

Energy norm 1

```
library(dplyr)
library(ggplot2)
library(tidyr)
library(knitr)

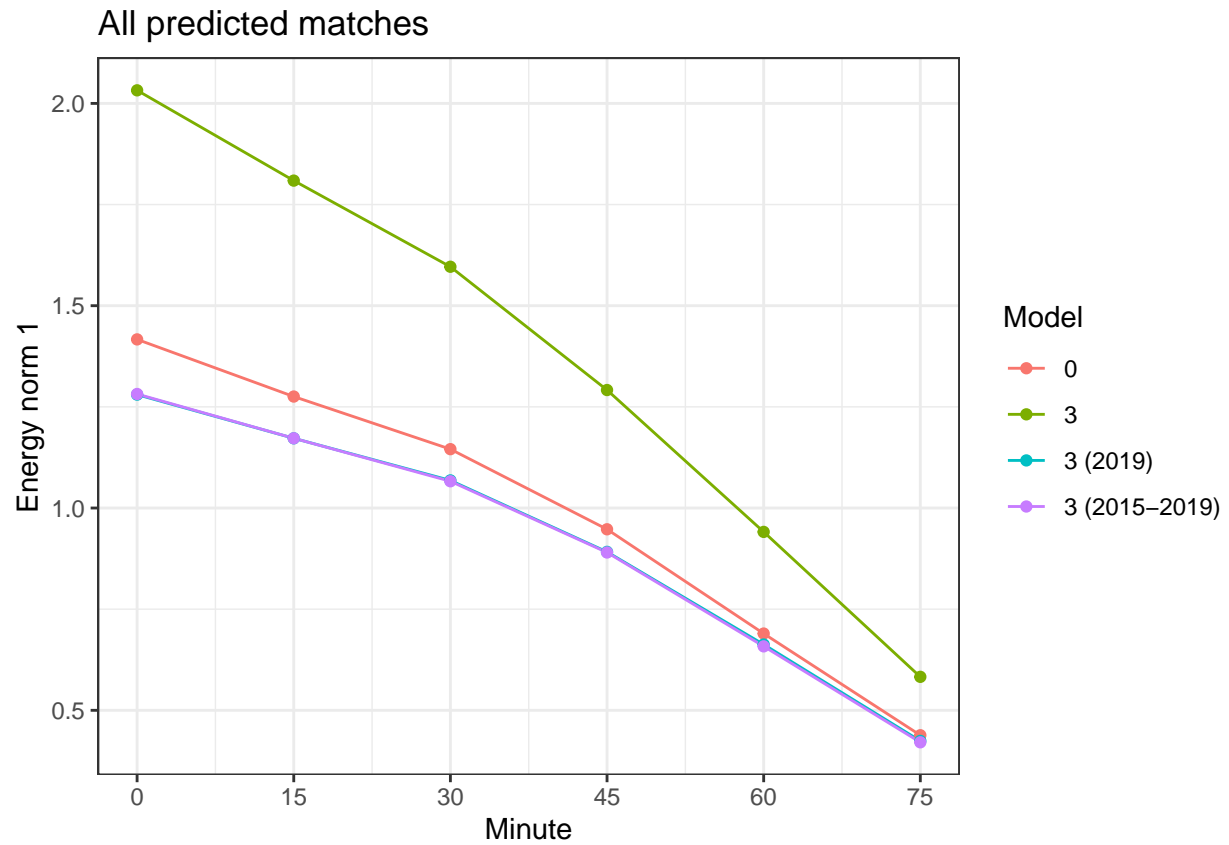
load("data/HDA2.RData")

nrow(HDA2)
```

```
## [1] 350
```

```
all = tibble(ENERG1 = apply(HDA2[,c(129:152)], 2, mean),
              Minute = as.integer(rep(c(0, 15, 30, 45, 60, 75), 4)),
              Model = factor(c(rep("0", 6), rep("3", 6), rep("3 (2019)", 6),
                               rep("3 (2015-2019)", 6)),
                             levels = c("0", "3", "3 (2019)", "3 (2015-2019)")))

all %>%
  ggplot(aes(x = Minute, y = ENERG1, col = Model)) +
  geom_line() +
  geom_point() +
  scale_x_continuous(breaks = c(0, 15, 30, 45, 60, 75)) +
  theme_bw() +
  ggtitle("All predicted matches") +
  ylab("Energy norm 1")
```



```
all %>%
  pivot_wider(id_cols = "Model", values_from = "ENERG1", names_from = "Minute",
              names_prefix = "Minute ") %>%
  kable()
```

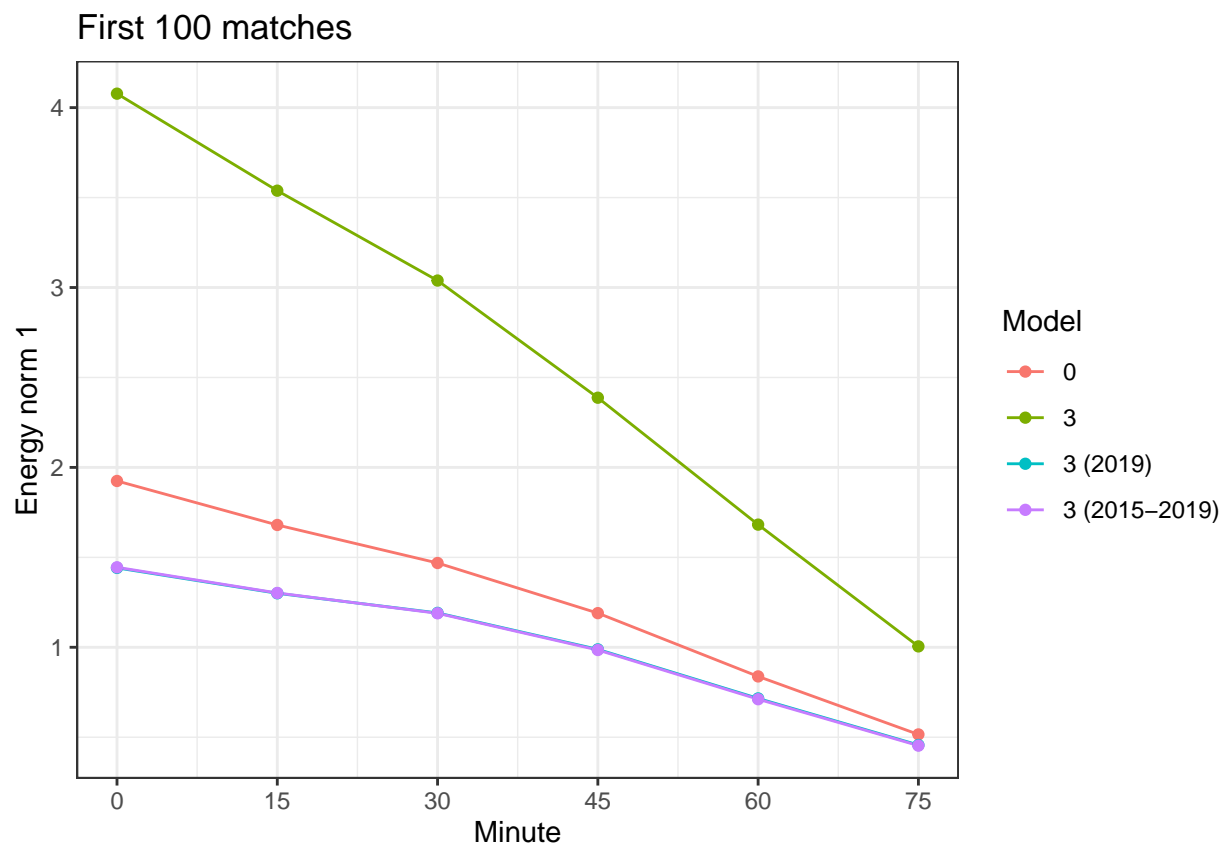
Model	Minute 0	Minute 15	Minute 30	Minute 45	Minute 60	Minute 75
0	1.416731	1.275500	1.145464	0.9474226	0.6896969	0.4384210
3	2.032316	1.809181	1.596261	1.2916162	0.9409667	0.5827161
3 (2019)	1.280258	1.172301	1.068218	0.8915819	0.6627024	0.4243915
3 (2015-2019)	1.281747	1.172376	1.066107	0.8900828	0.6580866	0.4209386

```

first_100 = tibble(ENERG1 = apply(HDA2[c(1:100),c(129:152)], 2, mean),
  Minute = as.integer(rep(c(0, 15, 30, 45, 60, 75), 4)),
  Model = factor(c(rep("0", 6), rep("3", 6), rep("3 (2019)", 6),
    rep("3 (2015-2019)", 6)),
    levels = c("0", "3", "3 (2019)", "3 (2015-2019)")))

first_100 %>%
  ggplot(aes(x = Minute, y = ENERG1, col = Model)) +
  geom_line() +
  geom_point() +
  scale_x_continuous(breaks = c(0, 15, 30, 45, 60, 75)) +
  theme_bw() +
  ggtitle("First 100 matches") +
  ylab("Energy norm 1")

```



```

first_100 %>%
  pivot_wider(id_cols = "Model", values_from = "ENERG1", names_from = "Minute",
    names_prefix = "Minute ") %>%
  kable()

```

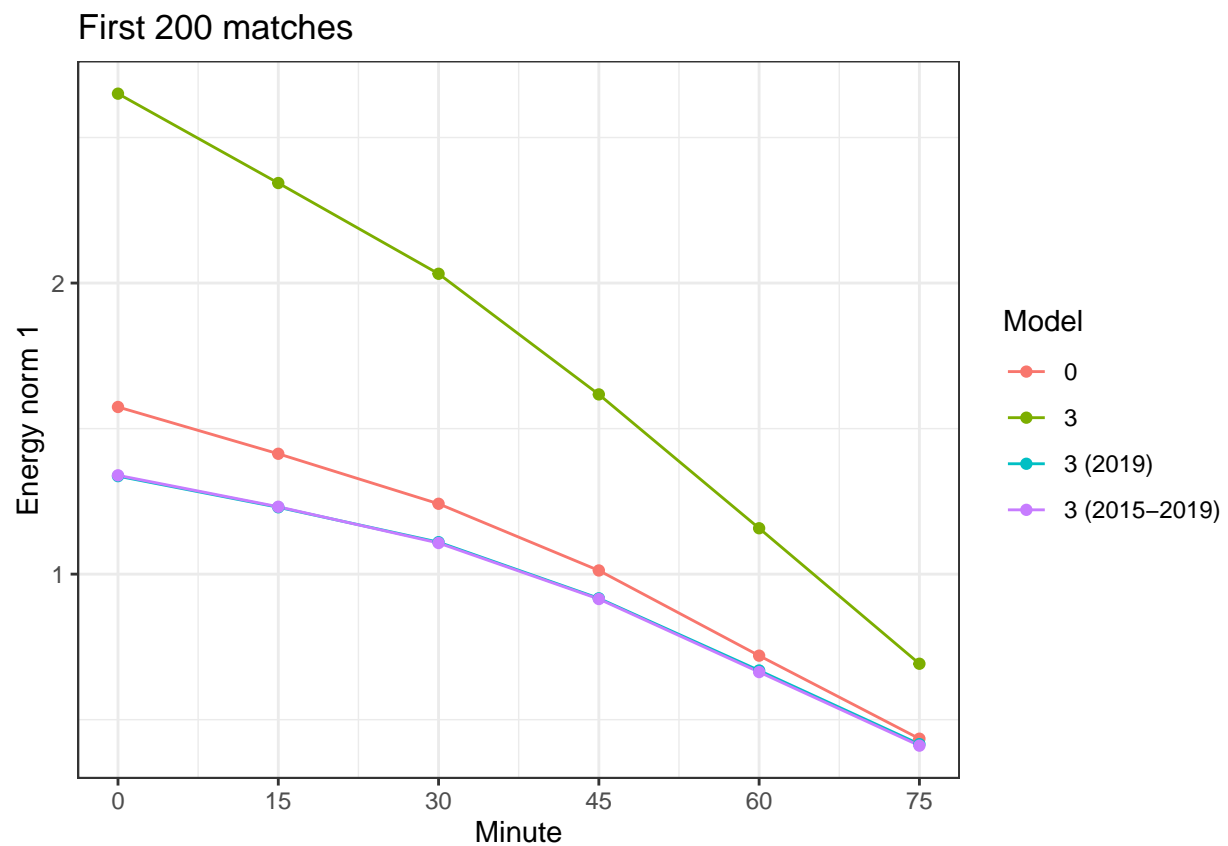
Model	Minute 0	Minute 15	Minute 30	Minute 45	Minute 60	Minute 75
0	1.924594	1.679907	1.468576	1.1898810	0.8380468	0.5154891
3	4.077620	3.538322	3.038754	2.3873376	1.6819023	1.0050816
3 (2019)	1.441326	1.300169	1.191182	0.9884599	0.7157695	0.4568464
3 (2015-2019)	1.444636	1.301959	1.188916	0.9849995	0.7113664	0.4532568

```

first_200 = tibble(ENERG1 = apply(HDA2[c(1:200),c(129:152)], 2, mean),
  Minute = as.integer(rep(c(0, 15, 30, 45, 60, 75), 4)),
  Model = factor(c(rep("0", 6), rep("3", 6), rep("3 (2019)", 6),
    rep("3 (2015-2019)", 6)),
    levels = c("0", "3", "3 (2019)", "3 (2015-2019)")))

first_200 %>%
  ggplot(aes(x = Minute, y = ENERG1, col = Model)) +
  geom_line() +
  geom_point() +
  scale_x_continuous(breaks = c(0, 15, 30, 45, 60, 75)) +
  theme_bw() +
  ggtitle("First 200 matches") +
  ylab("Energy norm 1")

```



```

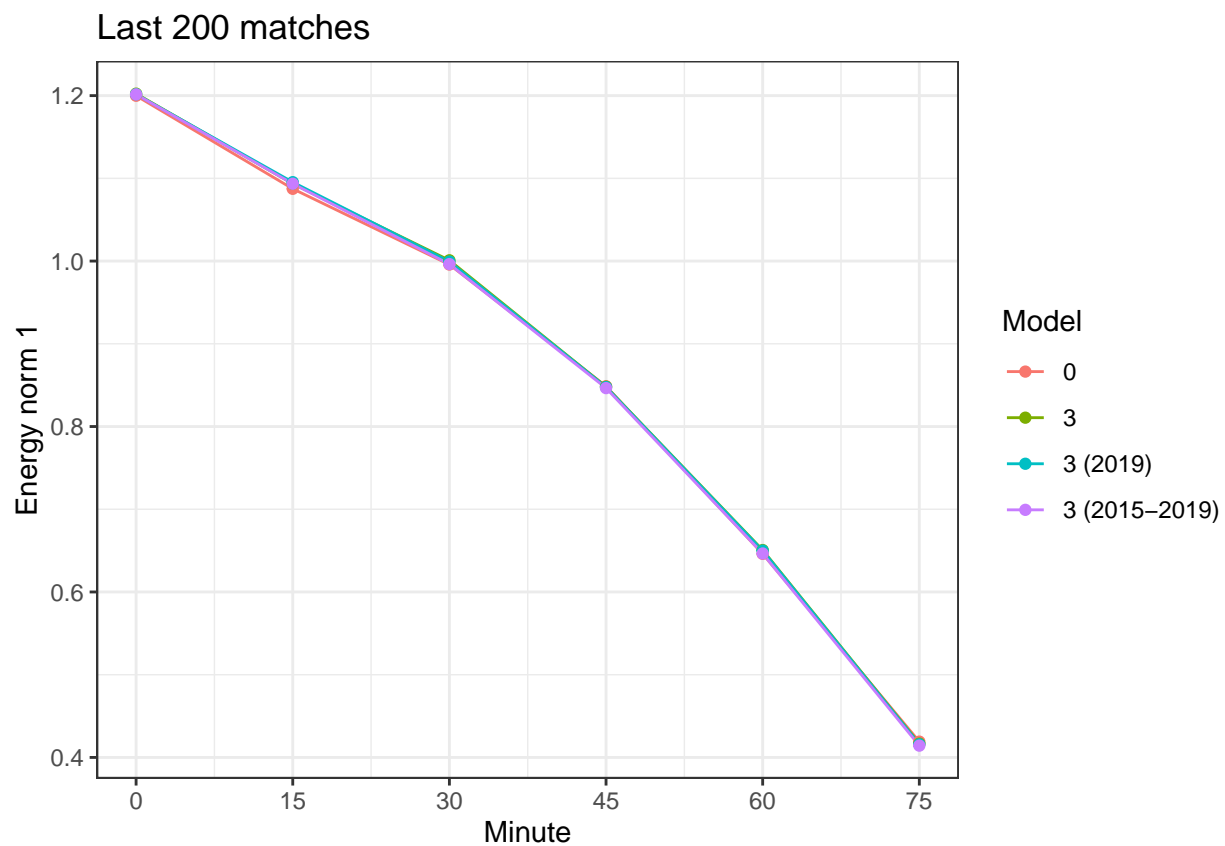
first_200 %>%
  pivot_wider(id_cols = "Model", values_from = "ENERG1", names_from = "Minute",
    names_prefix = "Minute ") %>%
  kable()

```

Model	Minute 0	Minute 15	Minute 30	Minute 45	Minute 60	Minute 75
0	1.574287	1.413491	1.241729	1.0125934	0.7199628	0.4346901
3	2.650623	2.343613	2.031910	1.6174486	1.1576741	0.6922046
3 (2019)	1.336716	1.229686	1.109857	0.9169231	0.6690643	0.4160890
3 (2015-2019)	1.339462	1.231521	1.106970	0.9145600	0.6635769	0.4108334

```
last_200 = tibble(ENERG1 = apply(HDA2[c(151:350),c(129:152)], 2, mean),
  Minute = as.integer(rep(c(0, 15, 30, 45, 60, 75), 4)),
  Model = factor(c(rep("0", 6), rep("3", 6), rep("3 (2019)", 6),
    rep("3 (2015-2019)", 6)),
    levels = c("0", "3", "3 (2019)", "3 (2015-2019)")))

last_200 %>%
  ggplot(aes(x = Minute, y = ENERG1, col = Model)) +
  geom_line() +
  geom_point() +
  scale_x_continuous(breaks = c(0, 15, 30, 45, 60, 75)) +
  theme_bw() +
  ggtitle("Last 200 matches") +
  ylab("Energy norm 1")
```

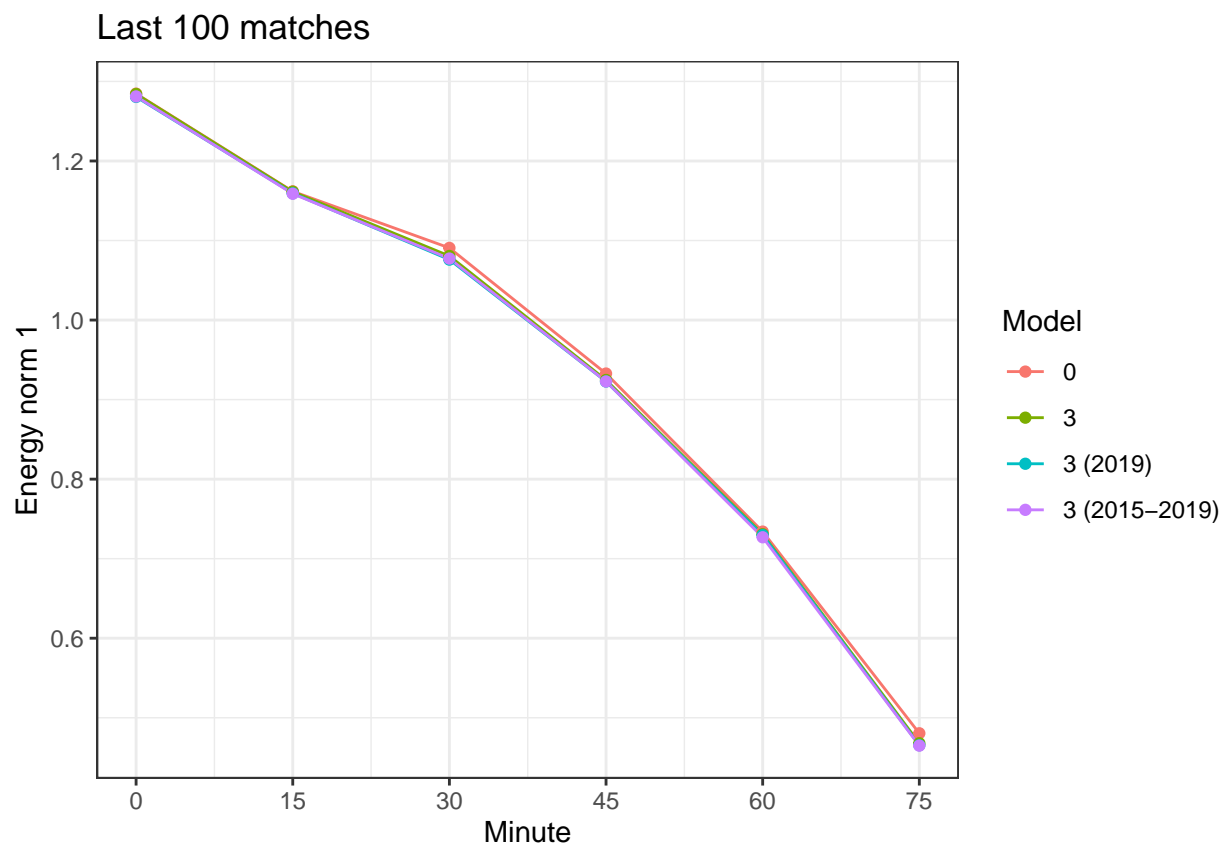


```
last_200 %>%
  pivot_wider(id_cols = "Model", values_from = "ENERG1", names_from = "Minute",
    names_prefix = "Minute ") %>%
  kable()
```

Model	Minute 0	Minute 15	Minute 30	Minute 45	Minute 60	Minute 75
0	1.199849	1.087348	0.9957940	0.8486737	0.6461170	0.4190861
3	1.202347	1.093527	1.0009215	0.8480606	0.6506796	0.4166904
3 (2019)	1.201644	1.095384	0.9994241	0.8476594	0.6500358	0.4159374
3 (2015-2019)	1.201479	1.093465	0.9963420	0.8464626	0.6464974	0.4142601

```
last_100 = tibble(ENERG1 = apply(HDA2[c(251:350),c(129:152)], 2, mean),
  Minute = as.integer(rep(c(0, 15, 30, 45, 60, 75), 4)),
  Model = factor(c(rep("0", 6), rep("3", 6), rep("3 (2019)", 6),
    rep("3 (2015-2019)", 6)),
    levels = c("0", "3", "3 (2019)", "3 (2015-2019)")))

last_100 %>%
  ggplot(aes(x = Minute, y = ENERG1, col = Model)) +
  geom_line() +
  geom_point() +
  scale_x_continuous(breaks = c(0, 15, 30, 45, 60, 75)) +
  theme_bw() +
  ggtitle("Last 100 matches") +
  ylab("Energy norm 1")
```



```
last_100 %>%
  pivot_wider(id_cols = "Model", values_from = "ENERG1", names_from = "Minute",
    names_prefix = "Minute ") %>%
  kable()
```

Model	Minute 0	Minute 15	Minute 30	Minute 45	Minute 60	Minute 75
0	1.284627	1.161783	1.090716	0.9327373	0.7340294	0.4804622
3	1.284209	1.161353	1.080553	0.9246842	0.7307545	0.4679582
3 (2019)	1.280551	1.159389	1.076009	0.9227410	0.7296558	0.4654888
3 (2015-2019)	1.281158	1.158814	1.077323	0.9227840	0.7269314	0.4649406