

## Supplementary materials

**Title:** Incidence of Head and Neck Cancer in black populations: Analysis of Cancer registry data by the African Caribbean Cancer Consortium

**Supplementary table 1:** Ranking of proportion of head and neck cancer subsite by country

	Ranking of frequency						
	1	2	3	4	5	6	7
<b>Caribbean</b>							
Barbados	OP	LX	OC	NP	SNC	HP	SG
Grenada	OP	OC	LX	HP	SNC	NP	SG
Guadeloupe	OP	LX	OC	HP	SG	NP	SNC
Jamaica	OC	OP	NP	HP			
Trinidad	LX	OC	OP	NP	SG	HP	
<b>Africa</b>							
Ghana	OC	LX	SNC	NP	SG	OP	HP
Kenya	OC	NP	LX	SG	SNC	HP	OP
Nigeria	NP	OC	SG	LX	SNC	OP	HP
<b>USA</b>							
SEER	LX	OP	OC	SG	HP	NP	SNC
Florida	LX	OP	OC	SG	HP	NP	SNC

*n*=19,125 cases

OC: oral cavity, OP: oropharynx, NP: Nasopharynx, LX: Larynx, HP: Hypopharynx, SG: Salivary gland, SNC: Sinonasal cavities

NB: empty cells mean that not all subsites were provided from initial data sets received

**Supplementary table 2:** Age-specific crude IR of HNC from 2013-2015 by subsite and sex using PBCR data

Age	Caribbean						Africa				USA			
	Barbados		Guadeloupe		Trinidad		Kenya		Nigeria‡		SEER-21		Florida	
	IR	CI 95%	IR	CI 95%	IR	CI 95%	IR	CI 95%	IR	CI 95%	IR	CI 95%	IR	CI 95%
<b>Men</b>														
<40	1.4	(0.0-2.9)	1.0	(0.0-2.1)	0.2	(0.0-0.4)	1.4	(1.1-1.8)	1.0	(0.8-1.3)	0.8	(0.7-1.0)	1.0	(0.6-1.4)
40-54	19.3	(10.1-28.4)	25.6	(16.7-34.5)	5.9	(3.5-8.3)	11.8	(9.5-14.2)	5.5	(4.1-7.0)	22.4	(20.7-24.1)	18.3	(15.4-21.1)
55-64	62.7	(40.6-84.7)	77.9	(56.1-99.7)	28.8	(21.3-36.2)	42.5	(32.8-52.3)	10.2	(6.5-14.0)	73.4	(69.2-77.6)	62.8	(55.6-70.0)
65+	40.4	(23.5-57.2)	89.9	(68.0-111.7)	30.9	(22.3-39.5)	77.1	(57.4-96.7)	14.7	(9.7-19.6)	89.8	(84.5-95.0)	81.7	(72.7-90.8)
<b>Women</b>														
<40	0.9	(0.0-2.2)	0.3	(0.0-0.9)	0.6	(0.2-1.0)	0.8	(0.6-1.1)	0.7	(0.5-1.0)	0.7	(0.5-0.9)	0.7	(0.4-1.0)
40-54	3.1	(0.0-6.6)	4.1	(0.8-7.3)	4.0	(2.0-6.0)	8.3	(5.9-10.7)	5.0	(3.4-6.6)	8.5	(7.5-9.5)	6.8	(5.2-8.4)
55-64	5.3	(0.0-11.3)	9.6	(2.5-16.7)	5.1	(1.9-8.3)	31.5	(21.3-41.6)	10.2	(5.9-14.6)	20.3	(18.3-22.4)	17.0	(13.5-20.4)
65+	11.2	(3.4-19.0)	11.9	(5.2-18.6)	6.8	(3.1-10.5)	40.7	(26.4-55.1)	12.7	(7.8-17.7)	23.3	(21.1-25.5)	20.2	(16.4-24.0)

IR: Incidence rate per 100 000 persons, and CI: Confidence intervals

‡: Contributing registries for Nigeria were Abuja, Adamawa, Calabar, Ekiti, Enugu, Sokoto, Uyo

Trinidad: Trinidad & Tobago

SEER and Florida blacks

**Supplementary table 3:** Age-standardised (world) IR of HNC from 2010-2012 and 2013-2015 by subsite and sex using PBCR data

	Oral cavity		Oropharynx		Nasopharynx		Larynx		Hypopharynx		Salivary gland		Sinonasal cavity	
	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)
<b>Men</b>														
<i>Caribbean</i>														
Barbados	NA	1.4 (0.5-2.2)	NA	4.2 (2.6-5.8)	NA	1.5 (0.5-2.6)	NA	2.6 (1.3-3.8)	NA	0.6 (0.0-1.2)	NA	0.5 (0.0-1.1)	NA	1.2 (0.2-2.2)
Guadeloupe	2.4 (1.4-3.5)	3.2 (2.1-4.4)	6.7 (4.9-8.4)	6.5 (4.7-8.2)	0.6 (0-1.2)	0.7 (0.1-1.2)	3.7 (2.5-5.0)	4.0 (2.7-5.3)	1.7 (0.8-2.6)	2.1 (1.1-3.0)	0.7 (0.1-1.3)	0.9 (0.2-1.5)	0.7 (0.1-1.3)	0.5 (0.0-1.1)
Jamaica	1.8 (0.9-2.7)	NA	0.7 (0.1-1.2)	NA	0.5 (0.1-0.9)	NA	NA	NA	0.4 (0.0-0.8)	NA	NA	NA	NA	NA
Trinidad	1.0 (0.6-1.4)	1.2 (0.8-1.6)	1.3 (0.8-1.7)	0.9 (0.5-1.3)	0.7 (0.3-1)	0.6 (0.3-0.8)	3.0 (2.3-3.7)	2.2 (1.6-2.8)	0.2 (0.0-0.4)	0.2 (0.0-0.3)	0.5 (0.2-0.8)	0.5 (0.2-0.7)	NA	NA
<i>Africa</i>														
Ghana	0.1 (0.0-0.2)	0.5 (0.2-0.7)	0.0 (0.0-0.1)	0.1 (0.0-0.2)	0	0.1 (0.0-0.2)	0	0.3 (0.1-0.5)	0	0	0.1 (0.0-0.1)	0.0 (0.0-0.1)	0	0.1 (0.0-0.3)
Kenya	4.2 (3.3-5.1)	3.6 (2.8-4.5)	0.4 (0.0-0.7)	1.1 (0.6-1.6)	5.0 (4.1-5.8)	3.1 (2.5-3.7)	3.0 (2.1-3.9)	3.2 (2.4-4.1)	0.6 (0.2-0.9)	0.5 (0.2-0.8)	0.6 (0.2-1.0)	0.3 (0.1-0.4)	0.9 (0.4-1.3)	0.6 (0.3-0.9)
Nigeria <sup>†</sup>	0.5 (0.3-0.7)	0.6 (0.4-0.8)	0.4 (0.2-0.6)	0.5 (0.3-0.7)	0.7 (0.5-0.9)	1.3 (1.0-1.6)	0.6 (0.4-0.8)	0.6 (0.3-0.8)	0.0 (0.0-0.1)	0.1 (0.0-0.2)	0.4 (0.2-0.5)	0.3 (0.2-0.5)	0.3 (0.2-0.4)	0.2 (0.1-0.3)
<i>USA</i>														
Florida	2.1 (1.7-2.5)	2.6 (2.2-3.0)	3.9 (3.3-4.5)	4.2 (3.7-4.8)	0.9 (0.6-1.2)	0.7 (0.5-1.0)	5.0 (4.4-5.6)	4.4 (3.9-5.0)	1.3 (1.0-1.6)	1.1 (0.9-1.4)	0.7 (0.5-1.0)	0.9 (0.6-1.1)	0.4 (0.2-0.6)	0.6 (0.4-0.8)
SEER	2.8 (2.6-3.1)	2.5 (2.3-3.1)	5.2 (4.9-5.5)	5.1 (4.8-5.4)	0.9 (0.8-1.0)	1.0 (0.9-1.2)	5.9 (5.6-6.2)	5.5 (5.2-5.8)	1.3 (1.1-1.4)	1.1 (0.9-1.2)	1.0 (0.9-1.1)	1.0 (0.9-1.1)	0.6 (0.5-0.7)	0.7 (0.6-0.8)
<b>Women</b>														
<i>Caribbean</i>														
Barbados	NA	0.4 (0.0-0.9)	NA	0.2 (0.0-0.5)	NA	0.3 (0.0-0.7)	NA	0.2 (0.0-0.5)	NA	0.3 (0.0-0.8)	NA	0.3 (0.0-0.8)	NA	0.5 (0.0-1.0)
Guadeloupe	0.8 (0.3-1.3)	0.8 (0.3-1.4)	1.0 (0.4-1.7)	0.6 (0.1-1.1)	0.5 (0.0-0.9)	0.2 (0.0-0.5)	0.3 (0.0-0.7)	0.3 (0.0-0.6)	0.0 (0.0-0.1)	0.1 (0.0-0.3)	0.6 (0.1-1.1)	0.3 (0.0-0.7)	0.1 (0.0-0.3)	0.2 (0.0-0.4)
Jamaica	0.5 (0.1-0.9)	NA	0	NA	0.2 (0.0-0.5)	NA	NA	NA	0.2 (0.0-0.6)	NA	NA	NA	NA	NA
Trinidad	1.0 (0.6-1.4)	0.8 (0.4-1.1)	0.1 (0.0-0.3)	0.1 (0-0.2)	0.1 (0.0-0.3)	0.4 (0.2-0.7)	0.2 (0-0.3)	0.2 (0.0-0.4)	0.1 (0.0-0.2)	0.1 (0-0.2)	0.2 (0.0-0.4)	0.2 (0.0-0.4)	NA	NA
<i>Africa</i>														
Ghana	0	0.1 (0.0-0.2)	0	0.1 (0.0-0.1)	0	0.1 (0.0-0.2)	0	0.1 (0-0.2)	0	0	0.1 (0.0-0.2)	0.2 (0.1-0.4)	0.1 (0.0-0.2)	0.1 (0.0-0.2)
Kenya	3.8 (2.7-4.8)	3.9 (3.0-4.9)	0.2 (0.0-0.4)	0.3 (0.1-0.6)	2.0 (1.4-2.6)	1.5 (1.0-1.9)	1.7 (0.9-2.4)	0.3 (0.0-0.6)	0.8 (0.4-1.3)	0.4 (0.1-0.7)	0.4 (0.2-0.6)	0.5 (0.3-0.8)	0.4 (0.1-0.8)	0.5 (0.2-0.8)
Nigeria <sup>†</sup>	0.4 (0.3-0.6)	0.8 (0.5-1.1)	0.2 (0.1-0.4)	0.1 (0.0-0.3)	0.6 (0.4-0.8)	0.9 (0.6-1.2)	0.3 (0.1-0.5)	0.2 (0.0-0.3)	0	0.1 (0.0-0.2)	0.5 (0.3-0.7)	0.6 (0.4-0.9)	0.2 (0.1-0.4)	0.4 (0.2-0.6)
<i>USA</i>														
Florida	1.4 (1.4-1.7)	1.2 (0.9-1.4)	1.1 (0.8-1.4)	0.9 (0.7-1.1)	0.3 (0.1-0.4)	0.4 (0.2-0.5)	0.8 (0.6-1.0)	0.6 (0.4-0.8)	0.3 (0.1-0.4)	0.2 (0.1-0.3)	0.7 (0.5-1.0)	0.8 (0.6-1.1)	0.4 (0.2-0.6)	0.4 (0.2-0.5)
SEER	1.4 (1.2-1.5)	1.3 (1.2-1.5)	1.3 (1.1-1.4)	1.2 (1.1-1.3)	0.4 (0.3-0.5)	0.4 (0.3-0.5)	1.4 (1.2-1.5)	1.1 (1.0-1.2)	0.2 (0.1-0.3)	0.2 (0.2-0.3)	0.8 (0.7-1.0)	1.0 (0.8-1.1)	0.4 (0.3-0.5)	0.4 (0.4-0.5)

IR: Incidence rate per 100 000 persons, and CI: Confidence intervals;

†: Contributing registries for Nigeria were Abuja, Adamawa, Calabar, Ekiti, Enugu, Sokoto, Uyo

NA: Not applicable, no cases provided for analysis, Trinidad: Trinidad & Tobago, SEER and Florida blacks

**Supplementary table 4:** Age-standardised (world) IR of Head and neck squamous cell carcinoma (HNSCC) only, from 2010-2012 and 2013-2015 by subsite and sex using PBCR data

	Oral cavity		Oropharynx		Nasopharynx		Larynx		Hypopharynx		Salivary gland		Sinonasal cavity	
	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)	2010-2012 IR (95%CI)	2013-2015 IR (95%CI)
<b>Men</b>														
<i>Caribbean</i>														
Barbados	NA	1.1 (0.3-1.9)	NA	4.1 (2.5-5.6)	NA	1.2 (0.2-2.2)	NA	2.2 (1.0-3.4)	NA	0.4 (0.0-0.9)	NA	0.2 (0.0-0.5)	NA	0.5 (0.0-1.0)
Guadeloupe	2.4 (1.4-3.5)	3.2 (2.0-4.3)	6.5 (4.8-8.3)	6.1 (4.4-7.8)	0	0	3.7 (2.5-5.0)	4.0 (2.7-5.3)	1.7 (0.8-2.6)	2.1 (1.1-3.0)	0.1 (0.0-0.2)	0.4 (0.0-0.9)	0.3 (0.0-0.7)	0
Jamaica	1.5 (0.7-2.4)	NA	0.7 (0.1-1.2)	NA	0.4 (0.0-0.8)	NA	NA	NA	0.4 (0.0-0.8)	NA	NA	NA	NA	NA
Trinidad	0.6 (0.3-0.9)	0.7 (0.4-1.1)	0.8 (0.5-1.2)	0.5 (0.2-0.8)	0.2 (0.0-0.4)	0.0 (0.0-0.1)	1.9 (1.3-2.4)	1.2 (0.8-1.6)	0.1 (0.0-0.3)	0.1 (0.0-0.2)	0.1 (0.0-0.2)	0.1 (0.0-0.3)	NA	NA
<i>Africa</i>														
Ghana	0.1 (0.0-0.2)	0.4 (0.2-0.7)	0.0 (0.0-0.1)	0.1 (0.0-0.2)	0	0.0 (0.0-0.1)	0	0.2 (0.0-0.3)	0	0	0	0	0	0.0 (0.0-0.1)
Kenya	3.6 (2.7-4.5)	2.5 (1.8-3.2)	0.2 (0.0-0.4)	0.3 (0.1-0.6)	1.1 (0.6-1.5)	0.9 (0.6-1.2)	2.3 (1.5-3.1)	2.0 (1.3-2.6)	0.4 (0.1-0.7)	0.4 (0.2-0.7)	0.1 (0.0-0.1)	0.2 (0.0-0.3)	0.1 (0.0-0.3)	0.2 (0.0-0.4)
Nigeria <sup>†</sup>	0.2 (0.1-0.4)	0.3 (0.2-0.5)	0.2 (0.1-0.4)	0.2 (0.1-0.4)	0.2 (0.1-0.2)	0.3 (0.1-0.4)	0.6 (0.4-0.8)	0.4 (0.2-0.6)	0.0 (0.0-0.1)	0.0 (0.0-0.1)	0.1 (0.0-0.1)	0.0 (0.0-0.1)	0.1 (0.0-0.2)	0.1 (0.0-0.1)
<b>Women</b>														
<i>Caribbean</i>														
Barbados	NA	0.4 (0.0-0.9)	NA	0.2 (0.0-0.5)	NA	0.1 (0.0-0.4)	NA	0.2 (0.0-0.5)	NA	0.3 (0.0-0.8)	NA	0	NA	0
Guadeloupe	0.6 (0.2-1.1)	0.8 (0.3-1.4)	0.9 (0.3-1.5)	0.6 (0.1-1.1)	0	0.2 (0.0-0.5)	0.3 (0.0-0.7)	0.3 (0.0-0.6)	0.0 (0.0-0.1)	0.1 (0.0-0.3)	0.1 (0.1-0.3)	0.3 (0.0-0.7)	0.1 (0.0-0.3)	0.2 (0.0-0.4)
Jamaica	0.5 (0.1-0.9)	NA	0	NA	0.1 (0.0-0.3)	NA	NA	NA	0.2 (0.0-0.6)	NA	NA	NA	NA	NA
Trinidad	0.7 (0.4-1.1)	0.7 (0.4-1.1)	0.0 (0.0-0.1)	0.0 (0.0-0.1)	0.0 (0.0-0.1)	0	0.1 (0.0-0.2)	0.0 (0.0-0.1)	0.0 (0.0-0.1)	0	0	0	NA	NA
<i>Africa</i>														
Ghana	0	0.1 (0.0-0.2)	0	0.1 (0.0-0.1)	0	0.1 (0.0-0.1)	0	0.0 (0.0-0.1)	0	0	0	0.1 (0.0-0.2)	0.0 (0.0-0.1)	0.1 (0.0-0.2)
Kenya	3.1 (2.1-4.2)	2.6 (1.8-3.4)	0.2 (0.0-0.4)	0.0 (0.0-0.1)	0.6 (0.3-1.0)	0.3 (0.1-0.5)	1.1 (0.5-1.7)	0	0.6 (0.3-1.0)	0.4 (0.1-0.6)	0.1 (0.0-0.2)	0.1 (0.0-0.2)	0.1 (0.1-0.3)	0.3 (0.1-0.4)
Nigeria <sup>†</sup>	0.2 (0.1-0.4)	0.2 (0.1-0.3)	0.1 (0.0-0.2)	0.1 (0.0-0.2)	0.1 (0.0-0.3)	0.2 (0.0-0.2)	0.3 (0.1-0.5)	0.1 (0.0-0.3)	0	0	0.0 (0.0-0.1)	0.0 (0.0-0.1)	0.0 (0.0-0.0)	0.1 (0.0-0.2)

IR: Incidence rate per 100 000 persons, and CI: Confidence intervals

†: Contributing registries for Nigeria were Abuja, Adamawa, Calabar, Ekiti, Enugu, Sokoto, Uyo

NA: Not applicable, no cases provided for analysis

Trinidad: Trinidad & Tobago

SEER and Florida blacks were omitted from this table due to unavailability

**Supplementary table 5:** World standardised incidence rates of head and neck cancers from African countries (IARC, 2018<sup>†</sup>).

Country	Registry/coverage	Period of diagnosis	Men					Women				
			Mouth	Salivary gland	Nasopharynx	Other pharynx	Larynx	Mouth	Salivary gland	Nasopharynx	Other pharynx	Larynx
			(C00-06)	(C07-08)	(C11)	(C09-10, C12-14)	(C32)	(C00-06)	(C07-08)	(C11)	(C09-10, C12-14)	(C32)
<b><i>Central Africa</i></b>												
Congo	Brazzaville	2009–2013	0.5	0.7	0.3	0.1	1.2	0.4	0.3	0.1	0.0	0.3
<b><i>Eastern Africa (mainland)</i></b>												
Ethiopia	Addis Ababa	2012–2013	1.3	0.6	1.1	0.1	0.6	1.4	0.4	0.7	0.2	0.1
Kenya	Eldoret	2008–2011	2.4	0.4	5.2	1.9	2.1	2.0	0.1	2.3	0.6	0.7
Kenya	Nairobi	2007–2011	7.5	1.0	4.2	2.1	3.9	6.1	1.0	2.0	1.7	1.3
Malawi	Blantyre	2009–2010	1.3	0.6	0.6	0.0	1.7	0.3	1.7	0.4	0.0	0.2
Mozambique	Beira	2009–2013	2.7	2.1	0.0	0.8	0.8	1.0	0.5	0.0	0.0	0.3
Uganda	Kampala	2008–2012	4.1	1.0	2.8	1.4	2.8	1.7	0.3	1.9	0.5	0.5
Zimbabwe	Bulawayo: Black	2011–2013	2.0	1.5	0.9	0.5	2.3	1.0	0.2	0.1	0.0	0.0
Zimbabwe	Harare: Black	2010–2012	2.6	1.3	1.4	1.3	5.6	1.8	1.0	0.7	0.5	0.2
<b><i>Eastern Africa (islands)</i></b>												
France	Réunion	2011	8.9	0.4	0.9	11.1	5.2	2.5	0.9	0.4	0.2	0.6
Mauritius	National	2010–2012	5.3	0.8	1.0	1.7	3.7	2.3	0.4	0.1	0.4	0.3
Seychelles	National	2009–2012	14.3	0.5	0.0	16.3	9.8	2.5	0.4	0.0	0.5	1.7
<b><i>Southern Africa</i></b>												
Botswana	National	2005–2008	6.5	1.0	1.1	3.3	4.1	1.4	0.6	0.5	0.3	0.2
Namibia	National	2009	10.2	2.7	1.0	4.7	4.5	4.0	1.2	0.4	1.1	1.1
South Africa	National	2007	5.0	0.5	0.2	1.3	2.8	1.5	0.3	0.1	0.3	0.3
South Africa	Eastern Cape	2008–2012	5.0	0.1	0.1	1.4	3.3	0.9	0.2	0.1	0.1	0.4
<b><i>Western Africa</i></b>												
Benin	Cotonou	2013–2015	0.5	0.0	0.7	0.0	1.1	2.1	0.0	0.3	0.5	0.0
Côte d'Ivoire	Abidjan	2012–2013	0.7	0.7	0.3	0.4	1.6	1.7	0.6	0.0	0.1	0.1
The Gambia	National	2007–2011	0.4	0.1	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0
Guinea	Conakry	2001–2010	1.1	0.3	0.2	0.3	1.3	1.7	0.3	0.0	0.2	0.5
Mali	Bamako	2010–2014	2.1	0.6	0.2	0.6	1.8	2.4	0.8	0.1	0.5	0.4
Niger	Niamey	2006–2009	1.4	0.6	0.5	0.6	1.1	1.4	0.3	0.1	0.3	0.1
Nigeria	Abuja	2013	1.3	2.2	0.6	0.0	0.4	0.9	1.6	0.0	0.0	2.0

Nigeria	Calabar	2009–2013	0.2	0.0	0.3	0.2	1.6	0.4	0.2	0.4	0.0	0.0
Nigeria	Ibadan	2006–2009	0.9	0.7	1.6	0.4	2.4	1.0	0.5	0.4	0.3	0.5

Incidence rate per 100 000 persons

†: Data derived from Cancer in Sub-Saharan Africa, IARC 2018, edited by D.M. Parkin, J. Ferlay, A. Jemal, M. Borok, S.S. Manraj, G.G. N’da, J.O. Ogunbiyi, B. Liu, F. Bray. IARC Scientific Publications; 167