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ORIGINAL ARTICLE

Endometrial cancer risk and trends among distinct African descent populations

Heidy N. Medina PhD, MPH[1] | Frank J. Penedo PhD[2,3] | Clarisse Joachim MD, PhD[4] | Jacqueline Deloumeaux MD, PhD[5] | Tulay Koru-Sengul PhD, MA, MHS[1,2] | Jonathan Macni MPH[4] | Bernard Bhakkan[5] | Jessica Peruvien[5] | Matthew P. Schlumbrecht MD, MPH[2,6] | Paulo S. Pinheiro MD, PhD, MSc[1,2]

[1]Department of Public Health Sciences, University of Miami School of Medicine, Miami, Florida, USA

[2]Sylvester Comprehensive Cancer Center, University of Miami School of Medicine, Miami, Florida, USA

[3]Department of Psychology, University of Miami, Miami, Florida, USA

[4]Martinique Cancer Registry, University Hospital of Martinique, Martinique, France

[5]Guadeloupe Cancer Registry, University Hospital of Guadeloupe, Guadeloupe, France

[6]Department of Obstetrics & Gynecology, University of Miami School of Medicine, Miami, Florida, USA

Correspondence
Heidy N. Medina, Don Soffer Clinical Research Center, 1120 NW 14th St, Miami, FL 33136, USA.
Email: h.medina3@med.miami.edu

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Abstract

Background: Endometrial cancer (EC) is the fourth most common cancer among Black women in the United States, a population disproportionately affected by aggressive nonendometrioid subtypes (e.g., serous, carcinosarcoma). To examine EC vulnerability among a wider spectrum of African descent populations, a comparison between Black women residing in different countries, rather than in the United States alone, is needed.

Methods: The authors analyzed 34,789 EC cases from Florida (FL) (2005–2018), Martinique (2005–2018), and Guadeloupe (2008–2018) based on cancer registry data. Age-adjusted incidence rates, incidence rate ratios (IRRs), and annual percent changes (APC) in trends were estimated for Black populations residing in the United States (non-Hispanic Blacks [NHB]) and Caribbean. The US non-Hispanic White (NHW) population was used as a reference.

Results: Caribbean Black women had the lowest rates for endometrioid and non-endometrioid subtypes. Nonendometrioid types were most common among US (FL) NHBs (9.2 per 100,000), 2.6 times greater than NHWs (IRR, 2.60; 95% confidence interval [CI], 2.44–2.76). For endometrioid EC, rates increased 1.8% (95% CI, 0.1–3.5) yearly from 2005 to 2018 for US (FL) NHBs and 1.2% (95% CI, 0.9–1.6) for US (FL) NHWs whereas no change was observed for Caribbean Blacks. For non-endometroid carcinomas, rates increased 5.6% (95% CI, 4.0–7.2) among US (FL) NHB, 4.4% (95% CI, 0.3–8.6) for Caribbean Black, and 3.9% for US (FL) NHW women (95% CI, 2.4–5.5).

Conclusions: Lower rates of nonendometrioid EC among Caribbean Black women suggest that vulnerability for these aggressive tumor subtypes may not currently be an overarching African ancestry disparity. Most importantly, there is an alarmingly increasing trend in nonendometrioid across all populations studied, which warrants further surveillance and etiological research for this particular subtype.

Plain Language Summary

- We analyze population-based incidence rates and trends of endometrial cancer (EC) for African descent populations residing in different countries (i.e., United States, Martinique, Guadeloupe) to examine whether EC vulnerability among Black women is socio-environmental or more ancestry-specific in nature.
- The increased EC risk was not uniform across all Black women since the Caribbean had the lowest rates (for endometrioid and nonendometrioid histology subtypes).
- Regardless, from 2005 to 2018, there was an increasing trajectory of nonendometrioid EC for all groups, regardless of race.

KEYWORDS
African descent, Black, Caribbean, endometrial cancer, endometrioid, incidence, nonendometrioid, population-based, registry, White

INTRODUCTION

Endometrial cancer (EC) is the fourth most common cancer among Black women in the United States (US), representing almost one in 10 of all new cancer cases in 2022.[1] Established risk factors for EC, particularly endometrioid histology types, include obesity, diabetes, nulliparity, oral contraceptive use, and hormonal therapy.[2–7] In the case of Black women, a higher prevalence of obesity, diabetes, and nulliparity may be contributing to racial/ethnic differences in EC incidence.[3] There is a clear difference in clinical outcomes between endometrioid and the more aggressive nonendometrioid EC histologies,[8] although prior evidence also shows important differences in prognosis for high-grade relative to low-grade endometrioid subtypes.[9,10]

In the 1970s, Black women had EC incidence rates nearly two times lower than that of White women[1]; yet, these rates surpassed those of non-Hispanic Whites (NHW) in 2007 and have consistently remained higher thereafter,[8] even after taking into account racial/ethnic differences in hysterectomy prevalence. Both endometrioid and nonendometrioid EC types are increasing more rapidly, rising 1.3% and 3.2% yearly, respectively, among non-Hispanic Black (NHB) women in comparison to NHW women.[8] Alarmingly, as better data on specific subtypes of EC became available, it has been found that NHB women have almost twice the rate of nonendometrioid subtypes as NHW women.[8]

Differences in EC risk between Black women, as an aggregate population, and White women in the United States have been well documented in the literature.[8,11–14] However, the extent to which intragroup heterogeneity in incidence exists among African descent populations has been less studied. A recent population-based registry study on Type 2 EC found that US-born, Caribbean-born, and Hispanic Black women unanimously had higher rates compared to NHWs, but this comparison was exclusively examined for populations residing in the United States.[14]

To ascertain whether the suggested vulnerability of US Black populations for EC as a whole and the more aggressive subtypes, in particular, is predominantly related to social factors corresponding to "assigned race" (i.e., societally constructed) and/or if it African ancestry-related (i.e., based on genetic origin), a comparison between African descent populations in the United States with those in other parts of the world is needed. Global studies on African descent populations are not common because of the deficient availability of quality population-based cancer registry data in African cancer registries, especially in terms of completeness of the data,[15–17] as well as the lack of race-specific data collection in many parts of the world where data completeness is not a problem and where there are large African descent populations (e.g., Europe). In this respect, the Caribbean islands of Martinique and Guadeloupe stand as an exception. Their populations are composed of majority non-Hispanic African descent populations (91% Black and/or mixed Black).[18] Moreover, as French overseas departments, they have a high Human Development Index,[19] a universal health care system, and robust infrastructure to ensure not only high health care quality but also overall registry data completeness and quality. Thus, these islands, referred to here as the French Caribbean, are a suitable population-based comparison to the US African descent population.

In the current study, we compared heterogeneity in incidence and trends for EC, overall and by histology, between African descent women in Florida with women in the French Caribbean, specifically, Martinique and Guadeloupe.

MATERIALS AND METHODS

Data sources and study population

We analyzed all cases of EC diagnosed in Florida (2005–2018), Martinique (2005–2018), and Guadeloupe (2008–2018) as reported

to the respective population-based cancer registries. De-identified data based on the *International Classification of Disease, for Oncology, 3rd edition* (ICD-O-3) topography code C54.X and C55.9 and morphology codes 8000–8951[20] were retrieved from the Florida Cancer Data System (FCDS), Martinique Cancer Registry, and Guadeloupe Cancer Registry. FCDS has been nationally certified by the North American Association of Central Cancer Registries at its highest level for meeting standards for completeness, timeliness, and quality. The Martinique and Guadeloupe registries abide by the high-quality control measures of the French Network of Cancer Registries.[21] Variables requested from the registries included: race/ethnicity and birthplace (in the case of Florida), age at diagnosis, a socioeconomic status indicator, date of diagnosis, and morphology (histology), among others.

Florida is demographically heterogeneous with Blacks comprising 17% of the total population.[22] Of these, nearly 20% are Caribbean in origin, with many immigrants from Haiti, Jamaica, and all other regional nations and territories. Thus, US NHB women in Florida were categorized as either US-born Blacks (i.e., African Americans) or US Caribbean-born based on country of birth.[17,23] Florida US NHBs with missing birthplace (25% of cases) were grouped into US-born Blacks or US Caribbean-born according to the majority group of known cases in a given census-tract based on previous single imputation methodology.[14,17] US Caribbean-born women in Florida were the subject of our previous investigation[14] and were excluded from this study because we wanted to compare incidence and trends between independent African descent populations, with independent health systems and negligible intermigration, such as US-born Blacks, and populations residing in the French Caribbean. In the case of the French Caribbean, all cases of EC from Martinique and Guadeloupe were included, and this population is hereafter referred to as "Caribbean Black." Last, as a non-Black reference population, we studied the US NHW population of Florida.

In terms of socioeconomic status, in Florida, census tract data was categorized into a poverty indicator as follows: low (less than 10%), moderate (between 10% and 20%), high (over 20%) poverty, and unknown. In the case of Martinique and Guadeloupe, a social deprivation index previously created using census data[24] was also categorized as a poverty indicator according to low, moderate, and high. These indicators are standardized metrics within their respective registry; however, the measures of low, moderate, and high poverty are relative between the United States and the French Caribbean.

Tumor histologic subtype was categorized as follows: endometrioid (8050, 8140, 8143, 8210–8211, 8260–8263, 8340, 8380–8384, 8560, 8570) and nonendometrioid (clear cell [8310], carcinosarcoma [8950–8951, 8980–8981], and serous [8441, 8460–8461]), and other (neuroendocrine [8013, 8041, 8045–8046, 8574], undifferentiated [8020], and general histologic descriptions [e.g., 8000, 8010]) as in previous research by Clarke et al.[8] Uterine corpus sarcomas and gestational trophoblastic tumors were excluded.

Statistical analyses

Detailed population denominators by sex and race/ethnicity in Florida were obtained from the United States Census Bureau for NHW and NHB women, using pooled and single-year American Community Survey (ACS) data for 2005–2018.[25] Population denominators for Martinique (2005–2018) and Guadeloupe (2008–2018) were obtained from the National Population and Housing Census from The French National Institute for Statistics and Economic Studies (Institut National de la Statistique et des Etudes Economiques). Age-adjusted incidence rates standardized to the 2000 US Standard Population using 18 age group bands, all 5-year except the last, 85 and older were calculated. Gamma intervals modification was used to calculate corresponding 95% confidence intervals (CIs).[26] Incidence rates were produced for all combinations of histology subtypes and race/ethnicity groups. Incidence rate ratios (IRRs) and 95% CIs were estimated using Tiwari's gamma intervals modification method[26] to compare incidence rates among US (FL) NHB women and Caribbean Black women to the reference group, US (FL) NHW women. Trends in EC incidence were estimated using the National Cancer Institute's Joinpoint regression software (version 4.9.1.0), which calculates annual percentage changes (APCs) and 95% CIs, using *t*-tests to determine statistical significance by testing whether the line segment slopes are different from zero.[27] APCs were used to summarize trends because a single segment had the best fit throughout the data. Trends were described as increasing or decreasing when the APC was statistically significant. When this was not the case, trends were considered stable.

All analyses were performed using SAS version 9.4 (SAS Institute, Cary, North Carolina). All p values were two-sided, with statistical significance defined as $p < .05$. The study was approved by the Florida Department of Health and the University of Miami institutional review board as well as all authorized officials at the Martinique and Guadeloupe Cancer Registries.

RESULTS

A total of 34,789 EC cases from the Florida, Guadeloupe, and Martinique Cancer Registries were analyzed (Table 1). Of these, in Florida, 30,011 and 3885 were US (FL) NHW and US (FL) NHB women, respectively; 893 were Caribbean Black women residing in Martinique/Guadeloupe. The median age of EC diagnosis was 65, 64, and 68 years old among US (FL) NHWs, US (FL) NHBs, and Caribbean Black women, respectively. Caribbean Black women had a greater proportion of endometrioid histology type (68%) compared to US (FL) NHBs (60%) but a lower proportion than US (FL) NHWs (79%) ($p < .0001$). US (FL) NHB women had the largest proportions of non-endometrioid carcinomas (34%) and International Federation of Gynecology and Obstetrics stage IV tumors (12%) of all populations. For Caribbean Blacks, 25% of EC cases were nonendometrioid subtypes and 3.4% of all tumors were diagnosed at stage IV. For US (FL) NHW women, nonendometrioid and stage IV tumors comprised 17% and

TABLE 1 Population-at-risk and characteristics of EC cases. Florida (2005–2018), Martinique (2005–2018), and Guadeloupe (2008–2018).

	White US (FL) NHW, No. (%)	African descent US (FL) NHB, No. (%)	Caribbean Black, No. (%)	p[a]
Average annual population-at-risk	5,617,969	1,267,684	376,563	
Total EC cases	30,011	3885	893	
Median age at diagnosis (years)				
Endometrioid	64	62	67	
Nonendometrioid	69	66	68	
All combined	65	64	68	
Poverty level				<.0001
Low	13,745 (45.8)	604 (15.5)	338 (37.8)	
Moderate	11,083 (36.9)	1146 (29.5)	253 (28.3)	
High	4882 (16.3)	2089 (53.8)	269 (30.1)	
Unknown	301 (1.0)	46 (1.2)	33 (3.7)	
Histologic subtype				<.0001
Endometrioid	23,783 (79.2)	2317 (59.6)	604 (67.6)	
Nonendometrioid				
Total	5061 (16.9)	1324 (34.1)	226 (25.3)	
Clear cell	451 (1.5)	104 (2.7)	24 (2.7)	
Mixed	1284 (4.3)	210 (5.4)	–	
Carcinosarcoma	1504 (5.0)	501 (12.9)	85 (9.5)	
Serous	1822 (6.1)	509 (13.1)	115 (12.9)	
Other	1167 (3.9)	244 (6.3)	63 (7.1)	
FIGO stage				<.0001
I	17,745 (59.1)	1795 (46.2)	324 (36.3)	
II	2947 (9.8)	448 (11.5)	91 (10.2)	
III	3083 (10.3)	458 (11.8)	98 (11.0)	
IV	1960 (6.5)	466 (12.0)	30 (3.4)	
Unknown	4276 (14.2)	718 (18.5)	350 (39.2)	

Note: --Sample size fewer than 10 cases.

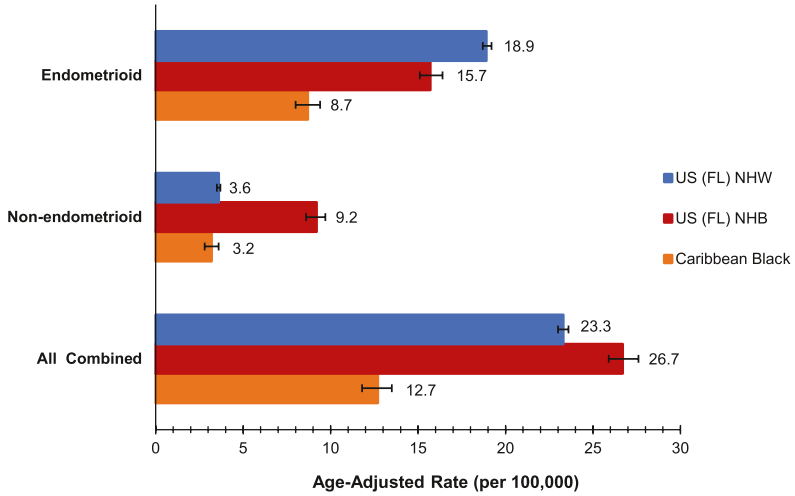
Abbreviations: EC, endometrial cancer; FIGO, International Federation of Gynecology and Obstetrics; FL, Florida; NHB, non-Hispanic Black; NHW, non-Hispanic White; US, United States.

[a]*p* value from χ^2 test.

7% of EC cases, respectively. Fifty-four percent of US (FL) NHB women with EC resided in areas of high poverty, compared to 30% for Caribbean Blacks and 16% for US (FL) NHW women.

To take into consideration the difference in median age at diagnosis between US (FL) NHWs, US (FL) NHBs, and Caribbean Blacks, we compared age-specific rates for EC overall and by subtype but did not find major differences in the pattern of distribution (Table S1). Age-adjusted EC incidence rates among US (FL) NHW, US (FL) NHB, and Caribbean Black women are shown in Figure 1. Overall, among all EC cases combined, US (FL) NHB women had the highest age-adjusted rate of 26.7 per 100,000, followed by US (FL) NHW women (23.3) whereas Caribbean Black women (12.7) had the lowest. In comparison to US (FL) NHW women, US (FL) NHBs had a 14% higher risk (IRR, 1.14; 95% CI, 1.11-1.18) of overall EC diagnosis whereas Caribbean Blacks had a 45% lower risk (IRR 0.55; 95% CI, 0.51-0.59) of EC diagnosis.

By histology type, rates of endometrioid carcinomas were highest among US (FL) NHW women (18.9) and lowest for Caribbean Black women (8.7). US (FL) NHB women and Caribbean Black women had a 17% (IRR 0.83; 95% CI, 0.80–0.87) and 54% (IRR 0.46; 95% CI, 0.42–0.50) lower rate of endometrioid EC diagnosis, respectively, than US NHW women. Nonendometrioid types were most common among US (FL) NHBs (9.2 per 100,000), and 2.6 (IRR, 2.60; 95% CI, 2.44–2.76) times greater than US (FL) NHWs. Meanwhile, Caribbean



	Endometrioid		Non-endometrioid		All Combined	
	Rate[a] (95% CI)	IRR (95% CI)	Rate[a] (95% CI)	IRR (95% CI)	Rate[a] (95% CI)	IRR (95% CI)
US (FL) NHW	18.9 (18.6-19.1)	Ref	3.6 (3.5-3.7)	Ref	23.3 (23.0-23.6)	Ref
US (FL) NHB	15.7 (15.0-16.3)	0.83 (0.80-0.87)	9.2 (8.7-9.8)	2.60 (2.44-2.76)	26.7 (25.8-27.5)	1.14 (1.11-1.18)
Caribbean Black	8.7 (8.0-9.4)	0.46 (0.42-0.50)	3.2 (2.8-3.6)	0.89 (0.78-1.02)	12.7 (11.9-13.6)	0.55 (0.51-0.59)

FIGURE 1 EC age-adjusted incidence rates. Florida (2005–2018), Martinique (2005–2018), and Guadeloupe (2008–2018). a, age-adjusted to the 2000 US Standard. CI indicates confidence interval; EC, endometrial cancer; FL, Florida; IRR, incidence rate ratio; NHB, non-Hispanic Black; NHW, non-Hispanic White.

Black women had the lowest rates of nonendometrioid EC (3.2), although not significantly different from those observed for US (FL) NHW women (IRR, 0.89; 95% CI, 0.78–1.02).

Figure 2 shows the APCs in age-adjusted EC incidence rates from 2005 to 2018. For all endometrial cases combined, incidence rates increased uniformly at approximately 3.1% (APC, 3.1; 95% CI, 1.7–4.6) per year from 2005 to 2018 for US (FL) NHB women and 1.5% (APC, 1.5; 95% CI, 1.1–2.0) for US (FL) NHW women whereas rates remained stable for Caribbean Black women (APC, 0.5; 95% CI, −1.7 to 2.7). For endometrioid EC tumors, rates increased at 1.8% (APC, 1.8; 95% CI, 0.1–3.5) yearly for US (FL) NHB women and 1.2% (APC, 1.2; 95% CI, 0.9–1.6) for US (FL) NHWs whereas no change was observed for Caribbean Black women (APC, −0.3; 95% CI, −2.8 to 2.3). For nonendometrioid ECs, an overall increasing trend was noted for all populations, with the greatest significant yearly increase of 5.6% (APC, 5.6; 95% CI, 4.0–7.2%) among US (FL) NHB women, followed by 4.4% (APC, 4.4; 95% CI, 0.3–8.6) for Caribbean Black women, and 3.9% for US (FL) NHW women (APC, 3.9; 95% CI, 2.4–5.5).

DISCUSSION

At a time when EC is becoming a public health priority as the fastest-increasing cancer in terms of mortality in US women and disproportionately afflicting NHBs, this population-based study reveals heterogeneous EC patterns in incidence between US and French Caribbean populations. There were important differences in rates between US (FL) NHWs, US (FL) NHBs, and Caribbean Blacks but surprising similarities in trends for nonendometrioid EC. Although US NHW women in Florida presented with an overall higher incidence of endometrioid EC, US (FL) NHB women had the highest rates for the more aggressive nonendometrioid subtype. Notably, Caribbean Black women had the lowest rates of EC overall, and for both endometrioid and nonendometrioid subtypes. Notwithstanding, there were remarkably increasing trends for nonendometrioid EC among women of all races, with the greatest increment of 6% per year observed among US (FL) NHB women followed by a 4% increase among Caribbean Black and US (FL) NHW women alike.

Our study findings for endometrioid EC among NHWs and NHBs in Florida are consistent with past US studies.[8,11–13] However, new results comparing US NHB women in Florida relative to Black women in the Caribbean, show a higher incidence of endometrioid subtypes among US (FL) NHBs. Past studies suggest that an overwhelming 70% of EC cases are attributed to potentially modifiable risk factors[2] (specifically obesity), especially applicable for endometrioid carcinomas, and can partially account for the differences among these two African descent groups. The prevalence of obesity and related chronic conditions such as diabetes is higher among Black women in the United States compared to those in the French Caribbean.[28–31] Differences in dietary patterns may be a contributing factor given that the French Caribbean traditional diet consists of a greater consumption of fruits, vegetables, fish, and traditional French West Indian dishes, and lower consumption of starches, red and processed meat, poultry, sweetened/alcoholic beverages, and snacks/fast foods.[32] Despite this, there is an increasing transition in dietary habits in the French Caribbean, especially among the younger generation, to a higher intake of "Western" foods.[32] However, the

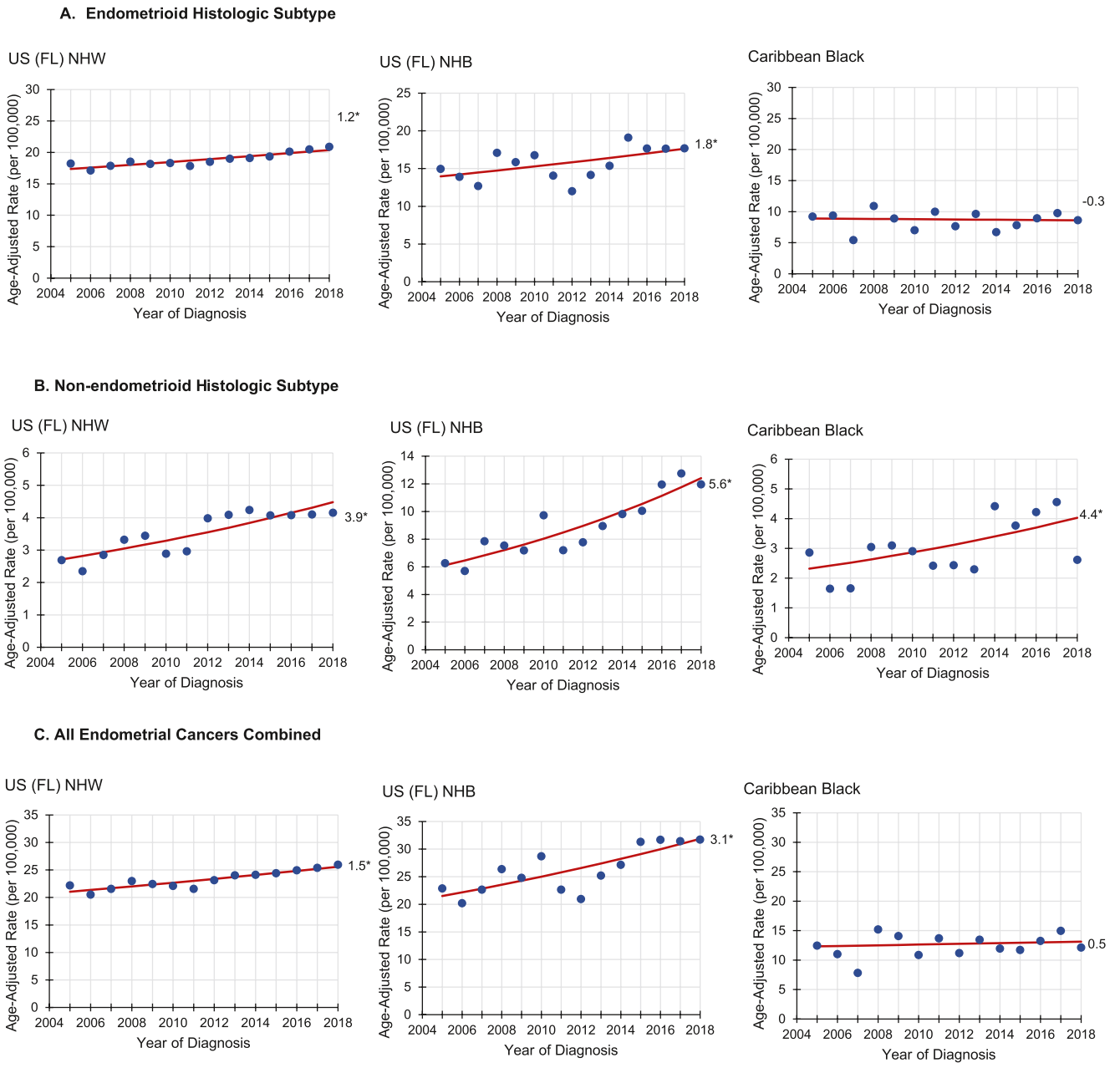


FIGURE 2 Trends in EC age-adjusted incidence rates. Florida (2005–2018), Martinique (2005–2018), and Guadeloupe (2008–2018). (A) Endometrioid histologic subtype. (B) Nonendometrioid histologic subtype. (C) All endometrial cancers combined. Annual percentage change estimates shown next to each respective curve. *Trend significantly different than zero at $p < .05$. EC indicates endometrial cancer; FL, Florida; NHB, non-Hispanic Black; NHW, non-Hispanic White.

prevalence of smoking, which is associated with reduced EC risk,[33] is lower among women in the French Caribbean than NHB women in Florida.[34,35] In terms of reproductive factors, a higher fertility rate is a protective factor in Martinique and Guadeloupe (1.9 and 2.1 live births per woman, respectively) compared to NHB women in the United States (1.7).[36,37] Additionally, a cross-sectional study examining intrauterine device use among women in Martinique documented a prevalence similar to that of mainland France, which is higher than that observed among US NHB women.[38,39]

The excess incidence of nonendometrioid EC observed among US NHB women in Florida in comparison to NHWs has been previously well documented in the literature.[8,13,14,40] However, what is surprising is the much lower rates observed for the predominantly African descent populations in the French Caribbean. There may be further heterogeneity for nonendometrioid EC by specific histological subtype (e.g., serous); however, among populations residing in the United States only, Pinheiro et al.[14] reported that Caribbean-born Black women had lower rates of all Type 2 histology subtypes than US-born Blacks. Although the role of genetic ancestry in EC risk cannot be ruled out given the complex genetic admixture and differences in US and Caribbean Black populations resulting from the African Diaspora,[41] the evidence in our study suggests that

vulnerability for these aggressive tumor subtypes is not an overarching African ancestry disparity. Varying genetic predispositions (e.g., *TP53* and *Her-2* oncogene mutations)[42] and epigenetic modifications, such as differences in ribosomal DNA methylation and microRNA expression that are associated with EC risk,[43] may well play a role in this observed disparity between US and Caribbean Black populations. Additionally, differential exposures to psychosocial and physiological chronic stress can affect the fight-or-flight response, induce inflammation, and suppress immunity, promoting tumorigenesis and cancer development.[44] African descent communities in the United States, in particular, are exposed to stressors such as job insecurity, financial strain, poor housing, neighborhood/built environment factors, as well as perceived discrimination/racism,[45] some of which do not have a parallel in a more egalitarian society as in the French Caribbean. However, this comparison across populations is made difficult by the lack of knowledge pertaining to risk factors, particularly for nonendometrioid subtypes.

A uniform striking increase in APC was observed for nonendometrioid EC across all populations, which warrants further surveillance for all racial groups. The increase in nonendometrioid EC was more rapid than for endometrioid tumors. It is important to note that the rate of increase in EC mortality (all subtypes combined) exceeds that of incidence,[46] likely a direct result of the increasing incidence for nonendometrioid subtypes[8] which carry worse prognosis.[14] The current practice of registries reporting incidence and trends for overall EC masks the important contrast between nonendometrioid and endometrioid histologies and does not support the pressing need for more detailed studies on the differences in risk factors between the two histological subtypes. Nonendometrioid tumor subtypes are presumably less hormone and obesity-related than endometrioid ECs.[33,47] Promising efforts have recently been made to investigate possibly implicated EC risk factors. For example, a possible link between exposure to the pesticide chlordecone, an endocrine disruptor, and cancer risk, has been explored in Martinique and Guadeloupe[48]; however, this would not justify the parallel increasing epidemiological patterns observed across different populations in the United States and worldwide. The same would apply to the more recent findings on hair-straightening products.[49] More in-depth studies determining the association between EC risk (by specific subtype) and exposures to hazardous carcinogenic and endocrine-disrupting chemicals are needed.[49,50]

Our study is novel in that few studies have taken advantage of the opportunity to combine international cancer data for majority African descent populations from high-quality registries to make comparisons across populations. This is likely a consequence of the difficulty in choosing an appropriate comparison population because many European countries including France do not collect census or other official data on racial and ethnic identity.[51] This study is also innovative in that incidence trends for endometrial cancer overall and by subtype have yet to be examined for Martinique and Guadeloupe. Martinique and Guadeloupe are unique in that they are similar to mainland France in terms of health insurance and infrastructural resources but have a lower gross domestic product and higher rate of unemployment; simultaneously, they have a similar cultural and historical context to other Caribbean islands but they also have a higher socioeconomic level.[52] With greater human and infrastructural resources, ongoing cancer surveillance, screening, and diagnostics in Martinique and Guadeloupe are more readily available than those Caribbean islands with high inequality such as Haiti.[53] Therefore, given the diversity in socioeconomic and political circumstances,[53] the EC trends noted in the French Caribbean may not be generalizable to the rest of the Caribbean islands.

Nonetheless, some limitations must be taken into consideration. First, there is no readily available detailed data by age-group regarding the prevalence of hysterectomy in the French Caribbean; therefore, we could not calculate hysterectomy-corrected incidence rates. However, this is unlikely to change our relative results but rather the magnitude, meaning that the differences observed may be underestimated given the much lower overall prevalence of hysterectomies among women in Martinique/Guadeloupe in comparison to Florida NHBs.[54,55] Second, due to a higher level of missing data for tumor grade in the French Caribbean, our analyses were restricted to examining EC histology according to endometrioid versus nonendometrioid carcinomas. Improved recognition of morphology over time could impact EC histology-specific trends, as malignant neoplasms not otherwise specified cases tend to decrease over time (i.e., better attribution to endometrioid and nonendometrioid subtypes as appropriate); however, these accounted for only 1.5% of cases among US (FL) NHWs, 2.0% of US (FL) NHBs, and 1.6% of Caribbean Black cases, and therefore are unlikely to affect our results. We are limited to analyzing tumor classification by histology, although endometrial cancer has been classified into molecular subtypes using The Cancer Genome Atlas data.[56] It is also difficult to ascertain whether there are differences in criteria for pathology subtyping between the United States and French Caribbean (e.g., varying distribution for mixed histology subtype between regions). Additionally, we studied all cases from Martinique and Guadeloupe, with the assumption that these are majority African descent populations because Caribbean registries do not collect demographic data on race, and therefore some women (although a small proportion) may not be of African descent. In Florida, only non-Hispanic populations of African descent were examined because only one-in-four of all Afro-Hispanics in the United States self-identify as Black.[57] Furthermore, as commonly noted in registry data, we do not have access to individual-level clinical data for important risk factors such as obesity and hormone-related factors (e.g., pregnancy, hormone replacement therapy, and oral contraceptives) as well as family history or genetic predisposition (e.g., Lynch Syndrome).

In summary, our registry-based international analysis reveals a complex EC histology-specific risk profile for women of African descent in a global setting/comparison. As the Black population worldwide continues to grow, with a population of over 46 million in the United States alone,[58] more race-specific high-quality cancer data is fundamental. Given the absence of strong cancer surveillance systems and registries throughout Africa, there needs to be a greater priority among the global health community in allocating resources to

improve data collection.[16] This study emphasizes the need to not generalize results from US Blacks to other African descent populations worldwide where limited data exists. The high risk for both endometrioid and nonendometrioid tumors was found to be more striking among Black women residing in the United States than those in the Caribbean. However, a rapid rise in nonendometrioid EC was identified across all race groups in both the United States and the French Caribbean. The intraracial differences in EC risk and trends do not appear to be explained purely by ancestry-specific characteristics given the shared genetic background between NHB women in the United States and the predominantly African descent populations of Martinique and Guadeloupe. Therefore, our study supports further evidence for advancing cancer control efforts through the lens of identifying potentially modifiable socioenvironmental underlying causes of this disparity.

AUTHOR CONTRIBUTIONS

Heidy N. Medina: Conceptualization, formal analysis, visualization, writing–original draft, and writing–review and editing. **Frank J. Penedo:** Formal analysis and writing–review and editing. **Clarisse Joachim:** Formal analysis and writing–review and editing. **Jacqueline Deloumeaux:** Formal analysis and writing–review and editing. **Tulay Koru-Sengul:** Methodology, formal analysis, and writing–review and editing. **Jonathan Macni:** Data curation and writing–review and editing. **Bernard Bhakkan:** Data curation and writing–review and editing. **Jessica Peruvien:** Data curation and writing–review and editing. **Matthew P. Schlumbrecht:** Formal analysis and writing–review and editing. **Paulo S. Pinheiro:** Conceptualization, methodology, writing–original draft, writing–review and editing, and supervision.

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CONFLICT OF INTEREST STATEMENT

Frank J. Penedo reports consulting fees from Blue Note Therapeutics. Matthew P. Schlumbrecht reports consulting fees from GlaxoSmithKline. The other authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The authors confirm that, for approved reasons, some access restrictions apply to the data underlying the findings. These data are confidential public health records with personal identifiers that can only be released for specific use on approvals from the Florida Department of Health Cancer Registry Program, Florida Department of Health Bureau of Vital Statistics, the Florida Department of Health Institutional Review Board, and authorized officials of the Martinique and Guadeloupe Cancer Registry. These data are never available for public repository given the confidential information they contain. In the case of the Florida Cancer Data System (FCDS), the data sets are available by request with required approvals from the Florida Department of Health Cancer Registry Program and Florida Department of Health Institutional Review Board. Applications for data request are available from the FCDS webpage (http://fcds.med.miami.edu/inc/datarequest.shtml).

ORCID

Heidy N. Medina https://orcid.org/0000-0002-1999-6448

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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