

Simulation Information

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2023-08-15

The simulations were run on the Irish Centre for High-End Computing (ICHEC) cluster. This document provides the `sessionInfo()` from each scenario as well as the number of cores used.

Baseline Scenario: $N = 280$, `prop_missing = 0.1`, `long_strength = 1`

```
## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /ichec/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /ichec/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8      LC_COLLATE=en_IE.UTF-8
## [5] LC_MONETARY=en_IE.UTF-8  LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8     LC_NAME=C
## [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
## [1] mvtnorm_1.2-2      progress_1.2.2      data.table_1.14.8  refund_0.1-32
## [5] lme4_1.1-34        Matrix_1.3-4        fda_6.1.4          deSolve_1.36
## [9] fds_1.8            RCurl_1.98-1.6      rainbow_3.7         pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0      Rcpp_1.0.8         here_1.0.1         lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1    rprojroot_2.0.2    foreach_1.5.2
## [9] utf8_1.2.2        R6_2.5.1           magic_1.6-1        pracma_2.4.2
## [13] ggplot2_3.3.5     pillar_1.7.0       rlang_1.0.1        minqa_1.2.5
## [17] nloptr_2.0.0      grpreg_3.4.0       munsell_0.5.0      gamm4_0.2-6
## [21] compiler_4.1.2    pkgconfig_2.0.3    pbs_1.1            mgcv_1.9-0
## [25] tidyselect_1.1.1  tibble_3.1.6       hdbc_3.4           matrixcalc_1.0-6
## [29] codetools_0.2-18  fansi_1.0.2        crayon_1.5.0       dplyr_1.0.8
## [33] bitops_1.0-7      grid_4.1.2         nlme_3.1-153       gtable_0.3.0
## [37] lifecycle_1.0.1  DBI_1.1.2          magrittr_2.0.2     scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0          doParallel_1.0.17  ellipsis_0.3.2
## [45] generics_0.1.2   vctrs_0.3.8        boot_1.3-28        iterators_1.0.14
```

```
## [49] tools_4.1.2      glue_1.6.1      purrr_0.3.4      hms_1.1.1
## [53] ks_1.14.0        abind_1.4-5     parallel_4.1.2   colorspace_2.0-2
## [57] cluster_2.1.2    RLRsim_3.1-8
```

- For this scenario, there were 39 cores used.

$N = 280$, `prop_missing = 0.1`, `long_strength = 2`

```
## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /icheck/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /icheck/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8      LC_COLLATE=en_IE.UTF-8
## [5] LC_MONETARY=en_IE.UTF-8  LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8     LC_NAME=C
## [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
## [1] mvtnorm_1.2-2      progress_1.2.2      data.table_1.14.8  refund_0.1-32
## [5] lme4_1.1-34        Matrix_1.3-4        fda_6.1.4          deSolve_1.36
## [9] fds_1.8            RCurl_1.98-1.6      rainbow_3.7         pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0      Rcpp_1.0.8          here_1.0.1          lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1     rprojroot_2.0.2     foreach_1.5.2
## [9] utf8_1.2.2        R6_2.5.1            magic_1.6-1         pracma_2.4.2
## [13] ggplot2_3.3.5     pillar_1.7.0        rlang_1.0.1         minqa_1.2.5
## [17] nloptr_2.0.0      grpreg_3.4.0        munsell_0.5.0       gamm4_0.2-6
## [21] compiler_4.1.2    pkgconfig_2.0.3     pbs_1.1             mgcv_1.9-0
## [25] tidyselect_1.1.1  tibble_3.1.6        hdbc_3.4            matrixcalc_1.0-6
## [29] codetools_0.2-18 fansi_1.0.2          crayon_1.5.0        dplyr_1.0.8
## [33] bitops_1.0-7      grid_4.1.2          nlme_3.1-153        gtable_0.3.0
## [37] lifecycle_1.0.1  DBI_1.1.2           magrittr_2.0.2      scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0           doParallel_1.0.17   ellipsis_0.3.2
## [45] generics_0.1.2    vctrs_0.3.8         boot_1.3-28         iterators_1.0.14
## [49] tools_4.1.2      glue_1.6.1          purrr_0.3.4         hms_1.1.1
## [53] ks_1.14.0        abind_1.4-5         parallel_4.1.2      colorspace_2.0-2
## [57] cluster_2.1.2    RLRsim_3.1-8
```

- For this scenario, there were 39 cores used.

$N = 280$, `prop_missing = 0.1`, `long_strength = 3`

```
## R version 4.1.2 (2021-11-01)
```

```

## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /icheck/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /icheck/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8      LC_COLLATE=en_IE.UTF-8
## [5] LC_MONETARY=en_IE.UTF-8  LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8     LC_NAME=C
## [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
## [1] mvtnorm_1.2-2      progress_1.2.2      data.table_1.14.8  refund_0.1-32
## [5] lme4_1.1-34        Matrix_1.3-4        fda_6.1.4          deSolve_1.36
## [9] fds_1.8            RCurl_1.98-1.6      rainbow_3.7         pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0      Rcpp_1.0.8         here_1.0.1         lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1    rprojroot_2.0.2    foreach_1.5.2
## [9] utf8_1.2.2        R6_2.5.1           magic_1.6-1        pracma_2.4.2
## [13] ggplot2_3.3.5     pillar_1.7.0       rlang_1.0.1        minqa_1.2.5
## [17] nloptr_2.0.0      grpreg_3.4.0       munsell_0.5.0      gamm4_0.2-6
## [21] compiler_4.1.2    pkgconfig_2.0.3    pbs_1.1            mgcv_1.9-0
## [25] tidyselct_1.1.1   tibble_3.1.6       hdrdce_3.4         matrixcalc_1.0-6
## [29] codetools_0.2-18  fansi_1.0.2        crayon_1.5.0       dplyr_1.0.8
## [33] bitops_1.0-7      grid_4.1.2         nlme_3.1-153       gtable_0.3.0
## [37] lifecycle_1.0.1   DBI_1.1.2          magrittr_2.0.2     scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0          doParallel_1.0.17  ellipsis_0.3.2
## [45] generics_0.1.2    vctrs_0.3.8        boot_1.3-28        iterators_1.0.14
## [49] tools_4.1.2       glue_1.6.1         purrr_0.3.4        hms_1.1.1
## [53] ks_1.14.0         abind_1.4-5        parallel_4.1.2     colorspace_2.0-2
## [57] cluster_2.1.2     RLRsim_3.1-8

```

- For this scenario, there were 39 cores used.

$N = 280$, `prop_missing = 0.2`, `long_strength = 1`

```

## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /icheck/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /icheck/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8      LC_COLLATE=en_IE.UTF-8

```

```

## [5] LC_MONETARY=en_IE.UTF-8    LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8       LC_NAME=C
## [9] LC_ADDRESS=C               LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
## [1] mvtnorm_1.2-2    progress_1.2.2    data.table_1.14.8 refund_0.1-32
## [5] lme4_1.1-34      Matrix_1.3-4      fda_6.1.4         deSolve_1.36
## [9] fds_1.8          RCurl_1.98-1.6    rainbow_3.7        pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0      Rcpp_1.0.8        here_1.0.1         lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1   rprojroot_2.0.2    foreach_1.5.2
## [9] utf8_1.2.2        R6_2.5.1          magic_1.6-1        pracma_2.4.2
## [13] ggplot2_3.3.5     pillar_1.7.0      rlang_1.0.1        minqa_1.2.5
## [17] nloptr_2.0.0      grpreg_3.4.0      munsell_0.5.0      gamm4_0.2-6
## [21] compiler_4.1.2    pkgconfig_2.0.3   pbs_1.1            mgcv_1.9-0
## [25] tidyselect_1.1.1  tibble_3.1.6      hdbc_3.4           matrixcalc_1.0-6
## [29] codetools_0.2-18  fansi_1.0.2       crayon_1.5.0       dplyr_1.0.8
## [33] bitops_1.0-7      grid_4.1.2        nlme_3.1-153       gtable_0.3.0
## [37] lifecycle_1.0.1  DBI_1.1.2         magrittr_2.0.2     scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0         doParallel_1.0.17  ellipsis_0.3.2
## [45] generics_0.1.2    vctrs_0.3.8       boot_1.3-28        iterators_1.0.14
## [49] tools_4.1.2       glue_1.6.1        purrr_0.3.4        hms_1.1.1
## [53] ks_1.14.0         abind_1.4-5       parallel_4.1.2     colorspace_2.0-2
## [57] cluster_2.1.2     RLRsim_3.1-8

```

- For this scenario, there were 39 cores used.

$N = 280$, `prop_missing = 0.5`, `long_strength = 1`

```

## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /icheck/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /icheck/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8    LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8     LC_COLLATE=en_IE.UTF-8
## [5] LC_MONETARY=en_IE.UTF-8 LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8    LC_NAME=C
## [9] LC_ADDRESS=C            LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##

```

```
## other attached packages:
## [1] mvtnorm_1.2-2      progress_1.2.2      data.table_1.14.8  refund_0.1-32
## [5] lme4_1.1-34        Matrix_1.3-4        fda_6.1.4          deSolve_1.36
## [9] fds_1.8            RCurl_1.98-1.6      rainbow_3.7         pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0      Rcpp_1.0.8          here_1.0.1          lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1     rprojroot_2.0.2     foreach_1.5.2
## [9] utf8_1.2.2        R6_2.5.1            magic_1.6-1         praca_2.4.2
## [13] ggplot2_3.3.5     pillar_1.7.0        rlang_1.0.1         minqa_1.2.5
## [17] nloptr_2.0.0      grpreg_3.4.0        munsell_0.5.0       gamm4_0.2-6
## [21] compiler_4.1.2    pkgconfig_2.0.3     pbs_1.1             mgcv_1.9-0
## [25] tidyselct_1.1.1   tibble_3.1.6        hdbc_3.4            matrixcalc_1.0-6
## [29] codetools_0.2-18 fansi_1.0.2          crayon_1.5.0        dplyr_1.0.8
## [33] bitops_1.0-7      grid_4.1.2          nlme_3.1-153        gtable_0.3.0
## [37] lifecycle_1.0.1   DBI_1.1.2           magrittr_2.0.2      scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0            doParallel_1.0.17    ellipsis_0.3.2
## [45] generics_0.1.2    vctrs_0.3.8         boot_1.3-28         iterators_1.0.14
## [49] tools_4.1.2       glue_1.6.1          purrr_0.3.4         hms_1.1.1
## [53] ks_1.14.0         abind_1.4-5         parallel_4.1.2       colorspace_2.0-2
## [57] cluster_2.1.2     RLRsim_3.1-8
```

- For this scenario, there were 39 cores used.

$N = 500$, `prop_missing = 0.1`, `long_strength = 1`

```
## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /icheck/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /icheck/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8      LC_COLLATE=en_IE.UTF-8
## [5] LC_MONETARY=en_IE.UTF-8  LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8     LC_NAME=C
## [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
## [1] mvtnorm_1.2-2      progress_1.2.2      data.table_1.14.8  refund_0.1-32
## [5] lme4_1.1-34        Matrix_1.3-4        fda_6.1.4          deSolve_1.36
## [9] fds_1.8            RCurl_1.98-1.6      rainbow_3.7         pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0      Rcpp_1.0.8          here_1.0.1          lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1     rprojroot_2.0.2     foreach_1.5.2
```

```
## [9] utf8_1.2.2      R6_2.5.1      magic_1.6-1    prama_2.4.2
## [13] ggplot2_3.3.5    pillar_1.7.0   rlang_1.0.1    minqa_1.2.5
## [17] nloptr_2.0.0     grpreg_3.4.0   munsell_0.5.0   gamm4_0.2-6
## [21] compiler_4.1.2   pkgconfig_2.0.3 pbs_1.1         mgcv_1.9-0
## [25] tidyselect_1.1.1 tibble_3.1.6   hdrcde_3.4      matrixcalc_1.0-6
## [29] codetools_0.2-18 fansi_1.0.2     crayon_1.5.0    dplyr_1.0.8
## [33] bitops_1.0-7     grid_4.1.2     nlme_3.1-153    gtable_0.3.0
## [37] lifecycle_1.0.1 DBI_1.1.2       magrittr_2.0.2   scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0       doParallel_1.0.17 ellipsis_0.3.2
## [45] generics_0.1.2   vctrs_0.3.8     boot_1.3-28      iterators_1.0.14
## [49] tools_4.1.2      glue_1.6.1      purrr_0.3.4      hms_1.1.1
## [53] ks_1.14.0        abind_1.4-5     parallel_4.1.2   colorspace_2.0-2
## [57] cluster_2.1.2    RLRsim_3.1-8
```

- For this scenario, there were 30 cores used.

$N = 1000$, **prop_missing** = 0.1, **long_strength** = 1

Due to out-of-memory (OOM) errors, this was split into two smaller batches of simulations (250 replicates each).

Part 1

```
## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /icheck/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /icheck/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8      LC_COLLATE=en_IE.UTF-8
## [5] LC_MONETARY=en_IE.UTF-8   LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8     LC_NAME=C
## [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
## [1] mvtnorm_1.2-2    progress_1.2.2    data.table_1.14.8 refund_0.1-32
## [5] lme4_1.1-34      Matrix_1.3-4      fda_6.1.4         deSolve_1.36
## [9] fds_1.8          RCurl_1.98-1.6    rainbow_3.7        pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0     Rcpp_1.0.8        here_1.0.1         lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1    rprojroot_2.0.2    foreach_1.5.2
## [9] utf8_1.2.2       R6_2.5.1          magic_1.6-1        prama_2.4.2
## [13] ggplot2_3.3.5    pillar_1.7.0      rlang_1.0.1        minqa_1.2.5
## [17] nloptr_2.0.0     grpreg_3.4.0      munsell_0.5.0      gamm4_0.2-6
## [21] compiler_4.1.2   pkgconfig_2.0.3    pbs_1.1            mgcv_1.9-0
```

```
## [25] tidyselect_1.1.1    tibble_3.1.6      hrcde_3.4         matrixcalc_1.0-6
## [29] codetools_0.2-18    fansi_1.0.2       crayon_1.5.0      dplyr_1.0.8
## [33] bitops_1.0-7        grid_4.1.2        nlme_3.1-153      gtable_0.3.0
## [37] lifecycle_1.0.1     DBI_1.1.2         magrittr_2.0.2    scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0         doParallel_1.0.17 ellipsis_0.3.2
## [45] generics_0.1.2      vctrs_0.3.8       boot_1.3-28       iterators_1.0.14
## [49] tools_4.1.2         glue_1.6.1        purrr_0.3.4       hms_1.1.1
## [53] ks_1.14.0           abind_1.4-5       parallel_4.1.2    colorspace_2.0-2
## [57] cluster_2.1.2       RLRsim_3.1-8
```

- For this scenario, there were 20 cores used.

Part 2

```
## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
##
## Matrix products: default
## BLAS: /icheck/packages/r/4.1.2/lib64/R/lib/libRblas.so
## LAPACK: /icheck/packages/r/4.1.2/lib64/R/lib/libRlapack.so
##
## locale:
## [1] LC_CTYPE=en_IE.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=en_IE.UTF-8      LC_COLLATE=en_IE.UTF-8
## [5] LC_MONETARY=en_IE.UTF-8  LC_MESSAGES=en_IE.UTF-8
## [7] LC_PAPER=en_IE.UTF-8     LC_NAME=C
## [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_IE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] splines      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
## [1] mvtnorm_1.2-2    progress_1.2.2    data.table_1.14.8 refund_0.1-32
## [5] lme4_1.1-34      Matrix_1.3-4      fda_6.1.4         deSolve_1.36
## [9] fds_1.8          RCurl_1.98-1.6    rainbow_3.7        pcaPP_2.0-3
## [13] MASS_7.3-54
##
## loaded via a namespace (and not attached):
## [1] mclust_6.0.0      Rcpp_1.0.8        here_1.0.1         lattice_0.20-45
## [5] prettyunits_1.1.1 assertthat_0.2.1    rprojroot_2.0.2    foreach_1.5.2
## [9] utf8_1.2.2        R6_2.5.1          magic_1.6-1        pracma_2.4.2
## [13] ggplot2_3.3.5     pillar_1.7.0       rlang_1.0.1        minqa_1.2.5
## [17] nloptr_2.0.0      grpreg_3.4.0       munsell_0.5.0      gamm4_0.2-6
## [21] compiler_4.1.2    pkgconfig_2.0.3    pbs_1.1            mgcv_1.9-0
## [25] tidyselect_1.1.1  tibble_3.1.6      hrcde_3.4         matrixcalc_1.0-6
## [29] codetools_0.2-18  fansi_1.0.2       crayon_1.5.0      dplyr_1.0.8
## [33] bitops_1.0-7      grid_4.1.2        nlme_3.1-153      gtable_0.3.0
## [37] lifecycle_1.0.1   DBI_1.1.2         magrittr_2.0.2    scales_1.1.1
## [41] KernSmooth_2.23-20 cli_3.2.0         doParallel_1.0.17 ellipsis_0.3.2
## [45] generics_0.1.2    vctrs_0.3.8       boot_1.3-28       iterators_1.0.14
## [49] tools_4.1.2       glue_1.6.1        purrr_0.3.4       hms_1.1.1
## [53] ks_1.14.0         abind_1.4-5       parallel_4.1.2    colorspace_2.0-2
## [57] cluster_2.1.2     RLRsim_3.1-8
```

- For this scenario, there were 20 cores used.