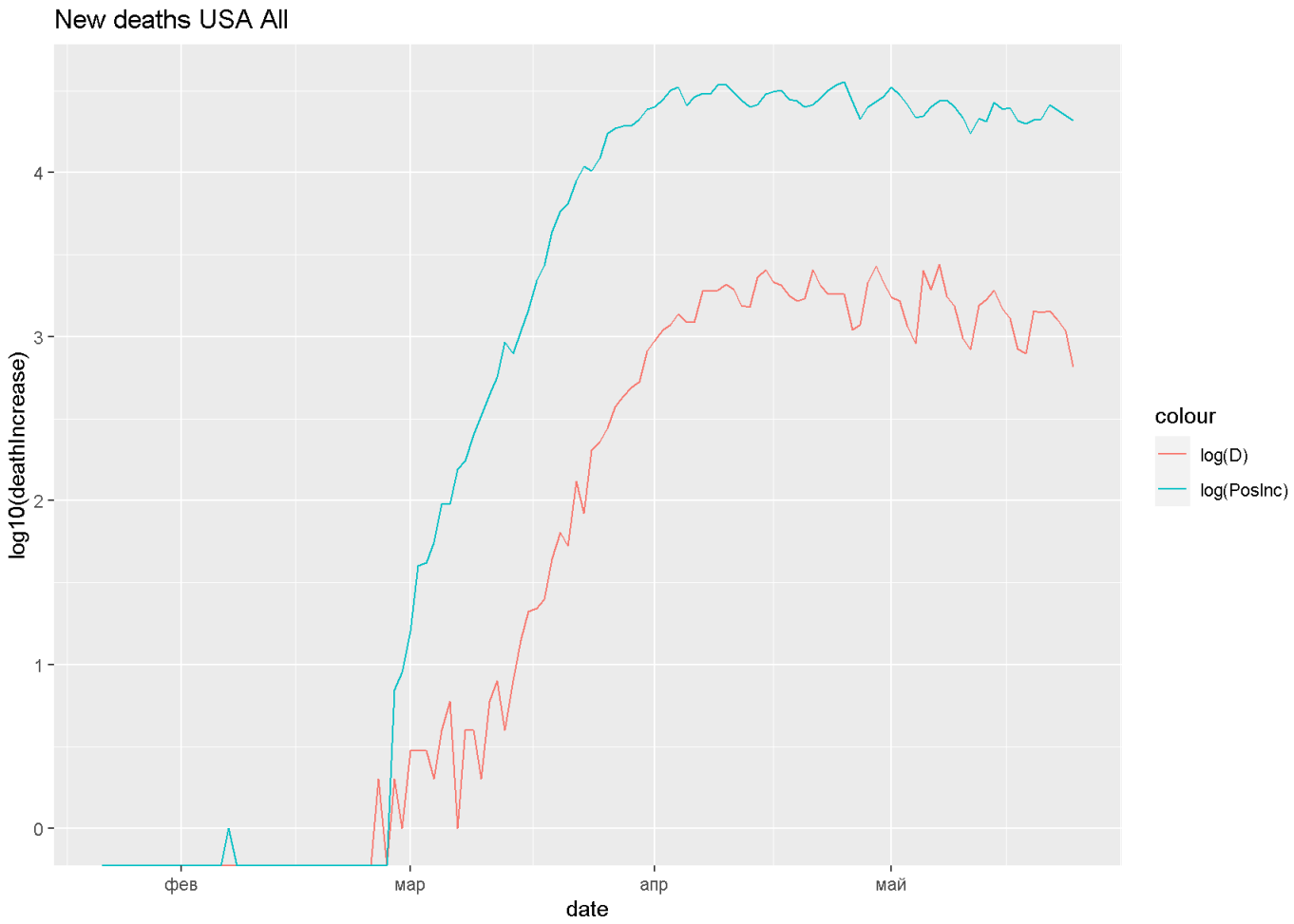
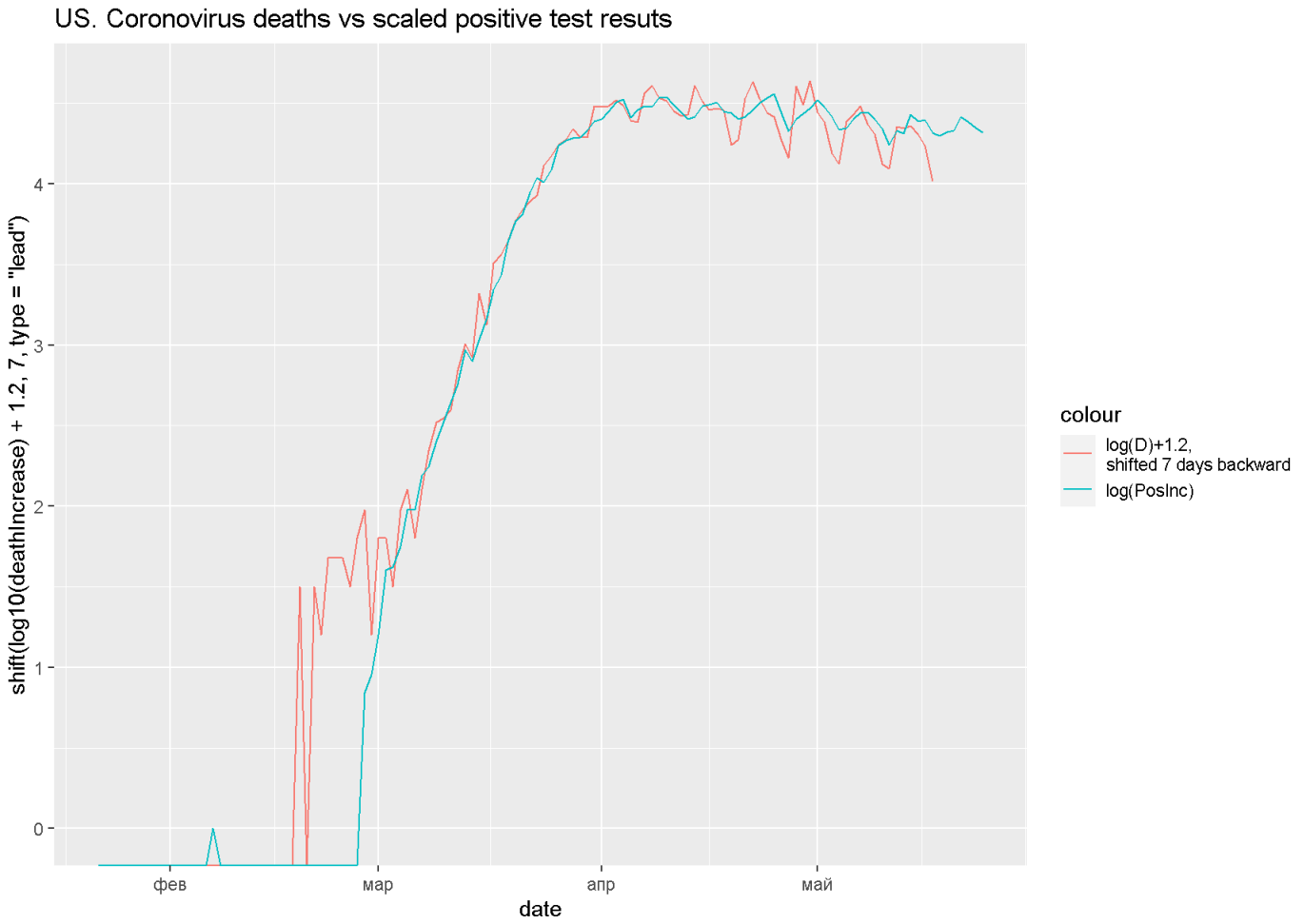
Correlations in US Covid daily variables

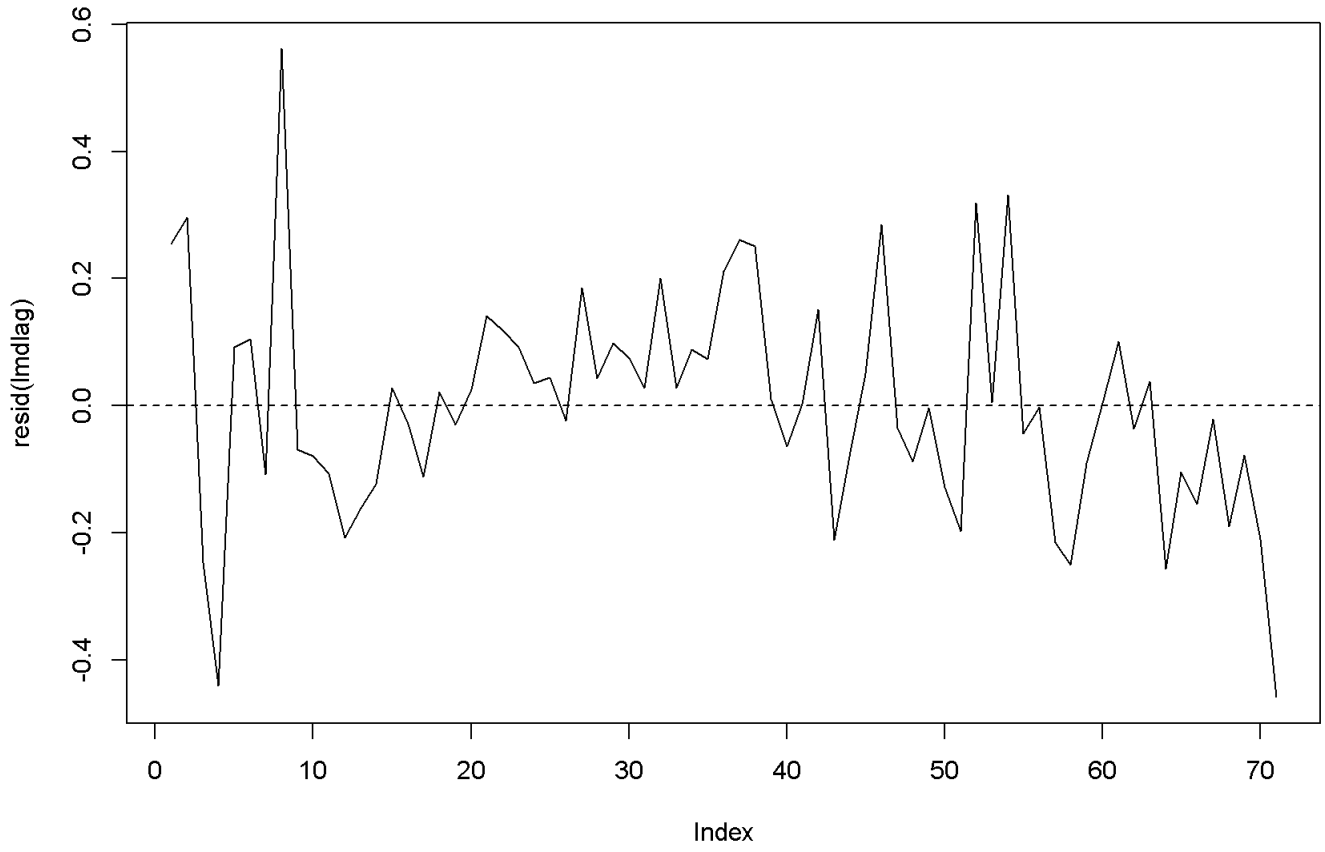
Q: Каков лаг между кривой выявления новых случаев и кривой смертельных исходов?





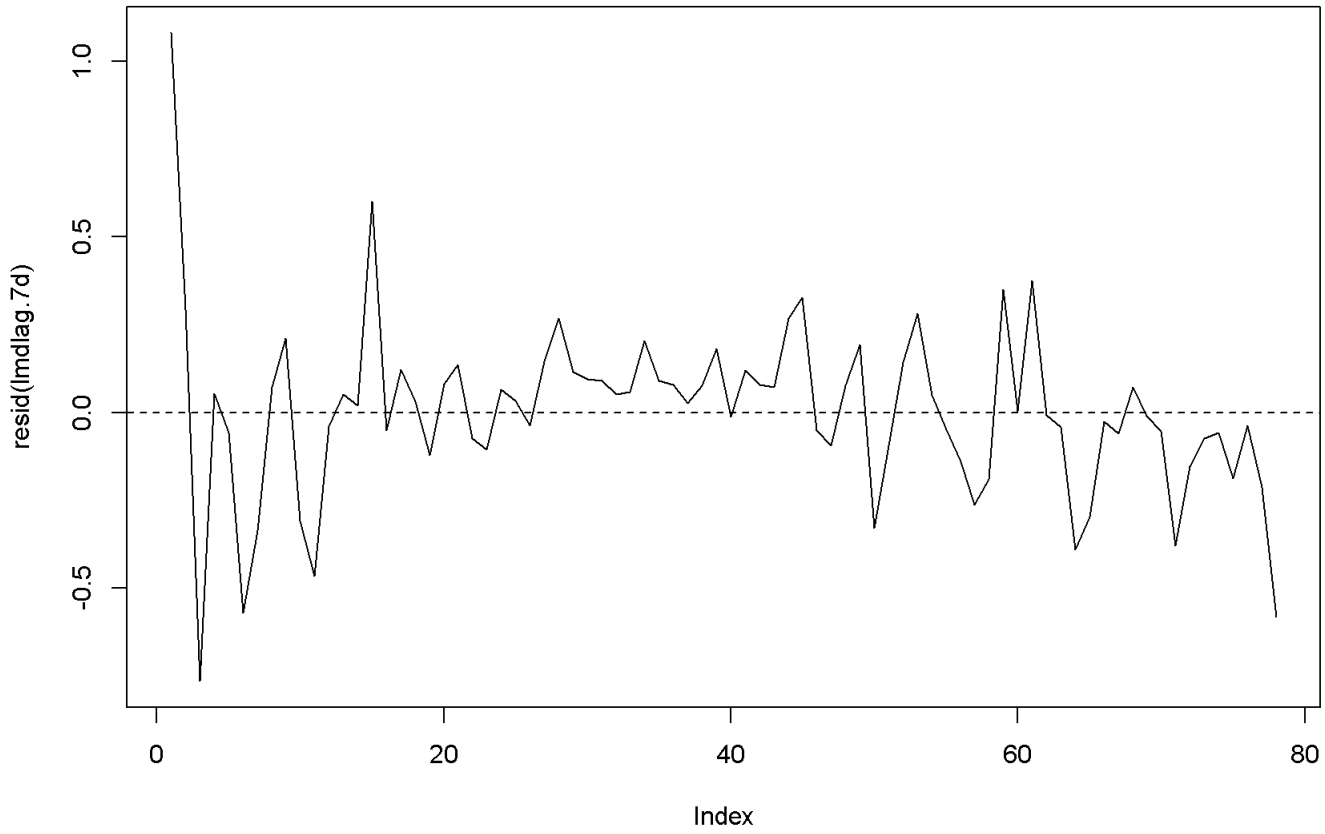
Модель с распределенными лагами и учетом дней недели.

```
##
## Call:
## lm(formula = log(deathIncrease) ~ shift(log(positiveIncrease),
##     5) + shift(log(positiveIncrease), 7) + shift(log(positiveIncrease),
##     10) + shift(log(positiveIncrease), 14) + weekday, data = data2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.45891 -0.10596  0.00269  0.09176  0.56159
##
## Coefficients:
##                                 Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     -3.17036    0.34069  -9.306 3.03e-13 ***
## shift(log(positiveIncrease), 5)   0.51126    0.18174   2.813 0.006623 **
## shift(log(positiveIncrease), 7)   0.59256    0.22456   2.639 0.010586 *
## shift(log(positiveIncrease), 10) -0.13507    0.18543  -0.728 0.469165
## shift(log(positiveIncrease), 14)  0.05132    0.08910   0.576 0.566813
## weekday2                        -0.04837    0.08554  -0.566 0.573842
## weekday3                         0.31965    0.09021   3.543 0.000772 ***
## weekday4                         0.21769    0.09969   2.184 0.032915 *
## weekday5                         0.20637    0.11040   1.869 0.066461 .
## weekday6                         0.15389    0.11157   1.379 0.172903
## weekday7                         0.13651    0.09794   1.394 0.168534
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1904 on 60 degrees of freedom
##   (14 observations deleted due to missingness)
## Multiple R-squared:  0.9819, Adjusted R-squared:  0.9789
## F-statistic: 326.2 on 10 and 60 DF,  p-value: < 2.2e-16
```



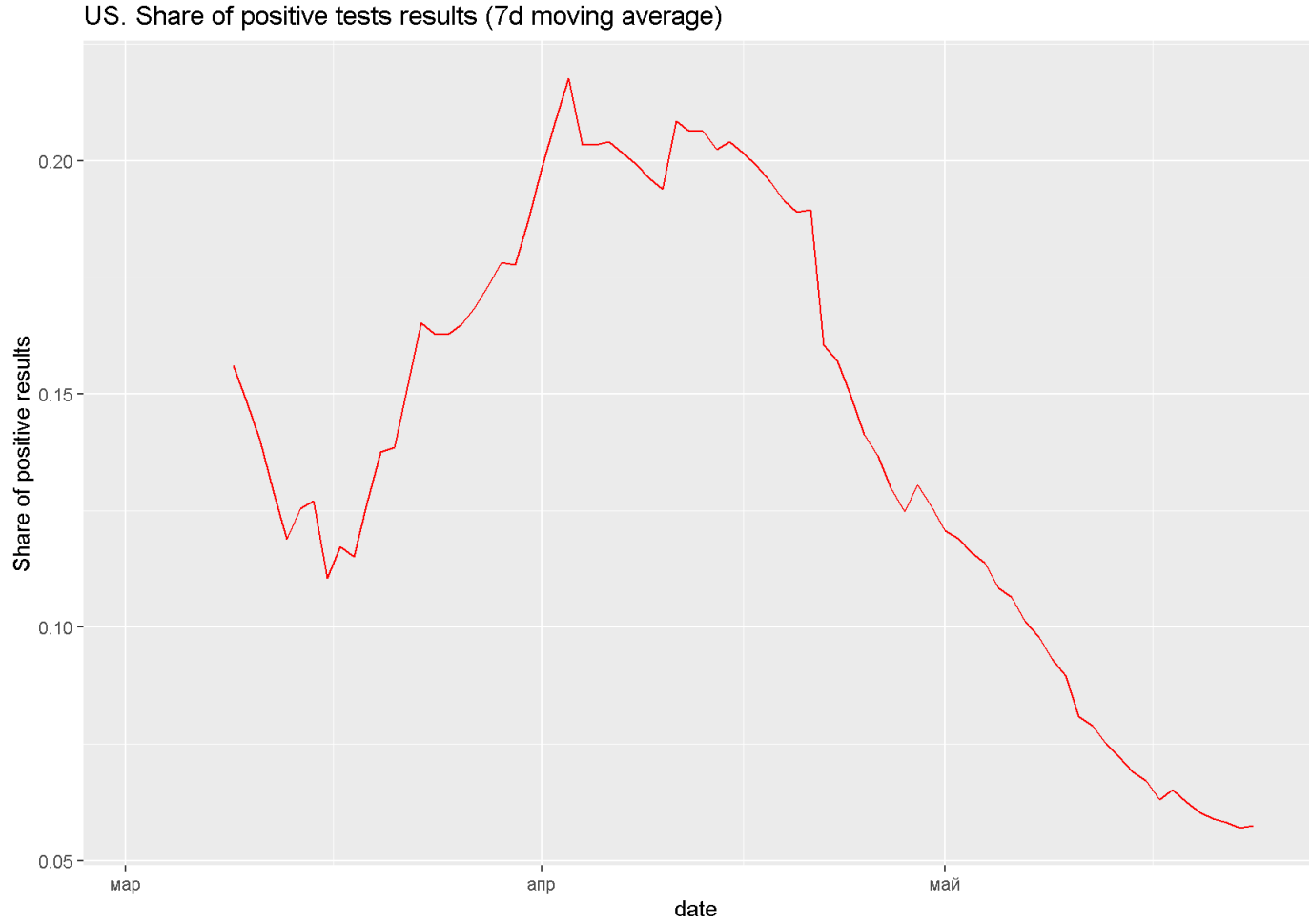

```
##
## Call:
## lm(formula = log(deathIncrease) ~ shift(log(positiveIncrease),
##     7) + weekday, data = data2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.76502 -0.08908  0.02347  0.09300  1.08042
##
## Coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    -2.30842    0.15244 -15.143   <2e-16 ***
## shift(log(positiveIncrease), 7)  0.94291    0.01504  62.712   <2e-16 ***
## weekday2                       -0.07563    0.11196  -0.676   0.5016
## weekday3                        0.24232    0.11197   2.164   0.0339 *
## weekday4                        0.25053    0.11202   2.237   0.0285 *
## weekday5                        0.15176    0.11217   1.353   0.1804
## weekday6                       -0.02785    0.11228  -0.248   0.8049
## weekday7                       -0.03265    0.11229  -0.291   0.7721
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2682 on 70 degrees of freedom
##   (7 observations deleted due to missingness)
## Multiple R-squared:  0.9828, Adjusted R-squared:  0.9811
## F-statistic: 571.4 on 7 and 70 DF,  p-value: < 2.2e-16
```

У остатков есть явная зависимость от времени.

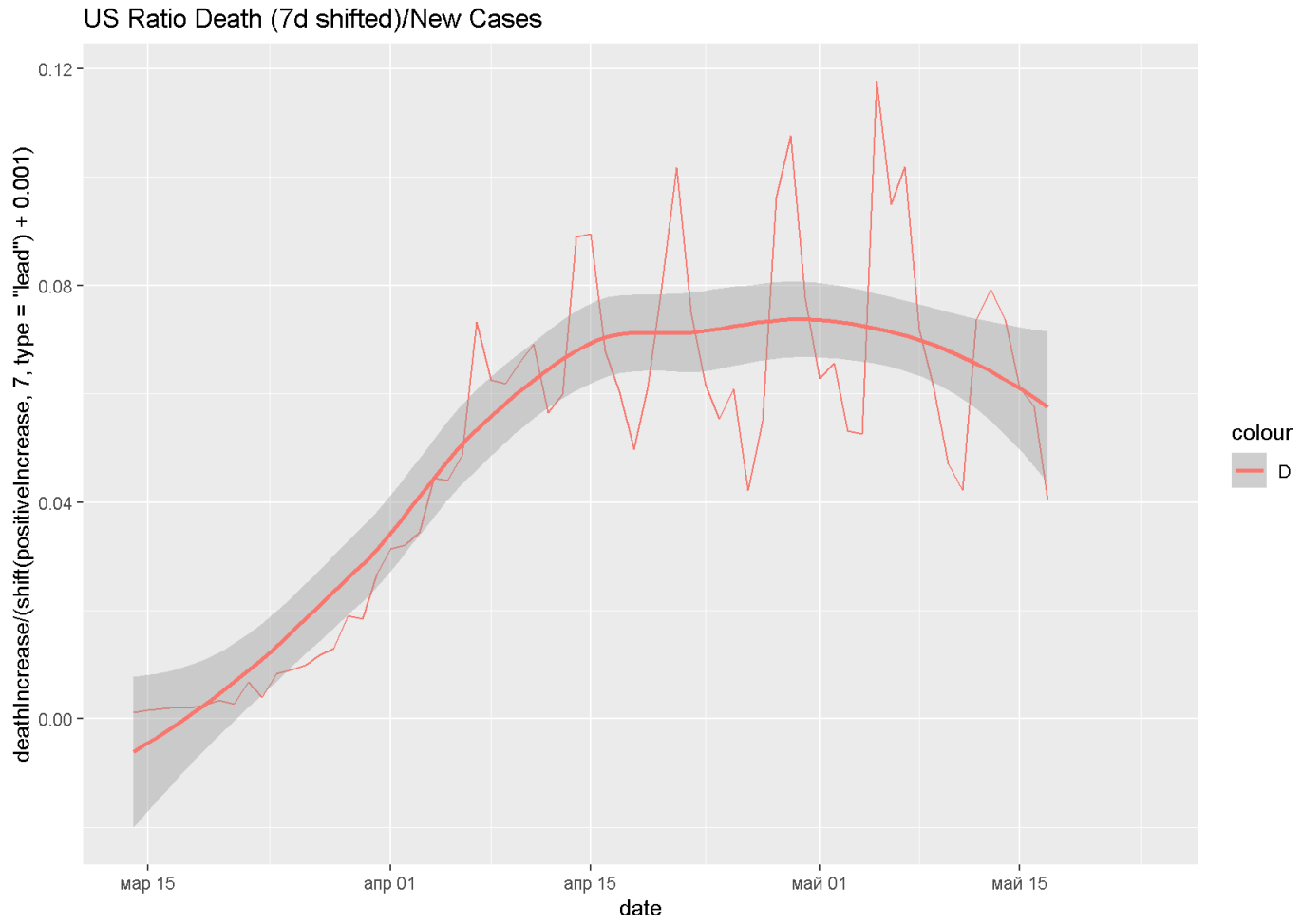


Вывод: DLM предпочитает модель с лагом 5-7 дней, но она описыает взаимное поведение кривых только в нулевом приближении. Со временем зависимость несколько меняется.

Q: Какая доля эффективных тестов (т.е. тестов, выявивших зараженных) от числа проведенных тестов)?



Q: Какая летальность видуса (CFR) в США?



Около 7%.