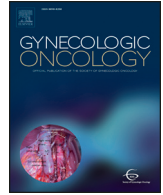




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Review Article

Investigating Black-White disparities in gynecologic oncology: Theories, conceptual models, and applications



Kemi M. Doll *

Division of Gynecologic Oncology, Department of Obstetrics and Gynecology, School of Medicine, University of Washington, United States
Seattle Cancer Care Alliance, United States

HIGHLIGHTS

- Environmental, biological, and social factors all create disparities in health outcomes.
- Frameworks that incorporate all three can be used to design and interpret disparities research.
- Ecosocial, fundamental cause, and critical race theories are examples of such approaches.

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ABSTRACT

Within gynecologic oncology are two of the top five widest Black-White mortality gaps among all cancer diagnoses in the United States. A rich body of work from the social sciences, including anthropology, sociology and social epidemiology, have broadened the understanding of and research approaches to the study of health and healthcare inequity experienced by Black Americans. Yet, these intellectual advancements in understanding are virtually absent from the gynecologic oncology literature. The goal of this analytic essay will be to introduce three current frameworks of studying racial inequity: The Ecosocial Theory of Disease Distribution, The Fundamental Cause Theory, and The Public Health Critical Race Praxis. Applications of each conceptual model to gynecologic oncology are illustrated. The Ecosocial Theory, in particular the concept of embodiment, can be used to design and interpret racial differences in molecular and genetic studies. The Fundamental Cause Theory explains the relationship of socioeconomic position with the evolving treatability of a given disease over time, and provides understanding to the contrast in racial disparities within ovarian, endometrial, and cervical cancers. The Public Health Critical Race Praxis is an iterative methodology that helps frame how to study the impact of racism on healthcare delivery. Different analytic approaches that account for the interaction of race and socioeconomic factors are reviewed. Finally, considerations for racial equity research in gynecologic oncology are proposed.

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* 1959 NE Pacific St, Box 365460, Division of Gynecologic Oncology, University of Washington Seattle, WA 98195, United States.
E-mail address: kdoll@uw.edu.

1. Introduction

Racial disparities are complex, as they reflect the multitude of ways advantages and resources are allocated in a race-conscious society [1]. In medical research, the gap between the biomedical explanation of disease and the social reality of race can lead to limited research design and narrow interpretations of racial disparities in disease. This is especially present when social, environmental, and biological factors are treated as independently operating mechanisms. Conceptual frameworks that allow us to consider disease processes as an integrated function of all three factors can allow for broader understandings and tangible routes for intervention.

Within gynecologic oncology are two of the top five widest Black-White mortality gaps among all cancer diagnoses in the United States: cervical and endometrial cancer [2]. A rich body of work from the social sciences, including anthropology, sociology and social epidemiology, have broadened the understanding of and research approaches to the study of health and healthcare inequity experienced by Black Americans. This expanded viewpoint has been endorsed by the National Academies of Science, Engineering and Medicine [3], and the recent position statement from the National Cancer Institute [4]. The purpose of this analytic essay is to introduce three frameworks for studying racial inequity in health as it pertains to Black women, demonstrate applications within gynecologic oncology, and present practical considerations for the design and interpretation of racial disparities research in our field.

2. The origins of the Black race

The Black race as it operates in the US, is a social construct originally defined by skin color and political class (human chattel), that was legally codified in the 1660s to be an indelible classification perpetuated through successive generations [5]. After uprisings where both European and African indentured workers joined forces against the colonial elite, laws were enacted to grant privileges to European workers (including a defined end to servitude) and to codify African workers as a permanent, slave underclass [6]. This legal dehumanization of the slaves also served to reconcile the contradictions between a burgeoning republic dedicated to the universal rights of “all men”, and the reality of wanting to preserve an unending source of free labor [7]. Ongoing procreation between differently raced peoples led to further legal action to define the Black race by the status of the mother and the “one drop” rule [6,8]. Thus the slave class, of a variety of skin tones and ancestral lineages, were grouped into one race, now called Black or African-American [9]. The story of the creation of other races is beyond the scope of this piece. However, for Asian Americans, Native Americans, and White Americans, a rich history of shifting categories of inclusion based on political and social factors, in addition to physical attributes, is well documented [10,11]. Today, self-reported race is the most accurate measure of the social stratification that persists in the US and its associated poor health outcomes. Common language helps to differentiate and identify disparities as distinct from differences (Table 1).

3. Disparity frameworks

3.1. Ecosocial Theory of Disease Distribution and “embodiment”

There has traditionally been a separation between disparities research that focuses on genetic, molecular, or biological differences between races and research that focuses on external, environmental factors. Theories based on racial-genetic determinism have been criticized due to the knowledge that genetic variation between races is minimal and classification techniques used among genetic researchers are inconsistent, ambiguous, and continue to incorporate social classifications [6,12]. In addition significant sampling bias is incorporated into current definitions of ancestral groups as small populations were used to represent entire continents [13]. On the other hand, epidemiologic

Table 1

Common language and definitions in use in disparities literature [49].

Disparity	An uneven rate of a given health outcome or risk <i>between</i> populations. One's ability to achieve and maintain good health may be influenced by factors that include: race or ethnicity, sexual or gender identity, socioeconomic status, age, and disability, among others.
Difference	An element that separates or distinguishes contrasting people, things, or situations. Individual people differ on factors such as race and gender; it is when these factors lead to unequal outcomes, risk levels, or access to care that disparities occur.
Inequity	An avoidable, systematic difference in the distribution of resources between groups. Examples of inequities that lead to disparity include: health insurance, education, fresh and healthy food, and clean air.
Social determinants of health	Social determinants of health (SDOH) are conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. Broadly, most SDOH fall under one of five categories: Economic Stability, Education, Social and Community Context, Health and Health Care, Neighborhood and Built Environment.

studies to identify and account for such social determinants as socioeconomic status, education, and healthcare access often result with residual significant associations between race and poor outcomes [14]. These residual ‘race effects’ are seen as evidence for the primary role of inherent biological differences. Neither perspective represents a comprehensive viewpoint. Within epigenetics and the science of the inheritable epigenome, many studies have demonstrated that genetic composition and especially gene expression do not operate independently of environment [15].

The Ecosocial Theory of Disease Distribution integrates both social and biological reasoning through the concept of ‘embodiment.’ Its chief concern is who and what drives social inequalities in health. Embodiment refers to how we, as humans, “literally biologically embody exposures arising from our societal and ecological context, thereby producing population rates and distribution of disease.” In the case of race, this results in racially patterned “exposure-induced pathogenic pathways”, mediated by physiology, behavior, and gene expression, that affect the development and regulation of our body's systems [16]. One example from women's health is the racial disparity in low birth weight (LBW) infants and preterm birth. For decades neither genetic studies nor social factors were found to adequately explain the persistently high rate of LBW infants among Black women in the US. Research that combines the knowledge of race as a social construct and the biological effects of maternal stress on fetal development that has led to greater understanding [17–20]. This work demonstrates the ‘pathway of embodiment.’ Currently, reduction of maternal stress as a viable pathway to intervention is a result of this empirical research on the specific way social context produces biological differences [15,21].

One example of ‘embodiment’ in cancer research is the link between stress and cancer outcomes. Psychosocial stressors are known to promote inflammation, decrease immunosurveillance, and inappropriately activate the HPA axis [22]. These physiologic changes can directly influence outcomes such as response to treatment and tumor progression. These potential links suggest that regardless of the purity and fidelity to a clinical trial protocol, a patient's external environment can affect their clinical outcomes. To understand why two populations that differ by a non-clinical category (i.e. race) have differential outcomes, it is important to incorporate measures of life stressors (early, acute, and chronic) such as discrimination, vigilance, poverty, and housing. This concept of embodiment, along with the Fundamental Cause Theory discussed later in this paper, is also applicable to efforts to understand why Black women on endometrial [23] and cervical cancer trials [24] have worse outcomes, and those on ovarian cancer trials may not [25]. Without any context as to how the social status of Black women on

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