

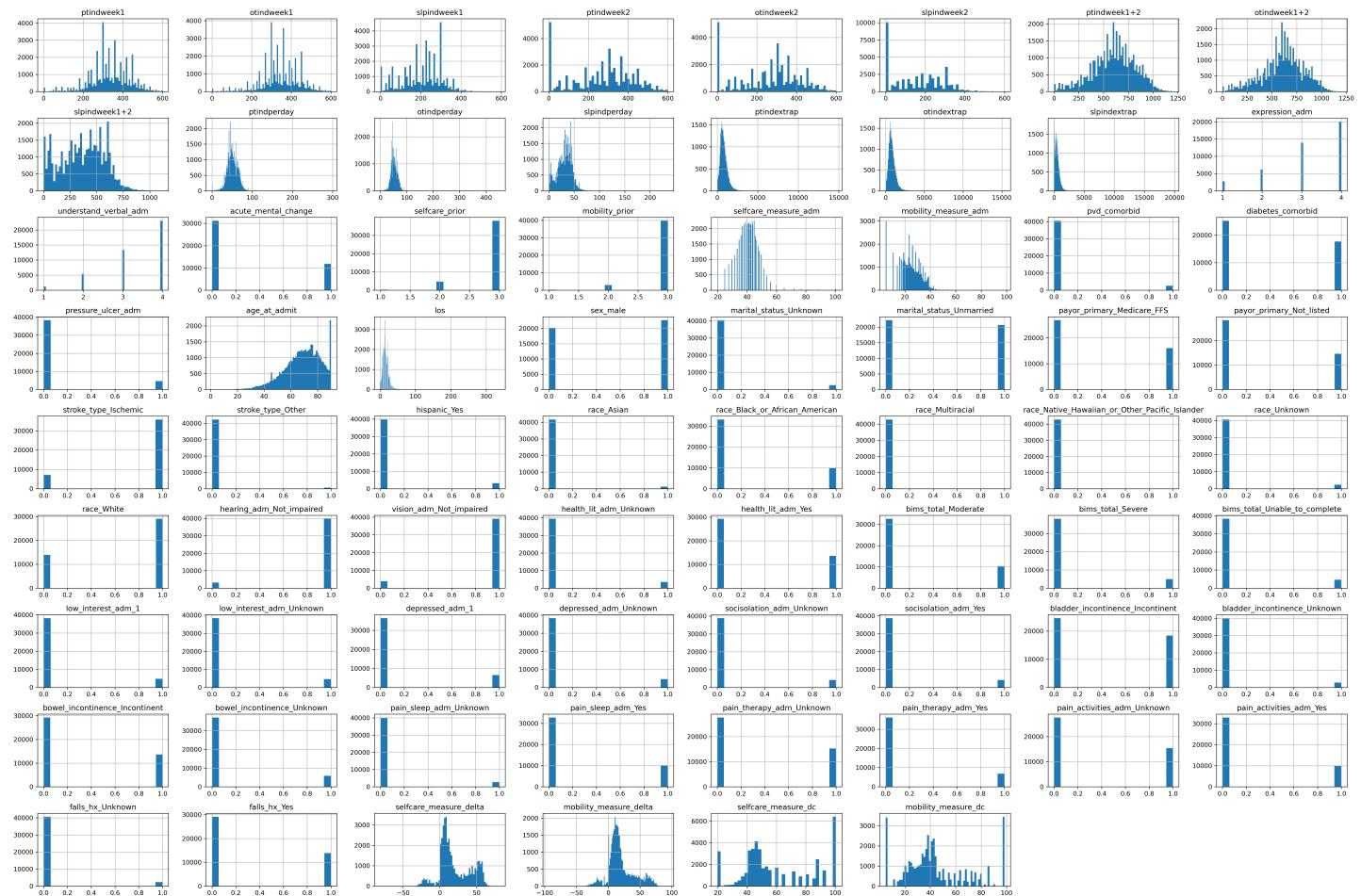
Follow-ups on Therapy Predictors Processing

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1. Updated histograms

Added new variables:

- `pt/ot/slpindweek1+2`: basically adding week1 + week2 doses.
- `pt/ot/slpindperday`: (week1 + week2)/los. If los > 14, it's clipped to 14 when calculating.
- `pt/ot/slpindextrap`: extrapolated total doses, i.e. perday * los.



1. Baseline

Same as discussed before, using pt/ot/slp ind week1 & week2 doses as therapy predictors.

This serves as a comparison baseline.

All used predictors:

+-----+-----+-----+-----+

Index	Name	Dtype	# of NaNs
0	ptindweek1+2	float64	0
1	otindweek1+2	float64	0
2	slpindweek1+2	float64	0
3	expression_adm	float64	0
4	understand_verbal_adm	float64	0
5	acute_mental_change	float64	0
6	selfcare_prior	float64	0
7	mobility_prior	float64	0
8	selfcare_measure_adm	float64	0
9	mobility_measure_adm	float64	0
10	pvd_comorbid	float64	0
11	diabetes_comorbid	float64	0
12	pressure_ulcer_adm	float64	0
13	age_at_admit	float64	0
14	los	float64	0
15	sex_male	float64	0
16	marital_status_Unknown	float64	0
17	marital_status_Unmarried	float64	0
18	payor_primary_Medicare_FFS	float64	0
19	payor_primary_Not_listed	float64	0
20	stroke_type_Ischemic	float64	0
21	stroke_type_Other	float64	0
22	hispanic_Yes	float64	0
23	race_Asian	float64	0

24	race_Black_or_African_American	float64	0
25	race_Multiracial	float64	0
26	race_Native_Hawaiian_or_Other_Pacific_Islander	float64	0
27	race_Unknown	float64	0
28	race_White	float64	0
29	hearing_adm_Not_impaired	float64	0
30	vision_adm_Not_impaired	float64	0
31	health_lit_adm_Unknown	float64	0
32	health_lit_adm_Yes	float64	0
33	bims_total_Moderate	float64	0
34	bims_total_Severe	float64	0
35	bims_total_Unable_to_complete	float64	0
36	low_interest_adm_1	float64	0
37	low_interest_adm_Unknown	float64	0
38	depressed_adm_1	float64	0
39	depressed_adm_Unknown	float64	0
40	socisolation_adm_Unknown	float64	0
41	socisolation_adm_Yes	float64	0
42	bladder_incontinence_Incontinent	float64	0
43	bladder_incontinence_Unknown	float64	0
44	bowel_incontinence_Incontinent	float64	0
45	bowel_incontinence_Unknown	float64	0
46	pain_sleep_adm_Unknown	float64	0
47	pain_sleep_adm_Yes	float64	0

48	pain_therapy_adm_Unknown	float64	0
49	pain_therapy_adm_Yes	float64	0
50	pain_activities_adm_Unknown	float64	0
51	pain_activities_adm_Yes	float64	0
52	falls_hx_Unknown	float64	0
53	falls_hx_Yes	float64	0

Not using `mobility_measure_adm` for selfcare prediction and vice versa, hereinafter.

RF performance:

(selfcare)

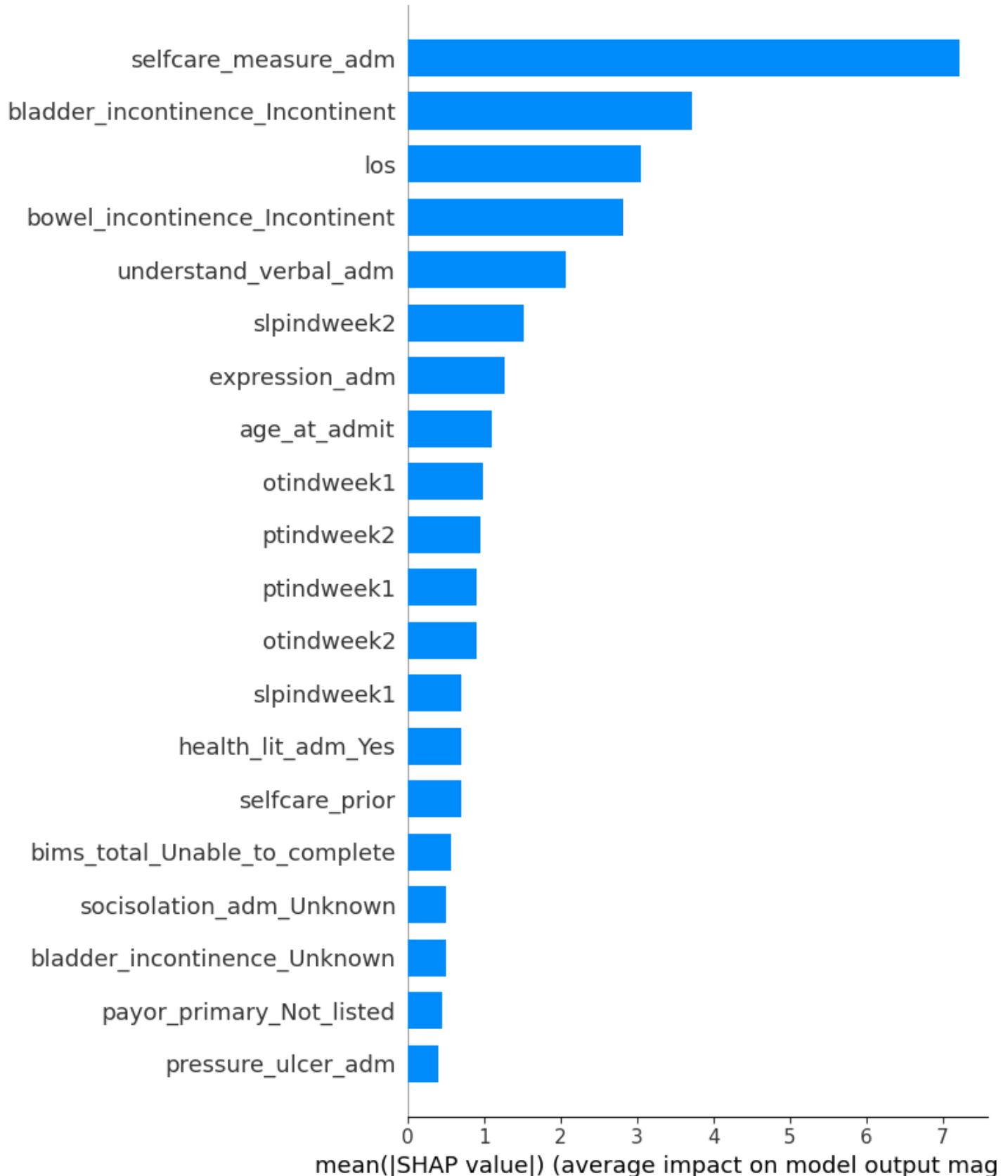
```
-----train set results-----
MSE: 90.44984792867425
R²: 0.8513949369740579
-----eval set results-----
MSE: 308.94019802050417
R²: 0.4963093190107718
-----test set results-----
MSE: 311.97168606142134
R²: 0.48391615978549984
```

(mobility)

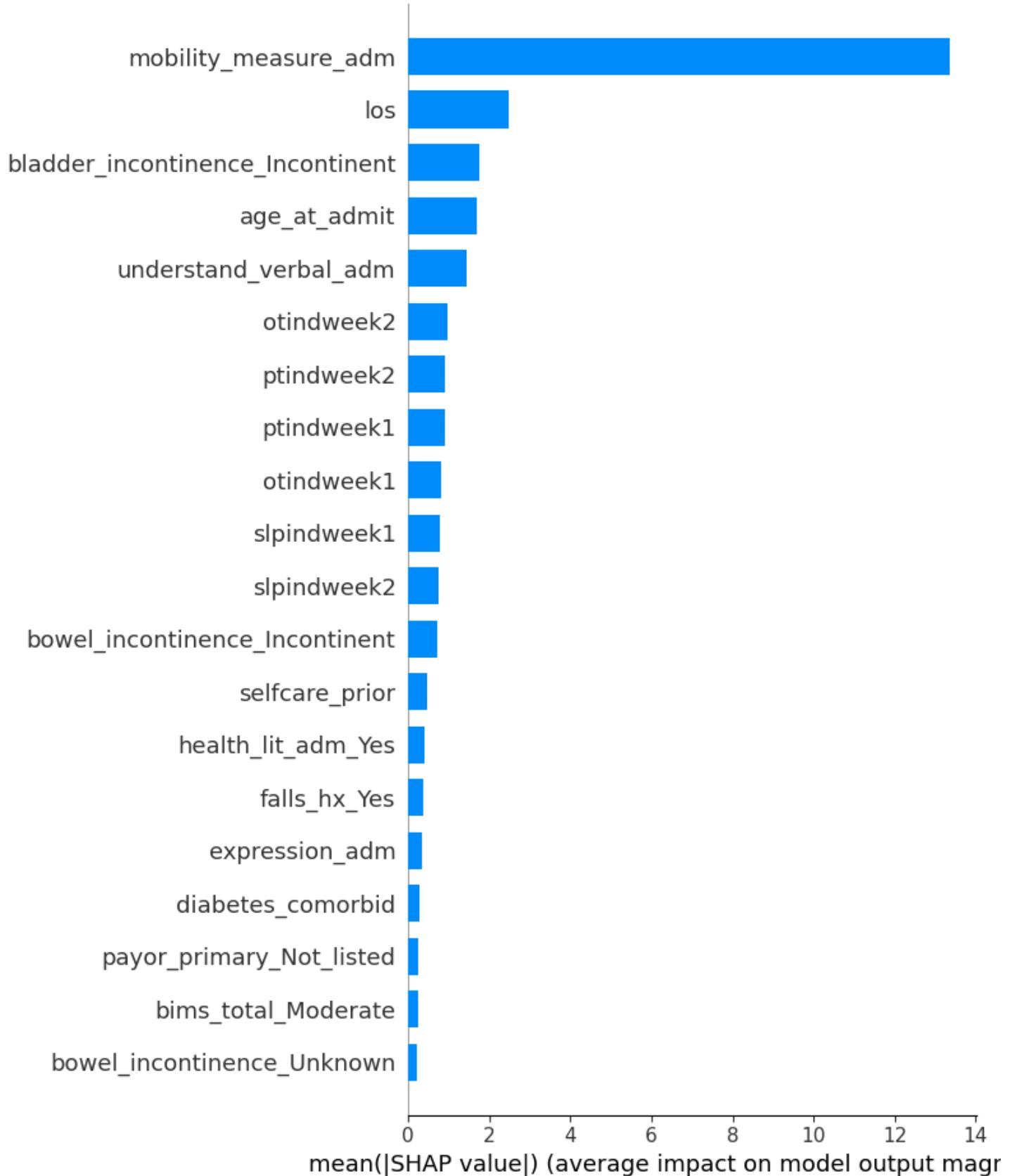
```
-----train set results-----
MSE: 68.64261322840972
R²: 0.8887898732836019
-----eval set results-----
MSE: 303.82256547072143
R²: 0.5121207785329656
-----test set results-----
MSE: 301.96675572914523
R²: 0.5115095824273486
```

Shapley values (top 20) as a reference:

(selfcare)



(mobility)



2. Use extrapolated total doses

Instead of week1 and week2 separate doses, use `pt/ot/slpindextrap` only.

2.1 All patients

RF results:

(selfcare)

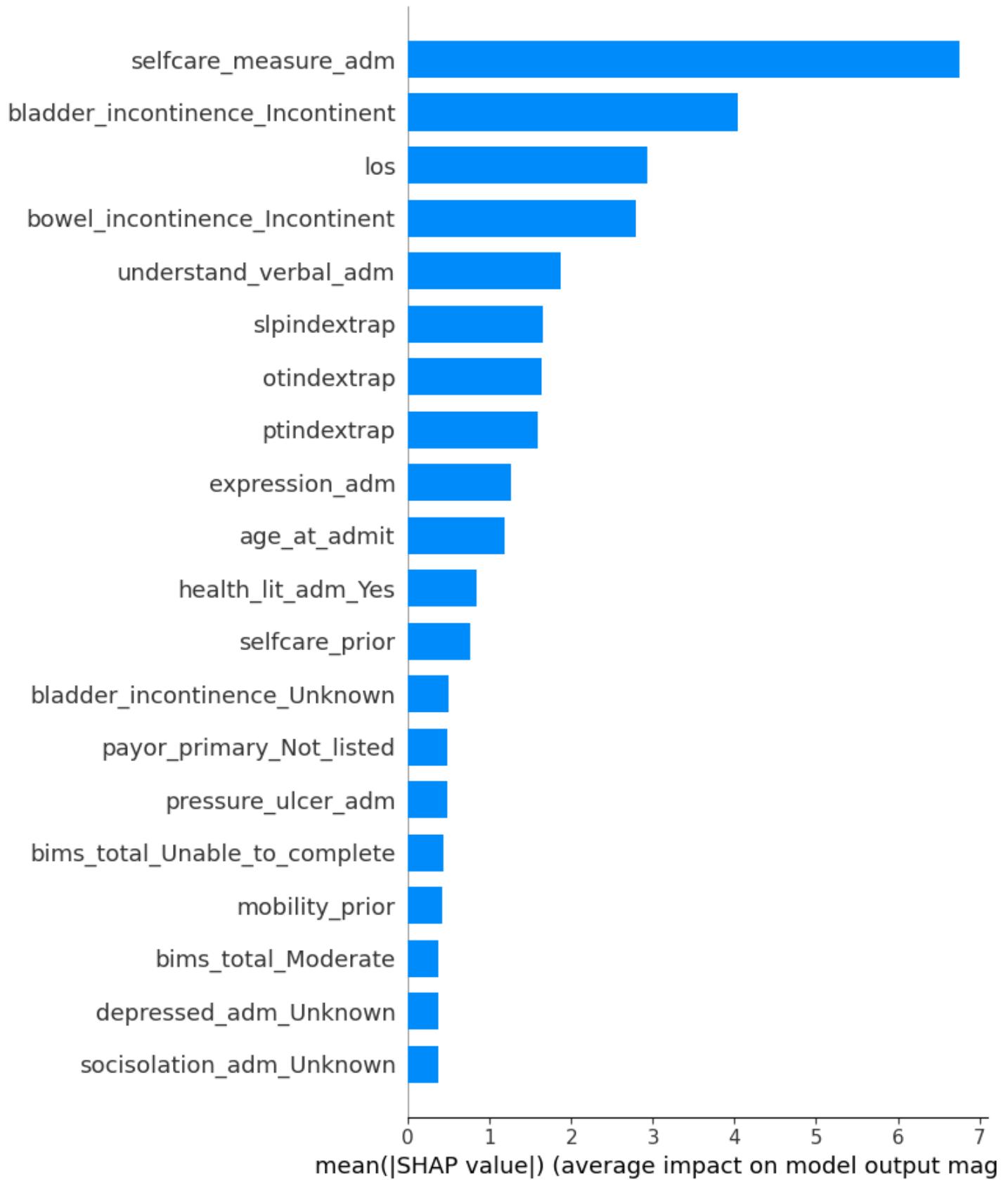
```
-----train set results-----
MSE: 99.01112147113858
R2: 0.8373291466660024
-----eval set results-----
MSE: 309.9645277033238
R2: 0.494639269859503
-----test set results-----
MSE: 312.3632101602575
R2: 0.48326847517342864
```

(mobility)

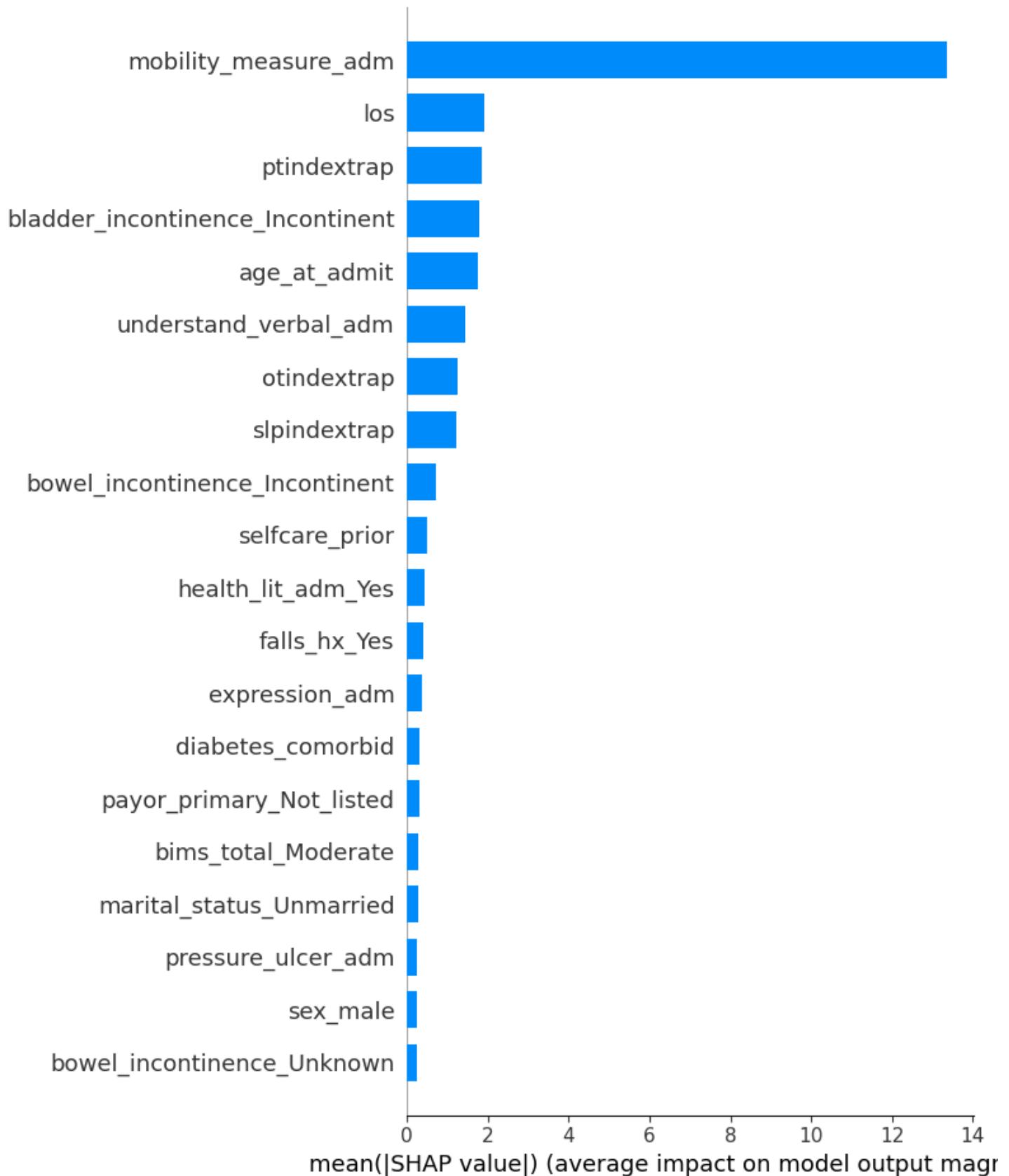
```
-----train set results-----
MSE: 71.75307979794282
R2: 0.8837505053884162
-----eval set results-----
MSE: 304.4736512103543
R2: 0.5110752630253592
-----test set results-----
MSE: 302.02879477324035
R2: 0.5114092221129071
```

Shapley values:

(selfcare)



(Mobility)



2.2 Patients with los<=14 only

RF results:

(selfcare)

```
-----train set results-----  
MSE: 124.80259466345709  
R2: 0.8432966774960053  
-----eval set results-----  
MSE: 402.9985375634285  
R2: 0.498446773012273  
-----test set results-----  
MSE: 413.59817573087787  
R2: 0.48621468638317433
```

(mobility)

```
-----train set results-----  
MSE: 94.46517878917584  
R2: 0.8887073617800083  
-----eval set results-----  
MSE: 430.33819688391907  
R2: 0.5039479883547606  
-----test set results-----  
MSE: 436.9447345830002  
R2: 0.4964713720135516
```

3. Use perday doses

Instead of week1 and week2 separate doses, use `pt/ot/slpindperday` only.

3.1 All patients

RF results:

(selfcare)

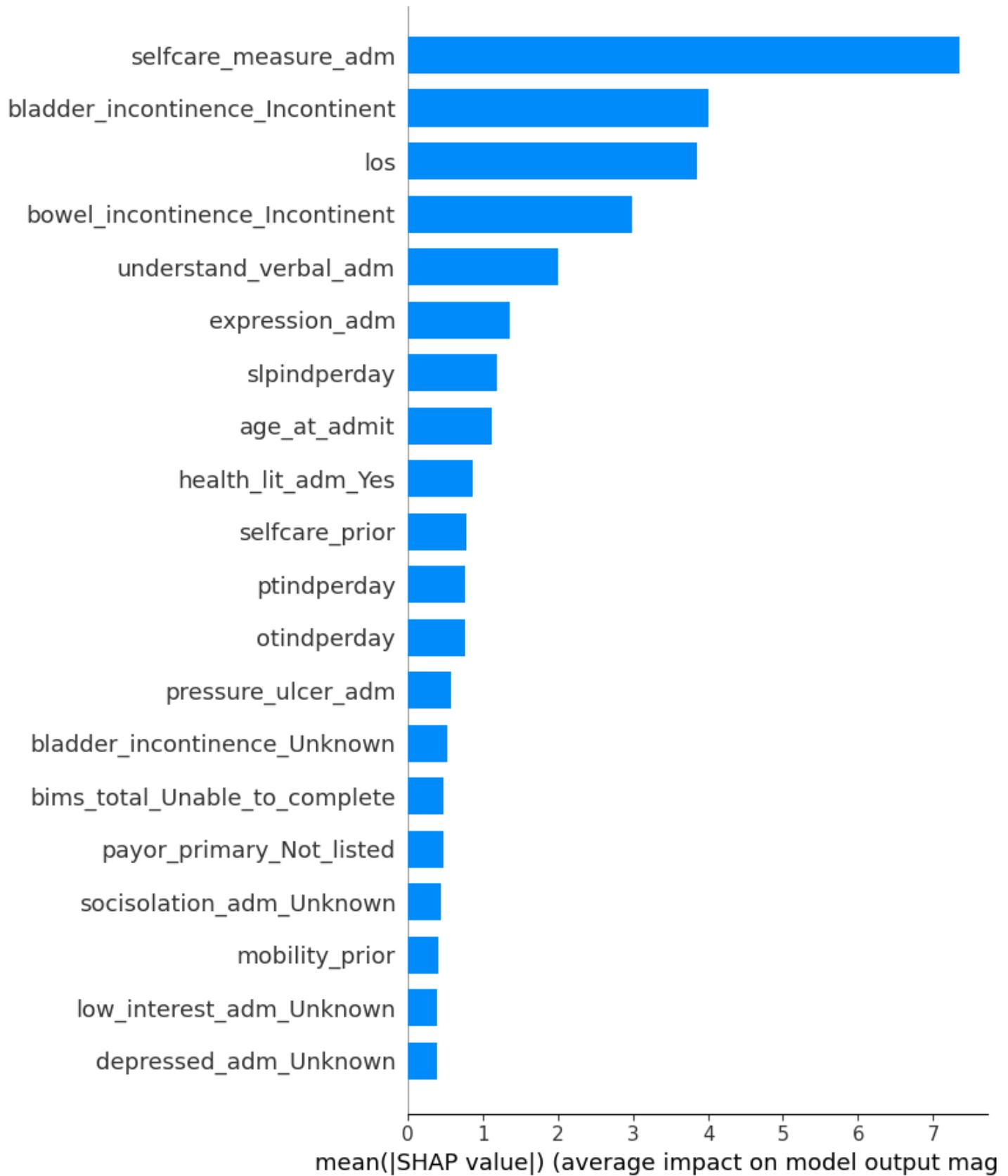
```
-----train set results-----  
MSE: 107.26886493119464  
R2: 0.8237620427356411  
-----eval set results-----  
MSE: 310.47420024984064  
R2: 0.49380830867775516  
-----test set results-----  
MSE: 313.8331371956519  
R2: 0.48083682633106506
```

(mobility)

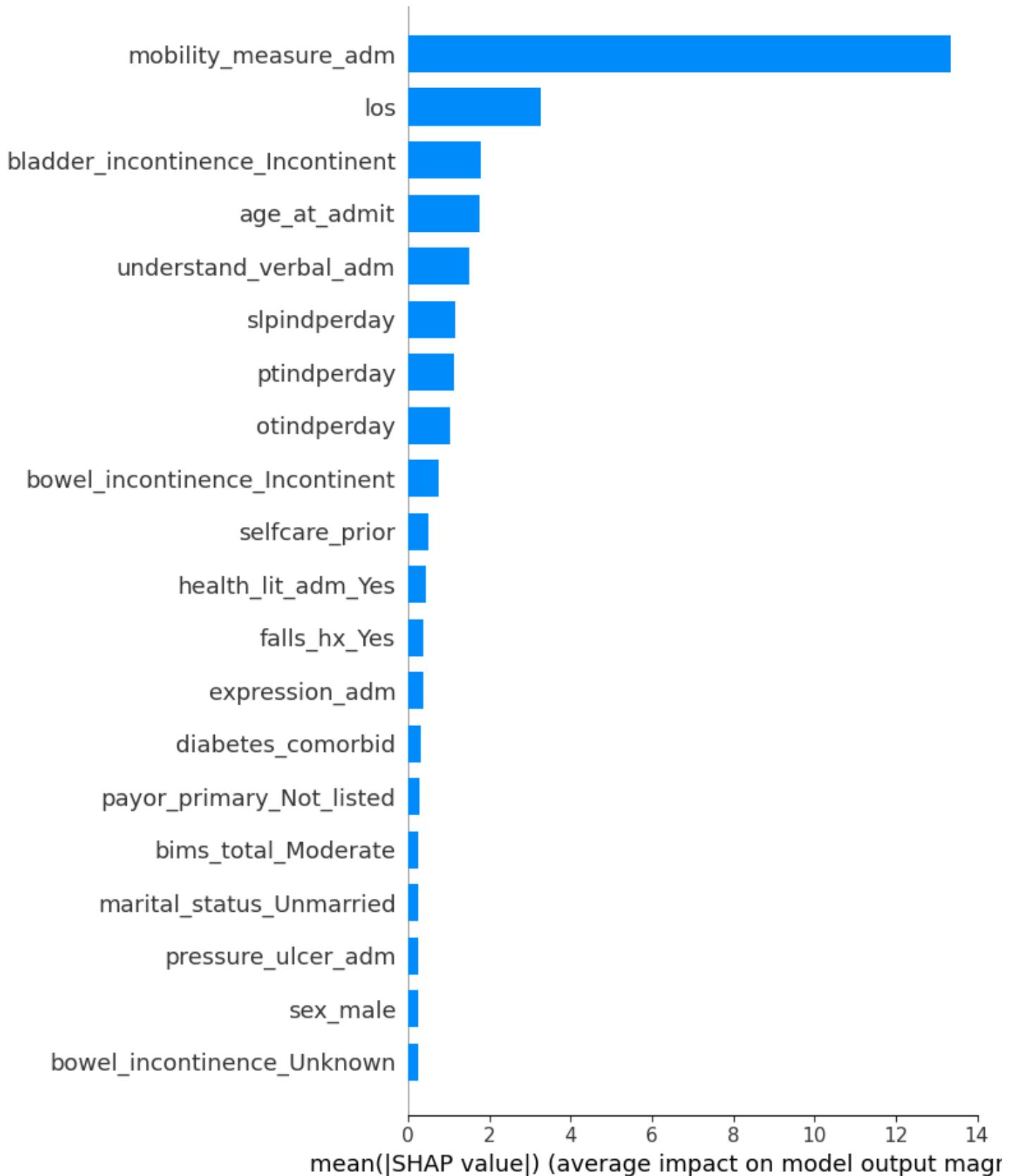
```
-----train set results-----  
MSE: 69.35077664400865  
R2: 0.8876425547378668  
-----eval set results-----  
MSE: 305.50870175945215  
R2: 0.509413175631388  
-----test set results-----  
MSE: 302.73446203928285  
R2: 0.5102676669883237
```

Shapley values:

(selfcare)

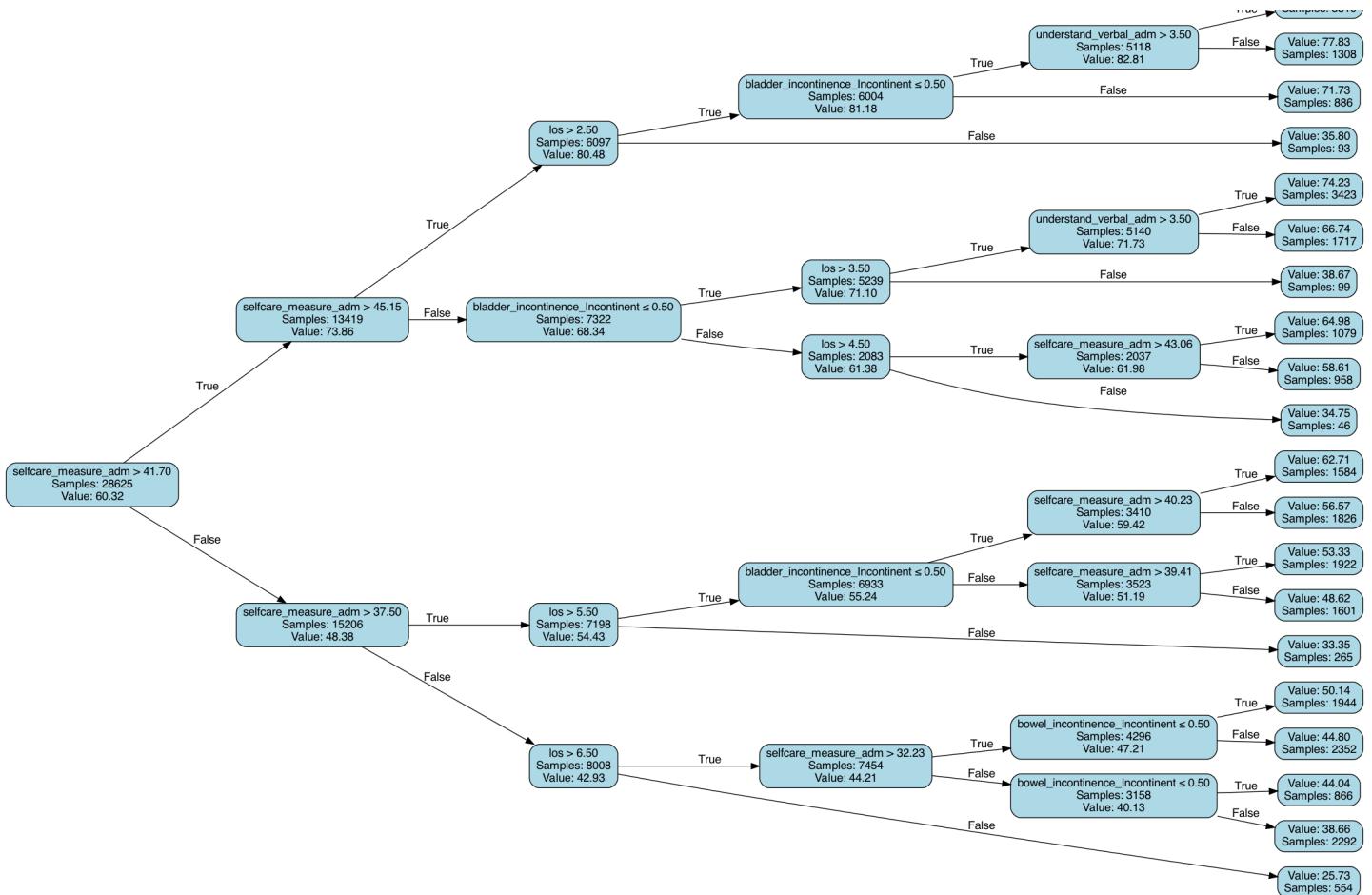


(mobility)

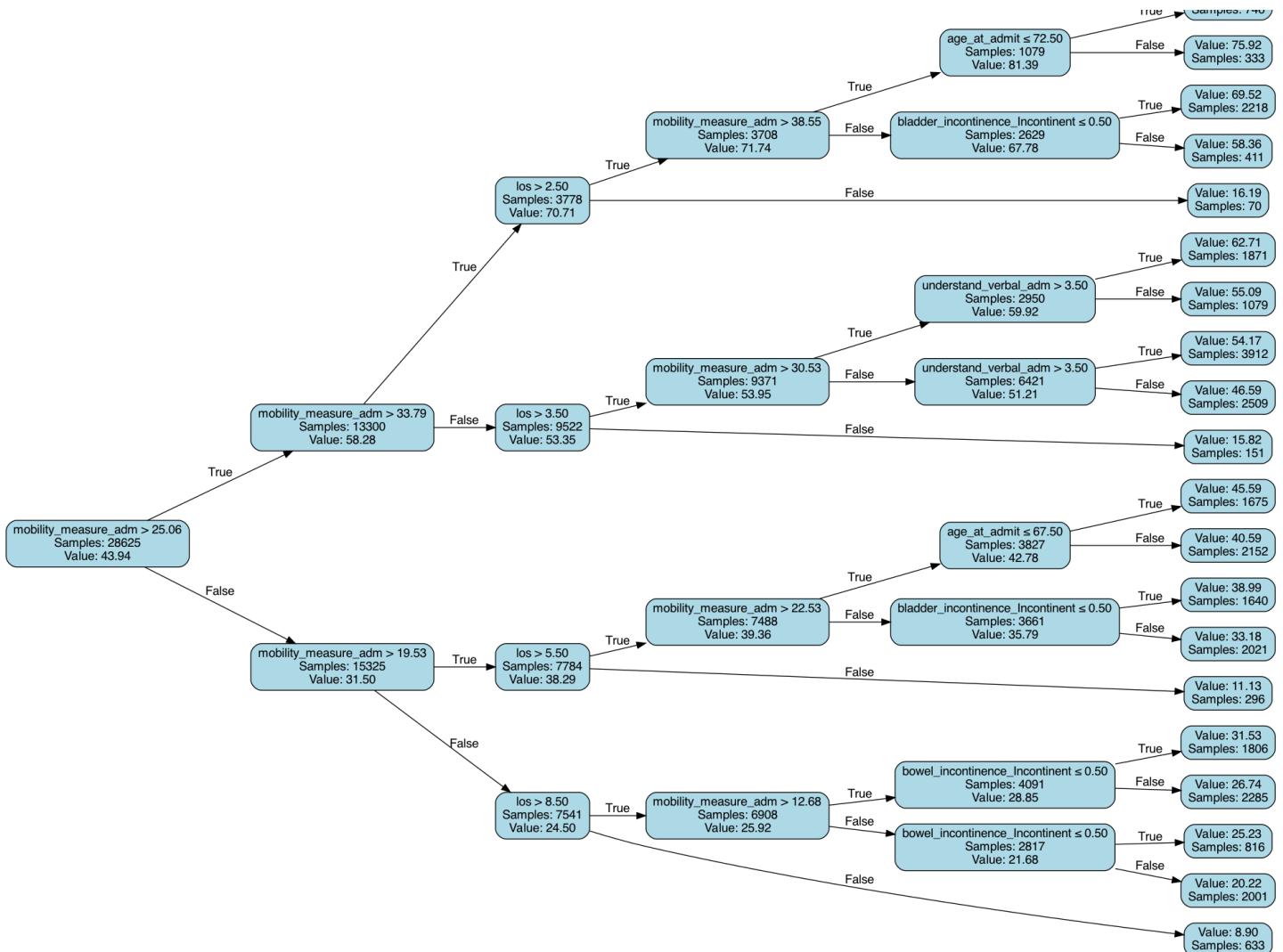


Summary trees:

(selfcare)



(mobility)



3.2 Patients with los<=14 only

RF results:

(selfcare)

```

-----train set results-----
MSE: 130.26370196106464
R²: 0.8364396593354968
-----eval set results-----
MSE: 401.1321538968262
R²: 0.5007695872746802
-----test set results-----
MSE: 411.0350418061539
R²: 0.4893986959959564

```

(mobility)

-----train set results-----

MSE: 90.38195401979993

R²: 0.8935179476790014

-----eval set results-----

MSE: 432.8022275662219

R²: 0.5011076934760756

-----test set results-----

MSE: 434.2182235916734

R²: 0.49961336281923774