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ORIGINAL ARTICLES

Clinical laboratory test prices in Zimbabwe: A case of profiteering?

C MUSARURWA, T NYAMAYARO, WB MUJAJI, HT MATARIRA, ZAR GOMO

Abstract

Objective: To compare the prices charged for clinical laboratory tests in Zimbabwean institutions with those of similar institutions abroad.

Design: An online analytical cross sectional study was conducted

Setting: An online survey

Subjects: We did an online survey of clinical laboratories that published prices of the tests offered on their websites. We also extracted price information from documents published by fees regulatory authorities.

Main Outcome Measures: Laboratory test prices for independent institutions, Laboratory test prices for State institutions.

Results: Overall for all countries, laboratory test prices were lower in state laboratories compared to the independent laboratories. In Zimbabwe, state laboratories generally charged about 50% of the independent laboratory tariff for most tests. However prices from both Zimbabwean institutions were generally much higher than those of the comparison countries (United Kingdom, South Africa, India, United States of America and New Zealand).

Conclusion: Prices of laboratory tests are indeed higher in Zimbabwean institutions compared to other centres abroad. These higher prices could be attributed to challenges in consumable procurement logistics. We also present measures that could be put in place to reduce the costs and therefore prices.

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Introduction

Cost containment has become a major cause of concern for health insurance companies and laboratory services-the traditional cash cow of hospitals can no longer be milked for institutional profit.^{1,2} In developing countries, studies and data on laboratory test prices are scanty. Measuring and understanding the reasons for the price of laboratory tests may contribute to the development of laboratory tests pricing policies that would ensure their affordability. Although public institutions in most developing countries provide some laboratory tests for free, equipment is often broken down and service unreliable.³ As a result, patients increasingly have to pay for services in better resourced independent laboratories.

Laboratory technology has advanced to the point where high volumes of tests can be handled quickly and

cheaply on automated equipment. Regardless of whether the resultant lower costs are passed on to the patient or his insurer, price has taken on new significance to all parties concerned with laboratory testing.⁴

Healthcare costs in Zimbabwe have generally been reported as being higher than elsewhere within Southern Africa and abroad. This trend was initially reported in the post-2000 during a period of economic instability.⁵ However, even after adoption of multicurrency in 2009 health costs are still generally viewed as being more exorbitant in Zimbabwe.⁶

In 2008, one newspaper article reported that 'the sick are left to die because they can't afford spiralling cost of medical treatment and Zimbabwe has turned into a dying nation'.⁷ Another article in 2009 queried whether medical care was now only a privilege for the people who can afford the absurd charges.⁸ Yet another article

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opined that medical costs were still so high that it was cheaper to fly a patient to a South African private hospital than use a Zimbabwean private hospital.⁹

To investigate whether healthcare costs are indeed more expensive in Zimbabwe we carried out an online survey of clinical laboratory test prices in independent and public medical laboratories in Zimbabwe and selected centres abroad.

Methods

In May 2012 we carried out an online cross-sectional survey to establish the current prices of general clinical laboratory tests in Zimbabwe, Republic of South Africa, The United Kingdom, New Zealand, India and the United States of America. Zimbabwean clinical laboratory test prices were extracted from the Association of Healthcare Funders of Zimbabwe relative fee schedules.¹⁰ Laboratory fees for the Zimbabwean state institutions were obtained from Parirenyatwa Hospital in Harare, Zimbabwe.

Comparison clinical laboratory prices were established from selected laboratories abroad whose fees were accessible online. Availability of online prices was the major determinant of a laboratory's inclusion in the study. Fees for state institutions could not be accessed for British and USA institutions.

In order to facilitate relative comparison, all prices were converted to United States dollar equivalents using an exchange rate prevailing on 15th May 2012. The prevailing rates for one US dollar were, 55.67 Indian Rupee, 8.52 South African Rand, 1.32 New Zealand Dollar and 0.65 Great Britain Pound. The United States Dollar was the one of the official trading currencies in Zimbabwe at the time of the study and prices were generally quoted in that currency across the

board.

Prices were accessed for six independent laboratories and four state laboratories worldwide.¹¹⁻¹⁸ The prices from each of the abroad sites were compared with the prevailing prices in Zimbabwean institutions. In cases where composite profile tests prices were not indicated, we calculated the profile test price as the sum of the prices of all tests that comprise the test profile in the Zimbabwean setting. Only tests common in all six regions were included with the exception of the United Kingdom site where only limited price data could be ascertained. Altogether we present price data for 25 common laboratory tests/profile. The price data is presented as median and mean unit price (SD) for each test. The data is also presented as comparative histograms depicting the cost of individual tests/profiles across the major laboratory disciplines of Clinical Biochemistry, Microbiology, Haematology, Blood Banking and Serology.

Results

Table I shows the prices of 25 selected clinical laboratory tests for the Zimbabwean independent and state labs and the median, mean and standard deviations of all clinical laboratories included in the study. All lab test prices for the Zimbabwean independent laboratories were higher than the mean prices of the other laboratories except for CSF MCS and RF which were marginally lower. Prices for Zimbabwean state laboratories tests were lower than the mean for U&E, LFT, Urinalysis, MCS, HIV, TORCH, HBsAg, RF, INR and urine pregnancy test. Zimbabwe state laboratory CSF biochemistry test price was almost double the mean of all the laboratories.

Table 1: Zimbabwean independent and State clinical Laboratory test prices and median and mean prices for all laboratories.

Test	Zim Independent Lab Price (USD)	Zim State Lab Price (USD)	Median Price All Labs (USD)	Mean Price All Labs (USD)	Standard Deviation
Glucose	16	13	5.18	7.79	6.82
U and E	23	10	14.74	17.05	8.98
LFT	50	25	29.08	28.67	14.14
Lipogram	72	25	23.83	27.26	19.71
TFT	75	75	31.79	39.58	25.00
CSF Chem	20	30	17	16.16	10.54
Cancer Marker	25	25	20.32	20.19	5.28
Hormone	25	25	12.69	16.07	9.41
CKMB	80	25	17.71	22.95	23.29
HBA1c	25	25	15.77	16.96	10.79
Urinalysis	10	5	5.43	7.52	5.56
Stool MCS	25	12	16.08	18.89	14.48
Urine MCS	20	12	16.12	18.09	14.47
CSF MCS	20	12	17.78	21.82	19.79
FBC	19	10	9.89	11.10	7.37
ESR	8	5	5	4.76	3.18
Group & Rh	15	8	8	6.85	4.77
AARB Smear	13	-	5.80	6.17	4.21
HIV Screen	62	10	10	15.34	18.49
CD4	36	-	22.35	24.37	10.85
INR	19	5	5.96	13.58	13.58
HBsAg	25	10	12.58	13.44	6.59
RF	6	5	5	6.09	4.46
TORCH Screen	84	25	64.60	78.96	61.16
Pregnancy Test	7	5	5	6.83	3.63

Figure I, compares the prices of plasma glucose test prices for all clinical laboratories. The glucose test price for the Zimbabwean independent (US\$16) and

Figure I: Comparison of plasma glucose test prices across the different laboratories.

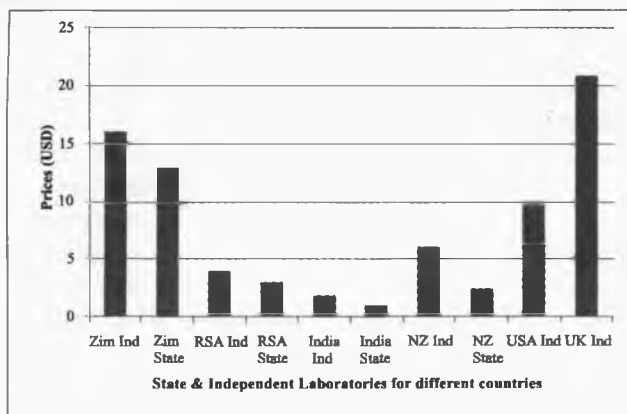


Figure II compares the prices of lipid profile prices for all clinical laboratories. The lipid profile price for the Zimbabwean independent laboratories at US\$72 was more than double the price of all laboratories except for the UK independent laboratory (US\$48.46). The lowest price was that from an Indian state laboratory (US\$5.69).

Figure II: Comparison of Lipid profile test prices across the different laboratories.

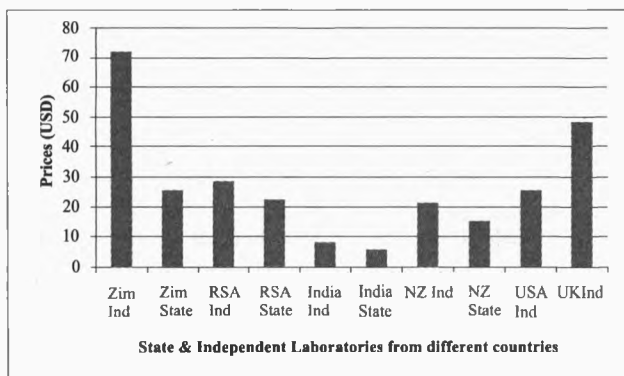


Figure III compares the prices of urinalysis test prices for all clinical laboratories. The price of urinalysis for the Zimbabwean independent (US\$10) was the third highest after New Zealand independent (USD 17.41) and New Zealand state (USD15.01). The Zimbabwe state laboratory price at US\$5 was comparable to the rest and the lowest price was that from an Indian state laboratory (US\$0.90). Urinalysis price for the UK independent lab could not be ascertained.

state laboratories (US\$13) was only lower than that of a UK independent laboratory (US\$20.77). The lowest price was that from an Indian state laboratory.

Figure III: Comparison of urinalysis prices across the different laboratories.

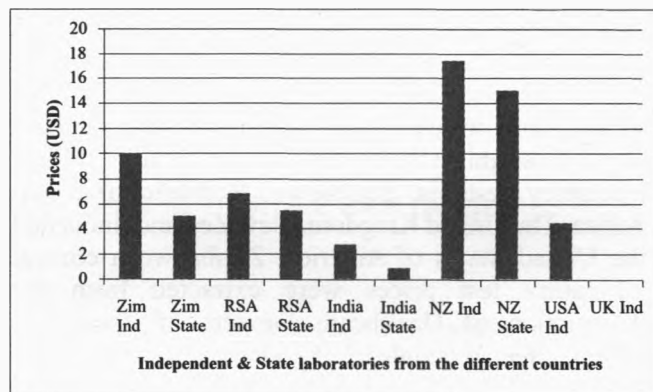


Figure IV compares the prices of stool microscopy, culture and sensitivity (Stool MCS) test prices for all clinical laboratories. The stool MCS test price for the Zimbabwean independent (US\$25) was the second highest after that of the UK independent lab (US\$56.15) The India state laboratory price of US\$0.90 was the lowest followed by the Zimbabwe state lab price of US\$12.

Figure IV: Comparison of Stool micro culture & sensitivity tests price across different labs.

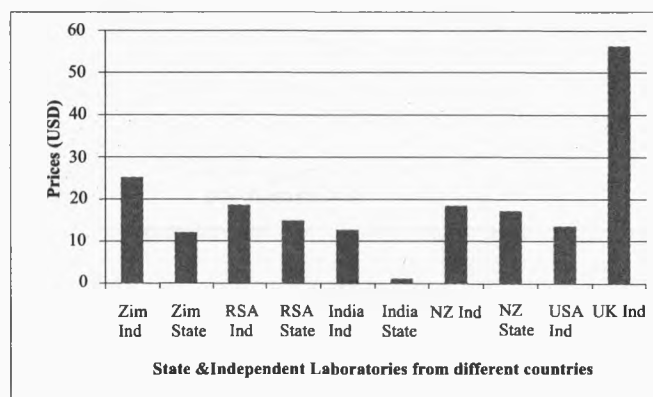


Figure V compares the prices of the full blood count (FBC) test for all clinical laboratories. The FBC test price for the Zimbabwean independent (US\$19) was the second highest after that of the UK independent lab (US\$26.15) The India state laboratory price of US\$2.70 was the lowest and the Zimbabwe state lab price of US\$10 was the third lowest.

Figure V: Comparison of Full Blood count price across different laboratories.

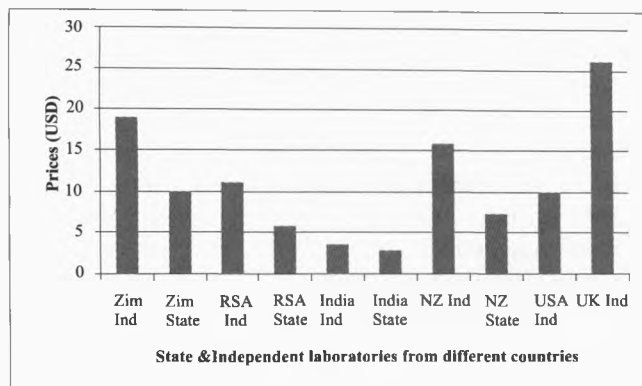


Figure VI compares the prices of the ABO & Rhesus blood grouping test for all clinical laboratories. The Zimbabwean independent laboratories price of US\$15 was the highest followed by the New Zealand independent laboratory price of US\$12.11. The India state laboratory price of US\$0.90 was the lowest and the Zimbabwe state lab price of US\$8 was almost similar to those of the New Zealand State and USA independent labs.

Figure VI: Comparison of Blood Group & Rhesus test price across different laboratories.

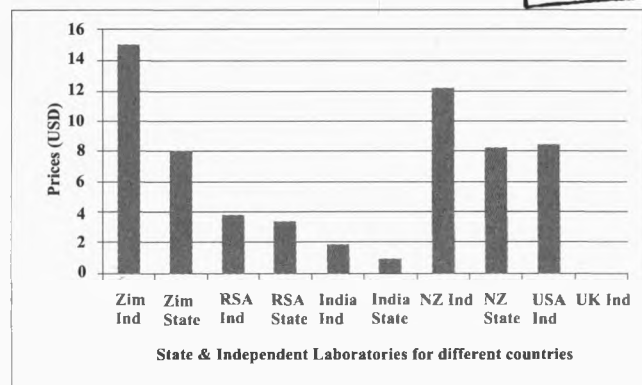


Figure VII compares the prices of the TORCH screen test prices for all clinical laboratories. The TORCH screen price was highest for the UK independent lab (US\$186.14) followed by the New Zealand independent lab (US\$158.960). The Zimbabwean independent lab price of US\$84 was close to the USA independent lab price of US\$70.84. The India state laboratory price of US\$3.60 was the lowest.

Figure VII: Comparison of TORCH Screen test price across different laboratories.

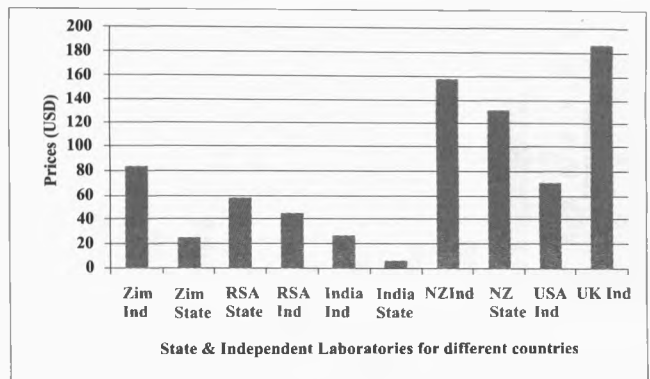


Figure VIII compares the prices of the urine pregnancy test prices for all clinical laboratories. The urine pregnancy test price was highest for the New Zealand state lab (US\$12.71) with the New Zealand independent lab price (US\$12.11) as the second highest. The Zimbabwean independent lab price was US\$7 and the Zimbabwe state lab price was US\$5. The RSA state lab price of US\$3.33 was the lowest.

Figure VIII: Comparison of Urine pregnancy test price across different laboratories.

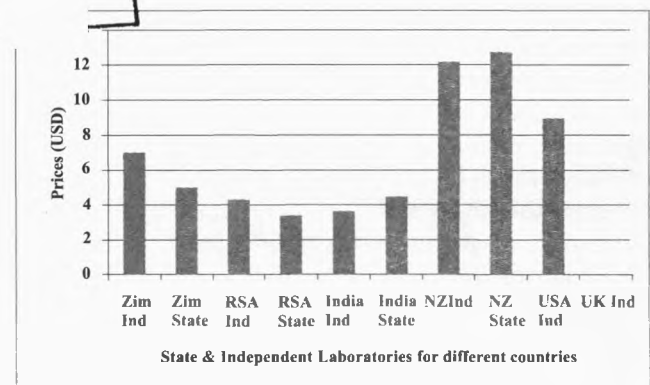
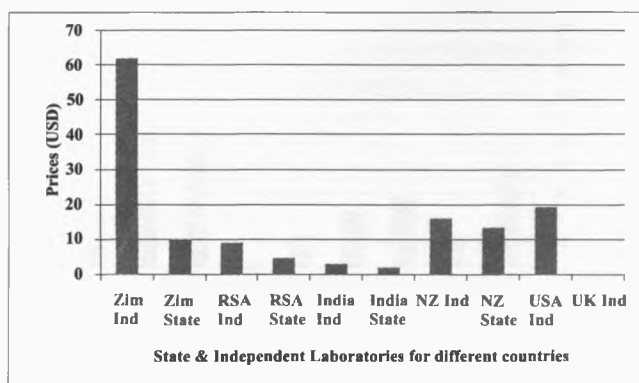


Figure IX compares the prices of the HIV screening test prices for all clinical laboratories. The HIV test price was highest for the Zimbabwean independent lab (US\$62) followed by the USA independent lab price (US\$19.43) as the second highest. The Indian state lab price was US\$1.80 was the lowest and the Zimbabwean state lab price was US\$10.

Figure IX: Comparison of HIV test price across different laboratories.



Discussion

This study was inspired by the perception in the Zimbabwean public media that prices of health services in Zimbabwean institutions are much higher compared to prices charged for similar services abroad. The present study focused on prices of pathology investigations from both independent and state institutions in Zimbabwe and abroad. To our knowledge, this is the first study comparing prices of Zimbabwean lab test prices with those of other centres regionally and overseas.

It was overall noted that the prices of laboratory investigations were higher at independent facilities compared to those charged at state institutions in all the countries studied. This was an expected finding since globally, public institutions are supported from the fiscus. However, the degree of support varies from country to country and this was reflected by the level of variation of prices between independent and state laboratories. In the present study, Zimbabwean state laboratories generally charged about 50% less than the independent laboratories for most tests. In RSA, the differences in charges were rather small at about 25% less for state laboratories. The largest variation was observed for Indian institutions which had the lowest prices all round and the difference in prices between state and independent varied from about 95% less to about 25% less. Differences for New Zealand laboratories ranged from 50% less to about 25% less.

The laboratory test prices from Zimbabwean independent laboratories were significant high outliers compared to prices from all the other laboratories surveyed. Notable differences were observed in the prices of a lipid profile [US\$72, US\$23.83 and US\$27.26 (expressed as Zimbabwean independent lab price, median price and mean price)], thyroid function test [US\$75, US\$31.79 and US\$ 39.58], CKMB [US\$80, US\$ 17.71 and US\$22.95] and HIV screening test [US\$62, US\$10 and US\$15.34]. This major variation could be explained by non-responsiveness of the statutory bodies that determine prices to advances in diagnostic technology and reductions in consumable prices.

A case in point is the CKMB test which on introduction was assayed using mass immunoassay techniques and because it was an emergency request would require immediate processing. This was not cost effective since traditionally immunoassay tests were batched to reduce the cost of standardization and procedural controls. However assay technology has since improved and the cost of performing a CKMB assay is now much lower than in the past. HIV screening was also initially done using the labour intensive immunoassay techniques but the introduction of rapid immunochromatographic tests has since brought down the cost of performing an HIV screen. Thus it can be noted that the major disparity in prices is for these analytes whose technologies have evolved over the recent years. Prices were however lower than the mean and median for some tests in the Zimbabwean state laboratories. These tests included the liver function panel, lipid profile, urinalysis, all microscopy, culture and sensitivity tests, U&E, INR, and TORCH screen.

The generally higher prices charged by the Zimbabwean institutions could however be justified by the prices of laboratory technologies and consumables. Laboratory technologies are rapidly advancing and laboratories need to have defined processes for continuous evaluation to determine if technologies are appropriate to their context. However, many laboratories have experienced a widespread introduction of expensive technology without assessing the technology's effectiveness and relevance; maintenance support and utilities; technology needs at different levels; recurring costs; and alternative options.

Most companies that supply laboratory consumables in Zimbabwe are monopolistic and unregulated in terms of pricing. Thus they import consumables in instances directly from the manufacturer and in some instances through third parties based within the Southern Africa region. The selling price to the Zimbabwean consumer laboratories is much higher than the manufacturer's price. In addition to freight charges the importer also faces various import levies which they pass on to the consumer.

The same scenario also applies when it comes to capital equipment purchase, servicing and maintenance. Service engineers for most of the equipment used in Zimbabwean laboratories are based abroad and will fly into the country as and when required. Makuwaza *et al*, in their study on the cost per test in Zimbabwean state laboratories reported that direct consumable costs were much higher than direct labour costs.¹⁹ This was at variance with cost profiles in other international settings.

Thus the prevailing direct consumable costs could be curtailed by having similar sized laboratories develop a common procurement and management of equipment and material policy which would also result in effective equipment maintenance systems. Standardization of laboratory commodities offers a unique opportunity to coordinate the maintenance of equipment, bulk

purchases, training on common instrumentation, and contract services mechanisms. The laboratories could agree on suitable uniform analysers which they can then install in their centres and purchase wholesale consumables as syndicates. Such a move could result in lower laboratory test prices as this would enable the laboratories to manage the supply chain.

As previously alluded to, immunoassay test costs are generally higher mostly due to direct labour costs since the test procedures are mostly manually. The high costs could be lowered by increasing the number of requests for particular tests. A cost effective approach would be to have laboratories develop an inter-referral system in which individual labs would commission low frequency tests to each other. Larger labs have invested in automated immunoassay analysers which in most instances are also underutilized because of low request volumes for most tests. Such an arrangement would therefore lower the cost of performing immunoassay tests as more requests are received and processed.

Most small to medium size independent laboratories in Zimbabwe rely on manual data handling systems whereas the larger institutions have introduced laboratory information management systems (LIMS). Although the initial cost is high, long term savings are achieved through lower direct labour costs. The quality of lab results is also improved by use of LIMS as few errors arise. Laboratories could reduce costs and therefore prices by investing in LIMS since this would reduce the number of clerical staff and communication costs for results transmission.

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