Appendix

Table 1: **Summary of Datasets and Selected Metadata**

Dataset	# Labels	Metadata	Imbalance Factor (IF)
CheXCOVID	3	Age	10.8
CheXpert	2	Age	9.6
Fitzpatrick17k	3	Skin	5.4
HAM10000	7	Age	58.3
PAPILA	3	Age	5.2
OL3I	2	Age	22.1

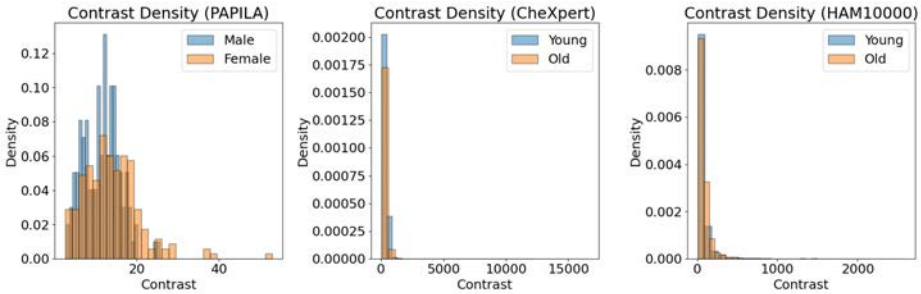


Fig. 5: Comparing pixel contrast density different datasets, we observe the significant difference in image characteristics across age groups in PAPILA.

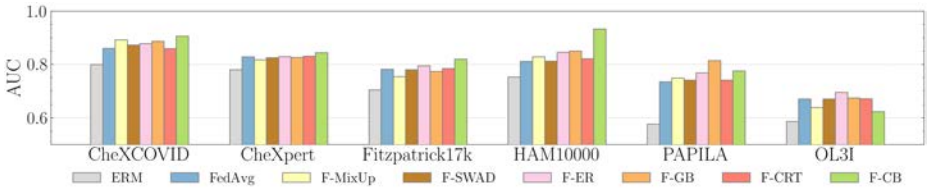
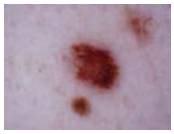
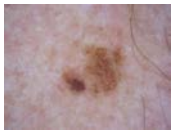
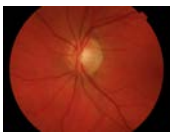


Fig. 6: **AUC Evaluation on New Demographic Distributions.** Reporting LTR (see Fig. 3) is important because a model trained on a severely imbalanced dataset (e.g. ERM on HAM10000) can learn to over-predict the majority class, resulting in an AUC (this figure) value much higher than the LTR value.

Table 2: **Samples of Datasets.** Samples from the six datasets used in our study show the diversity and real-world relevance of the selected medical imaging tasks.

CheXCOVID			
CheXpert			
Fitzpatrick17k			
HAM10000			
PAPILA			
OL3I