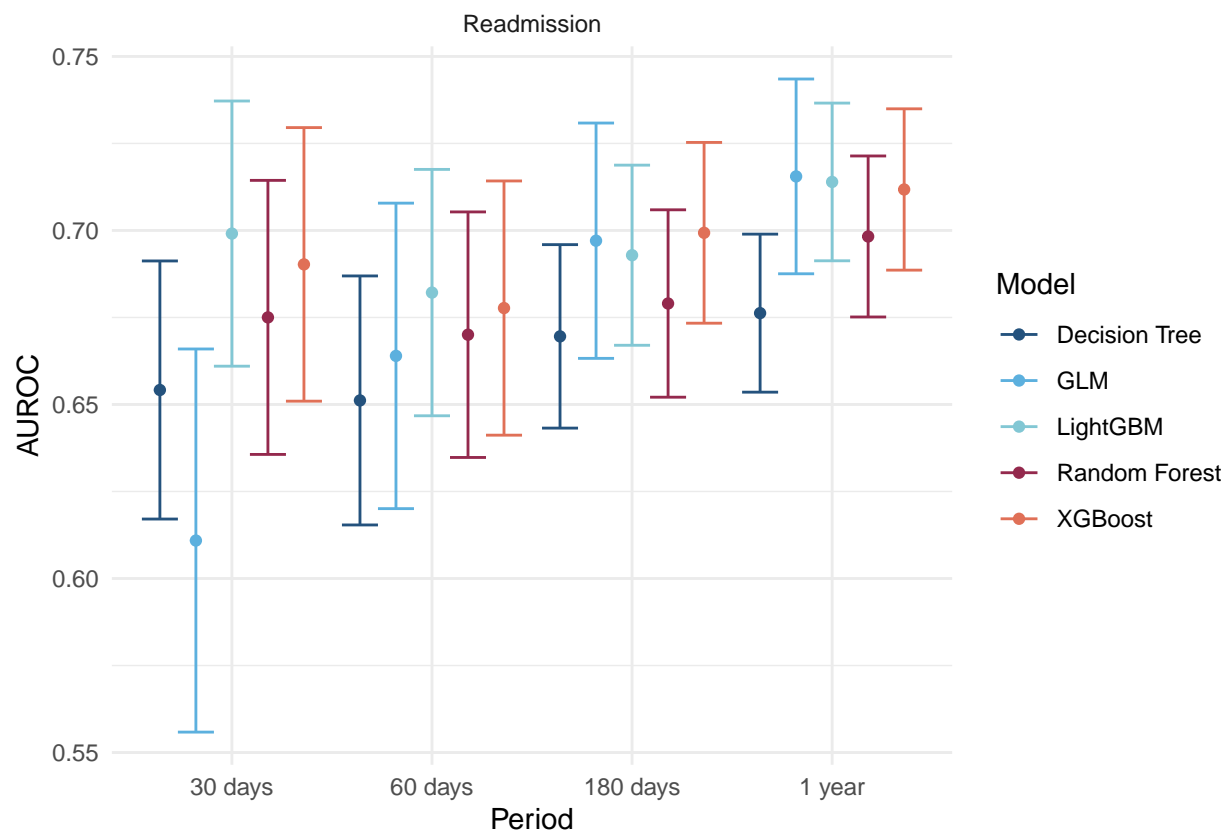# Model Selection Results

Eduardo Yuki Yada

Model Selection
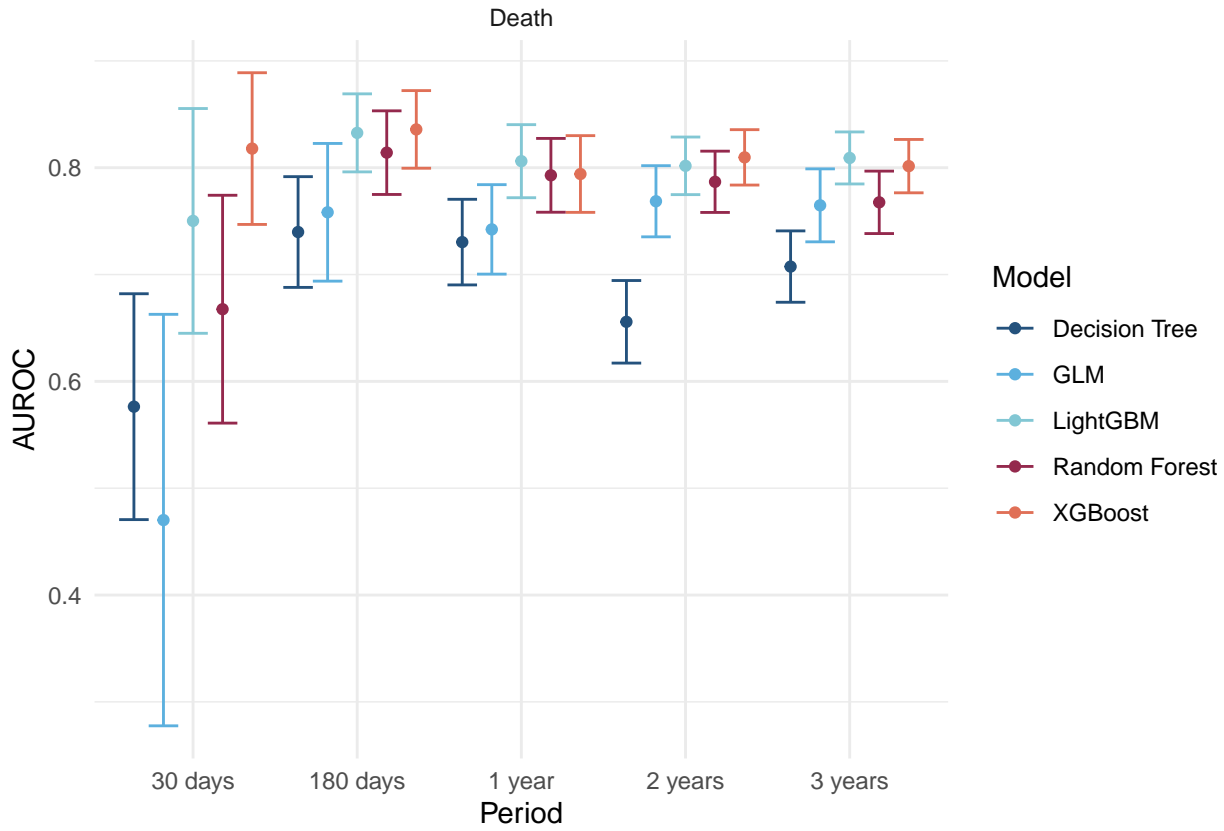
Death

Table 1: Readmission models comparison

Period	Model	AUROC	Lower Limit	Upper Limit
30 days	LightGBM	0.70	0.66	0.74
30 days	XGBoost	0.69	0.65	0.73
30 days	Random Forest	0.68	0.64	0.71
30 days	Decision Tree	0.65	0.62	0.69
30 days	GLM	0.61	0.56	0.67
60 days	LightGBM	0.68	0.65	0.72
60 days	XGBoost	0.68	0.64	0.71
60 days	Random Forest	0.67	0.63	0.71
60 days	GLM	0.66	0.62	0.71
60 days	Decision Tree	0.65	0.62	0.69
180 days	XGBoost	0.70	0.67	0.73
180 days	GLM	0.70	0.66	0.73
180 days	LightGBM	0.69	0.67	0.72
180 days	Random Forest	0.68	0.65	0.71
180 days	Decision Tree	0.67	0.64	0.70
1 year	GLM	0.72	0.69	0.74
1 year	LightGBM	0.71	0.69	0.74
1 year	XGBoost	0.71	0.69	0.73
1 year	Random Forest	0.70	0.68	0.72
1 year	Decision Tree	0.68	0.65	0.70

Table 2: Death models comparison

Period	Model	AUROC	Lower Limit	Upper Limit
30 days	XGBoost	0.82	0.75	0.89
30 days	LightGBM	0.75	0.65	0.86

Table 2: Death models comparison *(continued)*

Period	Model	AUROC	Lower Limit	Upper Limit
30 days	Random Forest	0.67	0.56	0.77
30 days	Decision Tree	0.58	0.47	0.68
30 days	GLM	0.47	0.28	0.66
180 days	XGBoost	0.84	0.80	0.87
180 days	LightGBM	0.83	0.80	0.87
180 days	Random Forest	0.81	0.77	0.85
180 days	GLM	0.76	0.69	0.82
180 days	Decision Tree	0.74	0.69	0.79
1 year	LightGBM	0.81	0.77	0.84
1 year	XGBoost	0.79	0.76	0.83
1 year	Random Forest	0.79	0.76	0.83
1 year	GLM	0.74	0.70	0.78
1 year	Decision Tree	0.73	0.69	0.77
2 years	XGBoost	0.81	0.78	0.84
2 years	LightGBM	0.80	0.77	0.83
2 years	Random Forest	0.79	0.76	0.82
2 years	GLM	0.77	0.74	0.80
2 years	Decision Tree	0.66	0.62	0.69
3 years	LightGBM	0.81	0.78	0.83
3 years	XGBoost	0.80	0.78	0.83
3 years	Random Forest	0.77	0.74	0.80
3 years	GLM	0.76	0.73	0.80
3 years	Decision Tree	0.71	0.67	0.74

Final Model

Death
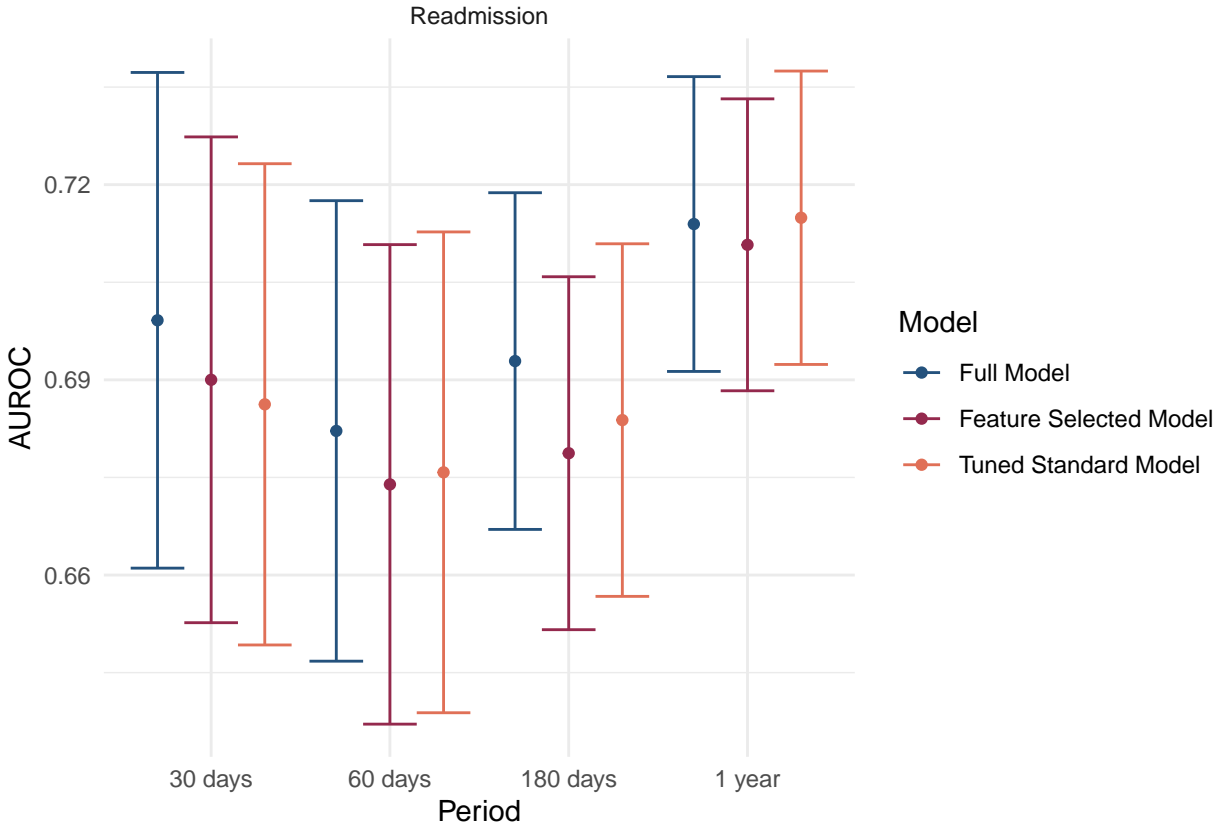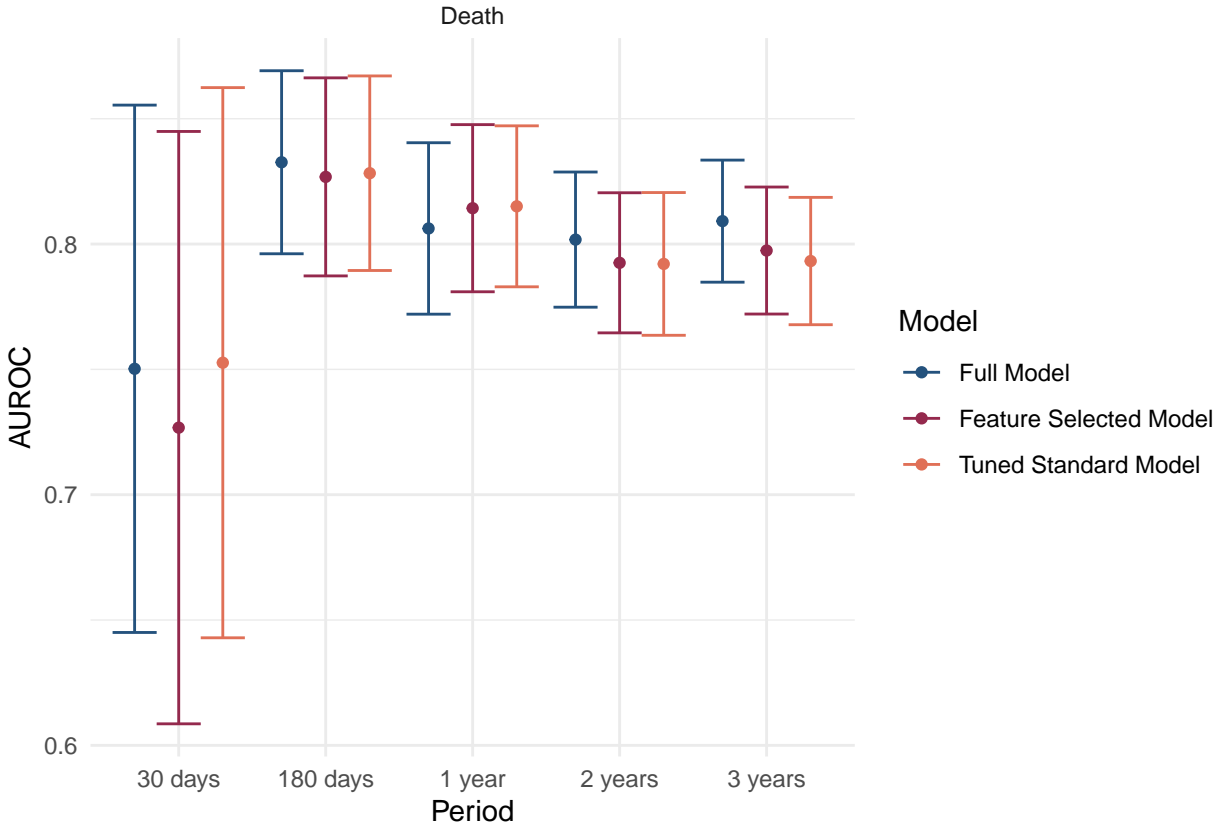
Table 3: Readmission models comparison

Period	Model	Features	AUROC	Lower Limit	Upper Limit
30 days	Full Model	76	0.70	0.66	0.74
30 days	Feature Selected Model	11	0.69	0.65	0.73
30 days	Tuned Standard Model	11	0.69	0.65	0.72
60 days	Full Model	84	0.68	0.65	0.72
60 days	Tuned Standard Model	4	0.68	0.64	0.71
60 days	Feature Selected Model	4	0.67	0.64	0.71
180 days	Full Model	95	0.69	0.67	0.72
180 days	Tuned Standard Model	7	0.68	0.66	0.71
180 days	Feature Selected Model	7	0.68	0.65	0.71
1 year	Tuned Standard Model	10	0.71	0.69	0.74
1 year	Full Model	97	0.71	0.69	0.74
1 year	Feature Selected Model	10	0.71	0.69	0.73

Table 4: Death models comparison

Period	Model	Features	AUROC	Lower Limit	Upper Limit
30 days	Tuned Standard Model	31	0.75	0.64	0.86
30 days	Full Model	64	0.75	0.65	0.86
30 days	Feature Selected Model	31	0.73	0.61	0.84
180 days	Full Model	78	0.83	0.80	0.87
180 days	Tuned Standard Model	9	0.83	0.79	0.87
180 days	Feature Selected Model	9	0.83	0.79	0.87
1 year	Tuned Standard Model	16	0.82	0.78	0.85
1 year	Feature Selected Model	16	0.81	0.78	0.85
1 year	Full Model	83	0.81	0.77	0.84
2 years	Full Model	80	0.80	0.77	0.83

Table 4: Death models comparison *(continued)*

Period	Model	Features	AUROC	Lower Limit	Upper Limit
2 years	Feature Selected Model	11	0.79	0.76	0.82
2 years	Tuned Standard Model	11	0.79	0.76	0.82
3 years	Full Model	81	0.81	0.78	0.83
3 years	Feature Selected Model	13	0.80	0.77	0.82
3 years	Tuned Standard Model	13	0.79	0.77	0.82

Selected Features

death__180days

1. hospital_stay
2. age
3. year_adm_t0
4. espironolactona
5. education_level
6. laboratorio
7. comorbidities_count
8. admission_pre_t0_count
9. vasodilatador

death__1year

1. hospital_stay
2. age
3. year_adm_t0
4. comorbidities_count
5. admission_pre_t0_count
6. espironolactona
7. education_level
8. antiarritmico
9. ieca_bra
10. cied_final_group_1
11. proced_invasivos_qtde
12. hypertension
13. ultrassom
14. admission_pre_t0_180d
15. antiplaquetario_ev
16. valvopathy

death__2year

1. hospital_stay
2. age
3. year_adm_t0
4. admission_pre_t0_count
5. espironolactona
6. education_level
7. comorbidities_count
8. diuretico
9. metodos_graficos_qtde
10. cied_final_group_1
11. antiarritmico

death__30days

1. hospital_stay
2. admission_pre_t0_count

3. year_adm_t0
4. metodos_graficos_qtde
5. education_level
6. vasodilatador
7. analises_clinicas_qtde
8. equipe_multiprof
9. meds_cardiovasc_qtde
10. bic
11. nyha_basal
12. holter
13. hypertension
14. citologia
15. cied_final_1
16. dva
17. classe_meds_qtde
18. ressonancia
19. renal_failure
20. diuretico
21. interconsulta
22. cultura
23. betabloqueador
24. af
25. proced_invasivos_qtde
26. tomografia
27. sex
28. procedure_type_1
29. ecocardiograma
30. admission_pre_t0_180d
31. cied_final_group_1

death_3year

1. hospital_stay
2. age
3. year_adm_t0
4. admission_pre_t0_count
5. espironolactona
6. education_level
7. comorbidities_count
8. ieca_bra
9. meds_cardiovasc_qtde
10. nyha_basal
11. antiarritmico
12. cied_final_group_1
13. ventilacao_mecanica

readmission_180d

1. hospital_stay
2. admission_pre_t0_count
3. vasodilatador
4. classe_meds_qtde
5. cied_final_1
6. equipe_multiprof
7. procedure_type_1

readmission_1year

1. hospital_stay
2. admission_pre_t0_count
3. year_adm_t0
4. meds_antimicrobianos

5. vasodilatador
  6. icu_t0
  7. procedure_type_new
  8. nyha_basal
  9. admission_pre_t0_180d
  10. cied_final_1

readmission_30d

  1. hospital_stay
  2. admission_pre_t0_count
  3. digoxina
  4. meds_antimicrobianos
  5. bic
  6. icu_t0
  7. antiarritmico
  8. anticonvulsivante
  9. comorbidities_count
  10. procedure_type_new
  11. prior_mi

readmission_60d

  1. hospital_stay
  2. admission_pre_t0_count
  3. classe_meds_qtde
  4. equipe_multiprof

Union

  1. hospital_stay
  2. age
  3. year_adm_t0
  4. espironolactona
  5. education_level
  6. laboratorio
  7. comorbidities_count
  8. admission_pre_t0_count
  9. vasodilatador
  10. antiarritmico
  11. ieca_bra
  12. cied_final_group_1
  13. proced_invasivos_qtde
  14. hypertension
  15. ultrassom
  16. admission_pre_t0_180d
  17. antiplaquetario_ev
  18. valvopathy
  19. diuretico
  20. metodos_graficos_qtde
  21. analises_clinicas_qtde
  22. equipe_multiprof
  23. meds_cardiovasc_qtde
  24. bic
  25. nyha_basal
  26. holter
  27. citologia
  28. cied_final_1
  29. dva
  30. classe_meds_qtde
  31. ressonancia

32. renal_failure
33. interconsulta
34. cultura
35. betabloqueador
36. af
37. tomografia
38. sex
39. procedure_type_1
40. ecocardiograma
41. ventilacao_mecanica
42. meds_antimicrobianos
43. icu_t0
44. procedure_type_new
45. digoxina
46. anticonvulsivante
47. prior_mi