Case Studies

Scenario 3: AI Tool for Automated Diagnosis of Tuberculosis (TB) from Chest X-Rays

A team of researchers is developing an AI tool for automated diagnosis of tuberculosis (TB) from chest X-rays. The intention is to use the tool to automate interpretation of X-rays in parts of the world where there is a shortage of skilled radiologists to perform this task. The AI tool will be trained using two datasets – one of confirmed TB cases from a hospital in India, and one of healthy controls from a hospital in the USA. A random subset of the data from both sites will be held out for testing.

Questions to consider:

- What dangers/risks of the use of AI for this problem can you identify at this stage?
- How would you go about addressing these?
- What fairness metric(s) do you think might be appropriate when assessing the AI tool for potential bias?

REMINDER - DEFINITIONS OF FAIRNESS

- *False Negative Rate (FNR): the rate at which positive cases are missed by the classifier*
- *Demographic parity - equal chance of being classified positive for each protected group*
- *Equalised odds - equal true positive rate (TPR) & false positive rate (FPR) for each protected group*
- *Equal opportunity - only equalise either FPR or FNR, not both*