Supplementary

Table S1 All of experimental results for the five-fold cross-validation

Model	Test	Pred	RMSE	Error interval (95%)	R	ρ	R^2	ICC
DenseNet	Internal	Pred1	2.080	(–3.951, 5.185)	0.929 (0.908, 0.945), P<0.001, T=36.38	0.917 (0.892, 0.937), P<0.001, T=33.31	0.863 (0.827, 0.895), P<0.001, F=1,322.80	0.923 (0.901, 0.941), P<0.001, F=24.95
		Pred2	2.112	(–4.06, 4.322)	0.928 (0.907, 0.945), P<0.001, T=36.09	0.915 (0.889, 0.935), P<0.001, T=32.87	0.861 (0.826, 0.892), P<0.001, F=1,300.80	0.920 (0.896, 0.938), P<0.001, F=23.97
		Pred3	2.159	(–3.816, 4.93)	0.927 (0.905, 0.943), P<0.001, T=35.82	0.902 (0.873, 0.925), P<0.001, T=30.28	0.858 (0.82, 0.89), P<0.001, F=1,268.90	0.916 (0.890, 0.935), P<0.001, F=23.26
		Pred4	2.196	(–3.68, 5.004)	0.923 (0.899, 0.940), P<0.001, T=34.76	0.900 (0.870, 0.923), P<0.001, T=29.92	0.851 (0.815, 0.884), P<0.001, F=1,199.40	0.915 (0.889, 0.934), P<0.001, F=22.85
		Pred5	2.159	(–3.497, 5.04)	0.925 (0.902, 0.942), P<0.001, T=35.28	0.908 (0.880, 0.930), P<0.001, T=31.41	0.854 (0.818, 0.887), P<0.001, F=1,228.40	0.921 (0.897, 0.939), P<0.001, F=24.68
		Mean	2.141	(–3.642, 4.958)	0.926	0.908	0.856	0.919
	External 1	Pred1	2.691	(–6.853, 5.322)	0.865 (0.821, 0.899), P<0.001, T=22.21	0.749 (0.672, 0.811), P<0.001, T=14.56	0.746 (0.661, 0.816), P<0.001, F=487.50	0.832 (0.773, 0.876), P<0.001, F=11.48
		Pred2	2.706	(–6.140, 4.754)	0.868 (0.824, 0.901), P<0.001, T=22.52	0.769 (0.696, 0.826), P<0.001, T=15.5	0.751 (0.665, 0.823), P<0.001, F=500.70	0.828 (0.764, 0.875), P<0.001, F=11.36
		Pred3	2.547	(–5.953, 4.513)	0.88 (0.84, 0.91), P<0.001, T=23.87	0.767 (0.694, 0.824), P<0.001, T=15.4	0.772 (0.689, 0.837), P<0.001, F=562.10	0.854 (0.801, 0.893), P<0.001, F=13.41
		Pred4	2.732	(–6.589, 5.755)	0.853 (0.806, 0.890), P<0.001, T=21.06	0.760 (0.685, 0.819), P<0.001, T=15.07	0.726 (0.647, 0.790), P<0.001, F=439.80	0.829 (0.774, 0.871), P<0.001, F=10.90
		Pred5	2.613	(–6.152, 4.930)	0.866 (0.823, 0.900), P<0.001, T=22.31	0.755 (0.679, 0.815), P<0.001, T=14.83	0.749 (0.657, 0.822), P<0.001, F=495.40	0.845 (0.795, 0.883), P<0.001, F=12.08
		Mean	2.658	(–6.215, 4.92)	0.866	0.760	0.749	0.838
	External 2	Pred1	2.314	(–4.959, 3.539)	0.918 (0.890, 0.939), P<0.001, T=29.19	0.909 (0.877, 0.933), P<0.001, T=27.50	0.842 (0.799, 0.881), P<0.001, F=847.30	0.898 (0.815, 0.939), P<0.001, F=22.72
		Pred2	2.660	(–5.399, 3.871)	0.896 (0.861, 0.923), P<0.001, T=25.44	0.877 (0.834, 0.909), P<0.001, T=23.02	0.802 (0.742, 0.857), P<0.001, F=644.00	0.863 (0.725, 0.922), P<0.001, F=17.37
		Pred3	2.319	(–5.149, 3.245)	0.910 (0.879, 0.934), P<0.001, T=27.68	0.892 (0.854, 0.921), P<0.001, T=24.88	0.828 (0.783, 0.873), P<0.001, F=765.40	0.897 (0.842, 0.931), P<0.001, F=20.73
		Pred4	2.511	(–5.618, 4.647)	0.900 (0.866, 0.926), P<0.001, T=26.04	0.895 (0.858, 0.922), P<0.001, T=25.30	0.810 (0.760, 0.856), P<0.001, F=677.80	0.885 (0.812, 0.926), P<0.001, F=19.02
		Pred5	2.297	(–4.596, 4.008)	0.914 (0.884, 0.936), P<0.001, T=28.41	0.896 (0.859, 0.923), P<0.001, T=25.44	0.834 (0.791, 0.872), P<0.001, F=798.80	0.901 (0.843, 0.934), P<0.001, F=21.86
		Mean	2.420	(–4.932, 3.735)	0.908	0.894	0.823	0.889
	External 3	Pred1	2.499	(–5.001, 4.295)	0.915 (0.897, 0.929), P<0.001, T=45.30	0.919 (0.902, 0.933), P<0.001, T=46.56	0.837 (0.807, 0.862), P<0.001, F=2,048.90	0.905 (0.881, 0.924), P<0.001, F=21.00
		Pred2	2.418	(–4.652, 4.864)	0.917 (0.900, 0.932), P<0.001, T=45.92	0.925 (0.909, 0.938), P<0.001, T=48.63	0.841 (0.807, 0.870), P<0.001, F=2,110.40	0.910 (0.892, 0.926), P<0.001, F=21.46
		Pred3	2.421	(–4.574, 5.065)	0.917 (0.900, 0.931), P<0.001, T=45.92	0.922 (0.906, 0.936), P<0.001, T=47.57	0.840 (0.815, 0.867), P<0.001, F=2,094.70	0.908 (0.889, 0.924), P<0.001, F=20.75
		Pred4	2.537	(–4.953, 4.920)	0.910 (0.891, 0.925), P<0.001, T=43.84	0.916 (0.898, 0.930), P<0.001, T=45.61	0.827 (0.796, 0.857), P<0.001, F=1,907.40	0.898 (0.877, 0.915), P<0.001, F=18.77
		Pred5	2.410	(–4.456, 4.923)	0.917 (0.899, 0.931), P<0.001, T=45.92	0.923 (0.906, 0.936), P<0.001, T=47.91	0.840 (0.812, 0.866), P<0.001, F=2,094.70	0.913 (0.895, 0.928), P<0.001, F=20.02
		Mean	2.457	(–4.665, 4.747)	0.915	0.921	0.837	0.907
RegNet	Internal	Pred1	2.252	(–3.626, 5.747)	0.917 (0.892, 0.936), P<0.001, T=33.31	0.908 (0.880, 0.930), P<0.001, T=31.41	0.840 (0.796, 0.875), P<0.001, F=1,102.50	0.908 (0.881, 0.929), P<0.001, F=20.70
		Pred2	2.389	(–4.283, 5.478)	0.906 (0.879, 0.928), P<0.001, T=31.02	0.884 (0.850, 0.911), P<0.001, T=27.40	0.820 (0.778, 0.859), P<0.001, F=956.70	0.895 (0.865, 0.919), P<0.001, F=18.00
		Pred3	2.366	(–3.993, 5.755)	0.912 (0.886, 0.932), P<0.001, T=32.22	0.896 (0.864, 0.920), P<0.001, T=29.24	0.831 (0.788, 0.867), P<0.001, F=1,032.60	0.897 (0.866, 0.921), P<0.001, F=18.97
		Pred4	2.321	(–4.235, 5.312)	0.910 (0.884, 0.931), P<0.001, T=31.81	0.901 (0.871, 0.924), P<0.001, T=30.10	0.828 (0.786, 0.868), P<0.001, F=1,010.90	0.907 (0.880, 0.928), P<0.001, F=20.46
		Pred5	2.168	(–4.247, 4.858)	0.922 (0.899, 0.940), P<0.001, T=34.51	0.903 (0.874, 0.926), P<0.001, T=30.46	0.850 (0.811, 0.881), P<0.001, F=1,190.00	0.918 (0.894, 0.937), P<0.001, F=23.38
		Mean	2.299	(–4.196, 5.262)	0.913	0.898	0.834	0.905
	External 1	Pred1	2.721	(–5.035, 6.227)	0.873 (0.831, 0.905), P<0.001, T=23.06	0.768 (0.695, 0.825), P<0.001, T=15.45	0.761 (0.676, 0.828), P<0.001, F=528.60	0.809 (0.750, 0.856), P<0.001, F=9.57
		Pred2	2.726	(–4.716, 6.872)	0.872 (0.830, 0.904), P<0.001, T=22.95	0.796 (0.731, 0.847), P<0.001, T=16.94	0.759 (0.664, 0.831), P<0.001, F=522.80	0.807 (0.747, 0.854), P<0.001, F=9.40
		Pred3	2.719	(–5.663, 6.198)	0.863 (0.819, 0.897), P<0.001, T=22.01	0.750 (0.673, 0.811), P<0.001, T=14.61	0.744 (0.642, 0.824), P<0.001, F=482.40	0.815 (0.757, 0.860), P<0.001, F=9.84
		Pred4	2.536	(–4.770, 5.799)	0.882 (0.843, 0.912), P<0.001, T=24.11	0.773 (0.702, 0.829), P<0.001, T=15.70	0.777 (0.680, 0.853), P<0.001, F=578.40	0.843 (0.793, 0.882), P<0.001, F=11.76
		Pred5	2.668	(–5.325, 6.233)	0.862 (0.818, 0.897), P<0.001, T=21.91	0.774 (0.704, 0.830), P<0.001, T=15.75	0.742 (0.639, 0.829), P<0.001, F=477.20	0.830 (0.777, 0.872), P<0.001, F=10.84
		Mean	2.674	(–4.838, 5.973)	0.870	0.772	0.757	0.821
	External 2	Pred1	2.922	(–6.332, 3.613)	0.877 (0.835, 0.908), P<0.001, T=23.02	0.870 (0.825, 0.904), P<0.001, T=22.25	0.767 (0.693, 0.834), P<0.001, F=523.40	0.840 (0.676, 0.909), P<0.001, F=14.87
		Pred2	3.031	(–6.245, 4.652)	0.851 (0.802, 0.889), P<0.001, T=20.43	0.862 (0.814, 0.898), P<0.001, T=21.44	0.723 (0.625, 0.820), P<0.001, F=415.00	0.822 (0.710, 0.885), P<0.001, F=12.06
		Pred3	2.797	(–5.924, 3.667)	0.878 (0.837, 0.909), P<0.001, T=23.13	0.884 (0.843, 0.914), P<0.001, T=23.84	0.769 (0.683, 0.853), P<0.001, F=529.30	0.855 (0.754, 0.909), P<0.001, F=15.23
		Pred4	3.026	(–5.596, 3.222)	0.861 (0.815, 0.897), P<0.001, T=21.36	0.870 (0.825, 0.904), P<0.001, T=22.25	0.740 (0.637, 0.834), P<0.001, F=452.50	0.834 (0.712, 0.897), P<0.001, F=13.37
		Pred5	2.777	(–6.775, 5.462)	0.875 (0.832, 0.907), P<0.001, T=21.35	0.889 (0.850, 0.918), P<0.001, T=24.48	0.763 (0.694, 0.829), P<0.001, F=511.90	0.853 (0.763, 0.904), P<0.001, F=14.58
		Mean	2.911	(–6.031, 3.819)	0.868	0.875	0.752	0.841
	External 3	Pred1	2.727	(–3.914, 6.218)	0.894 (0.872, 0.912), P<0.001, T=39.85	0.895 (0.873, 0.913), P<0.001, T=40.08	0.799 (0.761, 0.831), P<0.001, F=1,586.10	0.884 (0.860, 0.904), P<0.001, F=16.54
		Pred2	2.714	(–4.548, 6.307)	0.894 (0.873, 0.912), P<0.001, T=39.85	0.899 (0.878, 0.917), P<0.001, T=41.00	0.799 (0.762, 0.835), P<0.001, F=1,586.10	0.887 (0.863, 0.906), P<0.001, F=16.81
		Pred3	2.707	(–4.221, 6.039)	0.896 (0.875, 0.914), P<0.001, T=40.03	0.903 (0.882, 0.920), P<0.001, T=41.95	0.803 (0.768, 0.834), P<0.001, F=1,626.40	0.890 (0.867, 0.910), P<0.001, F=17.64
		Pred4	2.737	(–4.732, 6.779)	0.891 (0.869, 0.910), P<0.001, T=39.20	0.891 (0.869, 0.910), P<0.001, T=39.20	0.793 (0.751, 0.833), P<0.001, F=1,528.50	0.888 (0.865, 0.907), P<0.001, F=16.81
		Pred5	2.558	(–4.814, 5.331)	0.905 (0.886, 0.922), P<0.001, T=42.49	0.910 (0.891, 0.926), P<0.001, T=43.84	0.819 (0.785, 0.850), P<0.001, F=1,805.40	0.901 (0.881, 0.918), P<0.001, F=19.13
		Mean	2.689	(–4.496, 6.014)	0.896	0.900	0.803	0.890
ResNet	Internal	Pred1	2.138	(–3.608, 5.042)	0.925 (0.903, 0.943), P<0.001, T=35.28	0.912 (0.886, 0.933), P<0.001, T=32.22	0.856 (0.821, 0.890), P<0.001, F=1,248.60	0.920 (0.896, 0.938), P<0.001, F=24.15
		Pred2	2.161	(–4.019, 4.550)	0.924 (0.901, 0.941), P<0.001, T=35.02	0.913 (0.887, 0.934), P<0.001, T=32.43	0.853 (0.818, 0.886), P<0.001, F=1,218.60	0.917 (0.893, 0.936), P<0.001, F=23.25
		Pred3	2.297	(–4.245, 5.302)	0.913 (0.887, 0.933), P<0.001, T=32.43	0.902 (0.873, 0.925), P<0.001, T=30.28	0.833 (0.787, 0.871), P<0.001, F=1,047.50	0.909 (0.882, 0.930), P<0.001, F=21.09
		Pred4	2.248	(–3.784, 5.133)	0.921 (0.897, 0.939), P<0.001, T=34.26	0.904 (0.875, 0.927), P<0.001, T=30.64	0.847 (0.806, 0.880), P<0.001, F=1,162.50	0.907 (0.879, 0.928), P<0.001, F=20.77
		Pred5	2.327	(–4.367, 5.918)	0.910 (0.884, 0.931), P<0.001, T=31.81	0.898 (0.867, 0.922), P<0.001, T=29.58	0.828 (0.789, 0.864), P<0.001, F=1,010.90	0.903 (0.875, 0.925), P<0.001, F=19.51
		Mean	2.234	(–3.912, 5.072)	0.919	0.906	0.843	0.911
	External 1	Pred1	2.642	(–5.332, 5.678)	0.862 (0.817, 0.896), P<0.001, T=21.91	0.759 (0.684, 0.818), P<0.001, T=15.02	0.741 (0.654, 0.817), P<0.001, F=474.90	0.838 (0.786, 0.878), P<0.001, F=11.35
		Pred2	2.476	(–5.012, 5.788)	0.881 (0.841, 0.911), P<0.001, T=23.99	0.806 (0.743, 0.854), P<0.001, T=17.54	0.774 (0.688, 0.851), P<0.001, F=568.50	0.859 (0.814, 0.894), P<0.001, F=13.27
		Pred3	2.641	(–5.564, 6.144)	0.863 (0.819, 0.897), P<0.001, T=22.01	0.769 (0.697, 0.826), P<0.001, T=15.50	0.744 (0.662, 0.815), P<0.001, F=482.40	0.841 (0.790, 0.880), P<0.001, F=11.76
		Pred4	2.541	(–4.743, 5.044)	0.885 (0.847, 0.914), P<0.001, T=24.49	0.774 (0.703, 0.830), P<0.001, T=15.75	0.781 (0.700, 0.845), P<0.001, F=592.00	0.842 (0.792, 0.881), P<0.001, F=11.84
		Pred5	2.659	(–5.333, 6.721)	0.864 (0.820, 0.898), P<0.001, T=22.11	0.760 (0.685, 0.819), P<0.001, T=15.07	0.746 (0.654, 0.827), P<0.001, F=487.50	0.831 (0.778, 0.873), P<0.001, F=10.96
		Mean	2.592	(–5.137, 5.696)	0.871	0.774	0.757	0.842
	External 2	Pred1	2.606	(–5.942, 3.275)	0.906 (0.873, 0.930), P<0.001, T=26.99	0.910 (0.877, 0.934), P<0.001, T=27.68	0.819 (0.772, 0.865), P<0.001, F=719.50	0.877 (0.734, 0.932), P<0.001, F=20.03
		Pred2	2.781	(–5.912, 3.373)	0.891 (0.854, 0.919), P<0.001, T=24.75	0.891 (0.852, 0.920), P<0.001, T=24.75	0.792 (0.727, 0.851), P<0.001, F=605.40	0.857 (0.702, 0.921), P<0.001, F=17.05
		Pred3	2.420	(–4.793, 3.517)	0.910 (0.879, 0.933), P<0.001, T=27.68	0.899 (0.863, 0.925), P<0.001, T=25.88	0.827 (0.784, 0.868), P<0.001, F=760.10	0.891 (0.805, 0.933), P<0.001, F=21.00
		Pred4	2.819	(–5.884, 4.293)	0.870 (0.827, 0.903), P<0.001, T=22.25	0.881 (0.840, 0.912), P<0.001, T=23.48	0.752 (0.650, 0.839), P<0.001, F=482.10	0.844 (0.747, 0.898), P<0.001, F=13.75
		Pred5	2.470	(–5.750,4.039)	0.907 (0.875, 0.931), P<0.001, T=27.16	0.904 (0.871, 0.930), P<0.001, T=26.66	0.821 (0.769, 0.870), P<0.001, F=729..30	0.886 (0.794, 0.931), P<0.001, F=20.16
		Mean	2.619	(–5.696, 3.507)	0.897	0.897	0.802	0.871
	External 3	Pred1	2.516	(–4.661, 5.600)	0.909 (0.890, 0.924), P<0.001, T=43.56	0.912 (0.893, 0.927), P<0.001, T=44.41	0.826 (0.793, 0.855), P<0.001, F=1,894.10	0.904 (0.884, 0.920), P<0.001, F=19.79
		Pred2	2.475	(–5.158, 4.983)	0.914 (0.896, 0.928), P<0.001, T=45.00	0.919 (0.902, 0.933), P<0.001, T=46.56	0.834 (0.804, 0.861), P<0.001, F=2,004.60	0.906 (0.886, 0.922), P<0.001, F=20.56
		Pred3	2.416	(–4.718, 4.753)	0.918 (0.901, 0.932), P<0.001, T=46.24	0.921 (0.904, 0.935), P<0.001, T=47.22	0.842 (0.812, 0.869), P<0.001, F=2,126.30	0.912 (0.893, 0.927), P<0.001, F=22.02
		Pred4	2.660	(–4.31, 6.108)	0.898 (0.878, 0.916), P<0.001, T=40.77	0.907 (0.887, 0.923), P<0.001, T=43.06	0.806 (0.769, 0.869), P<0.001, F=1,657.70	0.888 (0.865, 0.907), P<0.001, F=16.88
		Pred5	2.462	(–4.758, 5.605)	0.913 (0.895, 0.928), P<0.001, T=44.70	0.915 (0.897, 0.930), P<0.001, T=45.30	0.833 (0.799, 0.863), P<0.001, F=1,990.20	0.908 (0.889, 0.924), P<0.001, F=20.74
		Mean	2.506	(–4.596, 5.404)	0.910	0.915	0.828	0.904

RMSE, root mean square error; R, Pearson correlation coefficient; ρ, Spearman's rank; R^2, coefficient of determination; ICC, intraclass correlation coefficient.

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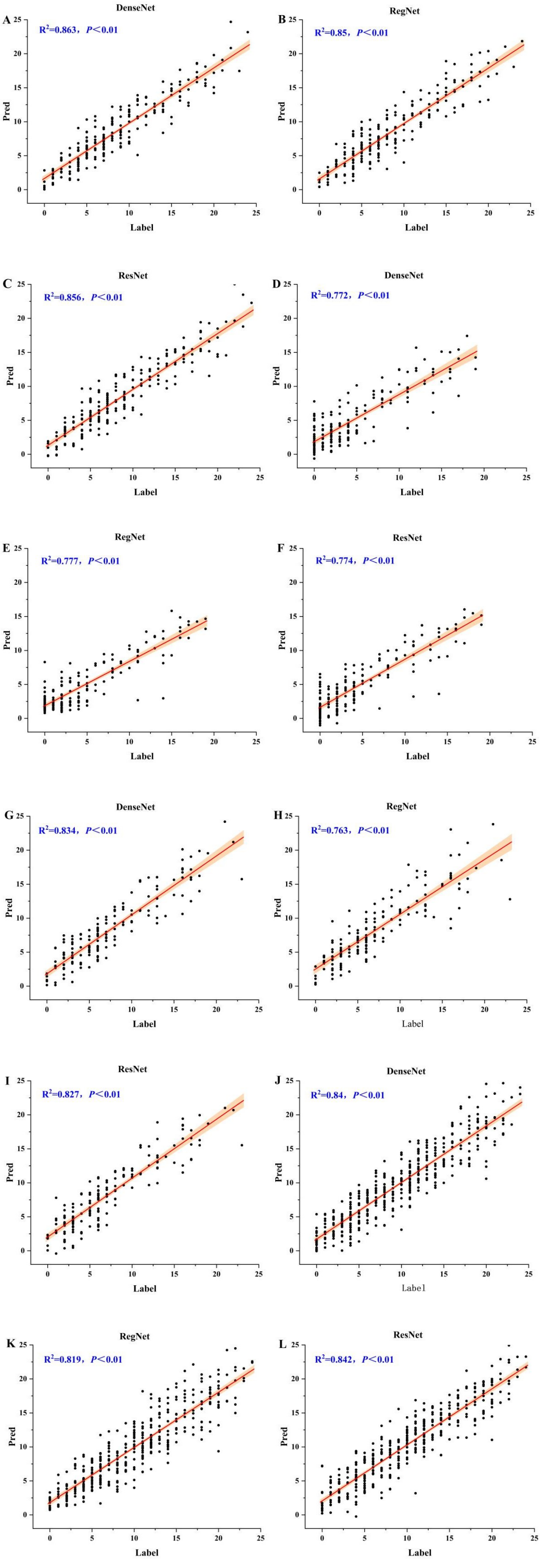

Figure S1 The correlation between the predictions of the models and the manual standard scoring. (A), (B) and (C) present the internal test set. (D), (E) and (F) present the external test set 1. (G), (H) and (I) present the external test set 2. (J), (K) and (L) present the external test set 3.

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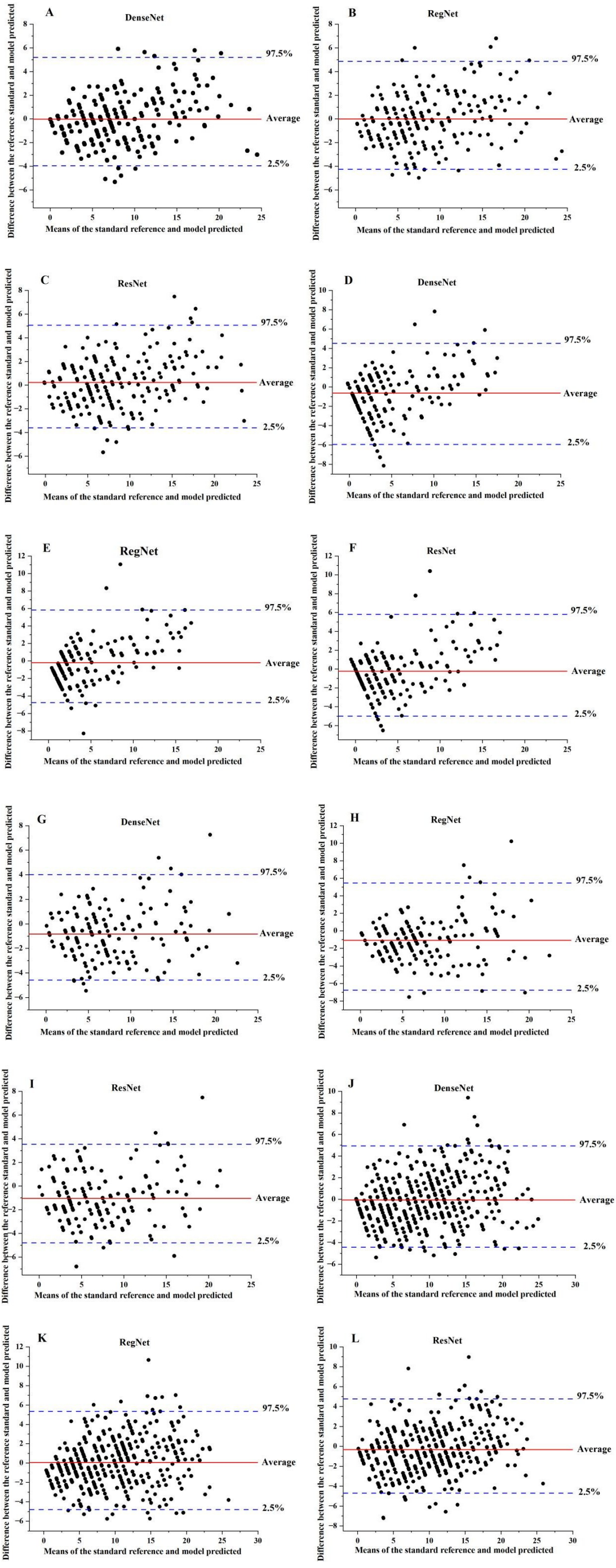

Figure S2 The consistency between the predictions of the models, and the manual standard scoring. (A), (B) and (C) present the internal test set. (D), (E) and (F) present the external test set 1. (G), (H) and (I) present the external test set 2. (J), (K) and (L) present the external test set 3.

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