

No more mammograms?

Cost evaluation of procedures for diagnosis of breast-related conditions at a comprehensive, public facility in Johannesburg, South Africa

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Breast cancer is the largest cause of cancer related deaths among women in Sub-Saharan Africa.

Among women in South Africa per year...

9 815 new breast cancer cases

3 848 deaths

Breast cancer most commonly diagnosed cancer amongst women in South Africa.

2012, Globocan

Access to comprehensive breast care services is a critical component of primary health care.



Gold standard is **triple assessment (ie physical exam, imaging, histology)**



Knowing the costs of triple assessment is important for service planning.

Cost literature focuses on mammograms – mainly cost-effectiveness of various screening intervals in developed country settings.

High cost options: Mammography versus ultrasound in low resource settings

Mammography

For diagnosis:

May miss malignant lesions in individuals with dense breasts.

For managing cancer:

If mastectomy is the only option, diagnostic mammography is not essential.

Ultrasound

For diagnosis in asymptomatic individuals:

Can be used as a screening test.

For diagnosis in symptomatic individuals:

Can play an important role in further evaluation of the clinical findings (i.e. exam).

For managing cancer:

Can help to determine the extent of the cancer within the breast.

Ultrasound is more readily available in low-resource settings.

Breast Health Global Initiative, 2006; Okello et al. 2014

Study Aims / Location

1

To estimate the costs of offering breast care diagnostic services at a large, urban, outpatient clinic in Johannesburg.

2

To explore the potential for costs savings in the same setting through shifting away from mammography-based services to those performed with ultrasound.

Methods

1 Retrospective file review



- Aug 2013 - Jun 2014
- Systematic random sample
- Aim: To document all breast-related complaints and diagnoses

Eligibility:

- First visit between Apr 2011 - Jun 2012
- Age ≥ 18 at first visit
- File available for review



Clinical results available as poster!

2 Cost evaluation



- Feb - Jul 2015
- Micro costing and time and motion observations
- Excel-based modelling tool



- Provider perspective
- Excluded: Cost of managing cancer, patient costs

Cost breakdown for each service includes...

Direct costs

- Personnel
- Consumables
- Labs
- Equipment

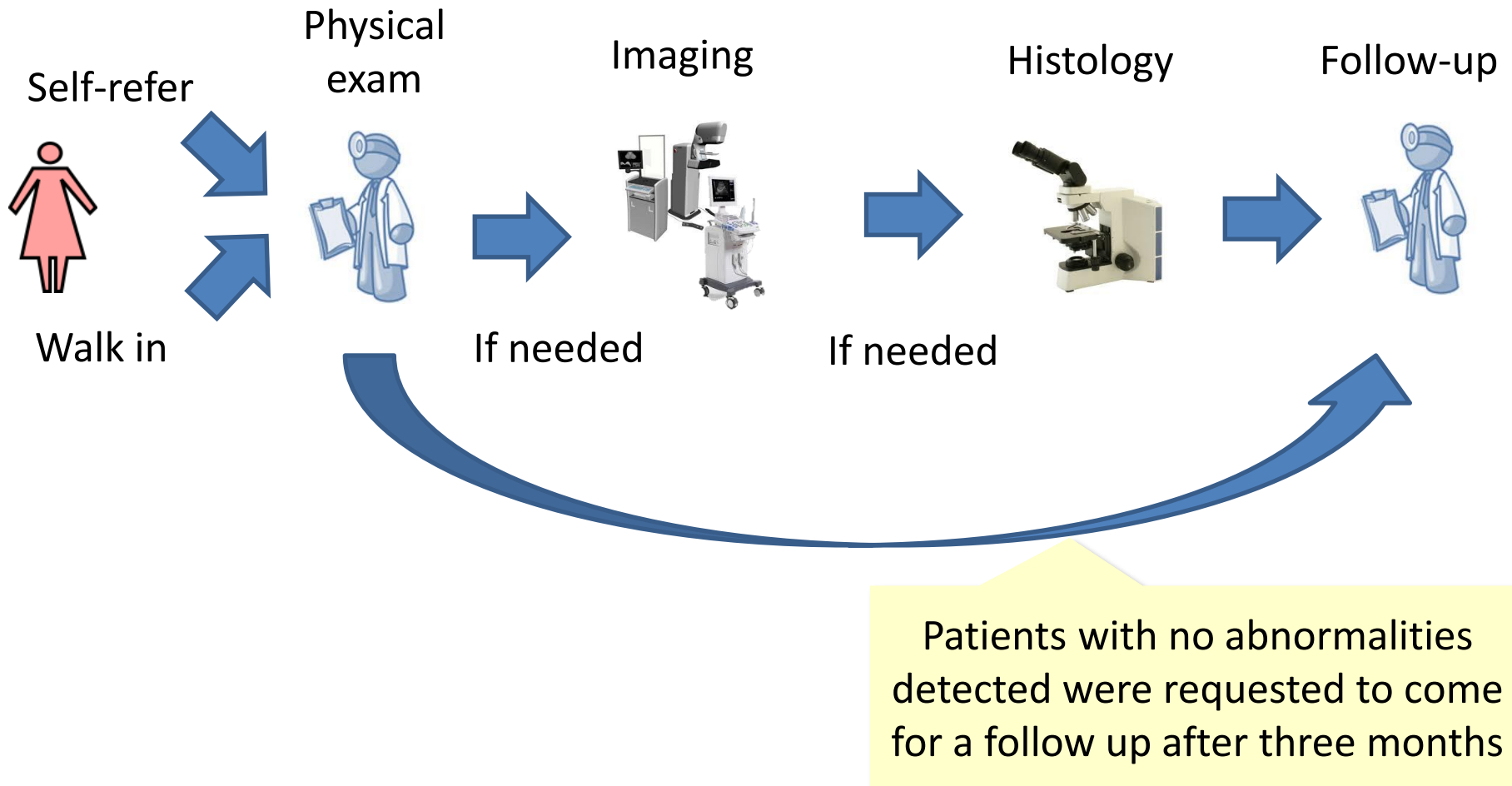
Indirect costs

- Personnel
- Equipment
- Infrastructure

Services:

- Initial consultation (physical exam)
- Imaging
 - Mammogram
 - Ultrasound
- Histology
 - Core biopsy – ultrasound-guided
 - Core biopsy – stereotactic
 - Fine needle aspiration (FNA)
- Follow-up visit

The outpatient clinic provides a comprehensive, triaging service for the diagnosis of breast conditions.



Procedures obtained by study sample and when extrapolated to full clinic population for 12 months

Procedure	Services obtained		Average number of services rendered per month (n=3 867)
	Study sample (n=365)	Hypothetical, full clinic population (n=3 867)	
Initial consultation	365 (100%)	3 867 (100%)	322
Imaging			
Mammography	149 (41%)	1 575 (41%)	131
Ultrasound	190 (52%)	2 008 (52%)	167
Histology			
Biopsy – U/S guided	59 (16%)	600 (16%)	50
Biopsy – Stereo. guided	15 (4%)	150 (4%)	13
Fine needle aspiration	4 (1%)	42 (1%)	4
Follow-up visit	365 (100%)	3 867 (100%)	322

Cost per procedure with breakdown, full clinic population (ZAR 2014)

	Initial consultation	Follow-up visit	Mammography	Ultrasound
Direct costs				
Personnel	67.45	79.67	194.58	139.50
Consumables	1.75	1.48	1.48	2.55
Labs	N/A	N/A	N/A	N/A
Equipment	3.24	3.24	488.96	30.69
Total direct costs	72.44	84.38	684.92	172.74
Indirect costs	36.64	36.64	52.81	52.24
Total costs	109.08	121.02	737.73	224.98

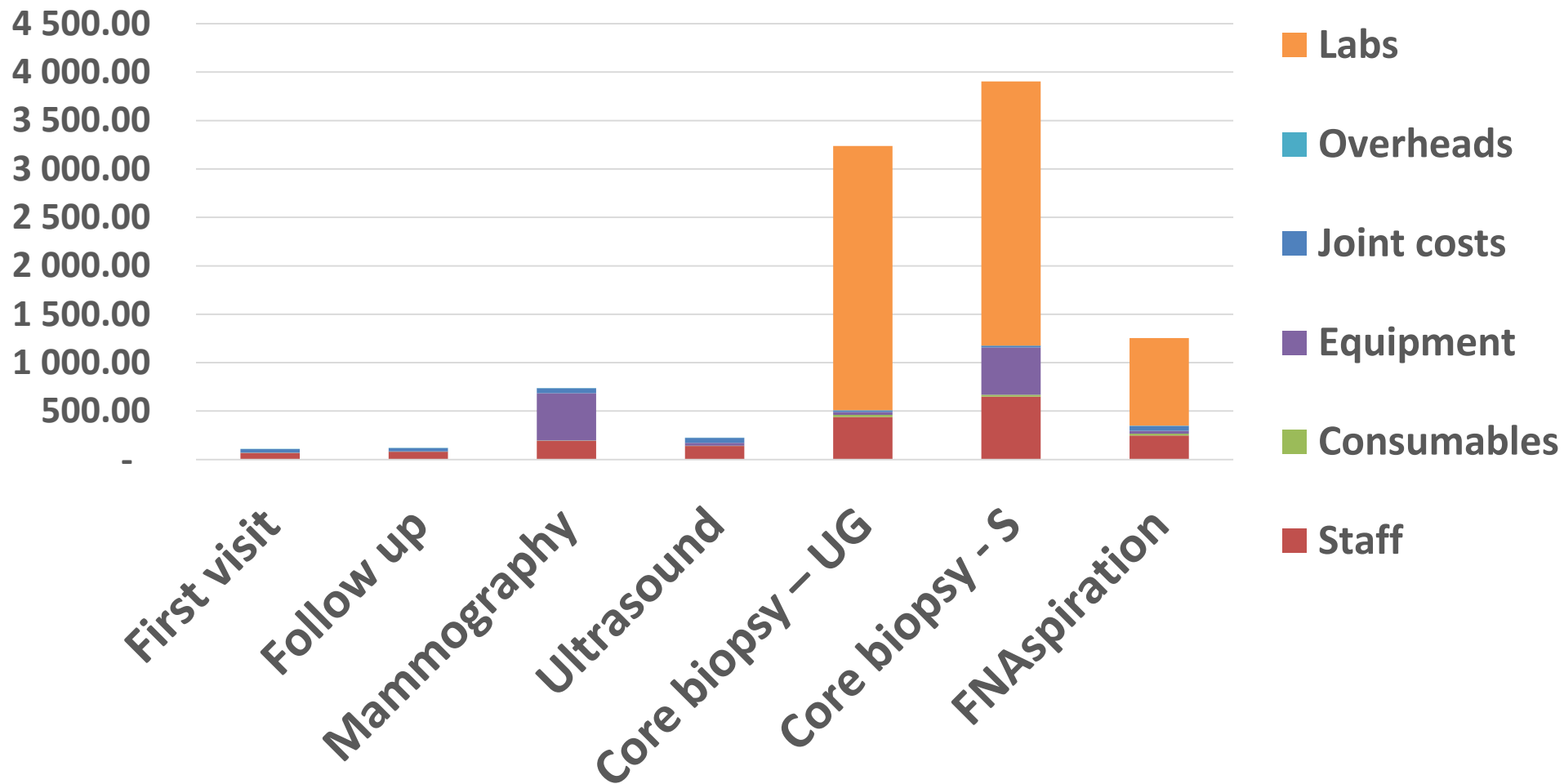
These procedure DON'T require any lab costs.

Cost per procedure with breakdown, full clinic population (ZAR 2014) (2)

	Core biopsy – U/S guided	Core biopsy - Stereotactic	Fine needle aspiration
Direct costs			
Personnel	439.47	649.31	247.87
Consumables	20.16	19.55	18.19
Labs	2 728.57	2 728.57	904.95
Equipment	30.69	488.96	30.69
Total direct costs	3 197.25	3 886.12	1 180.06
Indirect costs	17.60	18.17	52.24
Total costs	3 218.89	3 904.47	1 253.94

These procedure DO require any lab costs (i.e. NHLS charges).

Comparative cost per procedure, full clinic population (ZAR 2014)



Volume matters for per patient costs.

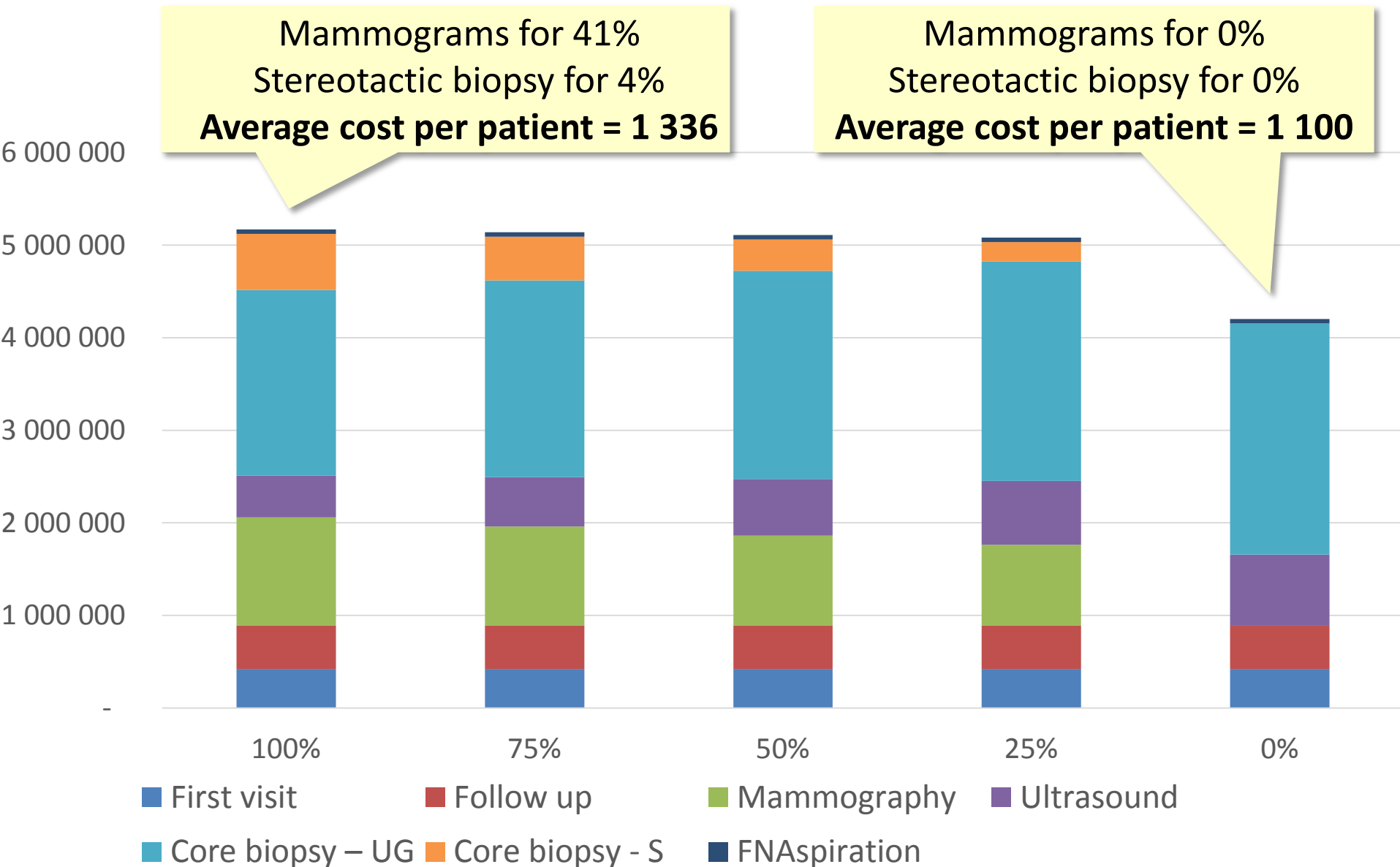
To fully understand costs, consider average cost per patient.

- Most patients got more than one procedure.
- Many got triple assessment (physical exam, imaging, histology).

Average total cost per patient seen and total costs (ZAR 2014)

	Study (n=365)	Full population, 12 months (n=3 867)
Average cost per patient	12 158.83	1 336.64
Total cost for all patients	4 437 972	5 169 049

Total annual costs, full clinic population (ZAR 2014), shifting from current mammogram usage to none



Limitations

- The clinical study was retrospective, and there were challenges with data quality when assessing services provided.
- Performing micro costing in a complex environment was challenging. To address this, we have used sensitivity analysis (not shown here) to assess variations in our assumptions.
- We assumed that the ultrasound machine was used for breast care only. In other settings, it may be used for many purposes, thus reducing the cost per use.

Conclusion

- The analysis contributes to understanding the costs of comprehensive breast-related diagnostic services
- The average cost per patient in a walk-in facility where triple assessment was offered was R1,336.64.
- When considering the average cost per diagnostic procedure, the following were cost drivers:
 - **Personnel costs** → For the initial visit and follow-up visit
 - **Equipment costs** → For imaging (mammogram and ultrasound)
 - **Lab costs (charges)** → For histology (biopsies and FNA)
 - **Volume** → For all procedures
- Where mammogram machines are available, they should be utilized to their full potential as scale and volumes matter!

Thank you

For further information

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