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## PURPOSE

Over the past decades, the workload of radiologists has increased significantly. In some cases, this may compromise quality of patient care and burnout has been recognized as a growing problem among radiologists. Consequently, it is important to assess the impact of AI based tools on the radiologist's workload.

The aim of this study is to analyze radiologists' reading times (RTs) in real-life conditions when using an Artificial Intelligence (AI) concurrent reading tool for breast cancer screening.

## METHODS

A set of 4769 reports from an AI system trained to detect suspicious regions of interest in the 4 views of a mammogram and to characterize their level of suspicion with a score ranging from 1 (low suspicion) to 10 (high suspicion of malignancy), was collected in one center in the US between February 2022 and April 2022.

When a report from the AI is opened on a workstation, the exact opening time and the workstation id are recorded. **The time to read and interpret the mammogram is computed as the difference between two consecutive opening times for the same workstation.** To eliminate aberrant values, only the reports whose RT was lower than 20 minutes were kept.

The analysis consisted in assessing RTs averages over time on a monthly basis from February to April. Student's t-test was used to know whether the differences among months were significant. Reports were grouped according to the level of suspicion (corresponding to the AI score): **Low suspicion (LS) for scores 1-4, Intermediate Suspicion (IS) for scores 5-6 and High Suspicion (HS) for scores 7-10.**

## RESULTS

**Average reading time in minutes for LS group was 6.5 (95% CI: 5.51, 7.51) in February, 4.8 (95% CI: 4.39, 5.16) in March and 4.7 (95% CI: 4.22, 5.18) in April. The results for IS group were 5.7 (95% CI: 4.57, 6.78) in February, 5.3 (95% CI: 4.68, 5.84) in March and 5.3 (95% CI: 4.65, 6.05) in April. HS group had 8.2 (95% CI: 6.01, 10.42) in February, 6.1 (95% CI: 4.91, 7.37) in March and 4.8 (95% CI: 3.61, 6.02) in April. T-test showed a significant difference between February and March (1.7 minutes reduction, p<0.001) as well as between February and April (1.8 minutes reduction, p<0.001) for IS. No significant differences were found for the other groups.**

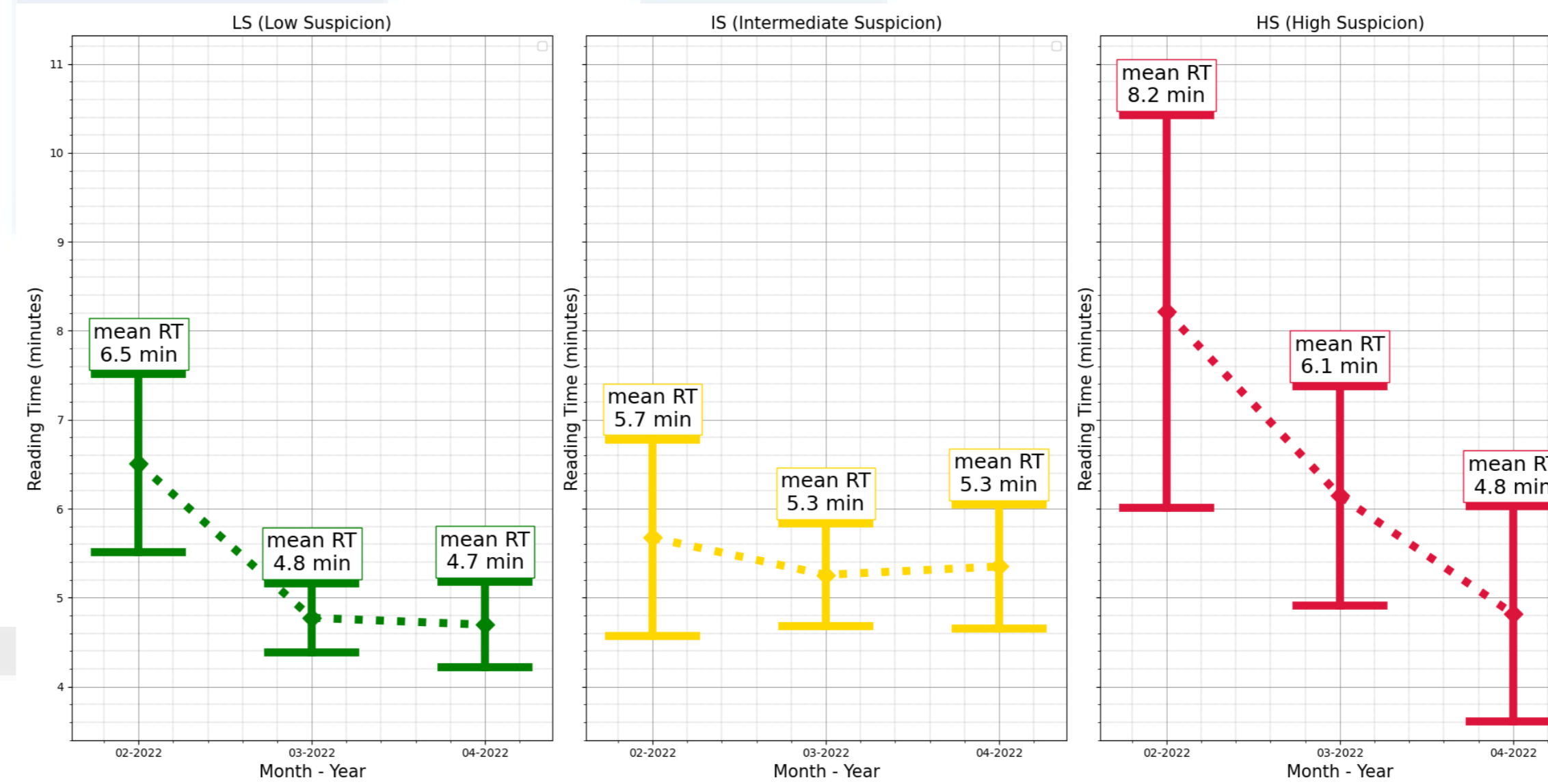


Figure 1 : Average RTs (and 95% CIs) for February, Mars and April 2022. RTs are grouped according to the suspicion of malignancy (score) given by the AI: Low suspicion for scores 1-4 (left graph), Intermediate suspicion for scores 5-6 (middle graph) and High suspicion for 7-10 (right graph).

Level of suspicion	LS	LS	LS	IS	IS	IS	HS	HS	HS
Month	02	03	04	02	03	04	02	03	04
Average (min)	6.5	4.8	4.7	5.7	5.3	5.3	8.2	6.1	4.8
CI [min, min]	[5.5, 7.5]	[4.4, 5.2]	[4.2, 5.2]	[4.6, 6.8]	[4.7, 5.8]	[4.7, 6.1]	[6.0, 10.4]	[4.9, 7.4]	[3.6, 6.0]
RT diff (min)	-	-1.7	-0.1	-	-0.4	+0.1	-	-2.1	-1.3
RT diff (%)	-	-26.7	-1.6	-	-7.4	+1.8	-	-25.2	-21.6

Table 1 : Average RTs (and 95% CIs) for February, Mars and April 2022. RTs are grouped according to the suspicion of malignancy (score) given by the AI: Low suspicion for scores 1-4 (LS, green color), Intermediate suspicion for scores 5-6 (IS, yellow color) and High suspicion for 7-10 (HS, red color). The decrease (or increase) compared to the previous month are indicated in minutes and percentage.

## CONCLUSION

Reading times were found to be higher as the level of suspicion increased (HS compared to LS). **A trend towards reduction in reading times when using this AI system was also observed.** More data is needed to confirm this preliminary study and conclude on the reduced reading time with AI support.