

# Costing Analysis of Delivery Structures Treating Sexually Transmitted Infection to High-Risk Groups in Karnataka, India over Three Years.



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## Introduction

Avahan The India AIDS Initiative of the Bill & Melinda Gates Foundation focuses on reducing the rate of transmission of HIV/AIDS and STIs. Prevention methods of syndromic and asymptomatic treatment are delivered by program link clinics (PLCs) and referral doctors. The study objective was to determine:

- the syndromic treatment cost per STI by delivery structure;
- the incremental costs of STI screening and treatment by syndrome;

## Methods

Four districts within Karnataka with mixed delivery structures were studied from the inception of the Project, December 2004, until March 2007. An Ordinary Least Squares (OLS) regression was compiled from district doctor time sheets to determine how STI variables affect total time patients spent with doctors. Once times were determined, costs associated with syndromes and delivery structures were estimated on the basis of salaries and fees (PLC doctors receive 9,000 INR/month; and estimated 1 INR/min. Referral doctor costs, not presented, receive 30 INR per client visit). These were added to other detailed costs such as drug costs to arrive at an average incremental cost.

## Results

Table 1. Summary Statistics

	Belgaum	Bangalore Rural	Chitradurga	Shimoga
Number of PLCs, 3 yr mean (min-max)	6.6 (3-12)	6.78 (4-10)	0 -	2 (1-3)
Number of ref. clinics, 3 yr mean (min-max)	11 (9-16)	4.11 (0-8)	8.25 (6-10)	14.08 (13-21)
Total STI Cases	3912	4622	10161	2913
Total Client Population	5572	9589	17290	6303

Figure 1. Syndrome Breakdown, Shimoga, Year 3

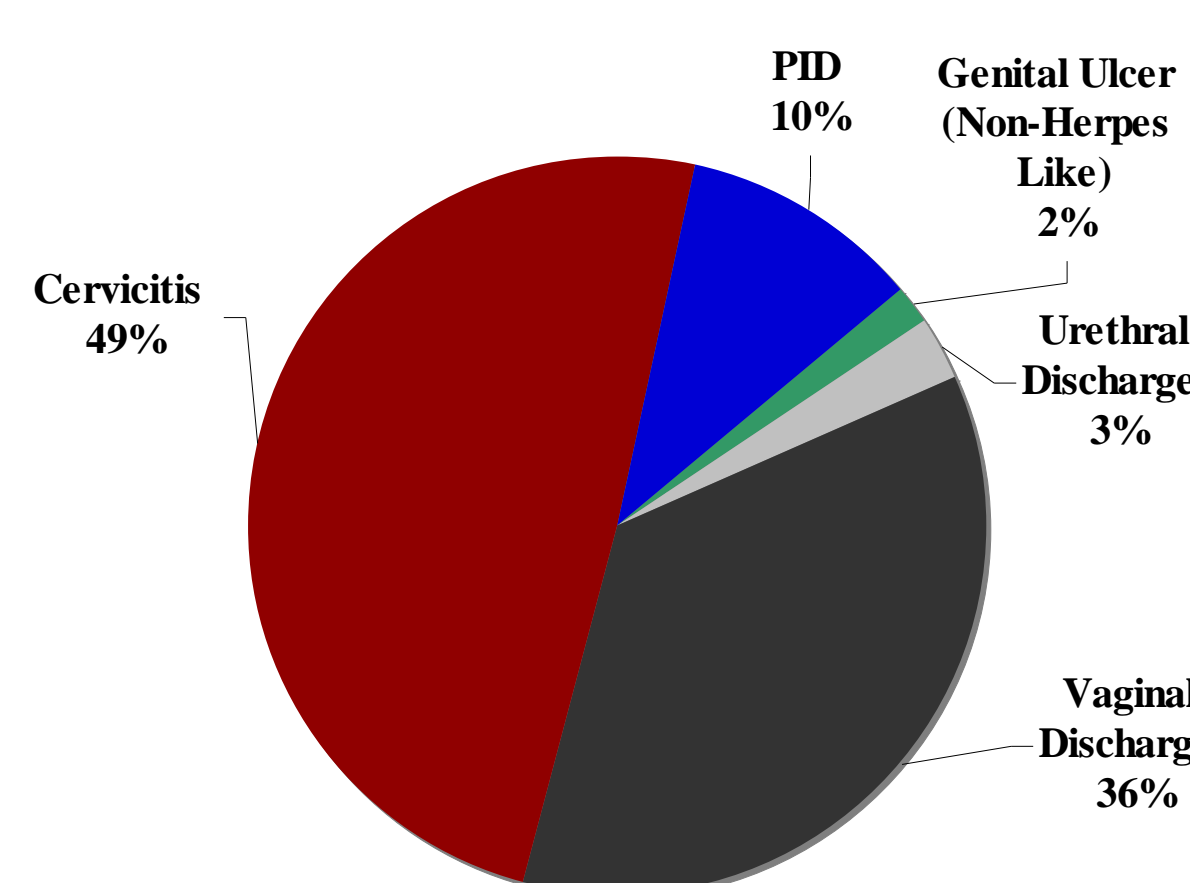


Table 2. OLS regression results, paired with individual patient data.

a) Belgaum

b) Shimoga

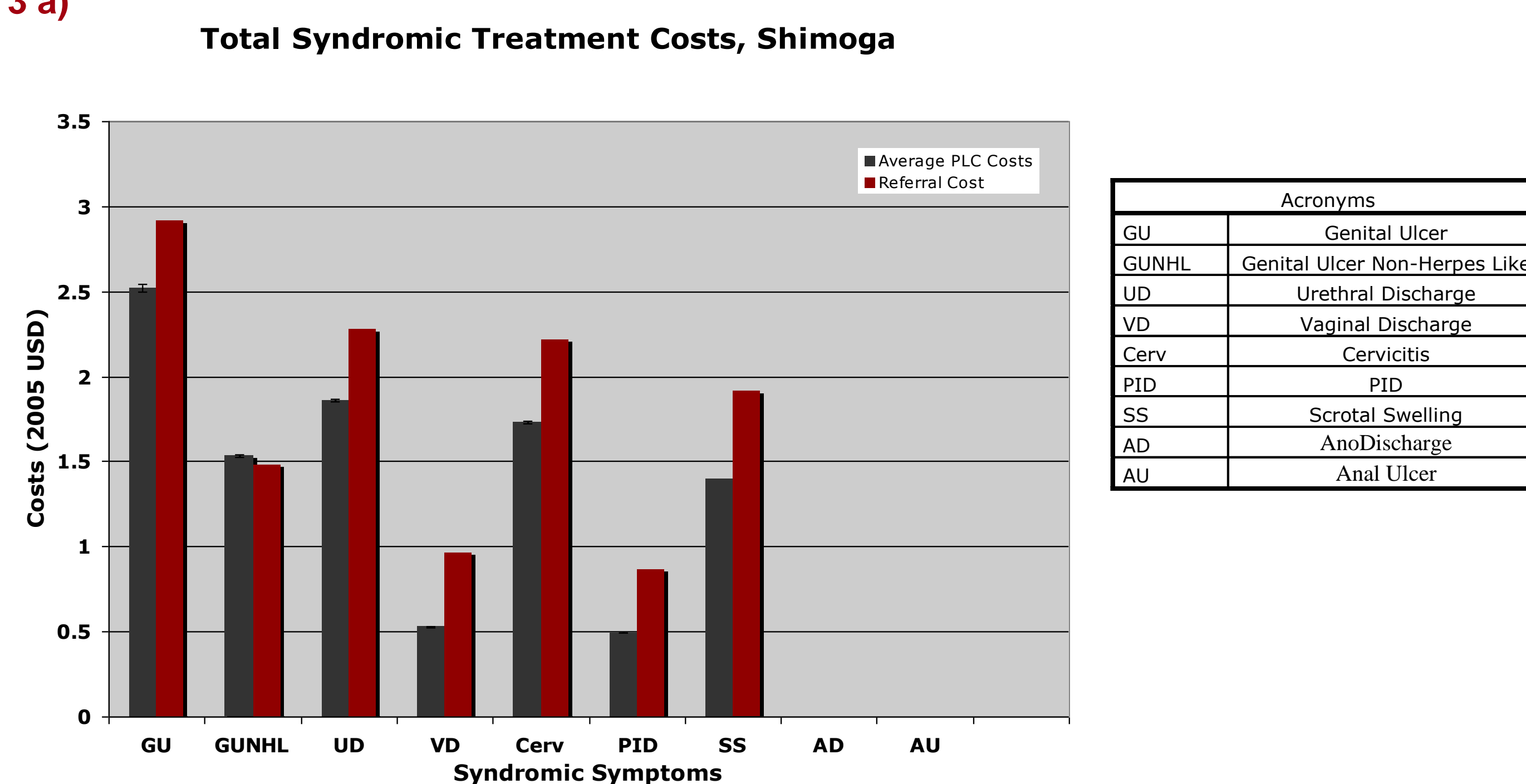
	Year 1			Year 2			Year 3		
	Mean Doctor Time (Minutes) (Minimum - Maximum)								
Genital Ulcer (Herpes Like) Total	12.47 (9.02-15.55)	10.49 (4.15-16.83)	11.61 (2.77-22.91)	-	20.79 (9.13-41.18)	8.71 (3.47-11.86)	-	-	-
Genital Ulcer (Non Herpes Like) Total	13.66 (8.38-20.45)	12.26 (2.50-22.89)	14.97 (4.03-26.73)	41.18 (10.66-41.18)	33.78 (7.82-41.18)	28.23 (8.23-40.69)	-	-	-
Urethral Discharge Total	6.43 (4.03-15.37)	5.72 (0.45-20.11)	8.77 (0.93-20.27)	22.05 (10.66-41.18)	12.24 (6.91-37.18)	10.69 (4.11-10.69)	-	-	-
Vaginal Discharge Total	8.46 (4.03-16.09)	7.01 (0.45-20.11)	9.3 (0.64-20.42)	11.7 (4.48-41.18)	12.35 (0.39-41.18)	12.43 (1.68-20.77)	-	-	-
Cervicitis Total	10.35 (7.09-15.55)	8.15 (1.81-20.73)	11.21 (1.81-23.55)	10.91 (0.39-41.18)	12.06 (0.39-41.18)	12.27 (1.68-20.77)	-	-	-
Lower Abdominal Pain (PID) Total	10.24 (4.03-18.34)	8.29 (2.13-22.89)	11.77 (2.13-26.73)	15.05 (12.89-17.81)	15.13 (0.39-41.18)	14.41 (7.63-40.69)	-	-	-
Inguinal Swelling Total	-	-	-	-	19.98 (7.82-34.34)	11.52 (8.23-17.81)	-	-	-
Scrotal Swelling Total	-	-	-	-	-	8.23	-	-	-
AnoDischarge Total	-	-	-	-	-	-	-	-	-
Anal Ulcer Total	-	-	14.89 (2.77-22.18)	-	-	-	-	-	-
Oral STI Total	-	-	8.5 (5.51-17.06)	-	-	-	-	-	-
Other STI Total	-	10.37 (8.58-12.17)	10.77 (0.45-26.73)	-	15.79 (8.23-25.75)	9.13	-	-	-

c) Bangalore Rural

	Year 1			Year 2			Year 3		
	Mean Doctor Time (Minutes) (Minimum - Maximum)								
Genital Ulcer (Herpes Like) Total	8.43 (7.93 - 8.93)	10.97 (6.63 - 19.29)	8.68 (7.93 - 8.93)	-	-	-	-	-	-
Genital Ulcer (Non Herpes Like) Total	43.29	43.56 (42.29 - 49.73)	43.59 (39.99 - 47.89)	-	-	-	-	-	-
Urethral Discharge Total	-	-	12.79 (8.32 - 17.27)	-	-	-	-	-	-
Vaginal Discharge Total	13.11 (9.11 - 23.44)	13.18 (9.11 - 25.16)	13.78 (9.11 - 24.44)	-	-	-	-	-	-
Cervicitis Total	13.31 (9.78 - 23.44)	13.09 (9.78 - 26.83)	14.00 (9.78 - 47.89)	-	-	-	-	-	-
Lower Abdominal Pain (PID) Total	16.64 (12.62 - 23.44)	16.63 (12.62 - 49.93)	15.99 (12.62 - 24.44)	-	-	-	-	-	-
Inguinal Swelling Total	13.62	-	14.924	-	-	-	-	-	-
Scrotal Swelling Total	13.08	-	-	-	-	-	-	-	-
AnoDischarge Total	-	-	-	-	-	-	-	-	-
Anal Ulcer Total	-	-	-	-	-	-	-	-	-
Oral STI Total	-	-	-	-	-	-	-	-	-
Other STI Total	21.238	21.23 (18.94 - 26.83)	20.92 (18.93 - 21.24)	-	-	-	-	-	-

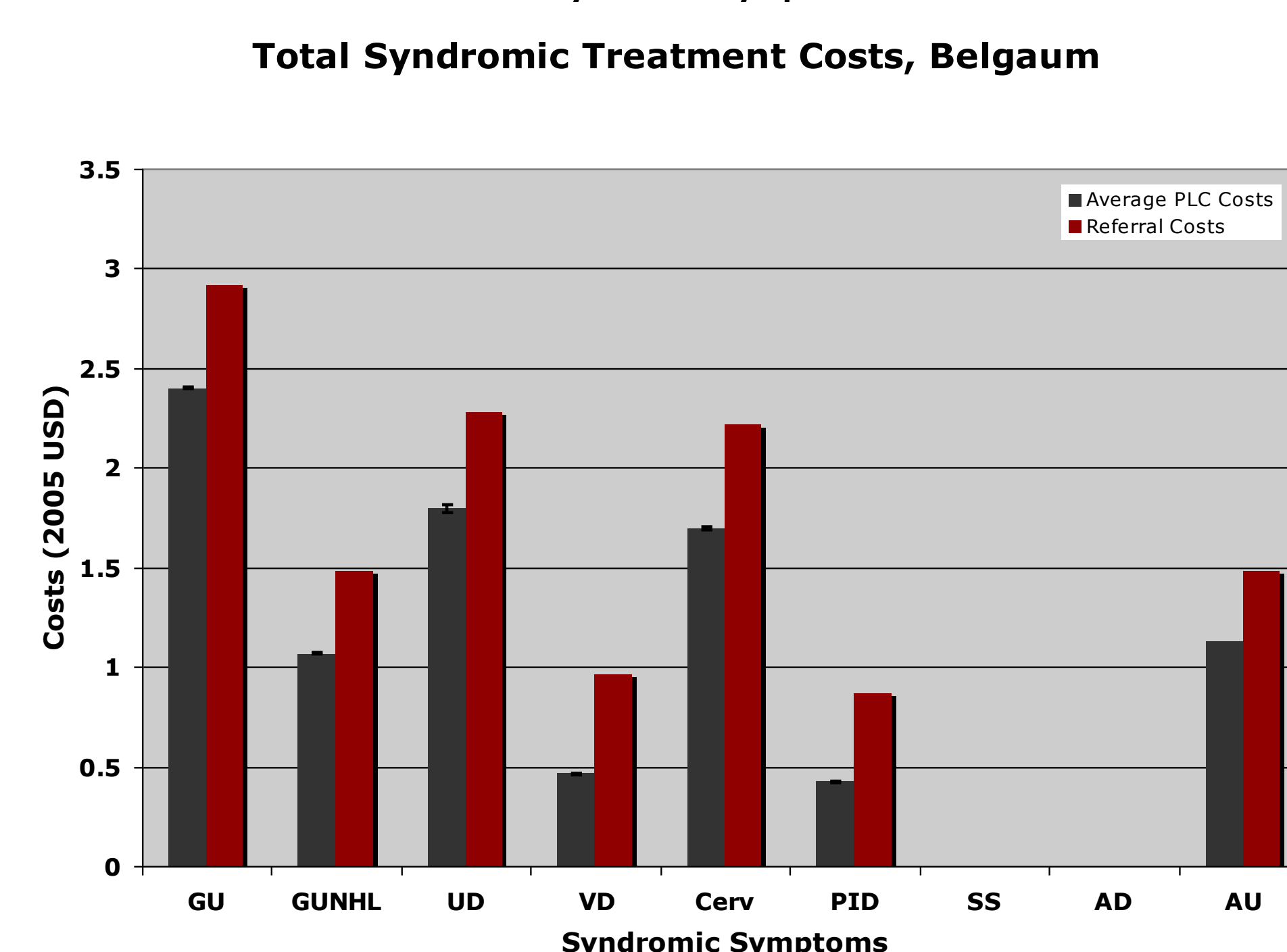
Table 3. Total costs: Doctor costs and syndromic treatment pack costs. (Cost differences found to be due to doctor cost, not delivery structure. Districts showed similar breakdown in symptoms and variance in syndrome costs). Cost with variance presented in 2005 USD.

Table 3 a)

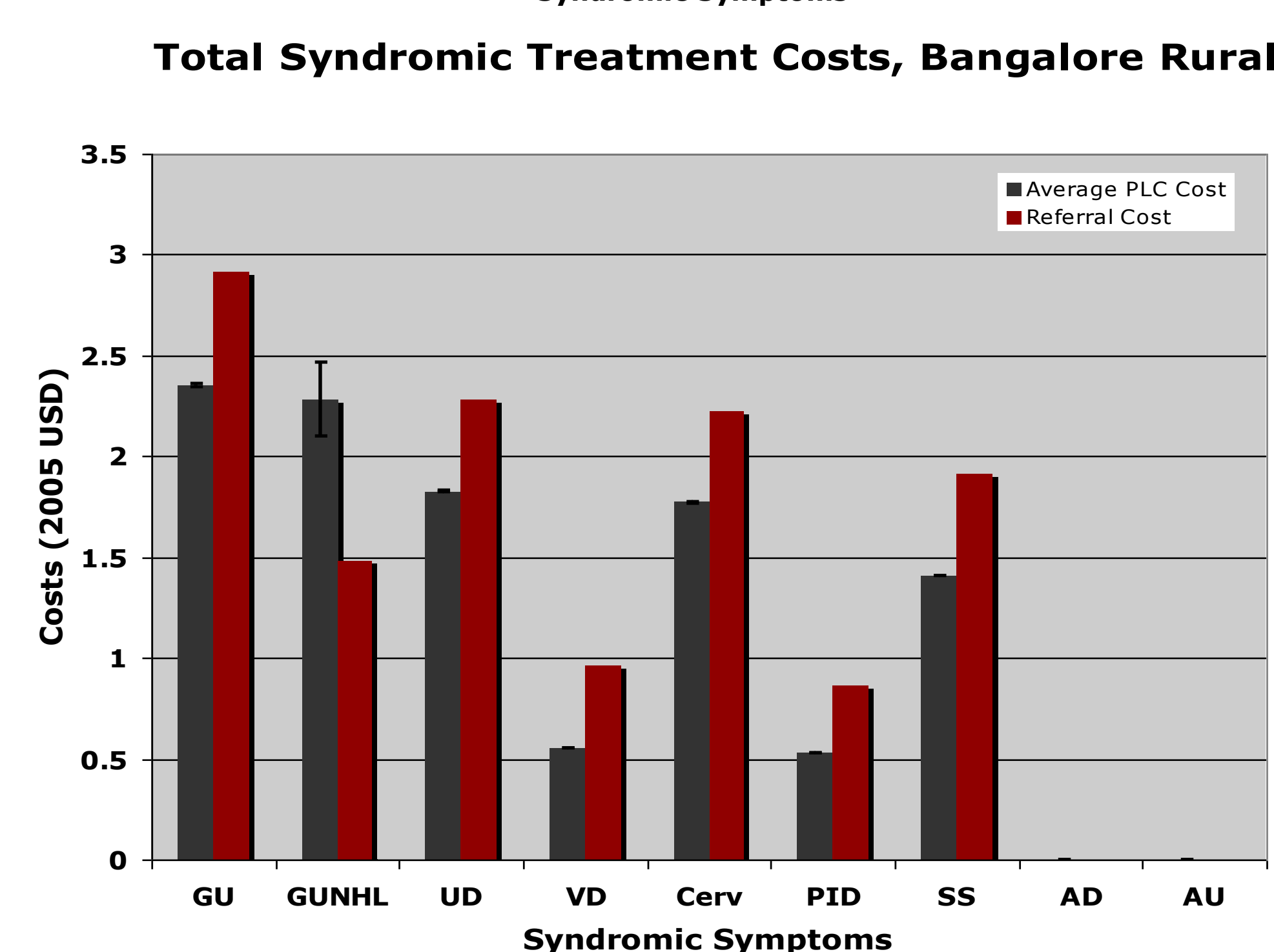


Acronyms	
GU	Genital Ulcer
GUNHL	Genital Ulcer-Non-Herpes Like
UD	Urethral Discharge
VD	Vaginal Discharge
Cerv	Cervicitis
PID	PID
SS	Scrotal Swelling
AD	AnoDischarge
AU	Anal Ulcer

b)



c)



Genital Ulcers (Non-Herpes Like) had the greatest variance for total syndromic treatment costs with a variance of 0.33. Variance for other symptoms was minimal, ranging between 0.0025 to 0.013.

Within Shimoga, average syndromic treatment costs were found to be \$0.34 (USD 2005) higher when delivered through referral delivery structures. Likewise, Belgaum referral syndromic treatment costs were \$0.48 (USD 2005) higher and Bangalore Rural referral costs were \$0.23 (USD 2005) higher.

Conducting a uni-variate sensitivity analysis; allocating a monthly salary of 8,000 INR and 10,000 INR to PLC doctors minimally alters the above stated findings. Doctor costs are consistently found to be less within a PLC delivery structure compared to a referral setting.

## Conclusions/ Next Steps

From this study, total costs for syndromic treatment averaged \$0.23-\$0.48 (USD 2005). Costs were lower in PLC delivery structure settings (for the same type and severity of cases). These findings suggest integrative delivery structures (PLC) may provide a higher level of efficiency. There was little overall variance observed between the incremental syndromic treatment costs over districts. This has implications for other costing studies, suggesting that extensive observations of time may not be necessary. Further analysis of additional costs associated with 'other drugs prescribed and other supplies' still needs to be conducted.

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