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Contribution of artificial intelligence to the decision-making process when performing a home blood pressure monitoring

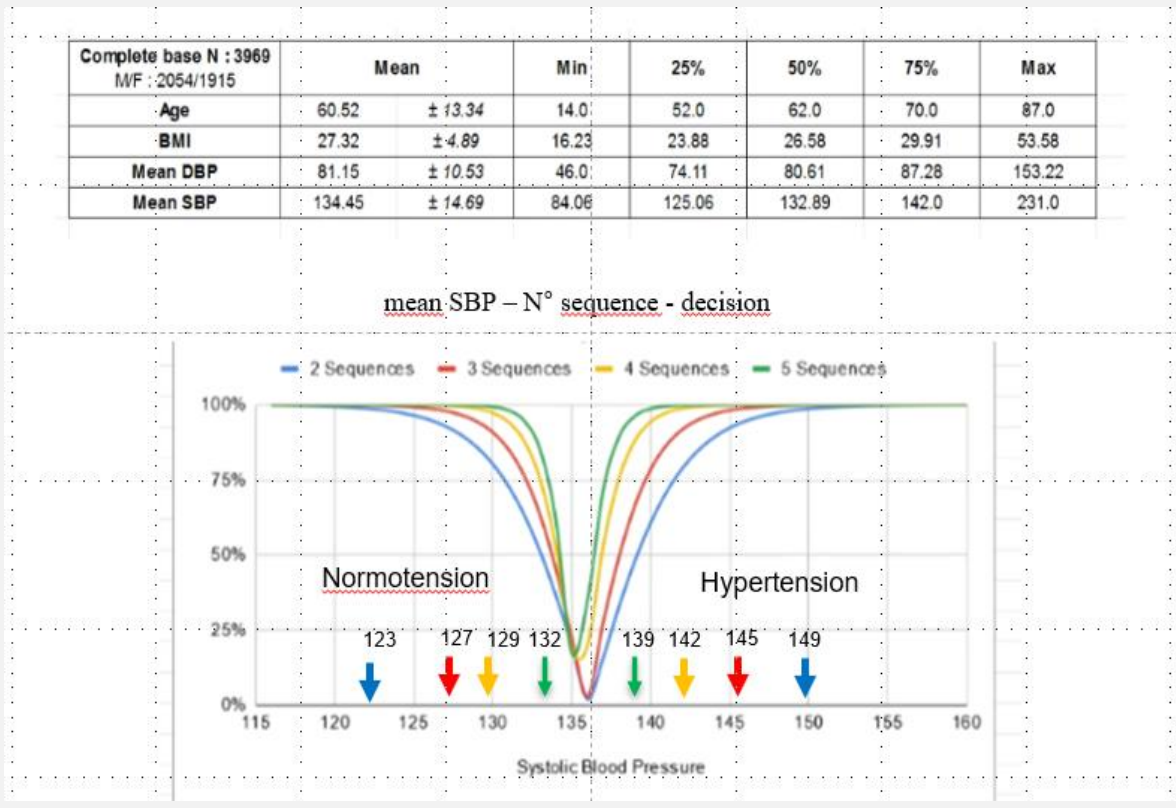
Paul de Buyer [2], Roland Asmar [1], Robert Boualit [3], Xavier Girerd [1]
1 Fondation de Recherche sur l'HTA, 2 Polynom, 3 Solutions Santé Digitale, Paris [1], Boulogne-sur-Seine[2], Clermont-Ferrand[3], France

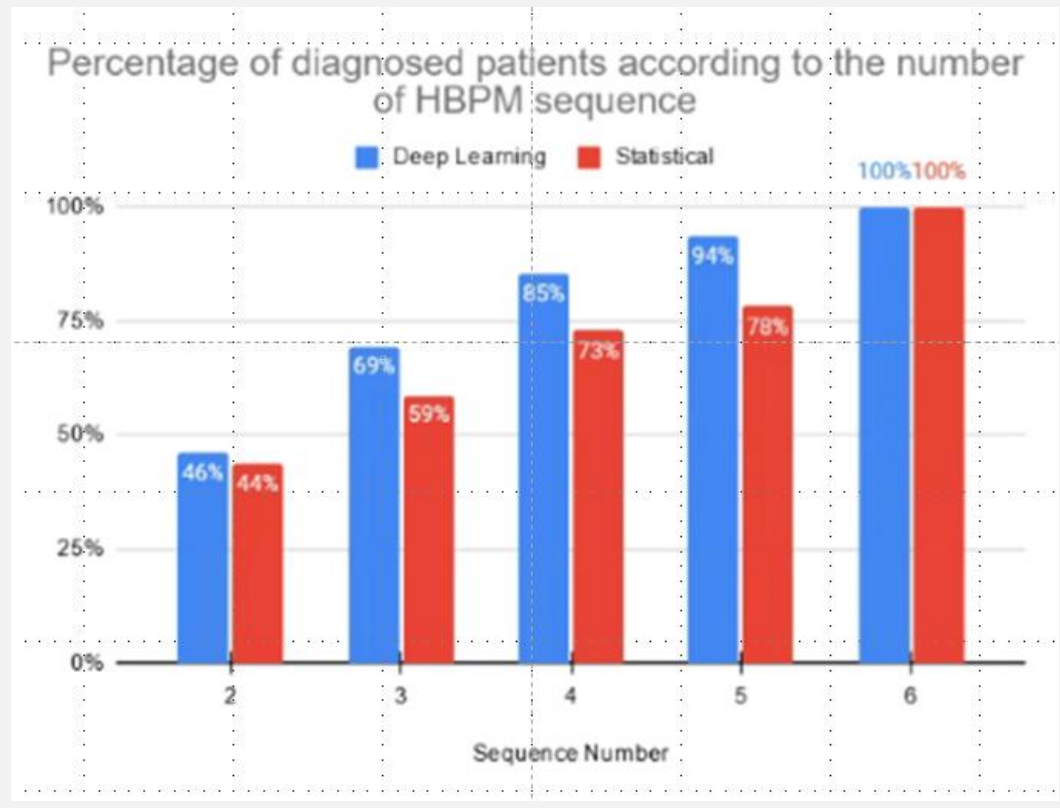
Methods

From an anonymized database of self-measurements performed in hypertensive patients followed in a hypertensive specialist center, artificial intelligence algorithms were used (logistic regression, gradient boosting tree, neural network) and compared with usual statistical methods. The self-measurement protocol consisted of 6 sequences over 3 days with 3 measurements per sequence, and 2 sequences per day. The mean of the 18 measures was used as a baseline to categorize the decision-making process with the thresholds SBP ≥ 135 or DBP≥ 85 to define hypertension status.

Results

Complete base N : 3969 M/F : 2054/1915	Mean		Min	25%	50%	75%	Max
Age	60.52	± 13.34	14.0	52.0	62.0	70.0	87.0
BMI	27.32	± 4.89	16.23	23.88	26.58	29.91	53.58
Mean DBP	81.15	± 10.53	46.0	74.11	80.61	87.28	153.22
Mean SBP	134.45	± 14.69	84.06	125.06	132.89	142.0	231.0





Conclusions

Artificial intelligence algorithms are more efficient than conventional statistical methods to categorize the blood pressure status of a subject after only 2 sequences of a Home Blood Pressure Monitoring. From this hospital database it appears that 4 sequences performed over 2 days are sufficient to confirm or deny the diagnosis of hypertension in more than 80% of subjects.