

Logistic regression to model malaria severity

Generated by the IPToolbox R package

May 2, 2018

Before selection, the model was:

```
status ~ parasite.load + parasite.DNA.ug + HEME.uM + HPX.zero +  
total.BB + EP0.mU.mL + H01.ng.mL + H01.blood + H01.activity.10E.6.M.NN.ng.H01.h
```

After selection, the model is

```
status ~ HPX.zero + total.BB
```

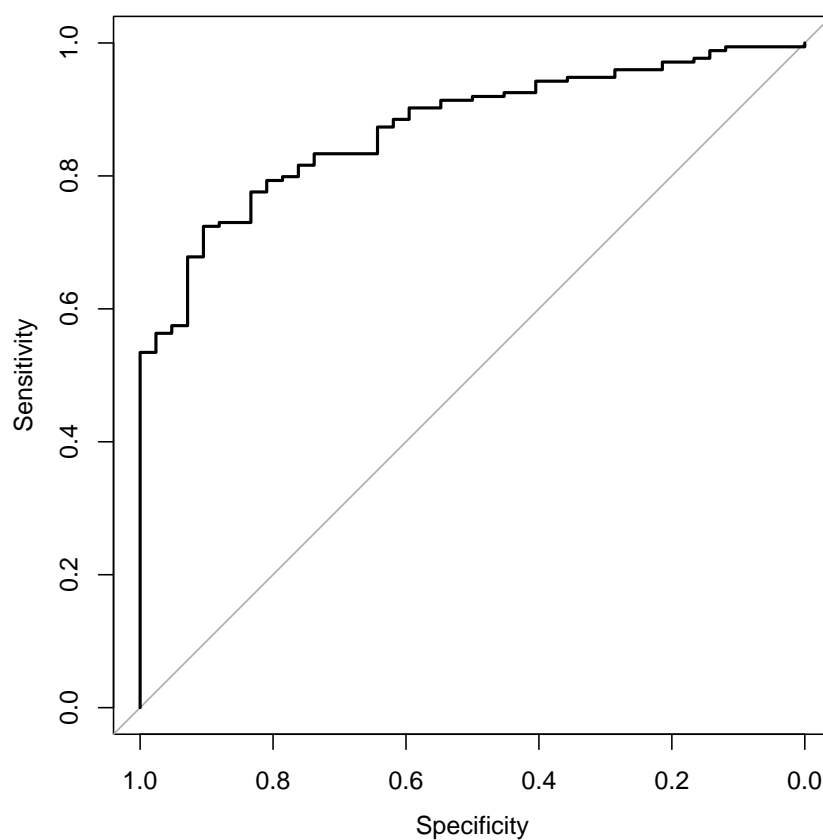


Figure 1: **ROC curve showing the relation between the specificity and the sensitivity of the model.** The specificity refers to the proportion of well predicted MM The sensitivity refers to the proportion of well predicted SM.

The Area Under the Curve (AUC) of this model is: **0.8719**

	status-MM	status-SM
<i>predicted-MM</i>	38	48
<i>predicted-SM</i>	4	126

Figure 2: **Table showing the numbers of well predicted MM and well predicted SM.**
This table also shows the number of wrongly predicted responder and wrongly predicted SM.

	status-MM	status-SM
<i>predicted-MM</i>	17.59	22.22
<i>predicted-SM</i>	1.85	58.33

Figure 3: **Table showing the percentages of well predicted MM and well predicted SM.**
This table also shows the percentages of wrongly predicted MM and wrongly predicted SM.

specificity	sensitivity	1-specificity	1-sensitivity
0.90476	0.72414	0.09524	0.27586

Figure 4: **Table showing the specificity, sensitivity, 1-specificity, and 1-sensitivity values.** The sensitivity is the proportion of well predicted SM. The specificity represents the link between the well predicted values and the status (MM or SM). The specificity is influenced by a high rate of wrongly predicted MM. The sensitivity is influenced by a high rate of wrongly predicted SM.

	coefficients	p.values
HPX.zero	-0.004	3e-04
total.BB	0.681	1e-03

Figure 5: **Table showing the p-values and the coefficients for each variable included in the model.** A p-value below 0.05 means that the contribution of the variable in the model is statistically relevant. The value of the coefficient is proportionnal to the contribution of this variable in the model.

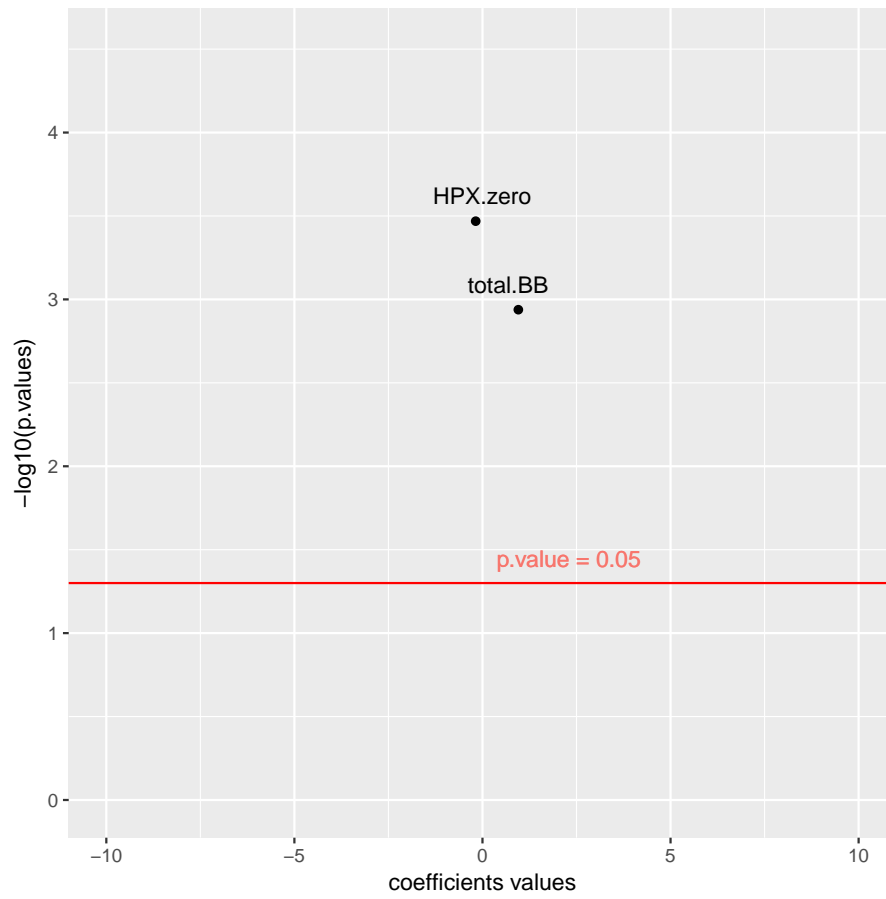


Figure 6: **Graphical representation showing the p-values and the coefficients for each variable included in the model.** P-values are represented as $-\log_{10}$. The red line is at $y = 1.3$ and represents an alpha risk of 5 percents. Each point above the red line is statistically relevant with a p-value under 0.05.

Sample ID	status	predicted
2	MM	MM
3	MM	MM
5	MM	MM
6	MM	MM
7	MM	SM
9	MM	MM
10	MM	MM
11	MM	MM
12	MM	MM
15	MM	MM
17	MM	MM
20	MM	MM
21	MM	MM
22	MM	MM
23	MM	MM
24	MM	MM
25	MM	MM
27	MM	MM
28	MM	MM
30	MM	SM
31	MM	MM
33	MM	MM
34	MM	MM
35	MM	MM
36	MM	MM
37	MM	SM
38	MM	MM
39	MM	MM
41	MM	MM
42	MM	MM
43	MM	MM
44	MM	MM
45	MM	MM
47	MM	MM
48	MM	MM
49	MM	MM
50	MM	MM
52	MM	MM
53	MM	MM
54	MM	MM
55	MM	MM
57	MM	SM
61	SM	SM
62	SM	MM
63	SM	SM
64	SM	MM
65	SM	MM
66	SM	SM
67	SM	SM
68	SM	SM
69	SM	SM
70	SM	MM
71	SM	MM
72	SM	SM
74	SM	MM
76	SM	SM

77	SM	SM
78	SM	MM
79	SM	SM
80	SM	MM
81	SM	SM
82	SM	SM
83	SM	SM
84	SM	SM
85	SM	MM
88	SM	SM
89	SM	SM
90	SM	MM
91	SM	SM
92	SM	SM
94	SM	MM
95	SM	SM
96	SM	MM
97	SM	MM
98	SM	MM
99	SM	MM
100	SM	SM
101	SM	SM
102	SM	SM
103	SM	SM
104	SM	MM
105	SM	MM
106	SM	SM
108	SM	MM
109	SM	SM
110	SM	MM
111	SM	SM
112	SM	SM
113	SM	SM
114	SM	SM
115	SM	SM
116	SM	SM
117	SM	SM
118	SM	SM
119	SM	SM
120	SM	MM
121	SM	SM
122	SM	SM
123	SM	SM
124	SM	MM
125	SM	SM
126	SM	SM
127	SM	SM
128	SM	SM
129	SM	SM
130	SM	SM
131	SM	SM
132	SM	SM
133	SM	SM
134	SM	SM
135	SM	SM
136	SM	SM
137	SM	SM
138	SM	SM

139	SM	SM
140	SM	SM
141	SM	MM
142	SM	SM
143	SM	SM
145	SM	SM
147	SM	SM
149	SM	MM
150	SM	MM
151	SM	SM
152	SM	SM
153	SM	SM
154	SM	SM
156	SM	SM
157	SM	SM
158	SM	SM
159	SM	SM
160	SM	MM
161	SM	SM
162	SM	MM
163	SM	SM
164	SM	SM
165	SM	SM
166	SM	MM
167	SM	MM
168	SM	SM
169	SM	SM
170	SM	SM
171	SM	MM
172	SM	SM
173	SM	SM
175	SM	MM
176	SM	SM
177	SM	SM
178	SM	SM
179	SM	SM
180	SM	SM
181	SM	SM
182	SM	SM
183	SM	SM
184	SM	SM
185	SM	SM
186	SM	SM
187	SM	SM
188	SM	SM
189	SM	MM
190	SM	SM
191	SM	MM
192	SM	SM
193	SM	SM
194	SM	MM
196	SM	MM
197	SM	MM
198	SM	SM
199	SM	MM
200	SM	MM
201	SM	SM
203	SM	SM

204	SM	SM
206	SM	SM
207	SM	SM
208	SM	MM
209	SM	MM
210	SM	SM
211	SM	SM
212	SM	SM
213	SM	SM
214	SM	MM
215	SM	SM
216	SM	SM
217	SM	SM
218	SM	MM
221	SM	SM
222	SM	SM
223	SM	MM
224	SM	MM
225	SM	MM
227	SM	SM
228	SM	MM
229	SM	SM
230	SM	SM
231	SM	MM
232	SM	SM
234	SM	SM
235	SM	SM
236	SM	SM
237	SM	SM
238	SM	SM
239	SM	SM
240	SM	SM
241	SM	SM
242	SM	SM
243	SM	MM
244	SM	SM
245	SM	SM
246	SM	SM
247	SM	MM
248	SM	SM
250	SM	SM
251	SM	SM
252	SM	SM
253	SM	SM

Figure 7: Table showing for each patient its status (MM or SM) and its predicted status