A rapid and accurate diagnosis of medical conditions like cardiomegaly and pleural effusion is of the utmost importance to reduce mortality and medical costs, and artificial intelligence has shown promise in diagnosing medical conditions. We evaluated how well Artificial Intelligence (AI) systems, developed by minoHealth AI Labs, perform at diagnosing cardiomegaly and pleural effusion, using chest x-rays from Ghana, Vietnam and the USA, and how well AI systems perform when compared with radiologists working in Ghana. The evaluation dataset used in this study contained 100 images randomly selected from three datasets. The deep learning models were further tested on a larger Ghanaian dataset containing 561 samples. Two AI systems were then evaluated on the evaluation dataset, whilst we also gave the same chest x-ray images within the evaluation dataset to four radiologists, with 5 - 20 years’ experience, to give their independent diagnoses.

For cardiomegaly, minoHealth.ai systems scored an Area Under the Receiver Operating Characteristic Curve (AUC-ROC) of 0.9 and 0.97 while the AUC-ROC of individual radiologists ranged from 0.77 to 0.87. For pleural effusion, the minoHealth.ai systems scored 0.97 and 0.91, whereas individual radiologists scored between 0.75 and 0.86. On both conditions, the best performing AI model outperforms the best performing radiologist by about 10%. These models will be of great use in regions, such as sub-Saharan Africa, where there are few radiologists. They can potentially be used to augment the effort of radiologists to improve the diagnosis and treatment of chest conditions.