# Machine learning and pathway simulation – major work packages

| Work Package | Notes |
|---|---|
| **Data:** | |
| Data request for additional data | (✔) Signed off by SSNAP. Ready to send to HQIP |
| **Machine learning:** | |
| Simplified ML model | ✔ 8-feature model developed |
| Explainable ML - SHAP | (✔) Substantial progress. Paper in preparation. |
| Explainable ML – Counterfactual examples | ✘ Not started |
| New models – XGBoost and LightGBM | ✔ Completed: XGBoost selected as a key model type |
| Machine learning outcome model | ✘ Not started (need new HQIP data) |
| Add in organisational factors | ✘ Not started (need new HQIP data) |
| Model with identified stroke units | ✘ Not started (need new HQIP data) |
| Patient vignettes | ✘ Not started |
| Further development of neural nets | (✔) Recently started (embedding nets for analysing, ordering and clustering patients and hospitals) |
| **Synthetic data:** | |
| Produce synthetic data | ✘ Work in prep/planning |
| **Stroke outcome model (based on time to IVT):** | |
| Disability (mRS) level model | ✔ Completed |
| Utility-adjusted mRS | ✔ Completed |
| **Pathway model:** | |
| Extend pathway model to include ambo time | ✘ Not started |
| **Web app for output:** | |
| Streamlit web app for hospital-level output | ✘ Work in prep/planning |
| **Link to qualitative and PPI work:** | |
| Seek feedback from qual and PPI work | ✘ Work in prep/planning |
| **Health econometrics model** | |
| QALY output | ✘ Not started (will do when life expectancies available) |
| Health Economics model with service costings | ✘ Not started |
| **Production code for SSNAP** | |
| Prototype code for SSNAP | ✘ Not started |
| **Other:** | |
| Demographic summary for stroke units | ✘ Not started |
| Literature review of ml for analysis of clinical decisions | ✘ Not started |
| **Papers:** | |
| Explainable ML | (✔) In progress |
| Detailed outcome model | (✔) In progress |