2020

The Relationship Between Cervical Cancer and Women Living with Disabilities in Kentucky

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2020

Abstract

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by

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MBA, Ashland University

BS, United States International University

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health, Epidemiology

Walden University

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Abstract

Despite many national interventions, cervical cancer (CC) rates persist, and in Kentucky (KY), CC incidence rates are on the rise. Additionally, women with disabilities face more barriers to secondary prevention and healthcare access, have more known risks, and experience more health disparities than women without disabilities. Given that 1 in 4 persons live with a disability, the purpose of this observational, cross-sectional, quantitative study was to explore the relationship between CC and women with disabilities as evidenced by reproductive cancer discharges from inpatient hospital (IHD) and outpatient services databases (OSD) so as to compare population-specific differences from social determinants of health framework. Data from the Kentucky Cabinet for Health and Family Services for 2015 to 2018 were analyzed using MLR. In total, the sample included 584 women with disabilities and 32,773 women without disabilities living in KY. Results of the IHD data analysis found that county of residence (p =.014) and insurance payer (p = .000) were statistically significant and that women on Medicaid were 9.6 times as likely to be diagnosed with CC. Results of the OSD data analysis found that county (p = .000) and age group (p = .000) were statistically significant and that women aged 40-44 were 9.5 and 2.9 times as likely to have breast cancer and CC respectively. This study's findings call for greater attention to the determinants that affect health factors among women in KY, to the visibility of people with disabilities in the data, and to tailored interventions that ensure increased access to value-based health services for women in KY thereby decreasing health disparities, especially for women with disabilities.

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Dedication

I dedicate this study to my deceased mother, Margaret Ngugi Muchene. I am honored that you were my mother. Your legacy of caring for women’s reproductive health lives on. I celebrate your disabilities. Thank you for paving the way.

Acknowledgments

I want to express my gratitude to my husband, Koffi Akakpo, who supported me in every possible way. To my beautiful daughters, Keren and Eyram, for bearing with the time away from precious moments, and to my family at large for their support. My chair, Dr. Sriya Krishnamoorthy was incredibly encouraging, responsive, and supportive. My committee member, Dr. Tolulope Osoba really helped me be thorough with the methodology and my URR member, Dr. Michael Brunet pointed to all the overall impact of this study. This committee made this a better study and mentored me to be a critical thinker and scholarly writer. They collectively made positive social change tangible and within reach. A big thanks to my friends and body in Christ that kept me going, and to Chartier B, I could not have done this without you!

I also want to acknowledge and thank a dear colleague, Michelle S., without whose inspiration and lived experiences this study would not have taken the focus that it did.

To God be the Glory, for indeed, He has been the source of all that I needed.

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Chapter 1: Introduction to the Study

Chronic diseases, such as cancer, have become a significant challenge among people with disabilities (PWD), specifically those living with intellectual and developmental disabilities (IDD). This can be attributed to the fact that this population is living longer than before given advances in technology and person-centered improved supports (Parish, Son, Powell & Igdalsky, 2018). Further research shows women with IDD are diagnosed with cancer at later stages and present with tumors of advanced cancers at younger ages than the general population (Satgé et al., 2014). Breast cancer has been noted at the same incidence rate among women with IDD than those without IDD (Partja, Eero, & Livanainen, 2001; Sullivan et al., 2003). However, additional breast cancer risk factors have been noted among women with IDD than those without (Taggart, Truesdale-Kennedy, & McIlfatrick, 2011). Women with IDD are at greater risk of developing uterine and ovarian cancers than cervical cancer (CC), although the disease etiology of cancer could lead to different incidence rates (Parish et al., 2018). According to Reichard, Haile, and Morris (2019), Medicare fee-for-service recipients with chronic physical conditions have higher rates of emergency department admissions as well as higher rates of 30-day readmissions than non-Medicare recipients. African-American women with IDD received breast cancer screenings at lower rates than White women with IDD (Parish, Swaine, Son, & Luken, 2013b). Further, women with IDD are half as likely to be screened for CC and one and a half times as likely to be screened for breast cancer as women without IDD (Cobigo et al., 2013).

In this quantitative, epidemiological study I used secondary data to investigate the disparities of CC in a manner that “include population-specific differences in health indicators between women with disabilities and those without disabilities” (Drum, Krahn, & Bersani, 2009, p. 138). The health of some populations is negatively impacted due to disparities that occur when different populations have lived experiences of discrimination and bias due to social status and underlying differences (Drum et al., 2009). With this study, I aimed to contribute to the advancement of health outcomes among women with disabilities in a way that advocates for inclusive public health services that ameliorates health disparities within this population.

The approach for this study included the use of secondary data, and the anticipated concerns of the present era where people with IDD are invisible in data (Havercamp & Krahn, 2019) was realized. The proposed plan was to examine the relationship of CC and other variables that included women with IDD; however, these women were invisible in data, and it was therefore not possible to examine the differences with this very important demographic of the population. The International Classification of Disease, 10th Revision, Clinical Modifications (ICD-10-CM) codes that would have identified women with IDD were either not used by hospitals and outpatient services whose data contributed to this study, or it was not common practice to include these codes when women with IDD were being treated for cancer, a non-IDD condition.

In view of the invisibility in data for women with IDD, it was necessary to include that for the purpose of this study, women with disabilities will refer to all types of disabilities (which include IDD). When IDD is used in this study, the term will refer to that specific demographic within the larger disability demographic. This study contributes in a small way to the use of available administrative data and also affirms the growing need for a robust, collaborated health surveillance system toward improved health services for this demographic in the general population

This chapter introduces the study problem followed by the study's purpose, research questions, and the theoretical framework used. The significance of the study will also be presented along with the implications for social change.

Background

From a Centers for Disease Control and Prevention's (CDC) 2016 report, among all PWD, about 32% live in rural areas while about 24% live in large, central metropolitan areas (CDC, 2020c). Overall, over 61 million people (1 in 4) live with a disability. Six domains are used to determine a person's disability status based on the functional level of known deficits, including hearing, vision, cognition, mobility, self-care, and independent living deficits (CDC, 2020d). Given the above domains to help determine a person's disability status, there is a growing body of concern about the inconsistency of the prevalence of persons with IDD. A recent systemic review indicated that, among adults, the prevalence was estimated at 41.0 per 1,000 people for developmental disabilities (DD) while that of ID and/or DD was 7.9 per 1,000 for adults, a rate much lower than that of children, which was noted at 38.2 per 1,000 from birth to age 5. In addition, among working-age adults, about 137 per 1,000 receive Social Security income or disability benefits and noted as the prevalence of ID from administrative data (Anderson, Larson, MapelLentz, & Hall-Lande, 2019). Although the prevalence rates of women with IDD are not known, rates of men with IDD are about 36 per 1,000, and the CDC estimates more women than men live with IDD (CDC, 2020c).

PWD experience health disparities in many forms, which excludes this population from secondary prevention measures. Screening for CC continues to be a key prevention measure for CC control and treatment. Ouellette-Kuntz, Cobigo, Balogh, Wilton, and Lunksy (2015) noted that, within a 2-year period, 22% of adults with disabilities had a physician health examination compared to 26.4 % for adults without a disability. It is also well documented that adults with disabilities do not undergo screening at the recommended age nor the gender-specific screening for such cancers as cervical, breast, or colorectal (Ouellette-Kuntz et al., 2015).

The U.S. Preventative Services Task Force (USPSTF, 2018) recommends CC screening with cervical cytology only every 3 years for women aged 21-29. For women aged 30-65, the recommendation is every 3 years for cervical cytology only, or every 5 years for a combined, high-risk HPV test with cervical cytology (USPSTF, 2018). For women aged 50-74, the USPSTF recommends biennial mammography screening. For women with a known high risk or who want to start early, the USPSTF recommends biennial screening between the ages of 40-49 (USPSTF, 2018).

Despite these recommendations, Plourde, Brown, Vigod, and Cobigo (2018) found that women with IDD were less likely to be screened for CC using a pap smear even with high to moderate levels of continuity of care as compared to low continuity of care. In addition, women with IDD have been noted to lag women with less severe disabilities as well as behind women without disabilities with regard to pap tests and mammograms. When controlling for geographic, demographic, and socioeconomic factors, women with more severe disabilities experience even higher disparities (Horner-Johnson, Dobbertin, Andresen, & Iezzoni, 2014). Furthermore, Smith, Ouellette-Kuntz, and Green (2018) found that women in general, face further disparities while men with IDD were more likely to receive age-appropriate screening than women with IDD.

Parish, Swaine, Son, and Luken (2013a) used medical records from 2006-2010 to identify women with IDD aged 18-65. They found that women who had an obstetrician/-gynecologist and who lived in residential facilities in rural communities had higher rates of CC services than other women with disabilities, necessitating improvement of CC screening services and awareness for this population. Hospital discharge rates among women treated for incidences of uterine cancer were found to be higher than those of CC, according to Parish et al. (2018). Women hospitalized for CC treatment stayed longer, were younger, and the majority were on public insurance for healthcare.

Leser (2016) and Cobigo et al. (2013) provided the foundation that promotion of health behaviors for PWD is lacking and that direct service professionals (DSPs) and support groups need to be educated on the promotion of health behaviors for the implementation and intervention services that reduce disease incidences, including CC (Parish et al., 2018). Individualistic, person-centered reviews are warranted for a good understanding of what is occurring to prevent disease prevalence among PWD. However, the fear of violating the rights of PWD keeps DSPs from promoting health, nutrition, and physical activity, and it manifests itself as a significant barrier (Leser, 2016).

Campbell (2017) asserted that nutrition plays a significant role in cancer development, despite the complexity of multistage etiology. Because of the way cancer develops, there is room for nutrition to either slow the disease or contribute to it. Cancer occurs in three stages, according to Campbell and Campbell (2016). The first occurs when a carcinogen is introduced into the body, which leads to the development of cancer-prone cells that develop into masses, the second stage, which then leads to metastasis, the third stage (Campbell & Campbell, 2016). A whole-food, plant-based diet offers the most nutritional value in cancer reduction, according to Campbell and Campbell, while nutrition and healthy lifestyles were advanced by Campbell and Campbell to be the next frontiers of medicine given that poor lifestyles and nutrition are related to higher disease risk.

Zam and Khadour (2017) noted that cellular signaling is changed by epigenetics related to a high-fat, high-calorie diet while Del Cornò, Donninelli, Conti, and Gessani (2017) found that red-meat combined with the consumption of processed foods increases cancer risks. Physical activity, according to Davies, Batehup, and Thomas (2011), lends itself to better outcomes for cancer reduction, mainly because low body weight decreases disease risks.

Fisher and Howell (2010) offered that empowerment and self-efficacy improve outcomes. Teitelman et al. (2011), using the theory of planned behavior (TPB), provided a technique for use in focus groups to determine perceptions of cancer prevention. Stacy et al. (2016) advanced that when people had a goal related to their behavior, outcomes were realized within a given timeframe. Education that is tailored to intervention toward improved healthy lifestyles is also an important variable for this study (Spector, 2009).

From a broader perspective, HealthyPeople.gov (2020) has noted that health data for PWD that informs public policy so as to support programs that tackle disparities is a problem, calling for the inclusion of standard disability items in health data surveillance instruments. Effective health and wellness programs applicable for PWD is a problem, hence HealthyPeople have called for the introduction of evidence- and community-based strategies in health promotion, and, public infrastructure and universal designs that t ensure that professionals who work with this population are appropriately trained to meet this population's health care prevention and treatment needs (HealthyPeople.gov, 2020). This current study aligned with these issues and hoped to meaningfully contribute to one or more of these areas as noted by HealthyPeople.gov. In summary, prevention measures that include screening, engaging in healthy behaviors, gaining health education, a disability competent workforce, and including PWD in health data surveillance instruments are all efforts to improve services, thereby reducing CC prevalence and mortality.

This current study was needed because, despite the growing body of research available pointing at the health disparities for this population, none had examined the relationship of CC for this population in KY using inpatient and outpatient discharge data after cancer treatment. A Healthcare Cost and Utilization Project study that used 2010 data from discharges linked cancer treatment to younger women with disabilities and longer hospital stays (Parish et al., 2018) for this population. Parish et al.'s (2018) study was based on 30 women diagnosed with both CC and IDD and 21,635 women with CC without a disability from the 2010 data. It is important to re-state that PWD are invisible in data, and the numbers may have been limited due to identifying standard elements not being imbedded in data used by Parish et al. (2018). It is also worth noting that the study did not include outpatient treatment services data, although research trends show a shift from inpatient to outpatient cancer treatment.

This current study captured women diagnosed with CC living with disabilities that could potentially be receiving radiation and chemotherapy in settings that offer outpatient services. In KY, there was no population-based study found that addressed CC prevalence from secondary data in a way that specifies the characteristics of women discharged from the treatment of reproductive cancers to account for population-specific differences. This study stepped to the plate and filled that gap. This current study was important as it contributed to learning about CC relative prevalence in KY noted in the discharges of women receiving reproductive cancer treatment. The emphasis on CC was due to the growing rates of CC prevalence in KY, and because CC can be eradicated by vaccinations, screening and appropriate timely treatment for precancerous lesions or for the invasion of CC according to World Health Organization (WHO; 2019a).

Problem Statement

CC has persisted as one of the leading causes of death around the world and is, unfortunately, the fourth most frequent cancer, representing 6% of all cancers among women (WHO, 2019a). In 2018, 570,000 new CC cases were estimated, according to the WHO. In 2020, the American Cancer Society (ACS; 2020b) estimated that 4,290 women would die, while 13,800 new cases of invasive CC were estimated. Early detection through effective screening, prevention, and treatment are strategies to eliminate CC, and while vaccinations are available to reduce the risk of disease, CC incidences and mortality persist. From the most recent data (2015), for example, KY’s incidence of CC was 8.8 per 100,000, with mortality of 2.7 per 100,000, with higher rates in Appalachian KY, which was a noted increase from 2014 data (ACS, 2020a).

In KY, according to the CDC (2020b), the overall prevalence of all disability types for those 18 and older is 35%. KY women experience higher rates of disabilities than men (37.3% versus 33%), which translates to about 677,681 KY women (CDC). Women with an IDD are a vulnerable population, typically requiring lifelong support (Knox, 2008). People with IDD live longer, are being diagnosed with cancer earlier in life, and, when compared to the general population, depend on public funding (i.e., Medicare, Medicaid) for their healthcare needs (Parish et al., 2018). There is scrutiny for more innovation and more efficient processes of purchasing that define the health care delivery system for PWD (Anthes, 2018). A value-driven system that includes the reduction of CC incidences and better health outcomes is emerging in public health, with the responsibility of, among other things, ensuring health equity that adds to quality community inclusion for women with IDD (Drum et al., 2009).

IDD is defined as a limitation that significantly affects the intellectual functioning as well as the behavior adaptation affecting social and physical adaptations of daily living (American Association of Intellectual and Developmental Disabilities [AAIDD], 2019). IDD usually occurs before age 18, and mostly occurs at birth, affecting such body systems as the nervous system, sensory system, and metabolism (National Institute of Health, 2016). People with IDD are siblings, friends, neighbors, employees, parents, students, and community members, and the diagnosis does not imply a reduction in the right to thrive in health or to have an engaged and active life (Hewitt & Nye-Lengerman, 2019). There are several risks in the physical comorbidities faced by this population, namely obesity, cardiovascular disease, diabetes, and cancer, to name a few (Haveman, Heller, Maaskant, Shooshtari, & Strydom, 2010). In addition to these risks, this population has been shown to have higher rates of disease incidences, while the use of healthcare services has not been consistent with set guidelines, especially for the screening of colorectal, breast, and CC (Ouellette-Kuntz, Coo, Cobigo, & Wilton, 2015).

Disability, on the other hand, is a term that is broadly used around the world to refer to a mental, physical, sensory, or intellectual impairment of a person (Drum, et al., 2009). Different cultures interact with disability differently. Disability, according to WHO (2020), contains three dimensions: impairment, activity limitation, and participation restriction. The International Classification of Functioning, Disability and Health (ICF) offers a standard language that helps to classify the three dimensions, mainly used for qualification purposes in the health decisions for service and supports. According to ICF (CDC, 2020c), activity and participation that are hard to define are included in the following categories:

- Learning and applying knowledge
- Managing tasks and demands

- Mobility (moving and maintaining body positions, handling and moving objects, moving around in the environment, moving around using transportation)
- Managing self-care tasks
- Managing domestic life
- Establishing and managing interpersonal relationships and interactions
- Engaging in major life areas (education, employment, managing money or finances)
- Engaging in community, social, and civic life

Although much progress in overall services has been noted in this population, adults with a disability in KY and in the United States in general continue to experience tremendous health-risk behaviors and health characteristics compared to adults without a disability (Havercamp, 2017). Recognized risks in this population, according to Dixon (2015), include, but are not limited to: inactivity, physical comorbidities, low understanding of risks, poor hygiene, obesity, and sexual victimization, all factors that increase CC risk. In addition to these risks, according to Parish et al. (2013), only 55% of the women with IDD aged 18-65 years old received pap screenings during 2008-2010, which is below the target rate of 93% set from a baseline of 84.5% by HealthyPeople.gov (2014).

Furthermore, extensive research on barriers to screening for CC, breast, or colon cancer have also been noted, and despite early screening being identified as integral for higher survival rates (Kilic, Tastan, Guvenc & Akyuz, 2019), women with disabilities are still at a higher risk of dying from reproductive cancers and more specifically from CC than women without disabilities (Parish et al., 2018). These barriers can be categorized in domains that include cost, transportation, health literacy, lack of expertise and attitude of healthcare providers, prior negative healthcare experiences, health care access to include tools and lack of environmental adaptations to meet the needs of this population, referral patterns, and psychosocial factors (Akinlotan, et al., 2017; Magasi, et al., 2019; Merten et al., 2015; Reis, et al., 2015; Todd & Stuifbergen, 2012 & Yankaskas, et al., 2019).

Despite the extensive research on barriers, disparities, and the growing cancer prevalence for this population due to living longer and better supports, very little has been done around health disparities from hospital data. Two studies in the United States (Lezzoni et al., 2008 & Parish et al., 2018) and one in Australia (Sullivan & Hussain, 2008) looked at hospital trends and outcomes, treatment options for this population, as well as reproductive cancer treatment hospitalizations using inpatient data. However, there are no studies that have looked at the relationship between CC and women living with disabilities in KY as evidenced by both inpatient and outpatient hospital data. This study examined the population-based specific health factors of CC and women with disabilities in KY to potentially develop or increase targeted interventions for this population (Parish et al., 2018).

Purpose of the Study

The purpose of this study was to quantitatively examine the relationship between CC and women with disabilities as evidenced by medical records. Secondary data from the KY IHD and OSD datasets were used. This database holds data variables including

(a) admission source; (b) primary and secondary procedures and diagnosis; (c) patient demographics (age, gender, county of residence, race and ethnicity); (d) hospital type and location; (e) service payment source; (f) length of stay, if admitted; and (g) patient status that includes discharge status details that can be used for this study's examination. This current study was important because it explored the relationship between CC and women with disabilities as evidenced by discharges from inpatient and outpatient treatment for women with disabilities strategically comparing population-specific differences from a Social Determinants of Health (SDOH) framework (Solar, 2010. Furthermore, this study contributed to the possibility of empowering women with disabilities so that they may overcome barriers to both screening and healthy behaviors to reduce CC mortality and morbidity rates (Orji, 2016). This study may potentially inform policy on health disparities for this population through health equity advocacy. Interventions to increase screening and prevention need to be tailored to the specific needs of the population at hand, for example, insufficient nutrition, exposure to infectious diseases, and trauma (Park, Kim, Yang, Lee, & Park, 2018). Well informed support for PWD is important for advocacy upon attendance of regular visits to a physician, all issues that render themselves to prevention measures. Lived experiences of women with disabilities would add greatly to the advocacy and strength of influencing preventive measures as well as treatment equity.

Research Questions

The following research questions guided this study:

RQ1: Is there a statistically significant relationship between IHD status of woman (with or without disability), payer type, age, county of residence, , and diagnosis of a CC?

$H_0$1: There is no statistically significant relationship between IHD status of woman (with or without disability), payer type, age, county of residence, and diagnosis of a CC.

H_a1: There is a statistically significant relationship between IHD status of woman (with or without disability), payer type, age, county of residence, and diagnosis of a CC.

A similar research question was used for the outpatient services data to capture those women discharged from outpatient care.

RQ2: Is there a statistically significant relationship between OSD status of woman (with or without disability), age, county of residence, and diagnosis of a CC?

$H_0$2: There is no statistically significant relationship between OSD status of woman (with or without disability), age, county of residence, and diagnosis of a CC.

H_a2: There is a statistically significant relationship between OSD status of woman (with or without disability), age, county of residence, and diagnosis of a CC.

Conceptual Framework for the Study

This study used the SDOH framework that draws its foundation from many researchers, most notably Diderichsen. In 1998, Diderichsen and Hallqvist introduced a model that framed disease as a production from a social outlook, and this was adopted as a health inequality mechanism by Diderichsen, Whitehead, and Evans (Solar, 2010). The model initially emphasized the pathway through social position and health risk exposures. This model was then elaborated to emphasize mechanisms that result in health outcomes that are stratified, which include

> Those central engines of society that generate and distribute power, wealth and risks and thereby determine the pattern of social stratification. The model emphasizes how social contexts create social stratification and assign individuals to different social positions. Social stratification, in turn, engenders differential exposure to health-damaging conditions and differential vulnerability, in terms of health conditions and material resource availability. Social stratification likewise determines differential consequences of ill health for more and less advantaged groups (including economic and social consequences, as well as differential health outcomes per se). (Solar, 2010, p. 23)

Add summary and synthesis to fully integrate the quote into the paragraph and to develop a conclusion for the paragraph.

The current SDOH theory as used by epidemiologists has three main directions. The first is the political economy of health or the social production of diseases (Solar, 2010). The second is the psychosocial approaches, and the third is the eco-social theory with multilevel frameworks according to Solar. These three directions are not mutually exclusive, but rather seek to find underlying explanations for health inequalities in society. The three directions cannot be reduced to mechanisms, or rather cannot provide causation. They differ in the emphasis they lend to biological or social conditions that shape target populations and in the recommendations that they provide (Solar, 2010). Chapter 2 offers a more in-depth explanation of this theory.

With the foundational connection between contextual settings and the individuals that live in them being susceptible to disease due to different factors, there is the need to identify the origin of differences that cause disease. It is appreciated, however, that the individuals may not be affected in the same way by contextual effects (Duncan, Jones, & Moon, 1998). This framework provided an appropriate foundation for this study in that it offered a means for between-individual and between-context variables to offer an explanation of the origins of the health inequalities faced by women with disabilities, paving the way for a multilevel analysis regression analysis that was able to address the complexities involved. This framework was able to answer the research questions that drilled more in-depth into the complexities of women living with a disability in KY.

Nature of the Study

The nature of this research was an observational, quantitative study based on the discharge of women with a disability from a reproductive cancer treatment (that includes CC) as the unit of observation in comparison to the discharged women without a disability. This study was also of a cross-sectional type, consistent with providing a snapshot of the relationship between CC and women with disabilities. An examination of discharge patient status provided characteristics that shed light into the origins of CC among other reproductive cancers. The data from the Kentucky Cabinet for Health and Family Services (KCHFS) IHD and OSD was helpful in the examination of this study.

In using the SDOH framework, the interdependence of distal and proximal variables was used in a way that considered both the reductionistic and purely ecological variables for a more sufficient explanation of the underlying origins of CC within this population. A multilevel analysis with the ability to interface the proximal (individual-level) and distal (group-level) variables (Szklo & Nieto, 2019) was used, providing a means to interpret the body of evidence more clearly (Duncan et al., 1998).

The independent variables for this study included (a) the status of discharged women, i.e. whether or not they had a disability, (b) age of the woman, (c) county of residence, (d) insurance payer type (as an indication of socioeconomic variable), and (e) patient status as it related to living conditions. In accounting for the population composition, the dependent variable for this study included the diagnosis of reproductive cancers, which included CC. In addition, due to the need for reliable estimates for individual and group-level variables, there was a need to have “many individuals from many places” (Ducan, Jones, & Moon, 1998, p. 113) for a precise assessment and to do useful work.

Secondary data was downloaded from KCHFS. This data was collected from inpatient and outpatient information and was aggregated as a discharge database for KY hospitals and health service providers. IHD data records every single utilization of service at an ambulatory facility, while the outpatient information (OSD) records a patient visit, not an admission to a hospital. The data was appropriate for outcome analysis and research (KCHFS, 2017a).

The SDOH framework used for this study recommends use of a multilevel analysis for the benefit of accounting for the individual- and group-level variables while dealing with the complexities of the data. Multinomial logistic regression (MLR) was used to both frame and test CC's variability and contextuality (see Duncan, Jones & Moon, 1998). Although a multilevel analysis can use the individual-level variables, I used the discharge as the unit for analysis, not the individual patient, due to privacy concerns. The idea behind this study is that "factors operating at the levels of groups or societies affect the health of individuals within them" (Diez-Roux, 1998, p. 221). It was with the possibility of incorporating other appropriate analytical strategies, that this multilevel analysis would contribute to the SDOH framework to strengthen public policy recommendations.

Definitions

The following terms were used in the understanding of incidence prevalence of reproductive cancers with more emphasis on CC for women with disabilities.

Developmental disability: This is a severe, chronic disability that is attributed to a mental or physical disability or a combination of mental and physical disabilities and is manifested before the age of 18 and is likely to continue indefinitely (Hewitt & Nye-Lengerman, 2019). Such disability has a result of substantial functional limitations in three or more of the major life activities, namely self-care, learning, mobility, receptive and expressive language, self- direction, the capacity of independent living or economic self-sufficiency according to Hewitt and Nye-Lengerman.

Disability: The CDC (2020c) definition of disability was paraphrased for this study. Disability is an impairment, or any condition of the mind or body that restricts the person from doing certain activities (activity limitation) or restricts their participating in activities in their environment.

Health: This study used the definition of *health* as developed by WHO in 1948: "A state of complete physical, mental and social well-being and not merely the absence of disease" (WHO, 2019c, para. 1).

Health disparity: The HealthyPeople 2010 definition was used for the purposes of this study: "Differences that occur by gender, race, or ethnicity, education or income, disability, living in rural localities or sexual orientation" (Drum et al., 2009. p. 137).

Incidence: Incidence measures new disease occurrence and describes the transition to disease from health. The type of incidence referred to in this study was the incidence rate captured when new cases of disease arise during a person-time of observation and it is a true rate (Aschengrau & Seage, 2014).

Intellectual Disability: "Intellectual disability is a disability characterized by significant limitations in both intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills. This disability originates before the age of 18" (Hewitt & Nye-Lengerman, 2019, p.1).

Prevalence: This is a measure of existing disease and focuses on the period when someone is ill and measures the proportion of the total population diseases at a point in time or for a period of time (Aschengrau & Seage, 2014).

Reproductive cancers: For the purpose of this study, IHD and OSD were restricted to the five cancers of interest, also referred to as reproductive cancers which included cancers of the cervix, ovary, uterus, breast, and other female genitals (vulva, vagina, fallopian tube; National Institutes of Health, 2018).

Person-centered supports: Supports that implement "person-centered planning, which is an ongoing process directed by an individual and others chosen by the individual to identify the individual's unique strengths, interests, abilities, preferences, resources, and desired outcomes as they relate to the individual's support needs” (Ohio Department of Developmental Disabilities, 2019).

Social determinants of health (SDOH): “The complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities. These social structures and economic systems include the social environment, physical environment, health services, and structural and societal factors. SDOH of health are shaped by the distribution of money, power, and resources throughout local communities, nations, and the world” (CDC, 2020h para 2). In short, SDOH are the “social, economic, and political resources and structures that influence health outcomes” (Drum et al., 2009, p. 132).

Assumptions

The assumptions of this study were that incidences of CC among other reproductive cancers do occur within the women with disabilities demographic in the population and that the goals of treatment would be for healthy outcomes and cancer survivorship. Given the high rates of CC in KY among the general population, it was assumed that CC rates among women with disabilities would be high as well. Another assumption was that cancer screening for women with disabilities was not occurring as recommended, given the health inequalities experienced by this population. This would mean that cancer rates would be higher for this population. It was also important to assume that some women were diagnosed at later stages for reasons that may include, but not be limited to, noncompliance with screening information, misdiagnosis, lack of access to health services, or missed appointments.

PWD are served and supported by many organizations, as well as by family members. The need is great for the message about screening for cancer to be assumed to have been shared at several levels and points where services for this population are offered. Screening as a secondary prevention is important to be understood by women with disabilities as well as their circles of support. Another important assumption was that awareness of health disparities for women with disabilities and the persuasion that screening and treatment for reproductive cancers are important for everyone, would lead to organizations implementing health strategies that ensure healthy outcomes for this demographic.

Scope and Delimitations

I examined the incident prevalence of CC among other reproductive cancers from a population-based perspective. Secondary data from KCHFS was used, and because of the issue of women with disabilities being invisible in the data, it was necessary to include a review of reproductive cancers as opposed to merely CC for a clearer picture. A population-based perspective allowed for an examination of reproductive cancers for women with and without disabilities, allowing for generalizability of findings. The data represents patient discharges from all hospitals in KY that offer cancer services. Hospital data was an excellent choice as it is an actual reflection of services provided.

The ages of interest for this study were 21-74-years-old. Previous studies noted that women with disabilities are diagnosed at an early age with a form of reproductive cancer (Satgé et al., 2014) and that, because PWD are living longer, chronic diseases are more prevalent (Parish et al., 2018). That this study has a population-based approach allows for generalizability. There is a need to include women with disabilities in comparison to women without disabilities. If data had been available, comparing these demographics in the population by different cancer types would contribute to the determination of deeper further need for more specific targeted interventions. The results are based on a population-based approach and offer a more valid argument for women with disabilities in comparison to those without.

Limitations, Challenges, and Barriers

Some potential barriers of this study included the fact that secondary data, although an efficient means of research, requires extensive clean up due to missing data or a lack of data appropriate for research (Cheng & Phillips, 2014). The more years of data used, the more complex the analysis and data cleanup required. It was necessary to use several years of data to obtain an appropriate sample for this study. The secondary data included a fee for data access, a confidential agreement for data ownership, and a secure server for data storage. Upon thorough review of the data variables, the study design and data analysis changed for a more appropriate analysis and to ensure valid results. The use of the MLR method helped limit some of the limitations of secondary data.

Administrative data at the state-level offered a quality source of research that involves people with disability. The context added to such efforts offer an avenue for critical evaluation of disability services at a state level (Wilkinson, Lauer, Greenwood, Freund, & Rosen, 2014). Health surveillance for PWD presents several challenges starting with *caseness* and a definition that clearly operationalizes the meaning of *disability*. Different definitions lend themselves to differing prevalence rates and perhaps overlapping of people in data (Havercamp & Krahn, 2019). Another challenge lies in finding people with IDD in the data due to national data not allowing for respondents with disabilities. While administrative data can be used for surveillance of disability health, many people may not be in the administrative data as they live with their families. KY maintains databases that capture women with disabilities, and this offers an opportunity to tailor an examination of reproductive cancer services as well as the impact of interventions in place in the DD system in KY.

Significance

This study was significant because community inclusion for PWD must include the breakdown of barriers to such healthcare services as prevention, screening, and treatment for reproductive cancers, as well as eliminating health disparities for this population. Health and wellness must include knowledge that educates those with disabilities as well as those that care for them on the risks associated with CC, as well as the need for prevention, early detection, and treatment (HealthyPeople.gov, 2014). The results of this research provide much-needed insights into the processes that can increase screening and health behaviors for women with disabilities in KY as well as provide the impact status of intervention strategies in place to meet the disability and health goals set by Healthy People 2020. The is growing emergence of the need to demonstrate value for money spent in Medicare and Medicaid, to ensure the demand is met for quality services, and perhaps to evaluate of the need for a surveillance system that addresses healthcare outcomes for women with disabilities (Fujiura, Li, & Magana, 2018).

The results of the research findings offer facts that can inform policymakers and DD professionals that desire to fully include people within their communities of the need for inclusive quality services in prevention, screening, and treatment. Including a demographic of PWD in research allows for a true picture of services and costs of healthcare for better planning and budget allocations. The results of the study will also offer information for continued advocacy for activities that promote accessibility and decrease health disparities that exist in cancer prevention for this population.

The positive social change significance includes advocating for increased quality health services that ensures equity and ameliorates health disparities among women with disabilities regarding CC and other reproductive cancers. This includes involving PWD in research and in the target interventions, educating PWD, their families, and medical professionals, public health practitioners as well as those who advocate for people with IDD. I hoped to refocus attention from just health prevention among the DD community, to the adoption of services geared toward that of increased promotion of health for this population from an integrated approach. This may help to ensure discussions in community inclusion for service and supports include reproductive cancer screenings so as to lessen the disparity in cancer outcomes, especially for those with IDD (see Drum et al., 2009; Parish et al., 2018). Social change that diffuses adherence of secondary preventive strategies to attain set guidelines in prevention and screening for better outcomes is a positive change in public health not only for women with disabilities, but in the communities in which they live. Understanding the origins of CC for this population and offering appropriate recommendations for consideration for public policy is a next step to social change.

Summary

It is evident that despite technology advances and improved person-centered supports, PWD are experiencing chronic diseases such as cancer. PWD have other health care needs not common to people without disabilities that could be compounded by chronic illnesses. To meet the needs of this demographic in the population, it is important to consider the conditions in etiology that leads to poorer health outcomes. Associated health conditions, secondary conditions, and comorbid conditions must be distinguished for health impact that matters most for this population. This quantitative study sought to identify the origins of CC among other reproductive cancers using data from KCHFS for women with and without disabilities for identifying the differences. The characteristics of these women were examined for an in-depth insight into the health conditions.

In Chapter 2, relevant literature is discussed, and the key words were *CC, reproductive cancer, breast cancer, IDD, disability, CC and breast screening, CC prevention, nutrition*, and *health behaviors*. Chapter 3 describes the methodology used for the study and the research questions to be answered, together with the variables to be used. Chapter 4 will describe the data collection, analysis, and the results of the analysis. Chapter 5 will follow with an interpretation of the results, limitations, recommendations, and implications of this study.

Chapter 2: Literature Review

Introduction

Although CC screening programs have been in place for many years, CC continues to claim many lives and is the fourth leading cause of mortality among all cancers, accounting for 6% of all cancers among women (WHO, 2019a). Inequalities persist in the adoption of early screening for CC, which perhaps affects regular screening participation (Hahm et al., 2011). SDOH have been shown to determine CC screening rates with more socioeconomically disadvantaged women participating at lower rates leading to higher mortality rates among this population. More educated women typically have higher CC screening rates while African-American women have typically lower screening rates and, by extension, higher rates of CC incidences according to Hahm et al. In reviewing healthcare use data, Ouellette-Kuntz et al. (2015) found CC screening services for African-American women do not meet federal screening guidelines among other types of cancers.

The challenges for CC screening access appears compounded among women with a disability. In KY, there are 677,681 women among the 37.3% of the population living with a disability (CDC, 2019b). This population is more at risk for disease due to such factors as inactivity, comorbidity, and the dependence on lifelong supports. PWD are less likely to be included in mainstream classrooms or to attend college, find competitive employment, visit their neighbors and make neighborhood meaningful connections in their neighborhoods, use technology in ways that benefit their health, receive prevention services and access fitness facilities, or to obtain health services appropriate to their needs. Krahn (2019) indicates that the health outcomes of adults, especially those with IDD, are poorer due partly to their limited access to health and wellness programs and health care, but also because of a combination of the SDOH factors.

The purpose of this quantitative study was to examine the relationship between CC and women with and without disabilities in KY as evidenced by medical records. This study identified gaps that can be addressed to reduce health disparities for this demographic and may contribute in a small way towards public policy, and advocacy for surveillance programs for this population that is unified and linked (see Krahn, 2019). Both inpatient and outpatient data from KY were used to examine the relationship between (a) socioeconomic factors embedded in the county of residence and CC status for women with disabilities, (b) level of disability as measured by diagnosis and CC screening status, (c) age and payer of health services, and (d) hospital discharge status of the women that identifies their living environments. The KY cancer registry would have been used as needed to verify that rates of women with a cancer diagnosis and a disability were captured accurately. Although persons with a disability typically are not well represented in the data, it was not necessary to link data across several data sources to arrive at a more accurate representation of women with disabilities, although that was great planning (see Lin et al., 2014).

This literature review begins with a description of search terms and techniques to inform the researcher of current CC screening data both nationally and in KY. The study's theoretical framework is then presented with a discussion to its application. This is followed by a review of the key variables and SDOH that impact CC screenings rates among women with disabilities. The chapter concludes with an introduction to the methodological approach to be used in this study.

Approach to the Literature Review

This section explains the methods used to explore the relationship between CC and women with disabilities in KY. The literature search was limited to quantitative studies, CC, women with disabilities, and SDOH framework. Keywords used to identify studies for review included *CC, CC screening, IDD, CC prevention, nutrition and health behaviors, disability in public health,* and *health disparities for women with IDD*. Searches were conducted at the Walden Library databases for dissertation both from ProQuest and globally and for articles in the Cumulative Index of Nursing and Allied Health Literature and Medline databases. The American Association on Intellectual and Developmental Disabilities (AAIDD) database also was used. Literature had to be published at least within 5 years, but not older than 10 years. A few literature options older than 10 years were used due to their quality of contributions, and since there was a lot more recent literature, they gave a well-balanced foundation to the review.

Most of the studies reviewed dealt with CC, breast cancer, ovarian, and uterine cancers, with a few specifically addressing the women with an IDD. A substantial amount of studies addressed the impact of protective factors, such as nutrition, healthy behaviors, and others on the reduction of risk factors for CC. CC etiology was addressed by a few studies, addressing most of the CC epidemiology. Regarding CC screening within the general population, literature was plentiful, although not so for the population with IDD. The role of support, self-determination, and person-centered services was addressed by a few articles. Very few studies were found that focused on the administrative data used to identify CC screening and prevention services among women with disabilities. Several articles identified the lack of surveillance programs of this population as a major challenge. One article and one dissertation were found that successfully link the SDOH framework to cancer studies for people with IDD.

Conceptual Framework

Social Determinants of Health Framework

The SDOH framework, according to WHO (2019b), draws most of its contributions from several researchers, primarily from Diderichsen and Hallqvist's model of disease production developed in 1998 as identified in Chapter 1. Other prominent researchers of the SDOH framework include Evans and Whitehead and their interpretation of health inequality mechanisms (Solar, 2010). According to WHO, a comprehensive framework should, as follows –

i) Identify the social determinants of health and the social determinants of inequities in health;
ii) Show how major determinants relate to each other;
iii) Clarify the mechanisms by which social determinants generate health inequities;
iv) Provide a framework for evaluating which SDOH are the most important to address; and,
v) Map specific levels of intervention and policy entry point for action on SDOH. (Solar, 2010, p. 20)

This framework as used in this current study had the ability to identify the determinants related to the reproductive cancers after a multivariate analysis. As noted above, the SDOH framework was a great foundation that was able to address the between-individual and between-context variables in a way that identified some differences between women with and without disabilities. Given all the complexities possible, this framework had the capability of guiding this study to meaningful results.

Solar (2010) argued that while it is impossible to fit all the elements into a single framework, several components must at least be considered. First among these is that theories of power impact action upon social determinants. For determinants of health to change, those in power must be willing to guide action in a way that distributes power to benefit the less advantaged. Power from “a relation in which people are not dominated but empowered through critical reflection leading to shared action” is desirable for meaningful social change (Solar, 2010, p. 21). The second component is that social position carries with its underlying mechanisms that stratify outcomes for the population. According to Solar, the most important stratifiers in society include occupation, education, social class, race/ethnicity, and gender. These SDOH inequities are the root causes of health inequities. In addition, there are intermediary determinants brought about by socioeconomic position, all of which influence health. These intermediary determinants include psychosocial, biological, and behavioral circumstances; and, material circumstances, such as housing, work, and neighborhood situations.

From the CDC (2020h), one way to summarize these intermediary determinants is to consider that “conditions in the places where people live, learn, work, and play affect a wide range of health risks and outcomes" (para. 2). WHO (2019b) reiterated and broadened this explanation by stating people are born, grow, live, work, and age in conditions that are shaped by power, distribution of money, and resources at a global, national, and local level, causing differences in health at all these levels (WHO). This information is summarized visually in Figure 1 which shows the socioeconomic and political determinants that have an impact on equity, health, and well-being.

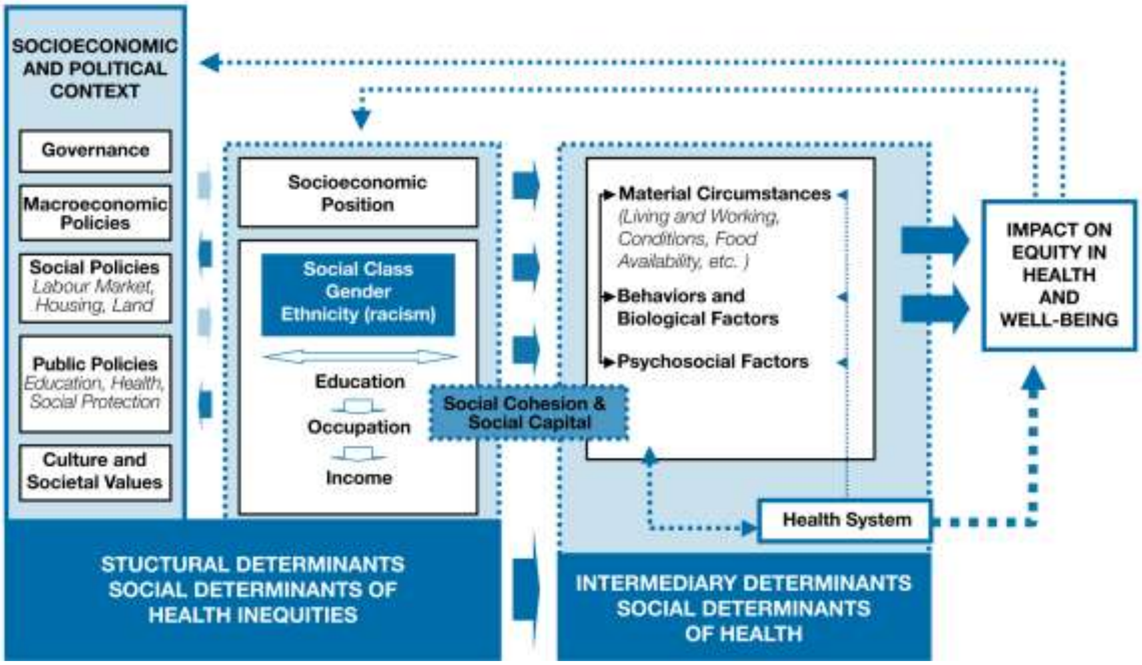


Figure 1. Social determinants of health conceptual framework. Adapted from Solar O, I. A. (2010). A conceptual framework for action on the social determinants of health. Social Determinants of Health Discussion. Paper 2. Policy and Practice.

Similar Application of SDOH

Opara (2017) used the SDOH framework in an investigation of male breast cancer (MBC) with a purpose of uncovering the underlying predictors of MBC by looking at age, grade of cancer, and race as the predictors of the outcome of MBC mastectomy.

Opara’s interest in the SDOH framework lay in seeking to understand how factors interacted with social determinants in the occurrence of MBC and its discovery as it is a very rare disease. While Opara did not find the grade of cancer to be significant predictors of MBC, she did find that race and age were significant predictors among white men diagnosed with MBC. Opera offers a great example of how the SODH can be used to identify determinants that are associated with a type of cancer, in this case, the MBC.

In another study, the population of Victoria, Australia, was compared using population data to measure the health and wellbeing of the citizens (Haider, Ansari, Vaughan, Matters, & Emerson, 2013). A total of 897 adults with ID and 34,168 people in the general population were used as the sample for the comparison of health outcomes. The SDOH framework revealed that poor social determinants of health were more prevalent among people with ID, as were depression, poor or fair health, and behavioral risks. People with ID were also found to have higher blood pressure and blood glucose levels, and that people with ID had lower CC and breast screening rates compared to the general population (Haider et al., 2013). It is important to note that the differences noted in the population was possible because those with ID were regarded as a subgroup in the general population and the SDOH offered a great framework.

In reviewing the 2014 Behavioral Risk Factor Surveillance System (BRFSS) data and the type of health insurance used for the payment of cancer screening, it was clear that disparities occur by health insurance status and insurance type (Zhao, Okoro, Dhingra, Xu, & Zack, 2018). Although the study by Zhao et al., did not involve adults with IDD, it was nevertheless framed by SDOH framework. Another study on cancer cost-of-care aimed to identify barriers, including psychosocial and financial factors, and their effects on care among cancer survivors aged 65 and older (Banegas et al., 2018). Factors identified included medical care, amounts owed, financial hardship, cancer-related variables, and caregiver status. The study by Banegas identified key insurance and financial risk factors that were barriers to receiving medical care among cancer survivors aged 65 and older. Those with financial hardship were less likely to receive medical care. As a patient's debt increased, the likelihood a patient received medical care declined even further. Survivors without insurance or caregivers or who were less likely to understand their medical bills did not receive the necessary medical care according to Banegas. (These studies provide an application of the SDOH framework and its ability to identify those influences on health outcomes. In such manner, the SDOH had the ability to identify the variables or determinants of health relating to reproductive cancer outcomes in the current study.

How SDOH Relates to this Study

I considered other theories for my study, including the health belief model, which attempts to predict why and whether people take action in the prevention, control, and detection of disease due to perceived susceptibility, severity, barriers, and benefits of engaging in a particular behavior when given relevant cues to action (see Glanz et al., 2015). However, the theory was dropped due to the limitation of the measurement variability of the theory's central constructs and the availability of secondary data. A second theory, the socioecological model, was considered due to its ability to conduct a multilevel study of determinants for more effective interventions. According to Glanz et al. (2015), the socioecological Model can expound on relationships between community, social factors, health, individuals, and physical environments. I ruled out this model, however, due to its inability to explain which variables contribute most to behavior that influences successful interventions. A third theory, the theory of planned behavior, used focus groups to identify cancer prevention perceptions as described in Teitelman et al. (2011). However, as a quantitative study, this approach would not have aligned with the methodology. A fourth theory, diffusion of innovation (Boston University, 2019), was considered, yet, at the proposal stage, it became apparent that it was not well aligned with the study and it was dropped.

The SDOH offers a framework from which to examine the individual and group differences in a population at a multilevel analysis without compromising the validity of results. In this study, I considered the discharge status of women with IDD diagnosed with CC as the unit of analysis, and because of the complexities that can bring, a multilevel analysis was preferred. The SDOH framework aligns well with this type of statistical complexity (Diez-Roux, 1998; Duncan et al., 1998;). In addition to the analysis, it also became clear that women with IDD experience greater health disparities than the general population. The SDOH framework was fitting as it offered the opportunity to engage more deeply into the complexities of disparities and to offer new opportunities and insights that may ameliorate these disparities (see Drum et al., 2009).

Literature Review Related to Key Variables

Key variables for this study included disability in public health, IDD, CC screening status, health disparities and health equity, residential options for women with disabilities, the role of DSPs, natural supports and professionals, the role of nutrition and health behaviors and administrative data. The following section addresses these variables from the literature review perspective.

Disability and Public Health

HealthyPeople 2020 called attention to disability and the need to include disability in all health systems that collect data to uncover and reduce health disparities to achieve health equity (HealthyPeople.gov, 2014). PWD have historically been overlooked in issues regarding their health status and disparities, even in routine health services like CC screenings. Disability has historically not been regarded as a partner of public health, but as a health outcome, a minority population, or a social factor (Drum et al., 2009), and since healthcare professionals are not typically well equipped to address the disparities in this population, or the health challenges for this population, the women with more severity of disability tend to experience lower cancer screening as well as other health disparities (Horner-Johnson et al., 2014). Even though in the United States the age-adjusted prevalence for any disability in 2017 was estimated at 26 % (CDC, 2020c) and that in general about one out of five people are living with a disability (U.S. Census Bureau, 2018), there are still few medical care providers, specialists and professionals that are well trained to confidently treat and work in public health settings for population-specific service deliveries that reduce disparities of health.

In KY, persons with disability comprise 35% of the population compared to the national average of 25.6% (CDC, 2020b). The disability status encompasses the highest percentage as those with a mobility disability at an estimate of 20.2 %, followed by those with a cognitive disability at 16.1%. Those with an independent living disability are at 10.2 %, hearing impaired are estimated to be at 8.3% while those with a self-care disability are at 5.7%, a little less than the visually impaired at 6.1%. According to the CDC, the Veterans with any disability are estimated at 39.3 % as compared to non-veterans with a disability estimated at 34.2% . Women are represented in all these categories with a total estimated at 37.3% while men are at 33%. Figures 2 and 3 offer more details on disability data available for KY within the CDC's Disability and Health Status Data System (DHDS) (CDC, 2020b).

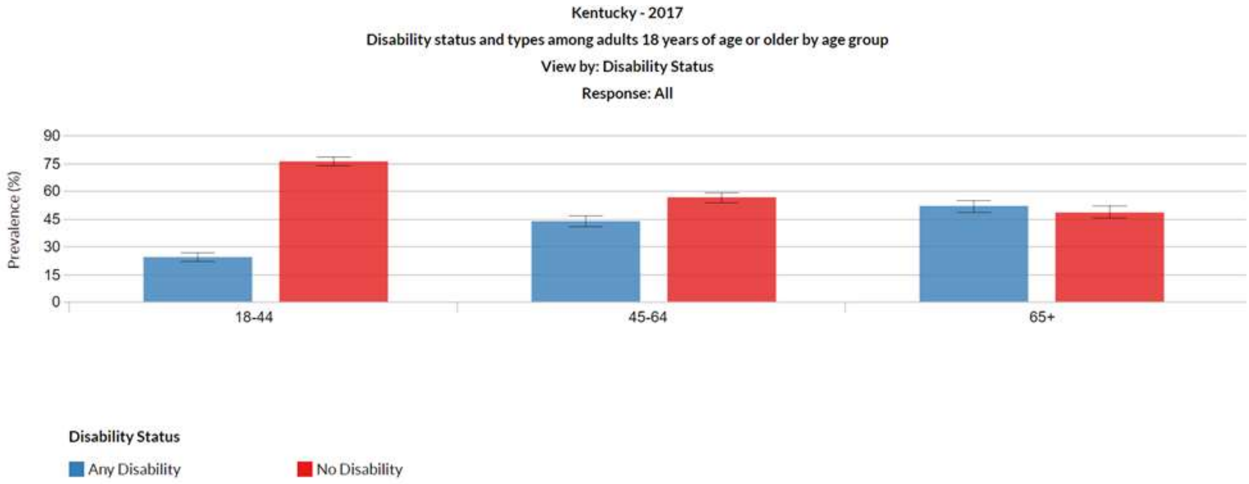
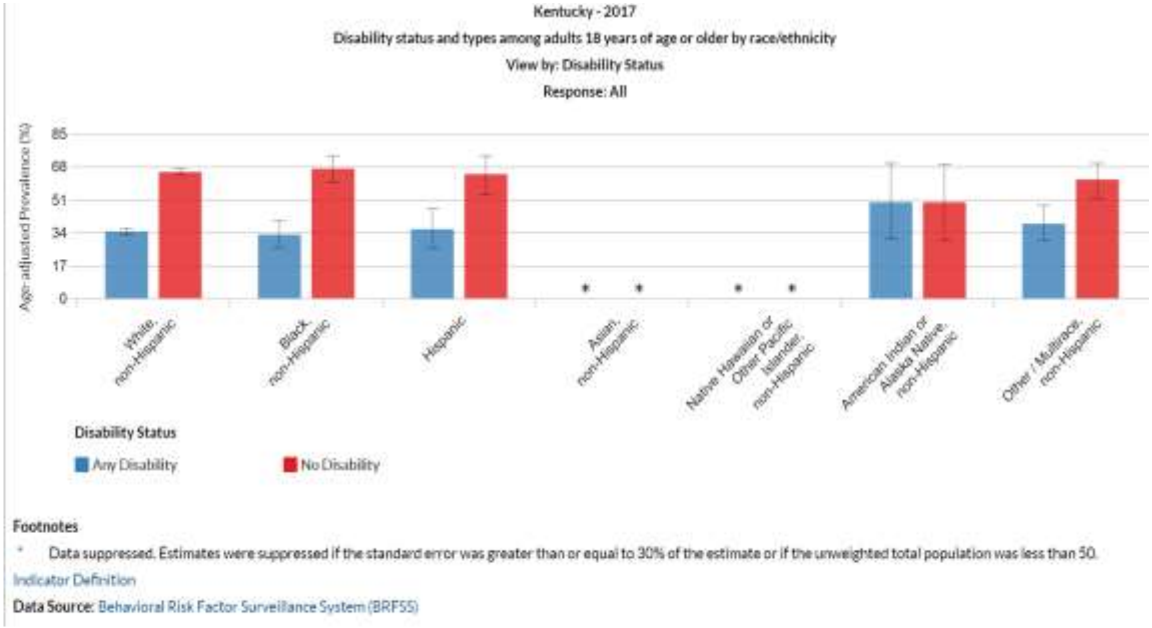


Figure 2. Disability status by age group in Kentucky, 2017. From Behavioral Risk Factor Surveillance System (BRFSS; CDC, 2020b).

Achieving quality cancer care is important to reduce inequities for women with disabilities. Excellent communication among support professionals and medical professionals is key in ensuring timely cancer care from prevention to diagnosis, to treatment (Kemp, 2019). The disability estimates above with the addition of Figure 2 are evidence that the estimates of those living with a disability represent a substantial target of the population in KY regarding public health challenges and opportunities. Disease prevention and interventions from a disability epidemiological design is possible through systemic inquiry into processes, distribution, patterns, determinants and disabling outcomes in populations (Drum et al., 2009). A disability may be examined as a population-specific subspecialty for the prospect of disease and death prevention for this population (Aschengrau & Seage, 2014). Public health planning, design, and implementation without considering this population can be detrimental to the whole.

It is difficult to determine disability incidence since various etiologies give rise to disabling conditions. Disabilities arise in the perinatal or neonatal periods, others from genetic or congenital alterations, others from chronic conditions, traumatic injuries while yet others arise from etiologies that are unknown (Drum et al., 2009). Some disabilities arising from time-limited discrete events like birth or traumatic injuries are relatively easy to identify and to have an incidence calculation. But incidences from chronic diseases that take a long time to develop are hard to detect. Historically, high disability prejudice has resulted in more institutionalization. Cohesive advocacy has led to fewer people in institutions; however, this could be at the expense of health equity (Friedman, 2019).



Kentucky - 2017

Disability status and types among adults 18 years of age or older by race/ethnicity

View by: Disability Status

Response: All

Footnotes

* Data suppressed. Estimates were suppressed if the standard error was greater than or equal to 30% of the estimate or if the unweighted total population was less than 50.

Indicator Definition

Data Source: Behavioral Risk Factor Surveillance System (BRFSS)

Figure 3. Disability types by race/ethnicity, Kentucky, 2017. From Behavioral Risk Factor Surveillance System (BRFSS; CDC, 2020b).

Disability has been conceptualized in three different models or approaches as explained by Drum et al. (2009), namely the medical, functional, and social models of disability. The medical approach relies on the description that disability is a result of being “sick” resulting in the need to be “cured” by adhering to a medical prescription regiment that includes treatment and interventions. Disability is therefore viewed as a health outcome and is measured by morbidity and mortality with failure being regarded as failure in prevention (Drum et al., 2009). The functional approach relies on disability being the inability to perform several functional activities. A third approach is the social model that insists that a person has a disability due to the barriers within the environment that include physical, social, political, and economic dimensions. Each of these approaches determine how a person with disability is treated and supported in the community.

Newer approaches to disability, according to Drum et al. (2009), include the need to view disability as a demographic, because disability in population health comprises a subgroup with large and unexplained differences in health outcomes. Disability as a mediating factor between impairment and health, social determinants shows that disability discrimination contributes to health disparities with lost opportunities towards health equity. When disability is addressed from a SDOH framework in public health, it provides a mechanism that drills deeper into complex health disparities for PWD, creating new roles and opportunities for public health per Drum et al. (2009).When professionals are not educated on the SDOH, service needs and gaps exist in the care received by people with IDD. Increasing knowledge among public health professionals is key to reducing disparities among women with IDD in CC cancer and in general. Public health professionals owe it to women with IDD to find ways to reduce health disparities. CC success in KY requires intentional interventions to this population. As the population ages, disability increases, requiring the shifting of funding to meet the needs of an aging population, among those with and without a disability. Figure 3 indicates the disability types of those 18 years old and above by race/ethnicity. It is imperative that disability status be included in public health data, in healthcare settings, and in administrative data.

Intellectual and Developmental Disability

It is important to understand disability, and especially IDD more so as a foundational knowledge base for this population demographic. This study recognizes there is a need to discuss people with disability while distinguishing between the disability types as previously discussed in the disability section. Depending on the cause of the disability, health insurance differs for these subgroups, as does the delivery of health services. This study was not able to distinguish the subtypes of disability, however disability in the data encompassed all types of disability and the study recognizes that some people have Intellectual Disabilities (ID) while others have Developmental Disabilities (DD), and some have both.

In addition to a previous definition of IDD, it can be added that IDD is a severe, chronic disability that is attributed to physical, cognitive, or a combination of the two, as manifested usually before age 18 with the likelihood of continuing indefinitely (Hewitt, Nye-Lengerman, 2019). IDD mostly occurs at birth affecting body systems like the nervous system, sensory system, metabolism, and degenerative systems (National Institute of Health [NIH], 2016). While this type of disability was impossible to identify in the data, it is such a huge disparity as this demographic needs to be represented in population specific public health agenda.

In most cases, a person qualifies for IDD services when their functional limitations are identified to be in seven key areas, namely limitations in; Self-care, Receptive and Expressive Language, Learning, Mobility, Self-direction, Capacity of independent living, and Economic self-sufficiency (Hewitt & Nye-Lengerman, 2019). The limitations in these areas have historically dictated the kinds of supports and services required for a person with IDD to function in their environment (Parish, 2001). These services are usually life-long and are directed by person-centered service planning.

Examples of Developmental Disabilities (DD) include spina bifida, autism, cerebral palsy, and ID (Hewitt & Nye-Lengerman, 2019). Persons with ID are further classified according to the corresponding intelligence quotient (IQ) levels as follows: mild ID (IQ of 50-55 to approximately 70); moderate ID (IQ of 35-40 to 50-55); severe ID (IQ of 20-25 to 35-40); and, profound ID (IQ below 20-25). In 2010, the definition of ID changed (AAIDD, 2011). Disability is “characterized by significant limitations both in intellectual functioning and in adaptive behavior, as expressed in conceptual, social, and practical adaptive skills. This disability originates before the age of 18” (AAIDD, 2019, para. 1). This definition change was largely in part due to the need to create better pathways to identifying the appropriate service and support need for each person with an IDD qualified for home and community-based services (HCBS). According to Luckasson and Schalock (2013), a functional approach of IDD classifications offers a holistic human being view with a language that is common, offering opportunities for flexible approaches to supports and services that are effective with meaningful outcomes.

The corresponding levels of support changed to be intermittent for episodic or 'as needed' supports and from a framework of what is important to/for a person with IDD (Hewitt & Nye-Lengerman, 2019). Limited supports are needed on a regular basis for a time limited period. Extensive supports are on a regular routine involvement for some environments (e.g., daily). The last type of support is the pervasive, which are constant and high-intensity supports provided across several environments and potentially life-sustaining in nature. These levels of support are needed in HCBS to include community employment, health, and safety and for social activities supported with Medicaid HCBS waivers. From Friedman (2019), HCBS waivers offer an opportunity to “waive key provisions of the Social Security Act to create and expand community long-term services and supports particularly tailored to populations that would typically require institutional care” (p. 264). The change to the service model seeks to impact services in education, to improve social roles, and to support self-determination.

Early childhood and school years require equally sophisticated planning. Furthermore, as youth enter adulthood, a lot of the information previously known can be lost in the transition. Transition planning for youth entering adulthood requires multidisciplinary professionals, which would include primary care physicians. However, individual and systemic barriers keep them from being involved (Dressler, Nguyen, Moody, Friedman, & Pickler, 2018). On the other end of the spectrum is the fact that women with IDD are represented in geriatric oncology, which is a subspecialty that is evolving in oncology. Women over 65 are underrepresented in clinical trials, which results in dilemmas of treatment for this population and, due to health inequality, even more so for women with IDD. Morbidity rates among the elderly lead to suboptimal treatments requiring the use of options that are contemporary surgical measures to reduce post-operative morbidity (Venkatesulu, Mallick, & Rath, 2017).

People with IDD experience more health challenges when compared to their peers with no disabilities. They have comorbidities that include cardiovascular disease, diabetes, obesity, psychiatric disorders, and gastrointestinal disorders among others. People with IDD are living longer, and they are therefore presented with geriatric issues, and with the absence of screening at recommended rates , the risk of disease is higher as are the challenges in old age for this population, especially increased morbidity. A Finland study found that cancer incidence among people with IDD was quite comparable to that of the general population despite some low unhealthy behaviors like smoking and decreased screening rates. However, PWD were at higher risk for some types of cancer (Patja & Iivanainen, 2001). In fact, some conditions that lead to ID have been associated with higher incidences of cancer such as Cowden syndrome, down Syndrome, Prader-Willi, Angelman Syndrome and fragile -X. Birth defects have also been identified to indicate higher risks of cancer, and with the increased life expectancy, people with IDD are living longer, resulting in more chronic conditions among this population according to Patja and Livanaine (2001). Clear guidelines and tracking processes can assure that people with IDD receive screening at recommended rates, preferably even at a higher rate than people without disability (Brown, Jacobstein, Yoon, Anthony, & Bullock, 2016), especially due to the increased health risks already mentioned.

Cervical Cancer Screening Among Women with IDD

The U.S. Preventative Service Task Force (USPSTF) recommends CC screening every 3 years via cervical cytology for all women between the ages of 21-29. USPSTF also recommends high-risk HPV (hrHPV) screening every 5 years and hrHPV testing and cervical cytology testing every 5 years for all women between 30 and 65 years old (USPSTF, 2018). Screening is not recommended for women who have had their cervix removed. These recommendations are meant for all women, with or without a disability. In addition to recommendations like those above, women with an IDD deserve continuous improvement of their daily living conditions, not only for quality community living, gaining employment in the community, but also in gaining access to appropriate health in all its technologies and assistive technologies (HealthyPeople 2020). As indicated by the Surgeon's General Call to Action, women with an IDD are leading healthy and long lives due to increased community inclusion and access to health care and the availability of professionals that know how to support this population demographic (Drum et al., 2009).

Women with IDD were less likely to have increased screening even with improving continuity of care and this has resulted in less than enough screening rates (Plourde et al., 2018). Studies have found that disparities exist for women both with disabilities and those without. In fact, the screening for breast and CC for both sets of women have been consistently below the Healthy2020 goals, with women with disabilities falling shorter, and more so for those women with more complex disabilities (Horner-Johnson et al., 2014). It has also been noted that in the United States, women in urban areas, especially in the northeast have higher rates of screening. In the United States, rural disparities, lower screening, and high levels of mortality have been associated more with the south (Horner-Johnson et al., 2014). Secondary prevention is hard for people with IDD mainly because they may not fully understand nor have the information, nor identify disease signs and symptoms. When only 22% of people with IDD in a two-year period participate in periodic health physical examination as compared to 26.4% for people without IDD, it is clear health disparities exist. When screening does not happen as recommended for gender and at age-specific periods, it puts this population at increased cancer risk (Ouellette-Kuntz et al., 2015).

When primary care physicians were asked about pap smear screening for women with IDD, 90 % of them expressed the need for women with IDD to get screened regularly. Public healthcare settings were more confident and prepared, and those with rapid screening capabilities and follow up reminder processes and systems were more confident in their ability to screen this population. Lin et al. (2010) added that those who felt this screening was needed, believed there was a need to set up a special screening for this group of women. This set up, however, would need to be well thought out as perhaps that could be viewed by many as creating a non-inclusive setting. Lin et al., found that 72.5 % of the medical facilities offered pap smear services and 51.5% had the experience of screening women with IDD (2010). Lin et al., also noted that women with ID had trouble and pain with the pap-test. It is no surprise that physicians seem unequipped, nor aware of the needs of the women with the more severe needs. This may be attributed to perhaps never been exposed to this demographic during their professional training. The discomfort that women feel during screening can be too much for any women to handle, leave alone when that is piled up with IDD or other type of a physical disability. Most physician offices may not have accessible examination tables for a good majority of this demographic.

Despite the great improvement of services for PWD, screening for women with an IDD has continued to lag that of women without a disability (Parish et al., 2018). Most physicians and caregivers overlook screening for this population due to the perception that these women are less sexually active (Brown et al., 2016). With increased community integration and more advocacy, women with IDD have had increased sexual relations, especially with the movement to de-institutionalize and more people moving into smaller group homes or congregate sites for community inclusion (Hewitt &Nye-Lengerman, 2019). More and more individualized service plans indicate educational needs for safe sexual relations. Furthermore, according to a survey conducted in 2012, over 70% of those people living with a disability reported as having been abused of which 41.6% was reported as sexual abuse (Baladerian, Coleman, & Stream, 2014). Since most of these may not be reported for fear or lack of knowledge to do so, etc, delays in appropriate services including CC screening may be of negative outcome. Furthermore, even when women with IDD have been noted to be sexually active through a known pregnancy, the uptake for CC screening has still been noted to be lower (Brown et al., 2016). The service delays in ensuring screening may also be due to lack of coordinated efforts to communicate to the medical professionals, hence the disconnect.

Diagnosis has tended to be made at later stages of cancer progression for this population leading to unfavorable outcomes. Age and level of education have been significantly associated with CC screening rates (Park et., 2018). In linking cancer hospitalization to women with IDD, Parish et al. (2018) found CC hospitalization was less prevalent for women with IDD at 2% as compared to that of women without a disability at 4% (2018). Although these percentages are not large, it is prudent to note that the data used was for inpatient hospitalizations and does not include services provided at cancer outpatient clinics or health facilities, and especially in a way that compares CC prevention, screening and treatment of women with disabilities from a sociodemographic manner. There is a need for educational campaigns on CC screening as well as the elimination of risks that are associated with CC (Ebu, Mupepi, Siakwa, & Sampselle, 2015) and more specifically in the IDD population.

Hospital discharges for women with IDD were associated with higher uterine cancer incidences and lower incidences for CC. The discharges were higher for younger women with IDD who experienced longer hospital stays utilizing public insurance (Parish et al., 2018). Adenocarcinoma in situ (AIS) and cervical intraepithelial neoplasia grade III (CIN III) Surveillance) is necessary for determining strategies for preventing disease. Data from the years 2009 - 2012 from the population-based cancer registries was analyzed by age, histology and race for Michigan, Louisiana, KY and Los Angeles. The highest rates of CIN II/AIS at 69.8% were found in KY followed by Michigan at 55.4% then Louisiana at 42.3%, and Los Angeles at19.2%. The authors found that generally, the rates went lower for the younger aged women likely as a relation of screening recommendations and more human papillomavirus vaccinations (HPV) intake (Watson et al., 2017). KY had the highest rates of CIN II/AIS, which may imply that women with disabilities may be highly represented in that number, due to the noted lag in screening.

Lee, Shin, Hwang, and Lee, (2017) studied breast and CC screening behaviors of cancer survivors and found that breast cancer screening rate was 56.6%, higher than that of non-cancer survivors or of CC screening at 51.4%. The low screening for CC can be explained by the non-recommendation for CC screening for women who have undergone a total hysterectomy, although CC survivors were likely to get a CC screening ten years after diagnosis. Lee, Shin, Hwang, and Lee did not find sociodemographic to be associated with cancer screening and perhaps looking at factors beyond sociodemographic was required for comprehensive planning of screening behaviors (2017). Women with IDD may have similar breast cancer incidence as women without IDD, however, they have lower mammogram screening rates and higher breast cancer mortality (Greenwood et al., 2014). Although such disparities occur, women with IDD experience inequalities in access to screening for cancer. According to Cobigo et al., (2013), women with IDD who do not get mammography are one and a half times more than women without IDD, and twice as many that do not receive CC screening.

Receiving screening as recommended helps to identify health problem signs early, affording any patient the opportunity for treatment and hopefully avoiding starting attention prior to health-threatening stages of breast and CCs. There are many barriers to secondary prevention for breast and CC (Swaine, Parish, & Luken, 2013). Some of these barriers according to Merten et al., include income, education, employment, history of screening, age tobacco use, geographic location, disability level and activity level (2015). When the cancer was not detected early, it resulted in tumors with higher stages according to the American Joint Committee on Cancer (AJCC), for younger women with IDD even when histological types and tumor grade may not have been significantly different. Women without IDD had less advanced tumors discovered at later ages than women with IDD (Satgé et al., 2014). It is apparent that women with IDD deserve the right to have breast and CC (BCC) screening as early as women without disabilities for better health outcomes.

Cervical Cancer Screening in Kentucky

From the Cancer Action Network (CAN), women diagnosed with CC have a 92% 5-year survival rate compared to a 99% 5-year survival rate among women diagnosed with breast cancer (CAN, 2019). CAC indicates that many of the women not receiving screening are uninsured and low-income or underinsured (CAN, 2019). Since the IDD population is largely insured by public insurance, this indicates some may fall through the cracks, or do not as stated earlier, receive screening as recommended and are in fact experiencing screening disparities as captured in the CAN statistics. Twenty states exceed CAN's goal of ensuring no woman is left uninsured or denied cancer screening due to appropriating $1 in-state funds for every $3 in federal funds. Four states—Hawaii, Vermont, KY, and South Dakota—missed the opportunity to fund early detection programs. This may be an area for policy advocacy impact from this study, for timely strategic planning that puts KY in a position of ensuring no woman is left unscreened. With the high rates of CC in KY, a partnership collaboration may offer great advocacy.

CC has been explained with contextual-level information making it important to ameliorate effects of contextual effects for increased health equity. Targeting socially deprived areas is a strategy that would assure progress toward health equity (Lin, 2014). From the CDC's BRFSS data, women with disabilities receive CC screenings at rates lower than those without a disability based on 2018 data (2020b). BRFSS data was compared from 2016 to 2018 prevalence rates for CC screening in KY. It was evident that women with disabilities received CC screening at a prevalence rate of 74.7%, a rate lower than the national US, DC and territories rate of 77% in 2016. 2018 data revealed that women with disabilities had a similar trend (75.5%) in KY as compared to 78.1% nationally in the US, DC and territories. The CC screening prevalence in KY for women with no disabilities was higher than the national rates for both years at 86.6 % and 85.8 % respectively as shown in Table 1. There was a slight increase in screening rates in KY for women with disabilities while that of women with no disabilities went down slightly.

Table 1

Cervical Cancer Screening Among Females 21 to 65 Years of Age by Any Disability Status

	Any Disability	No Disability	Any Disability	No Disability
	2016		2018	
	USA, DC & Territories		USA, DC & Territories	
Prevalence (%)	77	83.7	78.1	83.9
95% CI	75.9-78.1	83.1-84.2	77.1-79.1	83.3-84.4
Weighted No.	10,778,066	44,276,164	12,826,235	48,698,632
	Kentucky		Kentucky	
Prevalence (%)	74.7	86.6	75.5	85.8
95% CI	69.5-79.3	84-88.8	69.6 - 80.6	83 – 88.3
Weighted No.	205,924	579,504	222,286	566,272

Adapted from CDC’s Behavioral Risk Factor Surveillance System (BRFSS). (CDC, 2020b).

It was helpful to review the prevalence of CC screening rates in KY by age from the BRFSS for any type of disability. Table 2 reveals the age specific information on the prevalence of CC screening for 2016 and 2018. The 2016 data indicates that the age with the highest CC screening was ages 21- 35 (78.9%) followed by ages 51- 65 (73.8%). For 2018, the age group with the highest CC Screening was 21- 35 (81.5%), followed by the age group 35 - 50 (77.6%). Data shows there was an increase in screening for women with disabilities in KY for these age groups in regard to actual weighted numbers, although disability rates were also noted to have increased.

Table 2

Comparing Kentucky Cervical Cancer Prevalence Rates Among Women with Any Disability by Age

Age	21 - 35	35 - 50	51 - 65	21 - 35	35 - 50	51 - 65
		2016			2018	
		USA, DC & Territories			USA, DC & Territories	
Prevalence (%)	76.9	81.2	73.7	77	82	76.2
95% CI	74.5-79.1	79.5-82.8	72-75.4	75.1-78.9	80.2-83.6	74.6-77.8
Weighted No.	3,375,397	3,458,343	3,944,417	4,279,496	3,796,431	4,750,309
		Kentucky			Kentucky	
Prevalence (%)	78.9	72.1	73.8	81.5	77.6	68.3
95% CI	66.7-87.5	60.8-81.2	68.4-78.6	67.9-90.1	68.8-84.5	59-76.4
Weighted No.	60,279	66,004	79,642	79,570	69,045	73,670

Adapted from Behavioral Risk Factor Surveillance System (BRFSS). (CDC, 2020b)

The CC screening in KY in 2016 had a similar trend nationally in the US, however in 2018, KY screening rates beat the national rates for ages 21 – 35, but lag for age groups 35 – 50 and 51 – 65. It is important to understand that cervical cancer is a disease that progresses over time. Although the BRFSS data was collected at the same time as the KCHFS IHP and OSD data was being collected, it is hard to correlate the two. Without the ability to link the data, and by using the discharge as the unit of analysis it is difficult to pinpoint and identify the progression of disease for specific intervention strategies. It is important, however, to acknowledge that CC screening is happening and although KY may lag in some age groups, from a national perspective, CC screening interventions are occurring in KY, for both women with and without disabilities due to statewide strategic interventions.

The most recent 2018 BRFSS data as noted by CDC (2020b) indicated that the prevalence for CC screening by disability is as follows: a) cognitive disability (80%), b) hearing disability (76.3%), c) mobility disability (72.7%) and d) vision disability (68.4%). By disability type, the 2016 BRFSS data showed that the CC screening prevalence for a) cognitive was 72.4%, b) Hearing 76.1, c) mobility (74.9%) and d) vision at 73.2%. Those with cognitive and hearing disabilities had an increase in screening, while those with mobility and vision disability types had a decrease in CC screening (CDC, 2020b).

Health Disparities and Health Equity

According to the CDC (2020a para.1), health disparities are “preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations.” According to Friedman (2019), as a whole, PWD are among the most socioeconomically disadvantaged populations, leading to ways in which they are discussed and characterized, perhaps diffusing their health disparities despite the movement from institutions to community-based living arrangements.

Whether a person with a disability has access to a public or private health plan is another way in which to explain the health disparity facing this population. In KY, 14.3% of persons with a disability in the Appalachian region receive disability benefits, a rate higher than the U.S. population as a whole (5.1%) and higher than KY residents from non-Appalachian regions (6.8%) (Appalachian Regional Commission, 2017). With respect to cancer mortality rates, Appalachian KY cancer death rates are 35%, a rate which is also higher than that of the nation as a whole and of non-Appalachian KY residents. The health of Kentuckians is affected by SDOH that affect where people live, learn, work, and play. Poverty limits access to healthy food while more education and safe neighborhoods are predictors of desirable health outcomes (CDC, 2020i). Applying known facts about SDOH improves the health of all people, including women with disabilities. HealthyPeople 2020 recommends a framework that is location-relevant in addressing health disparities in order to implement initiates that are effective in bringing about healthier outcomes and greater health equity (HealthyPeople.gov, 2014). These initiatives are best through collaborations across sectors to best ensure diffusion of information, initiatives, and, more to the purposes of this study, CC screening (Ridgeway, 2018). HealthyPeople 2020 organizes the SDOH into five categories: health and healthcare; economic stability; neighborhoods and built environments; social and community context; and education (2014). It was from the lens of these five categories that this study addressed the relation of CC with women in KY.

Bollinger et al. (2018) used principal component analysis to rank KY's counties into quartiles based on such variables as poverty rates, educational attainment, social associations, environmental conditions (water and air quality), and healthcare providers (Figure 4). Central and Western KY counties had the best outcomes, while Eastern counties fared less favorably in terms of health outcomes. The map was a useful reference for identifying county of residences for the discharged women with or without a disability.

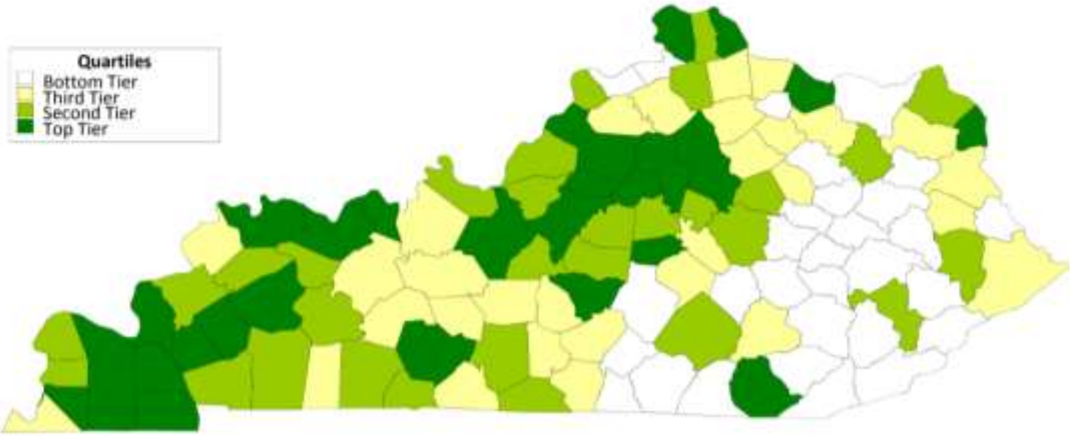


Figure 4. Social determinants of health by Kentucky county. Source: Bollinger, Hoyt, Blackwell & Childress (2018).

Research has demonstrated that disparities in healthcare services occur to PWD as a result of such access barriers as inadequate education, inadequate training among healthcare professionals, and discrimination (Gibbons, Owen & Heller, 2016). Hall and

Kurth (2019) compared survey data for Americans with IDD, those with Autism Spectrum disorder (ASD), and those with other disabilities. Although all three groups were found to have poorer overall health and less access to healthcare services compared to people without disabilities, those with IDD and ASD reported different outcomes and experiences than those with other disabilities. This necessitates further examination among persons with IDD or ASD, especially with respect to CC screening so as to inform policies and target interventions for these populations (Hall & Kurth, 2019).

From the research, persons with an IDD face health care service disparities in the form of inadequate education, prejudice and discrimination, access barriers, and inadequate health professional training. This then means there is a gap in the way that supports and strategizes the needs of people with IDD. Gibbons, Owen, and Heller (2016) studied the perceptions of health and health of people with IDD and found that this population defined good health as "(a) absence of pain, disease, and symptoms, (b) adherence to or not requiring treatment, (c) physical self-care, (d) mental or spiritual self-care, and (e) ability to perform the activities one wants to do. Participants conceptualized healthcare as (a) ensuring needs are met through access to services, (b) obtaining quality services, (c) navigating the healthcare system successfully, and (d) receiving humanizing healthcare" (p.1).

Women with an IDD who have had a pregnancy are more likely to: be young, to live in neighborhoods that are low income, live in the rural, and have high morbidity rates. According to Brown et al. (2016), women with an IDD are screened less even when they have had a pregnancy and are known to be sexually active, pointing to a need for requiring equitable screening levels as persons without a disability. This health disparity could very well be due to the disconnect of information between the medical physician world and that of people with IDD.

While women with an IDD experience breast cancer at the same rate as women without a disability, breast cancer screening rates are much lower among women with an IDD. Greenwood, Dreyfus, and Wilkinson (2014) conducted a qualitative study with XIV family members, which revealed certain themes into the differences in perspectives between women with an IDD and those without. Although women with an IDD are valued family members, a mammogram represented several challenges for loved ones, including: a) that families needed to acknowledge sexuality and all that this may mean for an adult female family member with an IDD, b) come to terms with a cancer diagnosis, c) quality health, which did not necessarily include screening. This whole process was feared because facing screening may necessitate difficult conversations and decisions that needed to be made, but decisions that family members were not ready to make, or did not want to make.

In a similar study of examining perspectives from caregivers who were women, Swaine, Dababneh, Parish, and Luken (2013) found that caregivers did not believe or know that screening was needed. Preparation prior to the exam was the most common factor mentioned by the caregivers as causing a huge barrier of screening. Other perspectives included knowing the risks and signs and symptoms but having lived through negative experiences, lack of educational materials, attitudes, physical and emotional attributes, all challenges that add up as barriers to screening for this demographic (Taggart et al., 2011).

It is important to note that strategies for breaking bad news of cancer to women with IDD and their families are inadequate. Open communication and best practice models are needed to support this population (Tuffrey-Wijne, Bernal, & Hollins, 2010). Because most people with IDD depend on caregivers, communication would be best when tailored to the train the trainer perspective, affording time to process best way to communicate to each person with IDD in the most specific and effective way to each individual.

In reviewing differences between breast cancer and CC screening from a disability severity perspective, Horner-Johnson et al. (2014) analyzed Medical Expenditure Panel Survey data from 2002-2008. What they found was that although differences were great for women with disabilities, those with more severe complexities fell even shorter of the HealthyPeople 2020 goals. After controlling for geographic, demographic, and socioeconomic factors, Horner-Johnson et al. (2014) found that disparities for CC screening remained significant unlike that of mammography. For comparison, data from 2008-2009 showed that 29% of African-American women as compared to 59% White women received mammographs. When model covariates were included, the persistent racial disparities were noted (Parish, Swaine, Son, & Luken, 2013a). In looking at other population groups, Adeyemi, (2013) found that education level, family income and age-associated significantly with CC screening for women living in the U.S. after emigrating from Africa.

Residential Options for Women with Disabilities

The push toward community integration among people with IDD finds many women with IDD living in assisted, residential group homes in the community (Hewitt & Nye-Lengerman, 2019). Well-functioning teams within a residential unit are bound to have quality patient safety and the implementation of quality services, to include timely physician appointments and screenings for women with disabilities (Suchman, 2011). Among women residing in residential group homes, there is the potential for them to remain invisible to current health care data surveillance systems due to the fact that this population might not be recognized in the larger population and that residential characteristics of people with IDD may not match the survey options of data collection (Krahn, 2019). With only 60% of community-dwelling people with IDD identified in the data, poor planning in public health services is an obvious, though unfortunate, outcome.

Parish et al. (2018) linked hospital discharge statistics with place-of-residence among women with disabilities and showed most such patients were younger, more than likely from poorer neighborhoods, on public insurance programs, and had lengthier hospital stays. Parish, Swaine, Son and Luken (2013b) used 2006-2010 medical records to identify CC screening rates among women with IDD aged 18-65 and who lived in primarily rural residential facilities. They found that women who had an obstetrician/gynecologist had higher CC screening rates than women with IDD who had no obstetrician/gynecologist, necessitating improvement of CC screening services and awareness for this population. It is important to empower women to overcome CC screening barriers and, by extension, reduce overall mortality and morbidity rates (Orji, 2016). Interventions to increase CC screening and prevention efforts that are tailored to specific needs of women with IDD regardless of the place of residence do well in increasing equity for this population (Park et al., 2018).

The sub-population of people who live in residential, 24-hour group homes or congregate sites had better representation in administrative data than those who lived independently or with family members. Administrative data kept for tracking client health and improving communication between providers indicated a low false-negative cancer rate as compared to hospital data (Wilkinson et al., 2014). Massachusetts requires service providers to keep and maintain up-to-date electronic health records. Representation is important, and administrative data had very high representation. Women who lived at home with family and family caregivers surprisingly exhibited the most limited CC and breast cancer screening knowledge and awareness (Parish, Swaine, Luken, Rose, & Dababnah, 2012). This is an area that may require creative interventions to raise awareness and health literacy.

Leser (2016) and Cobigo et al. (2013) provided the foundation that promotion of health behaviors for people with IDD is needed and that DSPs and support groups need to be educated on the need for implementation and intervention that leads to fewer disease incidences (Parish et al., 2018). Well-informed support for people with IDD is important for advocacy and for clear articulation of status while on a physician regular visit. When care staff were asked about cancer engagement regarding supporting people with IDD for prevention and promotion of health, most staff indicated they had not received any training on cancer prevention, nor had they received any information on family histories on cancer for those they cared for. Although women with ID were reported to have higher body weights than their male counterparts, which poses a higher risk for developing cancer (Hanna, Taggart, & Cousins, 2011), care staff were not aware of the relation between higher body weight and cancer and the need to maintain a healthy weight.

Horner-Johnson et al. (2014) found pap testing was not accounted for by socioeconomic, geographic, or insurance variables as was breast cancer screening by mammography. Training that is on-going for staff that work in disability systems is needed to improve communication especially with healthcare primary providers, Education for staff on the importance of early screening as well as the collection of data that is accurate (Brown et al., 2016). It is of utmost importance that women with disabilities are supported to understand the need to acquire primary care as well as why early health screening is important for them.

Caregiver perspectives reveal the need to understand insurance utilization, the benefits of continuity of care, the need for clear communication among physicians, women with IDD and caregivers, the need to have women with IDD buy-in to health equity, and the need to prepare professionally to work with this population (Erickson, Salgado, & Tan, 2016). There is a positive impact by the patient-centered medical home in increasing health screening due to proper incentives and strategies (Dixon, 2015).

Cost

Healthcare costs for people with IDD have differences in mixed pattern service rates. Second, from prescription medicine, the highest cost utilizer, secondary chronic diseases and poor mental health were the highest predictors of across the board high expenses of health care (Fujiura et al., 2018). There are those that think that since disease rates may be less among women with IDD, it is not cost-effective to invest in screening. For example, less than 1% of women with down syndrome were found to have breast cancer among data for 684 women with 2 % up-taking breast cancer screening. There are those that question if this is a cost-effective and beneficial effort (Chicoine, Roth, Chicoine, & Sulo, 2015). Most people with IDD may utilize public insurance, however, the percentage that uses private insurance makes insurance payer an important variable to study (Krahn, 2019).

Use of Administrative Data

Women with disabilities are invisible in the data, making it important to leverage linking datasets to borrow from the strengths of different data sets. Chronic conditions have been identified to be affecting cost and use as well as render greater risks due to high obesity levels in this population. It is critical that PWD are visible in data for quality healthcare in terms of monitoring and healthcare delivery as well as costs and policy (Fujiura et al., 2018). Databases can be linked to population-based research as well as for identifying people with IDD as identified in studies from Canada and Australia.

Infrastructures need to be created to leverage data linking for research that impacts policy to the benefit and support of people with IDD and their health and well-being (Balogh et al., 2019). Common surveillance methods for acquiring prevalence for people with IDD include a review of administrative data, population-based surveys and public health surveillance. Administrative data that analyzes claims from Medicaid and Medicare offers an opportunity to understand the health status of a large population by conducting surveillance that utilizes brevity, simplicity and uniformity (Reichard et al., 2019). The current study used KCHFS data as it contained both the Medicaid and Medicare variables, affording the opportunity to explore the relation of CC and women with and without disability in Kentucky.

When PWD have been asked about their perspectives on healthcare, they have indicated better results than what people without disabilities would have perceived as not good. Themes that emerge from PWD's perspective on good health are: not needing treatment, or stable conditions, absence of pain, disease, and symptoms, ability to engage in activities of choice, spiritual or mental care and physical self-care (Gibbons, Owen & Heller, 2016). These perspectives complement the need to uncover more from administrative data.

In as much as administrative data is important, it is not able to identify: barriers to screening from lived experiences by PWD, healthcare providers quality of communication, poor communication and coordination of care, communication status between PWD and physicians, or between physicians and issues relating to policies and procedures or non-compliance to recommended screenings (Erickson, Salgado, & Tan, 2016). This type of examination may be best acquired through a qualitative methodology.

Administrative data at the State-level offer a refreshing source of avenue for research into the IDD population. The context added to such efforts offer an avenue for critical evaluation of IDD services at a state level (Wilkinson et al., 2014). KY maintains databases that capture women with disabilities, and this offers an opportunity to tailor an examination of CC screening services as well as the impact of interventions in place in the DD system in KY. Self-reporting for both cervical and breast cancer are generally overreported by women with IDD, just like for women without a disability (Son, Parish, Swaine, & Luken, 2013). Self-reported data does require corroboration with other data sources for more accurate results.

It is not surprising that health data that includes disability offers the opportunity to examine CC for women with an IDD to inform services towards quality care and also for financial accountability. According to Andresen et al. (2013), most studies have not agreed on the definitions of disability, making it hard to pinpoint what disparities exist for women with disabilities. The federal government has supported administrative data by subgroups (for example race and gender), however, there have not been policies requiring data of disability by status making it hard to study this population at a deeper epidemiologic level, from secondary data. With the little data available that states disability status, women with Multiple sclerosis (MS) have been identified as with effective disparity while pap tests have significantly declined as functional ability declines among women with a disability (Andresen et al., 2013).

Another area of data for this type of study is population-based cancer registries, figuring out how best to compare the women with disabilities represented in the registries, to those found in IHD and OSD. According to Tucker (2019), important scientific and technical advances have occurred in the population-based cancer-registries that include but not limited to refinements in natural language processes (NLP), linking records using probabilities, genomic sequencing performance. Studies based on such registries can provide external validity strength. The use of cancer registry data offers an opportunity to use a scientifically representative underlying population. This may not always be possible per Tucker with Hospital data, especially data from hospitals without multidisciplinary cancer programs (2019). Central cancer registries are a good source of data that is well representative of a population-based sample that provides external validity that can confidently be generalized. Cancer registries can also provide evidence-based guidance for the implementation of quality services (Tucker et al., 2019).

Linking KY cancer registry data with information from inpatient and outpatient discharge-from-care data makes for an interesting variable in the effort to contribute to the determinants of health data (Krahn, 2019). Issues such as why a patient population may be visible in one system and not the other, along with health outcomes, may help to educate clinicians, the public, and other stakeholders on more specific barriers—and opportunities to overcome those barriers—within the SDOH framework. It is clear that interoperability while difficult to achieve due to the current infrastructure in health records, can be improved and linked to personal health records to allow for more accurate information (Akubuiro, 2018). For this to be designed more cohesively, a uniform standard is needed for the collection and sharing of data among organizations. This will require the good will or well-informed people in power to distribute the benefit by empowering organizations to improve interoperability for meaningful social change in the world of data sharing (Solar, 2010).

Educating Women with Intellectual and Developmental Disabilities

Education is a major component within the SDOH framework to address health disparities. When women seek knowledge of CC from different reputable sources, increased preventative behaviors are likely to occur (Habtu, Yohannes & Laelago, 2018). Women with IDD can be encouraged to advocate for access to CC screening for reduced morbidity, mortality, and costs associated with CC (Oriji, 2016). Cancer screening sessions aimed at increasing awareness and benefits of screening have shown increased knowledge on the importance of screening while reducing anxiety. Women age 35 to 44 years have been noted to have a heightened fear of cancer (Cullerton et al., 2016). Women were noted to not have undergone screening because they did not believe they were at risk, they had no symptoms, and they did not know where to go or they feared examinations.

Studies have shown that women with IDD have retained information on screening, however, an increase in the knowledge about breast cancer and CC screening is needed, especially for CC as the knowledge is lower than it is for breast cancer. Receiving care can be blocked by lack of understanding (Swaine, Parish, Luken, Son, & Dickens, 2014). It is clear that increasing the knowledge base for women with IDD, their families and caregivers are key areas to address for screening rates to increase and for disease incidences and mortality to reduce. Providers that adhere to screening rates need to be acknowledged even with incentives (Susan, Jamie, Esther, and Karen, 2013).

In addition to women learning about why it is important to screen early for CC, their knowledge base can be expanded on a person-centered approach to include knowledge on other reproductive diseases, to include but not limited to breast, ovarian, uterine and even colon cancers. Cancer, as Campbell (2017) asserts, is a complicated disease consisting of multistage and multifactorial etiology, thus requiring multifactorial strategies, in all the stages that involve prevention, screening, diagnosis and treatment. According to Campbell and Campbell (2016), cancer occurs in three stages, namely the implantation of a carcinogen into the body, the promotion of cancer-prone cells that develop into masses over a long time, and then metastasis occurs causing death. Nutrition can promote or slow down cancer stages despite the complexity of multistage etiology. Prevention education for cancer must include the fact that nutrition is important, and this same message must be shared with women with IDD, the DSPs, families and stakeholders that support them. A high risk for numerous neoplastic diseases is that of inappropriate dietary/nutrition and a change in these habits can reduce the risk of cancers (Wołoszynek, Stępnik, & de Pourbaix, 2019). Obesity, diet and physical inactivity have been identified to cause human cancers at a rate of at least 35%. Given that 30 % of cancers occur due to uncontrollable factors, reducing the risks that can be controlled, for example diet, physical activity, and obesity (Miron, 2018) provide preventable actions. Hagemann suggests there is need for evidence that women with IDD who qualify for bariatric surgery or pharmacologic treatments do receive these treatment options like other women without IDD (Hagemann, 2017). Women with IDD have a right to equitable treatment of all arrays of treatment from a person-centered approach that address all individual specific variables.

Although diet and nutrition have been of interest in the medical professions as early as 1800s in regard to the ability to reduce cancer risk, this information remains uncertain and not implemented equitably for women with IDD in regard to CC prevention (Campbell, 2017). Consuming whole food plant-based diet (WFPB) offers the most nutritional value in cancer reduction (Campbell & Campbell, 2016) and the implementation of WFPB eating is not well adapted for this population. While Zam & Khadour (2017) noted that high fat, high calories added to disease risk, and while Del Cornò et al. (2017) added that consumption of red meats combined with processed foods increased cancer risks, this information has yet to diffuse for this population. Equipping women with this information could lead them to become allies in reducing heath disparities and in reaching more favorable outcomes from reproductive cancers, including CC, Other information that can help is health and wellness programs that include accessible physical activity according to Davies et al. (2011), as it lends itself to better outcomes for cancer reduction. Other contributing factors to risk are smoking, obesity, lack of physical activity and large alcohol consumption. Such information must be included in the health discussions with women with IDD in a culturally competent and person-centered manner for real transformation to occur equitably for this population.

Health and wellness matters, as it encompasses many dimensions that affect each other in ways that create a sense of well-being (Hewitt & Nye-Lengerman, 2019). In addition to physical exercise and good nutrition, the aspect of environmental barriers leaves many not included in their community, and PWD face environmental and community barriers at higher rates than those with no disabilities, for example, non-accessible neighborhoods for safe walking, or availability of fresh foods. Health disparities due to fewer physicians taking the most common form of insurance for this population means people with IDD have less preventative care. In addition, provider-patient interactions do not get to culturally competent care in most cases, mostly because physicians are not trained on how to work with this population.

Summary and Conclusions

Disparities in health occur among women with disabilities, more so for women with an IDD and more complex disabilities. Further, CC screening quality/rates lag HealthyPeople 2020 goals. This literature review identified a need for cultural and health competencies that are needed for this group. There is a need for examining early detection as well as an examination of actions resulting after such studies (Brown et al., 2016). It was clear that knowledge for women with IDD, their caregivers/ families and DSPs is lacking. It was also clear that healthcare professionals are still not well equipped to handle the challenges of this population.

Disparities in health do exist for women with IDD, and they are receiving health services at rates lower than women without disabilities and lower than women with other disabilities. Administrative data is still limited in identifying women with disabilities, making it hard for epidemiological studies that identify types of disparities for this population. There is still a gap in professionals that are well trained on disability issues for the best population-based public health strategies. It was very clear women with disabilities are receiving CC screening at rates lower than for women with other disabilities as well as for women with no disabilities. According to Parish et al. (2018), PWD with cancer were admitted to hospital more frequently than those without IDD from an Australian study finding where women with IDD were hospitalized more than men with IDD. Women with neurological conditions and mental disorders received less radiation therapy and breast conservative surgeries than their peers with these disabilities. Women with ID were more likely to die from cancer. According to Parish et al., discharges of women with IDD were associated with higher rates of uterine cancer and lower incidences of CC from the 2010 Healthcare and Utilization Project Nationwide Inpatient Sample representing hospital data.

What was very limited, and not known, despite all the evidence noted above, was the relationship between CC and women with disability types in KY as evidenced in clinical data. There were no population-based studies that compared CC, other reproductive cancers in relation to women with and without disabilities and the general population through the use of inpatient and outpatient discharge data. Given that 35% of the KY population has some disability, this is a huge gap in the literature.

This study will examine the IHD and OSD data to determine the relationship between CC and women with and without disabilities in comparison with other reproductive cancers to examine the influence of the predictors of disability status, age, payer type, zip code, and length of hospital stay. This study will also examine the characteristics of the women receiving the treatment based on after their inpatient or outpatient treatment discharges for any structural or intermediary determinants of health (Solar, 2010).

This chapter provided a review of the literature pertaining to the relationship between CC and women with IDD and disability as a whole, and more specifically, to the determinants of health and disparities experienced in CC screening and prevention efforts of this population. There have been many innovative health and wellness strategies, and preventative strategies in place in KY. The SDOH framework was shown to be ideal for digging deeper into the complexities pertaining to this population and was chosen as a more ideal framework. The chapter concluded with an introduction to the types and availability of administrative data available to the researcher. This data was used to explore the relationship between CC and women with and without IDD and disability as a whole and the predictive determinants of health in KY from a population-based prevalence as evidenced by hospital discharges and also to examine the characteristics found among these women. The purpose of this study as previously stated was to understand the influence of the determinants of health in CC for women with disability that include IDD in KY. The next chapter—Methodology—reviews these sources of data in more detail and describes how the researcher intends to use these sources for analysis.

Chapter 3: Research Method

Introductions

This study examined the relationship between CC and women living in KY with and without a disability, including women with IDD. This chapter addresses the research design and rationale, the methodology, threats to validity, and ends with a summary. Use of the term *women with disabilities* for the purpose of this study and chapter, refers to different types of disabilities, including IDD.

In order to examine the relationship mentioned above in a methodology that aligns with the SDOH, CC was examined together with other reproductive cancers—cancers of the cervix, breast, uterus, ovary, and other female genitals—among KY women with and without a disability. I considered it important to carry out meaningful work by using a sample more representative of what was occurring in relation to SDOH as part of the methodology. The study design offered a valid relationship from a population-based point of view, as evidenced by actual hospital discharges. The characteristics of these discharged women after they received treatment of the reproductive cancers was examined. Such characteristics as patient status, payer type, age, zip code or county of residence, disability status, and length of hospital stay were of interest. Isolating patient diagnoses and identifying women with disabilities discharged from reproductive treatment as an independent variable was of great importance. The corresponding demographic data revealed specifics of the population being studied, KY women discharged from a reproductive cancer that included CC and a pre-existing diagnosis of disability. I intended this data to be used to gain insights into the challenges facing the population of study to gain further insight into more effective prevention efforts targeted specifically for this population.

The following research questions guided the study from the IHD data:

RQ1: Is there a statistically significant relationship between the inpatient discharge status of a woman (with or without disability), payer type, age, county of residence, and diagnosis of reproductive cancer?

$H_0$1: There is no statistically significant relationship between inpatient discharge status of woman (with or without disability), payer type, age, county of residence, and diagnosis of reproductive cancer.

H_a2: There is a statistically significant relationship between inpatient discharge of woman (with or without disability), payer type, age, county of residence, and diagnosis of reproductive cancer.

A similar research question guided the data regarding women discharged from outpatient care.

RQ2: Is there a statistically significant relationship between outpatient service discharge status of woman (with or without disability), age, county of residence, and diagnosis of reproductive cancer?

$H_0$2: There is no statistically significant relationship between outpatient service discharge status of woman (with or without disability), age, county of residence, and diagnosis of reproductive cancer.

H_a2: There is a statistically significant relationship between outpatient service discharge status of woman (with or without disability), age, county of residence, and diagnosis of reproductive cancer.

Variables

Independent variables (IV) for this study included women with and without disability discharged from reproductive cancer treatment. Women with IDD were proposed to have been identified using the ICD-10-CM (CDC, 2020f), as noted in Table 3. Other IVs include such concomitant characteristic information as, payer type, age, and county of residence within the geographic boundaries of KY.

The dependent variable (DV) for this study was women discharged from inpatient or outpatient hospitals/health care facilities with a diagnosis of one of the five reproductive cancers.

Inpatient hospitalization or outpatient services care for five reproductive cancers—cancer of the cervix, breast, uterus, ovary, or other female genitals—as identified in the ICD-10-CM procedures and diagnoses codes was used for this research. I examined the relationship between women with and without disabilities discharged from reproductive cancer treatment with regard to age, payer type, county of residence and reproductive cancer status.

Table 3

Classification of Intellectual and Developmental Disabilities

Intellectual and Developmental disabilities	ICD-10-CM code
Mild Mental Retardation	F-70
Moderate Mental Retardation	F-71
Severe Mental Retardation	F-72
Profound Mental Retardation	F-73
Unspecified Mental Retardation	R42.82
Fragile X Syndrome	Q99.2
Prader-Willi Syndrome	Q87.11
Down Syndrome	Q90.9
Rett Syndrome	F84.2
Lesch Nyhan	E79.1
Cri du Chat	Q93.4
Autistic Disorder	F84.0
Childhood Disintegrative Disorder	F84.3
Other Specified PDDs	Q51.28
Unspecified PDD	F60.9
Tuberous Sclerosis	Q85.1
Fetal Alcohol Syndrome	Q86.0
Athetoid cerebral palsy	G80.3
Spastic diplegic cerebral palsy	G80.1
Spastic hemiplegic cerebral palsy	G80.2
Spastic quadriplegic cerebral palsy	G80.0
CP Monoplegic	G83.30
Other CP	G80.8
Infantile CP	G80.4

Research Design and Rationale

The research design used in this study was correlational in a quantitative method using secondary data. This approach was necessary to understand the relationship between CC and women with a disability as well as identifying the relationship between the variables that exist for women with and without a disability discharged for the same five reproductive cancer treatments (see Parish et al., 2018). There were no constraints regarding time for data collection, and the cost to download each dataset for research purposes was $10, payable to KCHF. The objective of understanding the relationship between the variables was imminent. Given there are 43 options for patient status, and that any woman could fall into any such status, the information was used as-is (See Appendix A).

This study used secondary data not only because it was readily available, but because this data was a great representation of what is occurring in KY. This data also offered opportunities for analysis that would be hard to capture from primary sources while providing insight into the health services for women in KY. Further, secondary data includes unique characteristics and features, allowing a researcher the ability to disaggregate during the statistical analysis (Evans, Grella, Murphy & Yih-Ing Hser, 2010). While acquiring data was expedited by the fact that it was readily available, I took care to ensure data cleaning and preparation was conducted appropriately. For these reasons, it was a logical choice for the researcher to use the KCHFS data to answer the research questions.

Population Sampling Procedures from Secondary Data

The target population for this study was all women discharged from inpatient hospitalizations and outpatient services. Women with and without disabilities were also drawn for regression to examine what if any disparities existed between the two groups of women. This study exclusively examined those women discharged after the treatment of one of the five female reproductive cancers – cancer of the breast, uterus, cervix, ovaries, or other genital organs. These reproductive cancers were used in the analysis. The women with IDD could not be identified as the coding described in the ICD-10-CM as described by Table 3 was not used This study used all women discharged with CC as part of the reproductive cancers and examined associations or differences between those with and without disabilities. Data was available from 2014 to 2018, which made it possible to find an appropriate sample for analysis. However, data from 2014 was dropped because the ICD-10-CM codes were implemented in 2015. Using 2014 would not have yielded results based on a standard method. The desired sample size was calculated using the estimation of sample size formula based on the event per variable (EPV; Bujang, Sa'aat, Sidik, & Joo, 2018).

I considered using the individual woman as the unit of analysis. However, to do so would compromise anonymity and privacy, hence the choice was made to examine the discharge status of women with any of the five reproductive cancers as the unit of analysis. Using the individual woman also would have required additional administrative data, which I might not have been able to obtain given the vulnerable nature of the population being studied. As stated earlier, according to CDC (2020b), the population in KY comprised of approximately 677,681 women living with a disability.

Power Analysis

I compared two groups of women from KY, those with and those without a disability, discharged from an inpatient hospital or outpatient health services for treatment related to a reproductive cancer. It was expected that discharged women without a disability would be more than double the number of those discharged women with a disability. It was also possible that the same woman could have been discharged more than once in the same year or over several years.

To increase the sample size, to have a large enough population for practical significance, CC was observed together with other reproductive cancers (see Daniel & Cross, 2013). Furthermore, the population for this study was for the years between 2015 - 2018. Effect size can be explained as the magnitude of the result, either in ratio or in the difference found in the population. A good sample size was needed to determine the effect size. Given this information and expecting a higher number of discharged women without disabilities, it was prudent to have as large of a sample size as possible to be closer to the population value (see Daniel & Cross, 2013).

The formula $n = 100 + xi$ was used to estimate sample size based on event per variable (EPV; Bujang et al., 2018). In this formula, i represents the number of independent variables while x is an integer. The recommended rule of thumb is to use 50 as the integer: $n = 100 + 50\ (i)$ for observational studies (2018). In this case, $n = 100 + 50$ (four independent variables) = 300. For OSD, using the same formula with three independent variables, 250 women with disabilities would be needed for a good sample size. It was not possible to merge the IHD and OSD data as described previously as there was no unique identifier with which to do so. As such, I carried out every due diligence and was able to identify 304 discharges of women with disabilities in the IHD and 280 women with disabilities in the OSD data, which was important for validity of results (see Daniel & Cross, 2013).

Secondary Data Access and Procedure

The KCHFS had a systemic process in place for retrieving operational data. The KCHFS encouraged use of their data for research only after it had been decoded. I signed an agreement for ownership and protection of the data. Each data set cost $10 as it was being used for academic purposes. The data was then downloaded from the KCHFS website in a secure manner, then cleaned and used for analysis. The integrity of the data was evaluated prior to analysis. The KCHFS provided a codebook for each data set, and the person responsible for the data was available for questions and more specific details. This was helpful in aligning the data to the research questions to fit the anticipated statistical test of MLR analysis.

The MLR is used to predict the dependent variable, given one or more independent variables. The assumptions of MLR include that the dependent variable should be measured as a nominal value, although it could also be of ordinal value, with the recommendation of using ordinal regression if that was the case (Laerd Statistics, 2018c). Other assumptions include that one or more independent variable was in use and could be of nominal, ordinal or continuous values, that observations are independent with an exhaustive and mutually exclusive dependent variables category and that the independent variables could not be highly correlated causing multicollinearity. A linear relationship between independent and dependent variables was another assumption as was the fact that there should be no outliers according to Laerd Statistics. (2018c). This study was utilizing a dependent variable at the nominal value with five categories (five reproductive cancers) and using several social determinant variables as predictors to the dependent variable.

Operationalization of the Variables

The data collected by KY Hospitals was representative of the population in KY for the years of 2015 to 2018. The validity and reliability of the data is verified as it is submitted. KCHFS checks for completeness and presence of required fields, duplicate records, the validity of submissions, and timeliness. Records with errors are returned to hospitals and facilities for resubmission upon correction. (KCHFS, 2017a) Table I contains the operationalization and coding of the variables of interest for this study and contains those ICD-10-CM codes that will be used to identify women with IDD and as adopted from Parish et al. (2018). The ICD-10-CM codes were updated to reflect current codes.

Table 4

Coding and Operationalization of Study Variables

Variable Name	Variable Type	Operationalization	Coding/Values
Diagnosis of Reproductive Cancer	Dependent	Nominal	Cancer of uterus- C55 Cancer of breast - Range: D05.02 – D07.1 Cancer of cervix - C53.9 Cancer of ovary - C79.60 Other female genitals- D07.3, C57,
Discharge status of woman	Independent	Nominal	Woman with IDD 0 = No, 1 = Yes
Age	Independent	Categorical	Age Group Range 6 -16
County of residence	Independent	Ordinal	Federal Information Processing Standard Code
Patient Status	Independent	Scale	Range 0 – 95 (See Appendix A)
Insurance Payer	Independent	Categorical	PayerGroup Range 1-5 1-Medicare 2-Medicaid 3-Commercial 4-Self-Pay& Charity 5- Other

Data Analysis

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 23.0. The MLR test was used for analysis. The dependent variable is a nominal variable with four independent variables that are continuous, ordinal and nominal. The retrieved data was examined for the independence of observations while the dependent variable was examined to ensure it was mutually exclusive and that categories were exhaustive. During the analysis, the test for multicollinearity was added and a linear relationship was established between the continuous independent variable and the dependent variable's logit transformation. Outliers and influential high points were minimized (Laerd Statistics, 2018c).

This study's research questions were revised from Chapter 1 to reflect the literature review discoveries of what was already known and what was not known as described earlier. The research questions were also revised with the understanding that CC is one of the reproductive cancers. By including other reproductive cancers, it was possible to increase the sample as well as the associations in the variables of interest. The research questions were therefore as follows:

RQ1: Is there a statistically significant relationship between IHD status of woman (with or without disability), payer type, age, county of residence, and diagnosis of a CC?

$H_0$1: There is no statistically significant relationship between IHD status of woman (with or without disability), payer type, age, county of residence, and diagnosis of a CC.

H_a1: There is a statistically significant relationship between IHD status of woman (with or without disability), payer type, age, county of residence , and diagnosis of a CC.

RQ2: Is there a statistically significant relationship between OSD status of woman (with or without disability), age, county of residence, and diagnosis of a CC?

$H_0$2: There is no statistically significant relationship between OSD status of woman (with or without disability), age, county of residence, and diagnosis of a CC.

H_a2: There is a statistically significant relationship between OSD status of woman (with or without disability), age, county of residence, and diagnosis of a CC.

Merging and appending was necessary, although the researcher was open to the thought of merging should the inpatient and outpatient data sets have benefitted from merging. Merging files occurs to allow for two data sets to be combined for analysis of variables that may not be present in either data set unless they are combined (Bates College, 2019). Merging was not possible; hence the research questions were not revised to be one question and the inpatient and outpatient status were not included as an independent variable. Merging files would have only occurred if there was a way to link both inpatient and outpatient data using a single identifier and in so doing, capturing all the women treated with the five reproductive cancers both at the inpatient and outpatient hospitals/health centers. This would have given the best of two datasets/files. In order to merge two files, there should be a plan to examine if there is a single identifier common in both and to ensure that that identifier is either numeric (e.g. ID number) or a string variable. The common variable would need to have the same name or value (Princeton University, 2011).

The datasets had the age variable already converted from a continuous to a categorical variable. Patient status, on the other hand, could not be converted into a categorical variable and it was used to identify women with disabilities based on the services they were discharged to. There was some missing data, however, since a multiple regression method of analysis was being used, this helped with ensuring missing data did not affect the validity of results. Multinomial Regression helped with compounding and bias challenges.

Appropriate descriptive statistics were used. The median household income for the patient's county of residence were identified as well as the mean of hospital stay in days it took for the women to be discharged from inpatient hospital services of reproductive cancer treatment. The frequency of the insurance payer type was calculated as well as the age of the women. Inferential statistics were used to help generalize the KY population by use of the study sample that is a good representation of the general population. It was important that this study ensured the sample extraction strategies adhered to the reduction of error and bias so that results could be valid. Inferential statistics were helpful to estimate parameters and in the testing of the hypothesis (Laerd Statistics, 2018b). Inferential statistics compared data with theories and ideas to see how well they faired, or if there is a statistical significance (Kamrin, 2010).

The Odds Ratios (OR) were used in the description of the results of the analysis. The Confidence ratios were useful in measuring the uncertainty due to the use of the sample and the Confidence Intervals was set at the 95% estimate range of where values fell for the entire population and if anything deviated from that, it was significant

(Marshall & Jonker, 2010). When the statistical significance was clearly stated, and the null hypothesis accepted or rejected, the conclusion was made.

Reliability and Validity

The inpatient and outpatient datasets were not "ready for analysis" and there was missing data or data that was incomplete, of poor quality, or biased. However, this study did not foresee many challenges with external and internal validity issues because data was checked and corrected as it was collected to minimize errors through quality data measures as certified by KCHFS. Missing data challenges have been mentioned earlier. However, multiple regression was a good analysis to deal with missing data. Selection bias was not an external validity issue; however, the study chose to use the population-based dataset to make generalizations possible because the sample drawn was a representation of the general population. This study used inpatient and outpatient discharges as the unit of analysis, instead of the patient themselves and the threat here was to explain the results from a patient focus. However, care was taken to explain the results from the discharge unit of analysis.

Ethical Considerations

There are typically fewer risks and ethical concerns when using secondary data because it is pre-existing, and although the population of interest is a vulnerable one, anonymity and confidentiality was already assured because the data included no identifiable information and informed consent was not necessary for ethical considerations. However, the researcher sought Walden University's Institutional Review Board (IRB) approval and permission was granted with IRB approval number 04-28-20-

0658410. Permission was also sought from KCHFS as well as from the University of KY’s CCTS for the use of their data for this study prior to data retrieval. Data retrieved from KCHFS and CCTS was maintained in a password-protected computer and stored appropriately per Walden procedures. There were no conflicts of interest or incentives in relation to the study.

Summary

This chapter stated the purpose of the study, especially after the insights gained from the literature review, necessitating a revision of the research questions. Another thorough review of methodology necessitated the use of more appropriate variables that would answer the unknown. The research then turned to examine the prevalence of five reproductive cancers with an emphasis with cervical cancer among women with and without disabilities, as well as identifying the characteristics of these discharged women as part of the research design and rationale. This chapter also covered the population, sampling procedure, operationalization of variables, the data analysis, threats to validity, and ethical considerations. Once the proposal for this study was approved, IRB approval was obtained. With these two approvals, the researcher downloaded the data and prepared it for analysis, the process and the results of which are detailed in Chapter 4

Chapter 4: Results

Introduction

The purpose of this observational and cross-sectional quantitative research study was to explore the relationship between CC and women with IDD in KY as evidenced by reproductive cancer discharge data from inpatient and outpatient treatment centers. This study is important in that women with IDD are a vulnerable population that typically require lifelong support and a dependence on public funding either through Medicare or Medicaid (see Knox, 2008; Parish et al., 2018). In public health, there is scrutiny for more innovative, efficient healthcare purchasing processes for people with IDD, including a reduction of CC incidences among women with IDD (Anthes, 2018; Drum et al., 2009).

Information used for this study was representative of the population as it was based on actual discharge data from both the IHD and OSD databases as reported to the KCHFS. The data was an excellent source of information of what occurred in KY during the 4-year period 2015 to 2018.

Two research questions guided this study as follows:

RQ1: Is there a statistically significant relationship between inpatient hospital discharge status of woman, payer type, age, county of residence, and diagnosis of reproductive cancer?

> $H_0$1: There is no statistically significant relationship between inpatient hospital discharge status of woman, payer type, age, county of residence, and diagnosis of reproductive cancer.

H_a2: There is a statistically significant relationship between inpatient hospital discharge status of woman, payer type, age, county of residence, and diagnosis of reproductive cancer.

A similar research question was used to capture those women discharged from outpatient care.

RQ2: Is there a statistically significant relationship between outpatient hospital discharge status of woman, age, county of residence, and diagnosis of reproductive cancer?

H_02: There is no statistically significant relationship between outpatient discharge status of woman, age, county of residence, and diagnosis of reproductive cancer.

*H*a2: There is a statistically significant relationship between outpatient hospital discharge of woman, age, county of residence, and diagnosis of reproductive cancer.

This chapter describes the protocol for data collection and analysis. It concludes with a presentation of the results of the data investigation and a summary of the findings.

Data Collection

Secondary data from the IHD and OSD as reported to the KCHFS was downloaded for the 4-year period, 2015 to 2018. The year 2014 was dropped and not used for analysis due to a different coding system, while data for 2019 was not yet available. For the purposes of this research, data from the KCHFS was hard to follow and analyze, however, the University of KY's Center for Clinical and Translational Science (CCTS) had the same data available for researchers. CCTS's Biomedical Informatics staff are trained on data, with a specialty of ensuring validity and translating data for research. With IRB preapproval, CCTS staff were able to extract the same information as contained in the KCHFS databases in variables suitable for research, and I downloaded this secondary data in May 2020.

Several subsequent, revision downloads were needed to ensure appropriate capture of all variables and with additional relevant data regarding women diagnosed with one of the five reproductive cancers of interest. It should be noted the ICD-10-CM was implemented in October 2015. As such, using only ICD-10-CM codes for inclusion would fail to have captured data for January through September 2015. Data was provided in a way that identified the dependent variable (diagnosis of reproductive cancer) and the independent variables identified in this study's research questions (i.e., discharge status of woman from the patient status and diagnosis, payer type, age, county of residence, etc.). CCTS required a signed contract, detailing provisions for the public use of this data within their set boundaries. I am grateful for the CCTS data service, which is supported by the National Institutes of Health's National Center for Advancing Translational Sciences (grant #UL1TR001998).

Included in the secondary data were data characteristics for women between the age of 21 and 74. Variables of interest for this study were diagnosis of cancer of the uterus, breast, cervix, ovary, and of other female genitals; discharge status; age; county; length of hospital stay; patient status; and, insurance payer. It was important to use the county information in a meaningful way, and the data presented KY's Federal Information Processing Standard (FIPS) codes for each of the 120 counties (see

Appendix C). Upon further review, it was noted that each county had been assigned a health factor based on four factors: health behaviors, clinical care, social and economic factors, and physical environment. This ranking was done by the County Health Rankings & Roadmaps program, a collaborative effort between the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation (County Health Ranking & Roadmaps, 2020). The collaboration is backed by a strong belief that health equity is for all people, regardless of race, ethnicity, gender, income, location, or other factors. The health factor rankings uniquely measure the health of most all counties in the U.S. for action and community learning.

Each county in KY was ranked on a scale from 1 to 120 with 1 being the highest rank and 120 the lowest. This information was used to represent the counties of residence in the analysis. Figure 5 displays the counties and their rankings, although it is important to note that ranking masks the differences within each county as well as differences between counties. The spread of the ranking is represented by scale to the right of the figure, and the graph represents the size of gap between counties in the ranking. Shadings display the quantiles used in the map and are similar to the social determinants map from Chapter 2. Appendix B features a map with the regions of Kentucky by household income.

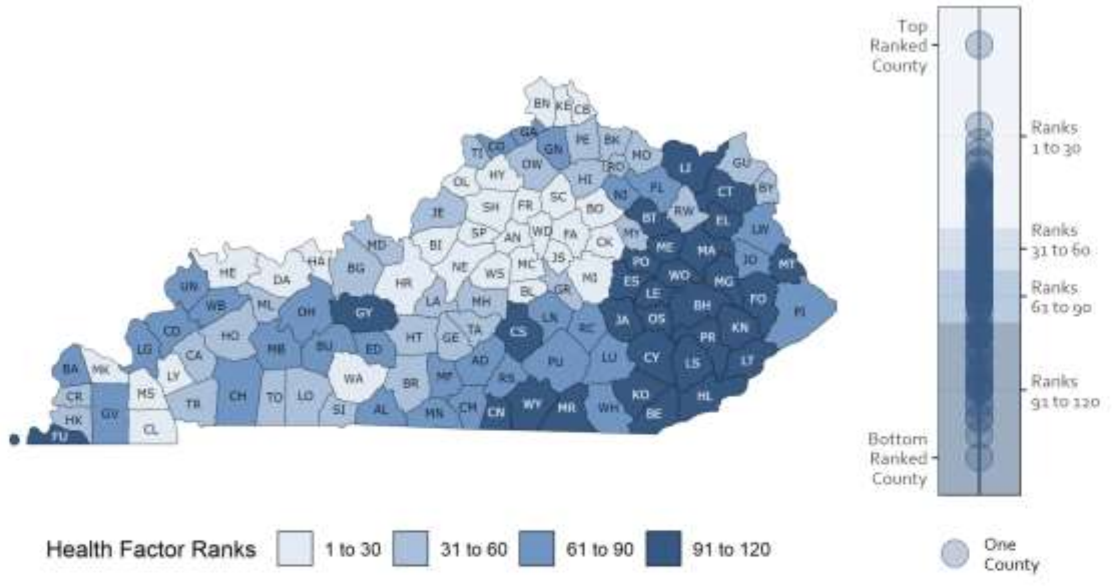


Figure 5. Map of Kentucky counties ranked by Health Factor scores. The scale at right shows the quartile distribution of counties by Health Factor rank. Retrieved from https://www.countyhealthrankings.org/reports/state-reports/2020-kentucky-report

Descriptive statistics from the data analysis are provided in the tables that follow. Inferential statistics are also provided after conducting the MLR model.

None of the ICD-10-CM codes yielded any results that could readily identify women with IDD. Women with disabilities were identified using other characteristics, such as the type of service to which they were discharged, insurance payer, Medicare/Medicaid, Severity Diagnosis Related Groups and descriptions. It had been anticipated that women with IDD would be invisible in the data. Since it was not possible to distinguish women with IDD among those with other disabilities, the discharge status of woman was changed to reflect women with and without a disability.

Data provided by CCTS's Biomedical Informatics team was further cleaned to reflect only data from KY, thereby excluding IHD and OSD data from Ohio, Indiana, Pennsylvania, Massachusetts, Colorado, New York, Michigan, Tennessee, Illinois, Georgia, West Virginia, Florida, Mississippi and some international destinations. The number of women visiting KY for oncology services was a testament of the quality of such services provided in KY.

Discharges of women from KY were identified by zip code and FIPS code. For the IHD, there were 1,837 women without a disability and 304 women with a disability, of which 1,947 women were White, 175 women were African American, 45 were Hispanic or Latino, and 7 identified as Asian. The data represented other, minor races/ethnic demographics as well. For the OSD, there were far more women without a disability—30,936—and 280 women with a disability. Of these, 28,336 were White, 2,260 women were Black or African American, 2,529 were Hispanic or Latino, and 98 identified as Asian.

Descriptive Statistics

Table 5 shows the IHD and OSD data and provides information on the highest frequency of cases ranked by the health factor assigned to each county, which was further categorized into groups. The health factor group with the highest inpatient hospital discharges was Group 10 (Pendleton, Jefferson, Garrard, Green, Trimble) with 437 (20.4%) discharges, located in the Urban Triangle. Group 5 (Bullitt, Hardin, Calloway, Kenton, and Franklin) carried 9.6% of the discharges (206) and, in general, there were more discharges to the Urban Triangle.

A review of OSD data revealed the highest health factor group was Group 10 (Pendleton, Jefferson, Garrard, Green, Trimble) with 6,813 (21.8%) discharges followed by Group 2 (Spencer, Boyle, Hancock, Daviess, Fayette) with 3,448 (11%) discharges. Group 5 (Bullitt, Hardin, Calloway, Kenton, Franklin) had the third highest discharges with 2,773 (8.9%).

The social determinants of health by KY quantile figure in Chapter 2 offered a map that was used to rank the information analyzed for the counties found to have the highest number of discharges. From Table 5, the counties with the highest inpatient hospital discharges included those from three third tier counties and two second tier counties (accounting for 20.4% of discharges) followed by two second tier counties and three top tier counties (9.6% of discharges). From the OSD data, the highest outpatient hospital discharges came from three third tier and two second tier counties (accounting for 21.8% of discharges) followed by five top tier counties (11% of discharges), and two second tier and three top tier counties (8.9% of discharges).

Table 6 shows that women with disabilities were discharged from inpatient care highest among the 55-59 age group (*n* = 44), followed by ages 70-74 and 45-49 (*n* = 39) with the fewest discharges noted for the 21-25 age group (*n* = 2). For women without disabilities, discharges from IHD were highest at 238 for women in the 50-54 age group followed by 234 discharges for women in the 55-59 age group. Among inpatient hospital discharges, women with disabilities were discharged at a higher number at a later age than for women without disabilities.

Table 5

Inpatient Hospital Discharges (IHD), Outpatient Hospital Discharges (OSD) Data By County, Health Factor, and Region

Counties in KY	Health Factor	No. of Cases (n) (%)	Quantile	Region
IHD				
Pendleton, Jefferson, Garrard, Green, Trimble	46-50	437 (20.4)	3 * Third Tiers and 2 * Second Tiers	4 Urban Triangle and 1 South Central Kentucky
Bullitt, Hardin, Calloway, Kenton, Franklin	21-25	206 (9.6)	2* second tiers and 3 * Top Tiers	4 Urban Triangle and 1 Western KY
Spencer, Boyle, Fayette, Hancock, Daviess	6-10	184 (8.6)	5 Top Tiers	3 Urban Triangle and 2 Western KY
OSD				
Pendleton, Jefferson, Garrard, Green, Trimble	46-50	6,813 (21.8)	3 * Third Tiers and 2 * Second Tiers	4 Urban Triangle and 1 South Central KY
Spencer, Boyle, Hancock, Daviess, Fayette	6-10	3,448 (11)	5 Top Tiers	3 Urban Triangle and 2 Western KY
Bullitt, Hardin, Calloway, Kenton, Franklin	21-25	2,773 (8.9)	2* second tiers and 3 * Top Tiers	1 of each

Note.
i) Each county’s health factor ranking appears in Appendix C.
ii) The Kentucky quantiles used in Chapter 2 are reflected under “quantiles.”
iii) A map of Kentucky regions appears in Appendix B.

Table 6

Age Distribution of Inpatient and Outpatient Hospital Discharges

Years of Age	Inpatient Discharges of Women Without Disability (n)	Inpatient Discharges of Women with Disability (n)	Outpatient Discharges of Women Without Disability (n)	Outpatient Discharges of Women with Disability (n)
21-24	**17**	2	554	5
25-29	86	12	1,318	9
30-34	97	11	1,641	6
35-39	164	26	2,120	17
40-44	195	24	2,802	23
45-49	212	**39**	3,361	35
50-54	**238**	35	3,744	**47**
55-59	**234**	**44**	**4,274**	35
60-64	208	**36**	**4,358**	**41**
65-69	202	**36**	3,971	32
70-74	184	**39**	2,800	30
Total	1,837	304	30,943	280

OSD data shows that women without disabilities had the greatest number of discharges at ages 60-64 (4,358), followed by women in the 55-59 age group (4,274 discharges). Women with disabilities had the greatest number of discharges at ages 50-54 (47), followed by 41 discharges at ages 60-64, with the least number of discharges at ages 21-24 (5). Based upon the highest rates of discharge by age, women with disabilities were more likely to be discharged at a younger age than women without disabilities (ages 50-54 versus ages 60-64 from outpatient services.

Table 7 shows the race and insurance payer characteristics for women with IDD and without based upon the IHD, OSD data. The table shows there were 27 discharges linked to Black, African American women, and 274 discharges linked to White women from the IHD for women with disabilities. Comparing this to the OSD data, 7 discharges were linked to Black, African American women while 265 were linked to White women. The numbers were higher for women without disabilities. The highest source of funding from the IHD data for women with disabilities was Medicare (116) followed by Medicaid (104) with a similar pattern for those without disabilities (695 and 603 respectively). This pattern was the same for the OSD; in total, public insurance was utilized more, despite commercial insurance being high for women with disabilities (127) as well as for women without disabilities (12,970). The mean age group was ages 40-44 years old for the IHD and 50-54 years old for the OSD. The mean hospital stay was 5 days. The average total cost for the IHD for all women was at $ 46,841.88 while that of the OSD was six times less at $ 7,678.23.

Table 8 compares the IHD and OSD data for women with disabilities and without based upon cancer diagnoses. More women with disabilities received outpatient breast cancer treatment (181) than inpatient treatment (58). The data also shows more women with disabilities received inpatient services than outpatient services (130 versus 53) for cancer of the cervix. CC was the highest type of inpatient reproductive cancer among women with disabilities (130), followed by cancer of the uterus (68), and ovarian cancer (13), which had the least number of discharges. Among outpatient discharges, women with disabilities received more services for cancer of the breast (181), followed by cancer of the cervix (53). Cancer of the ovary had the least number of discharges (3).

Table 7

IHD and OSD Race and Insurance Payer Data for Women with and Without Disabilities

	IHD		OSD	
	Women with Disability (N= 304)	Women Without Disability (n=1,837)	Women with Disability (n=280)	Women Without Disability (n=30,936)
Race				
American Indian	1	2	0	11
Asian	1	6	5	293
Black or African American	27	148	7	2,253
White	274	1,672	265	28,071
Hispanic	0	36	2	527
Insurance Payer				
Medicare	116 (38)	695(37)	86 (31)	9,136 (30)
Medicaid	104 (34)	603(33)	59 (21)	8,053(26)
Commercial	76 (25)	478 (26)	127 (45)	12,970(42)
Self-pay/Charity	6	38	3	4,09
Other	2	23	5	375

Table 8

Inpatient Hospital Discharges (IHD), Outpatient Hospital Discharges (OSD) for Women with and Without Disabilities by Type of Cancer

	IHD		OSD	
Type of Cancer	Women with Disability (*n* = 304) (%)	Women Without Disability (*n* = 1,837) (%)	Women with Disability (*n* = 280) (%)	Women Without Disability (*n* = 30,936) (%)
Uterus	68 (22)	422 (23)	26 (9)	3,243 (10)
Breast	58 (19)	321 (17)	181 (65)	17,067 (55)
Cervix	130 (43)	817 (44)	53 (19)	8,064 (26)
Ovary	13 (5)	55 (3)	3 (1)	374 (1)
Other female genitals	34 (11)	219 (12)	17 (6)	2,146 (7)

Just as women with disabilities had higher IHD rates for CC (43%) and cancer of the uterus (22%), women without disabilities also had the highest number of inpatient discharges for CC (44%) followed by cancer of the uterus (23%). OSD data shows that women without disabilities had highest discharges for breast cancer (17,067) followed by CC discharges (8,064) and the least number of discharges were for cancer of the ovary (374). Women with disabilities had similar high rates of breast cancer (65%) followed by CC (19%).

Inferential Statistics

Research Question One

RQ1: Is there a statistically significant relationship between inpatient hospital discharge status of woman, payer type, age, county of residence, and diagnosis of reproductive cancer?

> $H_0$1: There is no statistically significant relationship between inpatient hospital discharge status of woman, payer type, age, county of residence, and diagnosis of reproductive cancer.
>
> H_a2: There is a statistically significant relationship between inpatient hospital discharge status of woman, payer type, age, county of residence, and diagnosis of reproductive cancer.

Results of Research Question One

MLR was used to test the hypothesis on the relationship between the discharge status of woman, age, county of residence (categorized into health factor continuous scale), insurance payer, and the diagnosis of reproductive cancer. The number of women with disabilities identified in the data was 304, just short of the 400 predicted in Chapter 3. The hypothesis was tested with four independent variables to maintain the effect size as calculated in Chapter 3 for power of analysis. The independent variables used were i) discharge status of woman, ii) county of residence (categorized into a health factor ranking), iii) age group and iv) insurance Payer. This model was found to be statistically significant in identifying the relationship between the discharge status of woman, payer type, age, county of residence and the reproductive cancers as noted in Table 9.

Table 9

Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	4,607.849	--	--	--
Final	4,255.636	352.213	112	.000

The Nagelkerke results indicated that 16.2 % of the variance in the diagnosis of reproductive cancer was accounted for by the combination of the independent variables. From Table 9, the variables added improved the model in a statistically significant manner as compared to the intercept alone, and as noted, the chi-Square was 352.2. The *p*-value was at .000, therefore, the null hypothesis was rejected. There is a statistically significant relationship between payer type, county of residence (categorized into a health factor scale), and diagnosis of reproductive cancer.

The likelihood ratio tests in Table 10 shows the independent variables most significantly related to a diagnosis of reproductive cancer. The discharge status of a woman (with or without disability) and the age group were not significant observations ($p = .443$ and $p = .996$ respectively). The county to which a woman was discharged to (categorized in health factors scale) was found to be statistically significant ($p = .014$) as well as the insurance payer (MSSOP) at $p = .000$. It is more likely that a woman with reproductive cancer was from a specific county and used a certain insurance payer.

Table 10

Likelihood Ratio Tests for Inpatient Hospital Discharges

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	Df	Sig.
Intercept	4,255.636[a]	.000	0	--.
FIbhealthfactor	4,273.206	17.570	7	.014
Dischargestatus	4,262.503	6.867	7	.443
AGE_GROUP	4,298.479	42.843	70	.996
MSSOP	4,543.251	287.615	28	.000

Note. The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

In looking at the parameter estimates output for this model (see appendix D), the odds of being diagnosed with a reproductive cancer as determined by the county in which a woman lived was 1.081 as likely for cancer of the uterus, 1.081 for breast cancer, 1.084 for cervical cancer, 1.079 for cancer of the ovary, and 1.089 for other female genitals. The odds of being diagnosed with a reproductive cancer for women without disabilities was higher across the board (1.26 for cancer of the uterus, 1.1 for cancer of the breast, 1.3 for CC, and 1.3 for other female genitals), but much higher for cancer of the ovary (8.8). It was apparent that women on Medicare received more treatment for cancer of the ovary, while women on Medicaid were 9.6 times as likely to be diagnosed with CC and 6.9 times as likely to be diagnosed with cancer of other female genitals. As to whether a woman’s status (with or without disability) confounded the relationship of reproductive cancer, this was found not to be statistically significant.

Research Question Two

RQ2: Is there a statistically significant relationship between outpatient hospital discharge status of woman, age, county of residence (ranked into a health factor scale), and diagnosis of reproductive cancer?

H$_0$2: There is no statistically significant relationship between outpatient discharge status of woman, age, county of residence (ranked into a health factor scale), and diagnosis of reproductive cancer.

*H*a2: There is a statistically significant relationship between outpatient hospital discharge of woman, age, county of residence (ranked into a health factor scale), and diagnosis of reproductive cancer.

The hypothesis was tested using MLR to determine the significance of the relationships between a woman's discharge status (with or without disability), age, county of residence, and diagnosis of reproductive cancer of woman. The independent variables were reduced from 5 independent variables to 3 because only 280 women with disabilities were identified in the OSD as opposed to the 350 planned for in Chapter 3 for effect size. Since this study used the SDOH framework, keeping the county of residence (categorized into a health factor scale), discharge status, and age was more fitting. The *p* values less than .05 for any of the independent variables, i.e., discharge status of woman (distinguishing between woman with or without disability), age (categorized in age group), and county of residence (ranked into a health factor scale) would point to a significant association with diagnosis of reproductive cancer. In using this model to analyze data, approximately 10% of the variance in the diagnosis of a reproductive cancer was accounted for by the combination of the independent variables. The model was found to be statistically significant in predicting the dependent variable better than using the intercept-only model. The Chi-Square was large and the *p* value of less than .05 (at *p* =.000), indicated the results were significant in the Model Fitting Information Output.

Results of Research Question Two

Table 11 indicates the Likelihood Ratio Tests Output and shows the changes of each of the independent variables added. The discharge status of woman (i.e. whether woman had or did not have a disability) was not found to be a significant contributor to the relationship of a reproductive cancer (*p* = .573). The specific individual variables that demonstrated significant associations with reproductive cancer discharges for the OSD were the county of residence (categorized into a health factor scale) where the women were discharged to (*p* = .000) and age group (*p* = .000), therefore, the null hypothesis was rejected. There is a statistically significant relationship between age, county of residence (ranked into a continuous health factor scale), and diagnosis of reproductive cancer.

The parameter estimates reveal a woman's discharge status to be significant in the relationship with reproductive cancers, specifically women without disability, statistically significantly relating to cancers of the uterus, breast, cervical and ovary all at *p* = .000 (see appendix E). In comparing reproductive cancer rates for women with or without a disability, it is more likely a diagnosis belongs to a woman without disabilities. It is more likely that the discharge from cancer of the uterus, breast, cervix, and ovary was from a woman without a disability. Women aged 40-44 were 3.6 times as likely to be discharged from cancer of the uterus; 9.5 times as likely to have cancer of the breast; 2.9 times as likely to have CC; 5.1 times as likely to have cancer of the ovary; and, 1.01 times as likely for cancer of other female genitals. CC diagnosis rates were highest at ages 45-49 than any of the other reproductive cancers.

Table 11

Likelihood Ratio Tests for Outpatient Service Discharges

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	22,633.530[a]	.000	0	--.
HealthFactors	23,218.085[b]	584.555	15	.000
Dischstatusofwoman	22,646.911	13.381	15	.573
Age_group	25,191.174	2,557.644	150	.000

Note. The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

b. Unexpected singularities in the Hessian matrix are encountered. This indicates that either some predictor variables should be excluded, or some categories should be merged.

Summary

In this chapter, data download and challenges encountered were discussed, as well as the adjustments made to ensure validity of the sample data. The descriptive and inferential statistics were calculated to answer the study’s two research questions. MLR was then used to test the hypothesis.

For the first research question using IHD, the county of residence (ranked into health factor scale) as well as the insurance payer were found to be statistically significant in relation to reproductive cancer. Consequently, for research question two, it was found that it was more likely that the discharge from cancer of the uterus, breast, cervix, and ovary was from a woman without a disability. The county of residence (ranked in the health factor scale) as well as the age of the woman were found to significantly relate to reproductive cancers. The interpretations of these results, the limitations of the study, recommendations for future research, as well as the implications for public health professionals will be discussed in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

This study explored the relationship between CC and women with disability as evidenced by reproductive cancer discharges from inpatient and outpatient treatment while comparing population-specific differences from a social determinants of health framework. The nature of this study was observational, quantitative research based on women with and without disabilities discharged from reproductive cancer treatment, including CC. The unit of analysis was the discharge status of the woman (whether they had or did not have a disability). The study was also a cross-sectional type as it provided a snapshot of the relationship between CC and women with a disability in KY.

The four independent variables for IHD included the discharge status of woman (i.e., woman with or without a disability), insurance payer type, age, and county of resident's health factor ranking. For OSD, the three independent variables were: discharge status of woman, age, and county of residence (ranked as health factor scale). The dependent variable for both the IHD and OSD data sets was the diagnosis of a reproductive cancer (cancer of the uterus, breast, cervix, ovary and other female genitals).

This study was necessitated by the fact that, despite the many healthcare interventions available nationwide, CC has persisted, and in KY, CC incidence rates, which stood at 8.8 per 1,000 people based on 2015 data, eclipsed the healthypeople.gov's goal of 7.3 cases per 1,000 (ACS, 2018). Also necessitating this study was the fact that women with disabilities face more barriers to secondary prevention and health care access, have more known risk factors, and have greater health disparities than women without disabilities and, by extension, are exposed to higher rates of disease and higher death risks than their peers. As such, this study’s significance lies in filling the gap of examining the relative prevalence of CC among women with disabilities from both inpatient and outpatient hospitals and health services discharge data with the noted shift to the current outpatient cancer treatment. In examining population-specific relationships between CC and women with disabilities linked to hospital inpatient and outpatient data, this study’s findings may potentially offer targeted interventions for this population.

Interpretation of the Findings

Inpatient Hospital Discharges

The findings revealed that several factors were associated to a reproductive cancer (i.e., cancers of the uterus, breast, cervix, ovary, and other female genitals) for both women with and without disabilities. Past studies showed no association between reproductive cancers and OSD data, mainly because there had not been a study using OSD to examine the relationship of reproductive cancer with women with disabilities. From this study’s literature review, neither has there been such a study conducted that used both IHD and OSD data, although a study conducted in Australia found cancer patients had higher admission rates overall, especially among women (see Sullivan & Hussain, 2008). The findings indicated that more women with disabilities were identified in the IHD data than the OSD data, which can be attributed to the fact that more patient variables were captured in the IHD data, affording me the ability to identify more women with disabilities using variables not present in the OSD data. An earlier study that the results of my study could not confirm or disconfirm compared women with and without disabilities and found those with mental disorders and neurological conditions to have lower rates of breast conserving surgeries and radiation (Lezzoni et al., 2008).

IHD data findings demonstrate that women without disabilities had the first and second highest reproductive cancer discharge rates at ages 50-54 and 55-59 respectively. For the same data set, the highest discharge rates for women with disabilities were among the 55-59 and 45-49 age groups, which partially confirmed Parish et al.'s (2018) findings with the difference being that the highest discharge rates among women with disability in this study was at the same age group that came in second in frequency for women without disabilities (i.e., 55-59 years).

Findings from the IHD data indicated that 38% of women with disabilities used Medicare while 34% used Medicaid, confirming Parish et al.'s (2018) findings that a majority of women with disabilities were on public insurance. It is noteworthy, however, that both groups of women used public and private insurance at similar rates. In addition, the mean length of stay for women with a reproductive cancer with or without a disability was 5 days, although a review of the average found that women with disabilities stayed longer in a hospital than their counterparts. According to Parish et al., women with disabilities were from zip codes with lower median incomes. Findings from this current study indicated that the top five counties to which women were discharged, except for women with disabilities, came from the region of KY with the highest median income (the Urban Triangle). This study also found the second highest number of discharges came from the state's third highest median income area (South Central KY) while women without disabilities had the fifth highest rates of discharge from Eastern KY, the region of KY with the fourth lowest median incomes.

CC has persisted in KY, and it was the highest type of reproductive cancer, according to the IHD data, comprising 43% (130) of all reproductive cancers among women with disabilities and 44% (817) of such cancers among women without disabilities. CC was the highest reproductive cancer type overall (44.2%, 947 women) in KY followed by cancer of the uterus (22.9%, 490 women). Of interest, the odds of being diagnosed with CC for women without disabilities was 1.3 times greater than for women with disabilities while the odds of being diagnosed with cancer of the ovary for women without disabilities was 8.8 times higher than that of women with disabilities. The addition of age-group and discharge status (with or without disability) independent variables to the model was not significant for the IHD data. However, the independent variables found to be of most significance were the county in which the woman lived (p = .014) and insurance payer type (.000).

Contrary to previous research, this study’s findings from the IHD data indicated that hospitalization for CC was more prevalent than for other types of reproductive cancers in KY among women both with and without a disability. Cancer of the uterus was more frequent than breast cancer. In KY, contrary to previous research, public insurance was utilized at the same rate by women with and without disabilities at a higher rate than commercial insurances. The study confirmed women with disabilities are likely diagnosed at a later stage in life and have longer hospital stays. In KY, where a woman lived, and her insurance were associated more with a reproductive cancer.

Outpatient Services Discharges

Regarding the OSD data and from this study's literature review, this study extends those studies that have come before. The highest number of women with disabilities receiving outpatient services were between the ages 50-54, while the highest number of women without disabilities receiving outpatient services were between 60-64. This was a distinct difference from the results of the IHD data. Women without disabilities were more likely than women with a disability to have commercial insurance. In addition, woman with disabilities and a reproductive cancer were most likely discharged from outpatient services from a Health Factor Group 2 counties (Davies, Fayette, Hancock, Boyle, or Spencer counties), which is in the Urban Triangle, as were women with uterine cancer and without a disability. There were no other differences among the highest frequencies of reproductive cancers. Furthermore, breast cancer had the highest number of outpatient services (17,248 discharges) among all women in this study, representing 55.3% of all reproductive-cancer related outpatient services.

Many more women received outpatient services than inpatient services with most of those services occurring among women without disabilities. MLR was found to be a fitting model for analysis and the county of residence also referred to as the county the woman was discharged to and age group were the most significant independent variables. Furthermore, women aged 45-49 were 3.8 times more likely to be diagnosed with CC and women aged 40-44 were 9.5 times more likely to be diagnosed with breast cancer, which was also the leading type of cancer, according to the OSD data.

Conceptual Framework

This study was based on the SDOH. According to the WHO, a comprehensive framework can:

i) Identify the social determinants of health and the social determinants of inequities in health;
ii) Show how major determinants relate to each other;
iii) Clarify the mechanisms by which social determinants generate health inequities;
iv) Provide a framework for evaluating which SDOH are the most important to address; and,
v) Map specific levels of intervention and policy entry point for action on SDOH (Solar, 2010, p. 20).

Although the elements of this framework cannot all be included in a single study, some key areas to consider include the willingness of those in power to guide action that distributes power benefits to the less advantaged and recognition of the fact that there are underlying mechanisms that stratify population outcomes, including education, occupation, race/ethnicity, social class, and gender. These underlying mechanisms that stratify outcomes are the root causes of health inequities. The SDOH framework is easily summarized by CDC (2020h) as a consideration of how conditions in the places where people live, learn, work, and play affect a wide range of health risks and outcomes. Furthermore, as stated in Chapter 2, people are born, grow, live, work, and age in conditions that are shaped by power, distribution of money, and resources at a global, national, and local level, causing differences in health at each level (see WHO, 2019b).

PWD experience far more challenges than their counterparts in finding a job, being easily included in the educational mainstream, receiving secondary prevention services, visiting fitness facilities, obtaining sufficient social-emotional support, and using health information technology (Healthypeople.gov, 2020). The SDOH framework, therefore, was used to help identify what mechanisms stratify outcomes for women with disabilities in relation to CC and reproductive cancers in the constraints of the variables used for this study. SDOH was used to identify any population-level differences in women with and without disabilities in the presence of the five reproductive cancers. This study considered women with disabilities as a subgroup in the population demographic, and the study used the SDOH framework to explore deeper into the differences among women with disabilities using a multi-variate analysis to identify the complexities present.

The SDOH framework emphasizes that those in power have to be willing to guide actions that change the determinants of health. Women with disabilities were invisible in data, for both the IHD and OSD databases, and it took considerable time to identify these women using inputs and characteristics from the Major Diagnostic Category (MDC) and Medicare Severity Diagnosis Related Groups (MS-DRG) data sets. Using the SDOH framework, one can interpret women with disabilities’ invisibility in data as a health disparity. This is an indication that those in power may not have been willing or been aware of the need to guide action that includes PWD in surveillance systems for better health data that can inform program and policy development where issues of health disparities are critical. Women with disabilities may also not have been empowered, either through critical reflection or relationships, to ensure shared action in better, more complete disability health data. Many more women in the OSD database had one of the reproductive cancers, yet women with disabilities were less (280) than those identified in the IHD data (304). It is also possible that oncology treatment may not be occurring at the same rate among women with disabilities in outpatient health centers, affirming findings from Lezzoni et al. regarding lower rates of breast conserving surgery and radiology therapy (2008).

According to the SDOH framework, the difference in ages is a form of social stratification in that women with disabilities were diagnosed at later ages (55-59) than women without disabilities (50-54 years old) in the IHD data. Again, for the OSD data, women with disabilities were younger (50-55) than women without a disability (60-64). This disparity of health exposes women with disabilities to greater cancer-damaging conditions, especially if the diagnosis is made at a later stage of disease, differentiating the health outcomes between the two groups of women with respect to vulnerability in resources and survival. When cancer is diagnosed at a later stage, chances of recovery and survival may be less. Women with disabilities also had hospital stays longer than the mean 5 days, indicating disparities in after-hospital discharge patient status or severity of disease consequences. Given that KY has a median income lower than most states, which leads more women to utilize public funding, women with disabilities in this study qualified for both Medicare and Medicare insurance.

Ovarian cancer rates among women with disabilities was less than that of women without disabilities. According to SDOH, this disparity may be caused by the fact that at age 50, fewer women with disabilities are recommended for an ovarian test. Another disparity was found for CC among both types of women. According to the SDOH, where the women lived was an underlying cause of the disparities. In addition, the SDOH framework revealed that the determinants for OSD records were age, insurance type, county, and cancer type.

Limitations of the Study

Although this study revealed some valuable results, there are some limitations worth noting. First, this study was based on secondary data from KCHFS, which was not designed primarily for research and was, therefore, limited in examining CC and other reproductive cancer due to how cases were captured in IHD and OSD records. For this reason, the same data was downloaded from CCTS as noted earlier. According to KCHFS, errors in IHD and OSD input materials are sent back to hospitals and outpatient facilities for correction. However, data that could have been lost in translation, absent or miscoded was not verifiable, nor were errors of incomplete information, recall bias, and noninclusivity of the target population all too common limitations of secondary data. The second and greatest challenge, however, was that women with disabilities were invisible in the data. Although the ICD-10-CM codes were implemented in 2015, none of the IDD-relevant codes were used to differentiate women with IDD from other disabilities, perhaps because health centers may or may not have entered the ICD-10-CM codes when treating a woman with IDD for a chronic, nondisability condition. It was also not possible to identify if women with disabilities lived independently, with family or in group homes to allow for differences between where they resided in addition to their county of residence.

Third, I spent considerable time cleaning the data as well as identifying women with disabilities using other characteristics, such as patient status description (where they were discharged to). Use of the MDC and the MS-DRG data sets was appropriate and helped in identifying women with disabilities, yet this process took time. Furthermore, women with disabilities not identified in the MDC and MS-DRG data sets were not considered because the method used to identify women with disabilities may or may not have captured everyone. Outpatient data was even more limited in the MDC and MS-DRG data sets, as was patient status, more so because discharge information was limited in the characteristics included.

The IHD and OSD data was based on the discharge being the unit of analysis as opposed to a single woman with a unique identifier. The possibility that a single woman was discharged several times over the 4 years of this study was very likely. According to Parish et al., (2018) women with disabilities have been documented as having more repeat hospitalizations and perhaps more outpatient services than their women peers, which presented as the fourth limitation for this study.

The age limitation for this study was age 21-74 years old and women diagnosed with a reproductive cancer earlier or later than this age restriction were not considered. Furthermore, women who may have been deceased before discharge were also not included. Any or all these limitations could have influenced reproductive cancer case outcomes as well as the discharge status of the women, posing a misrepresentation of the state of KY. While this study acknowledges these limitations, the findings do offer utility in identifying differences that may allow for target interventions toward health equity for all women in KY. This study used population-based data, which provided much strength in the validity of results. Furthermore, the data was high quality and representative of what has occurred in KY between the years of 2015 to 2018. The data used was not restricted by sampling bias or selection bias, nor was it restricted to one county in KY, or from one hospital. To the best of the author's knowledge, the data was trustworthy as were the gaps identified.

Recommendations

Future recommendations include research that uses individual women, and not the discharge, as the unit of analysis, as was the case in this study. A woman could have been discharged several times in a quarter or year. It is possible that using the woman as the unit of analysis would inform strategies specific to women in KY. For example, the data analysis did not allow for investigation into the appropriateness of outpatient or hospital services, or what the differences in the treatment services were for women with disabilities as compared to women without disabilities. Furthermore, CC was the highest type of cancer in the IHD data set, but it was not possible to investigate what, if any, risk factors were present, nor could the high cases of CC be linked to data that could correlate minimal screening services or to the challenging, complex barriers for CC screening among women in KY. Furthermore, longitudinal studies are recommended so as to provide health outcomes over the long-term and may offer information that helps to understand how cultural or social influences, such as information shared among family and neighbors, for instance, may affect secondary prevention choices.

Future research could use the IHD and OSD data sets and continue the work of this study by investigating other reproductive cancer types as well as look at trends from 2015 to the current year. This may offer further comparisons of the target population. A further study could use an external validation of the reproductive cancer rates to arrive to results closer to the woman as the unit of discharge as much as possible. Such an external validation could use the KY cancer registry while ensuring the privacy of subjects through use of a unique identifier. Another means of validation could be tapping into the databases of private providers of home and community-based services for women with IDD as recorded by the state, which record any major occurrences in the lives of women with disabilities for more accurate, individual information while ensuring the privacy of women subjects is protected.

Implications

This study revealed that, for the IHD data, the county or geographic location of residence and the insurance payer were associated with reproductive cancer diagnoses. Women utilizing public funding were more likely to be diagnosed with a reproductive cancer, and women utilizing Medicaid were 9.6 times as likely to be diagnosed with CC. For the OSD data, the geographic county of residence and age-group was associated with diagnosis of a reproductive cancer. Furthermore, women aged 45-49 were 3.8 times as likely to be diagnosed with CC.

This study reinforces the need for professionals in health care, as well as public health leaders, to pay attention to determinants that affect the health factors of each county in KY in a way that influences change. Furthermore, with increased technology and interconnectivity between counties, there is the potential to improve environmental designs and public infrastructure by increasing partnership capacity so as to address access to secondary screenings toward meaningful health impact among women in KY.

Positive Social Change

Advocacy for increased quality services is needed as part of positive social change. This advocacy is needed not just for health prevention, but to ensure that services foster an integrated approach such that, at a community level, women with disabilities are connected to services that lead to increased adherence to screenings per USPSTF recommendations. According to the SDOH framework, those in power pay attention to what they know, and the attention of those in power is informed by what is advocated to them. Increasing the participation of women with disabilities in all areas of research would no doubt draw more attention to specificity in the process and in the identification of more efficacious, healthful strategies for this population. This participation may include social change with a strong advocacy voice to influence policy makers so as to influence environmental and physical barriers that allow for accessible CC and breast screening, as well as increase access to healthcare, issues that can then be well articulated, and identified in public health agendas and activities in all communities in KY.

In regard to an upstream positive social change, from a perspective of a graduate education in public health, it is extremely important to include disability content that is both comprehensive and exclusive. Most Master of Public Health graduates go on to careers in government, or private organizations dealing with the general public, and it would be of utmost importance to ensure they are ready and well-equipped to identify gaps in the population for targeted service implementation as well as policies that support health equity for all. A recent study indicated that only 10 out of 128 Schools and Programs of Public Health affiliated with the Association of Schools and Programs of Public Health offered courses in disability in graduate public health curricula (Akakpo, Lobianco, & Lollar, 2020). Of the 10 institutions, only 3 offered content that was exclusive and comprehensive in disability content within graduate curricula in Public health. From that study:

> Training professionals in how to identify the magnitude and severity of problems in the population and then appropriately intervening is the cornerstone of academic education in public health. Disability as a construct and PWD [persons with disabilities] as a population facing health inequalities has not yet emerged as an integral part of public health education and training. (pg. 1510)

Advocacy is needed from PWD, their family members, students, academia partners, as well as other appropriate stakeholders to include disability content in the MPH curricula. A well-prepared disability in public health workforce that is competent in population wide challenges that include targeted interventions for people with disabilities as a demographic would be a great social change.

In addition to upstream education, training the workforce already serving in the field is equally important. Social change could be achieved through training that offers continuing education credits or units in a way that influences change in the design and implementation of service pathways and in the inclusion of PWD in all aspects of community living that increases community inclusion. Doing so may build capacity to serve women with disabilities while supporting them and their families or caregivers in maneuvering all the reproductive cancer issues raised within this current study. Training in the form of technical assistance could also help in reducing disparities of health as described below.

An example of a positive social change can be showcased in the work done by the Ohio Disability and Health Program (ODHP) and the Ohio Department of Health's Creating Healthy Communities (CHC) program. The CHC awarded disability-focused technical assistance to 23 community-based awardees in Ohio. This technical assistance included phone calls, in-person presentations, email assistance as well as virtual conferencing. To examine the impact of these efforts on disability inclusion, CHC found that its technical assistance led to a prioritizing of persons with disabilities in capacity building, including healthy eating, active living, and community wellness activities. (Ellsworth, Smith, Havercamp, Shetterly & Robinson, 2020). This example can be duplicated in locally relevant ways in KY to increase positive social change.

There is an identifiable need to establish a surveillance system to monitor the health of PWD that can also stratify according to disability type, including IDD. Hospitals and outpatient services in KY could choose to include ICD-10-CM codes that identify the characteristics of women with disabilities in their data collection of each patient. Positive social change can be achieved by identifying surveillance systems already in use in KY and determining how best to include disability-focused assistance to all the parties involved to increase prioritizing of PWD and the use of the ICD-10CM codes. As part of their quality outcomes efforts, hospital systems and outpatient services can incorporate disability-focused technical assistance to the workforce responsible for data entry, and other appropriate personnel, with the goal of capturing PWD in data. Leveraging hospitals and other data capturing partners to create visibility in data is a positive social change that is feasible.

Perhaps health care providers committing to the CDC guideline of using six questions to identify people with disabilities would be part of an effort as detailed above to move the needle of ICD-10-CM code use that would lead to more visible persons with disability in the data (CDC, 2020d). These six questions, as noted by CDC, address areas of: hearing; vision; cognition; mobility; daily activities, such as bathing and dressing; and, independent living, such as visiting a doctor or running errands in the community. Adding these ICD-10-CM in addition to the CDC recommended questions to hospital and health center inpatient records would help to identify and drill deeper into the complexities of social determinants that lead to differences between women with and without disabilities in future reproductive cancer outcomes. Several studies agree to a need for change in creating a surveillance system that allows for improved services and supports and, by extension, health for this population, increased collaboration between government agencies to make PWD visible in data, as well as operational standards for definitions of disability (Krahn & Havercamp, 2019; Reichard et al., 2019; Wilkinson et al., 2014). Positive social change can come by inviting inpatient hospital and outpatient center representatives into a collaborative discussion on how to include 1CD-10-CD codes that identify women with IDD without requiring the hospitals to do much more that they are already doing.

When women attend medical appointments or screening services, it is likely that certain barriers present difficulties that prevent them from receiving quality services. Consistent care and frequency of primary care has not been shown to improve BCC screening rates for women with disabilities, revealing the need to explore system-level factors (Plourde et al., 2018). Some of these factors include health literacy/lack of information/knowledge of risk factors, personal reasons, environmental factors, cost, transportation, health care access, attitude and knowledge of healthcare providers and referral patterns, prior negative health care experiences, as well as psychosocial factors (Akinlotan et al., 2017; Magasi, et al., 2019a &b; Merten et al., 2015; Reis, et al., 2015; Todd & Stuifbergen, 2012; Yankaskas, et al., 2010). These studies advocate for social change that addresses the environmental and physical barriers that prevent quality services for this target population because the best way to reduce cancer rates is through prevention and early detection. That women with disabilities and reproductive cancers were hospitalized at an older age than women without disabilities points to gaps in continuous regular screening and prevention services at an earlier age for women with disabilities long before any problems occur. Building capacity for environmental designs that allow access to facilities—as well as access to the actual services—is an important social change toward health equity for cancer outcomes for women with disabilities. CC was the highest type of cancer from the IHD data noted in this study, and although this is a statewide concern, CC screening for women with disabilities would present many more physical barriers, and strategies to meet these and other challenges should be explored. This is an area that positive social change can be magnified by adopting a leveraging of partners conducting screening services and offering technical assistance towards prioritization of accessible screening services for women with disabilities, that include women with IDD.

I want to acknowledge the CC screening occurring in KY as noted from 2016 and 2018 BFRSS data in chapter 2 of this current study. There was a slight increase of CC screening for those ages 21-35, but a decrease for those aged 35-50 and 51-65 years old. Given the current study's results indicated the highest number of women with disabilities receiving inpatient hospitalization services were aged 55-59 years old and 50-54 years old for OSD, does call for reaching women for prevention and continuous regular screening at younger ages.

As noted from the 2018 BRFSS data, 75.5 % is the prevalence for CC screening rate for women with disabilities, lagging the 85.8% CC screening prevalence for women without disabilities. In addition, women with mobility and vision disabilities had decreased CC screening lagging other types of disabilities. This is an area that would benefit from positive social change, by focusing strategies and resources in KY, to make CC screening accessible for those with mobility and vision disabilities and perhaps reducing the disease. This calls for environments and infrastructure change that is inclusive in the health services provider community.

The CDC, through a collaboration of local agencies, partnerships, and cooperatives, offers low-cost or free breast and CC screenings for eligible women (CDC, 2020g). In KY, this work is carried out by the Kentucky Women's Cancer Screening Program (KWCSP) (KCHFS, 2017b). KWCSP has, at the mention of this study, partnered with the Kentucky Inclusive Health Collaborative at the Human Development Institute at the University of Kentucky to identify the barriers from a lived experience that women with disabilities face during access to BCC screening (Wellness4ky.gov, 2020). This partnership worked on an assessment to identify the barriers in KY for targeted strategies that would hopefully removing barriers, hence increasing BCC screening in KY. This work has already started and is such a great positive change and a direct impact influenced by this current study. Given that a majority of the women in this study were found to be utilizing public funding, it is possible that many more women in KY can benefit from increased BCC screening through the KWCSP services. The KWCSP partners with healthcare providers across the state, and collaboration with these providers to ensure barriers are removed for all women in a way that both women with or without disabilities receive USPSTF-recommended screenings may greatly reduce the regional and age disparities noted in this study.

Conclusion

This research was an observational, quantitative, and cross-sectional study whose target population was women with and without disabilities diagnosed with a reproductive cancer in the state of KY between the years of 2015 to 2018. IHD and OSD data from the KCHFS was analyzed using the descriptive information provided in the data sets. The two data sets affirmed that geographic location of residence was associated with a discharge from treatment with a diagnosis of a reproductive cancer. Surprisingly, there was a distribution of reproductive cancers to the higher median income regions/counties. The IHD data found the insurance payer type significant while OSD data found age and county of residence to be a significant contributor to discharge for concerns related to a reproductive cancer. Public health insurance was more likely the most frequently utilized type of insurance, and women with disabilities had longer hospital stays. CC was found to be the leading type of reproductive cancer in both data sets. More research that explores the differences in CC diagnoses between women with and without disabilities is needed as is research that examines the accessibility of BCC screening services in KY for women with disabilities.

I was able to confirm several earlier studies as well as add to the SDOH framework that health factors contribute to CC as well as other reproductive cancers. The highest rates of cancer were associated with higher income regions, calling into question secondary prevention measures within these regions and whether services in KY are concentrated more so in rural versus urban areas. The study also noted the significant association with public insurance and with nearly $48,000 a minute reimbursed to providers in rural counties (Anthes, 2018), the integrity of public insurance is at stake, and value-based reforms to increase the share of women in KY who access BCC screening based on USPSTF’s most current guidelines is a responsibility that cannot be taken lightly. The idea that women with disabilities were older in the IHD data and younger in the OSD data reveals complexities of whether women with disabilities were receiving care of screening, diagnosis, and treatment when they needed it. It is most encouraging to note that positive social change, a direct impact of this current study, is already occurring. The next best step would be to advocate for accessible BCC screening through inclusive environmental designs for all types of disabilities to close the gap between the differences noted for women with and without disabilities to ensure health equity for all women in KY.

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Appendix A: Patient Status

The patient status variable is information available from the Kentucky Cabinet for Health and Family Services (KCHFS) inpatient database identifies more than 40 discharge or transfer scenarios following a course of inpatient or outpatient reproductive cancer care. These variables will help to identify women with an IDD not otherwise noted in the diagnosis and provide yet another way in which to validate the data. The KCHFS discharge or transfer variables are as follows:

- Unknown Status
- Routine discharge (home/self-care)
- Inpatient-other short-term hospital
- Skilled nursing facility (SNF)
- Intermediate care facility (ICF)
- Designated Cancer Center or Children's Hospital
- Home health
- Left/discontinued care AMA
- Admitted as inpatient to this hospital (Medicare only)
- Expired/Did not recover
- Discharged/transferred to court/law enforcement
- Still Patient
- Expired at home (Medicare, CHAMPUS claims only)
- Expired in a medical facility (Medicare, CHAMPUS claims only for hospice care)
- Expired-place unknown (Medicare, CHAMPUS claims only for hospice care)

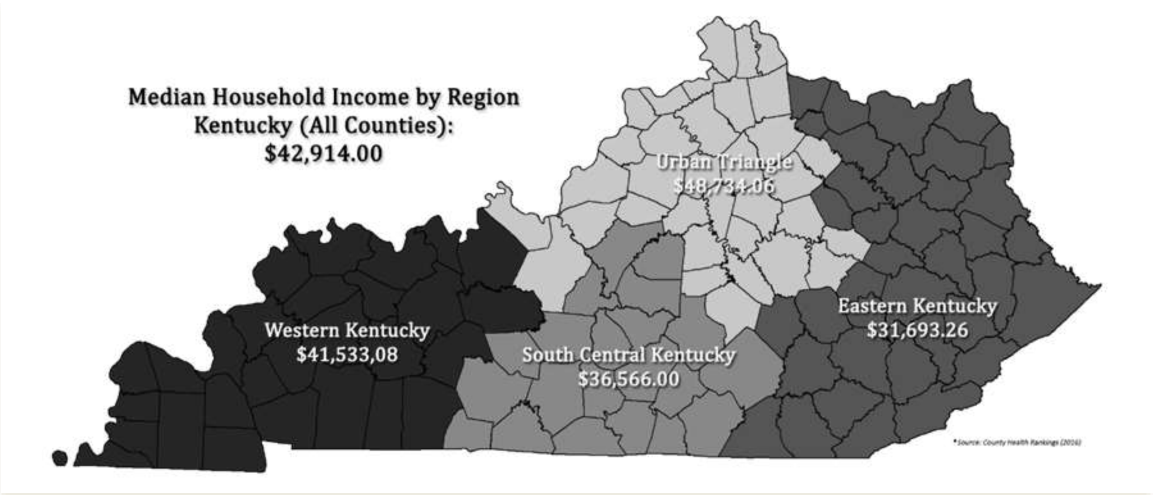
- Discharged/transferred to a federal hospital
- Hospice-home
- Hospice-medical facility
- Transfer w/in institution to Medicare swing bed
- Discharged/transferred to rehab facility or hospital unit
- Discharged/transferred to long-term care hospital
- Discharged/transferred to nursing facility certified under Medicaid -not Medicare
- Discharged/transferred to psychiatric hospital or psychiatric distinct part unit of a hospital
- Discharged/transferred to critical access hospital (CAH)
- Discharged/transferred to a designated disaster alternate care
- Discharged/transferred to another type of healthcare institution not otherwise defined
- Discharged/transferred to another institution for outpatient services as specified in the plan of care
- Discharged/transferred to another institution for outpatient services as specified in the plan of care
- Discharged to Home or Self Care with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a Short-Term General Hospital for Inpatient Care with a Planned Acute Care Hospital Inpatient Readmission

- Discharged/Transferred to a SNF with Medicare Certification with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a that provides Custodial or Supportive Care with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a Designated Cancer Center or Children's Hospital with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to Home Under Care of Organized Home Health Organization with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to Court/Law Enforcement with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a Federal Healthcare Facility with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a Hospital-based Medicare Approved Swing Bed with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to an IFR including Rehabilitation Distinct Part of a Hospital with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a Medicare Certified Long Term Care Hospital (LTCH) with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a Nursing Facility Certified by Medicaid but not Certified by Medicare with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to a Psychiatric Hospital or Psychiatric Distinct Part of a Hospital with a Planned Acute Care Hospital Inpatient Readmission

- Discharged/Transferred to a Critical Access Hospital (CAH) for Inpatient Care with a Planned Acute Care Hospital Inpatient Readmission
- Discharged/Transferred to another type of Health Care Institution not Defined in this Code List with a Planned Acute Care Hospital Inpatient Readmission

Appendix B

Regional Map of Kentucky Showing Median Household Incomes



*Source: County Health Rankings (2016)

Appendix C

Kentucky Counties by Federal Information Processing Standard Code and H**ealth Factor Rank**

County FIPS names

FIPS	Name	Health Factor Rank
21001	Adair	72
21003	Allen	68
21005	Anderson	12
21007	Ballard	70
21009	Barren	43
21011	Bath	102
21013	Bell	111
21015	Boone	2
21017	Bourbon	28
21019	Boyd	44
21021	Boyle	7
21023	Bracken	45
21025	Breathitt	117
21027	Breckinridge	52
21029	Bullitt	21
21031	Butler	73
21033	Caldwell	31
21035	Calloway	23
21037	Campbell	4
21039	Carlisle	40
21041	Carroll	78
21043	Carter	98
21045	Casey	100
21047	Christian	61
21049	Clark	15
21051	Clay	120
21053	Clinton	93
21055	Crittenden	88
21057	Cumberland	84
21059	Daviess	9
21061	Edmonson	63
21063	Elliott	108
21065	Estill	99
21067	Fayette	10
21069	Fleming	62
21071	Floyd	103
21073	Franklin	25
21075	Fulton	104
21077	Gallatin	67
21079	Garrard	48

21081	Grant	64
21083	Graves	74
21085	Grayson	92
21087	Green	49
21089	Greenup	37
21091	Hancock	8
21093	Hardin	22
21095	Harlan	110
21097	Harrison	34
21099	Hart	59
21101	Henderson	30
21103	Henry	27
21105	Hickman	56
21107	Hopkins	42
21109	Jackson	109
21111	Jefferson	47
21113	Jessamine	20
21115	Johnson	75
21117	Kenton	24
21119	Knott	106
21121	Knox	112
21123	Larue	33
21125	Laurel	79
21127	Lawrence	90
21129	Lee	115
21131	Leslie	113
21133	Letcher	101
21135	Lewis	107
21137	Lincoln	85
21139	Livingston	65
21141	Logan	58
21143	Lyon	16
21145	McCracken	29
21147	McCreary	116
21149	McLean	38
21151	Madison	13
21153	Magoffin	114
21155	Marion	55
21157	Marshall	18
21159	Martin	105
21161	Mason	54
21163	Meade	36
21165	Menifee	95
21167	Mercer	26
21169	Metcalfe	66
21171	Monroe	81
21173	Montgomery	41
21175	Morgan	96
21177	Muhlenberg	80
21179	Nelson	11
21181	Nicholas	83
21183	Ohio	76
21185	Oldham	1
21187	Owen	60
21189	Owsley	119
21191	Pendleton	46

21193	Perry	91
21195	Pike	89
21197	Powell	94
21199	Pulaski	77
21201	Robertson	53
21203	Rockcastle	69
21205	Rowan	51
21207	Russell	82
21209	Scott	5
21211	Shelby	14
21213	Simpson	35
21215	Spencer	6
21217	Taylor	39
21219	Todd	57
21221	Trigg	32
21223	Trimble	50
21225	Union	86
21227	Warren	17
21229	Washington	19
21231	Wayne	97
21233	Webster	87
21235	Whitley	71
21237	Wolfe	118
21239	Woodford	3

Note. The Federal Information Processing Standard (FIPS) code is a unique identifier given to all U.S. counties as assigned by the American National Standards Institute. The first two digits (i.e., 21) identify the state, Kentucky. The remaining three digits identify the county within Kentucky.

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Appendix D

Inpatient Hospital Discharges Output

Parameter Estimates

Diagnosis_ReprCancer[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Cancer of the Uterus	Intercept	41.094	2575.447	.000	1	.987			
	FIbhealthfactor	.078	.105	.551	1	.458	1.081	.880	1.329
	[Dischargestatus=0]	-11.281	1066.831	.000	1	.992	1.261E-5	.000	.[b]
	[Dischargestatus=1]	0[c]	.	.	0	.	.	.	.
	[AGE_GROUP=6]	.007	8417.542	.000	1	1.000	1.007	.000	.[b]
	[AGE_GROUP=7]	.143	5255.267	.000	1	1.000	1.154	.000	.[b]
	[AGE_GROUP=8]	.220	5464.627	.000	1	1.000	1.246	.000	.[b]
	[AGE_GROUP=9]	.599	4048.186	.000	1	1.000	1.821	.000	.[b]
	[AGE_GROUP=10]	-15.619	2191.841	.000	1	.994	1.647E-7	.000	.[b]
	[AGE_GROUP=11]	.020	3642.569	.000	1	1.000	1.021	.000	.[b]
	[AGE_GROUP=12]	.360	3621.899	.000	1	1.000	1.433	.000	.[b]
	[AGE_GROUP=13]	-.063	3600.416	.000	1	1.000	.939	.000	.[b]
	[AGE_GROUP=14]	.292	3803.491	.000	1	1.000	1.339	.000	.[b]
	[AGE_GROUP=15]	.187	.338	.306	1	.580	1.206	.621	2.340
	[AGE_GROUP=16]	0[c]	.	.	0	.	.	.	.
	[MSSOP=1]	.145	1078.209	.000	1	1.000	1.156	.000	.[b]

	[MSSOP=2]	-13.580	831.056	.000	1	.987	1.266E-6	.000	.[b]
	[MSSOP=3]	-.116	.584	.039	1	.843	.891	.284	2.797
	[MSSOP=4]	-.603	3607.679	.000	1	1.000	.547	.000	.[b]
	[MSSOP=5]	0[c]	.	.	0	.	.	.	.
Cancer of Breast	Intercept	40.534	2575.447	.000	1	.987			
	FIbhealthfactor	.078	.105	.547	1	.460	1.081	.880	1.328
	[Dischargestatus=0]	-11.402	1066.831	.000	1	.991	1.117E-5	.000	.[b]
	[Dischargestatus=1]	0[c]	.	.	0	.	.	.	.
	[AGE_GROUP=6]	.344	8417.542	.000	1	1.000	1.410	.000	.[b]
	[AGE_GROUP=7]	-.084	5255.267	.000	1	1.000	.919	.000	.[b]
	[AGE_GROUP=8]	.208	5464.627	.000	1	1.000	1.231	.000	.[b]
	[AGE_GROUP=9]	.272	4048.186	.000	1	1.000	1.312	.000	.[b]
	[AGE_GROUP=10]	-15.536	2191.841	.000	1	.994	1.789E-7	.000	.[b]
	[AGE_GROUP=11]	.086	3642.569	.000	1	1.000	1.090	.000	.[b]
	[AGE_GROUP=12]	.580	3621.899	.000	1	1.000	1.785	.000	.[b]
	[AGE_GROUP=13]	.156	3600.416	.000	1	1.000	1.168	.000	.[b]
	[AGE_GROUP=14]	.270	3803.491	.000	1	1.000	1.309	.000	.[b]
	[AGE_GROUP=15]	.218	.360	.368	1	.544	1.244	.614	2.520
	[AGE_GROUP=16]	0[c]	.	.	0	.	.	.	.
	[MSSOP=1]	.011	1078.209	.000	1	1.000	1.011	.000	.[b]

	[MSSOP=2]	-12.779	831.056	.000	1	.988	2.820E-6	.000	.[b]
	[MSSOP=3]	.711	.655	1.178	1	.278	2.036	.564	7.353
	[MSSOP=4]	.025	3607.679	.000	1	1.000	1.025	.000	.[b]
	[MSSOP=5]	0[c]	.	.	0	.	.	.	.
Cancer of Cervix	Intercept	40.497	2575.447	.000	1	.987			
	FIbhealthfactor	.080	.105	.582	1	.445	1.084	.882	1.332
	[Dischargestatus=0]	-11.246	1066.831	.000	1	.992	1.306E-5	.000	.[b]
	[Dischargestatus=1]	0[c]	.	.	0	.	.	.	.
	[AGE_GROUP=6]	.067	8417.542	.000	1	1.000	1.070	.000	.[b]
	[AGE_GROUP=7]	-.034	5255.267	.000	1	1.000	.967	.000	.[b]
	[AGE_GROUP=8]	.016	5464.627	.000	1	1.000	1.016	.000	.[b]
	[AGE_GROUP=9]	.351	4048.186	.000	1	1.000	1.421	.000	.[b]
	[AGE_GROUP=10]	-15.519	2191.841	.000	1	.994	1.820E-7	.000	.[b]
	[AGE_GROUP=11]	.063	3642.569	.000	1	1.000	1.065	.000	.[b]
	[AGE_GROUP=12]	.439	3621.899	.000	1	1.000	1.552	.000	.[b]
	[AGE_GROUP=13]	.106	3600.416	.000	1	1.000	1.112	.000	.[b]
	[AGE_GROUP=14]	.097	3803.491	.000	1	1.000	1.102	.000	.[b]
	[AGE_GROUP=15]	.302	.318	.899	1	.343	1.352	.725	2.523
	[AGE_GROUP=16]	0[c]	.	.	0	.	.	.	.
	[MSSOP=1]	.489	1078.209	.000	1	1.000	1.630	.000	.[b]

	[MSSOP=2]	-11.554	831.056	.000	1	.989	9.593E-6	.000	.[b]
	[MSSOP=3]	1.056	.625	2.852	1	.091	2.874	.844	9.785
	[MSSOP=4]	1.344	3607.679	.000	1	1.000	3.835	.000	.[b]
	[MSSOP=5]	0[c]	.	.	0	.	.	.	.
Cancer of Ovary	Intercept	24.950	3045.855	.000	1	.993			
	FIbhealthfactor	.076	.105	.527	1	.468	1.079	.878	1.327
	[Dischargestatus=0]	-11.641	1066.831	.000	1	.991	8.795E-6	.000	.[b]
	[Dischargestatus=1]	0[c]	.	.	0	.	.	.	.
	[AGE_GROUP=6]	-14.922	8612.820	.000	1	.999	3.308E-7	.000	.[b]
	[AGE_GROUP=7]	-1.736	5255.267	.000	1	1.000	.176	.000	.[b]
	[AGE_GROUP=8]	-.916	5464.627	.000	1	1.000	.400	.000	.[b]
	[AGE_GROUP=9]	-1.273	4048.186	.000	1	1.000	.280	.000	.[b]
	[AGE_GROUP=10]	-15.867	2191.841	.000	1	.994	1.285E-7	.000	.[b]
	[AGE_GROUP=11]	-.340	3642.569	.000	1	1.000	.711	.000	.[b]
	[AGE_GROUP=12]	.087	3621.899	.000	1	1.000	1.091	.000	.[b]
	[AGE_GROUP=13]	-.365	3600.416	.000	1	1.000	.694	.000	.[b]
	[AGE_GROUP=14]	-.458	3803.491	.000	1	1.000	.632	.000	.[b]
	[AGE_GROUP=15]	-.582	.573	1.031	1	.310	.559	.182	1.718

	[AGE_GROUP=16]	0[c]	.	.	0	.	.	.	.
	[MSSOP=1]	15.105	1951.113	.000	1	.994	3632634.090	.000	.[b]
	[MSSOP=2]	1.824	1826.188	.000	1	.999	6.196	.000	.[b]
	[MSSOP=3]	15.109	1626.133	.000	1	.993	3643938.360	.000	.[b]
	[MSSOP=4]	.498	4134.356	.000	1	1.000	1.646	.000	.[b]
	[MSSOP=5]	0[c]	.	.	0	.	.	.	.
Cancer of Other Female Genitals	Intercept	40.069	2575.447	.000	1	.988			
	FIbhealthfactor	.086	.105	.663	1	.416	1.089	.886	1.339
	[Dischargestatus=0]	-11.227	1066.831	.000	1	.992	1.331E-5	.000	.[b]
	[Dischargestatus=1]	0[c]	.	.	0	.	.	.	.
	[AGE_GROUP=6]	.198	8417.542	.000	1	1.000	1.219	.000	.[b]
	[AGE_GROUP=7]	-.102	5255.267	.000	1	1.000	.903	.000	.[b]
	[AGE_GROUP=8]	-.035	5464.627	.000	1	1.000	.966	.000	.[b]
	[AGE_GROUP=9]	.165	4048.186	.000	1	1.000	1.179	.000	.[b]
	[AGE_GROUP=10]	-15.798	2191.841	.000	1	.994	1.378E-7	.000	.[b]
	[AGE_GROUP=11]	.126	3642.569	.000	1	1.000	1.135	.000	.[b]
	[AGE_GROUP=12]	.296	3621.899	.000	1	1.000	1.345	.000	.[b]
	[AGE_GROUP=13]	-.063	3600.416	.000	1	1.000	.939	.000	.[b]
	[AGE_GROUP=14]	.286	3803.491	.000	1	1.000	1.331	.000	.[b]
	[AGE_GROUP=15]	.040	.000	.	1	.	1.041	1.041	1.041

	[AGE_GROUP=16]	0[c]	.	.	0	.	.	.	.
	[MSSOP=1]	.212	1078.209	.000	1	1.000	1.236	.000	.[b]
	[MSSOP=2]	-14.190	831.056	.000	1	.986	6.873E-7	.000	.[b]
	[MSSOP=3]	.099	.000	.	1	.	1.104	1.104	1.104
	[MSSOP=4]	-.148	3607.679	.000	1	1.000	.862	.000	.[b]
	[MSSOP=5]	0[c]	.	.	0	.	.	.	.

a. The reference category is: 8.

b. Floating point overflow occurred while computing this statistic. Its value is therefore set to system missing.

c. This parameter is set to zero because it is redundant.

Appendix E

Outpatient Services Databases Output

Parameter Estimates

								95% Confidence Interval for Exp(B)	
DiagofReproCancer[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	Lower Bound	Upper Bound
Cancer of Uterus	Intercept	27.435	1034.810	.001	1	.979			
	HealthFactors	.027	.046	.346	1	.556	1.027	.939	1.124
	[Dischstatusofwoman=0]	-8.488	.314	729.377	1	.000	.000	.000	.000
	[Dischstatusofwoman=1]	0[b]	.	.	0	.	.	.	.
	[age_group=6]	-.106	2472.474	.000	1	1.000	.900	.000	.[c]
	[age_group=7]	-.651	1803.366	.000	1	1.000	.521	.000	.[c]
	[age_group=8]	-1.057	1679.515	.000	1	.999	.348	.000	.[c]
	[age_group=9]	-.872	1562.281	.000	1	1.000	.418	.000	.[c]
	[age_group=10]	-14.850	1034.810	.000	1	.989	3.554E-7	.000	.[c]
	[age_group=11]	-.411	1387.691	.000	1	1.000	.663	.000	.[c]
	[age_group=12]	-.391	1350.745	.000	1	1.000	.676	.000	.[c]
	[age_group=13]	-.146	1318.307	.000	1	1.000	.864	.000	.[c]
	[age_group=14]	-.108	1312.907	.000	1	1.000	.897	.000	.[c]
	[age_group=15]	-.041	1346.966	.000	1	1.000	.960	.000	.[c]
	[age_group=16]	0[b]	.	.	0	.	.	.	.
Cancer of Breast	Intercept	29.200	1034.810	.001	1	.977			
	HealthFactors	.026	.046	.310	1	.578	1.026	.937	1.123
	[Dischstatusofwoman=0]	-8.802	.258	1167.225	1	.000	.000	9.076E-5	.000

	[Dischstatusofwoman=1]	0[b]	.	.	0	.	.	.	.
	[age_group=6]	-.057	2472.474	.000	1	1.000	.945	.000	.[c]
	[age_group=7]	.192	1803.366	.000	1	1.000	1.211	.000	.[c]
	[age_group=8]	-.024	1679.515	.000	1	1.000	.977	.000	.[c]
	[age_group=9]	-.148	1562.281	.000	1	1.000	.862	.000	.[c]
	[age_group=10]	-13.867	1034.810	.000	1	.989	9.503E-7	.000	.[c]
	[age_group=11]	-.137	1387.691	.000	1	1.000	.872	.000	.[c]
	[age_group=12]	-.146	1350.745	.000	1	1.000	.864	.000	.[c]
	[age_group=13]	.007	1318.307	.000	1	1.000	1.007	.000	.[c]
	[age_group=14]	-.097	1312.907	.000	1	1.000	.908	.000	.[c]
	[age_group=15]	.071	1346.966	.000	1	1.000	1.074	.000	.[c]
	[age_group=16]	0[b]	.	.	0	.	.	.	.
Cancer of Cervix	Intercept	26.626	1034.810	.001	1	.979			
	HealthFactors	.035	.046	.587	1	.444	1.036	.947	1.134
	[Dischstatusofwoman=0]	-8.288	.286	837.994	1	.000	.000	.000	.000
	[Dischstatusofwoman=1]	0[b]	.	.	0	.	.	.	.
	[age_group=6]	.542	2472.474	.000	1	1.000	1.720	.000	.[c]
	[age_group=7]	.912	1803.366	.000	1	1.000	2.489	.000	.[c]
	[age_group=8]	1.109	1679.515	.000	1	.999	3.033	.000	.[c]
	[age_group=9]	1.155	1562.281	.000	1	.999	3.176	.000	.[c]
	[age_group=10]	-12.764	1034.810	.000	1	.990	2.861E-6	.000	.[c]
	[age_group=11]	1.332	1387.691	.000	1	.999	3.787	.000	.[c]
	[age_group=12]	.960	1350.745	.000	1	.999	2.612	.000	.[c]
	[age_group=13]	.644	1318.307	.000	1	1.000	1.904	.000	.[c]

	[age_group=14]	.503	1312.907	.000	1	1.000	1.654	.000	.[c]
	[age_group=15]	.285	1346.966	.000	1	1.000	1.330	.000	.[c]
	[age_group=16]	0[b]	.	.	0	.	.	.	.
Cancer of Ovary	Intercept	25.160	1034.811	.001	1	.981			
	HealthFactors	.035	.046	.595	1	.441	1.036	.947	1.134
	[Dischstatusofwoman=0]	-8.475	.629	181.345	1	.000	.000	6.078E-5	.001
	[Dischstatusofwoman=1]	0[b]	.	.	0	.	.	.	.
	[age_group=6]	-.202	2472.474	.000	1	1.000	.817	.000	.[c]
	[age_group=7]	-.633	1803.366	.000	1	1.000	.531	.000	.[c]
	[age_group=8]	-1.136	1679.515	.000	1	.999	.321	.000	.[c]
	[age_group=9]	-1.746	1562.281	.000	1	.999	.174	.000	.[c]
	[age_group=10]	-14.484	1034.810	.000	1	.989	5.127E-7	.000	.[c]
	[age_group=11]	-.545	1387.691	.000	1	1.000	.580	.000	.[c]
	[age_group=12]	-.964	1350.745	.000	1	.999	.381	.000	.[c]
	[age_group=13]	-.946	1318.307	.000	1	.999	.388	.000	.[c]
	[age_group=14]	-.726	1312.907	.000	1	1.000	.484	.000	.[c]
	[age_group=15]	-.130	1346.966	.000	1	1.000	.878	.000	.[c]
	[age_group=16]	0[b]	.	.	0	.	.	.	.
Cancer of Other Female Genitals	Intercept	27.254	1034.810	.001	1	.979			
	HealthFactors	.032	.046	.493	1	.483	1.033	.944	1.130
	[Dischstatusofwoman=0]	-8.460	.000	.	1	.	.000	.000	.000
	[Dischstatusofwoman=1]	0[b]	.	.	0	.	.	.	.
	[age_group=6]	-.867	2472.474	.000	1	1.000	.420	.000	.[c]
	[age_group=7]	-1.561	1803.366	.000	1	.999	.210	.000	.[c]

[age_group=8]	-1.709	1679.515	.000	1	.999	.181	.000	.[c]
[age_group=9]	-2.324	1562.281	.000	1	.999	.098	.000	.[c]
[age_group=10]	-16.102	1034.810	.000	1	.988	1.016E-7	.000	.[c]
[age_group=11]	-1.515	1387.691	.000	1	.999	.220	.000	.[c]
[age_group=12]	-1.120	1350.745	.000	1	.999	.326	.000	.[c]
[age_group=13]	-.790	1318.307	.000	1	1.000	.454	.000	.[c]
[age_group=14]	-.534	1312.907	.000	1	1.000	.586	.000	.[c]
[age_group=15]	-.209	1346.966	.000	1	1.000	.811	.000	.[c]
[age_group=16]	0[b]	.	.	0	.	.	.	.

a. The reference category is: 33.

b. This parameter is set to zero because it is redundant.

c. Floating point overflow occurred while computing this statistic. Its value is therefore set to system missing.