

# Substantial Progress in Confronting the HIV Epidemic in Swaziland: First Evidence of National Impact

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**Background:** Swaziland has the highest national HIV incidence and prevalence in the world. In response, the Swazi government extensively scaled-up national HIV prevention and treatment services. The 2016-17 Population HIV Impact Assessment (PHIA) Swaziland HIV Incidence Measurement Survey (SHIMS2) provides the first measure of the impact of national HIV programs scale-up on the epidemic's trajectory since the previous SHIMS1 survey conducted in 2011.

**Methods:** A nationally representative sample of individual  $\geq 15$  years (y) underwent household-based, rapid HIV testing from August 2016-March 2017. All HIV-positive samples were tested for HIV RNA and limiting antigen (LAg) Avidity. WHO criteria for HIV incidence estimates were used (LAg  $\leq 1.5$  ODn and HIV RNA  $> 1000$  copies/ml). Viral load (VL) suppression (VLS) was defined as  $< 1000$  copies/ml. Weighted measures of national HIV incidence, HIV prevalence, and population VL (among all HIV+, regardless of HIV knowledge or ART use) were compared with SHIMS1 results among adults 18-49 years (Table).

**Results:** A total of 10,934 participants  $\geq 15$ y were tested, 3,003 tested HIV+, with HIV prevalence [95% Confidence Interval] of 27.0% [25.7, 28.3], and HIV incidence of 1.36% [0.92, 1.81]. Among adults 18-49y incidence was 1.39% [0.83, 1.94], a 44% decrease from the 2011 incidence estimate of 2.48% [1.96, 3.00]. Adult HIV incidence was higher among women 1.95% [1.04, 2.84] than men 0.86% [0.23, 1.48], with 38% and 53% decreases in women and men, respectively, from 2011. VLS among all HIV+ participants was 73.1% [71.3, 75.0]. Among HIV+ adults 18-49y, VLS was 71.3% [69.0, 73.5], a two-fold increase from the 2011 VLS of 34.8% [33.4, 36.2].

**Conclusions:** Since 2011, VLS prevalence in Swaziland has doubled and national HIV incidence has decreased by nearly half. These remarkable findings in a high prevalence setting provide the first direct measure of the national impact of expanded HIV prevention and treatment programs. Sustaining these achievements will be paramount to Swaziland's success in curbing its severe HIV epidemic.

**Word count:** 349 (including table)

**Table: HIV incidence, prevalence, and viral load suppression among adults 18-49 years in SHIMS2, 2016-17 and SHIMS1, 2011**

Outcome	SHIMS2, 2016-17			SHIMS1, 2011			Comparison (Total)
	Men N=4,506	Women N=6,428	Total N=10,934	Men N=7,130	Women N=11,042	Total N=18,172	2016-17 versus 2011
HIV incidence <sup>€</sup> % (95% CI)	0.86 (0.23, 1.48)	1.95 (1.04, 2.84)	1.39 (0.83, 1.94)	1.83 (1.20, 2.46)	3.16 (2.40, 3.91)	2.48 (1.96, 3.00)	0.56* (0.36, 0.88) p=0.01
HIV prevalence % (95% CI)	21.2 (19.4, 23.0)	38.1 (36.2, 40.0)	30.5 (28.8, 32.1)	24.1 (22.9, 25.4)	38.8 (37.7, 39.9)	32.1 (31.1, 33.0)	0.95 <sup>¥</sup> (0.93, 1.04) p=0.52
VLS prevalence among HIV+ % (95% CI)	63.0 (59.2, 66.9)	75.0 (72.4, 77.6)	71.3 (69.0, 73.5)	32.7 (30.1, 35.3)	35.9 (34.5, 37.4)	34.8 (33.4, 36.2)	2.05 (1.94, 2.15) p<0.01

<sup>€</sup>Measured using LAg and VL. \*HIV incidence ratio for total population in 2016 vs 2011. <sup>¥</sup>HIV prevalence ratio for total population in 2016-17 vs 2011