2C   On Health Disparities and Motherless Children

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Serena Williams, one of the greatest athletes of all time, almost died while becoming a mother. Williams is a global superstar, one of the most dominant women to ever play in the WTA, who even won the 2017 Australian Open title while eight weeks pregnant. She is an entrepreneur, multi-millionaire, fashion designer, wife, sister, friend, daughter, and a mother. She is also a Black woman who, like far too many others in the United States, almost died because of her pregnancy. Williams delivered her daughter via an emergency C-section that initially seemed to go well. But the next day she began to feel short of breath, a worrying sign for a person with a history of blood clots and pulmonary embolisms. She assumed that the difficulty breathing indicated a coming pulmonary embolism. This world-class athlete, whose entire life has centered around being in tune with and control of her body, recognized worrying symptoms and immediately raised the alarm with a nearby nurse. Williams said that she needed a "CT scan with contrast and IV heparin (a blood thinner)" (Haskell 2018). The nurse suggested she was simply having a bad reaction to pain medication, but Williams did not back down. A physician at the hospital performed an ultrasound of her legs, not a CT scan, and found nothing. Still not satisfied, Williams insisted on the CT scan that she'd already requested. The medical team sent her for the CT scan, which revealed several small blood clots in Williams' lungs. She was soon given the drip that she'd asked for and lived to tell the tale.

Black women die or experience significant injury during pregnancy, childbirth, or in the immediate postpartum period far too frequently in the United States (Figure 2.10). The names of these women appear in numerous news reports as the crisis in maternal mortality for Black women has become a more mainstream discussion. Women like Dr. Shalon Irving, a CDC epidemiologist who studied health disparities, who died from complications related to high blood pressure three weeks after giving birth to her daughter (Martin and Montagne 2017). Or Sha-Asia Washington, who died after going into cardiac arrest while in labor (Dickson 2020). Or Dr. Chaniece Wallace, a pediatric chief-resident who died due to complications from preeclampsia two days after giving birth to her daughter (Burke 2020). So much preventable death at a time that should be full of wonder and happiness.

The US is one of the most dangerous countries for a woman who is pregnant or giving birth. In this country, 700 women die annually due to pregnancy or delivery complications. Unsurprisingly, there are significant racial disparities in the maternal mortality rate. According to the Commonwealth Fund, Black mothers in the United States have been more likely to die than white mothers for 100 years (Declercq and Zephyrin 2020). Black women and American Indian/Alaska Native Women are two to three times more likely to die from a pregnancy complication than are white women—a disparity that increases with age. Though higher education levels typically lead to better health outcomes, that is not so when it comes to maternal mortality. Black college-educated women are five times more likely to die from pregnancy-related complications than are white women with similar levels of education (Petersen et al. 2019). Thus, the data alarmingly reveals that education exacerbates the maternal mortality gap. Maternal deaths are more common among Black mothers with a college education than they are among white mothers with less than a high-school education (Declercq and Zephyrin 2020). Even where death does not result, research shows that Black and Latina women experience significantly higher risk of severe maternal morbidity, such as preeclampsia, which is much more common than maternal death (Artiga, Pham, and Orgera 2020). Despite advances in medicine, Black women continue to die at shocking rates because of pregnancy and childbirth, and efforts to combat this disparity have been sporadic and decidedly ineffectual (Declercq and Zephyrin 2020).

To be a Black woman in America is to live within a system that does not invest in your well-being. The historical line of mistreatment of Black women's bodies runs from the father of gynecology who experimented on enslaved women (Khabele et al. 2021), to the forced sterilizations of Black women across decades (Roberts 1999), to incarcerated women who have labored while chained to hospital beds (Goodwin 2020). The dignity of pregnancy and motherhood has frequently been denied to Black women, so it is no surprise to see persistent disparity in birth outcomes for Black women as compared to others.

Critically, it is racism, not race, that increases the risk of death for Black pregnant women. Research shows that the compounding effects of racism and the stress that it brings to the lives of Black women has a deleterious impact on health (Patterson, Becker, and Baluran 2022). Healthcare is an arena where Black women face deeply problematic interactions with clinicians who are blind to their own lack of cultural competence. One study found that, as compared with the white counterparts, Black women were more likely to report: unfair and disrespectful treatment from healthcare providers because of their race; being denied decisional autonomy during labor and delivery; and pressure to consent to a C-section. Low-income women on Medicaid, in contrast to women with private health insurance, were more likely to report no postpartum visit, a return to work within two months after the child's birth, less access to postpartum support (emotional and practical); a lack of decisional autonomy during labor and delivery, and unfair treatment and disrespect because of their insurance status.

As these findings illustrate, the experiences that women have with maternity care and childbirth differ significantly

across race, class, and insurance status. The maternal morbidity and mortality gap cannot be narrowed or eliminated without considering the root causes of racial disparities. Those causes can be related to health status (weight, chronic illnesses, nutrition), but the experiences that Black women have with the healthcare providers tasked with keeping them and their newborns safe is equally relevant and harder to quantify (Declercq and Zephyrin 2020).

There is no denying that the United States has a maternal morbidity and mortality crisis, and that crisis is even more pronounced in Black communities. Every pregnant woman or person deserves to have the tools to maximize their own health during pregnancy. As has been true for so much of the history of Black women in the United States, death presents itself in times that should be joyous. This will continue to be the case until there is a sustained commitment to identifying and weeding out bias in medicine, ensuring access to high-quality prenatal care for all pregnant people, providing community-based postpartum services and, most of all, valuing the lives of Black pregnant women as much as this country values those of other pregnant women.

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An alternative suggestion favored by Peter Medawar (1952), who won the Nobel Prize for major contributions to immunology, is that late-acting deleterious mutations may accumulate because there is only weak selection against them (Vijg and Dong 2020). Consider a population of otherwise immortal individuals whose fertility does not decrease over time. Some individuals will still be eliminated because of external factors such as lack of resources, predation, and disease. External risks of mortality are present throughout life, so their effects are cumulative and older age cohorts will contain fewer survivors. As a result, young cohorts make a greater contribution to the next generation than older ones.

This is why selection against deleterious mutations that take effect late in life—affecting only a reduced number of older individuals—will be relatively weak. So such mutations may progressively become more prevalent over time.

One advantage of Medawar's hypothesis is that it yields a straightforward testable prediction: species that are subject to high external levels of mortality under natural conditions should age more quickly and have shorter lifespans (Peccei 2001). Testing the prediction is complicated by the fact that, as with most biological features, large-bodied mammals generally live longer

than small-bodied mammals. Once appropriate scaling analyses take body size into account, however, it emerges that the predicted inverse relationship between mortality rates and lifespan does indeed exist. Mammal species that are subject to heavy mortality have relatively short lifespans and vice versa. Moreover, analysis of data from field studies has revealed that the age at which sexual maturity is achieved decreases as natural mortality rates increase. So species that are exposed to heavy mortality begin to breed earlier. As already noted, compared to other mammals, primates have relatively long lifespans. Their typical arboreal habits are seemingly associated with lower mortality. However, the development of exceptionally long lifespans in ground-dwelling humans requires a different kind of explanation. Undoubtedly, in our case cultural innovations that reduced death from resource depletion, accidents, predation, and (eventually) diseases played an important part. In any case, according to Medawar's hypothesis the relatively long lifespan of humans indicates that humans are biologically adapted for relatively low mortality.

In 1957, George Williams proposed a somewhat different evolutionary aging hypothesis, based on the fact that a single gene may have a number of different effects (*antagonistic pleiotropy*). Williams suggested that certain effects that positively influence survival early in life might exert negative influences at a later stage. Because there are many more young individuals in a typical population, even quite limited positive effects of a given gene early in life can be subject to strong selection. By contrast, selection against large negative effects that emerge only later in life is likely to be weak. Williams offered an imaginary example in which a gene promoting calcium deposition in bones during development also promotes deleterious accumulation of calcium later in life. Once again, the concept of a trade-off is involved, but Williams' aging hypothesis suffers from the drawback that it is largely theoretical and that very few practical examples have been reported since it was originally proposed. Nevertheless, it is notable that Williams' hypothesis also predicts that—in species with high levels of externally caused mortality—individuals should age more quickly and have shorter lifespans.

A radically different perspective is presented in David Sinclair and Matthew LaPlante's 2019 book *Lifespan: Why We Age—and Why We Don't Have To*. This is based on his *Informational Theory of Aging*, developed over recent decades on the basis of extensive experimental studies at the molecular level conducted on organisms ranging from yeast to mice in his and many other laboratories. As in several other examples, Sinclair's hypothesis depends on a trade-off, in this case between

resources needed for reproduction and repair of the fundamental genetic material. However, aging effects are attributed not to accumulating mutational errors in genes themselves but to increasing disruptions of *epigenetic* chemical tags that govern and guide their function. The *Informational Theory of Aging* differs from other proposals in that numerous experiments have indicated ways in which the effects of deleterious changes over time might be mitigated or even reversed. In sum, Sinclair argues persuasively that aging is not an unavoidable fact of life but a *disease* that can be cured (Gavrilov and Gavrilova 2018). The findings that he reports indicate that it should soon be possible to combat aging affects and add healthful decades to human lifespans. But it is not at all clear whether the treatments he envisages could extend the maximum lifespan beyond 125 years. Although Sinclair reports striking increases in age-at-death with experimental animals, there is as yet no evidence for survival beyond the maximum recorded lifespans for any of the species concerned. In a not-too-distant future, we may be enabled to live healthier, longer lives; but the long-sought goal of *immortality* will surely forever remain beyond our grasp.

This contrasts harshly with the way in which humans fantasize with the limits of their own existence and mortality. As this exhibit particularly shows, art has been a remarkable medium through which we express idealized notions of beauty, maturity, and the twilight of life. It is curious that when it comes to art produced to express such notions the number seven is a recurring theme. A superb illustration of this is the renowned painting *Seven Ages of Woman,* crafted in 1544 by the medieval German artist Hans Baldung Grien. This well-known masterpiece depicts seven female life-stages ranging from infancy through puberty and on into maturity and old age. An oft-quoted monologue from Shakespeare's play As *You Like It*, probably written in about 1599, provides a male counterpart. Jaques, a discontented nobleman, lists successive intervals, now widely known as the "seven ages of man": infant, schoolboy, lover, soldier, justice, pantaloon, and second childhood. (The word pantaloon here refers not to trousers but to a person showing signs of senility.) Interestingly, biology similarly leads us to distinguish seven key stages in the human lifespan too, though they are somewhat different: infancy, early childhood, later childhood, juvenile period, adolescence, adulthood, and old age. Similar parallels can be made with how the stages of death have been artistically represented by both ancient and modern cultures. A remarkable example is *the Nine Stages of Bodily Decay* depicted by Japanese Buddhist monks (see Foxwell in this volume). They reflected on the impermanence of the human body,

and, opposed to the aesthetic beauty of *nirvana*, envisioned death as a disgusting process of decay and evanescence of the body.

Returning to biology, investigation of longevity and human lifecycles, in general, has been particularly enriched through information derived from archaeological and bio-archaeological research. Human remains found in ancient cemeteries are sometimes preserved under excellent conditions, yielding a large proportion of available data when carefully examined in contexts (*archaeothanatology*). Through them, it is possible to study broad lifecycle characteristics (*palaeodemography*) in such population samples. However, it should not be forgotten that cemetery remains are death assemblages and do not provide a cross-sectional view of lives led in general populations.

Following the discovery of human skeletons at any given site, specialists are confronted with two practical tasks: inference of sex and estimation of age at death for the individuals represented. This information is of importance when trying to reconstruct life-history patterns for prehistoric populations. There is, in fact, a connection between sex and longevity because there is a certain tendency in human populations, other things being equal, for women to live longer than men, despite the challenges of childbirth (see also Mutcherson in this volume, on other factors affecting this tendency). In the USA, for example, the average life expectancy for women is currently around 81 years, whereas for men it is 77 years (Woolf, Masters, and Aron 2022; Woolf and Schoomaker 2019). In Europe, average lifespans are somewhat longer: 83 years for women and 78 years for men (United Nations Department of Economic and Social Affairs Population Division 2017). Information from archaeological sites may yield information about longevity from ancient populations. For example, age at death was estimated on skeletons recovered from graves at the Ukrainian locality of Sredny Stog, dated at about 7000 years ago. The results indicated that average life expectancy at birth was 44 years for women but only 36 years for men, a difference of eight years between the sexes (Wilmoth 1998). Eventually, analysis of information from a large number of well-documented archaeological sites may indicate whether the widely recognized sex difference in age at death in modern human populations dates back to antiquity. In fact, this seems highly likely as a large-scale survey of life histories of 101 wild mammal species has revealed a general tendency for females to live almost 20 percent longer than males, with relatively few exceptions (Lemaître et al. 2020).

Primary information regarding prehistoric life-history patterns comes from age-at-death estimations, derived

from similar techniques to those used by forensic scientists today. For infant and sub-adult individuals, age estimation is based on developmental markers, such as the formation and eruption of the dentition, and patterns of long bone fusion. For adult individuals, age estimation is based on increasing signs of degradation of the skeleton, a prime example being tooth wear (*dental abrasion*). However, age estimation for any individual skeleton becomes increasingly unreliable as the lifecycle advances, especially because environmental factors exert effects. For instance, the degree of dental abrasion depends upon physical properties of the food that is masticated, including contamination with wind-borne sand.

Specialists face many more challenges when it comes to the age-at-death estimations, and even more so for identification of the causes of death. For the former, specialists draw on gradual degenerative changes that occur in the skeleton after attainment of physical maturity. Combining both developmental and degenerative aspects, one special example actually overlaps the transition to adulthood: the fusion of skeletal elements that are initially formed from separate centers of bone formation (*ossification*). In humans, the process of gradual ossification of cartilage regions of long bones is completed between ages of 16 and 21 years, depending on the skeletal element concerned. Eventually, bone formation in the skeleton is completed, although faint traces of fusion sites are still visible externally (and especially internally) for a while. With X-rays, traces of the fusion sites can be detected for several years after the attainment of adulthood.

Skeletal information derived from archaeological sites can also be used to study potential causes of disease and death (*palaeopathology*) and to investigate broad dietary habits (*palaeonutrition*) in prehistoric populations. Unfortunately—apart from healed fractures—only a limited number of pathological features are reflected by identifiable lesions or other changes in human skeletons. Notable examples are bone cancers, anaemia, and end-stage syphilis. Thankfully, modern molecular techniques permit direct identification of disease agents in samples from archaeological skeletons. For instance, recent work on genetic traces of the bacterium that causes syphilis has provided confident confirmation of the presence of the disease in certain individuals. Moreover, comparison between samples has permitted reconstruction of an evolutionary tree that throws new light on the origins of syphilis (Xirocostas et al. 2020). In a similar way, modern techniques have also permitted reliable inference about dietary habits in prehistoric populations, notably using assessment of stable isotopes.

2D   Response to the Pandemic: Creativity in the Face of Precarity

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Field Museum

Toward the end of 2019, people in the city of Wuhan, China, started to fall ill in large numbers, affected by a respiratory disease we all soon came to know as COVID-19. Caused by the SARS-CoV-2 virus, the illness spread quickly around the world, and in March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic—a disease that was global in scope. In the United States, states and cities began to take measures to prevent the spread of the virus, shutting down public venues, requiring social distancing and masks, as the Centers for Disease Control (CDC) promoted national guidelines based on epidemiological investigation.

As museums began to recognize the enormity of the crisis, they began to implement programs to document the pandemic moment for the future. One of the earliest was the Victoria and Albert Museum in London, which started to make a collection there of pandemic-related material culture (Wainwright 2020).

The Field Museum also joined the effort and created a small task-force within the Science and Education Division to establish a collection of material culture that reflected the social and cultural responses to the COVID-19 pandemic. In part, this effort was spurred by the curiosity that there was virtually no representation of the material culture of previous pandemics, such as the 1918 influenza pandemic. In part, it was also part of a broader conversation in museums about future directions for collecting and representing practices (cf. Thorner 2022; Rotenberg and Wali 2014). By the early summer of 2020, it became clear that the pandemic was unfolding in tandem with other social and cultural events that represented significant shifts in the public manifestation of underlying tensions created by rising inequality (cf. Caduff 2020; Wahlberg, Burke, and Manderson 2021). The task force—social scientists from the Keller Science Action Center and the Negaunee Integrated Research Center (including scientific affiliates), together with anthropology collections staff—determined that the Field Museum collection should include documentation of the broader social circumstances.

Additionally, because scientific staff were working in venues across the world, the collection could reflect a global perspective on the pandemic. As of May 2022, the collection of objects numbers over 100 and includes: masks, visual art, song and poetry, educational materials, plant medicines, digital media, and more. The collection also includes over 60 interviews with cultural producers and community members. Our team is working with community partners in the Chicago, northwest Amazon, and south Philippines regions to identify creative cultural responses that give meaning to widespread suffering, and to support efforts to repair social well-being. From movements for racial, gender, medical, and environmental justice, to reflections on how to communicate with neighbors and strangers about the things that matter most, the stories and materials collected here demonstrate that even our most challenging moments invite us to connect and remake our world anew.

To find out more about the collection, please see the website: https://www.pandemic-collection.fieldmuseum.org.

One object in the current collection, displayed in the exhibition, encapsulates several themes emerging from the collection and ethnographic documentation. This is a textile made by Andrea Martinez, a life-long Chicagoan, and donated to the museum in 2021. Ms. Martinez is a neighbor of a Field Museum staff member, who happened to see the textile hanging from the fence in front of the house. It is a cotton fabric banner with hand-stitched letters cut out from other fabric scraps to spell out "Thank You Essential Workers." Ms. Martinez kindly donated the piece to the museum when she was contacted by the staff member. Subsequently, she agreed to be interviewed virtually (see Horton 2021 for an interesting perspective on doing remote ethnography during the pandemic) and narrated the story of the banner. She had been furloughed from her job and, with little to do, decided to sew the banner as her contribution to helping neighbors and family, some of whom were continuing to work. The banner stayed on the fence for several months, was photographed and shared on social media. Ms. Martinez was a self-taught seamstress, had a sewing machine, had saved fabric scraps, and obtained the blue cotton cloth for the banner from a neighborhood Facebook group set up as a barter site. The forced absence from her job inspired the creative response of making the banner. As stated in the interview, she "felt bad" that she couldn't do anything, that she wasn't "doing her part." Making the banner and hanging it connected her to her working relatives and friends. She also did a lot of baking and taking care of others. During the pandemic, she and her husband invited a close friend who lived alone to stay with them.

Ms. Martinez's account of her experience of the pandemic was similar to others we heard during ethnographic interviews. There were frustrations because plans had to be changed (her wedding was cancelled and instead became a small ceremony in her family's yard), but also the forging of closer connections to neighbors. Neighbors shared resources and, as the strict lockdowns faded, convened in their yards for shared meals. The experience of time also changed. To replace the routine of work, Ms. Martinez created a "to do" list every day that provided structure and prevented her from feeling idle. She brought a Kindle™ and read more than she had in years. Sewing also occupied her time. Ms. Martinez and her husband wanted to spend more time on their front porch so they could chat with neighbors and passers-by so they purchased outdoor