annually as compared to controls. This study is among the first to document the clinical burden leading to high economic impacts of DM.

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**POSO849 DEVELOPMENT AND VALIDATION OF A MACHINE LEARNING FOR MORTALITY IN THAI SYSTEMIC SCLEROSIS**

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**Background:** Clinical predictors of mortality in systemic sclerosis (SSc) are diversely reported due to different healthcare conditions and populations. A universal and simplified predictive model for SSc mortality is needed so that practitioners can be used for managing their patients appropriately.

**Objectives:** We aimed to develop and validate a simple predictive model for predicting mortality among patients with SSc.

**Methods:** Prognostic research with a historical cohort study design was conducted between January 1, 2013, and December 31, 2019, in adult SSc patients and attending the Scleroderma Clinic at a university hospital in Thailand. The data were extracted from the Scleroderma Registry Database. A deep learning algorithm with Adam optimizer and different machine learning algorithms (including Decision tree, AdaBoost, Random Forest, Gradient Boosting, and XGBoost) was used to classify SSc mortality. In addition, the model's performance was evaluated using the area under the receiver operating characteristic curve (auROC) and its 95% confidence interval (CI) and values in the confusion matrix.

**Results:** The analysis and predictive model development included 658 SSc patients, 416 (63.2%) females, 452 (69.1%) had dcSSc, and 218 died. The final model included the modified Rodnan skin score and the WHO functional class (WHO-FC) as predictors. Model 1 and 2 achieved 81.1% and 82.7% accuracy, respectively. The area under the curve (auROC) was 0.84 and 0.82, respectively, and the specificity was 86.9% and 88.9%, respectively. The positive likelihood ratio (PLR) was 3.69 and 3.91, respectively.

**Conclusion:** This simplified machine learning model for predicting mortality among patients with SSc could guide early referrals to specialists and help rheumatologists with close monitoring and management planning. External validation across multi-SSc clinics should be considered for further study.

**REFERENCES:**


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**Table 1. Generalizability of selected model(s) presented as accuracy, area under ROC, positive predictive value, positive likelihood ratio, specificity, and sensitivity**

<table>
<thead>
<tr>
<th>Selected Model</th>
<th>Accuracy</th>
<th>AUC (95%)</th>
<th>PPV (95%)</th>
<th>+LR (95%CI)</th>
<th>Specitivity (95%)</th>
<th>Sensitivity (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1 rMSS and WHO FC ≥ II</td>
<td>81.1</td>
<td>83.6 (77.5 – 89.6)</td>
<td>84.6 (95.4 – 94.1)</td>
<td>113.5 (25-27)</td>
<td>95.5 (90.4 – 98.3)</td>
<td>51.6 (38.7 – 64.2)</td>
</tr>
<tr>
<td>Model 2 rMSS and WHO FC ≥ III</td>
<td>82.7</td>
<td>82.4 (75.8 – 88.9)</td>
<td>73.4 (80.9 – 83.7)</td>
<td>5.7 (3-6.9)</td>
<td>87.1 (87.2 – 92.3)</td>
<td>73.4 (60.9 – 83.7)</td>
</tr>
</tbody>
</table>

95%CI 95% confidence interval, AUC Area Under the receiver operating characteristics (ROC), mRSS modified Rodman skin score