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Thyroid FNAB in a low-and-middle-income country

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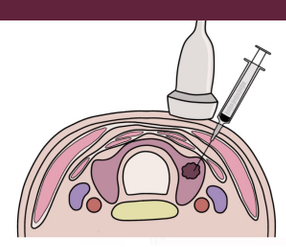
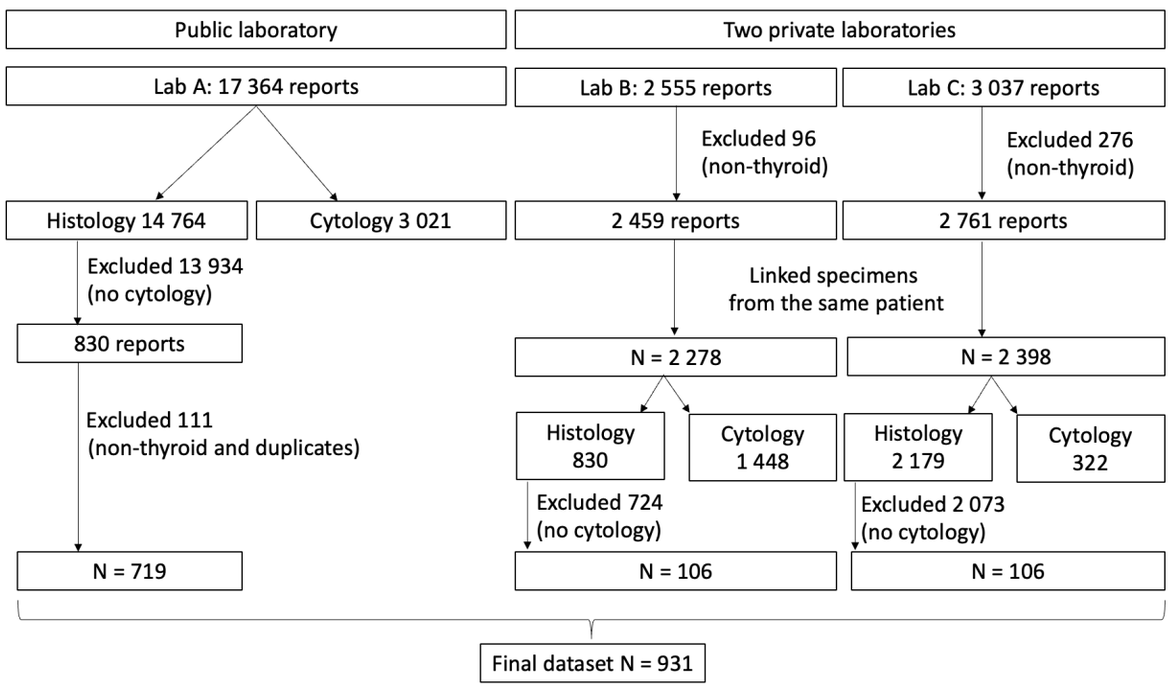
INTRODUCTION

There is limited evidence about the risk of malignancy (ROM) and diagnostic accuracy of fine needle aspiration biopsy (FNAB) in Sub-Saharan Africa [1,2]. This knowledge gap is echoed by Ogbera et al in their review of thyroid disease epidemiology in Africa, emphasizing the need for thyroid registries in Africa [3]. This study aimed to determine the ROM and accuracy of FNAB in South Africa (SA).



METHODS

Thyroid cytology and cytology specimens from 3 SA laboratories (1 public, 1 private) between Jan 2015 - Dec 2019 were included. Diagnostic accuracy was calculated based on cases that had surgery.



RESULTS: ACCURACY

Diagnostic accuracy of thyroid FNAB for the current study and other low- and middle-income countries

	Mahajan India [18]	Reuters Brazil [19]	Kraus-Fischer Mexico [33]	Zhu China [20]	Kamboj India [21]	Current study South Africa
Sensitivity	80.5%	92.1%	92.5%	98.1%	94.4%	73%
Specificity	85.9%	67.8%	63.1%	81.5%	61.9%	74%
PPV	80.7%	61.4%	78.7%	99.3%	90.3%	67%
NPV	85.7%	93.9%	-	61.1%	72.2%	79%
Accuracy	82.4%	-	80.8%	97.5%	-	74%

RESULTS: CORRELATION

Distribution of Bethesda categories and cytohistological correlation for operated patients

Bethesda category	All cytology n = 4 791 (% of total)	Cytology with correlating histology n = 931 (% operated)	Benign histology n = 589 (% operated)	Malignant histology n = 333 (% operated)	Low-risk neoplasms n = 9 (% operated)
I	1 810 (38%)	288 (16%)	216 (75%)	70 (24%)	2 (0.7%)
II	2 072 (43%)	292 (14%)	232 (79%)	60 (21%)	0 (0%)
III	303 (6%)	98 (32%)	59 (60%)	38 (39%)	1 (0.1%)
IV	314 (7%)	135 (43%)	60 (44%)	70 (52%)	5 (0.04%)
V	125 (3%)	59 (47%)	17 (29%)	41 (69%)	1 (0.02%)
VI	167 (3%)	59 (35%)	5 (8%)	54 (92%)	0 (0%)
Total	4 791 (100%)	931 (19%)	589 (63%)	333 (36%)	9 (0.01%)

Surgical rate in all FNAB cases were 19%

DISCUSSION

ROM higher than in other countries, particularly for follicular neoplasms (IV) (51.9%) – higher rate of FTC?

The 38% **NON-DIAGNOSTIC RATE** (vs 15%)[4] might be due to staff shortages, lack of seniority, limited FNAB training, and access to ultrasound. This might be improved by implementing an MDT biopsy team [1]

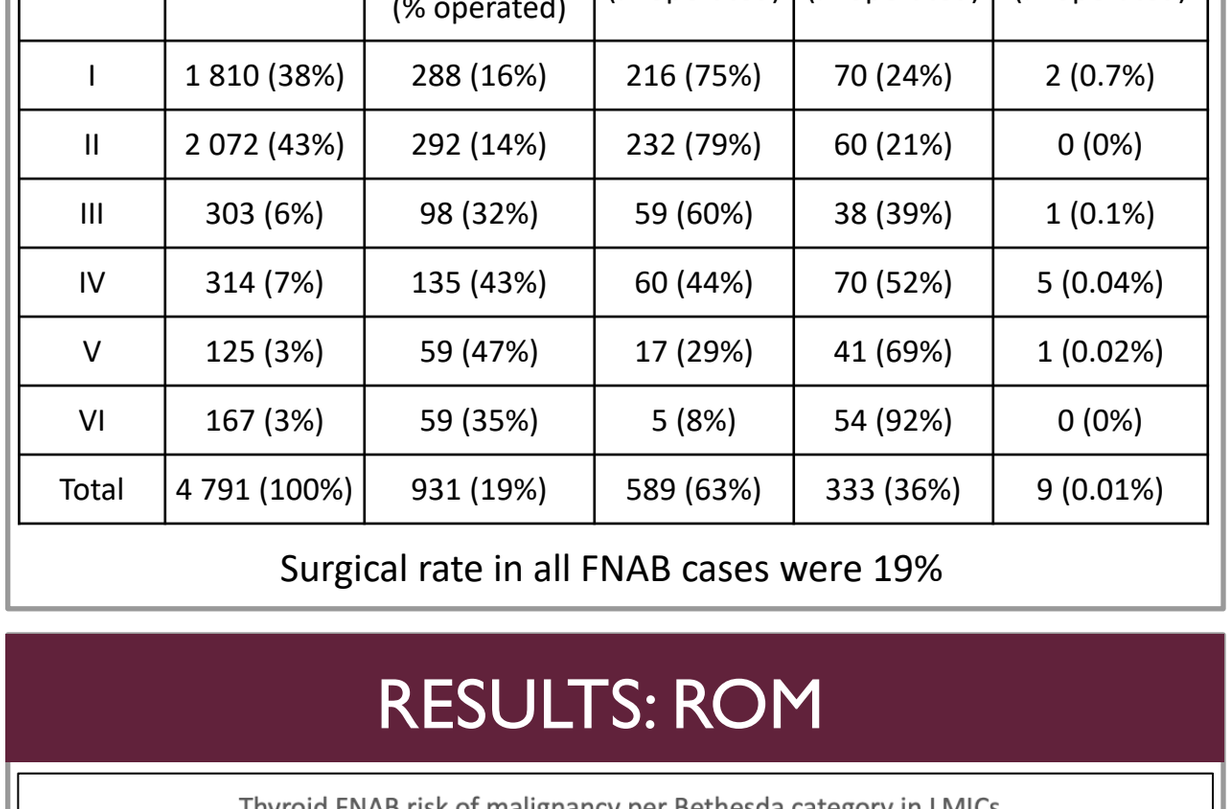
Histology with limited correlating cytology (0.5%), suggests many thyroid surgeries without FNAB: might be due to **LIMITED ACCESS TO FNAB.**

ACCURACY OF THYROID FNAB 74% compared to 69-78% [5,6] might be improved by improving specimen retrieval and interpretation, and molecular testing (expensive).

CHALLENGES in SA

Participation
Time
Data-capturing labor and time-intensive
Selection bias

RESULTS: ROM



	Tepeoglu 2014 Turkey [17]	Mahajan 2017 India [18]	Reuters 2018 Brazil [19]	Kraus-Fischer 2020 Mexico [33]	Zhu 2020 China [20]	Kamboj 2022 India [21]	Conradie 2024 South Africa
I	0%	50%	0%	67%	57%	79%	24%
II	0%	8%	6%	14%	39%	28%	21%
III	13%	50%	12%	28%	50%	53%	39%
IV	35%	24%	21%	36%	31%	54%	52%
V	91%	75%	73%	79%	79%	95%	70%
VI	100%	97%	97%	100%	99%	97%	92%

CONCLUSION

In SA, thyroid FNAB reflects a **higher ROM** with a lower surgical rate compared to other international publications.

The diagnostic accuracy of thyroid FNAB in SA and the **high rate of non-diagnostic diagnoses (38%)** is concerning and requires further investigation.

A **national thyroid registry** will allow for centralized data collection, contextual analysis, and inform appropriate interventions.

Scan for references

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