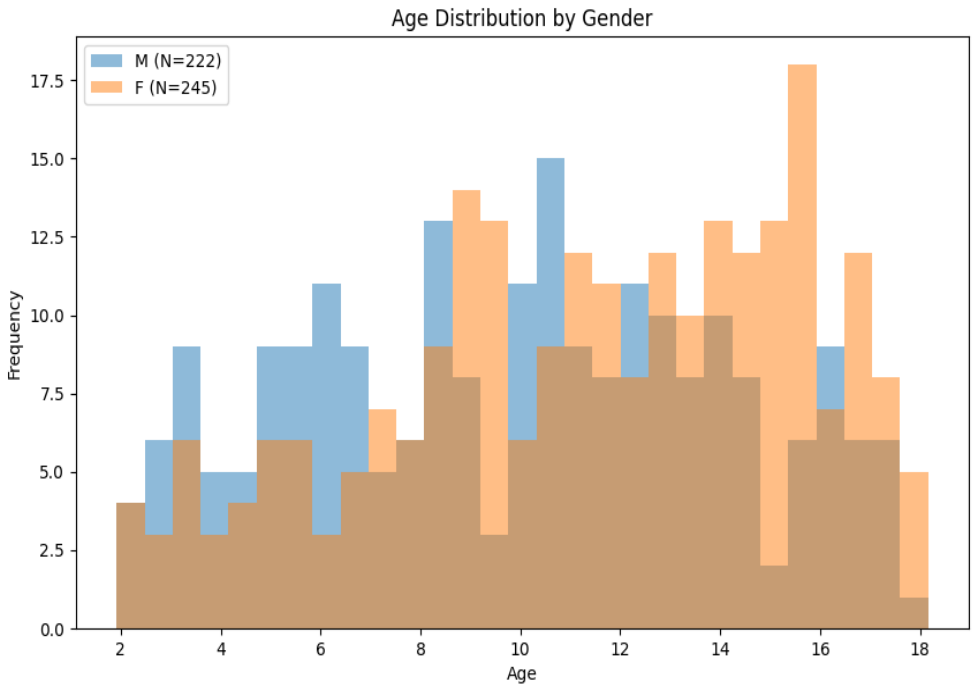
GAMLSS Age Curves Report

This is the output report for fitted GAMLSS models ran on: 2025-01-26 10:17:16.423694

Dataset filename: HSC_Normals_Biomarkers_FINAL_cleaned.xlsx
Disease data filename: HSC_Tumour_Biomarkers_FINAL_cleaned.xlsx
Run time: 0 h 0 min 4 s

This analysis uses Generalized Additive Models for Location, Scale and Shape (GAMLSS) in R to construct normative age curves for FLAIR biomarkers. The data is stratified by sex and tissue type, and models are optimized to characterize the relationship between age and each biomarker. The models account for changes in both the mean trend and the spread of values across age. Centile curves (3rd, 15th, 50th, 85th, and 97th percentiles) are generated to show the expected distribution of values at each age.



Age distribution between genders in the dataset analyzed for age curves.

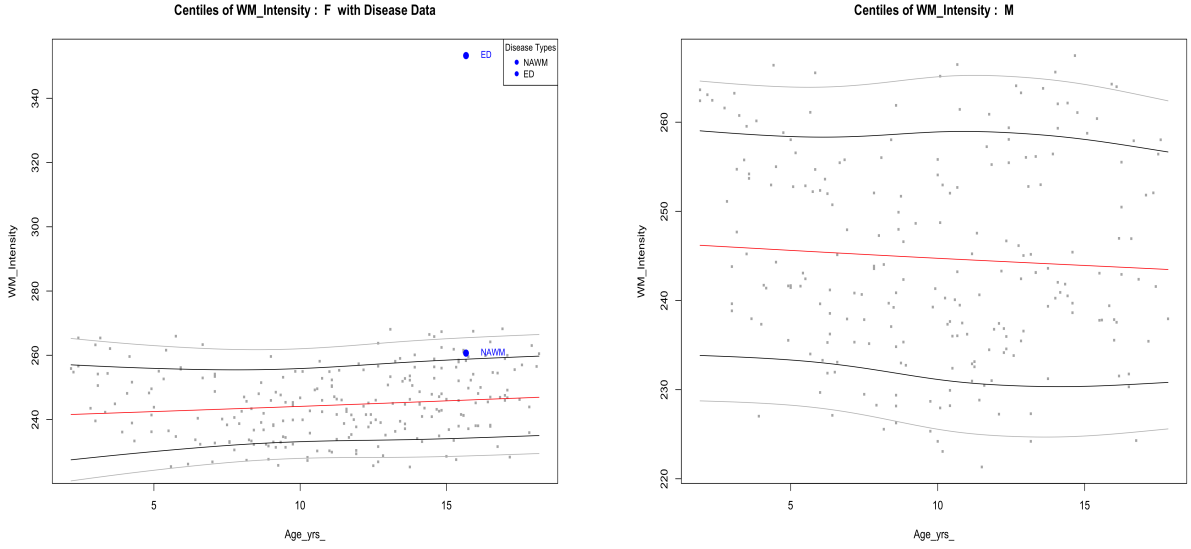
Modelling Results

Age Curves for Tissue Type: WM

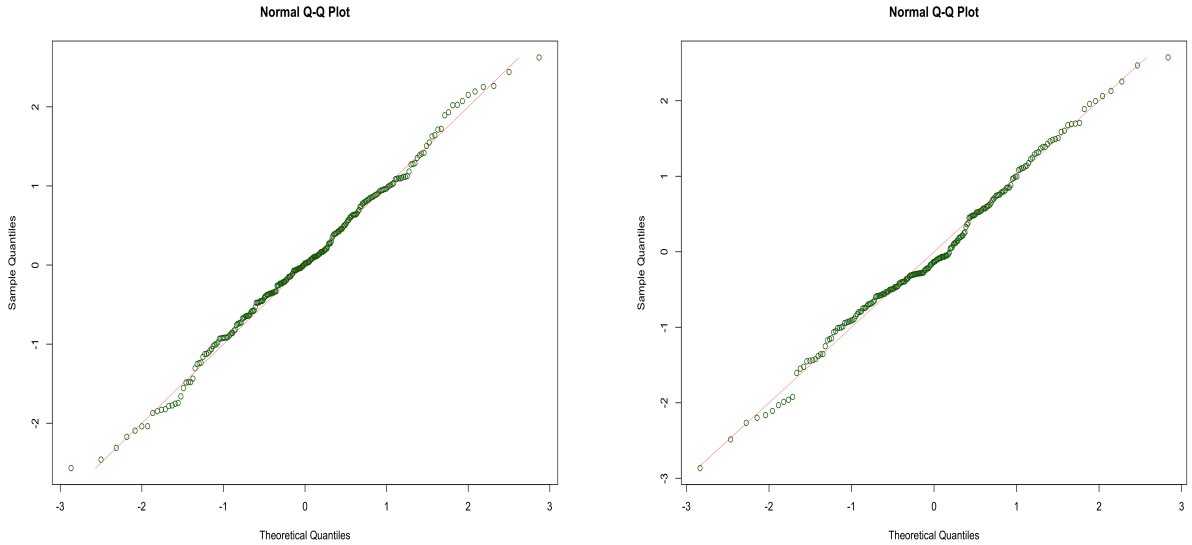
Biomarker: WM_Intensity

WM_Intensity Optimized Model Parameters by Sex

Parameter	Value (F)	Value (M)
Best model family	bcpe_model	bcpe_model
AIC	1817.76	1666.08
(Intercept)	240.760317	246.458092
pb(Age_yrs_, lambda = 3000)	0.336238	-0.169875
mu	Not Applicable	Not Applicable
sigma	Not Applicable	Not Applicable
nu	Not Applicable	Not Applicable
tau	Not Applicable	Not Applicable



Normative Intensity age curves for female (left) and male (right) in WM (Disease Tissue)

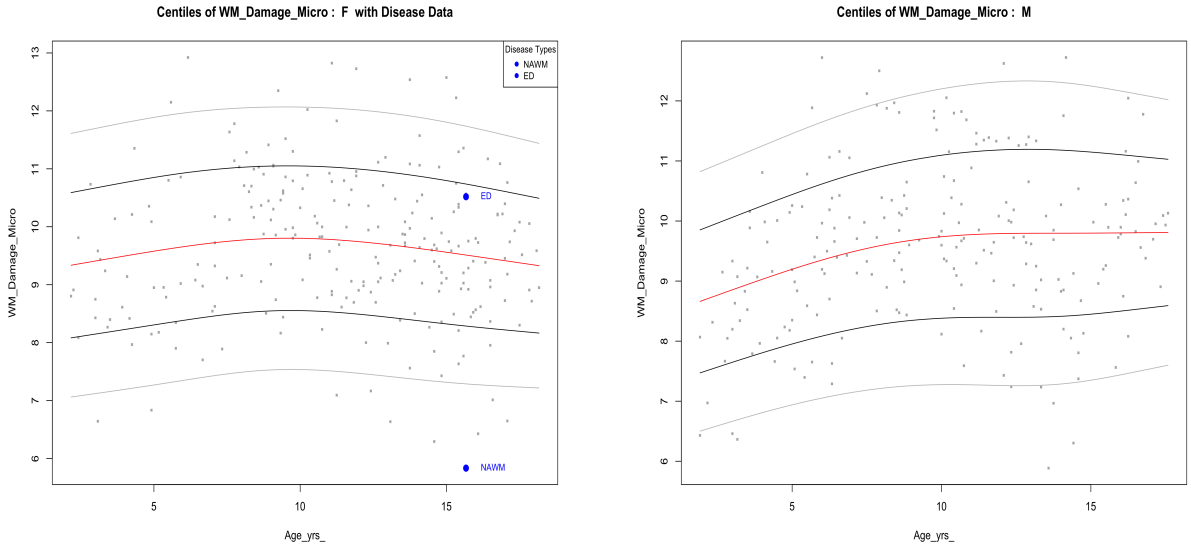


Residuals of female (left) and male (right) Intensity age curves in WM

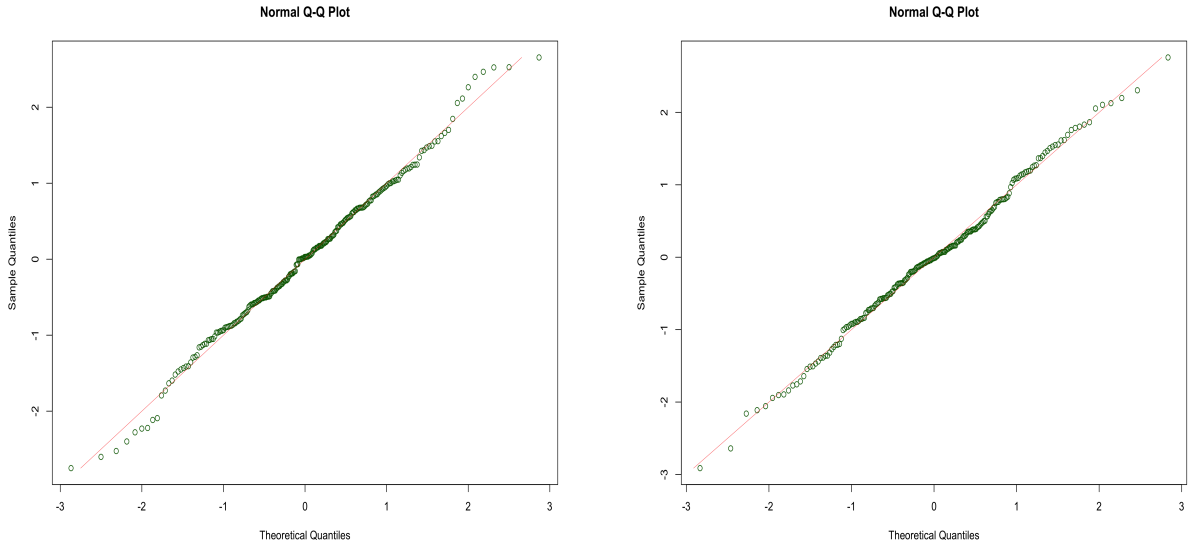
Biomarker: WM_Damage_Micro

WM_Damage_Micro Optimized Model Parameters by Sex

Parameter	Value (F)	Value (M)
Best model family	no_model	no_model
AIC	786.08	733.20
(Intercept)	9.737740	8.915507
pb(Age_yrs_, lambda = 3000)	-0.009274	0.065956
mu	Not Applicable	Not Applicable
sigma	Not Applicable	Not Applicable
nu	Not Applicable	Not Applicable
tau	Not Applicable	Not Applicable



Normative Damage_Micro age curves for female (left) and male (right) in WM (Disease Tissue)



Residuals of female (left) and male (right) Damage_Micro age curves in WM