

# Homework 8

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11.1 Using the crime data set `uscrime.txt` from Questions 8.2, 9.1, and 10.1, build a regression model using:

1. Stepwise regression
2. Lasso
3. Elastic net For Parts 2 and 3, remember to scale the data first – otherwise, the regression coefficients will be on different scales and the constraint won't have the desired effect.

```
uscrime_data <- read.table('C:/Users/mjpearl/Desktop/omsa/ISYE-6501-0AN/hw8/data/uscrime.txt', header = TRUE)
head(uscrime_data)
```

```
##      M So   Ed Po1 Po2   LF   M.F Pop   NW   U1 U2 Wealth Ineq
## 1 15.1  1  9.1  5.8  5.6 0.510  95.0  33 30.1 0.108 4.1   3940 26.1
## 2 14.3  0 11.3 10.3  9.5 0.583 101.2  13 10.2 0.096 3.6   5570 19.4
## 3 14.2  1  8.9  4.5  4.4 0.533  96.9  18 21.9 0.094 3.3   3180 25.0
## 4 13.6  0 12.1 14.9 14.1 0.577  99.4 157  8.0 0.102 3.9   6730 16.7
## 5 14.1  0 12.1 10.9 10.1 0.591  98.5  18  3.0 0.091 2.0   5780 17.4
## 6 12.1  0 11.0 11.8 11.5 0.547  96.4  25  4.4 0.084 2.9   6890 12.6
##      Prob   Time Crime
## 1 0.084602 26.2011   791
## 2 0.029599 25.2999  1635
## 3 0.083401 24.3006   578
## 4 0.015801 29.9012  1969
## 5 0.041399 21.2998  1234
## 6 0.034201 20.9995   682
```

Create Input Datasets to be used by all model types before scaling occurs

- 1) Step-Wise Regression: This will be an incremental approach to determine the relevant features that account for the most variance on the target variable. Either method (i.e. backward or forward) will go through each feature and determine it's relevance based on the p-value

```
#Remove So feature from the dataset as this is not required to normalize as it's a binary or
stepwise_x_colnames = colnames(uscrime_data[,names(uscrime_data) != "So" & names(uscrime_data) != "Crime"])

scale <- function(dataframe, cols) {
  result <- dataframe # make a copy of the input data frame

  for (j in cols) {
    m <- mean(dataframe[,j])
    std <- sd(dataframe[,j])

    result[,j] <- sapply(result[,j], function(x) (x - m) / std)
  }
  return(result)
}
```

```
}

uscrime_data.norm <- scale(uscrime_data, stepwise_x_colnames)
```

We will now fit the variable using AIC as the validation criteria, and cross validation to split the relevant data into training, validation and test. We will use backward step-wise regression to start with the full feature set and determine based on the iterative p-value scores which features to keep.

```
ctrl <- trainControl(method = "repeatedcv", number = 5, repeats = 5)

step_fit <- train(Crime ~ ., data = uscrime_data.norm, "lmStepAIC", scope =
  list(lower = Crime~1, upper = Crime~.), direction = "backward",
  trControl=ctrl)
```

```
## Start: AIC=381.85
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq  RSS   AIC
## - Wealth  1      11 472736 379.85
## - LF      1      628 473353 379.90
## - NW      1     3529 476254 380.12
## - M.F     1    10442 483167 380.66
## - So      1    12966 485691 380.85
## <none>          472725 381.85
## - Po2     1     46457 519182 383.32
## - U1      1     57487 530212 384.09
## - Pop     1     77426 550151 385.46
## - Time    1    123533 596258 388.44
## - U2      1    140628 613353 389.48
## - Ed      1    154146 626870 390.29
## - Po1     1    168279 641003 391.12
## - M       1    179418 652143 391.75
## - Ineq    1    191556 664280 392.44
## - Prob    1    226358 699083 394.32
##
## Step: AIC=379.85
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Ineq + Prob + Time
##
##      Df Sum of Sq  RSS   AIC
## - LF      1      618 473354 377.90
## - NW      1     3724 476461 378.14
## - M.F     1    10513 483249 378.66
## - So      1    13111 485847 378.86
## <none>          472736 379.85
## - Po2     1     47879 520615 381.42
## - U1      1     57535 530271 382.10
## - Pop     1     77974 550710 383.50
## - Time    1    126119 598856 386.60
## - U2      1    141590 614327 387.54
## - Ed      1    154281 627018 388.30
## - Po1     1    168988 641725 389.16
```

```

## - M      1      179429 652166 389.75
## - Prob  1      226356 699092 392.32
## - Ineq  1      258417 731153 393.98
##
## Step: AIC=377.9
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
##      Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - NW   1       3128 476482 376.14
## - M.F   1      10752 484107 376.73
## - So    1      12714 486069 376.88
## <none>                473354 377.90
## - Po2   1      52848 526202 379.81
## - U1    1      70320 543674 381.02
## - Pop   1      77377 550732 381.50
## - Time  1     127978 601333 384.75
## - U2    1     141881 615235 385.60
## - Ed    1     165675 639030 387.00
## - Po1   1     176542 649896 387.63
## - M     1     183218 656572 388.00
## - Prob  1     240519 713873 391.10
## - Ineq  1     258255 731610 392.01
##
## Step: AIC=376.14
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Ineq +
##      Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - M.F   1      11621 488104 375.03
## - So    1      12518 489001 375.10
## <none>                476482 376.14
## - U1    1      67606 544088 379.05
## - Po2   1      69194 545676 379.16
## - Pop   1      85010 561493 380.22
## - U2    1     138772 615255 383.60
## - Time  1     145785 622268 384.02
## - Ed    1     177796 654279 385.87
## - M     1     199668 676151 387.09
## - Po1   1     201377 677860 387.18
## - Ineq  1     284577 761059 391.47
## - Prob  1     327688 804170 393.51
##
## Step: AIC=375.03
## .outcome ~ M + So + Ed + Po1 + Po2 + Pop + U1 + U2 + Ineq + Prob +
##      Time
##
##      Df Sum of Sq    RSS    AIC
## - So    1      12228 500332 373.95
## <none>                488104 375.03
## - Po2   1      59766 547870 377.31
## - Pop   1      73487 561591 378.22
## - U1    1      76967 565071 378.45
## - U2    1     133480 621583 381.98

```

```

## - Time 1 134397 622501 382.03
## - M 1 189924 678027 385.19
## - Po1 1 190209 678312 385.21
## - Ed 1 192625 680729 385.34
## - Ineq 1 277514 765618 389.69
## - Prob 1 316428 804531 391.52
##
## Step: AIC=373.95
## .outcome ~ M + Ed + Po1 + Po2 + Pop + U1 + U2 + Ineq + Prob +
## Time
##
## Df Sum of Sq RSS AIC
## <none> 500332 373.95
## - Po2 1 51587 551919 375.58
## - Pop 1 68123 568455 376.67
## - U1 1 101402 601734 378.78
## - Time 1 132031 632363 380.61
## - U2 1 165301 665633 382.51
## - Po1 1 180223 680555 383.33
## - Ed 1 183713 684045 383.52
## - M 1 264031 764363 387.63
## - Prob 1 319562 819893 390.22
## - Ineq 1 452978 953310 395.80
## Start: AIC=414.6
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##
## Df Sum of Sq RSS AIC
## - Pop 1 299 1146066 412.61
## - Time 1 2636 1148402 412.69
## - Po2 1 16140 1161907 413.12
## - NW 1 19533 1165299 413.23
## - LF 1 20684 1166450 413.27
## - So 1 25525 1171292 413.42
## - M.F 1 33815 1179581 413.68
## - U1 1 42436 1188203 413.95
## - Wealth 1 43295 1189062 413.98
## - Prob 1 58044 1203811 414.43
## <none> 1145767 414.60
## - Po1 1 77617 1223384 415.03
## - U2 1 86663 1232429 415.30
## - M 1 167722 1313489 417.66
## - Ed 1 256900 1402667 420.09
## - Ineq 1 398849 1544615 423.66
##
## Step: AIC=412.61
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 +
## Wealth + Ineq + Prob + Time
##
## Df Sum of Sq RSS AIC
## - Time 1 2359 1148425 410.69
## - Po2 1 15842 1161908 411.12
## - NW 1 19249 1165315 411.23
## - LF 1 20453 1166519 411.27

```

```

## - So      1      25251 1171317 411.42
## - M.F     1      37530 1183596 411.81
## - U1      1      43149 1189215 411.98
## - Wealth  1      45311 1191377 412.05
## - Prob    1      57936 1204002 412.44
## <none>                1146066 412.61
## - Po1     1      77356 1223422 413.03
## - U2      1      86363 1232429 413.30
## - M       1     168141 1314207 415.68
## - Ed      1     256981 1403047 418.10
## - Ineq    1     440402 1586468 422.65
##
## Step:  AIC=410.69
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Po2    1      13611 1162036 409.13
## - NW     1      17070 1165494 409.24
## - LF     1      18788 1167213 409.29
## - So     1      22906 1171331 409.42
## - M.F    1      40873 1189298 409.98
## - U1     1      41372 1189796 410.00
## - Wealth 1      45386 1193811 410.12
## <none>                1148425 410.69
## - Prob   1      73762 1222187 410.99
## - Po1    1      78868 1227293 411.15
## - U2     1      85762 1234186 411.36
## - M      1     167224 1315649 413.72
## - Ed     1     256202 1404626 416.14
## - Ineq   1     438077 1586501 420.65
##
## Step:  AIC=409.13
## .outcome ~ M + So + Ed + Po1 + LF + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - NW     1      11810 1173846 407.50
## - LF     1      13960 1175996 407.57
## - So     1      21682 1183719 407.81
## - U1     1      36754 1198791 408.28
## - M.F    1      40114 1202150 408.38
## - Wealth 1      43752 1205788 408.49
## <none>                1162036 409.13
## - Prob   1      78321 1240357 409.54
## - U2     1      86996 1249032 409.80
## - M      1     183432 1345468 412.55
## - Ed     1     245219 1407255 414.21
## - Po1    1     373408 1535444 417.44
## - Ineq   1     463405 1625441 419.54
##
## Step:  AIC=407.5
## .outcome ~ M + So + Ed + Po1 + LF + M.F + U1 + U2 + Wealth +
##      Ineq + Prob

```

```

##
##           Df Sum of Sq      RSS      AIC
## - LF       1       7481 1181327 405.74
## - So       1      12003 1185849 405.88
## - U1       1      29449 1203296 406.42
## - M.F      1      30284 1204130 406.44
## - Wealth   1      36900 1210747 406.65
## <none>                1173846 407.50
## - Prob     1      69486 1243332 407.63
## - U2       1      81168 1255014 407.97
## - M        1     210570 1384417 411.61
## - Ed       1     233423 1407270 412.21
## - Ineq     1     457203 1631050 417.67
## - Po1      1     607744 1781590 420.94
##
## Step:  AIC=405.74
## .outcome ~ M + So + Ed + Po1 + M.F + U1 + U2 + Wealth + Ineq +
##       Prob
##
##           Df Sum of Sq      RSS      AIC
## - So       1       6309 1187636 403.93
## - M.F      1      22823 1204150 404.44
## - U1       1      23181 1204508 404.45
## - Wealth   1      35303 1216631 404.83
## - Prob     1      63979 1245306 405.69
## <none>                1181327 405.74
## - U2       1      81363 1262690 406.20
## - M        1     206774 1388101 409.70
## - Ed       1     227952 1409280 410.26
## - Ineq     1     480747 1662074 416.37
## - Po1      1     620078 1801405 419.35
##
## Step:  AIC=403.93
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - U1       1      20078 1207714 402.55
## - M.F      1      26252 1213888 402.74
## - Wealth   1      29641 1217277 402.84
## <none>                1187636 403.93
## - U2       1      76099 1263735 404.23
## - Prob     1      84067 1271703 404.46
## - M        1     207678 1395314 407.90
## - Ed       1     236368 1424004 408.65
## - Ineq     1     587231 1774867 416.80
## - Po1      1     671140 1858776 418.51
##
## Step:  AIC=402.55
## .outcome ~ M + Ed + Po1 + M.F + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - M.F      1      11209 1218924 400.89
## - Wealth   1      54949 1262663 402.20
## <none>                1207714 402.55

```

```

## - Prob 1 77122 1284836 402.84
## - U2 1 89604 1297318 403.20
## - Ed 1 216509 1424223 406.65
## - M 1 256929 1464643 407.69
## - Ineq 1 725194 1932908 417.95
## - Po1 1 860630 2068344 420.46
##
## Step: AIC=400.89
## .outcome ~ M + Ed + Po1 + U2 + Wealth + Ineq + Prob
##
## Df Sum of Sq RSS AIC
## - Wealth 1 57232 1276156 400.59
## <none> 1218924 400.89
## - Prob 1 74141 1293065 401.08
## - U2 1 119130 1338054 402.34
## - M 1 290324 1509247 406.80
## - Ed 1 347252 1566176 408.17
## - Ineq 1 767283 1986207 416.96
## - Po1 1 851891 2070814 418.50
##
## Step: AIC=400.59
## .outcome ~ M + Ed + Po1 + U2 + Ineq + Prob
##
## Df Sum of Sq RSS AIC
## <none> 1276156 400.59
## - U2 1 123048 1399203 402.00
## - Prob 1 175585 1451741 403.36
## - M 1 233980 1510136 404.82
## - Ed 1 479596 1755751 410.40
## - Ineq 1 779664 2055820 416.23
## - Po1 1 1795966 3072122 431.10
## Start: AIC=431.54
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##
## Df Sum of Sq RSS AIC
## - Time 1 2507 1099686 429.63
## - So 1 3345 1100524 429.66
## - LF 1 4454 1101633 429.70
## - Pop 1 5334 1102513 429.73
## - Wealth 1 7459 1104638 429.81
## - NW 1 14420 1111599 430.05
## <none> 1097179 431.54
## - Po2 1 69370 1166549 431.93
## - M.F 1 70279 1167459 431.96
## - U1 1 93843 1191023 432.74
## - M 1 110501 1207681 433.29
## - Prob 1 112203 1209382 433.34
## - Ineq 1 143109 1240288 434.32
## - Po1 1 189023 1286202 435.74
## - U2 1 190950 1288129 435.80
## - Ed 1 431733 1528912 442.48
##
## Step: AIC=429.63

```

```

## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - So      1      2093 1101780 427.71
## - Pop      1      4551 1104237 427.79
## - LF       1      5869 1105555 427.84
## - Wealth   1     10046 1109733 427.99
## - NW       1     24323 1124009 428.49
## <none>                1099686 429.63
## - M.F      1     67780 1167467 429.96
## - Po2      1     82294 1181981 430.45
## - U1       1     98651 1198337 430.98
## - M        1    115908 1215595 431.54
## - Ineq     1    149343 1249029 432.60
## - U2       1    199138 1298824 434.12
## - Prob     1    206750 1306437 434.35
## - Po1      1    210238 1309924 434.45
## - Ed       1    432320 1532007 440.56
##
## Step: AIC=427.71
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Pop      1      6025 1107804 425.92
## - LF       1     12414 1114194 426.14
## - Wealth   1     14713 1116493 426.22
## - NW       1     38438 1140218 427.04
## <none>                1101780 427.71
## - M.F      1     69479 1171259 428.09
## - Po2      1     81629 1183409 428.49
## - M        1    114459 1216239 429.56
## - U1       1    124662 1226442 429.89
## - Po1      1    208912 1310692 432.48
## - Prob     1    212796 1314576 432.59
## - Ineq     1    220959 1322739 432.83
## - U2       1    224848 1326628 432.95
## - Ed       1    430658 1532438 438.57
##
## Step: AIC=425.92
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Wealth   1     11753 1119557 424.33
## - LF       1     16507 1124312 424.50
## - NW       1     36580 1144384 425.19
## <none>                1107804 425.92
## - Po2      1     83835 1191640 426.76
## - M.F      1    124842 1232647 428.08
## - M        1    125719 1233523 428.11
## - U1       1    145095 1252899 428.72
## - Po1      1    205831 1313635 430.57

```



```

## - Prob 1 207079 1314883 430.60
## - Ineq 1 227519 1335323 431.20
## - U2 1 228884 1336688 431.24
## - Ed 1 439627 1547432 436.95
##
## Step: AIC=424.33
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 + Ineq +
## Prob
##
## Df Sum of Sq RSS AIC
## - LF 1 15094 1134652 422.85
## - NW 1 32602 1152160 423.45
## <none> 1119557 424.33
## - Po2 1 86922 1206480 425.25
## - M 1 121828 1241386 426.36
## - M.F 1 132410 1251967 426.69
## - U1 1 161096 1280653 427.57
## - Prob 1 220723 1340281 429.35
## - Po1 1 223734 1343291 429.44
## - Ineq 1 258987 1378544 430.45
## - U2 1 265909 1385466 430.64
## - Ed 1 478217 1597774 436.20
##
## Step: AIC=422.85
## .outcome ~ M + Ed + Po1 + Po2 + M.F + NW + U1 + U2 + Ineq + Prob
##
## Df Sum of Sq RSS AIC
## - NW 1 24602 1159253 421.69
## <none> 1134652 422.85
## - Po2 1 73217 1207869 423.29
## - M.F 1 122032 1256684 424.84
## - M 1 144233 1278884 425.52
## - U1 1 146002 1280654 425.57
## - Prob 1 205672 1340324 427.35
## - Po1 1 208641 1343293 427.44
## - Ineq 1 264508 1399159 429.02
## - U2 1 269688 1404339 429.17
## - Ed 1 476352 1611003 434.52
##
## Step: AIC=421.69
## .outcome ~ M + Ed + Po1 + Po2 + M.F + U1 + U2 + Ineq + Prob
##
## Df Sum of Sq RSS AIC
## - Po2 1 60621 1219874 421.68
## <none> 1159253 421.69
## - M.F 1 105768 1265022 423.09
## - U1 1 153508 1312762 424.54
## - Prob 1 181100 1340353 425.35
## - Po1 1 196102 1355356 425.78
## - M 1 220095 1379348 426.47
## - U2 1 280690 1439943 428.15
## - Ineq 1 405297 1564551 431.38
## - Ed 1 457813 1617066 432.67
##

```

```

## Step: AIC=421.68
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>                1219874 421.68
## - M.F    1      135965 1355839 423.80
## - U1     1      153336 1373210 424.29
## - Prob   1      187965 1407839 425.27
## - M      1      200728 1420603 425.62
## - U2     1      292433 1512307 428.06
## - Ed     1      415085 1634959 431.10
## - Ineq   1      513051 1732925 433.37
## - Po1    1     1420613 2640487 449.79
## Start: AIC=411.01
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop    1         260  815656 409.02
## - LF     1         684  816081 409.04
## - So     1         875  816271 409.05
## - Po1    1         956  816353 409.05
## - Po2    1        5727  821123 409.27
## - Time   1        9225  824621 409.43
## - Wealth 1       39465  854861 410.80
## <none>                815396 411.01
## - U1     1       69769  885165 412.13
## - M      1       71171  886567 412.19
## - M.F    1      111044  926440 413.86
## - Prob   1      126488  941884 414.49
## - U2     1      138749  954145 414.98
## - NW     1      154985  970381 415.62
## - Ed     1      190292 1005688 416.98
## - Ineq   1      264734 1080130 419.69
##
## Step: AIC=409.02
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - LF     1         534  816190 407.04
## - So     1         804  816460 407.06
## - Po1    1         833  816489 407.06
## - Po2    1        5794  821450 407.29
## - Time   1        9110  824766 407.44
## - Wealth 1       40558  856214 408.86
## <none>                815656 409.02
## - M      1       71933  887589 410.23
## - U1     1       77441  893097 410.46
## - Prob   1      127128  942784 412.52
## - U2     1      140692  956348 413.07
## - M.F    1      146186  961842 413.28
## - NW     1      158416  974072 413.76
## - Ed     1      196781 1012437 415.23

```

```

## - Ineq      1      264475 1080131 417.69
##
## Step:  AIC=407.04
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - So      1         316  816507 405.06
## - Po1     1        2185  818375 405.14
## - Po2     1        5763  821953 405.31
## - Time    1       10186  826377 405.51
## - Wealth  1       41855  858046 406.94
## <none>                        816190 407.04
## - M       1       82960  899150 408.72
## - U1      1      124959  941149 410.46
## - Prob    1      128343  944533 410.59
## - U2      1      142480  958670 411.16
## - NW      1      169135  985325 412.20
## - M.F     1     243411 1059601 414.96
## - Ineq    1     317744 1133935 417.54
## - Ed      1     339533 1155724 418.26
##
## Step:  AIC=405.06
## .outcome ~ M + Ed + Po1 + Po2 + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Po1     1         1995  818502 403.15
## - Po2     1         6197  822704 403.35
## - Time    1         9994  826501 403.52
## - Wealth  1        43070  859576 405.01
## <none>                        816507 405.06
## - M       1        87300  903807 406.92
## - U1      1       132776  949282 408.78
## - Prob    1       135013  951519 408.87
## - U2      1       152957  969464 409.58
## - NW      1       201342 1017848 411.43
## - M.F     1       243269 1059776 412.97
## - Ineq    1       338406 1154912 416.23
## - Ed      1       339270 1155777 416.26
##
## Step:  AIC=403.15
## .outcome ~ M + Ed + Po2 + M.F + NW + U1 + U2 + Wealth + Ineq +
##      Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Time    1        15712  834214 401.87
## <none>                        818502 403.15
## - Wealth  1        44630  863132 403.17
## - M       1        85670  904171 404.93
## - Prob    1       136664  955166 407.02
## - U1      1       141547  960049 407.21
## - U2      1       163603  982105 408.07
## - NW      1       202605 1021107 409.55

```

```

## - M.F      1      330699 1149201 414.05
## - Ed       1      338500 1157002 414.30
## - Ineq     1      347626 1166128 414.60
## - Po2      1      438023 1256525 417.44
##
## Step:  AIC=401.87
## .outcome ~ M + Ed + Po2 + M.F + NW + U1 + U2 + Wealth + Ineq +
##      Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>                834214 401.87
## - Wealth  1         62768 896982 402.63
## - M       1         95159 929373 403.98
## - U1      1        144007 978221 405.92
## - U2      1        170436 1004650 406.94
## - NW      1        208760 1042974 408.36
## - Prob    1        265087 1099301 410.36
## - M.F     1        324947 1159161 412.37
## - Ed      1        332554 1166768 412.62
## - Ineq    1        385289 1219503 414.30
## - Po2     1        422331 1256545 415.44
## Start:  AIC=414.85
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - NW      1          636 1154135 412.87
## - M.F     1          842 1154342 412.88
## - So      1         1902 1155401 412.91
## - Time    1         2665 1156164 412.94
## - LF      1         7198 1160697 413.08
## - U1      1        14777 1168276 413.32
## - Pop     1        23754 1177253 413.61
## - Po2     1        42109 1195608 414.18
## <none>                1153499 414.85
## - U2      1        112013 1265512 416.28
## - Wealth  1        113616 1267115 416.33
## - Po1     1        122940 1276439 416.60
## - M       1        198111 1351610 418.72
## - Prob    1        198479 1351978 418.73
## - Ed      1        324292 1477791 422.02
## - Ineq    1        460683 1614183 425.29
##
## Step:  AIC=412.87
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - M.F     1          519 1154655 410.89
## - Time    1         2044 1156179 410.94
## - So      1         4785 1158920 411.03
## - LF      1         6575 1160710 411.08
## - U1      1        14624 1168759 411.34
## - Pop     1        23884 1178019 411.63

```

```

## - Po2      1      41862 1195998 412.19
## <none>                1154135 412.87
## - U2      1      111689 1265824 414.29
## - Wealth  1      112983 1267118 414.33
## - Po1     1      122959 1277094 414.62
## - Prob    1      210049 1364185 417.06
## - M       1      213553 1367688 417.16
## - Ed      1      324491 1478627 420.04
## - Ineq    1      493370 1647505 424.04
##
## Step:  AIC=410.89
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time      1      2589 1157244 408.97
## - So        1      5089 1159743 409.05
## - LF        1      6209 1160864 409.09
## - U1        1     17009 1171664 409.43
## - Pop       1     26759 1181414 409.74
## - Po2       1     42335 1196990 410.22
## <none>                1154655 410.89
## - U2        1     113063 1267718 412.35
## - Po1       1     123649 1278304 412.65
## - Wealth    1     125516 1280171 412.71
## - Prob      1     220049 1374703 415.34
## - M         1     229217 1383872 415.59
## - Ed        1     327463 1482118 418.13
## - Ineq      1     518455 1673109 422.61
##
## Step:  AIC=408.97
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - So        1      5332 1162575 407.14
## - LF        1      5447 1162690 407.15
## - U1        1     14611 1171855 407.44
## - Pop       1     37403 1194647 408.15
## - Po2       1     39879 1197123 408.23
## <none>                1157244 408.97
## - U2        1     110491 1267734 410.35
## - Po1       1     121144 1278388 410.66
## - Wealth    1     127320 1284564 410.84
## - M         1     236368 1393612 413.85
## - Prob      1     256004 1413248 414.37
## - Ed        1     333982 1491226 416.36
## - Ineq      1     529863 1687107 420.92
##
## Step:  AIC=407.14
## .outcome ~ M + Ed + Po1 + Po2 + LF + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC

```

```

## - LF      1      11237 1173812 405.50
## - U1      1      26755 1189331 405.99
## - Po2     1      35807 1198382 406.27
## - Pop     1      44438 1207013 406.53
## <none>           1162575 407.14
## - Po1     1      116108 1278683 408.67
## - U2      1      129219 1291795 409.04
## - Wealth  1      141359 1303935 409.39
## - Prob    1      277447 1440023 413.06
## - M       1      289413 1451988 413.37
## - Ed      1      332927 1495502 414.46
## - Ineq    1      736050 1898625 423.29
##
## Step:  AIC=405.5
## .outcome ~ M + Ed + Po1 + Po2 + Pop + U1 + U2 + Wealth + Ineq +
##      Prob
##
##      Df Sum of Sq      RSS      AIC
## - U1      1      27394 1201206 404.35
## - Po2     1      29960 1203772 404.43
## - Pop     1      45945 1219757 404.92
## <none>           1173812 405.50
## - Po1     1      108754 1282566 406.78
## - Wealth  1      132105 1305917 407.45
## - U2      1      160204 1334016 408.23
## - Prob    1      266222 1440034 411.06
## - M       1      301418 1475230 411.96
## - Ed      1      339922 1513734 412.91
## - Ineq    1      742801 1916613 421.64
##
## Step:  AIC=404.35
## .outcome ~ M + Ed + Po1 + Po2 + Pop + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Po2     1      26434 1227640 403.16
## - Pop     1      39294 1240500 403.54
## <none>           1201206 404.35
## - Po1     1      106170 1307376 405.49
## - Wealth  1      155066 1356272 406.85
## - U2      1      184403 1385609 407.64
## - Prob    1      266901 1468107 409.78
## - M       1      295530 1496736 410.49
## - Ed      1      316612 1517818 411.01
## - Ineq    1      802923 2004129 421.29
##
## Step:  AIC=403.16
## .outcome ~ M + Ed + Po1 + Pop + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Pop     1      39361 1267001 402.33
## <none>           1227640 403.16
## - Wealth  1      157027 1384666 405.61
## - U2      1      168186 1395826 405.91
## - Prob    1      261478 1489118 408.30

```

```

## - M      1      291160 1518800 409.03
## - Ed      1      302730 1530370 409.31
## - Po1     1      596196 1823835 415.80
## - Ineq    1      837039 2064679 420.39
##
## Step: AIC=402.33
## .outcome ~ M + Ed + Po1 + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## <none>                1267001 402.33
## - Wealth  1      142345 1409347 404.27
## - U2      1      173167 1440168 405.07
## - Prob    1      247777 1514779 406.93
## - M       1      335568 1602569 409.02
## - Ed      1      360093 1627094 409.58
## - Po1     1      642368 1909369 415.50
## - Ineq    1      800979 2067980 418.45
## Start: AIC=434.08
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##           U2 + Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - LF      1          127 1170932 432.08
## - NW      1          371 1171175 432.09
## - So      1         1980 1172785 432.14
## - Time    1         4090 1174894 432.21
## - Wealth  1         8764 1179568 432.37
## - Pop     1        17685 1188489 432.66
## - M.F     1        18215 1189019 432.68
## - Po2     1        44892 1215696 433.54
## <none>                1170805 434.08
## - M       1        62679 1233484 434.11
## - Prob    1        78085 1248890 434.59
## - U1      1        86666 1257471 434.86
## - Po1     1       156074 1326878 436.96
## - U2      1       174664 1345468 437.50
## - Ineq    1       303684 1474489 441.07
## - Ed      1       436424 1607229 444.43
##
## Step: AIC=432.08
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
##           Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - NW      1          256 1171188 430.09
## - So      1         2080 1173011 430.15
## - Time    1         3970 1174901 430.21
## - Wealth  1         9972 1180903 430.41
## - Pop     1        17589 1188521 430.66
## - M.F     1        25815 1196746 430.93
## - Po2     1        50226 1221157 431.72
## <none>                1170932 432.08
## - M       1        63457 1234388 432.14
## - Prob    1        82743 1253675 432.74

```

```

## - U1      1      101697 1272628 433.33
## - Po1     1      165883 1336814 435.25
## - U2      1      174940 1345871 435.51
## - Ineq    1      325144 1496075 439.64
## - Ed      1      472230 1643162 443.29
##
## Step: AIC=430.09
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - So      1      1826 1173014 428.15
## - Time    1      3794 1174982 428.21
## - Wealth  1      11404 1182592 428.47
## - Pop     1      18213 1189401 428.69
## - M.F     1      25575 1196763 428.93
## - Po2     1      52711 1223899 429.81
## <none>                1171188 430.09
## - M       1      63403 1234591 430.14
## - Prob    1      98452 1269639 431.24
## - U1      1     101671 1272859 431.34
## - Po1     1     168298 1339485 433.33
## - U2      1     174689 1345876 433.51
## - Ineq    1     324985 1496173 437.64
## - Ed      1     472044 1643232 441.30
##
## Step: AIC=428.15
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time    1      4001 1177014 426.28
## - Wealth  1      13807 1186821 426.61
## - Pop     1      20465 1193478 426.82
## - M.F     1      24005 1197019 426.94
## - Po2     1      51600 1224614 427.83
## <none>                1173014 428.15
## - M       1      73876 1246890 428.53
## - Prob    1     102461 1275475 429.42
## - U1      1     110596 1283610 429.66
## - Po1     1     167040 1340054 431.34
## - U2      1     190487 1363501 432.02
## - Ineq    1     452044 1625057 438.86
## - Ed      1     473076 1646089 439.36
##
## Step: AIC=426.28
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Wealth  1      14918 1191932 424.77
## - Pop     1      17426 1194440 424.86
## - M.F     1      20774 1197789 424.96
## - Po2     1      60505 1237519 426.24

```



```

## <none>          1177014 426.28
## - M            1      98204 1275219 427.41
## - U1           1     112236 1289250 427.83
## - Po1          1     184252 1361267 429.95
## - Prob        1     189816 1366831 430.11
## - U2           1     198110 1375125 430.35
## - Ineq        1     449805 1626819 436.90
## - Ed          1     472222 1649236 437.44
##
## Step:  AIC=424.77
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Ineq +
##      Prob
##
##      Df Sum of Sq      RSS      AIC
## - Pop  1      12780 1204713 423.19
## - M.F  1      32871 1224803 423.83
## <none>          1191932 424.77
## - Po2  1      64083 1256015 424.82
## - M    1      84826 1276758 425.45
## - U1   1     157918 1349850 427.63
## - Po1  1     198364 1390296 428.78
## - Prob 1     212626 1404558 429.18
## - U2   1     253913 1445845 430.31
## - Ed   1     518200 1710132 436.85
## - Ineq 1     594298 1786230 438.55
##
## Step:  AIC=423.19
## .outcome ~ M + Ed + Po1 + Po2 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Po2  1      59985 1264698 423.08
## <none>          1204713 423.19
## - M.F  1      75843 1280555 423.57
## - M    1      92963 1297676 424.09
## - U1   1     182030 1386743 426.68
## - Po1  1     186331 1391044 426.80
## - Prob 1     200861 1405573 427.20
## - U2   1     255124 1459837 428.68
## - Ed   1     505826 1710539 434.86
## - Ineq 1     629116 1833828 437.58
##
## Step:  AIC=423.08
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>          1264698 423.08
## - M.F  1      97191 1361889 423.97
## - M    1     107746 1372444 424.27
## - U1   1     164738 1429436 425.86
## - Prob 1     212717 1477415 427.15
## - U2   1     257738 1522436 428.32
## - Ed   1     454549 1719247 433.06
## - Ineq 1     652785 1917483 437.32
## - Po1  1    1195967 2460665 447.04

```

```

## Start:  AIC=387.42
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - So      1      93 438403 385.43
## - M.F     1     1167 439478 385.52
## - Pop     1     6317 444627 385.96
## - NW      1     8833 447144 386.18
## - LF      1    12806 451116 386.51
## <none>                438311 387.42
## - Wealth  1     31955 470265 388.09
## - Po2     1     38035 476346 388.58
## - U1      1     73828 512138 391.33
## - Po1     1    120120 558431 394.62
## - U2      1    149219 587529 396.55
## - Time    1    149517 587828 396.57
## - M       1    293853 732163 404.91
## - Prob    1    314788 753098 405.99
## - Ineq    1    359171 797481 408.16
## - Ed      1    408348 846658 410.44
##
## Step:  AIC=385.43
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - M.F     1     1308 439711 383.54
## - Pop     1     6305 444708 383.97
## - NW      1    11034 449437 384.37
## - LF      1    18127 456530 384.97
## <none>                438403 385.43
## - Wealth  1     36147 474551 386.44
## - Po2     1     38969 477373 386.66
## - U1      1     92959 531362 390.73
## - Po1     1    121266 559670 392.71
## - Time    1    150132 588536 394.62
## - U2      1    158464 596867 395.15
## - M       1    300514 738918 403.26
## - Prob    1    319466 757869 404.23
## - Ed      1    408340 846743 408.44
## - Ineq    1    422981 861385 409.09
##
## Step:  AIC=383.54
## .outcome ~ M + Ed + Po1 + Po2 + LF + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - NW      1     9933 449644 382.39
## - Pop     1    10993 450704 382.48
## - LF      1    17710 457421 383.04
## <none>                439711 383.54
## - Wealth  1     35845 475557 384.52
## - Po2     1     40286 479997 384.87

```

```

## - U1      1      106349 546060 389.77
## - Po1     1      128606 568317 391.29
## - U2      1      157156 596867 393.15
## - Time    1      164903 604614 393.64
## - Prob    1      331812 771523 402.90
## - M       1      354916 794627 404.03
## - Ed      1      418394 858105 406.95
## - Ineq    1      444823 884534 408.10
##
## Step: AIC=382.39
## .outcome ~ M + Ed + Po1 + Po2 + LF + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - LF      1      17268 466913 381.82
## - Pop      1      17557 467202 381.84
## <none>                449644 382.39
## - Wealth  1      28215 477859 382.70
## - Po2      1      32205 481849 383.02
## - Po1      1     119853 569497 389.37
## - U1       1     128086 577730 389.91
## - Time     1     161231 610876 392.03
## - U2       1     187510 637154 393.63
## - Prob     1     330047 779691 401.30
## - Ed       1     408469 858113 404.95
## - Ineq     1     456043 905688 407.00
## - M        1     495344 944988 408.61
##
## Step: AIC=381.82
## .outcome ~ M + Ed + Po1 + Po2 + Pop + U1 + U2 + Wealth + Ineq +
##      Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - Pop      1     13256 480168 380.88
## - Po2      1     19129 486041 381.35
## <none>                466913 381.82
## - Wealth  1     25411 492323 381.83
## - Po1      1     102637 569550 387.37
## - U1       1     117085 583998 388.32
## - Time     1     160380 627293 391.04
## - U2       1     206575 673488 393.74
## - Prob     1     313813 780725 399.35
## - Ed       1     412250 879163 403.87
## - Ineq     1     440388 907301 405.06
## - M        1     478459 945371 406.63
##
## Step: AIC=380.88
## .outcome ~ M + Ed + Po1 + Po2 + U1 + U2 + Wealth + Ineq + Prob +
##      Time
##
##      Df Sum of Sq    RSS    AIC
## - Po2      1      23227 503395 380.68
## <none>                480168 380.88
## - Wealth  1      33046 513214 381.41

```

```

## - Po1      1      103608 583776 386.31
## - U1       1      110234 590403 386.74
## - U2       1      195945 676113 391.89
## - Time     1      252341 732509 394.93
## - Prob     1      304352 784520 397.54
## - Ed       1      428123 908291 403.11
## - Ineq     1      451162 931330 404.06
## - M        1      499236 979404 405.97
##
## Step:  AIC=380.68
## .outcome ~ M + Ed + Po1 + U1 + U2 + Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## <none>                    503395 380.68
## - Wealth  1         31077  534473 380.96
## - U1      1        107211  610606 386.02
## - U2      1        205697  709092 391.70
## - Time    1        231887  735282 393.08
## - Prob    1        288093  791489 395.88
## - Ed      1        481152  984547 404.17
## - M       1        492782  996177 404.62
## - Ineq    1        500918 1004313 404.92
## - Po1     1       1052361 1555757 421.56
## Start:  AIC=432.53
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##           U2 + Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Po2      1         3581 1128890 430.65
## - Time     1         8429 1133738 430.82
## - LF       1        32277 1157586 431.63
## - Po1      1        41143 1166452 431.93
## - So       1        41892 1167201 431.96
## - M.F      1        50496 1175805 432.24
## - Pop      1        50520 1175829 432.24
## - U1       1        54954 1180263 432.39
## <none>                    1125309 432.53
## - Prob     1        60972 1186281 432.59
## - Wealth   1        80406 1205716 433.22
## - NW       1        87891 1213200 433.46
## - M        1       102087 1227396 433.92
## - U2       1       113504 1238813 434.28
## - Ed       1       250728 1376038 438.38
## - Ineq     1       533974 1659283 445.68
##
## Step:  AIC=430.65
## .outcome ~ M + So + Ed + Po1 + LF + M.F + Pop + NW + U1 + U2 +
##           Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Time     1       15849 1144739 429.20
## - LF       1       29567 1158457 429.66
## - So       1       44137 1173028 430.15
## - M.F      1       52058 1180948 430.41

```

```

## - U1      1      52470 1181360 430.43
## - Pop     1      57189 1186079 430.58
## - Prob    1      57760 1186651 430.60
## <none>                1128890 430.65
## - Wealth  1      81933 1210823 431.39
## - NW      1      84386 1213276 431.47
## - M       1     104065 1232955 432.09
## - U2      1     114788 1243678 432.43
## - Ed      1     247284 1376175 436.38
## - Po1     1     485228 1614119 442.60
## - Ineq    1     569540 1698430 444.58
##
## Step:  AIC=429.2
## .outcome ~ M + So + Ed + Po1 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - LF      1      25577 1170316 428.06
## - So      1      42072 1186811 428.61
## - M.F     1      42910 1187649 428.63
## - Pop     1      45554 1190293 428.72
## <none>                1144739 429.20
## - U1      1      60623 1205362 429.21
## - NW      1      84279 1229018 429.97
## - Wealth  1      94276 1239015 430.28
## - U2      1     126169 1270908 431.28
## - M       1     132021 1276760 431.45
## - Prob    1     135131 1279870 431.55
## - Ed      1     231443 1376182 434.38
## - Po1     1     469522 1614261 440.60
## - Ineq    1     559768 1704507 442.72
##
## Step:  AIC=428.06
## .outcome ~ M + So + Ed + Po1 + M.F + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - M.F     1      20771 1191088 426.75
## - So      1      21104 1191420 426.76
## - U1      1      37928 1208244 427.30
## - Pop     1      49999 1220315 427.69
## - NW      1      60533 1230849 428.03
## <none>                1170316 428.06
## - Wealth  1      91762 1262078 429.00
## - U2      1     115819 1286135 429.74
## - Prob    1     134505 1304821 430.30
## - M       1     158304 1328620 431.01
## - Ed      1     205938 1376254 432.38
## - Ineq    1     534401 1704717 440.73
## - Po1     1     557977 1728293 441.26
##
## Step:  AIC=426.75
## .outcome ~ M + So + Ed + Po1 + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob

```

```

##
##           Df Sum of Sq      RSS      AIC
## - U1       1      20935 1212022 425.43
## - So       1      31354 1222442 425.76
## - NW       1      56309 1247396 426.55
## <none>                1191088 426.75
## - U2       1     100681 1291769 427.91
## - Pop      1     108022 1299110 428.13
## - Wealth   1     113243 1304331 428.29
## - Prob     1     123535 1314623 428.59
## - M        1     203742 1394830 430.90
## - Ed       1     248819 1439906 432.14
## - Po1      1     640923 1832010 441.54
## - Ineq     1     709691 1900779 442.97
##
## Step:   AIC=425.43
## .outcome ~ M + So + Ed + Po1 + Pop + NW + U2 + Wealth + Ineq +
##       Prob
##
##           Df Sum of Sq      RSS      AIC
## - So       1      23093 1235115 424.16
## - NW       1      56792 1268814 425.21
## <none>                1212022 425.43
## - Pop      1      97199 1309221 426.43
## - U2       1     129058 1341080 427.37
## - Prob     1     131223 1343245 427.43
## - Wealth   1     136674 1348696 427.59
## - M        1     200330 1412352 429.39
## - Ed       1     227925 1439947 430.15
## - Po1      1     677325 1889347 440.74
## - Ineq     1     722211 1934233 441.65
##
## Step:   AIC=424.16
## .outcome ~ M + Ed + Po1 + Pop + NW + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - NW       1      37061 1272176 423.31
## <none>                1235115 424.16
## - Pop      1      87562 1322677 424.83
## - Wealth   1     114803 1349918 425.63
## - U2       1     126507 1361623 425.96
## - M        1     181810 1416926 427.52
## - Prob     1     222829 1457944 428.63
## - Ed       1     322476 1557591 431.21
## - Ineq     1     709343 1944459 439.86
## - Po1      1     731401 1966516 440.30
##
## Step:   AIC=423.31
## .outcome ~ M + Ed + Po1 + Pop + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## <none>                1272176 423.31
## - Pop      1      67872 1340048 423.34
## - Wealth   1     118358 1390534 424.78

```

```

## - U2      1      134121 1406297 425.22
## - Prob    1      187148 1459324 426.67
## - Ed      1      288350 1560526 429.28
## - M       1      332040 1604216 430.36
## - Ineq    1      828558 2100734 440.88
## - Po1     1      882965 2155141 441.87
## Start:   AIC=394.17
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##          U2 + Wealth + Ineq + Prob + Time
##
##          Df Sum of Sq      RSS      AIC
## - Wealth  1          1835 1093227 392.23
## - Pop     1          2308 1093699 392.24
## - Po2     1          4216 1095607 392.30
## - Time    1          4977 1096368 392.33
## - LF      1          5194 1096586 392.33
## - So      1          7187 1098578 392.40
## - NW      1          7526 1098917 392.41
## - M.F     1         27766 1119157 393.05
## - U1      1         35301 1126692 393.28
## - Po1     1         37295 1128686 393.34
## - M       1         57211 1148602 393.95
## <none>                      1091391 394.17
## - Prob    1         67006 1158397 394.25
## - U2      1         97359 1188750 395.16
## - Ed      1        113828 1205219 395.64
## - Ineq    1        210125 1301517 398.33
##
## Step:    AIC=392.23
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##          U2 + Ineq + Prob + Time
##
##          Df Sum of Sq      RSS      AIC
## - Po2     1          3824 1097051 390.35
## - Pop     1          4568 1097794 390.37
## - LF      1          5100 1098326 390.39
## - Time    1          6801 1100028 390.44
## - So      1          8263 1101490 390.49
## - NW      1          8893 1102120 390.51
## - M.F     1         34142 1127369 391.30
## - Po1     1         36245 1129472 391.37
## - U1      1         40637 1133864 391.50
## - M       1         55526 1148753 391.96
## <none>                      1093227 392.23
## - Prob    1          91976 1185203 393.05
## - U2      1        103982 1197209 393.41
## - Ed      1        114159 1207386 393.70
## - Ineq    1        294052 1387279 398.56
##
## Step:    AIC=390.35
## .outcome ~ M + So + Ed + Po1 + LF + M.F + Pop + NW + U1 + U2 +
##          Ineq + Prob + Time
##
##          Df Sum of Sq      RSS      AIC

```

```

## - LF      1      3018 1100068 388.44
## - Time    1      5223 1102273 388.51
## - Pop     1      5611 1102662 388.53
## - NW      1      6483 1103534 388.55
## - So      1      6779 1103830 388.56
## - M.F     1      32227 1129277 389.36
## - U1      1      37113 1134164 389.51
## - M       1      61611 1158661 390.26
## <none>          1097051 390.35
## - Prob    1      91090 1188141 391.14
## - U2      1     101945 1198995 391.46
## - Ed      1     112913 1209963 391.78
## - Po1     1     207542 1304593 394.41
## - Ineq    1     298283 1395333 396.77
##
## Step:  AIC=388.44
## .outcome ~ M + So + Ed + Po1 + M.F + Pop + NW + U1 + U2 + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop    1      3579 1103647 386.56
## - So     1      3848 1103916 386.57
## - NW     1      6474 1106542 386.65
## - Time   1      7630 1107698 386.69
## - U1     1     35638 1135707 387.56
## - M.F    1     37549 1137618 387.62
## <none>          1100068 388.44
## - Prob   1     100171 1200240 389.49
## - U2     1     100468 1200536 389.50
## - Ed     1     109956 1210025 389.78
## - M      1     136267 1236336 390.53
## - Po1    1     219319 1319388 392.81
## - Ineq   1     337417 1437485 395.81
##
## Step:  AIC=386.56
## .outcome ~ M + So + Ed + Po1 + M.F + NW + U1 + U2 + Ineq + Prob +
##      Time
##
##      Df Sum of Sq      RSS      AIC
## - So     1      3037 1106685 384.65
## - Time   1      4731 1108379 384.71
## - NW     1      4932 1108579 384.71
## - U1     1     33796 1137443 385.61
## - M.F    1     34466 1138113 385.63
## <none>          1103647 386.56
## - Prob   1      97271 1200918 387.51
## - U2     1     101507 1205154 387.64
## - Ed     1     115427 1219074 388.04
## - M      1     132705 1236352 388.53
## - Po1    1     332810 1436457 393.78
## - Ineq   1     395430 1499078 395.28
##
## Step:  AIC=384.65
## .outcome ~ M + Ed + Po1 + M.F + NW + U1 + U2 + Ineq + Prob +

```



```

##      Time
##
##      Df Sum of Sq      RSS      AIC
## - NW    1      2208 1108893 382.72
## - Time   1      2762 1109447 382.74
## - U1     1     31196 1137881 383.63
## - M.F    1     32793 1139478 383.68
## <none>                1106685 384.65
## - Prob   1     94246 1200930 385.51
## - U2     1    101631 1208316 385.73
## - Ed     1    119218 1225903 386.23
## - M      1    129678 1236362 386.53
## - Po1    1    372631 1479315 392.81
## - Ineq   1    392398 1499082 393.28
##
## Step:  AIC=382.72
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time   1      1527 1110419 380.77
## - U1     1     29100 1137992 381.63
## - M.F    1     31144 1140037 381.69
## <none>                1108893 382.72
## - U2     1     99565 1208458 383.73
## - Prob   1    101041 1209933 383.78
## - Ed     1    117455 1226348 384.25
## - M      1    134791 1243684 384.74
## - Po1    1    533769 1642662 394.48
## - Ineq   1    553769 1662661 394.90
##
## Step:  AIC=380.77
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - U1     1     28242 1138662 379.65
## - M.F    1     40468 1150888 380.02
## <none>                1110419 380.77
## - U2     1     98068 1208488 381.73
## - Ed     1    117053 1227472 382.28
## - M      1    139294 1249713 382.91
## - Prob   1    166277 1276697 383.66
## - Ineq   1    563005 1673424 393.13
## - Po1    1    632412 1742832 394.55
##
## Step:  AIC=379.65
## .outcome ~ M + Ed + Po1 + M.F + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - M.F    1     22203 1160864 378.33
## <none>                1138662 379.65
## - Ed     1    103394 1242056 380.69
## - U2     1    110824 1249486 380.90
## - M      1    139704 1278366 381.70
## - Prob   1    172086 1310748 382.58

```

```

## - Ineq 1 626970 1765631 393.00
## - Po1 1 872753 2011414 397.57
##
## Step: AIC=378.33
## .outcome ~ M + Ed + Po1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>             1160864 378.33
## - U2 1 151409 1312273 380.62
## - Prob 1 184752 1345616 381.50
## - M 1 199389 1360254 381.87
## - Ed 1 343391 1504255 385.40
## - Ineq 1 768240 1929104 394.10
## - Po1 1 850594 2011458 395.57
## Start: AIC=412.54
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - LF 1 1384 1084872 410.58
## - Time 1 3557 1087045 410.66
## - Wealth 1 5796 1089284 410.73
## - NW 1 9905 1093393 410.87
## - Pop 1 27446 1110934 411.46
## - U1 1 30644 1114131 411.57
## - So 1 36096 1119583 411.75
## - Po2 1 38441 1121929 411.83
## - M 1 52736 1136224 412.30
## <none>             1083488 412.54
## - U2 1 61463 1144951 412.58
## - M.F 1 65162 1148650 412.70
## - Ineq 1 142154 1225642 415.10
## - Po1 1 146233 1229721 415.22
## - Prob 1 160952 1244440 415.66
## - Ed 1 295230 1378718 419.45
##
## Step: AIC=410.58
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time 1 4294 1089166 408.73
## - Wealth 1 4991 1089864 408.75
## - NW 1 8529 1093401 408.87
## - Pop 1 28719 1113591 409.55
## - U1 1 30863 1115735 409.62
## - Po2 1 37357 1122230 409.84
## - So 1 46326 1131198 410.13
## - M 1 57617 1142490 410.50
## <none>             1084872 410.58
## - U2 1 60800 1145673 410.60
## - M.F 1 72802 1157675 410.99
## - Ineq 1 140803 1225675 413.10
## - Po1 1 145919 1230792 413.25

```

```

## - Prob 1 160013 1244886 413.67
## - Ed 1 319441 1404313 418.13
##
## Step: AIC=408.73
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
## Wealth + Ineq + Prob
##
## Df Sum of Sq RSS AIC
## - Wealth 1 7246 1096412 406.98
## - NW 1 11209 1100376 407.11
## - Pop 1 24863 1114029 407.57
## - U1 1 39946 1129113 408.06
## - So 1 42271 1131437 408.14
## - Po2 1 51690 1140856 408.45
## <none> 1089166 408.73
## - M.F 1 69053 1158220 409.00
## - M 1 71128 1160295 409.07
## - U2 1 80718 1169884 409.38
## - Ineq 1 147408 1236574 411.43
## - Po1 1 171283 1260450 412.13
## - Prob 1 220261 1309428 413.54
## - Ed 1 324781 1413948 416.39
##
## Step: AIC=406.98
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
## Ineq + Prob
##
## Df Sum of Sq RSS AIC
## - NW 1 8672 1105085 405.27
## - Pop 1 20751 1117163 405.67
## - U1 1 43063 1139476 406.40
## - So 1 47292 1143704 406.54
## - Po2 1 54224 1150637 406.76
## <none> 1096412 406.98
## - M 1 69735 1166147 407.26
## - M.F 1 77879 1174291 407.51
## - U2 1 87828 1184240 407.83
## - Ineq 1 157583 1253995 409.94
## - Po1 1 186069 1282481 410.78
## - Prob 1 228870 1325282 411.99
## - Ed 1 352676 1449088 415.29
##
## Step: AIC=405.27
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Ineq +
## Prob
##
## Df Sum of Sq RSS AIC
## - Pop 1 17741 1122826 403.86
## - So 1 44797 1149882 404.74
## - Po2 1 46142 1151227 404.78
## - U1 1 51359 1156444 404.95
## <none> 1105085 405.27
## - M.F 1 74836 1179920 405.69
## - U2 1 103822 1208907 406.59

```

```

## - M      1      136766 1241850 407.58
## - Po1    1      177458 1282542 408.78
## - Prob   1      239927 1345012 410.54
## - Ineq   1      264417 1369502 411.20
## - Ed     1      344629 1449713 413.31
##
## Step: AIC=403.86
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - So   1      41585 1164411 403.20
## - Po2   1      44837 1167663 403.31
## - U1    1      56413 1179238 403.67
## <none>                1122826 403.86
## - U2    1     116486 1239312 405.51
## - M.F   1     125259 1248084 405.77
## - Po1   1     167001 1289827 406.99
## - M      1     179420 1302245 407.34
## - Prob   1     222703 1345529 408.55
## - Ineq   1     248870 1371696 409.26
## - Ed     1     373900 1496725 412.49
##
## Step: AIC=403.2
## .outcome ~ M + Ed + Po1 + Po2 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Po2   1      29562 1193973 402.13
## <none>                1164411 403.20
## - U1    1      98938 1263348 404.22
## - M.F   1     107127 1271537 404.46
## - Po1   1     144295 1308705 405.52
## - Prob   1     183421 1347832 406.61
## - U2    1     186553 1350963 406.70
## - M      1     293528 1457938 409.52
## - Ed     1     361800 1526211 411.21
## - Ineq   1     516992 1681402 414.80
##
## Step: AIC=402.13
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>                1193973 402.13
## - U1    1     106847 1300820 403.30
## - M.F   1     142670 1336643 404.31
## - U2    1     183928 1377901 405.43
## - Prob   1     190535 1384508 405.61
## - M      1     284310 1478283 408.03
## - Ed     1     342825 1536798 409.47
## - Ineq   1     559247 1753220 414.34
## - Po1    1    1082970 2276943 424.01
## Start: AIC=392.48
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##

```

```

##           Df Sum of Sq      RSS      AIC
## - LF       1         117  803758 390.49
## - NW       1        2055  805696 390.57
## - Po2      1        2600  806242 390.60
## - So       1        3071  806713 390.62
## - M.F      1        4168  807810 390.67
## - Wealth   1        8838  812480 390.88
## - Time     1       19307  822949 391.34
## <none>                      803641 392.48
## - Pop      1       48236  851878 392.58
## - Po1      1       52242  855883 392.75
## - M        1       78049  881690 393.82
## - U1       1      114214  917855 395.27
## - Ed       1      136056  939698 396.11
## - Ineq     1      159056  962697 396.98
## - U2       1      173762  977403 397.53
## - Prob     1      198255 1001896 398.42
##
## Step:  AIC=390.49
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - NW       1        1968  805726 388.58
## - Po2      1        2484  806242 388.60
## - So       1        4582  808340 388.69
## - M.F      1        4631  808389 388.69
## - Wealth   1        8723  812481 388.88
## - Time     1       19191  822949 389.34
## <none>                      803758 390.49
## - Pop      1       50378  854136 390.68
## - Po1      1       52617  856375 390.77
## - M        1       78466  882224 391.84
## - U1       1      139958  943716 394.27
## - Ed       1      146616  950374 394.52
## - Ineq     1      160715  964473 395.05
## - U2       1      174126  977884 395.55
## - Prob     1      199171 1002929 396.46
##
## Step:  AIC=388.58
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Po2      1        1479  807205 386.64
## - M.F      1        4132  809858 386.76
## - So       1        6789  812515 386.88
## - Wealth   1        7294  813020 386.90
## - Time     1       17261  822987 387.34
## <none>                      805726 388.58
## - Pop      1       49932  855658 388.74
## - Po1      1       50678  856404 388.77
## - M        1       92529  898255 390.49
## - U1       1      138804  944530 392.30

```

```

## - Ed      1      147126  952852 392.61
## - Ineq    1      163425  969151 393.22
## - U2      1      175905  981631 393.68
## - Prob    1      208721 1014447 394.87
##
## Step: AIC=386.64
## .outcome ~ M + So + Ed + Po1 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - M.F      1         4351  811556 384.83
## - So        1         5796  813001 384.90
## - Wealth    1         7125  814330 384.96
## - Time      1        15870  823075 385.34
## <none>                                807205 386.64
## - Pop       1        52229  859434 386.90
## - M         1        91648  898854 388.51
## - U1        1       142991  950196 390.51
## - Ed        1       146854  954059 390.66
## - Ineq      1       171807  979013 391.59
## - U2        1       184539  991744 392.05
## - Prob      1       207564 1014769 392.88
## - Po1       1       968227 1775432 413.02
##
## Step: AIC=384.83
## .outcome ~ M + So + Ed + Po1 + Pop + U1 + U2 + Wealth + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - So        1         3686  815242 383.00
## - Wealth    1         9283  820840 383.24
## - Time      1        23865  835422 383.88
## <none>                                811556 384.83
## - Pop       1        81374  892930 386.27
## - M         1       107130  918687 387.30
## - U1        1       140150  951706 388.57
## - Ed        1       172506  984062 389.77
## - U2        1       181939  993496 390.12
## - Ineq      1       215533 1027089 391.31
## - Prob      1       228998 1040554 391.78
## - Po1       1      1090176 1901732 413.49
##
## Step: AIC=383
## .outcome ~ M + Ed + Po1 + Pop + U1 + U2 + Wealth + Ineq + Prob +
##      Time
##
##      Df Sum of Sq      RSS      AIC
## - Wealth    1        12966  828208 381.57
## - Time      1       29993  845235 382.30
## <none>                                815242 383.00
## - Pop       1        82663  897905 384.47
## - M         1       114793  930035 385.74
## - Ed        1       173376  988619 387.94
## - U1        1       186945 1002188 388.43

```

```

## - U2      1      214779 1030021 389.42
## - Prob    1      228079 1043321 389.88
## - Ineq    1      322822 1138065 393.01
## - Po1     1      1147101 1962344 412.62
##
## Step: AIC=381.57
## .outcome ~ M + Ed + Po1 + Pop + U1 + U2 + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time  1      27799  856007 380.75
## <none>                828208 381.57
## - Pop   1      81601  909810 382.95
## - M     1     112642  940850 384.16
## - U1    1     203153 1031361 387.46
## - Ed    1     222929 1051137 388.15
## - Prob  1     241400 1069609 388.77
## - U2    1     251325 1079533 389.11
## - Ineq  1     408702 1236911 394.01
## - Po1   1    1431223 2259432 415.70
##
## Step: AIC=380.75
## .outcome ~ M + Ed + Po1 + Pop + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>                856007 380.75
## - M     1     101861  957868 382.80
## - Pop   1     133327  989334 383.97
## - U1    1     179697 1035704 385.61
## - Prob  1     234563 1090571 387.47
## - U2    1     235180 1091187 387.49
## - Ed    1     273949 1129956 388.75
## - Ineq  1     408798 1264805 392.81
## - Po1   1    1464046 2320053 414.65
## Start: AIC=405.33
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Po1    1         462  892239 403.35
## - Time   1         672  892450 403.36
## - U1     1         843  892620 403.37
## - Ed     1         984  892761 403.37
## - Pop    1        2115  893892 403.42
## - NW     1        8053  899830 403.66
## - M.F    1        8366  900143 403.68
## - Prob   1       19885  911662 404.15
## - So     1       21204  912982 404.20
## - Po2    1       24040  915817 404.32
## - Wealth 1       36289  928066 404.81
## <none>                891777 405.33
## - LF     1       82741  974518 406.61
## - U2     1      117112 1008890 407.90
## - Ineq   1      229490 1121267 411.80
## - M      1      408806 1300583 417.29

```

```

##
## Step: AIC=403.35
## .outcome ~ M + So + Ed + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time      1      492  892731 401.37
## - U1         1     1202  893441 401.40
## - Ed         1     2510  894750 401.46
## - Pop        1     2548  894787 401.46
## - NW         1     7963  900202 401.68
## - M.F        1     8080  900319 401.68
## - Prob       1    21566  913805 402.23
## - So         1    23372  915611 402.31
## - Wealth     1    39032  931271 402.94
## <none>                892239 403.35
## - LF         1   116560 1008800 405.89
## - U2         1   117216 1009456 405.92
## - Ineq       1   243526 1135766 410.28
## - M          1   472547 1364787 417.08
## - Po2        1   605633 1497873 420.52
##
## Step: AIC=401.37
## .outcome ~ M + So + Ed + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - U1         1     1336  894067 399.43
## - Pop        1     2156  894888 399.46
## - Ed         1     2230  894962 399.46
## - NW         1     7482  900213 399.68
## - M.F        1     7762  900493 399.69
## - So         1    22973  915704 400.31
## - Wealth     1    39761  932492 400.98
## - Prob       1    41175  933906 401.04
## <none>                892731 401.37
## - LF         1   119054 1011786 404.00
## - U2         1   122129 1014860 404.12
## - Ineq       1   248678 1141409 408.46
## - M          1   496567 1389298 415.74
## - Po2        1   638887 1531618 419.34
##
## Step: AIC=399.43
## .outcome ~ M + So + Ed + Po2 + LF + M.F + Pop + NW + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Ed         1     1256  895323 397.48
## - Pop        1     2566  896633 397.53
## - M.F        1     6462  900529 397.69
## - NW         1     7737  901804 397.75
## - So         1    22159  916227 398.33
## - Prob       1    41727  935794 399.11
## - Wealth     1    43167  937234 399.17

```



```

## <none>                894067 399.43
## - LF      1      162506 1056573 403.61
## - Ineq    1      248867 1142934 406.51
## - U2      1      276402 1170470 407.39
## - M       1      578257 1472324 415.88
## - Po2     1      747067 1641134 419.90
##
## Step:  AIC=397.48
## .outcome ~ M + So + Po2 + LF + M.F + Pop + NW + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Pop      1        2082  897405 395.56
## - NW       1        9074  904398 395.85
## - M.F      1        9980  905303 395.89
## - So       1       26915  922238 396.57
## - Prob     1       40491  935814 397.12
## - Wealth   1       44713  940036 397.28
## <none>                895323 397.48
## - LF      1      170807 1066130 401.94
## - Ineq    1      252775 1148098 404.68
## - U2      1      276339 1171662 405.43
## - M       1      610734 1506057 414.72
## - Po2     1      755655 1650978 418.12
##
## Step:  AIC=395.56
## .outcome ~ M + So + Po2 + LF + M.F + NW + U2 + Wealth + Ineq +
##      Prob
##
##      Df Sum of Sq      RSS      AIC
## - NW       1        9630  907035 393.96
## - M.F      1       18030  915435 394.30
## - So       1       28474  925879 394.72
## - Prob     1       38418  935823 395.12
## - Wealth   1       43263  940667 395.31
## <none>                897405 395.56
## - LF      1      169938 1067343 399.98
## - Ineq    1      251834 1149239 402.72
## - U2      1      277923 1175328 403.55
## - M       1      616286 1513691 412.91
## - Po2     1      797382 1694787 417.09
##
## Step:  AIC=393.96
## .outcome ~ M + So + Po2 + LF + M.F + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - M.F      1       31112  938147 393.21
## - So       1       45432  952467 393.77
## - Prob     1       48343  955377 393.88
## <none>                907035 393.96
## - Wealth   1       59054  966089 394.29
## - LF      1      160990 1068025 398.00
## - Ineq    1      242447 1149482 400.72
## - U2      1      272005 1179040 401.66

```

```

## - M      1      633890 1540925 411.57
## - Po2    1      1023582 1930617 419.91
##
## Step: AIC=393.21
## .outcome ~ M + So + Po2 + LF + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Prob  1      35977  974123 392.60
## - So    1      48642  986789 393.08
## <none>                                938147 393.21
## - Wealth 1      65248 1003395 393.70
## - Ineq   1      240713 1178860 399.66
## - LF     1      389021 1327168 404.04
## - U2     1      412020 1350167 404.68
## - M      1      877461 1815608 415.64
## - Po2    1      1027856 1966003 418.58
##
## Step: AIC=392.6
## .outcome ~ M + So + Po2 + LF + U2 + Wealth + Ineq
##
##      Df Sum of Sq      RSS      AIC
## <none>                                974123 392.60
## - Wealth 1      122947 1097071 395.00
## - So      1      143786 1117909 395.69
## - LF      1      354456 1328579 402.08
## - Ineq    1      376947 1351070 402.70
## - U2      1      408654 1382777 403.56
## - M       1      996968 1971091 416.68
## - Po2     1      1047205 2021328 417.61
## Start: AIC=425.17
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - So      1       7752 1191604 423.42
## - LF      1       8171 1192023 423.44
## - Po2     1       9924 1193776 423.49
## - M.F     1      17174 1201026 423.72
## - Pop     1      23964 1207816 423.94
## - Po1     1      27590 1211442 424.05
## - M       1      42821 1226673 424.52
## <none>                                1183852 425.17
## - U1      1      65141 1248992 425.21
## - NW      1      78243 1262095 425.61
## - Time    1      86976 1270828 425.87
## - Wealth  1      95491 1279343 426.12
## - U2      1     100712 1284564 426.28
## - Prob    1     138088 1321940 427.37
## - Ed      1     513405 1697257 436.86
## - Ineq    1     547031 1730883 437.61
##
## Step: AIC=423.42
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time

```

```

##
##      Df Sum of Sq      RSS      AIC
## - LF      1      3303 1194907 421.53
## - Po2      1      8757 1200361 421.70
## - M.F      1     13652 1205256 421.86
## - Pop      1     20771 1212375 422.08
## - Po1      1     28041 1219645 422.31
## - M        1     44759 1236363 422.82
## - U1       1     57995 1249599 423.23
## <none>             1191604 423.42
## - NW       1     72211 1263815 423.66
## - Time     1     80071 1271675 423.89
## - Wealth   1     87907 1279512 424.13
## - U2       1     93068 1284673 424.28
## - Prob     1    152245 1343849 425.99
## - Ed       1    506091 1697695 434.87
## - Ineq     1    581231 1772835 436.52
##
## Step:  AIC=421.53
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Po2      1      6893 1201800 419.75
## - M.F      1     10441 1205348 419.86
## - Pop      1     20703 1215610 420.18
## - Po1      1     25399 1220305 420.33
## - M        1     47728 1242635 421.02
## - U1       1     54724 1249630 421.23
## <none>             1194907 421.53
## - NW       1     69755 1264662 421.68
## - Time     1     79862 1274769 421.99
## - Wealth   1     88713 1283620 422.25
## - U2       1     96453 1291359 422.48
## - Prob     1    150933 1345840 424.05
## - Ed       1    515736 1710643 433.16
## - Ineq     1    579757 1774663 434.56
##
## Step:  AIC=419.75
## .outcome ~ M + Ed + Po1 + M.F + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - M.F      1     10917 1212717 418.09
## - Pop      1     26773 1228573 418.58
## - M        1     47184 1248984 419.21
## - U1       1     49085 1250885 419.27
## <none>             1201800 419.75
## - NW       1     65369 1267169 419.76
## - Time     1     74839 1276639 420.04
## - Po1      1     84835 1286635 420.34
## - U2       1     90022 1291822 420.49
## - Wealth   1     98955 1300755 420.75
## - Prob     1    144058 1345858 422.05

```

```

## - Ed      1      511085 1712885 431.21
## - Ineq    1      663513 1865313 434.45
##
## Step:  AIC=418.09
## .outcome ~ M + Ed + Po1 + Pop + NW + U1 + U2 + Wealth + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop      1      22501 1235218 416.79
## - U1        1      38195 1250911 417.27
## - NW        1      64887 1277604 418.07
## - M         1      64894 1277611 418.07
## <none>                1212717 418.09
## - U2        1      79826 1292543 418.51
## - Po1       1      84958 1297675 418.66
## - Time      1      95370 1308086 418.97
## - Wealth    1     123374 1336090 419.77
## - Prob      1     168682 1381398 421.04
## - Ed        1     579082 1791798 430.92
## - Ineq      1     821460 2034176 435.74
##
## Step:  AIC=416.79
## .outcome ~ M + Ed + Po1 + NW + U1 + U2 + Wealth + Ineq + Prob +
##      Time
##
##      Df Sum of Sq      RSS      AIC
## - U1        1      37852 1273070 415.94
## - NW        1      49980 1285198 416.30
## <none>                1235218 416.79
## - Time      1      73646 1308864 416.99
## - M         1      81518 1316735 417.22
## - U2        1      97862 1333079 417.69
## - Wealth    1     103831 1339049 417.86
## - Prob      1     168119 1403336 419.64
## - Po1       1     339750 1574967 424.02
## - Ed        1     557773 1792990 428.95
## - Ineq      1     811049 2046266 433.97
##
## Step:  AIC=415.94
## .outcome ~ M + Ed + Po1 + NW + U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - NW        1      66035 1339105 415.86
## - Time      1      66072 1339142 415.86
## <none>                1273070 415.94
## - M         1      73761 1346831 416.08
## - U2        1      74814 1347884 416.11
## - Wealth    1     127151 1400221 417.55
## - Prob      1     164837 1437907 418.56
## - Po1       1     454663 1727733 425.54
## - Ed        1     526190 1799260 427.08
## - Ineq      1     881745 2154815 433.93
##
## Step:  AIC=415.86

```

```

## .outcome ~ M + Ed + Po1 + U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - Time      1      30321 1369426 414.71
## <none>                1339105 415.86
## - U2         1      81499 1420604 416.10
## - Wealth     1      91564 1430669 416.37
## - Prob       1     111716 1450821 416.90
## - M          1     180835 1519940 418.67
## - Ed         1     475820 1814925 425.41
## - Ineq       1     924118 2263224 433.80
## - Po1        1     935531 2274636 433.99
##
## Step:  AIC=414.71
## .outcome ~ M + Ed + Po1 + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq    RSS    AIC
## <none>                1369426 414.71
## - Prob       1      81405 1450831 414.90
## - Wealth     1      88578 1458004 415.09
## - U2         1      90156 1459582 415.13
## - M          1     181029 1550455 417.43
## - Ed         1     600810 1970235 426.53
## - Ineq       1     893800 2263225 431.80
## - Po1        1     909746 2279172 432.07
## Start:  AIC=408.06
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - Wealth     1       1973  756587 406.16
## - So          1       1981  756596 406.16
## - Pop         1       9554  764168 406.54
## - M           1      15954  770569 406.86
## - U2          1      28901  783516 407.49
## - Po2         1      29075  783690 407.50
## <none>                754615 408.06
## - U1          1      51675  806289 408.58
## - Time        1      69358  823973 409.40
## - NW          1      90818  845433 410.38
## - Prob        1     105866  860481 411.05
## - LF          1     106443  861057 411.08
## - Po1         1     124868  879482 411.88
## - M.F         1     187780  942394 414.51
## - Ineq        1     309670 1064285 419.13
## - Ed          1     393518 1148133 422.01
##
## Step:  AIC=406.16
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - So         1       1511  758099 404.24
## - Pop        1      11581  768168 404.74

```

```

## - M      1      14200  770787 404.87
## - Po2    1      28634  785222 405.57
## - U2     1      29496  786084 405.61
## <none>           756587 406.16
## - U1     1      51092  807679 406.64
## - Time   1      75503  832090 407.78
## - NW     1      89000  845588 408.39
## - LF     1     104835  861423 409.09
## - Prob   1     106736  863323 409.18
## - Po1    1     127938  884526 410.10
## - M.F    1     190316  946903 412.69
## - Ed     1     408707 1165294 420.57
## - Ineq   1     431053 1187641 421.30
##
## Step: AIC=404.24
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop   1      12386  770484 402.85
## - M      1      13672  771771 402.92
## - U2     1      28374  786473 403.63
## - Po2    1      28754  786853 403.65
## <none>           758099 404.24
## - U1     1      53802  811901 404.84
## - Time   1      75960  834059 405.87
## - NW     1     104494  862592 407.14
## - LF     1     125780  883879 408.07
## - Prob   1     127282  885380 408.14
## - Po1    1     129736  887834 408.24
## - M.F    1     191431  949529 410.79
## - Ed     1     413630 1171729 418.78
## - Ineq   1     442688 1200786 419.71
##
## Step: AIC=402.85
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - M      1      11383  781867 401.41
## - Po2    1      24165  794649 402.03
## - U2     1      27823  798307 402.20
## <none>           770484 402.85
## - U1     1      45917  816401 403.05
## - Time   1      94862  865346 405.27
## - NW     1     101850  872334 405.57
## - LF     1     113399  883883 406.07
## - Prob   1     124785  895269 406.56
## - Po1    1     126867  897351 406.65
## - M.F    1     183162  953646 408.96
## - Ed     1     414856 1185340 417.22
## - Ineq   1     533742 1304226 420.85
##
## Step: AIC=401.41

```

```

## .outcome ~ Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 + Ineq +
## Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - U2    1      21309  803176  400.43
## - Po2    1      24550  806416  400.59
## <none>                781867  401.41
## - U1     1      46350  828217  401.60
## - Po1     1     125144  907011  405.05
## - Prob    1     126464  908330  405.11
## - Time    1     133082  914949  405.38
## - LF      1     133215  915082  405.39
## - NW      1     162516  944383  406.59
## - M.F     1     253112 1034978  410.07
## - Ed      1     404068 1185935  415.24
## - Ineq    1     547737 1329604  419.59
##
## Step:  AIC=400.43
## .outcome ~ Ed + Po1 + Po2 + LF + M.F + NW + U1 + Ineq + Prob +
## Time
##
##      Df Sum of Sq      RSS      AIC
## - Po2    1      25747  828923  399.63
## - U1     1      29462  832637  399.80
## <none>                803176  400.43
## - Prob    1     118652  921828  403.67
## - LF      1     129297  932473  404.10
## - Po1     1     147066  950242  404.82
## - NW      1     155120  958296  405.14
## - Time    1     158206  961382  405.26
## - M.F     1     233333 1036509  408.12
## - Ed      1     383156 1186332  413.25
## - Ineq    1     659659 1462835  421.22
##
## Step:  AIC=399.63
## .outcome ~ Ed + Po1 + LF + M.F + NW + U1 + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - U1     1      25135  854058  398.77
## <none>                828923  399.63
## - Prob    1      96211  925135  401.80
## - LF      1     108489  937412  402.31
## - NW      1     133264  962188  403.30
## - Time    1     232323 1061247  407.02
## - M.F     1     263069 1091992  408.11
## - Ed      1     357411 1186334  411.25
## - Ineq    1     733226 1562150  421.71
## - Po1     1    2011372 2840296  444.43
##
## Step:  AIC=398.77
## .outcome ~ Ed + Po1 + LF + M.F + NW + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## <none>                854058  398.77

```

```

## - LF      1      84718  938776 400.36
## - Prob    1      90143  944201 400.58
## - NW      1     129704  983762 402.14
## - Time    1     227303 1081360 405.73
## - M.F     1     285303 1139361 407.72
## - Ed      1     352578 1206636 409.90
## - Ineq    1     742656 1596713 420.54
## - Po1     1    2088394 2942452 443.77
## Start:  AIC=419.28
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - M.F      1         202  801404 417.29
## - NW       1         400  801603 417.30
## - So       1        3623  804825 417.46
## - LF       1       13952  815154 417.96
## - U1       1       15760  816962 418.04
## - Wealth   1       16138  817341 418.06
## - Pop      1       32933  834136 418.85
## <none>                801202 419.28
## - Time     1       54658  855860 419.86
## - Po2      1      103632  904835 422.03
## - U2       1      142467  943669 423.66
## - Prob     1      196381  997584 425.83
## - Po1      1      234887 1036089 427.31
## - M        1      366135 1167337 431.96
## - Ineq     1      398836 1200038 433.04
## - Ed       1      488238 1289440 435.84
##
## Step:  AIC=417.29
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - NW       1         602  802007 415.32
## - So       1        3421  804825 415.46
## - Wealth   1       16153  817557 416.07
## - LF       1       20995  822399 416.30
## - U1       1       27448  828852 416.61
## - Pop      1       38560  839964 417.12
## <none>                801404 417.29
## - Time     1       54522  855926 417.86
## - Po2      1      103470  904874 420.03
## - U2       1      149124  950528 421.95
## - Prob     1      200562 1001966 424.00
## - Po1      1      237396 1038800 425.41
## - M        1      409309 1210713 431.38
## - Ineq     1      427559 1228963 431.97
## - Ed       1      488286 1289690 433.85
##
## Step:  AIC=415.32
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time

```



```

##
##           Df Sum of Sq      RSS      AIC
## - So      1      6965  808971 413.66
## - Wealth  1     15863  817869 414.08
## - LF      1     20663  822670 414.31
## - U1      1     27235  829241 414.62
## - Pop     1     39381  841388 415.19
## <none>                802007 415.32
## - Time    1     63047  865053 416.27
## - Po2     1    108130  910137 418.25
## - U2      1    148527  950534 419.95
## - Prob    1    227083 1029090 423.04
## - Po1     1    242558 1044565 423.63
## - M       1    432022 1234029 430.13
## - Ineq    1    439226 1241232 430.35
## - Ed      1    499620 1301627 432.21
##
## Step:  AIC=413.66
## .outcome ~ M + Ed + Po1 + Po2 + LF + Pop + U1 + U2 + Wealth +
##           Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Wealth  1     17373  826344 412.49
## - LF      1     35432  844403 413.33
## - Pop     1     38561  847532 413.47
## <none>                808971 413.66
## - U1      1     46471  855442 413.84
## - Time    1     66685  875656 414.75
## - Po2     1    105389  914360 416.43
## - U2      1    182588  991559 419.60
## - Prob    1    223972 1032943 421.19
## - Po1     1    238407 1047378 421.73
## - Ed      1    515492 1324463 430.89
## - M       1    525253 1334224 431.17
## - Ineq    1    612081 1421052 433.63
##
## Step:  AIC=412.49
## .outcome ~ M + Ed + Po1 + Po2 + LF + Pop + U1 + U2 + Ineq + Prob +
##           Time
##
##           Df Sum of Sq      RSS      AIC
## - Pop     1     29909  856253 411.87
## - LF      1     31147  857490 411.93
## <none>                826344 412.49
## - U1      1     64934  891278 413.44
## - Time    1     88029  914373 414.43
## - Po2     1    120370  946714 415.79
## - U2      1    220355 1046699 419.71
## - Po1     1    275781 1102125 421.72
## - Prob    1    353988 1180332 424.39
## - M       1    514855 1341199 429.37
## - Ed      1    669942 1496286 433.64
## - Ineq    1    819026 1645370 437.35
##

```

```

## Step: AIC=411.87
## .outcome ~ M + Ed + Po1 + Po2 + LF + U1 + U2 + Ineq + Prob +
## Time
##
##      Df Sum of Sq    RSS    AIC
## - LF   1      27745 883998 411.12
## <none>                856253 411.87
## - U1   1      68188 924441 412.86
## - Po2   1     135887 992139 415.62
## - Time  1     157811 1014064 416.47
## - U2   1     224910 1081162 418.97
## - Po1   1     280771 1137024 420.93
## - Prob  1     381618 1237871 424.25
## - M     1     652598 1508851 431.97
## - Ed    1     703116 1559369 433.25
## - Ineq  1     789278 1645531 435.35
##
## Step: AIC=411.12
## .outcome ~ M + Ed + Po1 + Po2 + U1 + U2 + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## <none>                883998 411.12
## - U1   1      63453 947451 411.82
## - Po2   1     109164 993162 413.66
## - Time  1     140481 1024479 414.87
## - Po1   1     253449 1137447 418.95
## - U2   1     258684 1142681 419.13
## - Prob  1     354457 1238455 422.27
## - M     1     656571 1540568 430.78
## - Ed    1     731121 1615119 432.62
## - Ineq  1     763461 1647459 433.40
## Start: AIC=409.57
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - Wealth  1        453 785542 407.59
## - Pop     1      14525 799613 408.26
## - Prob    1      14776 799864 408.28
## - Po2     1      21194 806282 408.58
## - Time    1      24018 809107 408.71
## <none>                785088 409.57
## - U2      1      59781 844870 410.36
## - M       1      77383 862471 411.14
## - U1      1      81379 866467 411.31
## - NW      1      83696 868784 411.42
## - So      1      98321 883409 412.05
## - Po1     1     116584 901672 412.83
## - LF      1     139345 924434 413.78
## - M.F     1     176219 961307 415.26
## - Ed      1     248737 1033825 418.03
## - Ineq    1     308735 1093824 420.17
##
## Step: AIC=407.59

```

```

## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Prob  1      14401  799943  406.28
## - Pop   1      14494  800036  406.28
## - Po2   1      23890  809432  406.73
## - Time  1      25306  810848  406.79
## <none>                785542  407.59
## - U2    1      59414  844956  408.36
## - M     1      76929  862471  409.14
## - U1    1      81723  867265  409.35
## - NW    1      98348  883889  410.07
## - So    1     103211  888753  410.28
## - Po1   1     117574  903116  410.89
## - LF    1     139574  925116  411.80
## - M.F   1     178267  963809  413.36
## - Ed    1     255401 1040943  416.29
## - Ineq  1     435377 1220918  422.35
##
## Step: AIC=406.28
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Ineq + Time
##
##      Df Sum of Sq      RSS      AIC
## - Po2    1      15580  815523  405.01
## - Pop    1      16225  816168  405.04
## <none>                799943  406.28
## - U2     1      48518  848461  406.52
## - U1     1      69737  869680  407.46
## - M      1      78141  878084  407.82
## - NW     1      84976  884919  408.12
## - Time   1      98776  898719  408.70
## - Po1    1     107104  907047  409.05
## - So     1     109796  909739  409.17
## - LF     1     129626  929569  409.99
## - M.F    1     178308  978251  411.93
## - Ed     1     242297 1042240  414.33
## - Ineq   1     451954 1251897  421.30
##
## Step: AIC=405.01
## .outcome ~ M + So + Ed + Po1 + LF + M.F + Pop + NW + U1 + U2 +
##      Ineq + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop    1      17764  833287  403.83
## - U2     1      40369  855892  404.85
## <none>                815523  405.01
## - U1     1      58117  873640  405.63
## - NW     1      70631  886153  406.17
## - M      1      80370  895893  406.58
## - So     1     103445  918968  407.55
## - Time   1     114312  929835  408.00
## - LF     1     115699  931222  408.05

```

```

## - M.F 1 183469 998992 410.72
## - Ed 1 226904 1042427 412.34
## - Ineq 1 530420 1345943 422.05
## - Po1 1 866399 1681922 430.52
##
## Step: AIC=403.83
## .outcome ~ M + So + Ed + Po1 + LF + M.F + NW + U1 + U2 + Ineq +
## Time
##
## Df Sum of Sq RSS AIC
## <none> 833287 403.83
## - U2 1 46898 880185 403.91
## - U1 1 54859 888145 404.25
## - NW 1 64897 898184 404.68
## - M 1 84719 918006 405.51
## - So 1 100441 933728 406.16
## - LF 1 106953 940240 406.42
## - M.F 1 165786 999072 408.73
## - Time 1 177826 1011112 409.18
## - Ed 1 233136 1066422 411.20
## - Ineq 1 579454 1412741 421.89
## - Po1 1 1220985 2054271 436.12
## Start: AIC=382.53
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##
## Df Sum of Sq RSS AIC
## - LF 1 85 481581 380.53
## - NW 1 150 481645 380.54
## - Wealth 1 1853 483349 380.67
## - M.F 1 4429 485925 380.87
## - So 1 20280 501776 382.05
## <none> 481495 382.53
## - Pop 1 31459 512955 382.87
## - Time 1 34001 515497 383.05
## - U1 1 38226 519722 383.35
## - Po2 1 67681 549177 385.39
## - Ineq 1 129629 611125 389.35
## - Po1 1 192958 674453 393.00
## - Prob 1 193098 674593 393.01
## - U2 1 193746 675241 393.04
## - M 1 331095 812591 399.89
## - Ed 1 748413 1229909 415.23
##
## Step: AIC=380.53
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
## Wealth + Ineq + Prob + Time
##
## Df Sum of Sq RSS AIC
## - NW 1 289 481870 378.56
## - Wealth 1 2178 483758 378.70
## - M.F 1 6277 487857 379.01
## <none> 481581 380.53
## - So 1 26970 508551 380.55

```

```

## - Pop      1      32511  514092 380.95
## - Time     1      34206  515787 381.07
## - U1       1      43331  524911 381.72
## - Po2      1      69242  550823 383.51
## - Ineq     1     134191  615771 387.63
## - Po1      1     195053  676634 391.12
## - U2       1     195280  676860 391.13
## - Prob     1     195534  677115 391.14
## - M        1     331943  813523 397.93
## - Ed       1     780669 1262249 414.19
##
## Step: AIC=378.56
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Wealth  1      1973  483843 376.71
## - M.F     1      6134  488004 377.02
## <none>                481870 378.56
## - So      1     27043  508913 378.58
## - Pop     1     32345  514215 378.96
## - Time    1     38930  520800 379.43
## - U1      1     43270  525140 379.74
## - Po2     1     75002  556872 381.91
## - Ineq    1    135299  617169 385.71
## - U2      1    194990  676860 389.13
## - Po1     1    200890  682760 389.45
## - Prob    1    219345  701215 390.44
## - M       1    340539  822409 396.34
## - Ed      1    782827 1264697 412.26
##
## Step: AIC=376.71
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - M.F     1      8178  492020 375.33
## - So      1     25103  508945 376.58
## <none>                483843 376.71
## - Pop     1     35518  519360 377.33
## - Time    1     39520  523363 377.61
## - U1      1     43096  526939 377.87
## - Po2     1     73305  557148 379.93
## - U2      1    193461  677303 387.15
## - Po1     1    199701  683543 387.49
## - Prob    1    218376  702219 388.49
## - Ineq    1    279276  763119 391.57
## - M       1    365026  848869 395.51
## - Ed      1    828015 1311858 411.61
##
## Step: AIC=375.33
## .outcome ~ M + So + Ed + Po1 + Po2 + Pop + U1 + U2 + Ineq + Prob +
##      Time
##

```

```

##          Df Sum of Sq      RSS      AIC
## <none>                492020 375.33
## - Pop      1      27555 519576 375.34
## - So       1      30214 522234 375.53
## - Time     1      31810 523831 375.65
## - U1       1      53891 545911 377.17
## - Po2      1      67729 559750 378.10
## - Po1      1     191527 683547 385.49
## - U2       1     196862 688882 385.78
## - Prob     1     210898 702918 386.53
## - Ineq     1     274449 766469 389.73
## - M        1     363595 855615 393.80
## - Ed       1     871017 1363037 411.03
## Start:  AIC=426.5
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##          U2 + Wealth + Ineq + Prob + Time
##
##          Df Sum of Sq      RSS      AIC
## - LF       1       4959 1230776 424.65
## - M.F      1       5746 1231563 424.68
## - So       1       6903 1232720 424.71
## - Pop      1       8329 1234146 424.76
## - Po2      1       9058 1234875 424.78
## - NW       1      10221 1236038 424.81
## - Time     1      13010 1238827 424.90
## - Wealth   1      22737 1248554 425.20
## - U1       1      31968 1257785 425.48
## - Po1      1      65960 1291777 426.49
## <none>                1225817 426.50
## - M        1     147740 1373557 428.82
## - U2       1     155650 1381467 429.04
## - Ed       1     185316 1411133 429.85
## - Prob     1     197494 1423311 430.17
## - Ineq     1     237308 1463125 431.22
##
## Step:  AIC=424.65
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
##          Wealth + Ineq + Prob + Time
##
##          Df Sum of Sq      RSS      AIC
## - So       1       2878 1233653 422.74
## - Pop      1       6254 1237030 422.84
## - Time     1      11745 1242521 423.01
## - NW       1      12059 1242835 423.02
## - Po2      1      19920 1250695 423.26
## - Wealth   1      22657 1253432 423.34
## - M.F      1      30478 1261253 423.58
## <none>                1230776 424.65
## - U1       1      74270 1305046 424.88
## - Po1      1      93214 1323990 425.43
## - U2       1     163874 1394650 427.40
## - M        1     184087 1414863 427.95
## - Prob     1     193082 1423858 428.19
## - Ineq     1     280692 1511467 430.46

```

```

## - Ed      1      313901 1544677 431.28
##
## Step: AIC=422.74
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop      1      8449 1242102 421.00
## - Time      1     13356 1247009 421.15
## - Po2       1     18506 1252159 421.31
## - NW        1     21044 1254697 421.38
## - Wealth    1     28054 1261707 421.59
## - M.F       1     28787 1262441 421.62
## <none>              1233653 422.74
## - U1        1     85672 1319326 423.29
## - Po1        1     90649 1324302 423.43
## - U2        1    188162 1421815 426.13
## - Prob      1    190999 1424653 426.21
## - M         1    202507 1436161 426.52
## - Ed        1    311289 1544942 429.29
## - Ineq      1    336513 1570166 429.91
##
## Step: AIC=421
## .outcome ~ M + Ed + Po1 + Po2 + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Po2       1     18868 1260970 419.57
## - Time      1     20143 1262245 419.61
## - NW        1     21656 1263758 419.66
## - Wealth    1     25117 1267219 419.76
## - M.F       1     52402 1294504 420.57
## <none>              1242102 421.00
## - Po1       1     86455 1328557 421.56
## - U1        1    103517 1345619 422.04
## - Prob      1    191954 1434056 424.46
## - U2        1    197981 1440082 424.62
## - M         1    207615 1449716 424.87
## - Ed        1    304639 1546741 427.33
## - Ineq      1    333160 1575262 428.03
##
## Step: AIC=419.57
## .outcome ~ M + Ed + Po1 + M.F + NW + U1 + U2 + Wealth + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time      1      8599 1269569 417.83
## - NW        1     15034 1276005 418.02
## - Wealth    1     23311 1284281 418.27
## <none>              1260970 419.57
## - M.F       1     77910 1338880 419.85
## - U1        1    111339 1372310 420.79
## - Prob      1    173584 1434554 422.47
## - M         1    202087 1463057 423.22

```

```

## - U2      1      208155 1469126 423.38
## - Ed      1      286604 1547574 425.36
## - Ineq    1      329164 1590134 426.39
## - Po1     1      602585 1863556 432.42
##
## Step: AIC=417.83
## .outcome ~ M + Ed + Po1 + M.F + NW + U1 + U2 + Wealth + Ineq +
## Prob
##
##      Df Sum of Sq      RSS      AIC
## - NW      1      11117 1280686 416.16
## - Wealth  1      20784 1290353 416.45
## <none>                1269569 417.83
## - M.F     1     101413 1370982 418.75
## - U1      1     111303 1380872 419.02
## - M       1     193560 1463130 421.22
## - Prob    1     203197 1472766 421.47
## - U2      1     206714 1476284 421.56
## - Ed      1     293719 1563288 423.74
## - Ineq    1     322428 1591998 424.43
## - Po1     1     610088 1879657 430.74
##
## Step: AIC=416.16
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Wealth  1      17187 1297874 414.67
## <none>                1280686 416.16
## - M.F     1      92484 1373170 416.81
## - U1      1     109803 1390490 417.29
## - Prob    1     193623 1474309 419.51
## - U2      1     209736 1490422 419.93
## - M       1     231624 1512311 420.48
## - Ed      1     290531 1571217 421.93
## - Ineq    1     398204 1678890 424.45
## - Po1     1     889743 2170429 434.21
##
## Step: AIC=414.67
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>                1297874 414.67
## - M.F     1     117845 1415719 415.97
## - U1      1     135201 1433075 416.43
## - M       1     214568 1512441 418.48
## - Prob    1     238172 1536046 419.07
## - U2      1     244285 1542159 419.22
## - Ed      1     317891 1615765 420.99
## - Ineq    1     473813 1771687 424.49
## - Po1     1    1192053 2489927 437.43
## Start: AIC=412.29
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##

```



```

##           Df Sum of Sq      RSS      AIC
## - NW       1         449 1076613 410.30
## - LF       1         741 1076906 410.31
## - Time     1        3318 1079483 410.40
## - M.F      1        9791 1085955 410.62
## - Po2      1       14369 1090534 410.78
## - U1       1       18208 1094373 410.91
## - So       1       24619 1100784 411.12
## <none>                1076165 412.29
## - M        1       63136 1139301 412.40
## - Wealth   1       80522 1156687 412.96
## - Po1      1       84300 1160464 413.08
## - U2       1       87965 1164130 413.19
## - Pop      1       91995 1168160 413.32
## - Prob     1      168745 1244910 415.68
## - Ed       1      174857 1251022 415.86
## - Ineq     1      350794 1426959 420.73
##
## Step:  AIC=410.3
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - LF       1         1147 1077760 408.34
## - Time     1         2870 1079484 408.40
## - M.F      1        10372 1086985 408.66
## - Po2      1        17689 1094303 408.90
## - U1       1        18280 1094894 408.92
## - So       1        26403 1103016 409.20
## <none>                1076613 410.30
## - M        1        72567 1149180 410.71
## - Wealth   1        80925 1157538 410.98
## - U2       1        91155 1167769 411.31
## - Pop      1        92111 1168724 411.34
## - Po1      1        92790 1169403 411.36
## - Ed       1       176620 1253233 413.92
## - Prob     1       233622 1310235 415.57
## - Ineq     1       379903 1456516 419.48
##
## Step:  AIC=408.34
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Time     1         2933 1080693 406.44
## - M.F      1         9352 1087112 406.66
## - Po2      1        16673 1094433 406.91
## - U1       1        17328 1095088 406.93
## - So       1        40143 1117903 407.69
## <none>                1077760 408.34
## - M        1       71544 1149305 408.72
## - Wealth   1       80070 1157830 408.99
## - U2       1       90795 1168555 409.33
## - Po1      1       91686 1169447 409.36

```

```

## - Pop      1      95735 1173495 409.49
## - Ed       1      187047 1264808 412.26
## - Prob     1      236949 1314709 413.69
## - Ineq     1      409504 1487264 418.26
##
## Step: AIC=406.44
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - M.F      1        7183 1087877 404.69
## - U1       1       21664 1102358 405.18
## - Po2      1       24906 1105600 405.28
## - So       1       37811 1118505 405.71
## <none>                1080693 406.44
## - Wealth   1       80420 1161114 407.10
## - M        1       89912 1170605 407.40
## - Pop      1       93880 1174573 407.52
## - U2       1      106948 1187641 407.93
## - Po1      1      113308 1194002 408.13
## - Ed       1      184605 1265299 410.28
## - Prob     1      314723 1395416 413.90
## - Ineq     1      406817 1487511 416.26
##
## Step: AIC=404.69
## .outcome ~ M + So + Ed + Po1 + Po2 + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - U1       1       14614 1102491 403.18
## - Po2      1       31723 1119600 403.75
## - So       1       35334 1123211 403.87
## <none>                1087877 404.69
## - Wealth   1       99705 1187582 405.93
## - U2       1      100267 1188143 405.95
## - M        1      101611 1189488 405.99
## - Po1      1      134396 1222273 407.00
## - Pop      1      151844 1239721 407.52
## - Ed       1      216226 1304103 409.39
## - Prob     1      315408 1403285 412.11
## - Ineq     1      493848 1581724 416.54
##
## Step: AIC=403.18
## .outcome ~ M + So + Ed + Po1 + Po2 + Pop + U2 + Wealth + Ineq +
##      Prob
##
##      Df Sum of Sq      RSS      AIC
## - Po2      1       29784 1132275 402.17
## - So       1       56903 1159395 403.04
## <none>                1102491 403.18
## - M        1       97561 1200052 404.32
## - Wealth   1      117062 1219553 404.91
## - U2       1      127525 1230016 405.23
## - Po1      1      135121 1237612 405.46

```

```

## - Pop      1      144786 1247277 405.75
## - Ed       1      201613 1304104 407.39
## - Prob     1      361226 1463717 411.67
## - Ineq     1      519431 1621922 415.46
##
## Step: AIC=402.17
## .outcome ~ M + So + Ed + Po1 + Pop + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - So       1       41362 1173637 401.49
## <none>                      1132275 402.17
## - M        1      119115 1251390 403.87
## - U2       1      128830 1261105 404.15
## - Wealth   1      141730 1274005 404.53
## - Pop      1      152663 1284938 404.85
## - Ed       1      201763 1334038 406.23
## - Prob     1      346645 1478920 410.05
## - Ineq     1      661029 1793304 417.18
## - Po1      1      985487 2117762 423.33
##
## Step: AIC=401.49
## .outcome ~ M + Ed + Po1 + Pop + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## <none>                      1173637 401.49
## - Pop      1      138380 1312018 403.62
## - U2       1      139729 1313366 403.66
## - Wealth   1      172829 1346467 404.58
## - Ed       1      183782 1357419 404.88
## - M        1      208897 1382535 405.55
## - Prob     1      309572 1483209 408.16
## - Ineq     1      911218 2084856 420.75
## - Po1      1     1054738 2228375 423.22
## Start: AIC=421.86
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##           U2 + Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - LF       1         708 1085588 419.88
## - So       1         7469 1092349 420.12
## - Pop      1         8517 1093397 420.15
## - Time     1        24889 1109769 420.72
## - NW       1        26508 1111388 420.77
## - Po2      1        30155 1115035 420.90
## - M.F      1        37669 1122549 421.15
## - U1       1        55611 1140491 421.76
## <none>                      1084880 421.86
## - U2       1        82799 1167680 422.65
## - Po1      1        89076 1173956 422.86
## - Wealth   1       101017 1185897 423.24
## - Ed       1       104632 1189512 423.36
## - M        1       113021 1197902 423.62
## - Prob     1       140709 1225589 424.49
## - Ineq     1       432090 1516970 432.60

```

```

##
## Step: AIC=419.88
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - So      1      6968 1092556 418.12
## - Pop      1     10266 1095854 418.24
## - Time     1     24182 1109770 418.72
## - NW       1     26908 1112496 418.81
## - Po2      1     30095 1115683 418.92
## - M.F      1     39425 1125013 419.24
## <none>                1085588 419.88
## - U1       1     60797 1146384 419.95
## - U2       1     82645 1168233 420.67
## - Po1      1     90011 1175598 420.91
## - Wealth   1    100367 1185955 421.24
## - Ed       1    107759 1193347 421.48
## - M        1    113547 1199134 421.66
## - Prob     1    140654 1226242 422.51
## - Ineq     1    435850 1521437 430.71
##
## Step: AIC=418.12
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop      1     10431 1102987 416.49
## - NW       1     21503 1114059 416.87
## - Time     1     22768 1115324 416.91
## - Po2      1     33468 1126024 417.27
## - M.F      1     44648 1137204 417.65
## <none>                1092556 418.12
## - U1       1     59143 1151699 418.13
## - U2       1     80125 1172681 418.81
## - Wealth   1     94650 1187206 419.28
## - Po1      1     98799 1191355 419.41
## - M        1    106813 1199369 419.67
## - Ed       1    127730 1220286 420.33
## - Prob     1    181084 1273640 421.95
## - Ineq     1    455485 1548041 429.37
##
## Step: AIC=416.49
## .outcome ~ M + Ed + Po1 + Po2 + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - NW       1     20428 1123415 415.18
## - Po2      1     31353 1134340 415.55
## - Time     1     34400 1137387 415.65
## - M.F      1     50766 1153753 416.20
## <none>                1102987 416.49
## - U1       1     59800 1162786 416.49
## - U2       1     76106 1179093 417.02

```

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## - Po1      1      91012 1193999 417.50
## - Wealth   1      96021 1199008 417.66
## - Ed       1     120147 1223134 418.41
## - M        1     136148 1239135 418.91
## - Prob     1     178220 1281207 420.18
## - Ineq     1     454479 1557466 427.60
##
## Step: AIC=415.18
## .outcome ~ M + Ed + Po1 + Po2 + M.F + U1 + U2 + Wealth + Ineq +
## Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Po2      1      21553 1144968 413.91
## - Time     1      23317 1146732 413.96
## - M.F      1      41913 1165328 414.58
## - U1       1      53487 1176902 414.95
## <none>                1123415 415.18
## - U2       1      75240 1198655 415.65
## - Po1      1      78890 1202305 415.76
## - Wealth   1      91746 1215161 416.17
## - Ed       1     113940 1237355 416.85
## - Prob     1     158574 1281989 418.20
## - M        1     206622 1330037 419.60
## - Ineq     1     552709 1676124 428.39
##
## Step: AIC=413.91
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Wealth + Ineq + Prob +
## Time
##
##      Df Sum of Sq      RSS      AIC
## - Time     1      10681 1155648 412.26
## - U1       1      52300 1197268 413.60
## - M.F      1      55211 1200178 413.69
## <none>                1144968 413.91
## - U2       1      83972 1228940 414.59
## - Wealth   1      89469 1234437 414.76
## - Ed       1     131426 1276394 416.03
## - Prob     1     140342 1285310 416.30
## - M        1     199149 1344117 418.00
## - Ineq     1     575233 1720201 427.37
## - Po1      1     631773 1776741 428.60
##
## Step: AIC=412.26
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - U1       1      47703 1203351 411.80
## <none>                1155648 412.26
## - M.F      1      73757 1229406 412.61
## - U2       1      78769 1234417 412.76
## - Wealth   1      89900 1245548 413.11
## - Ed       1     143167 1298816 414.70
## - Prob     1     148483 1304131 414.85
## - M        1     189029 1344677 416.01

```

```

## - Ineq      1      569808 1725457 425.49
## - Po1       1      626364 1782012 426.72
##
## Step: AIC=411.8
## .outcome ~ M + Ed + Po1 + M.F + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - M.F      1       29884 1233235 410.73
## - U2       1       32447 1235799 410.81
## <none>                      1203351 411.80
## - Ed      1      120037 1323388 413.41
## - Prob    1      153814 1357165 414.37
## - Wealth  1      172479 1375830 414.89
## - M       1      231025 1434376 416.47
## - Po1     1      619920 1823271 425.59
## - Ineq    1      751079 1954431 428.22
##
## Step: AIC=410.73
## .outcome ~ M + Ed + Po1 + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - U2      1       52650 1285885 410.32
## <none>                      1233235 410.73
## - Prob    1      164379 1397614 413.48
## - Wealth  1      183620 1416855 414.00
## - Ed      1      239717 1472952 415.48
## - M       1      292311 1525546 416.81
## - Po1     1      597020 1830255 423.73
## - Ineq    1      809049 2042284 427.90
##
## Step: AIC=410.32
## .outcome ~ M + Ed + Po1 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## <none>                      1285885 410.32
## - Prob    1      177609 1463494 413.23
## - Ed      1      187657 1473542 413.49
## - Wealth  1      233156 1519041 414.65
## - M       1      241571 1527456 414.86
## - Po1     1      602003 1887888 422.91
## - Ineq    1      877592 2163477 428.09
## Start: AIC=397.54
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##           U2 + Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - So      1        3290  725734 395.71
## - Time    1        9749  732194 396.04
## - Pop     1       18480  740924 396.48
## - NW      1       18549  740994 396.48
## - LF      1       30256  752701 397.06
## - Wealth  1       34092  756536 397.25
## <none>                      722444 397.54
## - M.F     1       53685  776129 398.19

```

```

## - M      1      76561  799005 399.27
## - U1     1      82028  804472 399.52
## - Po2    1      90275  812719 399.90
## - U2     1     119226  841670 401.19
## - Prob   1     158850  881294 402.89
## - Po1    1     216061  938505 405.22
## - Ineq   1     359807 1082251 410.49
## - Ed     1     395867 1118311 411.71
##
## Step: AIC=395.71
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time  1      10913  736647 394.26
## - Pop   1      17025  742759 394.57
## - NW    1      19385  745119 394.68
## - Wealth 1      32978  758712 395.35
## - LF    1      38209  763943 395.61
## <none>                725734 395.71
## - M.F   1      53383  779117 396.33
## - Po2   1      90816  816550 398.07
## - M     1      93448  819182 398.19
## - U1    1      99094  824828 398.44
## - U2    1     145734  871468 400.48
## - Prob  1     165760  891494 401.32
## - Po1   1     218132  943866 403.43
## - Ed    1     395562 1121296 409.81
## - Ineq  1     396544 1122277 409.84
##
## Step: AIC=394.26
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - NW    1      13371  750018 392.93
## - Pop    1      22348  758995 393.37
## - Wealth 1      31661  768308 393.82
## - LF    1      32012  768660 393.83
## <none>                736647 394.26
## - M.F   1      70161  806808 395.63
## - Po2   1      80930  817577 396.12
## - M     1      83591  820238 396.24
## - U1    1      98062  834709 396.89
## - U2    1     138058  874705 398.62
## - Prob  1     170621  907268 399.97
## - Po1   1     215332  951979 401.75
## - Ed    1     386298 1122946 407.86
## - Ineq  1     459114 1195761 410.18
##
## Step: AIC=392.93
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##

```

```

##           Df Sum of Sq      RSS      AIC
## - Pop      1      17003  767020 391.76
## - Wealth   1      19961  769978 391.90
## - LF        1      20752  770770 391.94
## <none>                750018 392.93
## - M.F       1      57298  807316 393.65
## - Po2       1      68416  818434 394.16
## - U1        1      96134  846152 395.39
## - U2        1     185460  935478 399.10
## - Po1       1     203468  953486 399.81
## - Prob      1     208651  958669 400.01
## - M         1     227563  977581 400.73
## - Ed        1     375050 1125068 405.93
## - Ineq      1     481165 1231182 409.27
##
## Step:  AIC=391.76
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + U1 + U2 + Wealth +
##       Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - Wealth   1      18718  785739 390.65
## - LF        1      31251  798271 391.23
## <none>                767020 391.76
## - Po2       1      67471  834491 392.88
## - U1        1     125712  892732 395.37
## - M.F       1     126356  893377 395.40
## - U2        1     191858  958879 398.02
## - Po1       1     192407  959427 398.04
## - Prob      1     194959  961980 398.14
## - M         1     244278 1011299 399.99
## - Ed        1     377198 1144218 404.55
## - Ineq      1     466262 1233282 407.33
##
## Step:  AIC=390.65
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + U1 + U2 + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - LF        1      23134  808873 389.72
## <none>                785739 390.65
## - Po2       1      73981  859720 391.98
## - M.F       1     114151  899890 393.67
## - U1        1     115614  901353 393.73
## - Prob      1     197237  982976 396.93
## - U2        1     201440  987179 397.09
## - Po1       1     223729 1009468 397.92
## - M         1     237012 1022751 398.40
## - Ed        1     431446 1217185 404.84
## - Ineq      1     635799 1421537 410.58
##
## Step:  AIC=389.72
## .outcome ~ M + Ed + Po1 + Po2 + M.F + U1 + U2 + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## <none>                808873 389.72

```



```

## - Po2 1 57072 865944 390.24
## - M.F 1 91750 900623 391.70
## - U1 1 92745 901618 391.74
## - Prob 1 179468 988341 395.14
## - U2 1 190898 999771 395.56
## - Po1 1 202276 1011149 395.98
## - M 1 243304 1052177 397.45
## - Ed 1 419099 1227972 403.17
## - Ineq 1 631455 1440327 409.07
## Start: AIC=435.98
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##
## Df Sum of Sq RSS AIC
## - Po2 1 4990 1234284 434.14
## - So 1 6104 1235399 434.17
## - LF 1 11540 1240834 434.34
## - M.F 1 15420 1244714 434.46
## - Pop 1 17021 1246316 434.51
## - Po1 1 22033 1251327 434.67
## - Wealth 1 33181 1262475 435.02
## - NW 1 54346 1283640 435.66
## - U1 1 55822 1285116 435.71
## <none> 1229294 435.98
## - Time 1 66705 1295999 436.04
## - M 1 73465 1302759 436.24
## - U2 1 88372 1317666 436.68
## - Prob 1 149075 1378369 438.44
## - Ed 1 468972 1698266 446.58
## - Ineq 1 499154 1728448 447.27
##
## Step: AIC=434.14
## .outcome ~ M + So + Ed + Po1 + LF + M.F + Pop + NW + U1 + U2 +
## Wealth + Ineq + Prob + Time
##
## Df Sum of Sq RSS AIC
## - So 1 5578 1239863 432.31
## - LF 1 8812 1243096 432.41
## - M.F 1 13763 1248047 432.57
## - Pop 1 23072 1257356 432.86
## - Wealth 1 37665 1271949 433.31
## - NW 1 50915 1285199 433.71
## - U1 1 51021 1285305 433.71
## - Time 1 63492 1297776 434.09
## <none> 1234284 434.14
## - M 1 73673 1307957 434.40
## - U2 1 83824 1318108 434.70
## - Po1 1 96700 1330985 435.08
## - Prob 1 144732 1379016 436.46
## - Ed 1 463984 1698268 444.58
## - Ineq 1 544651 1778935 446.39
##
## Step: AIC=432.31
## .outcome ~ M + Ed + Po1 + LF + M.F + Pop + NW + U1 + U2 + Wealth +

```

```

##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - LF      1      4075 1243938 430.44
## - M.F      1     11751 1251613 430.68
## - Pop      1     20586 1260448 430.95
## - Wealth   1     35914 1275776 431.42
## - U1       1     45949 1285812 431.73
## - NW       1     46030 1285892 431.73
## - Time     1     58216 1298078 432.10
## <none>                1239863 432.31
## - M        1     72343 1312206 432.52
## - U2       1     78254 1318116 432.70
## - Po1      1    121822 1361685 433.97
## - Prob     1    139183 1379046 434.46
## - Ed       1    459709 1699572 442.61
## - Ineq     1    590570 1830432 445.50
##
## Step:  AIC=430.44
## .outcome ~ M + Ed + Po1 + M.F + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - M.F      1      8314 1252252 428.70
## - Pop      1     18073 1262011 429.00
## - Wealth   1     35522 1279460 429.54
## - U1       1     42006 1285943 429.73
## - NW       1     43610 1287547 429.78
## - Time     1     57554 1301492 430.20
## <none>                1243938 430.44
## - M        1     77319 1321257 430.79
## - U2       1     79880 1323818 430.87
## - Prob     1    135712 1379650 432.48
## - Po1      1    142162 1386099 432.66
## - Ed       1    474468 1718405 441.04
## - Ineq     1    586894 1830832 443.51
##
## Step:  AIC=428.7
## .outcome ~ M + Ed + Po1 + Pop + NW + U1 + U2 + Wealth + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Pop      1     15924 1268176 427.19
## - U1       1     33848 1286100 427.74
## - NW       1     40803 1293055 427.95
## - Wealth   1     43057 1295309 428.02
## <none>                1252252 428.70
## - Time     1     71929 1324181 428.88
## - U2       1     73500 1325752 428.92
## - M        1    103538 1355790 429.80
## - Po1      1    137591 1389843 430.76
## - Prob     1    158270 1410522 431.34
## - Ed       1    560912 1813164 441.13
## - Ineq     1    700879 1953131 444.03

```

```

##
## Step: AIC=427.19
## .outcome ~ M + Ed + Po1 + NW + U1 + U2 + Wealth + Ineq + Prob +
## Time
##
##      Df Sum of Sq    RSS    AIC
## - NW      1      30435 1298611 426.12
## - Wealth  1      42152 1310328 426.47
## - U1       1      42158 1310334 426.47
## - Time    1      58666 1326842 426.96
## <none>                1268176 427.19
## - U2       1      98277 1366452 428.10
## - M        1     118065 1386241 428.66
## - Prob     1     142437 1410613 429.34
## - Po1      1     401556 1669732 435.92
## - Ed       1     545447 1813623 439.14
## - Ineq     1     702537 1970713 442.38
##
## Step: AIC=426.12
## .outcome ~ M + Ed + Po1 + U1 + U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - Wealth  1     30558 1329169 425.02
## - Time    1     37959 1336570 425.24
## - U1       1     61068 1359679 425.91
## <none>                1298611 426.12
## - Prob     1     118194 1416805 427.51
## - U2       1     127845 1426456 427.78
## - M        1     208706 1507317 429.93
## - Ed       1     517872 1816483 437.21
## - Po1      1     662088 1960700 440.18
## - Ineq     1     726371 2024982 441.44
##
## Step: AIC=425.02
## .outcome ~ M + Ed + Po1 + U1 + U2 + Ineq + Prob + Time
##
##      Df Sum of Sq    RSS    AIC
## - Time    1     43460 1372629 424.28
## <none>                1329169 425.02
## - U1       1     79686 1408855 425.29
## - U2       1    169728 1498897 427.71
## - M        1    193068 1522237 428.31
## - Prob     1    242258 1571427 429.55
## - Ed       1    670753 1999922 438.96
## - Po1      1    792399 2121568 441.26
## - Ineq     1    870005 2199174 442.66
##
## Step: AIC=424.28
## .outcome ~ M + Ed + Po1 + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq    RSS    AIC
## - U1       1     66478 1439107 424.12
## <none>                1372629 424.28
## - U2       1    157056 1529685 426.50

```

```

## - M      1      193939 1566568 427.43
## - Prob  1      203538 1576167 427.67
## - Ed    1      764917 2137546 439.55
## - Ineq  1      828637 2201265 440.70
## - Po1   1      841253 2213882 440.92
##
## Step:  AIC=424.12
## .outcome ~ M + Ed + Po1 + U2 + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## <none>                1439107 424.12
## - U2      1      106511 1545618 424.91
## - M       1      173772 1612879 426.57
## - Prob    1      203224 1642331 427.27
## - Ed      1      699264 2138372 437.57
## - Ineq    1      924958 2364066 441.48
## - Po1     1     1244507 2683614 446.43
## Start:  AIC=408.64
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##           U2 + Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Time     1           53 766268 406.64
## - M.F      1          183 766398 406.65
## - So       1          185 766400 406.65
## - LF       1          553 766768 406.67
## - Pop      1          3897 770112 406.83
## - NW       1          4233 770447 406.85
## - Po1      1          9211 775426 407.10
## - Wealth   1         11503 777718 407.21
## - Po2      1         13032 779247 407.28
## - U1       1         29312 795527 408.07
## <none>                766215 408.64
## - U2      1         105351 871565 411.54
## - M       1         118705 884920 412.12
## - Prob    1         133595 899810 412.75
## - Ineq    1         140500 906714 413.04
## - Ed      1         213152 979367 415.97
##
## Step:  AIC=406.64
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##           U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - So      1          204 766472 404.65
## - M.F     1          291 766559 404.66
## - LF      1          677 766945 404.68
## - Pop     1          3844 770112 404.83
## - NW     1          4356 770624 404.86
## - Po1    1          9712 775980 405.12
## - Wealth  1         11700 777968 405.22
## - Po2    1         13273 779541 405.30
## - U1     1         29755 796023 406.09
## <none>                766268 406.64

```

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## - U2      1      114054  880322 409.92
## - M       1      140209  906477 411.03
## - Ineq    1      140791  907059 411.05
## - Ed      1      218504  984772 414.18
## - Prob    1      238387 1004655 414.94
##
## Step: AIC=404.65
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - M.F      1         168  766640 402.66
## - LF       1         476  766948 402.68
## - Pop      1        3907  770378 402.85
## - NW       1        6840  773311 402.99
## - Po1      1       11112  777583 403.20
## - Wealth   1       11654  778125 403.23
## - Po2      1       13397  779869 403.31
## - U1       1       38066  804538 404.50
## <none>                      766472 404.65
## - U2      1       116843  883315 408.05
## - M       1       140887  907359 409.07
## - Ineq    1       205165  971636 411.67
## - Prob    1       254045 1020517 413.53
## - Ed      1       256892 1023364 413.64
##
## Step: AIC=402.66
## .outcome ~ M + Ed + Po1 + Po2 + LF + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - LF      1         308  766948 400.68
## - Pop     1        4039  770679 400.86
## - NW      1        7014  773654 401.01
## - Po1     1       11915  778555 401.25
## - Wealth  1       12037  778677 401.26
## - Po2     1       13460  780100 401.32
## <none>                      766640 402.66
## - U1      1       57747  824387 403.42
## - U2      1       118115  884755 406.11
## - M       1       181517  948157 408.74
## - Ineq    1       208058  974698 409.79
## - Prob    1       254806 1021446 411.57
## - Ed      1       259905 1026545 411.76
##
## Step: AIC=400.68
## .outcome ~ M + Ed + Po1 + Po2 + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - Pop     1         4136  771084 398.88
## - NW      1         6706  773654 399.01
## - Wealth  1        12054  779002 399.27
## - Po2     1        13633  780582 399.35

```

```

## - Po1      1      15281  782229 399.43
## <none>                                766948 400.68
## - U1       1      58030  824978 401.45
## - U2       1     123333  890282 404.34
## - M        1     203676  970624 407.63
## - Ineq     1     234701 1001650 408.82
## - Prob     1     257087 1024035 409.66
## - Ed       1     393492 1160440 414.42
##
## Step: AIC=398.88
## .outcome ~ M + Ed + Po1 + Po2 + NW + U1 + U2 + Wealth + Ineq +
## Prob
##
##      Df Sum of Sq    RSS    AIC
## - NW      1      5453  776538 397.15
## - Po2     1     14000  785084 397.57
## - Wealth  1     14050  785134 397.57
## - Po1     1     14375  785460 397.58
## <none>                                771084 398.88
## - U1      1     54937  826021 399.50
## - U2      1    119328  890413 402.35
## - M       1    205707  976791 405.87
## - Ineq    1    231792 1002876 406.87
## - Prob    1    263763 1034847 408.06
## - Ed      1    393926 1165010 412.56
##
## Step: AIC=397.15
## .outcome ~ M + Ed + Po1 + Po2 + U1 + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq    RSS    AIC
## - Po1      1     11735  788273 395.72
## - Wealth  1     16019  792556 395.93
## - Po2     1     20787  797325 396.15
## <none>                                776538 397.15
## - U1      1     61941  838478 398.07
## - U2      1    129371  905909 401.01
## - M       1    237064 1013601 405.27
## - Prob    1    262344 1038881 406.21
## - Ineq    1    270298 1046836 406.50
## - Ed      1    393273 1169811 410.72
##
## Step: AIC=395.72
## .outcome ~ M + Ed + Po2 + U1 + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq    RSS    AIC
## - Wealth  1     16872  805145 394.53
## <none>                                788273 395.72
## - U1      1     66196  854469 396.78
## - U2      1    133318  921592 399.66
## - M       1    244591 1032864 403.99
## - Ineq    1    264436 1052709 404.71
## - Prob    1    281914 1070187 405.34
## - Ed      1    382603 1170876 408.76
## - Po2     1   1408913 2197186 432.67

```

```

##
## Step: AIC=394.53
## .outcome ~ M + Ed + Po2 + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>                805145 394.53
## - U1      1      56371 861516 395.10
## - U2      1     121097 926242 397.85
## - Prob    1     265156 1070301 403.34
## - M       1     287290 1092435 404.12
## - Ed      1     365942 1171087 406.76
## - Ineq    1     592459 1397603 413.48
## - Po2     1    1760111 2565256 436.56
## Start: AIC=414.55
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time      1         23 1144165 412.55
## - LF         1         554 1144696 412.57
## - NW         1         772 1144914 412.58
## - So         1         4147 1148288 412.69
## - Po2        1         7096 1151238 412.78
## - M.F        1        13104 1157246 412.97
## - U1         1        22962 1167104 413.29
## - Wealth     1        42841 1186983 413.91
## - Po1        1        58431 1202573 414.40
## <none>                1144142 414.55
## - M          1        68418 1212560 414.70
## - Pop        1        72529 1216671 414.83
## - Ed         1       107578 1251720 415.88
## - U2         1       117933 1262075 416.18
## - Prob       1       148689 1292831 417.07
## - Ineq       1       294802 1438944 421.03
##
## Step: AIC=412.55
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - LF         1         587 1144752 410.57
## - NW         1        1025 1145189 410.59
## - So         1        4168 1148333 410.69
## - Po2        1        8297 1152462 410.82
## - M.F        1       13125 1157290 410.97
## - U1         1       24249 1168414 411.33
## - Wealth     1       43204 1187369 411.92
## <none>                1144165 412.55
## - Po1        1       64514 1208678 412.58
## - M          1       71543 1215707 412.80
## - Pop        1       79068 1223233 413.03
## - Ed         1      107931 1252095 413.89
## - U2         1      119456 1263621 414.23
## - Prob       1      224095 1368260 417.17

```

```

## - Ineq      1      296640 1440805 419.08
##
## Step:  AIC=410.57
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - NW      1          681 1145433 408.59
## - So      1         6783 1151535 408.79
## - Po2     1         7711 1152463 408.82
## - M.F     1        13770 1158521 409.01
## - U1      1        24880 1169631 409.37
## - Wealth  1        42642 1187394 409.93
## <none>                    1144752 410.57
## - Po1     1        65053 1209805 410.62
## - M       1        74133 1218885 410.89
## - Pop     1        83014 1227766 411.16
## - Ed      1       108243 1252995 411.91
## - U2      1       123757 1268508 412.37
## - Prob    1       223582 1368334 415.17
## - Ineq    1       297719 1442470 417.13
##
## Step:  AIC=408.59
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - Po2     1          7518 1152951 406.84
## - So      1         10811 1156244 406.94
## - M.F     1         13327 1158760 407.02
## - U1      1         24213 1169646 407.37
## - Wealth  1         42063 1187496 407.93
## <none>                    1145433 408.59
## - Po1     1         65371 1210804 408.65
## - Pop     1         82562 1227995 409.17
## - M       1         88991 1234424 409.36
## - Ed      1        107725 1253158 409.92
## - U2      1        123116 1268549 410.37
## - Prob    1        223231 1368663 413.18
## - Ineq    1       320150 1465583 415.71
##
## Step:  AIC=406.84
## .outcome ~ M + So + Ed + Po1 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - So      1          6888 1159838 405.06
## - M.F     1         24852 1177803 405.62
## - U1      1         28955 1181906 405.75
## - Wealth  1         41580 1194531 406.15
## <none>                    1152951 406.84
## - Pop     1         83409 1236359 407.42
## - M       1         88727 1241678 407.58
## - Ed      1        100250 1253201 407.92

```



```

## - U2      1      128224 1281175 408.74
## - Prob    1      215920 1368870 411.19
## - Ineq    1      327209 1480159 414.08
## - Po1     1      781100 1934051 423.98
##
## Step: AIC=405.06
## .outcome ~ M + Ed + Po1 + M.F + Pop + U1 + U2 + Wealth + Ineq +
## Prob
##
##      Df Sum of Sq      RSS      AIC
## - M.F    1      21668 1181506 403.74
## - U1      1      37892 1197730 404.25
## - Wealth  1      45962 1205800 404.49
## <none>                1159838 405.06
## - Pop     1      92508 1252346 405.90
## - Ed      1      95841 1255679 405.99
## - M       1     110440 1270279 406.42
## - U2      1     152082 1311920 407.62
## - Prob    1     225069 1384907 409.62
## - Ineq    1     397835 1557673 413.97
## - Po1     1     817036 1976874 422.79
##
## Step: AIC=403.74
## .outcome ~ M + Ed + Po1 + Pop + U1 + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - U1      1      21935 1203441 402.42
## <none>                1181506 403.74
## - Wealth  1      74583 1256090 404.01
## - M       1     123089 1304595 405.41
## - U2      1     135352 1316858 405.75
## - Ed      1     143698 1325205 405.99
## - Pop     1     188721 1370228 407.22
## - Prob    1     228208 1409714 408.28
## - Ineq    1     647123 1828629 417.90
## - Po1     1     943284 2124790 423.46
##
## Step: AIC=402.42
## .outcome ~ M + Ed + Po1 + Pop + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## <none>                1203441 402.42
## - Wealth  1      87162 1290604 403.01
## - M       1     118263 1321704 403.89
## - Ed      1     122087 1325529 404.00
## - U2      1     157097 1360538 404.96
## - Pop     1     180765 1384206 405.60
## - Prob    1     242213 1445654 407.21
## - Ineq    1     662510 1865951 416.65
## - Po1     1    1069801 2273243 423.95
## Start: AIC=406.91
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
## U2 + Wealth + Ineq + Prob + Time
##

```

```

##           Df Sum of Sq      RSS      AIC
## - Pop      1      1749  932468 404.98
## - LF       1      8742  939460 405.26
## - Time     1     13474  944193 405.45
## - So       1     13785  944503 405.46
## - NW       1     20832  951551 405.73
## - M.F      1     31742  962460 406.15
## - U1       1     46765  977483 406.73
## - Po2      1     49117  979836 406.82
## <none>                930718 406.91
## - U2       1     87090 1017808 408.22
## - Po1      1    109296 1040014 409.02
## - Prob     1    118423 1049142 409.34
## - Ed       1    137922 1068641 410.03
## - Wealth   1    143778 1074496 410.23
## - M        1    260750 1191469 414.05
## - Ineq     1    298310 1229028 415.20
##
## Step:  AIC=404.98
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - LF       1     10343  942810 403.39
## - So       1     13415  945883 403.51
## - Time     1     15964  948432 403.61
## - NW       1     21746  954214 403.84
## - Po2      1     50268  982736 404.93
## - M.F      1     50704  983172 404.94
## <none>                932468 404.98
## - U1       1     57483  989950 405.20
## - U2       1     94642 1027110 406.56
## - Po1      1    108269 1040737 407.05
## - Prob     1    118226 1050694 407.40
## - Ed       1    137860 1070328 408.08
## - Wealth   1    142293 1074761 408.24
## - M        1    263327 1195795 412.19
## - Ineq     1    323822 1256290 414.01
##
## Step:  AIC=403.39
## .outcome ~ M + So + Ed + Po1 + Po2 + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - So       1      6208  949019 401.63
## - NW       1     14044  956854 401.94
## - Time     1     14649  957459 401.96
## - M.F      1     40363  983173 402.94
## - Po2      1     44978  987788 403.12
## - U1       1     47178  989989 403.20
## <none>                942810 403.39
## - U2       1     87282 1030093 404.67
## - Po1      1    103715 1046525 405.25
## - Prob     1    113573 1056383 405.60

```

```

## - Ed      1      128365 1071175 406.11
## - Wealth  1      135379 1078190 406.36
## - M       1      279043 1221853 410.98
## - Ineq    1      314414 1257224 412.04
##
## Step:  AIC=401.63
## .outcome ~ M + Ed + Po1 + Po2 + M.F + NW + U1 + U2 + Wealth +
##      Ineq + Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - NW      1          9625  958643 400.01
## - Time     1         10788  959807 400.05
## - U1       1         43892  992911 401.31
## - Po2      1         45391  994409 401.36
## - M.F      1         51484 1000503 401.59
## <none>                949019 401.63
## - U2       1         84633 1033651 402.79
## - Po1      1        106991 1056009 403.59
## - Prob     1        130001 1079020 404.38
## - Wealth   1        142832 1091850 404.82
## - Ed       1        158700 1107719 405.36
## - M        1        277840 1226858 409.13
## - Ineq     1        376214 1325233 411.99
##
## Step:  AIC=400.01
## .outcome ~ M + Ed + Po1 + Po2 + M.F + U1 + U2 + Wealth + Ineq +
##      Prob + Time
##
##      Df Sum of Sq      RSS      AIC
## - Time     1          6902  965545 398.27
## - Po2      1         38758  997402 399.47
## - U1       1         41602 1000245 399.58
## - M.F      1         48255 1006898 399.82
## <none>                958643 400.01
## - U2       1         83507 1042151 401.10
## - Po1      1        100391 1059035 401.69
## - Prob     1        121346 1079989 402.42
## - Wealth   1        142029 1100672 403.12
## - Ed       1        152488 1111131 403.47
## - M        1        350214 1308857 409.53
## - Ineq     1        460662 1419306 412.53
##
## Step:  AIC=398.27
## .outcome ~ M + Ed + Po1 + Po2 + M.F + U1 + U2 + Wealth + Ineq +
##      Prob
##
##      Df Sum of Sq      RSS      AIC
## - Po2      1         31930  997475 397.48
## - U1       1         40284 1005829 397.78
## <none>                965545 398.27
## - M.F      1         78771 1044316 399.17
## - U2       1         88097 1053643 399.50
## - Po1      1         99071 1064616 399.89
## - Wealth   1        138854 1104399 401.24

```

```

## - Prob    1    147485 1113030 401.53
## - Ed      1    176032 1141578 402.47
## - M       1    343983 1309528 407.55
## - Ineq    1    454528 1420074 410.55
##
## Step: AIC=397.48
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq    RSS    AIC
## - U1       1     49380 1046855 397.26
## <none>                        997475 397.48
## - M.F      1     96200 1093676 398.88
## - U2       1    114690 1112165 399.50
## - Wealth   1    132732 1130208 400.10
## - Prob     1    151978 1149454 400.72
## - Ed       1    189924 1187399 401.93
## - M        1    346524 1343999 406.51
## - Ineq     1    489261 1486737 410.24
## - Po1      1    529082 1526557 411.22
##
## Step: AIC=397.26
## .outcome ~ M + Ed + Po1 + M.F + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq    RSS    AIC
## - M.F      1     50823 1097678 397.02
## <none>                        1046855 397.26
## - U2       1     79922 1126777 397.99
## - Prob     1    144014 1190869 400.03
## - Ed       1    167881 1214737 400.77
## - Wealth   1    222303 1269159 402.39
## - M        1    423629 1470485 407.84
## - Po1      1    671542 1718397 413.60
## - Ineq     1    709768 1756623 414.42
##
## Step: AIC=397.02
## .outcome ~ M + Ed + Po1 + U2 + Wealth + Ineq + Prob
##
##           Df Sum of Sq    RSS    AIC
## <none>                        1097678 397.02
## - Prob     1    132661 1230339 399.24
## - U2       1    142378 1240056 399.53
## - Wealth   1    232723 1330401 402.13
## - Ed       1    452309 1549987 407.79
## - M        1    547198 1644876 409.98
## - Po1      1    636504 1734182 411.94
## - Ineq     1    843938 1941616 416.12
## Start: AIC=514.65
## .outcome ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 +
##           U2 + Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq    RSS    AIC
## - So       1         29 1354974 512.65
## - LF       1      8917 1363862 512.96
## - Time     1    10304 1365250 513.00

```

```

## - Pop      1      14122 1369068 513.14
## - NW       1      18395 1373341 513.28
## - M.F      1      31967 1386913 513.74
## - Wealth   1      37613 1392558 513.94
## - Po2      1      37919 1392865 513.95
## <none>          1354946 514.65
## - U1       1      83722 1438668 515.47
## - Po1      1     144306 1499252 517.41
## - U2       1     181536 1536482 518.56
## - M        1     193770 1548716 518.93
## - Prob     1     199538 1554484 519.11
## - Ed       1     402117 1757063 524.86
## - Ineq     1     423031 1777977 525.42
##
## Step:  AIC=512.65
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob + Time
##
##           Df Sum of Sq      RSS      AIC
## - Time     1      10341 1365315 511.01
## - LF       1      10878 1365852 511.03
## - Pop      1      14127 1369101 511.14
## - NW       1      21626 1376600 511.39
## - M.F      1      32449 1387423 511.76
## - Po2      1      37954 1392929 511.95
## - Wealth   1      39223 1394197 511.99
## <none>          1354974 512.65
## - U1       1      96420 1451395 513.88
## - Po1      1     144302 1499277 515.41
## - U2       1     189859 1544834 516.81
## - M        1     195084 1550059 516.97
## - Prob     1     204463 1559437 517.26
## - Ed       1     403140 1758114 522.89
## - Ineq     1     488834 1843808 525.13
##
## Step:  AIC=511.01
## .outcome ~ M + Ed + Po1 + Po2 + LF + M.F + Pop + NW + U1 + U2 +
##      Wealth + Ineq + Prob
##
##           Df Sum of Sq      RSS      AIC
## - LF       1      10533 1375848 509.37
## - NW       1      15482 1380797 509.54
## - Pop      1      21846 1387161 509.75
## - Po2      1      28932 1394247 509.99
## - Wealth   1      36070 1401385 510.23
## - M.F      1      41784 1407099 510.42
## <none>          1365315 511.01
## - U1       1      91420 1456735 512.05
## - Po1      1     134137 1499452 513.41
## - U2       1     184143 1549458 514.95
## - M        1     186110 1551425 515.01
## - Prob     1     237493 1602808 516.54
## - Ed       1     409448 1774763 521.33
## - Ineq     1     502909 1868224 523.75

```

```

##
## Step: AIC=509.37
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + NW + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - NW      1      11675 1387523 507.77
## - Po2      1      21418 1397266 508.09
## - Pop      1      27803 1403651 508.31
## - M.F      1      31252 1407100 508.42
## - Wealth   1      35035 1410883 508.55
## <none>                1375848 509.37
## - U1      1      80954 1456802 510.06
## - Po1      1     123896 1499744 511.42
## - U2      1     190746 1566594 513.47
## - M      1     217716 1593564 514.27
## - Prob     1     226971 1602819 514.54
## - Ed      1     413254 1789103 519.71
## - Ineq     1     500944 1876792 521.96
##
## Step: AIC=507.77
## .outcome ~ M + Ed + Po1 + Po2 + M.F + Pop + U1 + U2 + Wealth +
##      Ineq + Prob
##
##      Df Sum of Sq      RSS      AIC
## - Po2      1      16706 1404229 506.33
## - Pop      1      25793 1413315 506.63
## - M.F      1      26785 1414308 506.66
## - Wealth   1      31551 1419073 506.82
## <none>                1387523 507.77
## - U1      1      83881 1471404 508.52
## - Po1      1     118348 1505871 509.61
## - U2      1     201453 1588976 512.14
## - Prob     1     216760 1604282 512.59
## - M      1     309214 1696737 515.22
## - Ed      1     402754 1790276 517.74
## - Ineq     1     589736 1977259 522.41
##
## Step: AIC=506.33
## .outcome ~ M + Ed + Po1 + M.F + Pop + U1 + U2 + Wealth + Ineq +
##      Prob
##
##      Df Sum of Sq      RSS      AIC
## - Pop      1      22345 1426575 505.07
## - Wealth   1      32142 1436371 505.39
## - M.F      1      36808 1441037 505.54
## <none>                1404229 506.33
## - U1      1      86373 1490602 507.13
## - U2      1     205814 1610043 510.76
## - Prob     1     218607 1622836 511.13
## - M      1     307001 1711230 513.62
## - Ed      1     389502 1793731 515.83
## - Ineq     1     608627 2012856 521.25
## - Po1      1    1050202 2454432 530.57

```

```
##
## Step: AIC=505.07
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Wealth + Ineq + Prob
##
##      Df Sum of Sq    RSS    AIC
## - Wealth  1      26493 1453068 503.93
## <none>                 1426575 505.07
## - M.F      1      84491 1511065 505.77
## - U1       1      99463 1526037 506.24
## - Prob     1     198571 1625145 509.20
## - U2       1     208880 1635455 509.49
## - M        1     320926 1747501 512.61
## - Ed       1     386773 1813348 514.35
## - Ineq     1     594779 2021354 519.45
## - Po1      1    1127277 2553852 530.44
##
## Step: AIC=503.93
## .outcome ~ M + Ed + Po1 + M.F + U1 + U2 + Ineq + Prob
##
##      Df Sum of Sq    RSS    AIC
## <none>                 1453068 503.93
## - M.F      1     103159 1556227 505.16
## - U1       1     127044 1580112 505.87
## - Prob     1     247978 1701046 509.34
## - U2       1     255443 1708511 509.55
## - M        1     296790 1749858 510.67
## - Ed       1     445788 1898855 514.51
## - Ineq     1     738244 2191312 521.24
## - Po1      1    1672038 3125105 537.93
```

Now we're going to create a regression model based on the results of the Stepwise regression output to only include the features based on the highest AIC score. We'll first run the lm with the original dataset, followed by the reduced feature set produced from the stepwise output.

```
##
## Call:
## lm(formula = Crime ~ M.F + U1 + Prob + U2 + M + Ed + Ineq + Po1,
##     data = uscrime_data.norm)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -444.70 -111.07   3.03  122.15  483.30
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   905.09      28.52   31.731 < 2e-16 ***
## M.F           65.83      40.08    1.642  0.10874
## U1          -109.73      60.20   -1.823  0.07622 .
## Prob         -86.31      33.89   -2.547  0.01505 *
## U2           158.22      61.22    2.585  0.01371 *
## M            117.28      42.10    2.786  0.00828 **
## Ed           201.50      59.02    3.414  0.00153 **
## Ineq         244.70      55.69    4.394 8.63e-05 ***
## Po1          305.07      46.14    6.613 8.26e-08 ***
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 195.5 on 38 degrees of freedom
## Multiple R-squared:  0.7888, Adjusted R-squared:  0.7444
## F-statistic: 17.74 on 8 and 38 DF,  p-value: 1.159e-10

## [1] "Seperation between output for model1 and model2"

##
## Call:
## lm(formula = Crime ~ M + So + Ed + Po1 + Po2 + LF + M.F + Pop +
##     NW + U1 + U2 + Wealth + Ineq + Prob + Time, data = uscrime_data.norm)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -395.74  -98.09   -6.69  112.99  512.67
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   906.380     59.113   15.333 5.08e-16 ***
## M              110.382     52.424    2.106  0.04344 *
## So             -3.803    148.755   -0.026  0.97977
## Ed             210.678     69.458    3.033  0.00486 **
## Po1            572.995    315.347    1.817  0.07889 .
## Po2           -305.958    328.483   -0.931  0.35883
## LF            -26.826     59.394   -0.452  0.65465
## M.F            51.293     59.977    0.855  0.39900
## Pop           -27.906     49.095   -0.568  0.57385
## NW             43.234     66.642    0.649  0.52128
## U1           -105.056     75.906   -1.384  0.17624
## U2            141.714     69.536    2.038  0.05016 .
## Wealth         92.792    100.028    0.928  0.36075
## Ineq          281.954     90.630    3.111  0.00398 **
## Prob         -110.394     51.667   -2.137  0.04063 *
## Time          -24.655     50.780   -0.486  0.63071
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 209.1 on 31 degrees of freedom
## Multiple R-squared:  0.8031, Adjusted R-squared:  0.7078
## F-statistic: 8.429 on 15 and 31 DF,  p-value: 3.539e-07
```

As you can see the increase in score for the adjusted R2 taking into account the number of features, I would say that model1 with the features defined by stepwise is the better performing model compared to model2.

- 2) Lasso Regression: This method will define the features with least importance with a coefficient score of 0 to exclude these features from the result. we will use k-fold cross validation with Mean-Square error as the validation metric.

```
coef(lasso,s = lasso$lambda.min)
```



```
## 16 x 1 sparse Matrix of class "dgCMatrix"
##              1
## (Intercept) 893.42791
## M           101.81627
## So           34.24302
## Ed           168.42528
## Po1          297.31976
## Po2           .
## LF           .
## M.F          53.37330
## Pop          -14.40029
## NW           12.75189
## U1           -64.98287
## U2           108.25504
## Wealth       44.61329
## Ineq         239.05538
## Prob        -87.99596
## Time         .
```

```
lasso_lm <- lm(Crime ~ M + So + Ed + Po1 + M.F + Pop + NW + U1 + U2 + Wealth + Ineq + Prob, data = uscrime_data)
summary(lasso_lm)
```

```
##
## Call:
## lm(formula = Crime ~ M + So + Ed + Po1 + M.F + Pop + NW + U1 +
##      U2 + Wealth + Ineq + Prob, data = uscrime_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -434.18 -107.01   18.55  115.88  470.32
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   897.29      51.91  17.286 < 2e-16 ***
## M             112.71      49.35   2.284  0.02876 *
## So             22.89     125.35   0.183  0.85621
## Ed            195.70      62.94   3.109  0.00378 **
## Po1           293.18      64.99   4.511 7.32e-05 ***
## M.F            48.92      48.12   1.017  0.31656
## Pop           -33.25      45.63  -0.729  0.47113
## NW             19.16      57.71   0.332  0.74195
## U1            -89.76      65.68  -1.367  0.18069
## U2            140.78      66.77   2.108  0.04245 *
## Wealth         83.30      95.53   0.872  0.38932
## Ineq          285.77      85.19   3.355  0.00196 **
## Prob          -92.75      41.12  -2.255  0.03065 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 202.6 on 34 degrees of freedom
## Multiple R-squared:  0.7971, Adjusted R-squared:  0.7255
## F-statistic: 11.13 on 12 and 34 DF, p-value: 1.52e-08
```

3- Elastic

Elastic net can be configured to either use Ridge Regression or Lasso based on the alpha value. In our case we will specify an alpha of 0.5 to remain in the between the 0-1 range.

```
elastic_net=cv.glmnet(x=matrix_x,y=matrix_y,alpha=0.5,
                      nfolds = 5,type.measure="mse",family="gaussian")
```

*#Output the coefficients of the variables selected by Elastic Net*

```
coef(elastic_net, s=elastic_net$lambda.min)
```

```
## 16 x 1 sparse Matrix of class "dgCMatrix"
```

```
##              1
## (Intercept) 890.865296
## M           97.478728
## So          41.770692
## Ed          159.478315
## Po1         273.705325
## Po2         12.076751
## LF          .
## M.F         59.587454
## Pop        -9.512371
## NW         18.273181
## U1        -65.495213
## U2         105.552191
## Wealth      44.461476
## Ineq       221.722905
## Prob      -89.295293
## Time       .
```

```
elastic_lm <- lm(Crime ~ M + So + Ed + Po1 + Po2+ LF + M.F + NW + U1 + U2 + Wealth + Ineq + Prob, data = uscrime_data.norm)
summary(elastic_lm)
```

```
##
```

```
## Call:
```

```
## lm(formula = Crime ~ M + So + Ed + Po1 + Po2 + LF + M.F + NW +
##      U1 + U2 + Wealth + Ineq + Prob, data = uscrime_data.norm)
```

```
##
```

```
## Residuals:
```

```
##      Min       1Q   Median       3Q      Max
## -362.46 -111.81  -11.25   110.56   470.07
```

```
##
```

```
## Coefficients:
```

```
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  902.116      57.581  15.667 < 2e-16 ***
## M           108.054      50.708   2.131  0.04064 *
## So           8.722     144.545   0.060  0.95225
## Ed          212.991      68.053   3.130  0.00365 **
## Po1          497.845     292.064   1.705  0.09767 .
## Po2         -239.636     301.133  -0.796  0.43185
## LF          -30.057      57.578  -0.522  0.60514
## M.F          75.048      51.770   1.450  0.15659
## NW           31.952      62.388   0.512  0.61196
## U1          -108.086      72.904  -1.483  0.14767
```

```

## U2          138.808      67.811    2.047  0.04869 *
## Wealth      78.913      96.758    0.816  0.42059
## Ineq       266.813      85.986    3.103  0.00391 **
## Prob       -91.216      41.227   -2.213  0.03396 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 205 on 33 degrees of freedom
## Multiple R-squared:  0.7984, Adjusted R-squared:  0.719
## F-statistic: 10.05 on 13 and 33 DF,  p-value: 4.781e-08

```