) * lag(inzidenz, 1)) ***
## I(hotspot * lag(inzidenz, 1))        ***
## I(hotspotnb * lag(weightednbinz, 1)) ***
## A60.79.Anteil
## factor(week)8                     ***
## factor(week)9                     ***
## factor(week)10                     ***
## factor(week)11                     ***
## factor(week)12                     ***
## factor(week)13                     ***
## factor(week)14                     ***
## factor(week)15                     **
## factor(week)16                     *
## factor(week)17                     *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ',' 1
##
## Total Sum of Squares: 1718000
## Residual Sum of Squares: 342260
## R-Squared: 0.80078

```

```

## Adj. R-Squared: 0.79771
## F-statistic: 261.017 on 16 and 1039 DF, p-value: < 2.22e-16

zweit_pan<-pdata.frame(zweit,index=c("district","week"))

pool.zweit<-plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
                  + I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
                  +I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)
                  + A60.79.Anteil
                  + factor(week)
                  , data =zweit_pan, model = "pooling")

summary(pool.zweit)

## Pooling Model
##
## Call:
## plm(formula = inzidenz ~ lag(inzidenz, 1) + lag(weightednbins,
##     1) + I(log(density) * lag(inzidenz, 1)) + I(hotspot * lag(inzidenz,
##     1)) + I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf *
##     hotspot) + A60.79.Anteil + factor(week), data = zweit_pan,
##     model = "pooling")
##
## Balanced Panel: n = 96, T = 19, N = 1824
##
## Residuals:
##      Min.    1st Qu.     Median    3rd Qu.       Max.
## -47.39345 -2.78761  -0.72993   1.54923 179.77011
##
## Coefficients:
##                               Estimate Std. Error t-value Pr(>|t|)
## (Intercept)                0.273961  0.833675  0.3286 0.7424822 ***
## lag(inzidenz, 1)            0.467090  0.066509  7.0229 3.069e-12 ***
## lag(weightednbins, 1)       0.070331  0.045151  1.5577 0.1194837
## I(log(density) * lag(inzidenz, 1)) 0.025093  0.011417  2.1979 0.0280829 *
## I(hotspot * lag(inzidenz, 1))      1.525889  0.249523  6.1152 1.180e-09 ***
## I(hotspotnb * lag(weightednbins, 1)) 0.303457  0.088211  3.4401 0.0005947 ***
## A60.79.Anteil               -0.102526  1.022538 -0.1003 0.9201441
## factor(week)19              -0.678570  1.110154 -0.6112 0.5411186
## factor(week)20              -0.161211  1.122315 -0.1436 0.8857993
## factor(week)21              0.131747  1.122021  0.1174 0.9065409
## factor(week)22              0.860164  1.124962  0.7646 0.4446008
## factor(week)23              0.481517  1.122384  0.4290 0.6679654
## factor(week)24              0.462658  1.120989  0.4127 0.6798584
## factor(week)25              0.900542  1.117939  0.8055 0.4206160
## factor(week)26              2.886469  1.116552  2.5852 0.0098114 **
## factor(week)27              0.351492  1.123021  0.3130 0.7543262
## factor(week)28              1.267536  1.112829  1.1390 0.2548456
## factor(week)29              3.400907  1.129015  3.0123 0.0026291 **
## factor(week)30              5.225912  1.170209  4.4658 8.473e-06 ***
## factor(week)31              3.662153  1.159684  3.1579 0.0016155 **
## factor(week)32              5.573301  1.157555  4.8147 1.597e-06 ***
## factor(week)33              6.476474  1.156640  5.5994 2.483e-08 ***
## factor(week)34              5.590747  1.211877  4.6133 4.243e-06 ***

```

```

## factor(week)35          2.060693  1.220331  1.6886 0.0914628 .
## factor(week)36          4.934123  1.170717  4.2146 2.626e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares: 231230
## Residual Sum of Squares: 106030
## R-Squared: 0.54148
## Adj. R-Squared: 0.53536
## F-statistic: 88.5191 on 24 and 1799 DF, p-value: < 2.22e-16

dritt_pan <-pdata.frame(dritt, index=c("district", "week"))

pool.dritt <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbinz, 1)
                  + I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
                  + I(hotspotnb * lag(weightednbinz, 1)) + I(rate_zweitimpf * hotspot)
                  + A60.79.Anteil
                  + factor(week)
                  , data =dritt_pan, model = "pooling")
summary(pool.dritt)

## Pooling Model
##
## Call:
## plm(formula = inzidenz ~ lag(inzidenz, 1) + lag(weightednbinz,
##           1) + I(log(density) * lag(inzidenz, 1)) + I(hotspot * lag(inzidenz,
##           1)) + I(hotspotnb * lag(weightednbinz, 1)) + I(rate_zweitimpf *
##           hotspot) + A60.79.Anteil + factor(week), data = dritt_pan,
##           model = "pooling")
##
## Balanced Panel: n = 96, T = 21, N = 2016
##
## Residuals:
##      Min.    1st Qu.     Median    3rd Qu.     Max.
## -140.0835 -21.7091   -4.1429   15.4433  243.3128
##
## Coefficients:
##                               Estimate Std. Error t-value Pr(>|t|)
## (Intercept)                7.9732463  4.6841799  1.7022 0.0888807
## lag(inzidenz, 1)            0.7174329  0.0337259 21.2724 < 2.2e-16
## lag(weightednbinz, 1)       0.1976777  0.0295735  6.6843 3.004e-11
## I(log(density) * lag(inzidenz, 1)) -0.0010176  0.0051481 -0.1977 0.8433259
## I(hotspot * lag(inzidenz, 1))    0.6533205  0.1883441  3.4688 0.0005340
## I(hotspotnb * lag(weightednbinz, 1)) 0.2363805  0.1651654  1.4312 0.1525372
## A60.79.Anteil                 6.4837452 16.0044002  0.4051 0.6854309
## factor(week)38                 10.2715440  5.7295665  1.7927 0.0731686
## factor(week)39                 26.2599891  6.4515621  4.0703 4.878e-05
## factor(week)40                 47.4053304  5.9676632  7.9437 3.254e-15
## factor(week)41                 34.5753811  6.4555666  5.3559 9.498e-08
## factor(week)42                 11.6033447  6.8889762  1.6843 0.0922738
## factor(week)43                 9.4131253  7.0297130  1.3390 0.1807080
## factor(week)44                 12.2210521  6.9946970  1.7472 0.0807590
## factor(week)45                 5.2030500  7.0344008  0.7397 0.4595949
## factor(week)46                 39.5359118  7.0222104  5.6301 2.057e-08

```

```

## factor(week)47      13.7798730  7.4443172  1.8511  0.0643092
## factor(week)48     -27.8082116  7.6065987 -3.6558  0.0002630
## factor(week)49      2.4278935  6.9458965  0.3495  0.7267183
## factor(week)50      13.0202619  6.9365359  1.8771  0.0606568
## factor(week)51     -22.9439011  6.9671624 -3.2931  0.0010081
## factor(week)52     -25.5394766  6.5853401 -3.8782  0.0001086
## factor(week)53     -9.4966471  6.2102167 -1.5292  0.1263745
## factor(week)54     -14.6036090  6.0613673 -2.4093  0.0160738
## factor(week)55     -22.3443252  5.9389475 -3.7623  0.0001732
## factor(week)56     -0.6853762  5.8093032 -0.1180  0.9060962
## factor(week)57      5.1768050  5.8127921  0.8906  0.3732578
##
## (Intercept) .
## lag(inzidenz, 1) ***
## lag(weightednbinz, 1) ***
## I(log(density) * lag(inzidenz, 1)) ***
## I(hotspot * lag(inzidenz, 1)) ***
## I(hotspotnb * lag(weightednbinz, 1))
## A60.79.Anteil .
## factor(week)38 .
## factor(week)39 ***
## factor(week)40 ***
## factor(week)41 ***
## factor(week)42 .
## factor(week)43 .
## factor(week)44 .
## factor(week)45 .
## factor(week)46 ***
## factor(week)47 .
## factor(week)48 ***
## factor(week)49 .
## factor(week)50 .
## factor(week)51 **
## factor(week)52 ***
## factor(week)53 .
## factor(week)54 *
## factor(week)55 ***
## factor(week)56 .
## factor(week)57
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:  13275000
## Residual Sum of Squares: 3024500
## R-Squared:  0.77217
## Adj. R-Squared: 0.76919
## F-statistic: 259.27 on 26 and 1989 DF, p-value: < 2.22e-16

pool.viert <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbinz, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+ I(hotspotnb * lag(weightednbinz, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data = viert, model = "pooling", index=c("district", "week"))

```

```

pool.fuenft <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data =fünft, model = "pooling", index=c("district", "week"))
pool.schst <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data =schst, model = "pooling", index=c("district", "week"))
pool.siebt <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data =siebt, model = "pooling", index=c("district", "week"))

pool.zweit.a <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data = zweit_a, model = "pooling", index = c("district", "week"))
stats::AIC(pool.zweit.a)

```

## [1] 6505.428

```

pool.zweit.b <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data = zweit_b, model = "pooling", index = c("district", "week"))
stats::AIC(pool.zweit.b)

```

## [1] 6100.213

```

pool.schst.a <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))
+I(hotspotnb * lag(weightednbins, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data = schst_a, model = "pooling", index = c("district", "week"))
stats::AIC(pool.schst.a)

```

## [1] 7696.092

```

pool.schst.b <- plm(inzidenz ~ lag(inzidenz, 1) + lag(weightednbins, 1)
+ I(log(density)*lag(inzidenz, 1)) + I(hotspot * lag(inzidenz, 1))

```

```

+I(hotspotnb * lag(weightednbinz, 1)) + I(rate_zweitimpf * hotspot)
+ A60.79.Anteil
+ factor(week)
, data = sechst_b, model = "pooling", index = c("district", "week"))
stats::AIC(pool.sechst.b)

## [1] 13436.9

sum.nullt <- summary(pool.nullt)
sum.erst <- summary(pool.erst)
sum.zweit <- summary(pool.zweit)
sum.dritt <-summary(pool.dritt)
sum.viert <-summary(pool.viert)
sum.fuenft <-summary(pool.fuenft)
sum.sechst <-summary(pool.sechst)
sum.siebt <-summary(pool.siebt)
sum.zweit.a <-summary(pool.zweit.a)
sum.zweit.b <-summary(pool.zweit.b)
sum.sechst.a <-summary(pool.sechst.a)
sum.sechst.b <-summary(pool.sechst.b)

sum.nullt$r.squared

##      rsq      adjrsq
## 0.3820804 0.3689052

sum.erst$r.squared

##      rsq      adjrsq
## 0.8007773 0.7977094

sum.zweit$r.squared

##      rsq      adjrsq
## 0.541476 0.535359

sum.dritt$r.squared

##      rsq      adjrsq
## 0.7721656 0.7691873

sum.viert$r.squared

##      rsq      adjrsq
## 0.8411654 0.8388131

sum.fuenft$r.squared

##      rsq      adjrsq
## 0.3922400 0.3802326

```

```
sum.sechst$r.squared
```

```
##      rsq      adjrsq  
## 0.9341168 0.9332220
```

```
sum.siebt$r.squared
```

```
##      rsq      adjrsq  
## 0.9296226 0.9287879
```

```
sum.zweit.a$r.squared
```

```
##      rsq      adjrsq  
## 0.3090301 0.2980507
```

```
sum.zweit.b$r.squared
```

```
##      rsq      adjrsq  
## 0.5173485 0.5093895
```

```
sum.sechst.a$r.squared
```

```
##      rsq      adjrsq  
## 0.7697974 0.7657254
```

```
sum.sechst.b$r.squared
```

```
##      rsq      adjrsq  
## 0.8960583 0.8944070
```