

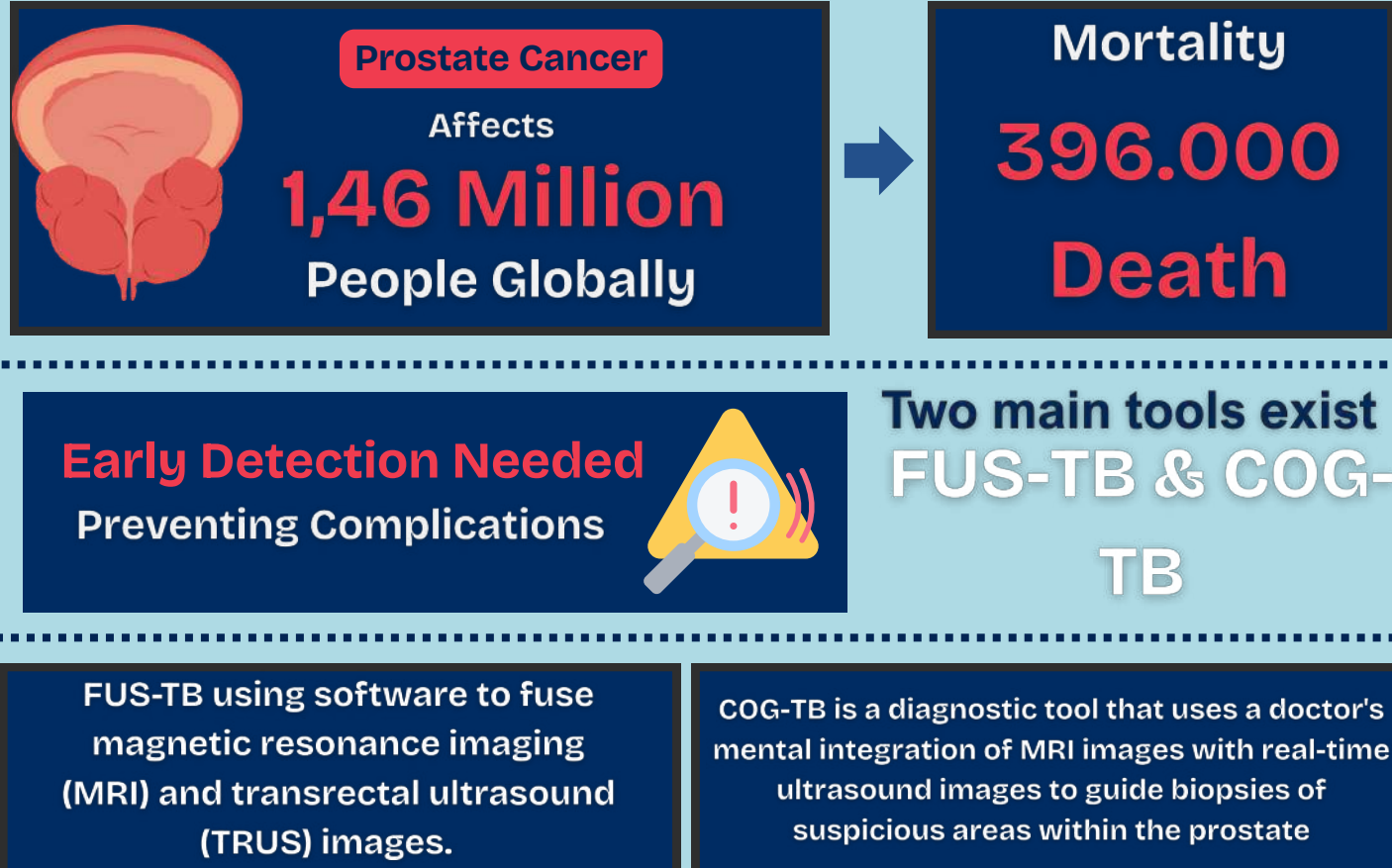


LESION-LEVEL META-DIAGNOSTIC OF COGNITIVE VS. FUSION MRI-TARGETED BIOPSY IN PROSTATE CANCER: INSIGHTS FROM PRECISION-2 AND RELATED TRIALS

Rayendra A. Zaidan¹, R. R. Daniswara¹, M. Daffa Al Amin¹

Faculty of Medicine, University of Indonesia, Jakarta, Indonesia¹

Backgrounds



Objectives

To determine the diagnostic accuracy comparison of **COG-TB** and **FUS-TB** in detection of prostate cancer

Methods

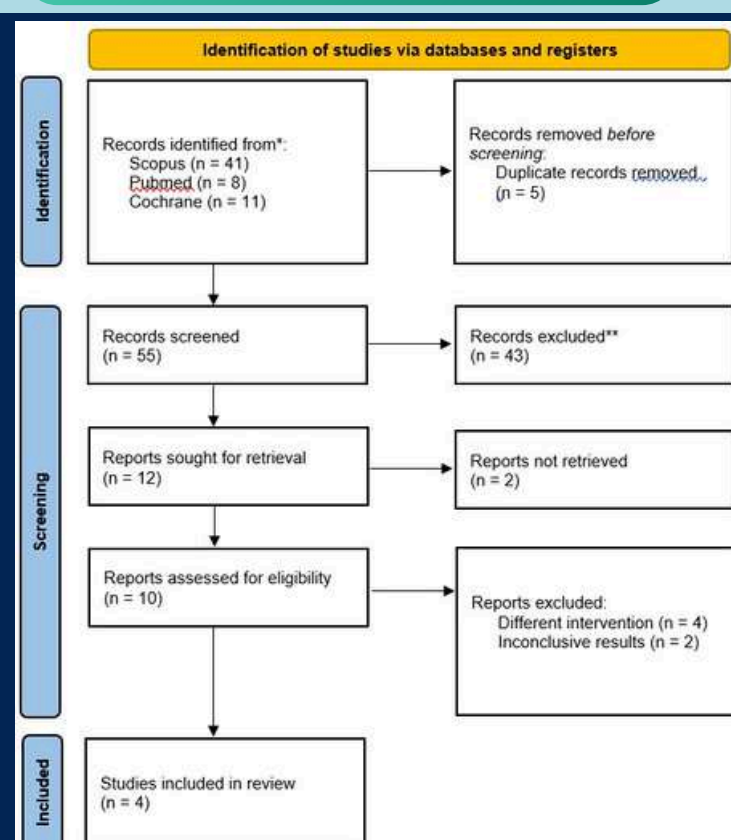


Figure 1. Prisma Flow

Meta-Diagnostic Run Using

R

“mada” package

Database

PubMed



Scopus

Inclusion Criteria

1. Contains **confusion matrix**
2. Using **COG-TB** or **FUS-TB**
3. Early detection **as outcome**

Exclusion Criteria

1. Does not contain confusion matrix
2. Not using prostate cancer as targeted diagnosis

Comparative diagnostic performance of mpMRI vs. MRI-targeted biopsy (cognitive vs. fusion) within the PRECISION-2 trial															
No	Author	Title	Study Design	Population			Sample Size	Outcome COG-TB				Outcome FUS-TB			
				Subject	Statistical Analysis Method	Age		TP	FP	TN	FN	TP	FP	TN	FN
1	Puech et al., 2013	Prostate cancer diagnosis: multiparametric MR-targeted biopsy with cognitive and transrectal US-MR fusion guidance versus systematic biopsy—prospective multicenter study.	Retrospective comparative cohort	Pasien dengan lesi mpMRI	Detection rates by lesion volume (chi-square)	Median age 65 years	COG: 64 lesi; In-bore: 155 lesi	45	15	25	10	47	13	27	8
2	Delongchamps et al. 2013	Prebiopsy magnetic resonance imaging and prostate cancer detection: comparison of random and targeted biopsies.	Comparative cohort (retrospective)	Pasien menjalani MTFGB vs COG-TB	Detection rates (percent comparisons)	Age not reported	COG ~180 lesi; Fusion ~220 lesi	120	60	130	80	150	70	120	50
3	Wysock et al. 2014	A prospective, blinded comparison of magnetic resonance (MR) imaging-ultrasound fusion and visual estimation in the performance of MR-targeted prostate biopsy: the PROFUS trial.	Comparative cohort	Pasien dengan lesi mpMRI	Proportion comparison	Age not specified	COG ~100 lesi; Fusion ~105 lesi	60	30	25	40	70	35	20	30
4	Hamid et al. 2019	The SmartTarget Biopsy Trial: a prospective, within-person randomised, blinded trial comparing the accuracy of visual-registration and magnetic resonance imaging-ultrasound image-guided targeted biopsies for prostate cancer risk stratification.	Retrospective analysis	355 pasien underwent TPB (131 FUS, 224 COG)	csPca detection rates with p-value (chi-square)	Median age 65 years	fusion group: 131 lesions; cognitive: 224 lesions	55	20	29	25	58	22	27	22

Figure 2. Extraction Table

Results

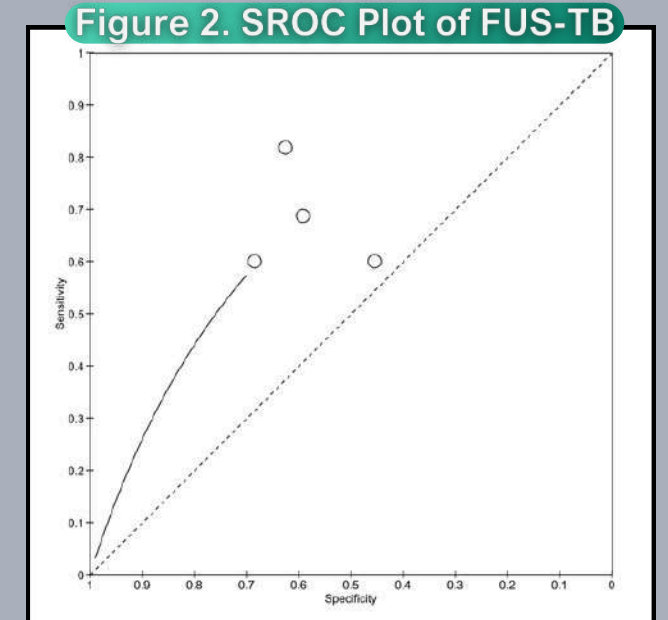
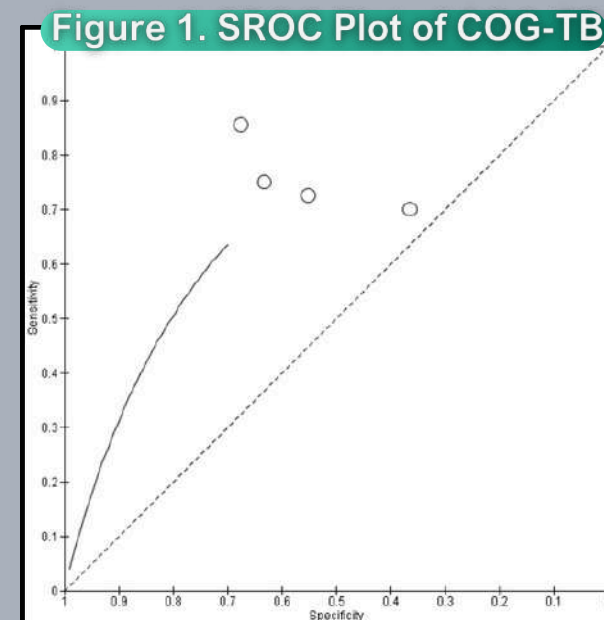


Figure 3. Forest Plot of FUS-TB

Study	TP	FP	FN	TN	Sensitivity (95% CI)	Specificity (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
Delongchamps et al. 2013	120	60	80	130	0.60 [0.53, 0.67]	0.68 [0.61, 0.75]		
Hamid et al. 2019	55	20	25	29	0.69 [0.57, 0.79]	0.59 [0.44, 0.73]		
Puech et al. 2013	45	15	10	25	0.82 [0.69, 0.91]	0.63 [0.46, 0.77]		
Wysock et al. 2014	60	30	40	25	0.60 [0.50, 0.70]	0.45 [0.32, 0.59]		

Figure 4. Forest Plot of COG-TB

Study	TP	FP	FN	TN	Sensitivity (95% CI)	Specificity (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
Delongchamps et al. 2013	120	60	80	130	0.60 [0.53, 0.67]	0.68 [0.61, 0.75]		
Hamid et al. 2019	55	20	25	29	0.69 [0.57, 0.79]	0.59 [0.44, 0.73]		
Puech et al. 2013	45	15	10	25	0.82 [0.69, 0.91]	0.63 [0.46, 0.77]		
Wysock et al. 2014	60	30	40	25	0.60 [0.50, 0.70]	0.45 [0.32, 0.59]		

- COG-TB has the sensitivity level of **66,9%**, specificity of **59,9%**, and area under the curve of **0,672**.
- FUS-TB has the sensitivity level of **74,5%**, specificity level of **56,3%**, and area under the curve of **0,739**.

Discussion

- Comparing both results, **FUS-TB** shows a **better result** in identifying people with prostate cancer, which is supported by **higher sensitivity** and AUC score.
- However, **COG-TB** has **higher accuracy** in terms of detecting person without prostate cancer, which supported by higher specificity.

Conclusion

FUS-TB poses as the better tool in terms of detecting people with prostate cancer. COG-TB, with a higher specificity score, poses as the better tool in detecting people without prostate cancer.

References

