

Appendix S3: Results of literature review

Appendix for the paper “*The per-patient costs of HIV services in South Africa: Systematic review and application in the South African HIV Investment Case*” by Gesine Meyer-Rath, Craig van Rensburg, Calvin Chiu, Rahma Leuner and Steve Cohen

No.	Author, year	Objective	Target population, setting, level of care	Cost perspective	Costing method	Costing period	Mean cost (2016 USD)	Range (2016 USD)	ARVs	Other drugs	Labs	Radiology	Staff/Consultation	Consumables	Overhead ¹	Equipment	Transport	Inpatient	Other
1. Cotrimoxazole																			
1	Hausler (2006)	Cost and effectiveness of a package of TB and HIV interventions	General population in Cape Town; CHC, PHC and STI clinic	Provider	Full economic cost, ingredients approach	2001 - 2002	<p>Screening for cotrimoxazole preventative therapy \$3.13 in community health centre \$1.57 primary health clinic</p> <p>Cost of screening per person started on cotrimoxazole preventative therapy \$7.84 in community health centres \$2.97 in primary health clinic</p> <p>Cost of 6 months of cotrimoxazole preventative therapy \$12.54 community health centre \$9.40 primary health clinic</p>	N/S		x			x	x	x	x			
2. ART outpatient cost																			

¹ includes other capital costs in some instances

3	Chimbindi (2015)	Cost associated with accessing public sector care over different stages of illness (TB, pre-ART, ART)	General population in rural KwaZulu-Natal, PHC	Patient	Economic and financial costs, bottom up approach	2009-2010	Financial costs per month \$18.61 pre-ART \$17.84 on ART Monetized time costs \$6.45 pre-ART \$9.49 on ART	All SD \$14.61-22.56 \$15.37-20.38 \$5.07-7.84 \$4.11-14.88		x			x					x		Opportunity costs	
6	Cleary (2012)	Explore barriers to access of ART at different treatment sites	Adult population (>18) in rural and urban treatment sites	Patient	Full financial costs, bottom up	N/S	Expenditure past month \$6.43- to reach ART facility (rural) \$18.34- all healthcare (rural) \$1.41- reach ART facility (Urban) \$5.77- all healthcare (Urban)	N/S		x									x		Patient health expenses
7	Cobb (2013)	Cost of applying WHO guidelines for the nutritional management of HIV-infected children	Children in a PHC in rural Hlabisa	Provider	Incremental financial costs, ingredients	2010	\$56.25 /child nutrition, 26 weeks, requiring NCP-B only \$178.33 / child nutrition, 26 weeks requiring NCP-C and NCP-B \$923.63 average cost of supplying ART	N/S	x												Nutritional supplement
9	Deghaye (2006)	Provide comprehensive costing of HAART to health care workers in different hospitals	Health Care Workers	Provider	Full Economic and incremental financial costs, bottom up	2004	Total financial cost per year \$1379.18 urban \$896.74 peri-urban Total economic cost per year \$1399.80 urban \$1066.89 peri-urban	N/S	x	x	x		x	x	x						

22	Moshabela (2012)	Investigate factors associated with patterns of plural healthcare utilization	Adults	Patient	Incremental financial costs, bottom up	April 2008-March 2009	Report expenditure 4 weeks prior to ART visit \$5.65 private chemist \$8.47 self-care \$17.88 doctor \$6.59 primary health clinic	IQR \$2.82-12.23 \$2.82-23.52 17.88-28.23 0.94-2.82 IQR		x			x						
25	Rosen (2007)	Estimate the costs patient occur in obtaining ART	Adults	Patient	Full financial and economic costs, bottom up	July 2005-June 2006	Total cost per visit \$15.83 urban hospital \$10.20 informal settlement clinic \$18.88 rural clinic \$14.62 all						x				x		Opportunity cost
26	Rosen (2008)	Estimate outpatient cost per patient in care and responding to treatment	General population	Provider	Full financial costs, bottom up	N/S	Annual cost per patient initiated: \$747.59 referral hospital \$886.04 private GP \$921.64 HIV clinic \$1113.48 NGO clinic \$917.68 all sites Cost to produce patient in care and responding: \$1115.46 referral hospital \$1703.84 private GP \$1463.54 HIV clinic \$1465.52 NGO clinic \$1422.01 all sites	N/A	x	x	x		x	x	x	x			
27	Tagar (2014)	Describe facility-level cost of ART in a random sample of facilities	General population	Provider	Full financial costs, top down	2011	Average cost of treatment per year \$521.46 weighted mean \$597.71 simple mean Average 1 st line cost \$160 cost for adults		x	x	x		x	x	x	x		Nutritional	

[illegible]

[illegible]

8	Smith de Cerif (2009)	Determine whether reasons for hospitalization were different for HAART vs non-HAART	Adult population (>18), secondary hospital, Cape Town	Provider	Full financial costs, ingredients (some costs from Cleary 2006)	July 2003-March 2004	Total hospitalization cost \$1513.91 in HAART group \$1401.09 in NON-HAART group	IQR \$777.91-2855.9 \$873.53-2231.64	x	x	x	x	x	x	x	x			
42	Meyer-Rath (2013)	Compare hospitalisation rates and costs in cohort of HIV+ patients before and after ART initiation	Adult population (over 18 years)	Provider	Full financial costs, ingredients approach	2009	Cost per patient per year, pre ART \$142.21 at 100 cells/mm ³ \$74.34 at 101 – 200 cells/mm ³ \$56.56 at 201 – 350 cells/mm ³ \$35.55 at >350 cells/mm ³ Cost per patient per year, on ART \$330.49 at 100 cells/mm ³ \$74.34 at 101 – 200 cells/mm ³ \$56.56 at 201 – 350 cells/mm ³ \$35.55 at >350 cells/mm ³	95% CI \$76.76-234.33 \$39.59-122.82 \$56.56-83.23 \$20.20-54.14 \$120.40-694.91 \$75.96-327.25 \$58.18-139.79 \$18.58-64.64											

[illegible]

30	Barton (2013)	Estimate cost effectiveness of nurse-led ART vs doctor lead ART	Adult population (16+)	Provider	Full financial costs, bottom up	2008-2010	Cost at 12 months post enrollment, patients CD4 <=350 and not yet on ART \$383.05 nurse lead ART \$285.70 doctor lead ART \$23,444 per death averted Costs at 12 months post enrollment, Patients on ART at enrollment 460.68 nurse lead ART 402.91 doctor lead ART 12,042 per undetectable viral load	95% CI \$17,529-19,625 \$7,079-9,550	x	x			x	x	x			x	Set up costs
31	Foster (2012)	Evaluate indirectly supervised pharmacists' assistant (ISPA) and nurse based care against full time pharmacist	General population	Societal	Incremental financial and economic costs, bottom up	2009	Average annual costs: \$109.67 per patient with full time pharmacist (baseline) \$10.68 incremental cost for patient through ISPA \$27.11 incremental cost per patient through nurse Average societal cost per visit: \$14.10 with full time pharmacist (baseline) -\$2.89 incremental cost with ISPA -\$0.11 incremental cost with nurse Average cost to patient per visit \$8.54 with full time pharmacist (baseline) -\$2.21 incremental cost with ISPA -\$3.19 incremental cost with nurse Average cost to patient per visit \$5.57 with full time pharmacist (baseline) -\$0.69 incremental cost with ISPA \$3.07 incremental cost with nurse	N/S					x			x	x		Indirect patient costs

32	Long (2011)	Evaluate cost effectiveness of down referring from doctor managed to nurse managed ART in primary health care	Stable patients on ART > 11 months	Provider	Full financial costs, bottom up	N/S	Cost per patient: 514.55 DR/Hospital 463.95 Down referral Cost per patient in care and responding: 526.01 DR/Hospital 469.98 Down referral	Cost per patient (SD) \$379.95-649.15 \$70.40-557.51 Cost in care (SD) \$403.81-648.20 \$385.67-553.69	x	x	x		x	x	x	x				
45	Fatti (2016)	Compare pharmaceutical care quality, clinical outcomes and provider staff costs between task shifting pharmaceutical care models	ART naïve adults, 16 yrs and older	Provider	Incremental financial costs, bottom up	Jan 2013-Dec 2013	Mean staff cost per visit \$130 through ISPA 1.82 through nurse managed Staff cost per item dispensed \$0.41 through ISPA \$0.81 through nurse managed	N/S					x							

53	Long (2016)	Compare outcomes and costs of NIMART between primary health clinics and hospital based HIV clinics	Adults >18yr	Provider	Full financial costs, bottom up	2014	Average cost for all patients: 323.74 HIV outpatient 201.63 PHC Average cost per patient alive & in care 405.15 HIV outpatient 225.29 PHC Average cost per dead/LTFU 115.49 HIV outpatient 94.66 PHC	All patients (95%) 308.60-338.89 193.11-210.15 Alive & in care 399.47-427.87 220.56-230.97 Dead/LTFU 100.34-129.69 82.36-106.97	x	x	x	x	x		x	x				
	4. SMS notification																			
33	De Tolly (2012)	Investigate effectiveness of SMS to encourage HCT	General population	Provider	Full financial costs, bottom up	N/S (?2011)	\$0.02 per sms \$1.76 per additional tester	N/S												Cost per sms
	5. Adherence clubs																			

34	Bango (2016)	Assess cost effectiveness of lay health worker led group adherence clubs and describe and evaluate the associated patient costs	Adult, stable patients	Provider and patient costs	Full financial costs, top down	2011	Total cost per visit: \$12.97 adherence club \$14.16 standard of care Patient transport costs \$0.71 adherence club \$1.15 standard of care Total cost per patient yr \$235.45 adherence club \$293.53 standard of care	N/S	x		x		x	x	x	x	x		Patient opportunity costs
6. HIV counselling and testing (HCT)/ Voluntary counselling and testing (VCT)																			
36	Basset (2007)	Evaluate the yield of routine VCT vs provider referred VCT	General population	Provider	Full financial costs, top down	Jan – Mar 2005	Cost per test \$9 referral \$8.56 routine VCT Cost per HIV positive person identified \$13.48 referral \$25.81 routine VCT	N/S					x	x	x				
1	Hausler (2006)	Cost and effectiveness of a package of TB and HIV interventions	General population in Cape Town; CHC, PHC and STI clinic	Provider	Full economic cost, ingredients approach	2001 - 2002	Cost per VCT completed \$14.10 at community care center \$17.24 at primary health clinic \$10.97 at STI clinic Cost per HIV infection averted \$145.74 at community health center \$175.51 at primary health clinic \$104.99 at STI clinic	N/S		x			x	x	x	x			

[illegible]

[illegible]

46	Tchuenche (2016a)	Derive the unit cost of delivering VMMC at the facility level and to identify the level of spending currently incurred for VMMC demand creation	Men and boys	Provider	Full financial costs, ingredients	Jan-Dec 2014	Per circumcision performed \$124.95 across all facilities \$131.11 in facilities with outreach services \$123.15 in facilities without outreach services \$110.75 urban facilities \$137.26 peri-urban facilities \$111.70 rural facilities \$145.78 in hospitals \$114.54 health care centre/clinic	SD \$116.24-145.97 \$115.37-130.94 \$136.87-154.69 \$105.97-123.10		x	x		x	x	x	x			
47	Tchuenche (2016b)	To provide useful information on the scope of financial barriers that VMMC clients face	Follow up VMMC clients	Patient	Full economic costs, bottom up	Apr – May 2015	Average transport costs \$8.26 all clients \$9.43 urban clients \$7.45 peri-urban clients \$9.70 rural clients	N/S		x							x		Opportunity costs

IQR – Interquartile range

CI – Confidence interval

ISPA – Indirectly supervised pharmacist assistant