



Cervical cancer

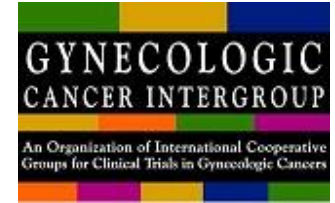
Current impact and situation of the disease in Sudan



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Worldwide outlook on cervical Cancer



- 500,000 new cases identified each year
- 80% of the new cases occur in developing countries
- At least 200,000 women die of cervical cancer each year
- Cervical cancer is the third most common cancer worldwide
- YET - Cervical cancer is a preventable disease

USA Perspective

- In 1930s, cervical ca most common cause of ca deaths in U.S. women
- Incidence/mortality rates for cervical ca declined dramatically following Pap screening & intervention
- For 2001, ~12,900 new cases of cervical CA and 4,400 deaths due to cervical ca projected for U.S.*
- Woman's lifetime risk of cervical ca dx currently ~0.85%; risk of dying from disease is ~0.30%**

*Janicek MF & Averette HE, 2001; Greenlee RT et al., 2001

**Ries LAG et al., 2000 (Surveillance, Epidemiology, & End Results [SEER] data, NCI)

3.1.1 Cervical cancer incidence in Sudan

KEY STATS.

About **833 new cervical cancer cases** are diagnosed **annually** in **Sudan** (estimations for 2012).

Cervical cancer **ranks as the 2nd cause** of female cancer in **Sudan**.

Cervical cancer is the **5th most common** female cancer in **women aged 15 to 44 years** in **Sudan**.

Table 3: Cervical cancer incidence in Sudan (estimations for 2012)

Indicator	Sudan	Northern Africa	World
Annual number of new cancer cases	833	5,813	527,624
Crude incidence rate ^a	4.5	5.6	15.1
Age-standardized incidence rate ^a	7.9	6.6	14.0
Cumulative risk (%) at 75 years old ^b	0.9	0.7	1.4

Data accessed on 15 Nov 2015.

Estimate for Sudan and South Sudan

Incidence data is available from frequency data sources. Incidence rates were estimated partitioning age/sex specific rates for 'all cancers' using data on relative frequency of different cancers (by age and sex). For more detailed methods of estimation please refer to <http://globocan.iarc.fr/old/method/method.asp?country=729>

^a Rates per 100,000 women per year.

^b Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: <http://globocan.iarc.fr>

Table 1: Key Statistics on Sudan

Population		
Women at risk for cervical cancer (Female population aged ≥15 yrs)		12.02 millions
Burden of cervical cancer and other HPV-related cancers		
Annual number of cervical cancer cases		833
Annual number of cervical cancer deaths		534
Crude incidence rates per 100,000 population and year ‡:		
	Male	Female
Cervical cancer	-	4.5
Anal cancer	-	-
Vulvar cancer	-	-
Vaginal cancer	-	-
Penile cancer	-	-
Pharynx cancer (excluding nasopharynx)	0.5	1.1
Burden of cervical HPV infection		
Prevalence (%) of HPV 16 and/or HPV 18 among women with:		
	Normal cytology	3.0 [†]
	Low-grade cervical lesions (LSIL/CIN-1)	18.5 [†]
	High-grade cervical lesions (HSIL/CIN-2/CIN-3/CIS)	40.0 [†]
	Cervical cancer	96.4
Other factors contributing to cervical cancer		
Smoking prevalence (%), women		-
Total fertility rate (live births per women)		3.9
Oral contraceptive use (%) among women		6.2
HIV prevalence (%), adults (15-49 years)		0.2 [0.2 - 0.3]
Sexual behaviour		
Percentage of 15-year-old who have had sexual intercourse (men/women)		- / -
Range of median age at first sexual intercourse (men/women)		- / -
Cervical screening practices and recommendations		
Cervical cancer screening coverage, % (age and screening interval, reference)		% (screened every 3y, Hassan 2009)
Screening ages (years)		-
Screening interval (years) or frequency of screens		-
HPV vaccine		
HPV vaccine introduction		
	HPV vaccination program	No Program
	Date of HPV vaccination routine immunization programme start	-
	HPV vaccination target age for routine immunization	-
	Full course HPV vaccination coverage for routine immunization: % (calendar year)	-

‡Range of crude incidence rates of the following registries: -.

[†] The data is the subregion Northern Africa

3.1.4 Cervical cancer mortality in Sudan

KEY STATS.

About **534 cervical cancer deaths occur annually in Sudan** (estimations for 2012).

Cervical cancer **ranks as the 3rd cause** of female cancer deaths in **Sudan**.

Cervical cancer is the **8th leading cause of cancer deaths** in **women aged 15 to 44 years in Sudan**.

Table 6: Cervical cancer mortality in Sudan (estimations for 2012)

Indicator	Sudan	Northern Africa	World
Annual number of deaths	534	2,717	265,672
Crude mortality rate ^a	2.9	2.6	7.6
Age-standardized mortality rate ^a	5.3	3.2	6.8
Cumulative risk (%) at 75 years old ^b	0.6	0.4	0.8

Data accessed on 15 Nov 2015.

Estimate for Sudan and South Sudan

No country-specific mortality data available. Mortality rates were estimated from national incidence estimates using modelled survival. For more detailed methods of estimation please refer to <http://globocan.iarc.fr/old/method/method.asp?country=729>

^a Rates per 100,000 women per year.

^b Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

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Cervical cancer in Sudan



- Second most common cancer (12 -14.5%) in Sudanese females after breast cancer (29 - 34.5%)
- Expected incidence is 40,000 per year
- Around 10,000 new cases are treated at RICK and Madani centers per year
- Crude incidence 4.5per 100,000 population per year (Rick 2007&gezaira 2006 registries)
- 85% present at stage 3&4, Stage 1 only 4 -- 5%, Stage 2 = 5 --10 %
- More than 70 % present with history of Vaginal Bleeding and Discharge for more than 3 months
- 5% with renal failure
- 4%fistulas

Aida fadlala&dina khalifa(GFMER Sudan 2012)

Cancer registry in Sudan

- Cancer of the cervix 4.0 per 100,000 population
- Cervix Gender specific rate 8.5 per 100,000
- Cancer of ovary gender specific rate 8.0 per 100,000
- Highest incidence in women aged 55-64 then above 65.
- The ASRs in this study was 12.2per 100,000. Estimate for Sudan is 7 per 100,000 which is Low compared to Uganda 52.4per 100000.

Could this be due to low prevalence of HIV in adult women? In Sudan it is 0.53% compared to 8.4% reported among Ugandan women.



Sudan Statistic



Age Distribution 250 Patients, 1993 - 2008

Age Range	Prevalence
20	0.3%
21-30	4%
31-40	16.4%
41-50	23.5%
51-60	29.6%
61-70	12.7%
7	13.6%

Residence 250 Patients, 1993 - 2008

Age Range	Prevalence
Western	31.2%
Khartoum	26.4%
Central	20%
Northern	12.8%
Foreigners	4.8%
Eastern	3.2%
Southern	1.6%

Stages 250 Patients, RICK 1993 -- 2010

Stage1	4.8 %
Stage 2 A	4.8 %
Stage 2 B	6.4 %
Stage 3 A	36.8 %
Stage 3 B	33.6 %
Stage 4 A	5.6 %
Stage 4 B	8 %

Screening tests

- Conventional cervical cytology
- Unaided visual inspection (“down staging”)
- Naked eye visual inspection with 3-5% acetic acid (VIA)
- Visual inspection with acetic acid using low-level (2-4X) magnification (VIAM)
- Visual inspection with Lugol’s iodine (VILI)
- HPV testing

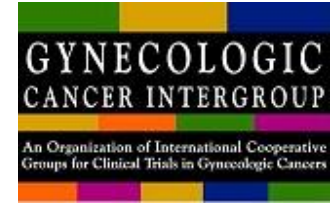
IARC'S CERVICAL CANCER SCREENING PROGRAMME

ACCURACY OF SCREENING TESTS

Test	No. of women (study sites)	Sensitivity % (range in study sites)	Specificity % (range in study sites)
Cytology	22,633 (5)	58 (29-77)	95 (89-99)
HPV testing	18,065 (4)	67 (46-81)	94 (92-95)
VIA	54,981 (11)	77 (58-94)	86 (75-94)
VIAM	16,900 (3)	64 (61-71)	87 (83-90)
VILI	49,080 (10)	92 (76-97)	85 (73-91)
VIA + or VILI +	49,080 (10)	94	81
VIA + and VILI +	49,080 (10)	79	89



Screen Tests used in Sudan



- *Pap smear* (low sen., high spec.,)
- Liquid based cytology
- *VIA* (higher sens. and lower spec. compared to pap smear)
- 2-HPV testing (availability, funding)
- 3-vaccination (who, when, how, Funding)

Visual inspection with acetic acid (VIA)

- 934 asymptomatic cases had pap smear and VIA; 119 cases were positive
- 88 confirmed positive by colposcopy and bx, out of them 22 were invasive cancer stage 1
- VIA had higher sensitivity and lower specificity than pap smear; 60.2%v47.7% 41.9% v83.8%
- Combining both results in better sensitivity 82.6 and specificity .92.2

Awareness

In a study carried out on 500 married women of which 52% were university degree holders the results were as below:

- 48% had never heard of pst
- 15.8% had a smear before
- 39.2% heard of HPV vaccination.
- 11.4% were positive

Source: Almobarak AO, et al; Asian Pac Jcancer Prev.2016

- In 2003, 42% of 256 cases where surveyed; almost 35% had never had a pap smear.
- In a survey of 23 married gynecologists working in Khartoum only 7 had a pap smear before

Source: Hassan FM,et al. Gulf J Oncolog.2009/



Is the issue health education?

4.1.2 HPV type distribution among women with normal cervical cytology, precancerous cervical lesions and cervical cancer

Table 14: Prevalence of HPV16 and HPV18 by cytology in Sudan

	No. tested	HPV 16/18 Prevalence	
		%	(95% CI)
Normal cytology ¹	-	-	-
Low-grade lesions ²	-	-	-
High-grade lesions ^{3,4}	-	-	-
Cervical cancer ^{5,4}	78	98.7	(93.1-99.8)

Data updated on 19 May 2017 (data as of 30 Jun 2015 / 30 Jun 2015).

95% CI: 95% Confidence Interval; High-grade lesions: CIN-2, CIN-3, CIS or HSIL; Low-grade lesions: LSIL or CIN-1;

The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells)

¹Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bruni L, J Infect Dis 2010; 202: 1789. 2) De Sanjosé S, Lancet Infect Dis 2007; 7: 453

²Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157

³Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Smith JS, Int J Cancer 2007;121:621 3) Clifford GM, Br J Cancer 2003;89:101.

⁴Contributing studies: Abate E, J Med Virol 2013; 85: 282

⁵Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

I. Key data on HPV and HPV-related cancers



Sudan has a population of 12.02 millions women ages 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 833 women are diagnosed with cervical cancer and 534 die from the

disease. Cervical cancer ranks as the 2nd most frequent cancer among women in Sudan and the 5th most frequent cancer among women between 15 and 44 years of age. Data is not yet available on the HPV burden in the general population of Sudan. However, in Northern Africa, the region Sudan belongs to, about 2.7% of women in the general population are estimated to harbour cervical HPV-16/18 infection at a given time, and 78.9% of invasive cervical cancers are attributed to HPV-16 or 18.

Table 1. Crude incidence rates of HPV-related cancers

	Male	Female
Cervical cancer	-	4.5
Anal cancer	-	-
Vulva cancer	-	-
Vaginal cancer	-	-
Penile cancer	-	-
Pharynx (excluding nasopharynx)	0.5	1.1

Figure 1. Comparison of the ten most frequent HPV oncogenic types in Sudan among women with and without cervical lesions

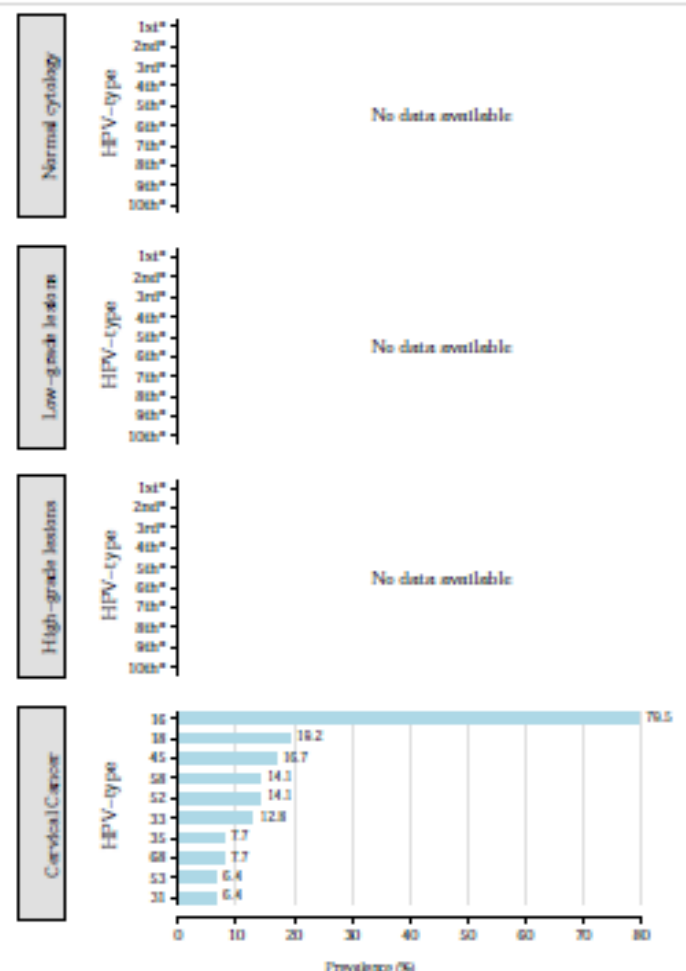


Table 2. Burden of cervical cancer

	Incidence	Mortality
Annual number of new cases/deaths	833	534
Crude rate	4.5	2.9
Age-standardized rate	7.9	5.3
Cumulative risk 0-74 years (%)	0.9	0.6
Ranking of cervical cancer (all years)	2nd	3rd
Ranking of cervical cancer (15-44 years)	5th	8th

Table 3. Burden of cervical HPV infection Sudan

	No. Tested	% (95% CI)
HPV prevalence in women with normal cytology	-	--
HPV 16/18 prevalence:		
Normal cytology	-	--
Low-grade cervical lesions	-	--
High-grade cervical lesions	-	--
Cervical cancer	78	98.7 (93.1-99.8)

Table 36: Estimated coverage of cervical cancer screening in Sudan

Reference ^{1,a}	Year	Population	Urban vs rural or both (all)	N Women	Age range	Within the last year(s)	Coverage (%) ^b
Hassan 2009	2003-2008	General female population	Urban	256	-	3y	-

Data accessed on 31 Dec 2016.

^aData from Khartoum. Cytology coverage

^bProportion of women in the total sample of the mentioned age range in the country or region that reported having a Pap smear during a given time period (e.g., last year, last 2, 3, 5 years or ever).

Data sources:

¹Hassan FM, Khirelseed M. Cervical cancer screening among Sudanese women. Gulf J Oncolog. 2009 Jul;(6):23-34.

Human Papilloma Virus in Sudan

In a study of 40 cases of which 10 were control; the cases were tested for types 16 and 18:

- (16/40) 40% were positive (high incidence)
- 8 type 16, 6 type 18 and 2 had both types 99.7% result from HR-HPV
- 16&18 70% OF SCCs .
- 50% of adenocarcinoma is thought to be due to type 18

Source: Elasbali et al ,infectious agents and cancer 2012 7:17

- From 135 smears, 69.3% of smears were negative, 16.3% were inflammatory, 8.9% were mild dyskaryosis, 3.7% were moderate dyskaryosis and 1.8% were severe dyskaryosis.
- 60.7% beta globin positive for HPV

Source Salih et al: Infectious agents and cancer 2010 5:26

Constraints

- Awareness (smear, vaccination)
- Lack of health education
- Late diagnosis
- Poverty
- Limited medical resources
- Not supported by the state
- No policies
- No commitment
- Local healers
- War

Thank you



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