Screening for Vulnerable Elderly: Is the “Probability of Repeated Admission” a useful tool?

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Background: the "Probability of repeated admission" (P*ra*) is a validated tool used worldwide to screen vulnerable elderly for adverse outcomes. Despite its extensive use, there is little evidence for its utility as a risk-prediction instrument. The aim of this study was to analyse the performance of P*ra* in predicting healthcare utilization and dependence in daily living.

Methods: this was a longitudinal prospective study and the sample was composed by individuals 65 years old and older from Rio de Janeiro city, Brazil, who participated in the three waves of the Frailty in Brazilian Older People study. At the baseline, carried out in 2009/2010, 764 elderly were assessed. Three years later, data of healthcare utilization and functional capacity were collected. In order to evaluate the P*ra* predictive performance, ROC curves were plotted against the healthcare outcomes and dependence in daily living.

Results: the accuracies were 0.62 (95%IC 0.57-0.68), 0.53 (95%IC 0.53-0.64) and 0.66 (95%IC 0.59-0.74) for hospital admission, emergency room visit, and dependence in daily living, respectively; sensitivity and specificity were 8,8 and 94,5%, 8,3 and 94,8%, 19,2 and 95,5%, respectively. These results suggest that the P*ra* is not reliable for excluding vulnerability in those individuals stratified as low risk. Also, in order to improve tool performance, future research should test another item composition.

$$Pra = \frac{e^{Bx}}{1 + e^{Bx}}$$

Where:
P*ra* = Probability of repeated admission within 4 years
e = the natural logarithim= 2,7183
$B_x = B_0 + \sum_{y=1}^{13} B_y X_y$
B_0 = (-1.802), a constant from the logistic regression
X_y = 1 or 0 according to the presence or absence of the risk factor
B_y = the regression coeficiente of the risk fator as shown below:

Y	Risk Factor	B*y*
1	Very good self-rated health	0.327
2	Good self-rated health	0.340
3.	Fair self-rated health	0.552
4	Poor self-rated health	0.770
5	Coronary artery disease	0.390
6	Diabetes in past year	0.319
7	Hospitalized in past year	0.545
8.	> 6 doctor visits in past year	0.318
9	No informal caregiver	-0.738
10	Age: 75-79	0.255
11	Age:80-84	0.327
12	Age: 85 ou +	0.559
13	Male gender	0.257

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