Challenges to recruitment and retention of Black forensic pathologists

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Abstract: Background: Informal estimates place the number of practicing Black forensic pathologists (BFPs) in the United States (US) at somewhere between 35 and 45 which is less than 10% the estimated total of 600. The legacy of medical and institutional racism means that BFPs in the US encounter particular challenges to training and career development that their White peers do not have to contend with.

Methods: A survey developed on SurveyMonkey in English, was distributed through social media networks and by direct email to known BFPs. Their responses to questions about the challenges they faced in training and as qualified specialists and factors that eased or facilitated their progress were collected and analyzed.

Findings: BFPs report challenges to recruitment and retention that are like those faced by Black peers in other medical specialties.

Interpretation: While personal determination is an essential ingredient to career success as a BFP, there are certain structural barriers that must be eliminated to increase the total number of BFPs. The pipeline that produces BFPs must be nurtured, reimagined, and reinvigorated.

Keywords: Black forensic pathologists ■ Recruitment ■ Retention

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1. INTRODUCTION

There are very few Black forensic pathologists (BFPs) in the United States (US) and fewer still in Canada or elsewhere in the world. Of some estimated 550 to 600 practicing forensic pathologists (FPs) in the US, less than a 10th are Black or of African origin. [1] Although the American Board of Pathology recognized forensic pathology as a subspecialty in 1959, it was not until 1989 that one author (JMC) became the first Black and first Black female to earn certification in the subspecialty. Prior to this, Black personnel had been involved as autopsy technicians.

While this paper describes challenges to recruitment of BFPs worldwide, the emphasis will be on BFPs in the US, who are the majority of BFPs in practice today. They face peculiar challenges to recruitment and retention especially in the context of racial stereotypes and discrimination that most other colleagues in the diaspora are unlikely to have experienced. Apart from having to navigate a system that has benefitted from the unethical experimentation on Black bodies, they may encounter discriminatory behaviors from colleagues and in some cases a frankly hostile work environment, where they are made to feel uncomfortable and unwelcome. [2-4]

Pathology like other medical disciplines has many subspecialties, some of which have been the preferred destination for many Black pathology graduates. Even though the number of BFPs has increased since 1988, Black medical school matriculation in the US varied between 6 and 7% of the matriculating class between 2006 and 2018. [5] The shortage of BFPs is unlikely to be alleviated unless other measures are taken to recruit more into medical school and expand the mechanisms and opportunities ("pipeline") that would ensure that more are attracted to the specialty.

The objective of this survey is to determine what barriers BFPs face in training, job recruitment and job satisfaction and to suggest ways that these barriers may be eliminated, and the training pipeline expanded.

2. MATERIALS AND METHODS

Questions were developed by the authors and then launched onto the SurveyMonkey® platform for distribution to BFPs through social media, including the Twitter feed of the National Medical Association (NMA), and targeted email solicitations. It consisted of 61 questions including 1 for express consent. The responses to the remaining 60 questions were grouped into 6 major categories (Table 1). The survey was open for 6 weeks begin-

Table 1. Areas covered by questionnaire.
The questions covered demographics, location of undergraduate and post graduate training in forensic pathology, practice locations and issues of support and mentorship at all levels of training and practice. Questions also covered the effects of COVID19 and publicized deaths of Black Americans on the well being of BFPs, and the challenges faced by BFPs who practice outside the US.

Questions
1: Written consent
2 to 11: Sex and age distribution; medical education including training and certification in forensic pathology (FP)
12 to 30: Practice location and reasons for selecting FP; involvement with FP initiatives
31 to 34: Awareness of Black Forensic Pathologists (BFP), relevance of diversity to the FP community
35 to 48: Mentorship, factors that have inhibited or supported training to become a FP
49 to 56: Effects of the COVID 19 pandemic and publicized deaths of Black Americans in 2020 on well-being as a BFP
57 to 61: Challenges to BFP who practice outside of the US

ning late April to early June 2021. Express consent was obtained by having the participant agree to the survey and the disposition of their responses before they could complete the survey; or implied by their participation in the survey before the survey was modified to include the consent page.

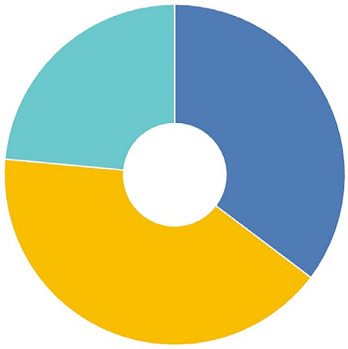
3. RESULTS

Note that not all questions were answered by all respondents. This is the reason for varying total responses to each question

Demographics

There were 21 total responses of which 71% (n = 15) were deemed complete; almost half of 17 respondents (n = 8) identified as female. The age range of the respondents spans a generation, from 30 to 59 years old (see Fig. 1)

Fig. 1. Age of respondents.



Answered: 17 Skipped: 4

20 to 29	0%	0
30 to 39	35.29%	6
40 to 49	41.18%	7
50 to 59	23.53%	4
60 to 69	0%	0
70 and older	0%	0

3.1. Awareness of forensic pathology

All but 3 developed an interest in FP before residency, most commonly in medical school (n = 8), followed by high school (n = 3), undergraduate study (n = 2), and elementary school (n = 1). Most also became aware of BFPs in medical school as shown in Fig. 2.

Most respondents indicated they chose forensic pathology out of interest, followed by "care about making an impact" (Table 2).

3.2. Medical school and post graduate training

Most graduated from medical school between 1998 and 2017. All but 2 completed residency after 2000 and all but 2 completed Forensic Pathology training after 2000. Slightly less than 50% (n = 8) graduated in the US, (Table 3).

3.2.1. Location of postgraduate training. Almost 70% (n = 12) obtained forensic training in the US (Table 4). This could be explained by the fact that the US has the most training positions in the English-speaking

Table 2. Reasons for choosing to specialize in forensic pathology.

ANSWER CHOICES	RESPONSES	
Wealth	N/A	N/A
Prestige	N/A	N/A
Interest	76.47%	13
Encouragement from parents/relatives	11.76%	2
Care about making an impact	52.94%	9
A medical school or residency rotation	17.65%	3
Encouragement from teachers/professors	23.53%	4
Motivated by experience of dealing with a death investigation system	17.65%	3
Other (please specify)	17.65%	3
Total:		**17**

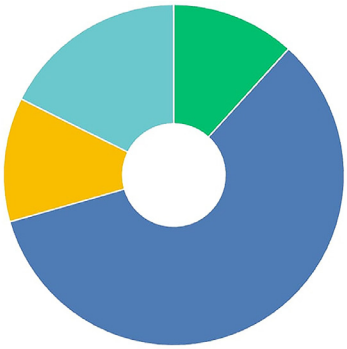
Table 3. Location of medical school.

Answer choices	Responses	
United States	47.06%	8
Canada	N/A	N/A
The Caribbean	17.65%	3
Africa	35.29%	6
Europe	N/A	N/A
Other	N/A	N/A
Total:		**17**

Table 4. Location of postgraduate training.

Answer choices	Responses	
United States	70.59%	12
Canada	N/A	N/A
The Caribbean	N/A	N/A
United Kingdom	5.88%	1
Other European country	N/A	N/A
Africa	29.41%	5
Australasia	N/A	N/A
South America	N/A	N/A
Asia	N/A	N/A
Total:		**17**

Fig. 2. Awareness of Black pathologists.



Answered: 17 Skipped: 4

Undergraduate	11.76%	2
Medical school	58.82%	10
Residency	11.76%	2
Other	17.65%	3

West. This is compounded by the lack of opportunity elsewhere, especially in anglophone sub–Saharan Africa (see section 4.3).

3.2.2. Mentoring. Almost 63% (n = 10 of 16) would change something about their training. One thing that 44% (n = 7 of 16) would change if they could, would be their mentors. Almost 65% (n = 11 of 17) had black mentors; 37.5% (n = 6 of 16) would not change anything. The overall impression from these results is that the training envi-

ronment and the type of mentors can significantly influence the subjective quality of one's training (see section 4.2.1).

3.3. Types of forensic pathology practices

Of 17 respondents, almost 71% (n = 12) classify their practice as "urban". The types of forensic pathology (FP) practices chosen are the Medical Examiner's office (n = 5), the coroner's office (n = 4), or a hybrid practice (n = 4) of those shown in Table 5. The nature of the hybrid was not further investigated

Table 5. Types of forensic pathology practices.

Answer choices	Responses	
Medical examiner's office	29.41%	5
Coroner's office	23.53%	4
Academic institution	5.88%	1
Private practice	5.88%	1
Hybrid	23.53%	4
Other (please specify)	11.76%	2
Total:		**17**

3.4. Certification

Of 17 respondents, 10 are certified in FP and 13 are still practicing FP. Note that the survey includes trainees who may not yet be eligible to challenge the FP examinations. Those who have certification or plan to obtain certification are shown in Table 6.

3.4.1. Question "Would you again choose to select forensic pathology as a career?". Of the 4 non-practicing BFPs, only 1 indicated it was for a change of careers while the others had either returned to anatomic pathology (n = 2) or were still in training (n = 1). To the question, "how likely are you to choose FP again?" with 100 being a definitive "yes" and 0 a definitive "no", only 17.6% (n = 3) responded with a "yes" (scores of 94 to 100) while 58.8% (n = 10) responded with a firm "no" (score of 0 to 6). The rest (n = 4) were ambiguous (scores of 24 to 62). There were 17 responses to this question (Q39).

Table 6. Certification.

Answer choices	Responses	
Yes I am board certified in forensic pathology	58.82%	10
Yes I plan to challenge the certification (board) examination in forensic pathology	11.76%	2
No I am not certified in forensic pathology	17.65	3
No I do not plan to challenge any certification examination in forensic pathology	11.76%	2
Total:		**17**

Table 7. Involvement in forensic pathology.

Answer choices	Responses	
Teaching	85.71%	12
Research collaborations	35.71%	5
Serve on expert panels	28.57%	4
Promoting quality and consistency in death investigations	42.86%	6
Developing and promoting standards for death certificate reporting	35.71%	5
Mentorship	35.71%	5
Construction of DNA databases	14.29%	2
Other (please specify)	7.14%	1
Total:		**14**

Table 8. Why diversity is important in forensic pathology.

Answer choices	Responses	
Greater productivity	41.18%	7
Reduced staff turnover	29.41%	8
Connect to a wider range of viewpoints	70.59%	12
Less risk of bias	58.82%	10
Reduced communication barriers	41.18%	7
Variety of perspectives	76.47%	13
Greater respect for the profession	29.41%	8
Will attract more visible minorities to the profession	64.71%	11
All of the above	29.41%	8
Total:		**17**

3.5. Forensic pathology initiatives

Fourteen BFPs are involved in various FP-related activities including teaching, research, mentorship, etc. as shown in Table 7. Only 4 are engaged in FP initiatives outside of the US although their precise location is unknown.

3.6. Diversity and cognitive bias in forensic pathology decision making

All of those who responded (n = 17) believed that diversity is important in FP. Table 8 describes the many reasons diversity in FP is important of which the top cited are:

- An appreciation of the variety of perspectives and viewpoints.
- The ability to attract more visible minorities to the profession.
- Less risk of bias.

All 17 respondents work with other BFPs; 11 work in a group which contains between 10 and 20% BFPs.

3.6.1. Opinions on the existence of cognitive bias. Over 80% (n = 14) believed that cognitive bias exists in forensic pathology decision making. Two were undecided.

3.7. Reasons not to specialize in forensic pathology

For the 6 respondents who replied to the question, several demotivating reasons were given why they were unlikely to choose FP as a specialty. The leading reason was financial (n = 4), followed by workloads (n = 3) and lack of government support (n = 3), as shown in Fig. 3. This correlates with the disinclination of most respondents to select FP as a career, if given the option. See Fig. 3.

Fig. 3. Reasons not to specialize in FP.

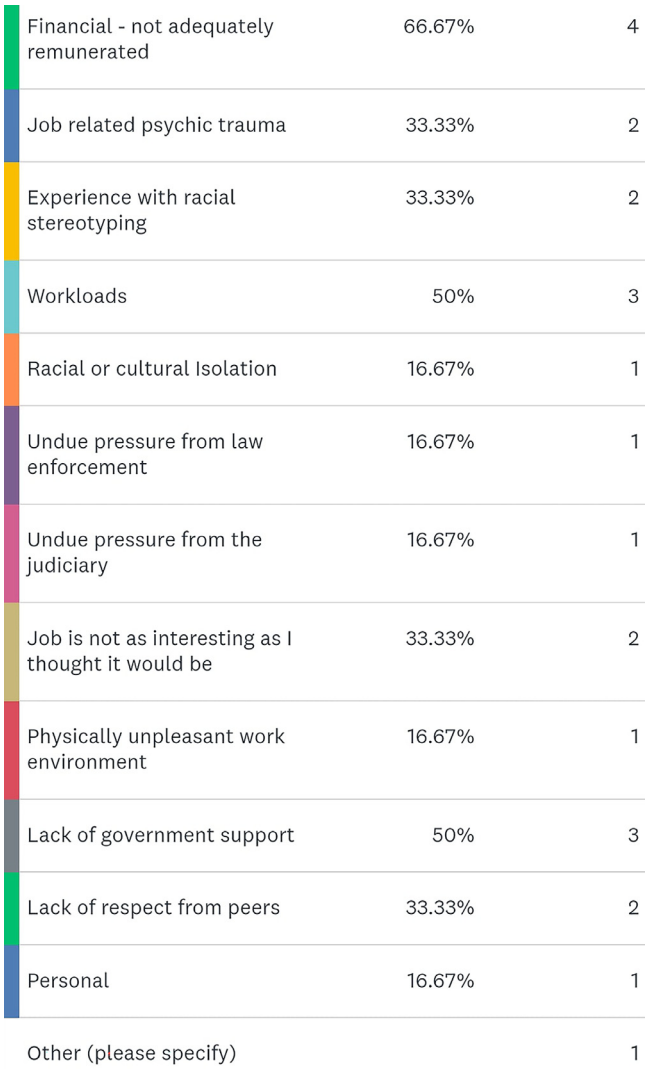
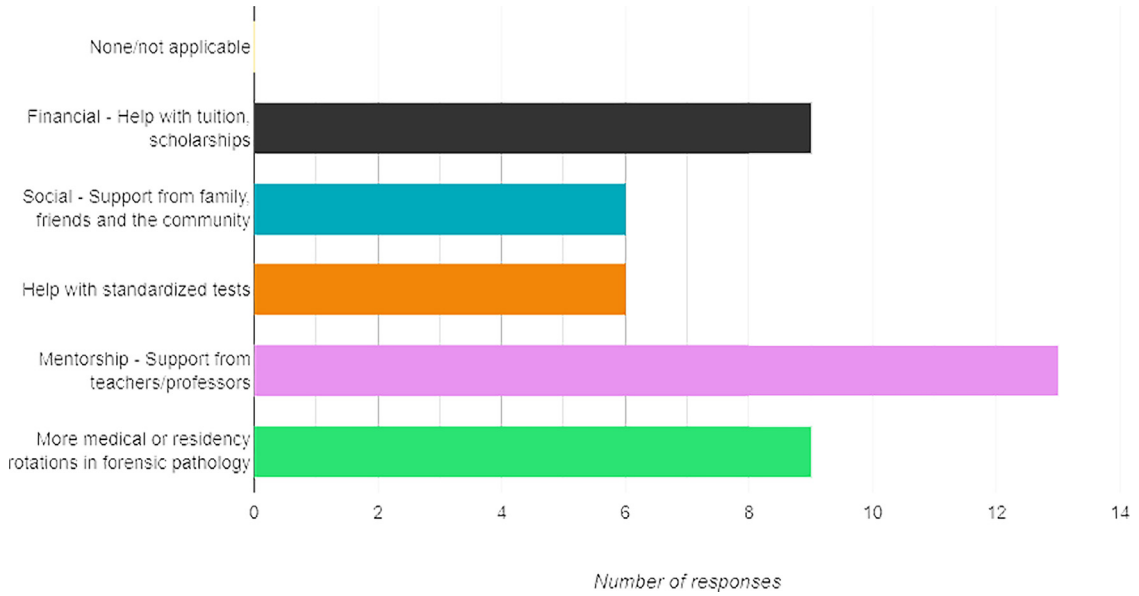


Fig. 4. Support.



3.8. Support mechanisms

Various support mechanisms were cited that would have helped with FP training, with "mentorship" in first place (n = 13), and "financial help" in second place (n = 9). See Fig. 4 for the list of support mechanisms cited in the survey.

3.9. Barriers to success

The nature of barriers to success changed from medical school to practice. As medical students, 11 respondents faced some type of barrier with financial burdens, social reasons, and experience with racial stereotyping equally selected as the most common barriers (Table 9). Some faced multiple barriers.

3.9.1. Barriers faced during residency and as attendings. As residents (n = 13) barriers increased with the most common being challenges with in-service examinations (n = 5) and "personal" challenges (n = 5), followed by racial stereotyping (n = 4). As attendings, 12 faced barriers with "social" challenges (n = 4) and racial stereotyping (n =4) being the most common.

Finances were also considered a barrier to success as attendings, and they were cited by some as a reason not to select FP as a career if they had the choice (see 3.8). However, none would cite it as the single most important inhibitor of their success. A hostile, unsupportive boss (n = 4) and a hostile work environment (n = 3) were the leading barriers to success. In the "other" category, responses included gender stereotyping, failure of current leadership, and a business model that did not always value the opinions of FPs.

"Personal not further specified" suggests reasons outside of the work environment as barriers to success

Table 9. Barriers faced as medical students.

Answer choices	Responses	
None/Not applicable	35.29%	6
Financial	29.41%	5
Social	29.41%	5
Challenges with standardized tests	23.53%	4
Experience with racial stereotyping	29.41%	5
Personal, not further specified	17.65%	3
Other (please specify)	5.88%	1
Total		**17**

3.10. Factors for success

For 17 respondents, personal determination was cited as the biggest single factor for success (n = 9) and for continuing to practise FP (n = 14). Also important to success was the support from family and friends (n = 9) /respect of colleagues (n = 9).

Fig. 5. Loved ones lost to non-covid causes.

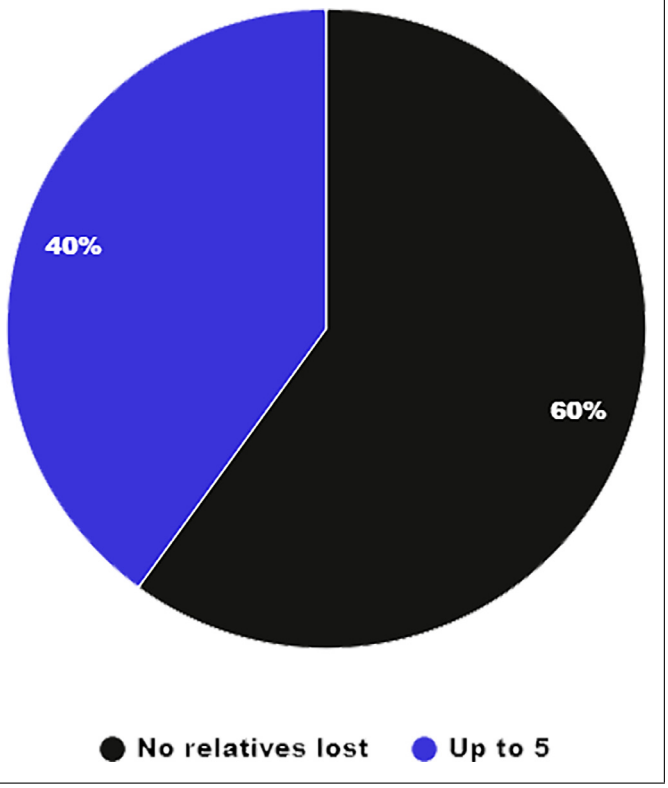


Table 10. Effect of the pandemic and publicized deaths of Black Americans on job motivation/demotivation.

Answer choices	Responses	
Yes	26.67%	4
No	46.67%	7
Undecided	26.67%	4
Total:		**15**

3.11. Effect of COVID19 and publicized deaths of Black Americans in 2020

Of 15 respondents, approximately 67% (n = 10) had at least 1 relative who developed COVID-19. Forty percent (n = 6) lost relatives to non-COVID-19 causes in 2020 (Fig. 5). Twenty percent (n = 3) have or had relatives who experienced long term complications of COVID-19 and have experienced stress getting relatives vaccinated.

3.11.1. Effects on mood and concentration at work. Eighty percent (n =12) experienced changes in behavior, mood, and/or concentration in the wake of the publicized deaths of Black Americans in 2020 although in all but 1 case, it did not affect their work performance (Table 10).

3.11.2. Sources of strength and support. Family (n =10) is reported as the biggest source of support (Table 11). Institutional support for Black faculty (n =1) and volunteer work (n =1) were also selected as support mechanisms.

4. DISCUSSION

The discussion is organized around the following headings:

- Why do we need more BFPs?
- What is the Optimum number of BFPs?
- Recruitment and Retention Challenges
- Influence of Household Type and Mentorship
- Capacity building and the pipeline
- Workplace barriers and stressors
- Attitudes towards Workplace Diversity
- Challenges to forensic pathology training in Africa
- The rarity of BFPs in the UK and Canada and Challenges to Recruitment in the Anglophone Caribbean
- Black Forensic Pathologists in the United Kingdom (UK)
- Forensic Pathology in the Caribbean
- One Author's (AEW) Experience as the only BFP ever trained in the United Kingdom (UK) and entered on the Home Secretary's Register of Pathologists
- Maintaining International Standards in Resource-limited Countries
- Impact of the Novel Coronavirus on BFPs Professional Lives and Practice
- Forensic pathologists and public health
- Survey limitations

4.1. Why do we need more BFPs?

The objective of this survey is to determine what barriers BFPs face in job training, job recruitment and job satisfaction in order to address the underrepresentation of BFPs in the profession. More BFPs are needed for the following reasons:

- Cognitive bias in certification of manner of death negatively impacts the quality of death investigations, many of which involve people of color.[6] For example, deaths at the hands of law enforcement are often blamed on the victim or their underlying medical condition, not on the actions of the police. Although this affects the visible majority, its effects on the Black community reignite long held impressions of collusion with authorities and coverups every time it occurs.
- Public health issues that disproportionately impact people of color often find their best advocates in other

Table 11. Support systems available during COVID-19 pandemic and publicized deaths of Black Americans.

Answer choices	Responses	
Family	66.67%	10
Friends	46.67%	7
Coworkers	26.67%	4
Church group	6.67%	1
Fraternity or sorority	6.67%	1
Neighbours	6.67%	1
Civic or community leaders	6.67%	1
Sport/fitness/exercise	40.00%	6
Meditation/yoga	20.67%	4
Hobbies	20.00%	3
Therapists/mental health professional	6.67%	1
Spiritual advisor	N/A	N/A
I did not experience any stress	13.33%	2
Other (please specify)	13.33%	2
Total:		**15**

people of color. Consider the reluctance of major professional organizations such as NAME to acknowledge that gun violence is a public health emergency in contrast to national organizations such as the National Medical Association[7]

- The US deserves a workforce that looks like America. Diversity of race and culture brings diversity of thought and diverse ways of solving problems and should be reflected from medical school to fellowships and eventually the work environment.[8]
- Black bodies have long been used to teach medicine and pathology and many FPs (including the current cohort of BFPS) have learned aspects of their craft mainly on Black decedents. Given the shortage of BFPs and the effect representation has on public health issues relevant to Black people in the US, it is only fair that many more BFPs are given the opportunities to learn from those bodies and then use that knowledge as an addition to the tool kit required to force change in public health and social policies that are harmful to Black people. There is strength in numbers and the more of us there are, the stronger the advocacy group we will be.
- For death investigation systems in resource limited countries which have overwhelmingly Black populations, leadership should come from BFPs that have been trained to international standards and who are supported both by their governments (provision of infrastructure and allied services) and the expertise of the international community.

4.2. What is the optimum number of BFPs?

According to a 2012 study, the minimum recommended number of FPs for the US is 1000. [9] If BFPs are to be represented as a proportion of the overall count of Blacks in the US population (13%) then there should be at least 130 BFPs. There are currently between 35 and 45 BFPs in the US. To achieve 130 over 10 years barring massive retirements, attrition, death, at least 9 to10 BFPs must be trained every year. Since most of the 21 respondents have been trained within the last 20 years, the current output can be estimated at 1 every other year (given the upper estimate of 45 total BFPs). In effect, we would need to enhance the pipeline to deliver 20 times its current output!

4.3. Recruitment and retention challenges

The success of BFPs, or in other words the successful completion of all that is necessary to qualify as a forensic pathologist by those of African descent, is multifactorial. There is not one experience that has led black physicians to choose FP as a discipline. What is clear is that there is a shortage of those who identify as Black within the medical examiner profession. So, as we explore the experiences of the limited cohort of BFP represented in this survey, it

is important to acknowledge the diversity of influences on our respective journeys and chosen career.

Circumstances of our upbringing such as the composition of our family, whether two parents raised us at home, the level of education attained by those closest to us, job satisfaction and earning power within our household, housing security and stability, and the safety within our communities; all play a part in our ability to attain success [10]. There is no difference between the intellect and competence of Black people seeking to attain expertise in forensic pathology than that of any other race. It is worth remembering that race is a social construct and intelligence has nothing to do with race. Therefore, our ability to become successful physicians and forensic pathologists has only been limited by access to opportunities which have not traditionally been designed to benefit people of color. WEB Dubois talks about access to education, economics, housing, health care, and equitable criminal justice practices as the five policy areas required for wholeness and completeness within any community. [11] To the extent that Black people lack access due to structural and institutional racism is the extent to which we witness persisting disparity and underrepresentation of Black people in medicine and FP in the Americas and across the African Diaspora.

4.4. Influence of household type and mentorship

Among the cohort surveyed, the majority were raised in dual parent households and the level of education attained by the primary caregiver was predominately postgraduate. Although we cannot attribute the success of the cohort solely to their upbringing and academic exposure, it is hard to ignore the direct correlations between family expectations of a high value education and the stability of the family unit, on the training of these forensic pathologists. If we are going to successfully recruit and retain BFPs, we must understand the importance of academic exposure. Whether academic excellence is facilitated by family, friends, or mentors, reinforcing cultural norms that emphasize the importance of education is critical. Therefore, where there is family instability there must be broad external support. Reliable, consistent, and caring adults are essential to the successful development of all humans.

The majority of those surveyed reported having black mentors early in their lives. However, if given the opportunity to change anything about their training, 44% (n = 7 of 16) would have changed their type of mentors during their medical education (see Results, Section 3.2, Mentoring). Clearly there are not enough black physicians who mentor Black students. This problem is not unique to forensic pathology; it has been reported in psychiatry and otorhinolaryngology where Black physicians are particularly underrepresented.[12]

4.5. Capacity building and the pipeline

Among the larger group of forensic pathologists, there is a proportion who are in mid or late career, and it is for this reason that the pipeline needs to be urgently reinforced. BFPs must create a pipeline organization dedicated to filling the void of diversity within the medical examiner community. This is not an issue that can be solved by the structures steeped in the history and practice of white supremacy. There must be new structures and pipelines developed to ensure the development of BFPs across the diaspora. These new structures must be designed to increase the number of black physicians going into the field, not merely to replace the current cohort.

Organizations that have been successful in increasing diversity within medicine include Mentoring in Medicine (https://medicalmentor.org), Nth Dimensions (http://www.nthdimensions.org) and Young Doctors DC (www.youngdoctors.DC.org). BFPs should be encouraged to engage organizations such as these to assist in diversifying the experiences of the young people already in these programs. Additionally, there is an opportunity for BFPs to engage historically black medical organizations such as the National Medical Association (NMA). The NMA has a centralized and viable Pathology Section that should be leveraged to allow exposure and access to all pathology specialties and subspecialties by communities of color. In addition, there is opportunity to establish pipeline structures towards FP through the Society of Black Pathologists (SBP), the American Society of Clinical Pathologists (ASCP), the College of American Pathologists (CAP), and the Association of Pathology Chairs (APC). It is time to create partnerships between Historically Black Colleges and Universities (HBCUs) lacking Departments of Pathology, local institutions who have them, and nearby medical examiners and coroners' offices. Optimally to overcome financial barriers to participation, those experiences should be free of cost to the interested candidate. The recruitment funnel that is widest in medical school could be expanded even further and deeper to include more aggressive outreach to high schools where it has been shown that many successful career decisions have been made. [13] By the time students reach high school (16 years) we should have begun visiting high schools, inviting students to visit our offices to witness organ dissection or examine previously dissected and anonymized organs, hold mock court sessions, hold mock scene examinations and so on. The same outreach should be expected in university and medical school.

A major point from this survey, that is emphasized elsewhere in this paper is that most BFPs were motivated out of a personal interest and not necessarily because there were specific environmental cues that ignited that interest (see Results, 3.1, Table 2). A personal determination to succeed was the driver of success (reported by over half of respondents). These factors make it even more important that current BFPs develop and maintain a personal responsibility to mentor, advocate, research, and publish material dedicated to the sustainable recruitment and retention of new black forensic pathologists. It is noteworthy that the majority (n = 12 of 14) (see Results, 3.5 Forensic Pathology Initiatives) are involved in forensic pathology initiative such as teaching or research. However, initiatives that should be encouraged include seeking leadership positions within local and national medical associations, attaining leadership roles in the city, county, and state medical examiner offices, and fully engaging the local academic medical infrastructure. The latter may be the most important of them all. To this end, our cohort of BFPs should seek positions on medical school admission committees, curriculum committees, lecture medical students at all levels of matriculation, work with local pathology resident directors to increase forensic pathology exposure to underrepresented minorities, as well as seek positions as fellowship directors at the local death investigation office.

Of course, opportunities to provide mentorship may be impeded by rising case loads caused by several factors. There are increased fatalities due to the scourge of the opioid epidemic and increased fatalities due to the COVID19 pandemic, which has affected case loads in two ways. Directly it has increased fatalities by the severity of respiratory illness and other associated complications. Indirectly it has overwhelmed health care institutions with sick patients and expansive safety protocols, leading to delay in the diagnosis and treatment of other serious diseases especially cancers. The COVID19 pandemic has also been associated with an unfortunate increase in homicide rates in the US.

4.6. Workplace barriers and stressors

Interestingly, 7 respondents reported either a hostile work environment or an unsupportive or hostile boss as being impediments to their success. For many BFPs, the workplace can be a hostile environment where they must confront societal inequities. Subtle microaggressions not faced by their White contemporaries may be sufficient to tip the scales into a markedly unsatisfying work environment. As such, a more supportive work environment is needed to mitigate these harmful psychological stressors. A starting point is to devote more attention and resources to the mental health and wellbeing of all in the workplace consistent with modern human resources management policies. The vicarious trauma sustained by seeing death daily, which is often violent, is rarely discussed within the death investigation community and for many BFPs this trauma is experienced through that seen on black bodies. This topic deserves more attention on a national level. Professionals in death investigation should be taught how to recognize stress, when it affects wellbeing, and how to mitigate its effects. Additional resources need to be made available to underrepresented colleagues who face a unique set of work-related challenges. The effect of COVID-19 is an additional stressor that particularly impacts Black families and medical professionals. This is discussed in more detail in the section "Impact of the Novel Coronavirus on BFPs Professional Lives and Practice"

The most alarming part of the survey is that 10 BFPs would almost certainly not select FP as a career choice if they had to do it all over again (see Results 3.4). When we talk of refashioning the pipeline to attract more into the profession, we need colleagues who are happy with their jobs and would be great ambassadors for the profession. Until the concerns of these colleagues are addressed, we will continue to face an existential crisis. All talk of taking leadership roles in various local and internal committees and on medical student admission committees would have been for naught.

4.7. Attitudes towards workplace diversity

It is reassuring that all surveyed agreed that for a variety of reasons that diversity was important in the workplace **(see Results, 3.6, Table 8).** Increased diversity in the workforce helps create a sense of belonging for many who have been historically underrepresented, who often suffer professional isolation, and can provide an extended family within the workplace.

Unfortunately, as recent studies have shown despite decades of efforts at increasing diversity, underrepresented minority groups are often less well represented than they were decades ago in many medical training programs in the United States, including pathology. [14]

Despite the push for equity, diversity, and inclusion (EDI) in medicine, enticing Black students to a career in forensic pathology is fraught with certain challenges. First, in most medical schools, pathology is only taught as a basic science in the first- and second years. Exposure to pathology during clinical rotations is limited unless the medical student has a particular interest or is inspired by certain medical school faculty. This leads to the second challenge, mentorship by Black physicians who represent

a tiny minority of pathology faculty in general. Since they are so few, but their influence can be exponential, an argument could be made that they have a special responsibility to mentor Black medical students even when they are the first or only BFP in the medical examiner's office or on the medical school faculty. This requires the BFP to be self aware and confident. It would be a task made easier when that BFP enjoys the support of their colleagues.

Coupled with decreasing matriculation of U.S. medical graduates into the field of pathology and then into the subspecialty of forensics, this challenge requires a multifaceted approach. A relatively untapped pool is those attending HBCUs (Gasman, Smith, Ye and Nguyen, 2017). Of the 107 HBCUs in America, only four are home to medical schools and only two are home to Departments of Pathology. Other than expanding admissions to majority White institutions and opening more medical schools to accommodate the needs of Black students, as satellite campuses of the HBCU medical schools, the only realistic way to increase the pool of available candidates is to try to recruit earlier and to make sure there are appropriately placed "signposts", including mentors and supportive financial networks. In other words, we need to build and maintain a new forensic "railroad". The recruitment drive must be targeted and unrelenting if the situation is to be addressed with the urgency it deserves.

For current BFPS, there must be opportunities for them to meet, to develop a sense of professional belonging and to grow. While the Pathology Section of the National Medical Association has always been welcoming, majority organizations such as the National Association of Medical Examiners, the College of American Pathologists, and the American Society of Clinical Pathology should also develop initiatives to recruit and support BFPS These types of initiatives should support BFPS by giving them a national platform dedicated to enhancing their connection to the larger fraternity in order to decrease feelings of professional isolation. A welcoming, nurturing community is one that will be more successful at recruiting a workforce that is more representative of the US.

4.8. Challenges to forensic pathology training in Africa

The practice of forensic sciences, particularly FP in Sub-Saharan Africa (SSA), remains underdeveloped compared not only to other regions of the world but also to other medical specialties. Except for the Republic of South Africa where structured FP training is available, other countries lack formal instruction in the specialty making it difficult to train suitable individuals in this field. This hinders evidence-based practice of forensic pathology and hence the delivery of justice whenever forensic expert testimonies are sought in courts of law.

In sub-Saharan countries with no formal FP trainings or residency programs, local pathologists particularly anatomical pathologists (upon completion of a 3-4-year pathology residency) must obtain further training elsewhere such as in South Africa or in other countries across Europe, the United States, Canada, and Australia to qualify as fully trained forensic pathologists or as graduates of shorter courses which cover the essentials of FP.

In many sub-Saharan African countries however, even the number of graduating anatomical pathologists – which forms the basis for further sub-specialization/fellowship in FP – is itself still insufficient to the pathology needs of the local populations. In 2009, Zambia with a population of approximately 13.2 million, had fewer than 10 practicing anatomic pathologists, a ratio of 1 pathologist to 1.4 million people! [15] Of these, only four were Zambian, who themselves had trained outside Zambia. They attribute this shortage not only to the general lack of financing for medical education, but also the lack of local faculty to provide the specialist training.

Training abroad is not sustainable in the long term given the prohibitive costs involved and the additional accreditation and licensure requirements that African-trained medical practitioners must meet before formal training in the host institutions can begin. One of the authors (HM), could only begin specialist training in forensic medicine in Germany after completing a minimum 8-month German language course and medical licensing exam, before completing the mandatory 5-year residency program and a board-certification exam at the end. [16] A co-author (AEW) originally from Trinidad and Tobago, a former British colony, was trained in the United Kingdom and so did not require an additional language course.

Anecdotally, most BFPs trained or certified in forensic pathology outside of the US appear to have received their training in English.

Other challenges hinder the recruitment, retention, and practice of forensic pathology in Sub-Saharan Africa, namely:

- Poor existing infrastructure in addition to a lack of investment from the governments.
- Workloads and inadequate remuneration for the few practicing forensic pathologists.
- Lack of training and other continuous professional development opportunities for the practicing forensic pathologists which in turn limit their abilities to practice based upon current best practices in the field.
- Lack of mentorship opportunities for young medical practitioners aspiring to pursue FP.

- Religious and socio-cultural perceptions towards handling of dead bodies especially concerning conventional autopsy procedures.
- Inadequate or non-existent national guidelines and regulations relating to the practice of FP.

The recently formed College of Pathologists of East, Central and Southern Africa is a regional step towards harmonized training in anatomic pathology. [17] We hope that it will consider adding FP training to its offerings once it is better established.

4.9. The rarity of BFPs in the UK and Canada and challenges to recruitment in the anglophone Caribbean

Currently, there are only 3 BFPs in all of Canada and these are Dr. Ken Obenson (KO) in New Brunswick, and Dr. Allan Hunte and Dr. Alfredo E. Walker (AEW) both in Ontario.

None undertook FP fellowship training in Canada. Two are co-authors of this paper (KO and AEW). Forensic pathology was only recognized as a subspecialty by the Royal College of Physicians and Surgeons of Canada (RCPSC (Royal College of Physicians and Surgeons of Canada)) in 2003 and a national fellowship training program with a qualification examination was established at the University of Toronto in 2008.[18]

4.10. Black forensic pathologists in the United Kingdom (UK)

Since the establishment of the Home Secretary's Register of Forensic Pathologists in England and Wales in 1991, only one BFP has been trained, qualified, and entered on the Home Secretary's Register of Pathologists. That individual (AEW) had migrated to the UK in 1999 from Trinidad and Tobago to pursue postgraduate training in anatomical pathology. Since his qualification as a forensic pathologist in 2006, no other BFP is known to have been trained anywhere in the UK (England, Wales, Scotland, and Northern Ireland) or Ireland.

4.11. Forensic pathology in the Caribbean

Historically, the island-states of the Caribbean have lacked qualified forensic pathologists to perform post-mortem examinations in criminally suspicious deaths and homicides. This activity has traditionally been undertaken by qualified anatomical pathologists, the majority of whom were trained in anatomical pathology (AP) at the Faculty of Medical Sciences (FMS) of the Mona, Jamaica campus of the University of the West Indies (UWI Mona).

The FMS at the UWI Mona was established in 1948 as the University College of the West Indies, a college of the University of London, with an initial intake of 33 medical students. A year later in 1949, Professor Kenneth Hill (an Englishman) was appointed Chair of Pathology as one of the first appointments of departmental Chairs in the faculty. The UWI Mona's first department of anatomy and pathology was established the following year in 1950.

Twenty-four years later in 1974, the UWI Mona introduced its four-year postgraduate residency training program in AP under the inaugural directorship of Professor Barrie Hanchard. It consists of hospital and medicolegal autopsies (without a specific rotation in FP), surgical pathology and cytopathology and rotations in hematology and clinical chemistry. The residency program is aligned with the Royal College of Physicians and Surgeons of Canada (RCPSC) which provides external examiners for quality assurance purposes. The UWI Mona program awards the Doctor of Medicine in Anatomical Pathology (DM Anatomical Path) degree on successful completion.

Between 1977 and 2015, the UWI Mona residency program produced 42 graduates in anatomical pathology from 12 different jurisdictions (11 Caribbean; 1 India). However, despite its long history of providing postgraduate training in AP and despite the fact that it offers a master's degree program in the forensic sciences, no fellowship training program in FP has been established at UWI Mona. This has prevented any possibility of subspecialty training in FP in the Caribbean region since no other local program exists.

Unfortunately, the history of FP has been such that important transformative advances, improvements and changes only tend or occur in response to either a political scandal, loss of public confidence, catastrophe, or any combination thereof. Woolmer in 2007 was one occasion when the Jamaican Forensic Pathology Service was undermined by poor decision making and reasoning. [19] In this case, a respected cricket coach was found dead in his hotel room in Kingston, Jamaica during the Cricket World cup in 2007. His death was initially ruled a homicide by Jamaican Police based on the conclusions of the forensic pathologist. An international review conducted by forensic pathologists in Northern Ireland, Canada and South Africa concluded that he had in fact died of natural causes.

An incident 3 years later was the final impetus that led to the existence of training options in Canada, for anatomic pathologists from the Caribbean. The fatal incident occurred in Tivoli Gardens, Kingston, Jamaica on May 24, 2010, in which more than 70 civilians and 3 members of the security forces died because of their attempt to restore state authority in that part of Kingston and arrest Christopher "Dudus" Coke (who was wanted extradition to the

USA on drugs and arms trafficking charges). This event changed the landscape for forensic pathology training. A Commission of Enquiry (CoE) concluded that there was evidence of at least 15 extrajudicial killings. The CoE was also extremely critical of many other aspects of the operation and its aftermath.

In response to the deaths, the Office of Public Defender had made a request of the United Nations Development Program (UNDP) to provide an international observer mission of international forensic pathologists to observe the post-mortem examinations. Dr. Michael S Pollanen, Chief Forensic Pathologist for the Province of Ontario and the Ontario Forensic Pathology Service, was the first to arrive in Jamaica and set up the UNDP observer mission and he was subsequently joined by 3 other forensic pathologists from Australia and Colombia. Over a four-week period beginning from mid-June 2010, the international team observed the post-mortem examinations that were supposed to have been performed to an agreed standard after discussions with the local prosecutors.

During its observer role, the international observer mission identified many deficiencies in the performance of the medicolegal post-mortem examinations of the decedents. Dr. Michael Pollanen expressed his concerns in writing to the Public Defender and others. Based on the identified issues and the knowledge that a department of pathology with a postgraduate program in AP existed at the UWI Mona, he also chose to reach out to the Department of Pathology at UWI with an offer of assistance. The department responded favorably to his offer and a professional relationship was established between the Dr Pollanen in his role at the University of Toronto (UoT) and the Department of Pathology at UWI Mona (Dr Nadia Williams, Senior Lecturer and Professor Carlos Escoffery, Head of Department).

A collaborative training proposal was developed by the UoT and UWI Mona to provide a certified one-year subspeciality fellowship program in forensic pathology for any interested graduate of the Doctor of Medicine (DM) Anatomical Pathology residency program at UWI Mona**.** It was envisaged that each forensic pathologist trained out of this arrangement would return to their Caribbean jurisdiction of origin, fill existing FP workforce gaps, and become a local resource for teaching and consultation. The objective was to facilitate long-term institution building and sustainability.

The first graduate of the UWI Mona residency program in AP to pursue the subspeciality fellowship in FP at the UoT was Dr. Mandi Pedican from the Bahamas who did so in the 2011-12 academic year as a self-funded candidate. Dr. Althea Neblett followed 3 years later. They both returned to the Caribbean.

Beginning in 2012, the G. Raymond Chang Foundation was approached for funding. The late Mr. G. Raymond Chang was a Jamaican-Canadian businessperson who was an active member of the Caribbean-Canadian community. Mr. Chang had a well-earned reputation for providing philanthropic financial support to the UoT. By 2015, the G. Raymond Chang Foundation had agreed to provide a CDN$2M endowment which led to the establishment of the G. Raymond Chang Fellowship in Forensic Pathology at the UoT. Mr. Chang understood the relevance of FP as a truth-seeking tool for justice and the fellowship serves to preserve his legacy.

The G. Raymond Chang Fellowship in Forensic Pathology is the first endowment fund in the world that enables young physicians from developing countries to train in FP at the UoT and return to their country of origin to strengthen the forensic capacity of that country. This endowment-funded fellowship provides financial support (CDN$80K per annum stipend) for those clinical fellows who would not otherwise be able to fund a year of training in Canada, particularly those from the Caribbean and Africa.

4.12. One author's (AEW) experience as the only BFP ever trained in the United Kingdom (UK) and entered on the Home Secretary's Register of Pathologists

Unlike the US, the UK has only ever registered 1 BFP on the Home Secretary's Register of Pathologists (a listing of approved forensic pathologists), the co-author AEW. A few BFPs from Africa and elsewhere in the British Commonwealth have successfully challenged the Diploma in Medical Jurisprudence, offered by the Worshipful Society of Apothecaries of London which is one of two certifying bodies for forensic pathology in the UK. This is how his experience compares to those of the respondents.

4.12.1. Awareness of BFP and mentorship (see Results, 3.1, Fig. 2). Most respondents became aware of BFP in medical school which correlates with the author's experience 64.71% of respondents had black pathology mentors and most indicated they became interested in FP in medical school.

AEW's main challenge as a medical student was financial. Government sponsorship only covered his undergraduate medical education tuition costs. His postgraduate training in FP in the UK was sponsored by the British Home Office and he was fortunate to receive mentorship support from his professors, social support and help with exam preparation.

He also had 2 Black mentors while attending medical school in Trinidad and Tobago. One obtained subspecial-

ity training in forensic pathology and returned to practice as a forensic pathologist. It was during his internship that this mentor's influence solidified his decision to train in FP. However, he received no guidance on specific training pathways to a career in FP beyond the basic need to first qualify in AP **(see Results, 3.8, Fig. 4).** This supports the critical need to have Black mentors that students can identify with in the recruitment of Black students into medicine and its specialties.

4.12.2. Barriers to success in postgraduate training and after. AEW was not confronted with any barriers to success during his post graduate training as did 35% of respondents nor has he since. Unlike 29% of respondents, he has not experienced racial stereotyping as an impediment to his success.

While acknowledging that perceptions of discrimination vary from individual to individual it is noteworthy that none had limited AEWs career progress. Another coauthor (KO) also had Black mentors at both the undergraduate and postgraduate level to which he also attributes his success in Canada. Like AEW he has not experienced racial discrimination in Canada as a barrier to his success.

It is important to underline that these experiences do not define most of the responses in the survey and must be understood in that context. They are nevertheless supportive of the notion that having Black mentors, especially early on, is likely to result in a positive career outcome.

4.13. Maintaining international standards in resource-limited countries

Forensic capacity development is often linked to public revelations of inadequately staffed offices or subpar practice following serious events such as assassination of John F. Kennedy in Dallas, the spectacle of the OJ Simpson trial in California and more recently in Jamaica the killings that occurred prior to the apprehension of a man wanted for drug trafficking by the United States Justice Department. Maintaining institutional capacity requires national government support, local and international partnerships, and where available, financial benefactors.

In resource-limited countries, the appropriate strategy should be multipronged. Overseas partners should offer short-term fellowships and observerships that would provide targeted training of pathologists and other experts from developing countries. [20] There should be a commitment from both donor and recipient countries to provide a transfer of skills, knowledge, and research assistance opportunities. A good start would be to first conduct capacity assessment in low- and middle-income countries. The International Society of The Red Cross has been helpful in this regard and has helped trained African forensic practitioners.

4.14. Impact of the novel coronavirus on BFPs professional lives and practice

The novel coronavirus pandemic has highlighted areas of inequity in many, if not most, American systems. These include but are not limited to current educational, healthcare, and housing systems in the United States where many policies are rooted in system racism and oppression. Black Americans are one of the racial groups that disproportionately bear the burden of COVID-19 with higher rates of cases, hospitalization, and death as compared to White, non-Hispanic individuals. [21] In this sample, two-thirds of respondents had at least one loved one develop COVID-19 with half of these knowing at least six people close to them who developed a symptomatic infection. Additionally, this pandemic afforded many increased time at home to visually absorb the killings of Black Americans, repeatedly. As demonstrated in a recent study, the publicized deaths of Black Americans by law enforcement agents unsurprisingly have lasting adverse effects on the mental health in Black Americans in the community. [22] Consistent with these findings, 80% of respondents to this survey reported a change in their behavior, mood, or concentration in the wake of the publicized deaths of Black Americans in 2020 with most, fortunately, reporting a lack of interference with job performance.

These paired stressors compound the added stress from increased workloads experienced by forensic pathologists over the course of the pandemic not only from COVID-19-related deaths but also from increases in homicides and overdose deaths.[19] Owing to the intersection of their race with their job, BFPs and forensic pathologists from other underrepresented and historically excluded minorities, have the unique burden of balancing an increased caseload at work with increased loss at home and in their communities. [23] Of those surveyed, many reported preferentially turning to friends and family in times of distress **(see Results, 3.11, Table 11).**

4.15. Forensic pathologists and public health

Forensic Pathologists in general and BFPs in particular, play an essential role in public health promotion and the prevention of avoidable injury and premature death. This is important for underserved populations which often bear the brunt of disease mortality and injury. It is no secret that these populations are frequently Black or Brown. FPs should use the platform that their public profiles provide to explain how those with less access to health care are more

likely to die prematurely. BFPs are in a unique position to explain how stress because of systemic racism may factor into cause of death narratives in the setting of certain chronic medical conditions and in suicides.

FPs contribute to public health safety, disease surveillance and changes to government policy and private sector behavior via the following mechanisms:

a. Morbidity and mortality conferences: FPs participate in regular morbidity and mortality conferences with treating physicians at local hospitals to review cause of death determinations that may not have been diagnosed antemortem either because the decedent expired from an overwhelming infection or rapidly deteriorating medical condition. FPs can also help other medical practitioners educate the general public about the benefit of post-mortem organ and tissue donations to the living.

b. Epidemiological research and contributions to the medical literature: While medico legal death investigation focuses on determining cause and manner of death of individual citizens, this information provides a strong basis for population level epidemiological research. Articles published from such information may alert policy makers to trends in substance abuse deaths, occupational injury fatalities and unusual infectious disease deaths. One such example cited above, is the documentation of deaths due to COVID 19, which in the US was found not only to have disproportionally impacted the Black community but also demonstrated its lack of access to health care and its continued mistrust of the majority medical community due to previous medical research misconduct[24], of which syphilis and the Tuskegee experiments[25] and the improper cloning of Henrietta Lacks tissue are among the more well researched. [26]

Of course, these post date the improper use of enslaved people for medical experiments, including the controversial "father of gynecology", Dr. J. Marion Sims. [27]

c. Product safety monitoring and public safety hazards: FPs, along with medical examiner and coroner offices contribute to maintenance of public health and wellness by participating in surveillance systems that follow trends in infant mortality and violence occurrences, changes in suicide rates and emerging threats of infectious disease. They also play a major role in consumer product safety monitoring by alerting manufacturers to product defects that may cause accidental deaths. Regarding environmental factors, one author (JC) has been asked to explain to government stakeholders how inadequate street lighting after sunset, inadequate signage at road intersections and the lack of railroad crossing barriers (all of which are more common in Black communities) are associated with repeat traffic fatalities. BFPs must be the loudest advocates for the Black population.

4.16. Survey limitations

The survey may have gained a greater number of responses if institutional review board approval had been obtained prior to the start of the survey. However, all participants gave their consent. Although in the minority given the numbers of certified forensic pathologists, a specific question that required the respondent to state their status (i.e., resident versus fully trained FP) would have been helpful**.**

The leading reasons why most would not select FP as a career choice were cited as being due to finance, heavy workloads and a "lack of government support". All require further exploration in order to determine exact parameters on which to base modifications and recommend improvements. Details of their dissatisfaction with the quality of mentoring and what they would have changed about their training are also worthy of more rigorous interrogation. We need to engage with both issues if we are to make a career in forensic pathology more appealing to future generations of BFPs.

The survey also lacked participation from BFPs in South Africa who may have experiences like those of their US peers given the history of apartheid and its effects on the education of Black Africans. Since the survey was conducted in English, it could not capture the experiences of BFPs practicing in Francophone or Lusophone Africa, in Hispanic countries in Africa and the Caribbean or in Brazil, the country with the largest Black population outside of Africa.

5. CONCLUSIONS

BFPs are increasing in number but the output is far below what should be expected. Many BFPs practicing in the US still face challenges unique to their ethnicity. To increase their representation, it will be important to modify the mechanisms that increase production of FPs (the "pipeline") and to destroy the barriers constructed by centuries of institutional racism. The project will be difficult but requires planning, cooperation and above all perseverance, a quality not in short supply among the survey cohort. As a matter of urgency, the work environment also must be made more supportive, and salaries for FPs need to be increased to ensure long term retention. Happy and contented BFPs will be excellent mentors and recruiters. As well as reducing high workloads, a problem common to all forensic pathologists, employers must develop cultural competences that facilitate an understanding of the unique challenges faced by BFPs as visible minorities. The survey findings are also a call to action, not just to support the existing collective but to develop and nurture the future of forensic pathology within the Black diaspora.

5.1. Implications

Since this is the first study of its kind, it should serve as a basis on which to build additional studies that would analyze the experience of BFPs in other parts of the world, particularly in Hispanic, Lusophone and Francophone countries. There is also much discussion of expanding the vaunted medical school "pipeline" to increase the numbers of Black forensic pathologists. However, a startling revelation from study is that the overwhelming majority of those that have already qualified as forensic pathologists would now opt not to choose it as a career choice. Unless retention is addressed as urgently as recruitment into the specialty, efforts to increase the proportion of practicing Black forensic pathologists might fall short. It would be important to repeat this survey in 10 years, to see how the circumstances might have evolved.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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