Determinants of Economic Efficiency in HIV Prevention: Evidence From ORPHEA Kenya

Galárraga O[1], Wamai RG[2], Sosa-Rubí SG[3], Mugo M[4], Contreras D[3], Bautista-Arredondo SB[3], Nyakundi H[4], Wang'ombe J[4]

[1] Brown University, USA, [2] Northeastern University, USA, [3] *Instituto Nacional de Salud Pública*, Mexico, [4] University of Nairobi, Kenya

Background

- Over 1.6 million people live with HIV in Kenya, with remarkable geographical diversity, ranging from 25.7% HIV prevalence in Homa Bay to 0.2% in Wajir county.
- Although HIV prevalence has declined, a number of key national targets have not been met in part due to funding gaps.
- Estimations of total resource requirements for universal access targets show that the funding gap reaches almost 50% of available funds, and 62% of HIV expenditure was financed by donors in 2014.
- Scale-up of HIV services in Kenya require sound and prompt economic data, in order to identify economies of scale and other opportunities to optimize the efficiency of service provision options in context of significant funding gaps.

Methods

- We used data from the "Optimizing the Response in Prevention: HIV Efficiency in Africa" (ORPHEA) project, a facility-based study of the costs and technical efficiency of HIV interventions conducted in Kenya, Rwanda, South Africa, and Zambia between 2011 and 2013.
- With multistage sampling techniques, we selected 71 sites for HTC, 62 sites for PMTCT, and 42 sites for voluntary medical male circumcision for a total of 189 sites in 78 health facilities, with most facilities offering more than one intervention.
- We collected district level and health facility data through standardized interviews, records verification, payslip checking, direct observation, patient exit-interviews and medical vignettes.
- Retrospectively we collected data for the most recent year available: 2011 or 2012.
- Production inputs included staff time, HIV test kits, equipment, utilities, training and supervision.
- We used time allocation and service utilization to prorate shared costs for jointly produced services.
- Average cost at the facility level were computed by dividing total annual intervention costs by the total number of clients served for each service in that facility.
- Using stepwise regression, we explored the association of the log cost per HTC and PMTCT procedure performed with several variables describing the technology of production for: a) scale, b) service delivery model, and c) management characteristics.

Conclusions

- We observed economies of scale (Figure 1) for the production of HIV counseling and testing (HTC) services as well as for prevention of mother-to-child transmission (PMTCT).
- Facilities that perform community-based testing showed higher average costs for HTC, but not for PMTCT.
- Services performed at hospitals (in comparison to other non-hospital settings) were associated with higher average costs for both HTC and PMTCT.
- Task shifting was associated with lower costs for PMTCT, but not for HTC.
- Having staff members receiving incentives for good performance was associated with higher costs in both HTC and PMTCT.
- Facility characteristics along with scale explained over 50% of the variability in average costs.

Results

Table 1. Multiple regression for cost per HTC client tested (log)

y=log of average cost per HTC client tested	Scale b	Scale se	Service delivery model b	Service delivery model se	Management b	Management se
Log of annual number of clients tested	-0.32***	0.10	-0.39***	0.10	-0.39***	0.08
Facility performs community based testing			0.69*	0.34	0.49*	0.28
Facility targets testing (PMAR - symptoms)			0.15	0.41	0.21	0.33
Facility peforms task shifting			-0.05	0.30	-0.03	0.24
Hospital					0.56**	0.24
Number of supervisions received in 2011					0.04***	0.01
Facility has a community advisory council					-0.16	0.24
Staff can receive rewards for good performance					0.50**	0.24
Constant	4.43***	0.74	4.75***	0.77	4.05***	0.62
Observations	48		48		48	
Adjusted R-squared	0.16		0.19		0.51	

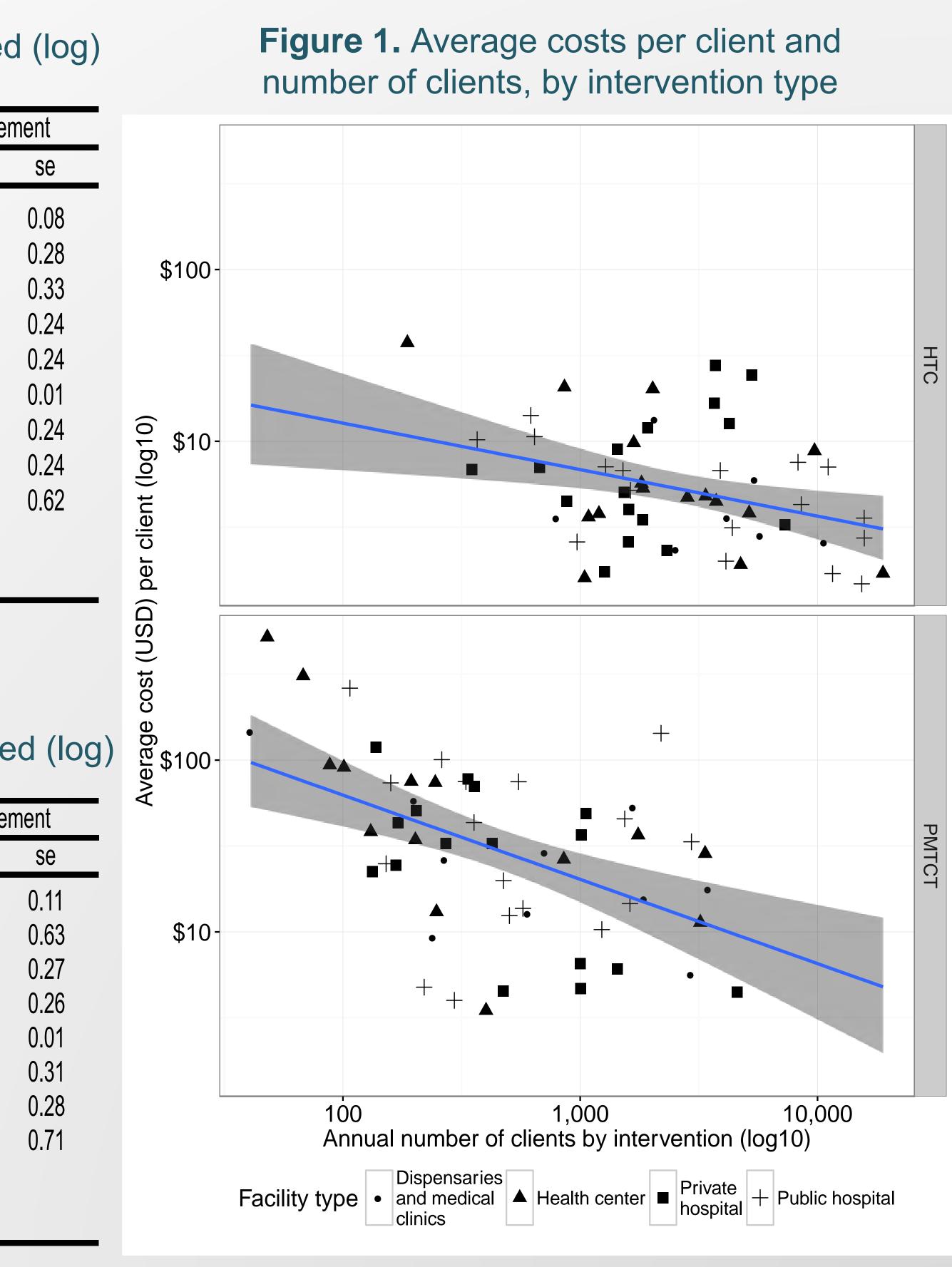Notes: *** p-value<0.01,** p-value<0.05, * p-value<0.10

Table shows coefficients and standard errors of a log-linear regression

Table 2. Multiple regression for cost per PMTCT client tested (log)

y=log of average cost per PMTCT client tested	Scale b	Scale se	Service delivery model b	Service delivery model se	Management b	Management se
Log of annual number of clients tested	-0.48***	0.14	-0.38***	0.13	-0.49***	0.11
Facility targets testing (PMAR - symptoms)			0.87	0.66	-0.05	0.63
Facility peforms task shifting			-0.77**	0.30	-0.47*	0.27
Hospital					0.60**	0.26
No. supervisions received 2011					0.02**	0.01
Funding linked to facility performance					-0.01	0.31
Staff can receive rewards for good performance					0.64**	0.28
Constant	6.56***	0.89	6.33***	0.81	6.08***	0.71
Observations	39		39		39	
Adjusted R-squared	0.22		0.37		0.55	

Notes: *** p-value<0.01,** p-value<0.05, * p-value<0.10

Table shows coefficients and standard errors of a log-linear regression

Figure 1. Average costs per client and number of clients, by intervention type

CROI 2016 Poster # 1059