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# Wage Equality among Internationally Educated Nurses Working in the United States

Sat Ananda Hayden  
*Walden University*

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# Walden University

College of Health Sciences

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Sat Ananda Hayden

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2013

Abstract

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by

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MSN, University of New Mexico, 1991

BSN, University of New Mexico, 1990

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Services

Walden University

September 2013

## Abstract

Discrimination against immigrants based on country of origin, gender, or race is known to contribute to wage inequality, lowers morale, and decreases worker satisfaction. Healthcare leaders are just beginning to study the impact of gender and race on the wages of internationally educated nurses (IENs). Grounded in Becker's theory of discrimination, this cross-sectional study examined nursing wages for evidence of wage inequality among IENs working in the United States using secondary data collected in the 2008 quadrennial National Sample Survey of Registered Nurses. Ordinary least square regression coupled with the Blinder-Oaxaca wage decomposition was used to analyze the wages of 757 IENs working in the U.S. healthcare system. *T* tests with effect size were calculated to find the impact on wage of gender, race, and country of education. The study found that white male IENs earned higher wages than all other immigrant groups, followed by nonwhite males and nonwhite females ( $R^2 = .143$ ;  $F(8,748) = 15.60$ ;  $p = .000$ ). White female IENs earned the least, at 80%, 88%, and 91% of wages earned by white male, nonwhite male and nonwhite female IENs, respectively ( $p < .005$ ). The relationship between hourly wage and being a white female was negative and statistically significant ( $p = .006$ ) and white females earned 19.6% less per hour than white male IENs. Working in tertiary care contributed 21.60% of wages for white IENs and 10.30% of wages for nonwhite IENs. Inequality in nursing wages was related to an interaction between race and gender for wages of white female IENs but not wages for nonwhite female IENs. Results of this study promote positive social change by motivating nursing departments to equalize wages and policymakers to strengthen equal pay statutes.



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## Dedication

This work is dedicated to hard working nurses regardless of their level of preparation, country of education, nationality, gender, or color. As nurses we treat our clients without regard to color, gender, or country of origin and as nurses we should be treated without regard to color, gender or country of origin in return. Disparity is never productive.



## Acknowledgments

They say it takes a village to accomplish meaningful goals large and small. I would like to acknowledge my village: My longtime friends and supporters, new acquaintances, old friends, colleagues, mentors, and students who have honored me with their confidence and encouragement along the way. We all deserve a long trip to the beach and a tall, cold drink or two!

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## Chapter 1: Introduction to the Study

### **Background**

When vacancies for highly skilled professionals exist in a nation's employment market, it makes economic sense to invite guest workers to fill them. Guest workers require no permanent commitment on the part of the host country, contribute by paying taxes, and allow time for the domestic production of native workers to meet increases in demand (Iredale, 2001). Once an adequate number of domestic professionals have entered the market, guest workers become superfluous and return home as their visas expire (Iredale, 2001). The United States has relied on internationally educated nurses (IENs) to meet cyclical shortages of registered nurses (RNs) since 1965 (Brush, 2002). In 2010, there were an estimated 165,659 IENs working in the United States, with 88.3% actively employed as RNs (U.S. Department of Health and Human Services & Health Resource and Services Administration, 2010). Currently, leaders of the healthcare industry are only beginning to understand the impact of IENs on the wage structure of RNs working in the U.S. healthcare system.

In the sections that follow, I present the background of the problem and purpose of this proposed study. Included are a problem statement, research question, and associated hypotheses, the theoretical basis for the study, the nature and scope of the study, as well as its assumptions, delimitations, and limitations. The chapter concludes with a section on the professional and social implications of the study that specifically addresses the how the study contributes to the profession of nursing and social change.

Historically, studies locating and identifying sources of wage differences focused on differences in gender and race, native and immigrant unskilled labor, or levels of education. Research about nursing wages initially focused on gender disparity in pay. Because research documenting gender disparities is ubiquitous in the literature, few recent studies analyzing gendered pay differences in nursing have been published. Scholars studying gender wage differences among nurses have consistently reported unexplained wage differences between male and female RNs. While the wage gap has narrowed, male RNs continue to earn more than female RNs when human capital and individual attributes are controlled. Additionally, researchers exploring the influences of gender, race, and immigrant status on wages agreed that white men received the most favorable wage, followed by men of color, white women, and then women of color. These findings support theories of discrimination and queuing, in which employers have preferences toward workers and order those preferences when necessary.

Within the last 5 years, there has been an increasing interest in pay differences between U.S. educated registered nurses (USENs) and IENs. The increasing numbers of nurses leaving their home countries (usually lesser-developed countries) to work for more developed countries (MDCs) sparked an interest in learning more about why IENs migrate and what happens to them when they arrived in their destination countries. As disturbing reports about human rights violations, mistreatment, and substandard pay began to surface (Pittman, Folsom, Bass, & Leonhardy, 2007), research about the lived experiences of IENs and discrimination in the workplace began to increase. Some researchers used quantitative statistical analysis to determine if unexplained wage

differences between USENs and IENs existed outside of the anecdotal stories of individual IENs. Published and unpublished research on wage differences between native and immigrant nurses indicated that, with the exception of a preference for white males, wage discrimination ran counter to historical findings about unexplained wage differences. According to recent studies, employers prefer nonwhite RNs and IENs to female, white USENs (Jones & Gates, 2004; Schumacher, 2010). While researchers concluded that nursing, a gendered occupation, operates differently than gender-integrated occupations, none offered an explanation as to why this might be the case.

In this study, rather than compare USENs and IENs, I analyzed differences within IENs to uncover possible explanations for the favorable discrimination that IENs appear to receive from employers. This approach has been neglected within the literature on wage discrimination in nursing. I hypothesized that there are subgroups within IENs who, because they are more preferred by employers, disguise the full extent of employer discrimination and preference for workers.

This study is needed to understand the impact of race on wages of IENs. Despite legal wage protections, women continue to earn less than men with the same qualifications who perform the same job (Hegewisch, Liepmann, Hayes, & Hartmann, 2010). If nursing wages are favorably influenced by gender, race, and country of education when country of education is not the United States, health care leaders need to understand why IENs earn more than USENs. Understanding the possible negative impact of a U.S. nursing education on wages is important to the nursing profession, health care industry, and schools of nursing. Further, a full understanding of how race

and country of education influence wages is necessary to reduce and eventually eliminate wage disparity and increase social justice.

### **Problem Statement**

Equal pay for equal work is an important social justice issue in the United States. According to Teitz and Chappel (1998), individuals are prevented from achieving full labor market potential when they are discriminated against by race or gender (p. 36). Although the number of men in nursing is far less than that of women, men receive more favorable wages (Hayden, 2005; Kalist, 2002). Despite legislation designed to eliminate wage disparity, gender differences persist. An unexplained wage difference between workers with the same characteristics is evidence of discrimination. In the United States, a chronic shortfall of nurses available to provide care has necessitated the use of IENs to meet the needs of U.S. citizens. If nurses cannot earn wages that other, similarly educated professionals earn, the United States will face even greater shortfalls of nursing labor.

Nursing wages are an important indicator of social justice in a number of ways. First, nursing is a segregated occupation. Historically female, 90.4% of the 3 million registered nurses in the U.S. workforce are women (U.S. DHHS & HRSA, 2010). Because RNs are overwhelmingly women, despite competition for equal wages, they experience wage penalties secondary to gender discrimination (Jarrell & Stanley, 2004; Stanley & Jarrell, 1998). Second, the majority of nurses are Caucasian and educated in the United States (Spratley, Johnson, Sochalski, Fritz, & Spencer, 2000; U.S. DHHS & HRSA, 2010). Historically, nonwhite workers in the United States experienced economic discrimination in the form of reduced wages across all sectors of the market

(Hersch, 2010; McGregory, 2011). Therefore, nonwhite female RNs are expected to face a double penalty in the workplace. However, recent literature demonstrates that gender segregated markets operate differently than all other labor markets and, according to McGregory, nonwhite nurses and teachers earn higher wages than white nurses and teachers. Therefore, nurses who are both female and white are expected to earn less than all other nurses. These wage differences affect millions of women working as nurses and may signal the devaluation of domestically educated RNs.

### **Gaps in the Literature**

Over the past five years, research on wage inequality among RNs based on country of education has increased significantly. However, the literature fails to categorize IENs by gender, race, or other professional or individual attributes that might affect either their return on human capital investment or employer preference. As a result, while USENs are differentiated by subgroups based on education, gender, and race, IENs are viewed as a single group. Therefore, while current research findings reflect that IENs earn a wage premium (Huang, 2011; Polsky, 2007; Schumacher, 2010; Toney, 2005), researchers provide no indication of why employers are willing to pay IENs more than USENs. This omission has been consistent in the literature. Chapter 2 reviews and discusses the literature about wages of immigrant nurses in depth.

Uncovering evidence of unexplained wages among RNs working in the U.S. healthcare system is important for a number of reasons. First, after accounting for inflation, wages have remained relatively flat for RNs over the past 25 years. This wage compression dissuades women from choosing nursing as a career. Second, an influx of

immigrant nurses earning less than U.S. educated nurses do depresses nursing wages even further, adding to the nursing shortage further by making it an unattractive professional choice. If, as recent researchers assert, IENs earn more than USENs, the value of a U.S. nursing education is diminished, and nursing remains an unattractive professional choice. According to the most recent estimates, of the 3,063,162 RNs living in the United States in 2008, 165,659 or approximately 5.4% were educated abroad (U. S. DHHS & HRSA, 2010). The size of the immigrant nurse population is enough to influence wages in both the market sectors and in the geographical locations where these nurses work and live. Third, unexplained differences in wages among nurses based on gender have persisted despite governmental efforts supporting equal pay (Chang & Walia, 2007). Fifth, an artificially low wage structure for RNs means that nurses, as both providers and consumers of health care services, disproportionately bear the burden of health care sector inefficiencies. Finally, unequal pay for equal skills based only on location of professional education extends social injustice based on gender, race, and nationality.

### **Purpose of the Study**

In this study, I analyzed the relationships of variables associated with wage discrimination among IENs working in the U.S. health care system using the economic theory of discrimination (Becker, 1971) and human capital theory (Becker, 1994; Mincer, 1974). The data were collected through the 2008 National Sample Survey of Registered Nurses (NSSRN) survey questionnaire (U. S. DHHS & HRSA 2010). These data contained the individual workers' attributes, human capital endowments, and wage

information necessary to evaluate the presence of unexplained wage differences (Hayden, 2004).

Data were analyzed using ordinary least square regression (OLS) analysis; along with the Oaxaca-Blinder (BO) wage decomposition (Blinder, 1973; Oaxaca & Ransom, 1994) with a Cotton-Neumark (CN) extension (Cotton, 1988). This wage decomposition method is an accepted and commonly used approach used to determine how workers' education, skills, and individual characteristics contribute to earnings. The BO wage decomposition assumes that, *ceteris paribus*, employers will discriminate based on their assumptions about workers or categories of workers (Blinder, 1973; Oaxaca, 1973; Oaxaca & Ransom, 1994). The CN extension to the BO decomposition posits that the desired category of worker receives a higher wage while the less desired worker faces a wage penalty (Cotton, 1988). As a result, employers ultimately pay more for workers than they would prefer.

Historically, research about nursing wages has sought to understand the relationships between race and gender in a segregated occupation. Research that is more recent included a variable representing international educational preparation as an RN. Other researchers proposed that assimilation effects (in-country work experience; Buhr, 2010) as well as labor force attachment (Arends-Kuening, 2006) play more important roles in wage differences than originally thought. The purpose of this study was to explore how race influences wages among IENs working in the U.S. healthcare system by synthesizing in-country work experience, breaks in service, country of educational

preparation, level of preparation, gender, and race as variables that affect the wages of IENs working in the United States.

### **Nature of the Study**

This study was a cross-sectional, quantitative analysis of RN wages for analyzing the impact of race on wages when human capital, individual, and market variables are controlled. These relationships were analyzed using OLS regression coupled with wage decomposition. Data came from the 2008 NSSRN, a quadrennial survey of registered nurses in the United States (U.S. DHHS & HRSA, 2010). The data are available to researchers free of charge through HRSA and de-identified before release.

### **Research Question and Hypotheses**

Is there evidence that the wages among IENs working in the U.S. healthcare system differ? If so, are those differences based on individual, professional, or market attributes, and how do those variables influence wages received by IENs? Previous research clearly supports a relationship between race and wages where white male RNs earn higher wages (Hayden, 2004; Jones & Gates, 2004; Kalist, 2002; Schumacher, 2010; Schumacher & Hirsch, 2008), but the relationship between race and gender has not been studied in the IEN population.

**RQ1.** Is the IEN population homogenous in terms of earnings or do some IENs earn higher wages than others?

**H1:** IENs working as staff nurses in urban tertiary care settings and are represented by a union earn different wages than IENs working in other positions in organizations that provide non-tertiary levels of care when level of professional



preparation, race, gender, years of experience working in the United States, discontinuous years of service, and professional and technical certifications are controlled.

$$H_0: IEN_{\text{stuu}} = IEN_{\text{other}}$$

$$H_1: IEN_{\text{stuu}} > IEN_{\text{other}}$$

**RQ2.** If differences in wages exist between IENs when individual, human capital and market variables are controlled, what is the influence of country of education on wages? Do wages of IENs differ based on their country of education regardless of work setting (tertiary, urban, union representation, organizational position); individual characteristics (race, gender) and human capital variables (level of educational preparation, professional and technical certifications, years of experience working in the United States, and continuity of service) are controlled? If differences exist, do those differences favor IENs who received their education in countries closely related to the United States (Canada and the United Kingdom)?

**H2.** Wages of IENs educated in European countries whose culture and values are similar to the culture and values of United States are higher than IENs who were educated in countries with cultures and values that are dissimilar to those of the United States when race, gender, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled.

$$H_0: IEN_{\text{euro}} = IEN_{\text{noneuro}}$$

$$H_2: IEN_{\text{euro}} > IEN_{\text{noneuro}}$$

**RQ3.** If differences in wages exist between IENs when, race, country of education, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled, what is the relationship of gender to those differences?

**H3.** Wages of IENs differ based on their gender when individual, workplace, and market attributes are controlled, with male IENs earning more favorable wages than nonwhite IENs.

$$H_0: IEN_m = IEN_f$$

$$H3: IEN_m > IEN_f$$

**RQ4.** . If differences in wages exist between IENs when, gender, country of education, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled, what is the relationship of race to those differences?

**HH4.** IENs who are white earn higher wages than IENs who are nonwhite when gender, country of education, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled.

$$H_0: IEN_w = IEN_{nw}$$

$$H4: IEN_w > IEN_{nw}$$

## Theoretical Base

This study explored the relationship between neoclassical economic theories about employer discrimination and wages while controlling for human capital investments in education. Wage decomposition equations divide contributions to wage differences as attributable to human capital attributes or as attributable to discrimination (differences that cannot be explained by human capital attributes). According to the economic theory of discrimination posited by Becker (1971), unexplained differences in wages will be present if employers discriminate based on their beliefs about employees' group membership (Phelps, 1972). Neoclassical economists such as Arrow (1998) and Stiglitz (1973) argued that discrimination, on its face, runs counter to market capitalism in which employers want to pay the least possible price per unit of productivity so they can maximize profits (Friedman, 2002).

Becker's (1971) theory of discrimination as well as other statistical theories of discrimination (Arrow, 1998; Phelps, 1972; Stiglitz, 1973) was bolstered by queuing theory (Toney, 2005) and Goldin's (2002) theory of pollution. Toney demonstrated that queuing theory provided evidence for a hierarchy of employer preference when hiring RNs. Goldin's theory of pollution argued that men are paid more when they either must accept women into their ranks or enter a predominately-female occupation. Both Goldin and Toney provided a strong theoretical basis for the presence of employers' preference and discrimination among employees in setting wages.

The theoretical foundation for this study, presented in depth in Chapter 2, is the economic model of discrimination. The act of discriminating is the process through

which an individual demonstrates preferences or tastes (Becker, 1971). For the purposes of this study, discrimination was defined as the preference of an employer for one type of worker over another when all human capital endowments, individual attributes, and market conditions are controlled. This preference is expressed through differences in pay. For example, if an employer prefers Asian to Caucasian employees, the reason for this preference may be unknown to the employer or others but is expressed in unexplained differences in pay when all other attributes and endowments are equal. Operational definitions for other concepts used in this proposed study are listed in the section that follows.

Oaxaca (1973; Oaxaca & Ransom, 1994) and Blinder (1973) searched for evidence of employer discrimination among genders and races. Blinder and Oaxaca developed what is commonly referred to as the Blinder-Oaxaca (BO) wage decomposition methodology for the purposes of locating and analyzing unexplained wage differences among men and women and black and white workers. While Oaxaca examined gender differences, Blinder used this methodology to look at the influence of gender and race within a group of workers. Therefore, the BO wage decomposition methodology is appropriate for the analysis of the influence of gender, race, and country of education on wages among IENs. A more detailed description of the theoretical framework and conceptual model that ground this study is included in Chapter 2.

### **Definition of Terms**

Operationalization of major theoretical concepts and independent variables are presented below. Operational definitions of all independent variables, measures, and

sources are presented in Chapter 3. A detailed codebook for the study appears in Appendix C.

**Attribute.** A descriptive term for an innate characteristic of a worker such as the characteristic of gender. (Babbie, 2004, p. 15)

**Country of education.** The country in which an RN earned his or her initial professional education (U. S. DHHS & HRSA, 2008).

**Endowment.** A characteristic of an individual that is acquired through investments in education, knowledge, and skills for increasing her income (Mincer, 1974).

**Human capital.** Endowments that accrue to an individual based on the attainment of education, knowledge, skill, or other training that can be brought to bear on a current or future position; an investment made for professional growth and income (Becker, 2002; Kaufman, 2008, Mincer, 1974).

**Immigrant nurse.** A nurse from another country who travels to the United States to obtain a license as an RN for work in the U.S. healthcare system (Iredale, 2001).

**Internationally educated nurse (IEN).** An immigrant nurse who undergoes an education equivalence assessment (VisaScreen), passed the National Certification Licensing Exam (NCLEX), and is working in the U.S. healthcare system as an RN. (Definition adopted at the 2004 Global Think Tank on International Nurse Migration by invitees)

**Registered nurse (RN).** An individual who has been granted a license to practice nursing in the United States by virtue of education, training, and competency as determined by the state in which he or she practices (Bureau of Labor Statistics, n. d).

**U.S. educated nurse (USEN).** An RN educated and licensed in the United States (Definition adopted at the 2004 Global Think Tank on International Nurse Migration by invitees).

**Wage difference.** The wage gap that exists between workers with the same attributes and endowments (Blinder, 1973; Oaxaca, 1973).

**Wage discrimination.** Setting a different wage for workers whose attributes are preferred in comparison to those with attributes that are not preferred when all other attributes are the same (Becker, 1971; Kalist, 2002).

The logical connections between independent and dependent variables closely follow the theoretical framework of Becker's (1971) theory of discrimination. Human capital endowments are used to control for investments made by individuals for their professional growth and advancement. Independent variables specific to this study include country of education, level of RN education, gender, race, years of experience in the United States, as well as market attributes that are expected to influence wage setting such as an urban location. A conceptual framework presented in Chapter 2 demonstrates these relationships.

### **Assumptions**

This study was founded on the assumption that wage inequality based on gender and race persists in the U.S. labor market despite the protection afforded by legislation.

Equal pay for equal work is a goal but not a reality in the U.S. labor market for RNs. As pay equity relates to this study, I assumed that employers' preferences are based on race, gender, level of preparation, and perceptions of quality of education based on the country of education of an IEN. While country of education may be a proxy indicator for darkness of skin color (Scandinavians being very light and Africans being very dark), this study assumed that it represents employers' preferences for educational products of countries that share the same attitudes, culture, and values as the United States (Australia, Canada, and the United Kingdom).

### **Limitations**

Methodological limitations of the study included the accuracy with which employers' preferences could be inferred based on pay differences. For example, there was no way to measure the degree of darkness of skin color that might influence employers, nor was it possible to evaluate the impact of English fluency or native accents. While IENs coming through the Commission on Graduates of Foreign Nursing Schools (CGFNS) are required to demonstrate literacy through an English language literacy test, there is no guarantee that the individual speaks the language fluently or without a heavy accent. Similarly, there is no way to measure the cultural fit between the IEN and U.S. healthcare. For example, some speech patterns and mannerisms specific to some cultures may be interpreted as a lack of caring or respect in the United States.

Other conditions that might influence wage setting at entry include perceptions of employers or the public regarding the quality of education or professional preparation of IENs. Although the CGFNS is charged with ensuring the equivalency of a foreign

nursing education with U.S. nursing education content, and after their visa screen IENS must pass the professional licensing exam as required by each state, these mechanisms ensure only that the minimum standard was met. Therefore the expertise, knowledge, English language fluency, and ability to practice may vary widely in graduates from foreign education programs. These data were not available in the data set and were not included in the study. Likewise, some human capital attributes may not transfer smoothly between countries (Huang, 2011; Vargas, 2005). For example, country of origin may trigger employers' beliefs about quality of education, and individuals who migrate may be inherently more motivated, productive, or from a higher socioeconomic class in their home countries than those who do not migrate or who are natives (Vargas, 2005).

There may be some biases that favor IENs from particular countries. For example, some countries do not teach their RNs to question physicians' orders or to expect collaboration in patient care. Likewise, there may be cultures where women remain subservient to men. These qualities may not be appreciated by USEN peers, but appreciated by U.S. employers and physicians. These biases could not be addressed in this study due to the limitations of the data set but might provide for interesting follow up research.

The results of the study are limited to the accuracy of the data reported by RNs returning the 2008 NSSRN survey questionnaire. The population from which the study sample was drawn was limited to the random selection of eligible RNs as determined by the survey design and sampling frame for the 2008 NSSRN and assumed that the accessible population is an accurate reflection of the target population of RNs practicing



in the U.S. healthcare system. The study was limited to RNs who elected to return the completed questionnaire and may be subject to self-selection bias.

The major effort taken to address biases otherwise inherent in the study was the selection of survey recipients. RNs working in the U.S. healthcare system were randomly selected to receive the survey based on state populations of RNs. Data collection occurred only after RNs licensed in multiple states were identified and limited to a single state's RN roster.

Although economic theories of discrimination place employers' preferences as the central component of wage setting, the data for this study did not directly measure employer preference. Therefore, employers' tastes or preferences must be inferred by controlling for other variables known to impact wages. The accuracy of findings is limited by the ability of these variables to reflect employers' preferences.

### **Delimitations**

This study was designed to address the question of wage equality among IENs working in the U.S. healthcare system in a tertiary care setting as compared to all other settings. This venue was selected because it represents the greatest concentration of nursing labor in the U.S. healthcare system and the largest number of IENs; therefore, delimiting the sample to this setting provided an opportunity to capture the greatest number of IENs in the setting that also reports chronic shortages of RNs.

This study was delimited to IENs who hold a professional license to practice as an RN in the state in which they work, who were not initially prepared at the master's or doctorate levels, and who worked as an RN for at least one year at the time they

completed the survey questionnaire. Initial education as an RN was outside the United States and its territories. Additionally, respondents selected for the sample reported working as RNs at least 36 hours per week at their primary job at the time of the survey. Nurses who met all other qualifications but identified themselves as Native American or Hawaiian or who were not working in a position that required an active license to practice as an RN at the time they completed the study were excluded.

Wages were measured through self-reported earnings of primary jobs in nursing for IENs who met selection criteria for this study. Annualized wages were reduced to hourly rates using the procedure outlined in Appendix B. Reported earnings from secondary nursing positions were not included. Only data collected in the 2008 NSSRN survey questionnaire were used in this study. Results of the study are generalizable only to IENs not educated in the 50 states, the District of Columbia, or a U.S. territory and who do not hold a master's or doctorate in nursing as their initial level of nursing education and who work in the United States.

### **Significance of the Study**

Roughly 5.6% of the 3,063,162 RNs working in the U.S. healthcare system are immigrants (U.S. DHHS & HRSA, 2010). This means that as of 2008, roughly 165,659 RNs were educated outside the United States. Many IENs come from countries that are considered less developed (LDC), are predominately nonwhite women, (Aiken, Buchan, Sochalski, Nichols, & Powell, 2004; Brush, 2002, 2008; Polsky, Ross, Brush, & Sochalski, 2007). Historically, women, nonwhite individuals, and immigrants have faced

discrimination and experienced wage penalties associated with the complex interactions of gender, nativity, and race in the workplace. This inequality is an issue of social justice.

Issues of social justice that arise from complex interactions defying simple solutions are called *wicked problems* (Rittel & Webber, 1973). Issues of ethnicity, gender, and race often combine to create thorny issues involving social justice for individuals within society. Solutions for wicked social justice problems are rarely straightforward and have multiple levels of complexity. Because each change presents an opportunity to decrease the intensity of a problem, wicked problems may be amenable to an incremental problem-solving approach. Therefore, it is important for healthcare leaders to know if wage inequality exists, the extent of any existing wage inequality, and to understand the factors that contribute to wage inequality in the labor market for nurses. This study examined the variables thought to contribute to wage inequality among RNs and contribute to a wicked problem in the United States.

### **Professional Application**

A critical shortage of nurses, once a cyclical phenomenon in the United States, is now a chronic and critical global issue (Buchan, 2001). Concerns about workplace satisfaction, low nursing education enrollment, and abandonment of the profession have become pandemic in the nursing profession. Nursing and health services research reveal that the negative effects of nurse dissatisfaction and inadequate supply of nurses is negatively experienced by patients globally (Aiken, Clarke, Sloane, & Sochalski, 2001). Workplace and wage dissatisfactions combined with an ageing RN population have created a perfect storm for nursing labor supply and demand.

Unexplained differences in the salaries of men and women are ubiquitous in the wage decomposition literature. Likewise, racial wage differences have persisted over time. These findings are troublesome from a number of perspectives. First, the nursing profession has tried to separate itself from its historical association as an extension of familial care giving. Caring occupations are considered inherently female and often undervalued or devalued (Goldin, 2002; Macpherson & Hirsch, 1995). Second, males entering predominately-female occupations, while often paid more than their female counterparts, are paid less than other men with equal attributes who work in non gender-segregated fields (Macpherson & Hirsch, 1995). This does not bode well for a profession eager to attract nontraditional entrants (men) into its profession.

Substitution of the lowest wage in the range for a minimum wage may make Chang and Walia's (2007) theory of the impact of enforcement on minimum wage setting applicable to the discovery of wage discrimination in nursing based on place of professional education. Wage setting in nursing is ostensibly based on observable worker attributes such as education, tenure in the profession, and specialized skills. However, healthcare organizations utilize a wage range for setting nursing wages at entry. Therefore, discrimination at entry and employers' preferences for one group over another may go undetected. Unobserved or subtle discrimination may very well result in a wage at entry that, while within the range, is less than one offered to another employee with comparable attributes but more preferred by the employer. When a prospective employee is a member of a preferred group, employers can discriminate while appearing to comply with legal wage setting requirements, union contracts, and internally established practices

designed to decrease wage discrimination (Chang & Walia, 2007). According to the wage-setting model of Chang and Walia, because there is little to no oversight at this point in wage setting, discrimination goes undetected. Finally, even if there are no differences among IENs, it is critical that the nursing profession and schools of nursing be aware of actions that may signal a devaluation a domestic nursing education.

### **Implications for Positive Social Change**

Implications for social change closely parallel the importance of social justice. First, understanding the wage structure of RNs in the U.S. healthcare system allows for correction of inequities and may help increase entry into the profession and retard abandonment of the profession. The result may well be a decrease in nursing vacancies and the elimination of cyclical shortages. Second, because approximately 5.6% of all nurses in the United States are educated outside of the abroad (U.S. DHHS & HRSA 2010), wage differences may be addressed and corrected in affected labor markets. Third, an influx of migrant nurses earning less than U.S. educated nurses may depress nursing wages and add to the perception of nursing as an unattractive professional choice. Correction of this perception will help increase the status of nursing as a desirable profession. Referring to the knowledge gap identified above, at the 2011 American Public Health Association conference, HRSA Director Edward Salsberg identified wage differences as a research priority for HRSA. Fourth, if unexplained differences in wages among nurses based on gender have persisted despite governmental efforts supporting equal pay, these differences must be redressed. Fifth, an artificially low wage structure for nurses means that nurses as both providers and consumers of health care services

disproportionately bear the burden of health care sector inefficiencies. Correction of this inequity provides for greater social justice. Finally, unequal pay for equal skills based only on location of professional education represents avoidable exploitation of immigrant nurses.

### **Summary and Transition**

This cross-sectional, quantitative study explored the relationship between variables believed to be important in wage setting for immigrant nurses working in the U.S. healthcare system. This study was important because of the nature of nursing work, an increasing demand for RNs, and the failure of the United States to achieve self-sufficiency in the production of RNs. The failure to be self-sufficient in the production of native nurses has led to a reliance on RNs whose professional education has been outside the United States to provide needed care to citizens.

IENS, as guest workers in the country, pay penalties in their contributions to the U.S. safety net for elders (social security and Medicare) but rarely benefit from their input. This situation creates a condition of social injustice where guest workers subsidize U.S. citizens' standard of living and payment for health care. An additional implication for social change is related to a greater understanding of the nature and extent of inequality of wages within the nursing profession.

This study addressed the knowledge gap created by studies comparing RN wages between USENs and IENs, assuming that IENs are a homogenous group. While USENs were divided into constituent groups based on level of education, gender, and race, comparisons with IENs were made as if all IENs belonged to a single group independent

of differences among country of education, gender, and race. The omission of subgroups among IENs may have contributed to an incomplete understanding of wage inequality among RNs working in the U.S. healthcare system.

This chapter presented the major constructs of the study, research question, and gaps in the current literature. Chapter 2 presents major themes from the relevant literature, the theoretical base of the study, and research questions that arise from gaps in the literature and discusses the choice of methodology for statistical analysis. A causal model representing the relationship of independent and dependent variables is included. Chapter 3 provides detailed information about the sample, data, independent and dependent variables, and methodology selected to explore relationships between variables. Chapter 4 presents the statistical analysis of data and major findings. Chapter 5 concludes the paper with a discussion of the implications of the findings for the nursing profession, healthcare industry, and social justice. Limitations of the study and recommendations for further study along with dissemination plans for current findings are also presented.

## Chapter 2: Literature Review

### Overview

The U.S. healthcare system relies on immigrant nurses to alleviate cyclic labor shortages and has welcomed IENs as guest workers since 1945 (Brush, 2002). As globalization grew and cross-border mobility became more feasible and less costly, more nurses migrated internationally (Aiken et al., 2004). This increase caused concern in the United States for a number of reasons. First, the number of IENs working in the United States jeopardizes the already precarious health systems of their native countries and raises concerns about the ethical implications of recruiting IENs ((Kirk, 2007)McElmurry et al., 2006; Milton, 2007; Muula, Mfutso-Bengo, Makoza, & Chatipwa, 2003; Singh, Nkala, Amuah, Mehta, & Ahmad, 2003). Second, increasing numbers of IENs working in the U.S. healthcare system has raised concerns about the impact of IENs on African American access to nursing education (Brush, 1999). Third, health care leaders questioned the influence of other cultures on the practice values of U.S. hospitals (Flynn & Aiken, 2002). Finally, ethical concerns about the recruitment of RNs from LDCs and the treatment of RNs after immigration remain. These concerns are not localized to the United States and prompted the global adoption of ethical recruiting guidelines (Buchan, 2004, 2006; McElmurry et al., 2006; Muula et al., 2003; Pittman et al., 2007; Sparacio, 2005; Stilwell et al., 2003; Xu & Zhang, 2005).

Much of the research regarding ethical treatment of IENs in host countries has been qualitative in nature, describing the experiences of individuals after migration. No national database of RNs exists in the United States, and state level data collected by state



boards of nursing are inconsistent and lack many of the elements necessary for quantitative analysis. As a result, researchers seeking quantitative evidence of unethical treatment of IENs have turned to wage studies because they could use Current Population Survey or other national data collected about workers in the United States. Therefore, most nursing studies about discrimination segment the labor market by groups, for example, by race (white versus nonwhite workers), by gender (male versus female workers), and by union membership (McGregory, 2011; Spetz, Ash, Konstantinidis, & Herrera, 2011). Historically, researchers have studied nursing wages by market type (monopsony), by race and gender, and, more recently, by country of education (Huang, 2011b) or in comparison to other groups considered educationally comparable (teachers and more generally college educated individuals of both genders; Schumacher, 2010).

Wage setting by immigration status is not new to labor economic research. As early as 1881, researchers explored the influence of foreign workers on native labor markets (Borjas, 1986; Borjas, Freeman, & Katz, 1996; See the collected works of Borjas and Chiswick for excellent longitudinal studies and discussions of the impact of foreign labor on native labor markets). However, few studied the interaction of both gender and race (Blinder, 1973; Yap, 2010), and no studies were found in the literature addressing wage differences among IENs. Recently scholars studying wage differences between USENs and IENs concluded that, outside a preference for white male USENs, IENs are treated more favorably in the workplace than USENs (Huang, 2011a; Schumacher, 2010). This finding is disturbing for a profession in need of increasing and diversifying its ranks. Not only does unfavorable economic treatment of USENs dissuade new entrants to the

profession, but also lower wages for USENs may signal a lack of value for a U.S. nursing education. Equally disturbing is the conclusion that the U.S. labor market for nurses operates differently from other labor markets because of the number of women in the profession. The ramification of concluding that foreign women educated, as nurses are more preferred than U.S. women educated as nurses are reaches deeply into the psyche of those nurses and raises critical questions about the culture of U.S. healthcare organizations.

To address these concerns, I analyzed wages within IENs by “slicing and dicing” (Yap, 2010, p. 466) human capital, individual and market attributes, and their synergistic influence on IEN wages in the United States. Previous research compared wages of USENs and IENs as groups, controlling for human capital, individual, and market attributes. However, they failed to analyze wage differences within the IEN group itself, and some IENs may earn more favorable wages than others do. Those differences in wages may result in skewing wages for the group. Locating the source of wage differences within IENs is the first step to accurately analyzing wage differences between USENs and IENs.

Using the economic theory of discrimination (Becker, 1971) and controlling for human capital, individual, and market attributes, I regressed and then decomposed wages among IENs working in the U.S. healthcare system. In the sections that follow, I will present the theoretical foundation of this study and review the literature on wage discrimination in nursing. I also provide the rationale for the methodology for analysis of wage differences. I include an integrated review of the literature highlighting the

knowledge gap that the results of my analysis filled. A conceptual model of the relationship of variables grounds the chapter's contents.

### **Theoretical Foundation**

During the hiring and wage-setting process, employers try to offset the risks and uncertainties brought about by the lack of observable information about an employee (Arrow, 1998). An employer cannot know that any given employee will come to work on time, come to work regularly, and contribute to the success of the firm by meeting its needs for a particular skill set. To offset these risks, employers make decisions about hiring that may be based on assumptions (stereotypes) about, beliefs about, or experiences with certain groups (Arrow, 1998). Hiring decisions can also reflect institutionalized social structures of organizations as well as the preferences of employers based on class, gender, race, or other group memberships held by prospective employees (Charles & Guryan, 2008). Decisions about hiring and wage at entry based on employers' preferences or beliefs about an applicant's unobservable behavior are considered discriminatory (Stiglitz, 1973). All forms of discrimination lead to inequality in wage setting at entry and will affect the lifetime earnings of an individual. In the section that follows, I discuss major economic theories thought to contribute to disparity in RN wages. The theory section concludes with a critical evaluation and synthesis of the major theories presented.

### **Theories of Discrimination**

Theory allows researchers to model behavior and to make inferences from behaviors that are otherwise unobserved (Varian, 1992, p. 3). According to Varian

(1992), use of neoclassical economic theory allows researchers to develop insight regardless of the theory's own value or ability to relate disparate concepts, and can serve as "an antidote to introspection" (p. 7). This neoclassical approach assumes that events and preferences are independent of context. Thus, neoclassical economic theory is anchored in "methodological individualism," limiting the phenomena it can describe only to what can be observed (Coleman, 1990; Varian, 1992, p. 7). Neoclassical economics is concerned more with ideas and relationships that are assumed static. An example of this property is the rule of transitivity. Transitivity assumes that individuals order their preferences in a hierarchical manner that does not vary with context. For example, if an individual prefers A to B to C, then a neoclassical economist assumes that in the absence of A, B will be preferred over C; therefore, the individual makes a *rational choice*. An employer's preference is fixed, and one group is always favored above another (referred to as queuing; Toney, 2005). Neoclassical economic theories include statistical discrimination (Arrow, 1998; Phelps, 1972; Stiglitz, 1973), prejudice (Charles & Guryan, 2008), and a taste or preference for discrimination (Becker, 1971; Marshall, 1974; Shulman, 1996).

Neoclassical economic theory defines discrimination as the exercise of a preference that is accompanied by economic inefficiency (Becker, 1971). Economic discrimination occurs in a competitive equilibrium when an individual will pay or forfeit pay in order to work (or avoid working) with others (Becker, 1971). Becker (1971) theorized that the willingness to pay less (or more) for labor based on group membership can be measured by the difference in wages actually paid to those workers. In Becker's

(1971) theory of discrimination, employers who have a “taste for discrimination” are identified by the overt action of setting a lower (or higher) wage, depending on if an individual is a member of a group that is favorably or unfavorably viewed. Becker’s classic example is the wage setting process that favors whites over nonwhites. In Becker’s (1971) example, employers prefer white workers and will pay nonwhite workers a lower wage. Becker’s (1971) theory of discrimination does not attempt to explain why an employer would discriminate in this way, but given the socio-political climate in the latter half of the 1960s, it is easy to draw the conclusion that discrimination was an accepted social phenomenon of the times.

Becker’s (1971) theory of discrimination dominates the literature about the discriminatory behavior of employers. Becker’s original work was centered on racial discrimination and based on the assumption that some employers would pay a premium to avoid working with or hiring nonwhite employees (Becker, 1971). Some employees may also demand a premium for working with employees considered less desirable (for example, nonwhites; Goldin, 2002). This preference also extends to other groups or a class of individuals based on some observable difference and is most frequently associated in literature concerned with gender-segregated occupations such as nursing and teaching.

Stiglitz (1973) asserted that wage discrimination is present only if individuals with the same attributes are systematically associated with other noneconomic, individual characteristics (p. 287). Stiglitz was careful to draw distinctions between systematic wage discrimination and segregation, which he defined as “the organization of workers into

homogenous groups for the purpose of production:” (p. 287). Petersen and Saporta (2004) drew on Reskin’s (1998) definition of discrimination as the differential treatment given to applicants with equal qualification but differentiated by gender. Differential discrimination, when combined with the structural discrimination that occurs when procedures more favorable to one gender over another are combined with processes ensuring the equal treatment of men and women, expanded the concept of discrimination to issues of gender and may be further extended to include race as well.

The concept of information asymmetry expanded and added depth to discussions of differential and statistical discrimination (Arrow, 1998; Marshall, 1974). Information asymmetry refers to the information that is only available to an employer or employee. This asymmetry results in incomplete information between the two and introduces an element of risk to the hiring process. For example, there is risk to employers because of unobservable and unknown characteristics of an employee. These characteristics involve work habits, skills, and abilities that make an employee desirable for a particular job. Therefore, when both employer and employee equally know qualifications, the unknowns (risks) reside in individual characteristics of the other.

Arrow (1998) contended that to compensate for this asymmetry of information, employers make assumptions based on previous experiences with individuals or groups of similar individuals. These assumptions result in statistical discrimination. Therefore, setting expectations for employee qualifications in the form of credentialing or licensing is central to setting wages at entry. Licensure and credentialing therefore offset some of the uncertainty about minimum skill competency. However, since individual work

characteristics and behaviors remain unknown and cannot be observed absent experience with the individual after hiring, risks to employers are only partially mitigated.

In contrast to neoclassical economists, Phelps (as cited in Marshall, 1974) proposed that an employer's "perceptions of reality" (p. 855) play an important role in wage setting. This alternative to Becker's theory of discrimination, statistical discrimination (Phelps, 1972), is based on prejudicial beliefs or stereotypes about a group. For example, if an employer never had any contact with members of a group, then the stories he learned about that group formed his beliefs about them. For example, if an employer never knew any African Americans but had come to believe that they were unreliable or lazy, that employer would use that stereotype to offset information asymmetry at hiring and set a wage accordingly. Disparity in wage setting when hiring two individuals otherwise matched in experience, education, and skills based on differences (either racial, ethnic, or gender) is an overt behavior (an intentional and observable action) driven by covert beliefs and values that renders visible otherwise invisible individual preferences (Goldin, 2002). These prejudices result in discrimination at wage setting (Charles & Guryan, 2008). To address this inconsistency, Shulman (1996) proposed the use of a theory of discrimination based on a foundation of political economy.

Some major differences between the neoclassical and political economy approaches to discrimination make each more or less suitable for this study. First, the neoclassical approach is much more amenable to quantitative research (Shulman, 1996). Second, the focus of neoclassical theory is market behavior rather than individual

behavior. Third, in terms of neoclassical theory, the act of discrimination is designed to minimize risk or maximize utility (Shulman, 1996). For these reasons, Shulman (1996) asserted that neoclassical economic investigations of discrimination rely on the presence or absence of statistical discrimination as a proxy measure for prejudice or on human capital theory (the identification of differences between workers in terms of the investments they make in order to increase earning). Political economists, according to Shulman, focus on the way in which discrimination is institutionalized within society, that is, on the context of decision-making about wages rather than on the preferences of an individual decision-maker (Shulman, 1996). Because political economy encompasses the concepts of behavior, individual preference is dependent on context and relationships based on class, gender, race, and status. Thus preferences are not transitive as they are in neoclassical economic theory. Shulman (1996) asserted that a political economy approach to discrimination accommodates feminist, race, institutional, and other areas of study that are concerned with conflicts of class and the exercise of power.

Shulman (1996) contended that discrimination has been institutionalized and may not represent any conscious or deliberate effort to favor one group over another. The political economy theory of discrimination describes the mechanisms through which discrimination becomes institutionalized (or altered) and allows those mechanisms to vary. Institutions are conceptualized as complex adaptive systems that respond to their socio-economic and political environments (Shulman, 1996). When institutions no longer reflect the social norms of their environment, they are forced to adapt their reality to the expectations of the environment (Shulman, 1996). Shulman (1996) contended that in the



United States, discriminatory beliefs resulting in wage inequality have become institutionalized. A political economy approach, therefore, looks at the impact of government sanctions, social beliefs, and values on wage disparity over time, taking into consideration the secular and societal changes that are reflected through institutional behavior.

Credentialing and licensure are economic tools used to decrease information asymmetry about quality, skills, and knowledge. Increases in information decrease the uncertainty (risk) of hiring someone with unknown traits, skills, and behaviors. Increases in certainty lead to decreases in the costs associated with risk. It follows, therefore, that licensure and credentialing should both protect occupational and professional prestige and income and decrease discrimination by signaling relative ability. Goldin (2002) argued that discrimination could also represent a mechanism to protect employees' ranks from the entrance of others with less social or professional prestige. According to Goldin's theory of pollution, the preferred groups of employees (usually white males) demand a premium for working with less preferred employees (usually women or nonwhites).

Goldin (2002) considered her approach to be a hybrid of Becker's theory of discrimination and discrimination based on prejudice (statistical discrimination; p. 4). According to Goldin, males (or any other dominant group) are protective against incursions by other groups. Goldin asserted that men derive utility from their occupation through position and prestige. Therefore, despite shifting societal beliefs and attitudes

about the social value of their jobs, men must maintain their prestige even though their income may be decreased because of technological or other innovations.

Because society is the “arbiter of prestige” (Goldin, 2002, p. 7), entrants into a profession or occupation from other groups can signal that the profession has lost its standing (or become polluted). With enough entrants indicating that the occupation has become less rigorous or has been deskilled (proletarianized), all members of the profession lose social standing. Thus, beliefs about new entrants trigger a protective mechanism, and new entrants face wage penalties at entry. According to Goldin, this penalty serves to offset any loss of prestige. For example, as more women gained access to medical education, male physicians felt the dominance of their profession would be negatively impacted. In this example, prestige was lessened because of the perception that women who became physicians had fewer of the desired characteristics than male physicians (they lacked dedication because they desired more part time employment and fewer pursued specialty practices). In cases of pollution, either men were paid a premium to work with less desirable workers, or the less desirable workers were paid less.

Charles and Guryan (2008) found support for regional wage inequalities based on regional racial prejudices. These findings might help explain why Becker’s theory of discrimination holds in some regions more than others, where discrimination has become institutionalized. Stewart and Dixon (2010) extended the discourse on racial prejudice and subsequent economic discrimination in their research on the intersection of race and nativity based on the theory of a dual labor market. In a dual labor market, employers assign either primary or secondary employment to applicants based on human capital,

stereotypes, past experiences, or other factors that form the basis of employers' preferences. This segmentation results in the grouping of applicants by status (race, gender, and immigrant status), rather than by human capital attributes. Stewart and Dixon also found that immigrants in the secondary job market had higher levels of human capital than natives did. This condition led to crowding in of immigrants into positions for which they were overeducated. This type of occupational segregation was theorized to result from a combination of statistical discrimination based on employers' beliefs about sending countries and the penetration of immigrants in a particular market (Stewart & Dixon, 2010). Assimilation more likely plays a role in the case of statistical discrimination based on country of origin while social factors such as prejudice were more likely to be associated with the regional impact on wages secondary to group membership (gender, race, and religion; Stewart & Dixon, 2010).

Racial discrimination is ubiquitous (Arrow, 1998), but not purely economic in nature. Some social effects (for example, networks) make discrimination profitable as a nonmarket effect. The literature suggests that the presence of discrimination can be tested against unearned benefits of employees with comparable endowments (Blinder, 1973; Cotton, 1988; Oaxaca, 1973; Oaxaca & Ransom, 1994). Federal laws to the contrary, employers order their preferences for workers and pay them according to that preference (Chang & Walia, 2007; Charles & Guryan, 2008). In the nursing profession, there is a history of research demonstrating that male nurses earn higher wages than female nurses earn (Hayden, 2004; Hirsch & Schumacher, 2005; Jarrell & Stanley, 2004; Kalist, 2002; Stanley & Jarrell, 1998).

## **Human Capital Theory**

Becker (2002) defined human capital as “the knowledge, information, ideas, skills, and health of individuals” (p. 3) and contended that it is “the most important form of capital in modern economies” (p. 3). According to Becker, the increase in wages in the United States is directly proportional to the increases in education over the past 50 years and is responsible for the increased wage difference between high school and college graduates in the job market (p. 5). Human capital theory (Becker, 1994; Chiswick, 2003; Mincer, 1974) contends that workers enter the workplace with attributes or endowments that contribute to an individual’s capital (or value to an employer). Mincer theorized that education, training, and especially experience contributed to wage setting at entry. Chiswick and others demonstrated that for immigrants, experience in the host country (assimilation) built the human capital that enabled immigrants to overcome initial wage penalties related to lack of experience in the host country.

Human capital attributes in the form of credentialing and experience may serve as a signal to employers about employees’ quality and other unobserved characteristics (willingness to learn and motivation to achieve), increasing information to employers (Willis, 1986). According to Willis, when ability cannot be otherwise observed, the acquisition of credentials signals a “form of equality of relative ability” (p. 561). Two of the strengths of human capital theory, according to Willis, are that “human capital theory can be falsified by the theory of equalizing difference” (p. 561) and that, over time, results from human capital theory research have demonstrated their generalizability.

### **Critical Analysis of the Literature**

While the distinctions about discrimination made by neoclassical and political economists are both interesting and important, methodology proposed by neoclassical economists and human capital theorists lend themselves to a straightforward quantitative approach. The major criticism of Becker's theory of discrimination is the lack of a rationale for why an employer would want to disadvantage himself economically to satisfy a preference based on beliefs that may or may not hold true. Becker's critics pointed out that employers who paid a premium to preferred group members would quickly find themselves priced out of a market in which competitors who agreed to work with those groups kept costs down by paying lower wages. This handicap may not, however, hold true in regions where prejudices were institutionalized. One result of an institutionalization of preference is the development of occupational segregation, as was the case with railroad porters in the South. Another result is wage depression in areas where discrimination has become institutionalized.

Because human capital theory is presented as unitary theory, regional attitudes cannot be rightly included in the theory. In this case, institutionalized beliefs about groups either enhance or detract from the value that employers place on individual characteristics of workers. Likewise, human capital endowments may signal information about individuals, but those signals may not overcome employers' statistical discrimination behaviors, preferences, or the effect of individual attributes; for example, heavily accented English language pronunciations or variations in skin color. Walby (2007) discussed the impact of these disparate but simultaneous causes of wage inequality and

the resulting in social inequities as an *intersectionality* of complex adaptive systems (Walby, 2007).

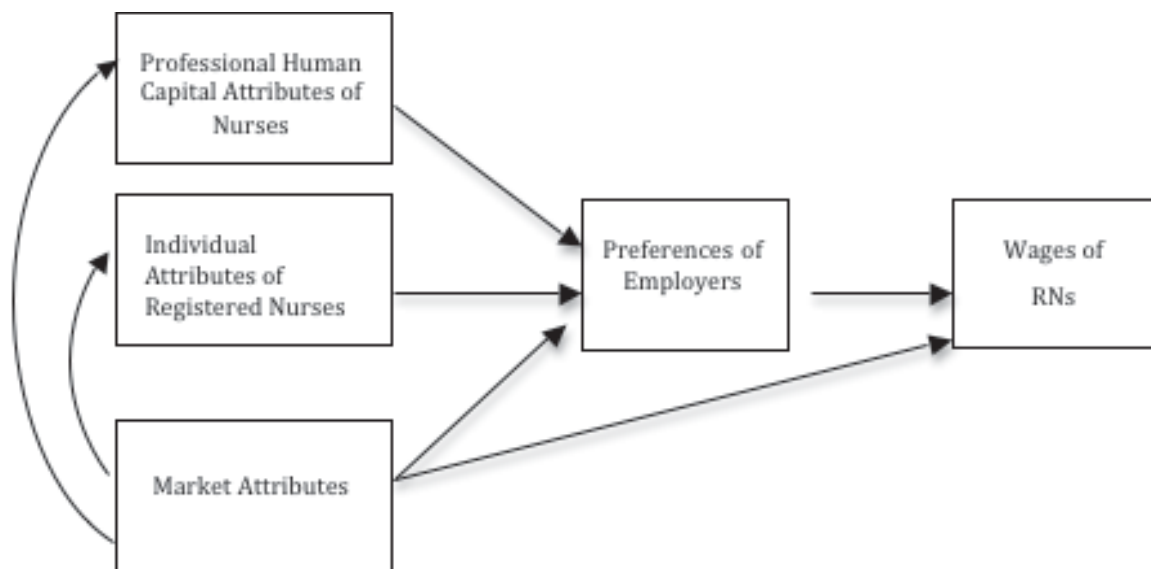
Walby (2007) asserted that anything less than a comprehensive approach to issues of social inequality marginalizes and overgeneralizes issues of class, gender, and race. Further, Walby argued that the reductionist approach inherent in neoclassical discrimination and human capital theories segregates and oversimplifies the complex social relationships of class, difference, and exclusion. Therefore, to accommodate a more robust approach, Walby suggested an exploring the intersections of dynamically interacting systems as sets of social relations. Looking at the causes of inequality through a non-hierarchical lens lends itself to a more complete analysis and an opportunity to effect real social change (Walby, 2007).

While the use of CAS theory is an attractive approach, it presents practical problems in terms of research. Too many variables explaining all of a phenomenon are not sensitive enough to provide meaningful explanatory data. The history of research on inequality and discrimination is robust but incremental. Few researchers ventured outside their theoretical domain to include human capital, discrimination, and assimilation factors to explain wage differences. Class, gender, ethnicity, and nationality comprise a “societization project” aligning institutions and addressing their “complex inequalities” (Walby, 2007, p.462). An integrated approach is particularly applicable in an era of globalization with its focus on social change because “class, gender, and ethnicity are complex adaptive systems that coevolve” (Walby, 2007, p. 462). While Walby contended that complexity theory provides a more robust analysis of “social interconnections with

reductionism” (p. 467), she failed to provide an example of a research approach that would accomplish the task. However, consistent with Walby, this study combined economics (class), gender, race, and country of education within the context of wage inequality through traditional wage decomposition methods by including class, gender, race, and country of education in an econometric model.

### **Conceptual Model**

The conceptual model (Figure 1) brings together the different social, organizational, economic, and individual variables that affect the determination of nursing wages. Variables in the model are divided into subgroups that differentiate attributes hypothesized to influence wages in the market for nursing labor. Professional attributes are human capital endowments (investments) made by nurses with an expectation of higher wages based on higher credentials or the acquisition of additional skills and knowledge (Mincer, 1974). Examples of these variables include current nursing preparation or planned education, secondary degrees, experience as an RN, and work interruptions. Individual attributes are those characteristics that are not choices such as gender and race, as well as life choices made by an individual such as marital status, having children, and geographical location (Becker, 2002). Market attributes are market characteristics and conditions that are known to influence wages. Examples of these attributes include supply and demand for nursing labor, rural or urban location of organization, healthcare business sector, and competition.



*Figure 1.* Conceptual model of registered nurse wages using discrimination, human capital, and neoclassical economic theories (Hayden, 2012)

The model indicates that market attributes are the primary driver of wages earned by registered nurses. The market demand for specific human capital endowments and preference for some individual attributes such as race, can drive the acquisition of skills and knowledge, and reflect social norms and business realities. Under conditions of labor market equilibrium or an oversupply of nurses in the labor market, employers' preferences for professional and individual attributes are hypothesized to mediate hiring and wage setting. However, when demand is high and supply is low, or market competition is strong, employers' preferences are not expected to mediate hiring and wage setting; employers' preferences will be considered a luxury. The current study tested only the influence of the professional attribute of country of education and the individual attributes of race and gender on wages of IENs while holding constant all other human capital, individual, and market attributes.



### **Review of Related Literature on Discrimination and Nursing Wages**

Historically, research on wage differences among and between workers focused either on gendered occupations such as nursing and teaching or skilled versus unskilled workers. Unexplained differences were assumed to be due to employers' tastes and preferences. An excellent example of economic discrimination occurs in gender-segregated occupations such as nursing. Men might demand a premium to work within a female dominated profession, or employers might offer a smaller wage to men in a profession where women are considered more desirable. The discrimination is based on an individual preference (or taste); therefore, the reason for wage discrepancy is not based on the ability of an applicant to perform the work, but on other attributes or characteristics not related to performance.

In their reviews of the literature and meta-analyses of 104 gender wage decomposition studies, Stanley and Jarrell (Jarrell & Stanley, 2004; Stanley & Jarrell, 1998) reported that, although declining over time, the gender wage gap was a persistent feature on the labor market landscape. Hirsch and Schumacher (1995, 2005, 2008; Schumacher, 2010; Schumacher & Hirsch, 1997) are perhaps the best-represented authors in the literature on wage differences in the nursing labor market. In 1997, these authors concluded that the premiums paid to hospital nurses were specifically related to job attributes, workplace characteristics, and worker characteristics; in particular, shift work, union activity, and intellectual ability (human capital endowments) rather than gender itself.

Hirsch and Schumacher (1995) also rejected the assumptions that efficiency wages and monopsony power drove up wages of hospital nurses. Macpherson and Hirsch (1995) found support for a theory of devaluation in which women's work is considered less valuable than the work done by men. These findings supported Goldin's (2002) work on pollution theory in which gendered work, rather than worker gender, could be viewed as an example of prestige (or lack thereof).

The concept of a monopsony market provided an economic foundation for research about nursing wages. Schumacher (2001) examined the role of supply and demand for nurses as mediators of wages as the market reaches equilibrium. Schumacher (2001) concluded that if the supply function is elastic, then wage structure is dependent on the suppliers of labor (RNs) rather than the demand of employers. This supply-side thinking supports the common conception of substitution between nurses (homogeneity of skills). Schumacher's conclusions also supported role for demand-side factors. In health care, the demand-side impetus comes from the monopsonistic nature of health care organizations in communities (Schumacher, 2001). Schumacher found a role for monopsony in nursing wages because along with increasing numbers of vacancies in hospital nursing positions, there were substantial declines in earnings related to worker returns in hospitals. This finding indicated that the usual supply and demand relationship does not influence nursing wages in times of high vacancies.

### **Search Strategy**

A comprehensive search strategy was used to locate relevant articles related to wage discrimination among nurses. Multiple databases were used to locate published and

unpublished studies and dissertations that were conducted in the literatures of economics, health services, human resources, political science, nursing, business, and migration for the years 2000–2012. Databases included CINAHL, Academic Premier, OVID, PROQUEST, SCIRUS, GOOGLE Scholar, JSTOR, MUSE, and Emerald. Keywords used included *nurse*, *wages*, *wage inequality*, *wage discrimination*, *wage disparity*, *human capital*, *discrimination*, *mobility*, and *immigrant* singly and in combination. Any recent research that used human capital, assimilation, and discrimination theories to explain wage inequalities in nursing were included. With the exception of dissertations, only articles that were peer reviewed and appeared in scholarly journals were included. I reviewed 247 relevant articles for inclusion. Only seminal research and studies conducted within the last five years are included in the following review of literature.

### **Wage Discrimination in Nursing**

Kalist (2002), looking for evidence of a persistence of wage inequality among nurses, reported an unexplained gap of \$4825; representing almost 90% of an unexplained wage gap between salaries of male and female nurses in the United States. Using the 1992 and 1996 NSSRN public use data files to analyze gross annual salary, Kalist (2002) found that male nurse salaries grew 4-6% faster than the salaries of their female counterparts. Using data from 1992, Kalist used a *t* test to find differences in earnings and human capital endowments between two groups of nurses selected on gender. He reported a statistically significant difference in the natural log salary, the independent variable ( $p < 0.01$ ,  $n = 28,955$ ) (Kalist, 2002). Human capital endowments that had statistically significant differences between the two groups included having an

associate's degree in nursing (ASN), years of experience (and experience squared), being married, and self-employment ( $p < 0.01$ ). Kalist reported that three work settings (tertiary care, long-term care, and ambulatory care) all had differences that were statistically significant ( $p < 0.01$ ). Statistically significant differences in wages based on organizational position were reported with group members in administrative, middle management, nurse specialist/nurse anesthetist, and staff positions being significant at  $p < 0.01$ . Earnings regressions for 1992 demonstrated that education level, coupled with work setting and organizational position, explained 42.8% of the variance for the pooled sample ( $F = 271.92$ ,  $n = 28955$ ) and 41.5% and 57.7% for females ( $F = 243.08$ ,  $n = 26990$ ) and males ( $F = 34.89$ ,  $n = 1965$ ), respectively.

Kalist (2002) also reported that the OLS regression analysis for the pooled and female samples had statistical significance at  $p < 0.01$  for all included variables while the sample for male nurses failed to be significant for race (white), marital status (married), and ASN level of education. Work setting variables for tertiary and long-term care were significant at  $p < 0.01$ . These variables, when decomposed using the BO decomposition equation, contributed 11.63% to differences in earning between the two groups. Kalist concluded that he may have found some evidence of statistical discrimination but differentiated this from the employers' preferences that Becker theorized despite the equality of outcome on earnings.

Building on the work of Kalist (2002), Jones and Gates (2004) also found evidence for gender wage discrimination in their wage decomposition using year 2000 data from the NSSRN. The purpose of their study was to see if wages favored male

nurses and if any difference identified was large enough to attract males to enter the profession. They hypothesized that any wage premium paid to male nurses would be a function of discrimination or represent a wage premium to induce male entrants into the profession during a time of labor shortage (Jones & Gates, 2004, p. 621).

Rather than an OLS regression model, Jones and Gates (2004) used feasible generalized least square (FGLS) regression to control for heteroscedasticity coupled with the BO wage decomposition equation as refined by Holtmann and Idson (Jones & Gates, 2004, p. 621). This analysis showed that male nurses ( $n = 1518$ ) were paid a premium of 2.7% over female nurses ( $n = 22553$ ;  $p < 0.01$ ); nonwhite women received 6% ( $p < 0.01$ ) more pay than white women while IENs earned 3% higher wages than USENs ( $p = 0.05$ ). Lower levels of education were negatively associated with earnings ( $p < 0.01$ ) as was experience squared ( $p < 0.01$ ). As in Kalist (2002), organizational role and work setting were also related to wages. Jones and Gates included market region in their regression analysis, all markets being significantly and inversely related to wages ( $p < 0.01$ ) except for the middle Atlantic region, which was not significantly related and the Pacific region, which was positively related to higher wages ( $p < 0.01$ ). This model explained 29% of the variance in wages for the pooled sample ( $F = 199.71$ ); 37% of the variance for males ( $F = 19.86$ ); and 28% of the variance for females ( $F = 184.91$ ).

Jones and Gates (2004) concluded that Kalist (2002) both overstated the difference and underestimated the impact of experience on earnings. Male nurses, according to Jones and Gates, had more earnings related human capital endowments than their female colleagues but a substantial portion of their earnings incomes remained

unexplained by variables included in the model. In their analysis of returns to experience, Jones and Gates found evidence to support the presence of wage compression in the nursing profession (32% for males and 26% for females 22 years after entry into practice).

Looking at the interaction between theories, Toney (2005) used human capital, neoclassical economic and queuing theories to explain RN earnings. Separate regression equations were formulated to predict earnings based on each theoretical construct. Using the variables that were statistically significant in initial regression analyses, a full OLS regression model was used to determine the variables that were able to provide the greatest explanation for the differences in earnings among 15,100 full time RNs who responded to the 2000 NSSRN Survey Questionnaire. Following testing of the full model, Toney (2005) conducted a Confirmatory Factor Analysis (CFA) with a Varimax rotation. She found strong support for the three theoretical constructs and was able to validate the importance of the independent variables she selected for her regression analysis (Toney, 2005).

Historically, queuing theory in employment studies demonstrated that employers prefer white men, followed by nonwhite males, white women, and nonwhite women when making hiring decisions (Toney, 2005). Supporting the findings of Jones and Gates (2004), Toney found that this employer queuing preference does not hold in nursing. Toney reported that while white men retained their position of preference, they were followed by minority RNs, IENs, and lastly, white female USENs. In this study, human capital variables of education and experience explained 20% of a nurse's wage while

demand theories explained 43% of nurse wages (Toney, 2005). Toney concluded that, in general, nurses are not rewarded for their human capital attributes.

Lastly, Toney (2005) looked specifically at IENs ( $n = 529$ ) compared with all other nurses ( $n = 145711$ ). OLS regression analysis revealed that the combination of gender, race, and country of nursing education explained only 2% of the earning variance among nurses (Toney, 2005, p. 101). In her analysis, IENs, on average, earned \$4316 more annually than USENs ( $p < 0.01$ ), which she translated as a 10% wage premium. Using the regression wage decomposition approach suggested by Jones and Gates (2004), Toney found that female nurses earn 11% less than male nurses. In terms of returns to human capital, Toney found that white nurses were advantaged in terms of qualifications, but that this advantage was offset through the interaction of other variables. These findings may suggest that the industry's efforts to promote diversity in bedside caregivers influences wages at entry but are counterintuitive when considered within the context of wage differentials in the literature on skilled professional immigrants.

Hirsch and Schumacher (2008) performed a wage analysis for RNs in the United States using Census Population Survey (CPS) data combined with data from the Occupation Information Network (O\*NET). The purpose of their study was to determine if wage differences, overall, contributed to what is commonly perceived as a chronic shortage of nurses working in the healthcare industry. The authors hypothesized that the traditional OLS regression model for wage analysis were less sensitive than those using a propensity score matching approach. Hirsch and Schumacher found that wages were influenced by unobservable skills and knowledge (SK) as well as working conditions

(WC) as reported in O\*NET when compared with a control group of college educated individuals. For the case of gender, Hirsch and Schumacher argued that because the SK and WC for RNs contain both male and female work preferences and job attributes, using a mixed-gender control group was a reasonable approach. Hirsch and Schumacher compared a non-parametric analysis with a Mincerian semilog regression model to determine the accuracy of each approach.

Using the CPS Outgoing Rotation Group (ORG) for January 2005 through June 2008, data were matched between RNs ( $n = 11514$ ) and a control group of other college educated workers ( $n=190119$ ). Hirsch and Schumacher (2008) then matched RNs ( $n = 8292$ ) to a control group of college educated workers ( $n = 135593$ ) using indices they created from O\*NET data on SK and WC. The authors used CPS data in a log wage regression model to measure differences in wages between the two groups. Education, gender, location, migration status, and race were used to regress wages. The authors concluded that the effect of the predictor variables was small (.220 log points) and, when compared to the control group, RNs are “paid well” (Hirsch & Schumacher, 2008, p. 10).

Based on their initial findings, Hirsch and Schumacher (2008) then added the O\*NET indices for SK and WC to the findings from the wage gap analysis. They found that the addition of these indices reduced differences overall. Specifically, using the mixed gender approach, Hirsch and Schumacher reported positive but not statistically significant findings when WC was added as a log measure to the CPS log of wage difference. When samples were divided by gender, the findings were negative but not statistically significant. However, gender-specific groups demonstrated a difference.



When a male control group was used, wage differences were small (.008 log points). These findings were inconsistent with a women-only group where the gap was higher (.257 log points) but not statistically significant. These findings led the authors to conclude that when controlling for job attributes such as skill and knowledge, differences in wages declined (Hirsch & Schumacher, 2008).

When compared to the propensity score-matching model, Hirsch and Schumacher (2008) found that the traditional Mincerian OLS regression equation offered no additional value over the mean wage (or log) approach. This finding led the authors to conclude that a Mincerian approach not only fails to improve on the findings obtained through nonparametric analysis, but may actually inflate wage gaps. However, their findings added little understanding about the differences in wages among individual RNs based on human capital endowments or about employers' preferences in hiring.

Schumacher (2010) compared the wages of native and immigrant nurses working in the U. S. health care system using data from the Current Population Survey (CPS) and NSSRN data from 2004. Using the 2004 NSSRN data in a regression wage equation, Schumacher accounted for human capital endowments between immigrant and native RNs. Supporting previous work by Borjas (1986; Borjas et al., 1996), Schumacher found that immigrant nurses from more developed countries (MDCs) faced a smaller penalty than those from less developed countries (LDCs). This penalty disappeared after several years. Schumacher presumed that the equalization of wages demonstrated the influence of assimilation on wages. Wage penalties also differed by country of origin (Schumacher, 2010). Schumacher did not break his samples down to look at the effect of gender wage

penalties, which, given historical inequality, might have influenced his overall results. While he reported the wage penalties by country (Canadian RNs faced the least penalty and Indian RNs the most), Schumacher did not draw any conclusion regarding the impact of color on those penalties.

Following his determination of wage differences using worker attributes from the 2004 NSSRN, Schumacher (2010) used CPS data to evaluate the impact of immigrants on wages of native registered nurses (RNs). He used an interaction term between market penetration (percent of immigrant RNs), a dummy variable for RNs and for other college-educated women not employed in health care, and found that a minimal dampening of wages could be attributed to immigrant RNs. Because Schumacher did not report on the statistical significance of these findings, no inferences could be drawn.

Using human capital theory, Buhr (2010) looked for evidence of wage discrimination among female nurses in Canada. Specifically, Buhr analyzed the impact of nurse immigration on the wages of native Canadian RNs. Buhr assumed that credentialing exerted an equalizing impact on wages and hypothesized credentialing levels the playing field and that nurse immigrants would pay no wage penalty related to migration. Following Schumacher (2008), Buhr used a Mincerian equation to regress data from the 2001 Canadian Census on Individuals (CCI). Three populations were compared: Canadian natives who obtained their nursing education in Canada, immigrant nurses who obtained their nursing education outside of Canada, and immigrant nurses who obtained their initial nursing education outside of Canada but earned subsequent degrees in Canada after immigration. When compared with Canadian RNs, immigrant RNs who earned their

nursing degree outside of Canada experienced a 9% wage penalty (Buhr, 2010).

However, immigrant nurses from MDCs faced only a 4% wage penalty when working in Canada (Buhr, 2010).

Buhr (2010) also found that nurses, who self-identified as a visible minority, experienced an 11-13% wage penalty. A 7% penalty was identified for immigrant RNs with Canadian education, but this finding did not reach statistical significance. Education as a BSN was correlated with a 12% wage benefit (Buhr, 2010). Like Schumacher (2010), Buhr found that returns on human capital investments were related to length of time working in country. This finding provided support for the hypothesized relationship between length of time in-country and assimilation effects. This relationship indicates that years of experience working in the host country are a reasonable proxy measure for assimilation effects.

Using a longitudinal approach, Kalist, Spurr, and Wada (2010) studied the impact of immigrant RNs on market wages and the elasticity of substitution for nurses from 1980 through 2000. Kalist et al. reported that Goldin found an inverse relationship of immigrants to native wages in that a 1% increase in the immigrant labor force decreased wages by 1 – 1.5%. Using a regression analysis, the authors used a cross-sectional approach to determine the presence of a wage effect related to the number of immigrant RNs at the regional, state, and county levels. Kalist et al. followed Borjas (1996), and separated workers into groups with like factors at the national level to determine the elasticity of substitution. These authors assumed that the market for nurses exists at the state, rather than regional or national levels. This assumption makes intuitive sense

because professional practice is defined, and RNs are credentialed, at the state level. For the years between 1984 and 2005, the supply of RNs in a state was comprised of 49.5% state residents, 44% native RN migrants, and 6.5% RNs whose education was not in the United States (IENs).

In controlling for endogeneity, the findings of Kalist et al. (2010) were even more pronounced. They posited that this effect might be due to the concentration of immigrants at the county level due to the effects of immigrant networks. Immigrant networks occurred due to market conditions that led to higher wages overall. This finding was supported when the authors looked at the elasticity of substitution of RNs in a state. They found that a 5% increase in wages increased the population of immigrant nurses by 10%. However, after regressing human capital endowments against the log of mean wage, Kalist et al. found a negative and statistically insignificant relationship between RN wages and the penetration of immigrant RNs into a geographic area. The authors concluded that the entry of immigrant RNs neither displaced resident RNs nor decreased the number of in-migrant native RNs (Kalist et al., 2010).

While Kalist et al. (2010) initially found strong support for Goldin's findings, the authors concluded that, overall, there was no detrimental effect on nursing that could be attributed to the penetration of immigrant RNs into a market. However, since immigrant RNs enter markets where demand is high and native supply insufficient, higher wages for all nurses could be expected in a capitalist market or, as hypothesized by Spetz et al. (2011), could be an effect of the monopsony position of employers where there is an intention to control the marginal cost of each additional employee.

McGregory (2011) looked for a mediating impact of union membership on wage differences among nurses based on race. He hypothesized that any monopsony power of employers would be mitigated by the effect of unionization on employer freedom to use preference-based wage setting strategies. Using data from the Current Population Survey- Outgoing Rotation Group (CPS-ORG) 1994-2006 ( $N = 20,842$ ), McGregor conducted a regression analysis using the Heckman-Lee correction for selectivity bias based on union endogeneity. McGregor created a matrix variable ( $Z$ ) to account for human capital and regional variables. Independent variable  $T$  was created to capture changes in wage determination due to secular influences (McGregory, 2011). To capture the influence of unobserved worker variables on the wage earned, McGregor included a variable that represented an inverse Mills ratio and another variable that accounted for probability and cumulative densities among workers.

When all variables were controlled, McGregor (2011) found that a 6.12% penalty accrued to nurses who are nonwhite as compared to Caucasian nurses. Additional findings revealed that nurses who are black and not union members accrued a 7.58% penalty when compared with nurses who are white and non-union members, but that union members earned a premium of 12.18% when compared with non-union members. Black nurses in unions faced a wage penalty of 0.85% when compared with their non-black colleagues who were also union members. McGregor concluded that unions provided an effective countervailing effect to monopsonist employers who are able to indulge their preferences for discrimination in hiring.

Spetz et al. (2011) looked at the effect of unionization on the wages of RNs working in tertiary care organizations. These authors used CPS data to regress human capital and demographic data against wages for unionized and non-unionized nurses. They found that unions controlled for wage penalties based on gender, race, and immigrant status but that those penalties were not statistically significant at the 5% level. Spetz et al. reported a significant wage penalty for nurses whose preparation was at the diploma level. This finding may support the presence of a wage penalty based on education, a major contributor to human capital. Based on the findings in this study, unionization is expected to decrease the importance of human capital endowments on wages in general. A matrix of literature reviewed appears in Appendix A.

### **Synthesis and Critical Analysis of Literature on Wage Decomposition**

#### **Synthesis of Findings**

Despite the claims of some scholars and researchers to the contrary, there is evidence to support the conclusion that gender and race based wage discrimination currently exists in nursing. This literature review revealed three important findings about wages as they affect nurses. First, salaries for women remain lower than those of men. Second, women of all races realize lower salaries than men do, regardless of race (Durden & Gaynor, 2000; Hirsch & Schumacher, 2005). Third, nursing wages have remained flat overall but tend to favor men (Jones & Gates, 2004). Therefore, it is reasonable for nurses to be concerned about wage protections. Despite these findings, there remains debate as to whether immigrant nurses face a wage penalty or, if, despite their immigrant status and nonwhite ethnicities, they experience favorable discrimination.

Buhr (2010) and Schumacher (2010) both reported a relationship between variations in color and wages. Buhr reported that darker skinned IENs in Canada earned lower wages than lighter-skinned IENs. Schumacher reported that nurses from MDCs (mostly European and white) earned more than did nurses educated in LDCs (mostly nonEuropean and nonwhite). Hersch (2010) supported these findings, but maintained that lighter skinned individuals are more preferred by employers than those with darker skin are. The work of these authors, when taken together, indicate that variation in skin color may play a role in employers' preferences and that country of education might provide a reasonable proxy measure for this phenomenon.

In addition to variations in skin color, the literature reviewed drew a cohesive portrait of a gender-segregated occupation that continues to prefer white male RNs, despite a change in queuing preference. IENs have moved up in queuing preference and are now preferred over nonwhite USENs. According to research findings over the past five years, white female USENs now hold the least preferred place in employers' preferences. This queuing preference runs counter to other occupations with the exception of teaching, another gender-segregated occupation (McGregory, 2011).

### **Critical Analysis of Literature**

Schumacher (2010) did not address issues of race or nationality; however, parallels might be drawn from wage literature looking at historical wage discrepancies between white and non-white workers in the United States as well as in research exploring the impact of sending country on wage setting. Additionally, no studies were located that included the impact of specific sending countries nor studied the prejudicial

attitudes within a region and their potential impact on wage setting for nurses. These shortcomings support Walby's (2007) claim that inequality studies are reductionist and ignore the interaction of multiple contexts on wage setting at entry.

Another common deficiency of wage studies found in the literature is the impact the Cost of Living (COL) on wages (Lacey & Nooney, 2006). While some studies included geographical regions and differentiated between rural and urban locations, according to Lacey and Nooney, none have discussed the impact of COL and its relationship to regional wage differences. This omission means that the impact of differences in earning power has been a neglected variable and overall, wage difference comparisons between regions might have overstated the actual impact of those differences unless researchers made some adjustments for purchasing power. Additionally, none of the cross sectional studies included in the review of literature reported adjusting for inflation across time.

Spetz et al. (2011) found support for unionization as a tool for obtaining wage equality; however, no studies validate their findings, taking into consideration COL or regional differences in attitudes. It is therefore possible that the prevalence of unionization among nurses occur in geographic locations where cost of living typically outstrips purchasing power or where additional overtime or shift work is required to maintain an adequate standard of living. This might be the case in geographic areas such as New York and California, but not in geographic areas where costs of living are typically lower, for example, more rural areas. If Kalist et al. (2010) are correct and nursing wages increase by 1.3% with each 1% increase of IENs in a market, then



unionization may be a protective market mechanism for USENs to prevent any reverse discrimination that favors IENs over native workers. However, regional prejudices may also play a covert role in wage setting in those markets where discrimination has become institutionalized (Charles & Guryan, 2008).

Assimilation effects may also affect wage setting at entry into a job. If an IEN comes from a location considered highly equivalent to the United States, such as Canada, the years of experience practicing in the United States might not be as important as they are for IENs from countries where culture, education, language, and health care practices are considerably different (for example, India; Schumacher, 2011). Given the circular migration patterns of IENs that may bring them to the United States from countries other than their country of birth and education (Kingma, 2006; O'Neil, 2003), segments of the IEN population may have already countered the assimilation effects that tend to equalize wages with USENs (Gidwani & Sivaramakrishnan, 2003; Kingma, 2001, 2006). Huang's (2011) findings found support for assimilation effects and the cumulative impact on wages for nurses who emigrated from countries that are similar to the United States in culture, language, and values.

None of the current literature drew on the data available from the 2008 NSSRN and no previous studies reported on the differences in IEN wages by gender, race, or country of education. Kalist (2002) found support for the persistence of a gender wage gap in nursing validated by Jones & Gates (2004) and Hayden (2005) using data from the 2000 NSSRN. It is important to know, however, if wage discrimination in nursing based on location of education extends to the gender and race of the IEN. Arhends-Kuenning

(2006) found that a higher than average percent of IENs are male than is found in the domestic supply of nursing labor. It is possible that the increased numbers of men skew wages for IENs as a group, giving the appearance of a wage premium. This is especially true if a higher number of male IENs come from European countries or are white. The lack of examination of the IEN group as a whole means that researchers have failed to account for employers' preferences within the IEN population. IEN wages may, in fact, be more a function of race and gender than country of education.

In the literature reviewed, none of the authors who concluded that employers' preferences operated differently in the market for nursing labor discussed the impact of this preference on domestic schools of nursing (Jones & Gates, 2004; Kalist et al., 2010; Schumacher, 2010). Jones and Gates, Kalist et al., and Schumacher drew conclusions of preference, without any critical discussion of possible rationales for this employer preference. The lack of discourse on this finding is startling. If employers prefer RNs educated in countries other than the United States what does that preference signal about the value of a domestic nursing education? Why would such a preference exist in the market? Do employers' preferences signal a weakness in the U. S. nursing education system? Failure to discuss the impact of this conclusion on domestic nursing education represents a shortsighted approach to the findings reported by these authors. Absent slicing and dicing wages among IENs, little more can be determined than unexpected results were reported and replicated. Perhaps the replication of these results stems from a systematic error in the treatment of IENs as a homogenous group. Studies included in the literature shared other weaknesses. Studies did not address the impact of shift work or

secondary positions on earnings. Occupational segregation and shift work can understate wage gaps in highly skilled occupations (Hegewisch et al., 2010; Hirsch & Schumacher, 2008). These variables need to be addressed before a full and complete understanding of wage inequality among can be achieved.

A significant change in 2008 NSSRN sample methodology also impacts strength and accuracy of earlier results that used NSSRN data collected between 1977 and 2004. An additional concern that stems from the use of the sampling methodology used between 1977 and 2004 was that younger nurses were underrepresented in earlier surveys (Fritz et al., 2010). These shortcomings were addressed in the 2008 methodology. In 2008, sample selection was changed from a design that clustered on last name (Fritz, DiGaetano, Green, & Clark, 2010) to one that produced a more representative sample. Changes in oversampling strategies, how missing responses were handled, new post stratification imputation processes, and the point at which responses were weighted resulted less biased sample (Fritz et al., 2010). Because of these changes in sampling design and methodology, results of studies using the 2008 data may not be comparable with data using earlier surveys.

### **Methods to Decompose Wages**

Becker's (1971) initial work served as the foundation for the development of an econometric analysis of wage discrimination by Oaxaca (Blinder, 1973; Oaxaca, 1973). The Blinder-Oaxaca (BO) decomposition model proposes that unexplained differences in wages provide evidence of employer discrimination. Goldin (2002) argued that because wage decomposition looked only for evidence of discrimination *ex post facto*, the

approach served only as an indicator of an unobservable behavior when in actuality, calculation of the marginal utility of a worker allowed economists and researchers to study the observed action of employers. While the distinctions about discrimination made by neoclassical and political economists are both interesting and important, methodology proposed by neoclassical economists lend themselves to a quantitative approach that makes good use of the data provided by HRSA.

### **Regression-based Analyses**

Economic theories rest on the assumption that relationships are linear and not interdependent. Regression analysis reflects the Mincerian wage equation well because the analysis looks at the intersection of variables along a continuum. A predictive analytical tool, OLS regression, allows researchers to classify scores based on variables. In human capital theory, these variables represent worker endowments that interact to make workers more or less likely to meet employers' expectations. The BO decomposition builds on OLS regression in that it allows researchers to decompose regression findings to locate the variables that explain differences in wages. Once those variables are identified and the difference quantified, the remaining (unexplained) difference is assumed to be due to employer preference; thus providing evidence of discrimination. In both economic and nursing literature, OLS regression-based analysis is the preferred statistical analysis tool when determining wage inequality.

### **Wage Decomposition**

**BO wage decomposition method.** Blinder (1973) and Oaxaca (1973) introduced a wage decomposition method (BO) that divided earnings into two groups: difference and

endowment. The wage differences between group members were based on the identification of the preferred group (usually white males) and the amount of earnings experienced by less favored groups. The difference equation has been the topic of the much debated identification problem. The endowment group, based on human capital theory, looks for the sources of identified differences within endowments (gender, education, and skill) and attributes of work context (region, metropolitan areas, and impact of unionization). The traditional BO decomposition methodology is suspected to conceal a selectivity bias and is, therefore, often paired with a Heckman correction. Recently, scholars have reported that inclusion of a Heckman correction yielded no difference in their findings or in the over or understatement of differences in earnings (Fisher & Houseworth, 2009; McGregory, 2011). Despite persistent questions about bias and sensitivity in the BO decomposition, Zhao and Shyr (2009) found that the seminal papers published by Blinder and Oaxaca were cited over 1,000 times in the Social Sciences Citation Index (p. 159) and the methodology is accepted as the standard for identifying and locating wage differences.

Nopo (2008) contended that the BO decomposition model is based on a counterfactual for discrimination and asks, in effect “What would a male earn if the compensation scheme for his individual characteristics align with that of a female?” (p. 290). The method assumes that components of difference (observable and unobservable) are related to market discrimination and that results are based on average or mean differences (Nopo, 2008). Nopo asserted that a major weakness in use of the BO decomposition method is its inability to account for characteristics that cannot be

compared between the genders and that therefore, genders may not be comparable using the BO decomposition method. Because of this misspecification, Nopo contended that the BO decomposition method overstates differences in rewards between genders but is silent on the distribution of those rewards.

According to Zhao and Shyr (2009), the BO decomposition method has three major weaknesses. First, the equation uses two regression measures to identify one form of discrimination and cannot be considered a parsimonious model. Second, the equation uses categorical variables. Third, and perhaps most important, Zhao and Shyr asserted that because the decomposition results in percentages, the statistical significance of those findings cannot be established. However, Zhao and Shyr agreed that a methodological strength of the BO decomposition is that the differences and endowments clearly flow from independent variables (IVs) and identify differences from both the constant and the IVs. This strength, however, depends on the clarity of thought of the researcher because misspecification can occur with omitted variables or the inclusion of confounding variables (Zhao & Shyr, 2009).

**Extension of traditional BO model.** Cotton (1998) and Neumark (1998) extended the traditional BO decomposition model through the assumption that a wage premium is paid to the preferred group and a wage penalty experienced by the less favored group. The Cotton-Neumark extension (CN) assumes that the true wage lies between these the wage premium and penalty. To identify differences Cotton and Neumark pooled regressions using coefficients to create unique values for both difference and discrimination (Zhao & Shyr, 2009). However, Zhao and Shyr contended that the CN

decomposition model is “hampered by the lack of sufficient investigation of its accuracy” (p. 160).

### **Summary of Methods**

OLS regression coupled with decomposition analysis is the most commonly used and widely accepted approach to the study of wage difference among workers within groups. This quantitative statistical approach allows researchers to identify, quantify, and predict differences. For human capital and discrimination theorists, this quantitative approach allows identification and quantification of those specific attributes or conditions that are most related to unexplained differences in earnings.

Following the conceptual model presented at the beginning of this chapter, an OLS regression analysis will identify human capital endowments, individual, and market attributes that influence nursing wages. Because some market conditions override individual employer preferences and queuing behaviors, conditions of market disequilibrium will render employer preference irrelevant. The regression analysis is designed to identify markets in which employer discrimination is a luxury that cannot be supported in a capitalist market. Following the regression analysis, statistically significant endowments and attributes will be decomposed using the BO decomposition model with the CN extension. Oaxaca’s development of the decomposition methodology was designed specifically to analyze data in a manner that supports Becker’s (1971) theory of discrimination. Therefore, the combination of these two analytical methods will demonstrate the presence or absence of employer discrimination at wage setting for IENs.

### **Synthesis and Critical Analysis of Literature on Methodology**

Stanley and Jarrell (1998) found that the use of the Oaxaca decomposition provided stable findings without the use of a correction method for bias. Madden (2000) contended that the problem with the approaches of Blinder, Oaxaca, Cotton and Neumark was that these researchers looked at discrimination only after a worker's entry into a labor market. Madden posited that access to the job market itself was discriminatory and therefore, any measure of difference in wages had to be looked at in terms of selection into the market before it could be valid.

In their comparison of the two decomposition models, Zhao and Shyr (2009) found that the CN decomposition model was more parsimonious but that both models produced unbiased estimates of discrimination. Therefore, Zhao and Shyr did not find it necessary to use both models to identify discrimination. When tested against a regression model in a simulation, the decomposition models demonstrated unbiased estimates of discrimination but had larger variance in error terms, leading Zhao and Shyr to conclude that decomposition models are less efficient than regression models in detecting discrimination (p. 169). Zhao and Shyr concluded that if identical model structures are assumed, BO, CN, and regression analysis are strongly related and reach statistical significance and that regression analysis is sufficient to determine discrimination and identify its sources (that is, independent variables; Zhao & Shyr, 2009).

#### **Strengths**

The strength of pairing an OLS Regression model with the BO decomposition model is that the approach has been widely used and accepted and allows for a



straightforward comparison between the findings of the proposed study and those reported in the literature. Additionally, use of the OLS regression establishes a level of confidence in the statistical significance of the independent variables selected; this lends statistical credibility to the decomposition method to which no statistical significance can be inferred. The addition of the CN extension to the BO decomposition eliminates the need to create interaction terms among the IVs.

### **Weaknesses**

The major weakness of the proposed methodology is lack of statistical inference from the use of a decomposition equation. Additionally, the literature about methodology in wage discrimination studies is divided about the use of a correction for selection bias.

### **Limitations**

Limitations of the methodology consist of the use of categorical and summary-level variables, the large number of independent variables required for decomposition studies, and the risk of improperly interpreting the results. Wage decomposition methods report only mean differences so nuanced relationships between variables may be masked. Lastly, a limitation of the proposed methodology is the inability of wage decomposition to provide causal inference and statistical significance.

## **Integrated Review of Literature**

### **Major Themes and Findings**

Major findings in the literature on wage decomposition and effects of discrimination varied. Comparisons of heterogeneous occupations yielded findings very different from those found in gender-segregated occupations. Across all studies,

employers demonstrated a preference for white male workers, even in occupations that are predominately female. However, in occupations not segregated by gender, employers' preferences, in descending order, is for nonwhite males, white females, followed by nonwhite females. Nursing, a female gendered occupation operates in a significantly different manner. While white men retain their primary position they are followed by nonwhite women, IENs, and white, domestically educated female nurses in employers' preferences

An unexpected finding was that wage discrimination among nurses in Canada operates very differently than it does in the United States. Canadian studies were reviewed and included because of an assumption that Canadian culture and values are analogous to those of the United States. According to the Canadian study included in the literature review, this assumption did not hold.

Although there was significant discourse about its accuracy, the review of literature demonstrated that the most established and accepted methodology is a Mincerian wage equation (OLS regression analysis) coupled with a BO wage decomposition. When this combination of analytical tools was not used, authors most frequently used a regression analysis coupled with another wage decomposition equation.

While there was discussion about the comparability of data sources that could be used to determine the source of wage differences among RNs, some independent variables were statistically significantly related to wage differences over time. These variables included level of education, gender, organizational position, healthcare sector, race/ethnicity, marital status, children, and region of employment. Other variables that

might lead to over or understatement of wage differences were consistently ignored. Included among these variables is COL, secular economic and social events that affect the equilibrium of supply and demand in the market for nursing labor, wage differences between male and female IENs, the institutionalization of prejudice in a region, and the penetration of IENs in a region or market. The omission of any one of these variables could cause differences to be over or understated.

Country of nursing education has been a neglected variable in the nursing literature. Studies have pooled all IENs within a sample. However, with the majority of IENs educated in the Philippines, preference for Philippine nurses of any gender may overstate wages paid to IENs as a group. As with gender, national differences among IENs have been omitted variables that may have overstated IEN wages.

Finally, with the exceptions of Charles and Guryan (2008) and Toney (2005), the research on wage differences among genders, racial, and occupations was reductionist. Human capital, neoclassical, political, and social theoretical foundations were prevalent in the literature. Discrimination, however, functions within a complex and multifaceted context.

### **Knowledge Gap**

Despite the prevalence of wage studies in the literature, few studies looked at wage discrimination within the context of a complex social system. The gaps in literature on wages in nursing include the failure to differentiate between wages of male and female IENs, differences in purchasing power between regions, failure to explore the impact of other college degrees (or other health care experience), on nurse wages and the implicit

assumption that all IENs were otherwise like USENs in temperament and previous education. Also left to explore is the impact of secular events on the supply and demand of nursing labor and wages, as well as the impact of immigrant networks, institutionalization of prejudice in a market, and the penetration of IENs in regional labor markets.

### **Summary**

This chapter presented the review of literature related to wage differences between occupations, races, genders, and focused on the literature relevant to wage differences in the gender-segregated occupation of nursing. Literature about the wages and methodological approaches used in studies of wage differences were also discussed, along with the strengths and weaknesses of those methods. Gaps in the literature were identified and discussed. In the chapter that follows, the design, data, and methodology of the proposed study will be discussed in detail.

## Chapter 3: Research Method

This study explored the relationships between human capital investments, individual attributes, and market influences on wage setting for RNs working in the U.S. healthcare system. These relationships have been studied extensively in issues of gender, migrant status, and race, but less so within the context of an occupation segregated by gender (nursing). Studies about wage differences have historically used standard Mincerian human capital regression equations coupled with a BO wage decomposition. In the sections that follow, I present the research design and methodology of the study along with research questions and hypotheses. The section begins with a description and brief discussion about the method of inquiry and includes sections describing the target population, sampling frame, data collection, and data analysis methodologies. I present dependent and independent variables and their sources. I identify independent variables included in regression equations and define them within the context of the concept they measure. A full data dictionary for the project appears in Appendix C. The chapter concludes with a discussion of internal and external threats to validity.

### **Research Design and Rationale**

#### **Method of Inquiry**

This inquiry was a cross-sectional, quantitative analysis of wages using a secondary database to discover the presence of unexplained wage differences among RNs working in the United States. The research was based on data from a survey designed using a two stage statistical process with random sampling. First, I performed a multivariate least squares (OLS) regression analysis using a standard regression equation

to obtain the coefficient effects with SPSS statistical software. The regression analysis was followed with a wage decomposition equation, developed by Oaxaca and Blinder in 1973 and extended by Cotton and Neumark in 1988 to test Becker's hypothesis of wage discrimination.

### **Wage Decomposition**

The BO decomposition identifies the percentage of wage difference that can be explained by each attribute or endowment characteristic. The measure of difference (discrimination) is  $D$  and represents the observed ratio of male to female wages. According to Oaxaca (1973),  $D$  is present when the observed wages of females is below that of males when employers set wages for each worker based on the same factors (in analysis of gender, male replaces white and female replaces nonwhite). This equation assumes that employers prefer minimizing costs and have no taste for discrimination using the Blinder-Oaxaca decomposition equation streamlines analysis. Without the use of the CN extension, the analysis would require the creation of an interaction term for each independent variable with all others for each of the regression analyses.

Jarrell and Stanley (1998) developed equations using worker's wage, a constellation of characteristics (attributes) considered important for job entry (hire), and a measure of difference. Equation 1 is the  $D$  (Difference) of wages for males, and Equation 2 is the  $D$  (Difference) of wages earned by females. The right hand side (RHS) of the equation uses the natural log (nl) of the wage. Endowment effects are represented by  $B_f(\bar{X}_m - \bar{X}_f)$  for females and  $B_m(\bar{X}_m - \bar{X}_f)$  for males, where  $\bar{X}_m$  and  $\bar{X}_f$  represent the absolute and relative endowment effects of the groups and where  $\beta_m$  and  $\beta_f$  represent the

absolute and relative partial effects of variables and are on the left hand side (LHS) of the equation.

Following Jarrell and Stanley (1998) who, in their meta-analysis, found the BO decomposition provided stable findings without correction methods, no correction for selectivity bias will be used. The following equations provided by Jarrell and Stanley (1998) will be used to decompose wages:

$$D = \ln Y_m - \ln Y_f = \beta_m(\bar{X}_m - \bar{X}_f) + \bar{X}_f(\beta_m - \beta_f) \quad (1)$$

$$\ln Y_m - \ln Y_f = \beta_f(\bar{X}_m - \bar{X}_f) + \bar{X}_m(\beta_m - \beta_f) \quad (2)$$

To enable interpretation of findings in terms of partial overcompensation of males relative to a non-discriminatory setting and the under compensation of females relative to a nondiscriminatory setting, the original Oaxaca model will be extended according to Cotton and Neumark (Cotton, 1988; Neumark, 1988). In this extension,  $\beta^*$  is a weighted average of the male/female coefficient and is obtained by using the formula:

$$\beta^* = \beta_m\left(\frac{nm}{N}\right) + \beta_f\left(\frac{nf}{N}\right) \quad (3)$$

The full equation used to decompose wages between males and females is expressed as

$$\ln Y_m - \ln Y_f = \frac{\beta_m(\bar{X}_m - \bar{X}_f) + \bar{X}_f(\beta_m - \beta_f)}{\beta^*(\bar{X}_m - \bar{X}_f)} \quad (4)$$

where  $m$  represents male and  $f$  represents females<sup>1</sup>. In the decomposition equation,  $m$  represents the preferred group (white).

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<sup>1</sup> I am indebted to Jennifer Troyer, PhD for these formulae adapted from Cotton (1988) and Neumark (1988).

### **Research Questions and Hypotheses**

Is there evidence that the wages among IENs working in the US healthcare system differ? If so, are those differences based on individual, professional or market attributes and how do those variables influence wages received by IENs? Previous research clearly supports a relationship between race and wages where white male RNs earn higher wages (Jones & Gates, 2004; Hayden, 2004; Kalist, 2002; Schumacher, 2010; Schumacher & Hirsch, 2008), but the relationship between race and gender has not been studied in the IEN population.

Is there evidence that the wages among IENs working in the U.S. healthcare system differ? If so, are those differences based on individual, professional, or market attributes, and how do those variables influence wages received by IENs? Previous research clearly supports a relationship between race and wages where white male RNs earn higher wages (Hayden, 2004; Jones & Gates, 2004; Kalist, 2002; Schumacher, 2010; Schumacher & Hirsch, 2008), but the relationship between race and gender has not been studied in the IEN population.

**RQ1.** Is the IEN population homogenous in terms of earnings or do some IENs earn higher wages than others?

**H1:** IENs working as staff nurses in urban tertiary care settings and are represented by a union earn different wages than IENs working in other positions in organizations that provide non-tertiary levels of care compensated equally when level of professional preparation, race, gender, years of experience working in the United States,



discontinuous years of service, and professional and technical certifications when individual, human capital, and market variables are controlled?

**H1:** All IENs are not equally compensated when individual, human capital and market variables are controlled.

$$H_0: IEN_{\text{stuu}} = IEN_{\text{other}}$$

$$H_1: IEN_{\text{stuu}} > IEN_{\text{other}}$$

Wages of IENs differ based on their country of education when individual, human capital, and market variables are controlled, and IENs educated in European countries earn higher wages than those not educated in European countries

**RQ2.** If differences in wages exist between IENs when individual, human capital and market variables are controlled, what is the influence of country of education on wages? Do wages of IENs differ based on their country of education regardless of work setting (tertiary, urban, union representation, organizational position), individual characteristics (race, gender) and human capital variables (level of educational preparation, professional and technical certifications, years of experience working in the United States, and continuity of service) are controlled? If differences exist, do those differences favor IENs who received their education in countries closely related to the United States (Canada and the United Kingdom)?

**H2.** Wages of IENs educated in European countries whose culture and values are similar to the culture and values of United States are higher than IENs who were educated in countries with cultures and values that are dissimilar to those of the United States when race, gender, educational level, professional and technical certifications,

years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled.

$$H_0: IEN_{euro} = IEN_{noneuro}$$

$$H2: IEN_{euro} > IEN_{noneuro}$$

**RQ3.** If differences in wages exist between IENs when, race, country of education, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled, what is the relationship of gender to those differences?

**H3.** Wages of IENs differ based on their gender when individual, workplace, and market attributes are controlled, with male IENs earning more favorable wages than nonwhite IENs.

$$H_0: IEN_m = IEN_f$$

$$H3: IEN_m > IEN_f$$

**RQ4.** If differences in wages exist between IENs when, gender, country of education, educational level, professional individual, human capital, and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation market variables are controlled, what is the relationship of race to those wage differences?

Wages of IENs differ based on their race when individual, workplace, and market attributes are controlled with white IENs earning more favorable wages than nonwhite IENs.

**H4.** IENs who are white earn higher wages than IENs who are nonwhite when gender, country of education, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled.

$$H_0: IEN_w = IEN_{nw}$$

$$H4: IEN_w > IEN_{nw}$$

## **Methodology**

### **Population**

The target population consisted of the estimated 165,659 IENs working in the United States that are included in the estimated 3,063,162 RNs that comprise members of the RN workforce in the United States (U.S. DHHS & HRSADHHSRSA, 2010). The sampling frame was the 55,141 RNs who were randomly selected to participate in the 2008 NSSRN survey that included an unknown number of IENs. The accessible population was the 1548 IENs who voluntarily returned the 2008 NSSRN Survey Questionnaire.

### **Power Analysis**

A power analysis was conducted for an a priori sample size for multiple regression using an online sample size calculator (Soper, n.d.). The effect size was estimated at 0.15 with a power level of 0.80 and a probability of 0.05. The number of predictor variables was set at 12 to include identified independent variables. The analysis indicated that a sample size of 127 was required for the study

### **Sample and Sampling Procedure**

The sample consisted of 33,549 registered nurses who completed and returned the quadrennial National Sample Survey for 2008. The sample was self-selected from independent, systematic random samples from sampling frames for 50 states plus the District of Columbia that were drawn from the database of the state boards of nursing responsible for regulating the practice of nursing and licensing registered nurses (Fritz, DiGaetano, Green, and Clark, 2010). Fritz et al. compared the databases for duplicates in the event that a nurse was licensed in multiple states. If a respondent returned more than one survey, the data were pooled to create a single entry (U.S. DHHS & HRSAHHSRSA, 2010). For 2008, new sampling measures improved reliability in variance estimates and reduce bias (Fritz et al., 2010). The data collection process was well documented by Fritz et al.

Respondents were selected for inclusion if their responses on the 2008 NSSRN indicated that they:

1. received their initial education as an RN outside the United States or its territories,
2. worked at least 36 hours during a normal work week at a primary position as an RN,
3. were employed as an RN at the time of the survey,
4. were required to maintain an active license as an RN for their primary job,
5. worked as an RN for 1 year or longer, and
6. did not identify themselves as Native American or Hawaiian.

Respondents who reported working part time, were self-employed, or reported working as an RN for less than one year were excluded. No data were included from nurse respondents who were not living and working within the United States at the time of the survey.

### **Data and Data Collection**

All data for this cross sectional study came from the anonymized 2008 quadrennial NSSRN established by P.L. 94-63 [Section 951]. The 2008 NSSRN database contains much the necessary data to determine characteristics of nurses that may or may not contribute to differences in wages. All data were downloaded from the HRSA Data Warehouse website as an SPSS formatted file made available without charge for use by the public. No other data were collected. The state level data file was used for this study.

The 2008 NSSRN database is comprised of data collected from 33,549 surveys completed by web access or through the completion of a mailed pencil and paper survey with mailed follow up reminders. The response rate was 62.4% (U.S. DHHS & HRSA, 2010). The data are available as a de-identified public use file and downloaded without charge from the HRSA data warehouse website. Full documentation includes the survey instrument, data collection methodology, and details regarding sampling frames, random sampling techniques, imputation of missing data, and identification of duplicate respondents if nurses are registered in more than one state. The survey development, data collection, data cleaning, missing response imputation, and response weighting methods are included in the documentation that accompanies the dataset. A data use agreement is

included in the documentation provided to researchers and provides for the protection and privacy of respondents.

Data from past surveys have been used by a number of economists to either study or validate findings of wage decomposition for the nursing profession. This data has an advantage over the Census Population Survey (CPS) often used by economists for wage decomposition because it provides specific information about the endowments of individual nurses. Hirsch and Schumacher (2008) were able to demonstrate coherence in findings between the CPS and NSSRN in their 1997 research exploring differences in wages among male and female nurses in the United States. These initial findings were recently substantiated (Hirsch & Schumacher, 2008; McGregory, 2011; Schumacher, 2010; Spetz et al., 2011).

The NSSRN survey offers advantages over the ACS data because the data were collected from the RNs themselves while ACS data are collected from an unidentified member of the family who may not be able to classify accurately the work category of all family members (U.S. DHHS & HRSA, 2010). As a result, some individuals may be classified as *nurses* when in fact they are nursing assistants, licensed practical nurses, or home health aides (U.S. DHHS & HRSA, 2010).

### **Operationalization of Constructs**

#### **Dependent Variable**

The dependent variable was log wage of regular hourly earnings (lnW) calculated from data reported in the 2008 NSSRN sample survey by an RN working 40 hours per week for 52 weeks at a primary job for which a nursing license is required. Regular

hourly wages were defined as the number of hours per week that the nurse worked excluding hours paid as overtime (OT). Hourly regular wages were calculated by dividing the annual salary by the average number of regular hours worked less overtime hours worked at time and a half. The formula and process used to calculate the dependent variable appears in full in Appendix B.

### **Independent Variables and Operational Definitions**

Independent variables are the acquired and innate attributes of each individual RN as well as the characteristics of a market sector and region within which a nurse works. The Data Dictionary (Appendix C) identifies variables, codes, sources, and operational definitions for all independent variables used in the study.

For each research question, three linear regression analyses using SPSS® were conducted. Independent variables were regressed on the natural log of hourly wage. In the decomposition equations for each hypothesis,  $m$  represented the preferred groups (white). The following OLS regression formulas that follow were used to regress independent variables on the dependent variable.

$$\text{Regression 1a: } \gamma \text{ IEN}_{m=} \partial \text{ IEN}_f + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + e$$

$$\text{Regression 1b: } \gamma \text{ IEN}_{f=} \partial \text{ IEN}_m + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + e$$

$$\text{Regression 1c: } \gamma \text{ IEN}_{ALL=} \partial \text{ IEN}_{ALL} + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + e$$

Variables were categorized as belonging to one of three types that are known to influence employers' wage setting preferences and contribute to wage differences.

Following the literature on the impact of specific human capital variables, human capital

attributes that are accrued by purposeful activity on the part of an individual for the purpose of work, professional advancement, and professional satisfaction are represented in Table 1 as professional level variables. Individual level variables (Table 2) include attributes that are not choices, such as age, race, and gender, as well as those that represent individual lifestyle decisions such as marriage and childbearing. Therefore, the analysis of variable relationships to wages will distinguish between professional and individual attributes and their relative contributions to earnings. Market variables (Table 3) represent market conditions within a region.

**Professional attributes.** Professional human capital variables included initial level of preparation as an RN, country of education, U.S. experience, U.S. experience squared, and breaks in service. Discontinuous service, or breaks in work history are common occurrences for women who bear and raise children or have other dependents that require them to take time off to provide care. Breaks in service have heretofore been theorized but poorly studied. Inclusion of this variable helps refine differences in wages and add to the body of knowledge in this area.

Years of experience as an RN in the host country represent an assimilation effect that has been reported to have an equalizing effect on wages of immigrants. Therefore, this variable demonstrates the impact of assimilation on nursing wages. Vargas (2005) addressed the influence on immigrant wages that can be played by country of birth because of associated beliefs about the productivity of individuals from certain countries. Specifically, Vargas cited Borjas' (1985) findings about decreasing levels of immigrants' skills, and Chiswick's (1986) discussion of the productivity and job performance of



Cuban men (pp. 579-580). Therefore, inclusion of country of education served as proxy measure for the perceived alignment of culture and values with those of the United States.

Table 1

*Professional Attribute Variables*

Variable	Operational Definition	Code	Source
Diploma	Initial preparation in a diploma program	0: No 1: Yes	Q3 2008 NSSRN
ASN	Initial preparation in an associate program	0: No 1: Yes	Q3 2008 NSSRN
BSN	Initial Preparation in a baccalaureate program	0: No 1: Yes	Q3 2008 NSSRN
COE	Country of education of initial nursing program	0: US 1: Philippines 2: Canada 3: UK 4: Nigeria 5: India 6: Other 7: Korea	Q5 2008 NSSRN
Prof. Cert	At least 1 professional nursing certification	0: No 1: Yes	Q70a 2008 NSSRN
Skills Cert	At least 1 technical/skill certification	0: No 1: Yes	Q70b 2008 NSSRN
Additional Ed	Additional higher education after initial RN prep	0: No 1: Yes	Q13 2008 NSSRN
USEXP	Years experience working in the US as an RN	Years	Q50 2008 NSRN
USEXP <sup>2</sup>	USEXP squared	Years squared	Calculated
Breaks in Service	Did not work in nursing for one or more years	0: No 1: Yes	Q51 2008 NSRN

**Individual attributes.** In addition to family structure and childbearing decisions, individual level variables further refine race and nativity.

Table 2

*Individual Attribute Variables*

Variable	Operational Definition	Code	Source
Gender	Sex of respondent	0: Male 1: Female	2008 NSSRN
Race	Self-identified race	0: White 1: Nonwhite	Q64b 2008 NSSRN
Marital Status	Marital status	0: Not married 1: Married/partnership	Q66 2008 NSSRN

**Market attributes.** Market level variables are defined as those conditions that affect nursing wages within a market or region. Independent market variables included, RNs who reported being represented by a union or other collective bargaining unit (*union*) and type of care provided (tertiary being the greatest consumer of RNs was selected as the sector of interest). As would be expected in any research on wage differences, rural and urban locations are included as variables (*urban*).

Organizational roles associated with higher wages are those with responsibilities that take nurses from the bedside. Holding a position as a staff nurse indicates the percent of time a nurse spends on the direct provision of patient care. Division by the amount of direct care delivery has been supported in the literature on nursing wages where differentiation between staff, charge nurse, and team leaders have not been significantly different. Therefore, the grouping by staff nurse provided a sufficient distinction and reduced the number of variables for organizational position.

Table 3

*Market Attribute Variables*

Variable	Operational Definition	Code	Source
Setting	Market sector of primary position	0: Other 1: Acute Care	Q23 2008 NSSRN
Staff RN	Position in organization	0: Not Staff RN 1: Staff RN	Q24 2008 NSSRN
Urban	Works in a metropolitan area	0: Not Urban 1: Urban	2008 NSSRN Appendix F
Union	Member of union or collective bargaining unit	0: No 1: Yes	Q31 2008 NSSRN

**Data Analysis Plan**

Data were analyzed using quantitative methods. Following the selection of cases that met requirements for inclusion, data were examined for missing responses. Independent variables were cleaned and recoded as necessary. Dummy variables were created as indicated in Tables 1, 2 and 3 so that data could be dichotomized for ease of interpretation. Outliers were identified by a calculated Cook's D. Outliers were eliminated if they reached the indicated Cook's D cutoff value. Independent variables were transformed as needed. Following transformations and treatment of independent variables, the dependent variable was calculated and transformed according to the process outlined in Appendix B. Variables were analyzed using SPSS to ensure that they meet the homoscedasticity, linearity, and normality assumptions for OLS multiple regression. The regression analysis was then conducted using a stepwise multiple regression variable entry method. Following the OLS regression analysis, significant findings were used in the BO decomposition equation with the CN extension using the equations identified above to identify unexplained differences in wages among IENs working in the U.S.

healthcare system. Findings, along with tables and graphs representing data, are presented in Chapter 4 and followed by discussion and conclusions in Chapter 5.

### **Threats to Internal and External Validity**

The survey respondents were self-selected in that they decided to respond or not respond to the survey. However, the objective nature of the survey as well as the high response rate reduces the threat of bias from this source. The elimination of selection of participants by alpha-segments coupled with the improved random sampling techniques used in the 2008 NSSRN also reduced threats to external validity.

Use of survey data faces threats to validity and reliability if the survey has not been carefully constructed. Mailed surveys using self-reported data may compound these threats by adding an additional self-selection bias. Data used in this study addressed those threats in a number of ways. First, the survey has been repeated and refined every four years since 1977. The data collected in the survey is objective; no subjective data were used in the study. The most serious threat to external validity comes from the selection of the target population. Results may not be generalizable outside of nursing because the target population was restricted to registered nurses licensed to practice in the United States and who immigrated here from abroad.

Another threat to internal validity is the length of time an immigrant nurse has been away from her native country or the number of different countries in which she has worked. Both of these may have an effect on her comfort level and ability to appear acculturated. Immigration history and assimilation factors may play an important role in the ability of nurses to obtain premium wages. In addition, country of origin may play an

important role for immigrants from Canada and the United Kingdom, since the languages and cultures of these countries are similar to those of the United States.

### **Ethical Procedures**

The study used secondary data from a publicly available, de-identified dataset provided by HRSA with an expectation that data will remain anonymized. All data were maintained in a confidential manner in an office with restricted access that was controlled by the primary investigator. Selection of participants into the study was conducted in a nonbiased manner and respondents received no incentive for their participation. There was no coercion in data collection procedures as they were described in the documentation accompanying the dataset. The study was submitted to the Walden University Institutional Review Board and approved prior to data analysis (approval number 09-17-12-0084388). No other approvals were sought.

Confidentiality will be maintained during dissemination of findings. Dissemination is planned through publication in professional journals and presentations at professional conferences. Following the study analyzed data will be stored on a computer, the access to which is restricted to the primary investigator. Stored data may be used for future research purposes. All data storage and use will be in accordance to the instructions and limitations set forth and published by HRSA.

### **Summary**

This chapter discussed the research design and methodology that was used in this cross sectional quantitative analysis of inputs to IEN earnings. The sample for the study with an effect of 0.15, significance of 0.05, and 12 variables required 127 cases. The

database contains records for 33,179 RNs working in the U.S. healthcare system. Of this number, 1,548 indicated that they were educated outside of the United States and its territories meeting the sample size set by the power analysis.

The sampling frame consisted of the databases from Boards of Nursing in all 50 States and the District of Columbia with duplicates removed. Data were cleaned and normalized prior to release by HRSA. Imputation of missing data were accomplished through a well-documented process using randomized responses for each question. Complete documentation accompanied the data files provided free of charge by HRSA for use by individual researchers. No additional data were collected.

The independent variable for the study was the natural log of hourly wage for an RN. The formula and process for computation appears in Appendix B. There are 12 dependent variables consisting of individual attributes, professional endowments, and market attributes of RNs who responded to the survey questionnaire. The data dictionary (codebook) for this study appears in Appendix C.

The standard wage regression equations, BO wage decomposition equation, and CN extension for each research question were presented along with the hypotheses they tested. The independent variable, logarithm of hourly wage, was identified and defined along with the independent predictor variables proposed for each concept. Threats to internal and external validity were presented. In Chapter 4, results of the regression analysis and wage decomposition for the research question and hypothesis are presented.

## Chapter 4: Results

This chapter presents the statistical analyses used to explore the way relationships between individual attributes, human capital endowments, and market factors influence wages in the nursing labor market. Descriptive statistics are presented followed by regression and decomposition data for the research question and its associated hypothesis. First, this chapter presents a description of how the sample was selected and data collected and treated by HRSA. Following is a description of how data responses were cleaned and validated prior to applying selection criteria for selection into the study. A description of dependent and independent variables precedes descriptive statistics of the sample. Results of statistical analyses are organized and presented according to research question and hypothesis tested. The chapter concludes with presentation of the findings of the statistical analysis and wage decomposition and a summary of findings.

### **Data Collection and Treatment**

#### **Sample Selection**

The state dataset was used to draw the sample of IENs meeting the criteria for inclusion. The data set consisted of responses from 33,549 individual RNs working in the United States as of March 10, 2008. Data were collected from July 2008 through March 2009. Of these respondents, 1,548 identified themselves as having been educated outside the United States and its territories.

#### **Data Collection and Treatment**

The dataset contains 865 variables derived from the 2008 NSSRN Survey Questionnaire, in which a stratified random sample of RNs were asked to answer

questions about their positions, individual attributes, human capital investments, and work environments. Data were collected under the auspices of the U.S. DHHS and HRSA over the period from July 2008 through March 2009. Paper surveys were mailed to 55,151 randomly selected participants who were working as RNs on March 10, 2008. Surveys were also available for online completion to these same participants, and some data were collected or clarified through telephone contact and follow up. Response rate (regardless of media) was 62.4% ( $n = 33,549$ ). The survey, sample selection, data collection, cleaning, and manipulation methods are well described in the publicly available documentation. In addition to two data sets, the downloaded material included the full codebook for the survey, the survey itself, sample selection methodology, description of data collection process, along with weighting, imputation, and raking procedures and their results. The documentation also describes how researchers detected and eliminated potential duplicates.

To protect respondents' confidentiality, data were divided into two datasets with information pertinent to the state and county levels. The state dataset includes more individual level information about respondents that, because of the number of respondents, cannot be used to identify individuals. The county-level dataset is comprised of more summary data elements but identifies respondents at the county and city level of where respondents work and reside. Both sets of data use unique identifiers for respondents, but the randomly assigned codes are not consistent between datasets and state and county data cannot be combined. Only data from the state level dataset was used for this study.



### **Data Cleaning and Validation**

I cleaned the data using SPSS. I searched the data for responses indicating that a respondent lived or worked outside of the United States on March 10, 2008. Six variables addressed where respondents worked or lived within the United States at the time of the survey. I examined responses to these variables for inconsistencies indicating that a respondent contradicted herself and eliminated respondents reporting conflicting information about location of work or residence from the final sample.

The data file was also examined for missing data. Respondents with data missing for variables in the study were eliminated from the final sample. Six additional respondents were excluded from the study because their initial level of preparation was at the MSN/PhD level (three white and three nonwhite respondents). Because this designation is ambiguous, the variable was dropped and associated cases excluded from the study.

Outliers were initially identified if they fell three standard deviations above the mean. The procedure for identifying outliers was conducted once and then repeated to ensure that all outliers were identified. Remaining outliers were then identified and eliminated using Cook's D cutoff at  $0.005, 4/(n-k-1)$ , for the eight final variables selected for inclusion in the regression analysis. One respondent reported years of experience in the United States at greater than 35 years; therefore, years of work in the United States were capped at 35. After applying the criteria for inclusion, cleaning, and validating the data for inconsistencies in responses, and eliminating outliers, the final sample for this study consisted of 757 IENs.

Following data selection, cleaning, and validation, ordinal variables were recoded as dummy variables. A master syntax file representing SPSS commands used for data cleaning, validation, and recoding appears in Appendix F.

### **Dependent Variable**

The dependent variable, wage, was extrapolated using the procedure in Appendix C. Once the hourly wage was calculated, it was transformed to its lognormal equivalent called  $\ln WAGE$  and used as the dependent variable. The lognormal form of the dependent variable was used to represent the approximate rate of change of wages in relationship to the independent variables. Wages were limited with upper and lower bounds being \$12/hr. and \$80/hr. ( $M = 35.39$ ;  $sd = 10.57$ ). Individuals with hourly wages calculated at less than \$12 based on the data reported, were eliminated from the study because data were considered suspect. One individual whose hourly wage was calculated at greater than \$80 was retained in the study but the wage was capped at \$80.

### **Independent Variables**

Nominal and categorical independent variables were recoded as dummy variables (1, 0). Gender was coded as Female (1) and Male (0), as the majority of nurses are female. Skin color, originally a categorical variable, was recoded white (1) and nonwhite (0). Age was calculated as stated age in 2008 minus Year of Birth ( $AGE$ ) and its squared value ( $AGE^2$ ). Years of experience in the United States ( $USEXP$ ) were transformed to its square ( $USEXP^2$ ). Country of initial RN education, a categorical variable, was recoded as six dummy variables representing the five most frequent individual countries sending the most nurses and a sixth category for all others representing other countries (Philippines,

Canada, UK, Nigeria, Other, India, and Korea). Initial preparation as an RN was also recoded as three dummy variables representing ASN, Diploma, and BSN levels of preparation. A complete data dictionary appears in Appendix D.

Examination of the variables for normal distribution of scores revealed some extreme skew and kurtosis for variables with high percentages of values in one characteristic. Inspection of these variables demonstrated that the preponderance of responses fell into one category. These variables were eliminated from the study after attempts to normalize data distribution through transformation and recoding was unsuccessful.

The variable, country of education, proved problematic. As a single categorical variable, skew and kurtosis fell close to 0 but when recoded as dummy variables, some countries were highly skewed (Korea, Nigeria, and India). After examining the data in detail, I decided to retain these variables because the skewed data came from the lopsided distribution of respondents from countries with few IENs in the sample (Korea  $n = 11$ ; Nigeria  $n = 25$ ; India  $n = 72$ ). Skew and kurtosis for the final set of variables ranged between  $\pm 2$ .

Bivariate correlations were performed to identify variables that were highly correlated to either each other and/or the DV, lnWAGE. A Pearson's  $r$  of greater than .850 was used to identify highly correlated variables. Following inspection of Pearson's  $r$ , Age and AGE<sup>2</sup> were eliminated as independent variables secondary to collinearity with lnWAGE, USEXP, and USEXP<sup>2</sup>. Similarly, USEXP and USEXP<sup>2</sup> were strongly and positively correlated however, USEXP<sup>2</sup> was included as a variable as is commonly done.

Other independent variables demonstrating collinearity were highest level of preparation as an RN and additional higher education. Higher education was retained as an independent variable because it subsumed additional RN education.

The data were examined to ensure that they were compatible with a linear regression analysis. The DV,  $\ln WAGE$ , was normally distributed, as were standardized residuals. Scatterplots were examined for confirmation of linearity and homoscedasticity. No evidence of heteroscedasticity, curvilinear, or nonlinear relationships was found. All independent variables closely approximated a normal distribution. Presence of collinearity was assessed through Tolerance and Variance Inflation Factor (VIF) analysis. Tolerance levels for all variables fell between .846 and .984 while VIF were less than 2.

Autocorrelation was assessed using the Durbin-Watson statistic and was found to be .270, indicating that there may be autocorrelation in the model. Levene's statistic for Homogeneity of Variance and the Shapiro-Wilkes statistic for Test for Normality, along with inspection of the residual scatterplots failed to detect non-normal distribution. I concluded that the assumptions for linear regression had been met.

## **Statistical Results**

### **Descriptive Statistics**

The final sample ( $n = 757$ ) represented IENs educated abroad but currently working within the United States as an RN. This sample consisted of 89% women ( $n = 681$ ) and 11% men ( $n = 76$ ) from predominately LDCs ( $n = 630$ , 80%). The white males in this sample ( $n = 15$ ) came from Canada ( $n = 10$ ), the United Kingdom ( $n = 2$ ), and other unspecified countries ( $n = 3$ ). The distribution of these 15 IENs in terms of

educational level, work setting, union representation, holding a staff RN position, or working in an urban location was not different from the distribution of the sample as a whole.

Mean wage for the sample ( $IEN_{all}$ ) was \$35.39 ( $n = 757$ ;  $sd = \$10.57$ ). Mean wages for  $IEN_w$  and  $IEN_{nw}$  were \$33.26 and \$35.96, respectively. A \$2.70 (93%) wage gap was identified between white and nonwhite respondents. For each dollar earned by a nonwhite IEN in this sample, a white IEN in the sample earns \$0.93; indicating an unexplained wage difference of 7%. Table 4 presents the hourly mean wages for study respondents categorized by group membership, while table 5 presents mean hourly wage by country of education.

Table 4

*Mean Hourly Wage in Dollars Reported by IENs in 2008*

Group	<i>N</i>	Mean Hourly Wage
Nonwhite Females (NWF)	537	35.85
White Females (WF)	144	32.5
White Males (WM)	15	40.51
Nonwhite Males (NWM)	61	36.87
All Males	76	37.58
All Females	681	35.15
All White	159	33.26
All Nonwhite	598	35.96

Table 5

*IEN Hourly Wage in Dollars by Country of Education*

	Mean	Min	Max	<i>N</i>
Philippines	36.40	12.00	69.44	537
Canada	33.22	12.82	69.44	92
United Kingdom	35.84	18.03	80.13	35
Nigeria	37.38	22.44	64.10	25
India	34.65	14.79	62.25	72
Korea/S. Korea	37.33	13.87	48.08	14
Other	33.57	13.22	62.50	128

Because the impact of assimilation (or lack thereof) and a discontinuous work history are thought to contribute to lower wages for women, these variables were included in the initial model for the study. Years of work experience in the United States (USEXP) were used as a proxy measure for assimilation effects. The mean years of experience working in the United States (USEXP) as an RN for this sample was 13.51 years ( $sd = 9.69$ ). Of this sample, 93 (12%,  $M = .12$ ) respondents reported taking a break from nursing for more than one year. Table 6 presents descriptive statistics for independent variables used in the study.

Respondents were identified by gender, race, level and country of preparation, country of education for the top six countries represented in the sample and for a sixth category called other (for ease of reference this category is considered as an individual country). Table 7 describes the sample organized by country of education. Of the top six sending countries, only Canada and the United Kingdom have RNs who identified themselves as white (87.9% and 54.2%, respectively).

Table 6

*Descriptive Statistics for Independent Variables*

	Mean	SEM	Std Dev	Variance	%	Frequency	N
Break in Service $\geq$ 1 year	0.12	0.012	0.328	0.108	12.3	93	757
Skin Color (White)*	0.21	0.015	0.408	0.166	21	159	757
Marital Status (Married)	0.77	0.015	0.424	0.179	76.6	580	757
At Least 1 Professional Certification	0.58	0.018	0.494	0.244	58.1	440	757
Position (Staff RN)*	0.75	0.016	0.433	0.188	75	568	757
Additional Higher Education	0.17	0.014	0.374	0.14	16.8	127	757
Acute Care Setting*	0.71	0.016	0.452	0.205	71.3	540	757
At Least 1 Skill Certification	0.55	0.018	0.498	0.248	54.8	415	757
Urban*	0.93	0.009	0.258	0.066	92.9	703	757
Gender (Female)*	0.9	0.011	0.031	0.09	90	681	757
Diploma as Initial RN*	0.3	0.017	0.457	0.209	29.7	225	757
ASN as Initial RN**	0.1	0.011	0.301	0.09	10	76	757
BSN as Initial RN*	0.6	0.018	0.49	0.24	60.2	456	757
Represented by Union *	0.28	0.016	0.449	0.202	28	212	757
Educated in the Philippines	0.52	0.018	0.5	0.25	51.7	391	757
Educated in Canada	0.12	0.012	0.327	0.107	12.2	92	757
Educated in the UK	0.05	0.008	0.21	0.044	4.6	35	757
Educated in Nigeria	0.03	0.006	0.179	0.032	3.3	25	757
Educated in India	0.1	0.011	0.294	0.086	9.5	72	757
Educated in Korea **	0.02	0.005	0.135	0.018	1.8	14	757
Educated in Other Country	0.17	0.014	0.375	0.141	16.9	128	757
Years Experience in US*	13.51	0.352	9.685	93.806			757
lnWAGE	3.52	0.012	0.317	0.1			757

\*Independent variables retained in reduced model.

\*\* Reference variables.

Table 7

*Descriptive Statistics by Country of Education*

	Philippines	Canada	UK	Nigeria	Other	India	Korea/S. Korea
Diploma	34	58	20	10	68	31	4
ASN	9	13	9	14	24	5	2
BSN	348	21	6	1	36	36	8
White	0	82	24	0	53	0	0
Non-White	391	10	11	25	75	72	14
Male	48	10	4	3	9	2	0
Female	343	82	31	22	119	70	14
Union	133	18	6	8	29	14	4
Staff RN	313	55	19	16	95	61	9
Acute Care	272	68	24	17	88	61	10

**RQ1.** Is the IEN population homogenous in terms of earnings or do some IENs earn higher wages than others?

**H1:** IENs working as staff nurses in urban tertiary care settings and are represented by a union earn different wages than IENs working in other positions in organizations that provide non-tertiary levels of care when level of professional preparation, race, gender, years of experience working in the United States, discontinuous years of service, and professional and technical certifications are controlled.

$$H_0: IEN_{\text{stuu}} = IEN_{\text{other}}$$

$$H_1: IEN_{\text{stuu}} > IEN_{\text{other}}$$

### Statistical Analysis: Regression Model

Independent variables were selected for inclusion in the model based on the human capital theoretical foundation of the study and findings in the literature on nursing wages. These variables represented individual characteristics, human capital investments, and market characteristics as identified earlier in the section on Independent Variables.



The variables were used as predictors of wage in a multiple regression in a stepwise entry method using SPSS. All steps used the same criteria for entering and removing variables: probability of  $F$  equal to or less than .050 to enter and greater than or equal to .100 to remove. Regression of the full model demonstrated that for all IENs, regardless of skin color, there were statistically significant relationships between  $\ln$ WAGE and USEXP, ACUTE CARE, URBAN, UNION, STAFF RN, WHITE, DIPLOMA, and GENDER, with a moderate effect size of 14%,  $R^2 = .143$ . The model demonstrated a good fit with  $F(8, 748) = 15.60; p < .001$ .

Table 8

*Stepwise Regression Fit, IENs (all), Full Model*

MODEL 8	Sum of Squares	<i>df</i>	Mean Sq	<i>F</i>	Sig
Regression	10.851	8	1.356	15.60	0.000
Residual	64.951	748	0.087		
Total	75.802	756			

*Note.* DV:  $\ln$ WAGE; Predictors: (Constant), USEXP, ACUTE CARE, LOCATION, UNION, DIPLOMA, GENDER, SKIN COLOR

The initial regression model containing 12 independent variables produced a reduced model with eight statistically significant predictors of wage. A ninth independent variable, BSN preparation, was retained in the model because of the significance of this level of preparation to the profession and the ethical debate in the global nursing community regarding brain drain and concerns about the inappropriate use and remuneration of BSN foreign nurses educated in LDCs but working in MDCs. The final (reduced) regression model for  $IEN_{all}$  demonstrated the same goodness of fit as the full model and revealed that all retained variables were statistically significant

predictors of IENs wages. The model accounted for 14% of the variance in wages,  $R^2 = .143$ . The variable BSN was not statistically significant. Because no gross improvement in the model fit or explanation of the variance in wages was observed, an analysis of the improvement in prediction provided by the reduced model was conducted using Balkin's (2004) formula for determining effect of change in  $R^2$  between full and reduced regression models.

$$F = \frac{\frac{R_{full}^2 - R_{reduced}^2}{j_{full} - j_{reduced}}}{\frac{1 - R_{full}^2}{N - j_{full} - 1}} = \frac{\frac{.143 - .143}{20 - 9}}{\frac{1 - .143}{757 - 20 - 1}} = 0$$

The more parsimonious model produced no improvement in  $R^2$  values.

Regression results for the reduced model (all IENs) revealed that years working in the United States working in tertiary care, an urban location, and being represented by a union are all positively related to wages. Working as a staff RN is negatively related to wages  $R^2 = .143$ ,  $R^2_{adj} = .134$ ,  $F(8,748) = 15.60$ ,  $p < .001$ . While this model predicts earnings for IENs with statistical significance it is unable to explain much about the wages of IENs with these particular variables.

Table 9

*Analysis of Variance Regression IEN (all), Reduced Model*

MODEL 8	Sum of Squares	df	Mean Sq	F	Sig
Regression	10.851	8	1.356	15.62	0.000
Residual	69.951	748	0.087		
Total	75.802	756			

*Note.* DV: lnWAGE; Predictors: (Constant), USEXP, ACUTE CARE, URBAN, UNION, STAFF RN, WHITE, DIPLOMA, GENDER

Eight models were produced with variables entered in the following order: USEXP, ACUTE CARE, URBAN, UNION, STAFF RN, WHITE, DIPLOMA, and FEMALE, and regressed on the dependent variable lnWAGE. The reference variable was ASN preparation and the variable, BSN, was excluded from the model. The model with the best fit is described in Table 9, and was used for data interpretation.

Table 10

*Coefficients, IEN (all), Reduced Model*

Model 8	Standardized Coefficient			95% Confidence		Collinearity Statistics	
	Beta	<i>t</i>	Sig	Lower bound	Upper bound	Tolerance	VIF
(Constant)		56.001	0.000	3.245	3.481		
USEXP	0.215	6.000	0.000	0.005	0.009	0.894	1.119
ACUTE CARE	0.180	5.146	0.000	0.078	0.174	0.935	1.070
URBAN	0.113	3.300	0.001	0.056	0.222	0.977	1.023
UNION	0.124	3.563	0.000	0.039	0.135	0.952	1.050
STAFF RN	-0.140	-3.806	0.000	0.155	-0.500	0.846	1.182
WHITE	-0.090	-2.475	0.014	-0.125	-0.014	0.870	1.149
DIPLOMA	-0.089	-2.446	0.015	-0.111	-0.012	0.874	1.144
FEMALE	-0.076	-2.233	0.026	-0.151	-0.010	0.984	1.016

*Note.* DV: LNWAGE; EXCLUDED VARIABLES: BSN

Analysis of this model revealed that regardless of level of education, or gender, staffs RNs earn 10.24% less per hour than IENs who do not work as staff nurses. Female nurses overall, earn 8% less per hour than their male coworkers. White IENs earn 6.98% less per hour than nonwhite IENs earn. Nurses initially prepared at the diploma level of education earn 6.13% less per hour than those educated at the ASN and BSN levels do. Therefore, an IEN who is white, female, and works as a staff nurse faces more

cumulative hourly wage penalties when compared to other IENs. Offsetting these penalties, some of the variables are related more positively to wages.

Wages are positively and statistically significantly related to working in a tertiary care setting (12.6%), working in an urban location (13.89%), and being represented by a union (8.71%), Years of experience working in the United States were a statistically significant predictor of wages earned by IENs. IEN realize a gain (0.7%) per hour per year of experience Table 20 presents the magnitude of impact of differences in hourly wages of IENs of the three regression models (all IENS, IEN<sub>w</sub>, and IEN<sub>nw</sub>)).

Table 11

*Differences in Mean Hourly Wage for all IENs When Working in Acute Care*

Group	N	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		Cohen's ES r	Cohen's d
										Lower Bound	Upper Bound		
Acute Care	540	36.4	10.62	0.457									
Other	217	32.88	10.06	0.683									
Pooled	757	34.64			4.186	755	0.000	3.52	0.841	1.869	5.170	0.168	0.340

*Note.* Independent Samples *t* Test; Equal Variances Assumed

Table 12

*Differences in Mean Hourly Wage for all IENs When Represented by Union*

Group	N	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		Cohen's ES r	Cohen's d
										Lower Bound	Upper Bound		
Union	212	37.78	10.98	0.754									
Non Union	545	34.46	10.27	0.44									
Pooled	757	34.64			3.923	755	0.000	3.33	0.846	1.662	4.990	0.154	0.312

*Note.* Independent Samples *t* Test; Equal Variances Assumed

Accordingly, the null hypothesis is rejected in favor of the alternative hypothesis stating there is evidence of wage inequality between IENs when individual, human capital, and market variables are controlled.

**RQ2.** If differences in wages exist between IENs when individual, human capital, and market variables are controlled, what is the influence of country of education on wages? Do wages of IENs differ based on their country of education regardless of work setting (tertiary, urban, union representation, organizational position), individual characteristics (race, gender) and human capital variables (level of educational preparation, professional and technical certifications, years of experience working in the United States, and continuity of service) are controlled? If differences exist, do those differences favor IENs who received their education in countries closely related to the United States (Canada and the United Kingdom)?

**H2.** Wages of IENs educated in European countries whose culture and values are similar to the culture and values of United States are higher than IENs who were educated in countries with cultures and values that are dissimilar to those of the United States when race, gender, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled.

$$H2: IEN_{euro} > IEN_{noneuro}$$

The sample contained IENs from two countries that can be considered European; Canada and the United Kingdom. This hypothesis was designed to test the strength of national affiliations and employers' preferences for IENs educated and emigrating from

countries with values considered close to those of the United States. The regression analysis failed to identify country of education as a predictor of wage for IENs. However, in post-hoc examination of the differences in mean wages of IENs educated in the top sending different countries findings of statistical and practical significance were identified. RNs educated in the Philippines earn \$2.08 more per hour than IENs not educated in the Philippines (Table 13). Canadian RNs earn \$2.47 less per hour than RNs not educated in Canada (Table 14). IENs from countries other than the Philippines, Canada, the United Kingdom, Nigeria, India, and Korea earn \$2.19 less per hour than IENs educated in those countries and working in the United States (Table 15).

According to Cohen's 1988 work quantifying the effect of differences (Monroe, 2005), the differences in wages for Filipina, Canadian, and Korean IENs, along with the IENs educated in other, unspecified, countries, the differences in hourly wage are moderately strong. While regression analysis failed to identify an impact on wages that could be related to country of education, differences do exist in mean wages between these groups of IENs independent of gender and race. While nurses educated in the Philippines have a more favorable wage than IENs educated elsewhere, there was no evidence to support either the null or the alternative hypotheses for this research question.

Table 13

*Hourly Wages of IENs from the Philippines*

Group	N	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		ES	r	Cohen's d
										Lower Bound	Upper Bound			
Philippines	391	36.39	11.00	0.556										
Other	366	34.32	10.00	0.523										
Pooled	757	35.36			2.724	754.356	0.007	2.08	0.763	0.581	3.578	0.098	0.197	

Note. Independent samples *t* test. Equal variances not assumed ( $p < 0.042$ ).

Table 14

*Hourly Wages of IENs from Canada*

Group	N	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		ES	r	Cohen's d
										Lower Bound	Upper Bound			
Canada	92	33.22	10.5	1.095										
Other	665	35.69	10.56	0.409										
Pooled	757	34.455			-2.101	755	0.036	-2.465	1.173	-4.769	-0.162	-0.116	-0.235	

Note. Independent samples *t* test. Equal variances not assumed

Table 15

*Hourly Wages of IENs Not Educated in the Philippines, Canada, UK, Nigeria, India, Korea/S. Korea*

Group	N	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		ES	r	Cohen's d
										Lower Bound	Upper Bound			
COE Not Specified	128	33.57	9.37	0.828										
COE Specified	629	35.76	10.77	0.429										
Pooled	757	34.67			-2.144	755	0.032	-2.19	1.023	-4.201	-0.186	-0.108	-0.217	

Note. Independent samples *t* test. Equal variances assumed.

**RQ3.** If differences in wages exist between IENs when, race, country of education, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation individual, human capital, and market variables are controlled, what is the relationship of gender to those differences?

**H3.** Wages of IENs differ based on their gender when individual, workplace, and market attributes are controlled, with male IENs earning more favorable wages than nonwhite IENs.

$$H3: IEN_m > IEN_f$$

The results of the statistical analysis found wage the wage difference between male and female IENs was 94% (females earned \$0.94 for each dollar earned by males). No statistical significance could be inferred. Additionally, the number of males in the sample did not reach the critical threshold for group number (100) to allow for a BO decomposition of wages. Therefore, I failed to reject the null hypothesis and found no evidence to support the alternative hypothesis for this research question. However, examination of data revealed that the impact of gender might be conflated with the impact of race as will be discussed in the sections that follow.

**RQ4.** If differences in wages exist between IENs when, gender, country of education, educational level, professional individual, human capital, and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation market variables are controlled, what is the relationship of race to those wage differences?

**H4.** IENs who are white earn higher wages than IENs who are nonwhite when gender, country of education, educational level, professional and technical certifications, years of experience working in the United States, continuity of services, level of care, position, urban location, and union representation are controlled. Wages of IENs differ



based on their race when individual, workplace, and market attributes are controlled with white IENs earning more favorable wages than nonwhite IENs.

$$H_0: IEN_w = IEN_{nw}$$

$$H_4: IEN_w > IEN_{nw}$$

Stepwise regression results for white IENs showed that working in tertiary care is positively related to wage but that being a female or working as a staff RN is negatively related to wage,  $R^2 = .15$ ,  $R^2_{adj} = .134$ ,  $F(1,155) = 5.634$ ,  $p = .019$ . This model explains 15% of the variance in wages earned by white IENs. The Analysis of Variance indicates that the model is a good fit ( $p < .001$ ). A summary of the model is presented in Table 16.

Table 16

*Analysis of Variance Regression IEN (white)*

MODEL 3	Sum of Squares	df	Mean Sq	F	Sig
Regression	2.477	3	0.826	9.115	0.000
Residual	14.04	155	0.091		
Total	16.517	158			

Note. DV: lnWAGE; Predictors: (Constant), ACUTE CARE, STAFF RN, FEMALE

Four models were produced selecting for white respondents (skin color = 1). Variables were entered in the following order: STAFF RN, ACUTE CARE, URBAN, FEMALE, DIPLOMA, BSN, UNION, USEXP, and USEXP<sup>2</sup> and regressed on the dependent variable lnWAGE using a stepwise approach. One variable, initial RN preparation at the BSN level was excluded from the model. Reference category for initial preparation as an RN was ASN preparation. The model with the best fit is described and used for data interpretation.

Table 17

*Regression Results for lnWage IENs (white)*

Model 4	Unstandardized Coefficients		Standardized Coefficient		Sig	95% Confidence Interval	
	B	SE	Beta	t		Lower Bound	Upper Bound
(Constant)	3.577	0.092		36.006	0.000	3.236	3.419
ACUTE CARE	0.216	0.056	0.304	3.886	0.000	0.106	0.326
STAFF RN	-0.159	0.052	-0.239	-3.066	0.003	-0.261	-0.056
FEMALE	-0.195	0.082	-0.177	-2.374	0.019	-0.358	-0.033

Note. DV: LNWAGE; SELECTING ONLY CASES WHERE COLOR = WHITE  
EXCLUDED VARIABLES: URBAN, UNION, USEXP, BSN, DIPLOMA

This model reveals that an IEN who is white and works in the tertiary care setting earns 21.6% more per hour than IENs who work in other settings. White IEN females earn 19.5% less per hour than their white IEN male coworkers earn. White IEN staff nurses earn 15.9% less per hour less than white IEN nurses who do not work as staff nurses. For white IENs, education, an urban location, union representation, and years of experience working in the United States as an RN do not predict wage.

Regression results for nonwhite IENs showed that years of experience working in the United States, being represented by a union, working in an urban location, and an tertiary care setting are all positively related to wage while holding a staff nurse position is negatively related to earnings,  $R^2 = .126$ ,  $R^2_{adj} = .119$ ,  $F(1,593) = 7.568$ ,  $p < .001$ . This model explains 12.6% of the variances in wages earned by nonwhite IENs. The Analysis of Variance (see Table 18) shows that the model is a good fit.

Table 18

*Analysis of Variance Regression IEN (nonwhite)*

MODEL 5	Sum of Squares	df	Mean Sq	F	Sig
Regression	7.362	5	1.472	17.06	0.000
Residual	51.092	592	0.086		
Total	58.454	597			

Note. DV: lnWAGE; SELECTING ONLY CASES WHERE COLOR = NONWHITE

Five models were produced with variables entered in the following order: tertiary care, location, gender, diploma, BSN, USEXP, and country of initial RN education, where skin color = 0 (nonwhite) and regressed on the dependent variable lnWAGE. Excluded variables were initial RN preparation as a BSN and country of initial RN education. Reference category for initial preparation as an RN was ASN preparation. The model with the best fit is described and used for data interpretation.

Table 19

*Regression Results for lnWage IEN (nonwhite)*

Model 5	Unstandardized Coefficients		Standardized	t	Sig	95% Confidence Interval	
	B	SE	Coefficient			Lower Bound	Upper Bound
(Constant)	3.25	0.061		53.029	0.000	3.13	3.37
USEXP	0.007	0.001	0.218	5.482	0.000	0.004	0.009
UNION	0.096	0.026	0.142	3.66	0.000	0.045	0.148
URBAN	0.168	0.053	0.123	3.184	0.002	0.064	0.272
ACUTE CARE	0.103	0.027	0.15	3.779	0.000	0.05	0.152
STAFF RN	-0.086	0.031	-0.113	-2.751	0.006	-0.147	-0.025

Note. DV: LNWAGE; EXCLUDED VARIABLES: GENDER, DIPLOMA, BSN, AND COUNTRY OF RN EDUCATION

The model for nonwhite IENs differs from that of white IENs, in that gender and level of education are excluded from the model as predictors of wage. Union representation, years of experience working in the United States, and working in an urban tertiary care setting, however, are positive and statistically significant predictors of wage. Nonwhite IENs earn 0.7% more per hour for each year of experience they have working in the United States. Additionally, these nurses earn 9.60%, 10.30%, and 16.8% for being represented by a union, working in a tertiary care setting, and working in an urban location, respectively. Nonwhite IENs earn 8.60% less per hour if they are working at the staff nurse level compared with nonwhite IENs who are not in a staff RN position.

Following the analysis of wages earned by white and nonwhite IENs, the null hypothesis was not supported and a difference in wages was identified between white and nonwhite IENs. However, the favored group in this analysis was the nonwhite group rather than the hypothesized white group. However, the sources of the differences were related to wage penalties that were paid by white IENs and not assessed against nonwhite IENs. Therefore, I conclude that there is a positive difference in average wages of IENs who are nonwhite over those who are white, but that the source of that difference is related to penalties faced by white IENs primarily relating to being female, working as a staff RN, type of organization, and union membership (see Table 19).

The magnitude of impact of the variables on wages appears in Table 20. Overall, nonwhite IENs with one year of U.S. experience earn more per hour than white IENs because they do not face wage penalties associated with gender, realize a benefit from

union representation, and working in an urban location positively impacts hourly wage. Additionally, nonwhite IENs earn a 0.7% more per hour for each year of experience they have working in the United States. However, nonwhite IENs working in a tertiary care setting contributes less to the hourly wage than working in this setting contributes to white IEN wages (10.30% and 21.6% respectively). Working in an urban location also contribute to the hourly wage of an IEN who is nonwhite while an urban location is not a statistically significant variable related to wages for IENs who are white. When compared to nonwhite female IENs, white female IENs experience a wage penalty associated with gender.

Table 20

*Magnitude of Impact on Wages from Stepwise Regressions (Reduced Model)*

	All IENs		White IENs		Nonwhite IENs	
	B	% change*	B	% change*	B	% change*
Years USEXP	0.007	0.7%	-	-	0.007	.0.7%
UNION	0.087	8.71%	-	-	0.096	9.60%
URBAN	0.139	13.89%	-	-	0.168	16.80%
ACUTE CARE	0.126	12.61%	0.216	21.60%	.103	10.30%
FEMALE	-0.08	-8.02%	-0.195	-19.50%	-	-
WHITE	-0.07	-6.98%	-	-	-	-
STAFF RN	-0.102	-10.24%	-0.159	-15.9%	-0.086	-8.60%
DIPLOMA	-0.061	-6.13%	-	-	-	-
Overall Impact on Wage/HR		4.54%		-13.8%		28.8%

\*Percent of change per each unit of lnWage over time,

### **Statistical Analysis: Wage Decomposition**

To understand the impact of individual attributes, human capital endowments, and market influences on wages, wages were decomposed using the BO decomposition model with a Cotton-Neumark extension. Following Jarrell and Stanley (1998), the stability provided by the BO decomposition eliminates the need for correction of selectivity bias when identifying the reference group. Use of the Cotton-Neumark extension addresses the theory underlying the selection of reference groups by using a weighted measure ( $\beta^*$ ) that assumes that the proper wage falls between the two groups. Wage decomposition methods were applied to the same dataset as the stepwise regression analysis after cleaning, validation, and recoding as described above.

The BO wage decomposition utilizes the means and unstandardized beta coefficients to differentiate wages into endowment effects and coefficient effects. Endowment effects (means) are those effects that are related to human capital investments and individual characteristics (considered observable) while coefficient effects (unstandardized betas) represent the effects of discrimination (considered unobservable). Means and coefficients for white IENs, nonwhite IENs, and all IENs (pooled group) appear in the tables below.

Table 21

*Means and Standard Deviations for IENs (white, nonwhite, and pooled) With Racial Gap*

Indep Var	Pooled		White <sup>‡</sup>		NonWhite		Racial Gap
	Mean	SD	Mean	SD	Mean	SD	
LnWge	3.52	0.317	3.45	0.323	3.54	0.313	-0.09
Break	0.12	0.328	0.21	0.407	0.1	0.301	0.11
Married	0.77	0.424	0.67	0.471	0.79	0.407	-0.12
Prof_Cert	0.58	0.494	0.5	0.502	0.6	0.49	-0.1
Staff RN	0.75	0.433	0.62	0.486	0.78	0.412	-0.16
Add_Ed	0.17	0.374	0.21	0.411	0.16	0.363	0.05
Acute Care	0.71	0.452	0.71	0.455	0.71	0.452	0
Skill_Cert	0.55	0.498	0.45	0.499	0.57	0.495	-0.12
Urban	0.93	0.258	0.87	0.34	0.94	0.229	-0.07
Female	0.9	0.301	0.91	0.293	0.9	0.303	0.1
Diploma	0.3	0.457	0.57	0.497	0.23	0.418	0.34
BSN	0.6	0.49	0.28	0.452	0.69	0.464	-0.41
Union	0.28	0.449	0.18	0.382	0.31	0.462	-0.13
USEXP	13.51	9.685	15.3	9.128	13.03	9.781	2.27
USEXP2	276.128	318.414	316.754	319.896	265.326	317.411	51.43
White	0.21	0.408					
<i>n</i>	757		159		598		

Note. DV: LNWAGE

Table 22

*Racial Comparison of Coefficients, Standard Errors, and Confidence Levels for Independent Variables*

Variables	White <sup>†</sup>				Nonwhite			
	Unstandardized Coefficients		95% CI for B		Unstandardized Coefficients		95% CI for B	
	B	SE	Lower	Upper	B	SE	Lower	Upper
BREAK	0.001	0.063	-0.124	0.125	-0.037	0.04	-0.117	0.042
MARRIED	-0.065	0.053	-0.17	0.04	-0.01	0.03	-0.068	0.049
P_CERT	-0.035	0.121	-0.274	0.205	-0.024	0.073	-0.168	0.119
STAFF RN	-0.153	0.057	-0.266	-0.04	-0.077	0.033	-0.141	-0.012
ADD_ED	0.016	0.064	-0.111	0.143	0.023	0.036	-0.047	0.094
ACUTE CARE	0.218**	0.059	0.101	0.336	0.108**	0.028	0.053	0.162
S_CERT	0.028	0.123	-0.215	0.271	0.057	0.073	-0.086	0.199
URBAN	0.041	0.075	-0.106	0.189	0.162*	0.053	0.058	0.266
FEMALE	-0.192*	0.085	-0.361	-0.023	-0.044	0.04	-0.123	0.035
DIPLOMA	-0.095	0.071	-0.234	0.045	-0.051	0.048	-0.146	0.044
BSN	0.015	0.08	-0.143	0.172	-0.006	0.044	-0.092	0.08
UNION	0.069	0.066	-0.062	0.2	0.085*	0.027	0.032	0.137
USEXP	0.01	0.01	-0.01	0.03	0.016**	0.005	0.007	0.025
USEXP2	0	0	-0.001	0	0	0	-0.001	0
R <sup>2</sup>	0.21				0.142			
Adj R <sup>2</sup>	0.133				0.121			
n	159				598			

\* $p < .05$ \*\* $p < .01$ <sup>†</sup>Reference Group = White



The mean gap in wages between white and nonwhite IENs is - 0.09 log points, with white IENs earning less than nonwhite IENs (a difference in \$2.70 per hour). White IENs were 11% more likely to have taken a break of a year or more, but 12% less likely to be married at the time of the survey (both groups, however, were predominately married, 67% for white IENs and 79% of nonwhite IENs). White IENs were also less likely to hold professional or skill certifications (10% and 12%, respectively) but 5% more likely to have obtained additional higher education after their initial preparation as an RN. However, 34% of white IENs were initially prepared at the diploma level, while nonwhite IENs were 41% more likely to have been educated at the baccalaureate level. Nonwhite IENs were 13% more likely to have been represented by a union at the time of the survey. White IENs had approximately two years more years of experience working in the United States as an RN and experienced a greater return on their years of experience overall.

The unstandardized Beta coefficients (Table 22) were obtained through regression of the dependent variable,  $\ln WAGE$ , on  $STAFF\ RN$ ,  $ACUTE\ CARE$ ,  $URBAN$ ,  $FEMALE$ ,  $DIPLOMA$ ,  $BSN$ ,  $UNION$ ,  $USEXP$ , and  $USEXP^2$  using the ENTER method. Each group (pooled, white, nonwhite) was regressed,  $R^2_{pooled} = .154$  ( $n = 757$ ),  $F(15,741) = 9.005$ ;  $R^2_w = .210$  ( $n = 159$ ),  $F(14,144) = 2.736$ ;  $R^2_{nw} = .142$  ( $n = 598$ ),  $F(14,583) = 6.893$ ,  $p \leq .001$  for all regression equations. The variables explained more of the variance for the  $IEN_w$  model at 21% and lesser for the  $IEN_{NW}$  group at 14%. The amount of variance accounted for in the pooled IEN group was approximately 15.5%, indicating that the model was able to account for the most variance in wages for  $IEN_w$ .

The standard BO detailed decomposition was conducted along with the Cotton-Neumark extension that uses weighted measures for determining relative advantages and disadvantages for each group. Table 23 presents the variables and their contributions toward understanding the difference in mean wages between white and nonwhite IENs. Omitted variables prevented the model from fully identifying sources of differences due to skill and those that remained unexplained. Overall, the regression analysis did a better job of identifying and quantifying sources of differences between wages earned by white and nonwhite IENs than the decomposition.

Table 23

*Percent of Wage Difference Explained Using BO Decomposition*

Variables	White % Explained	Nonwhite % Explained
BREAK	2.93%	0.70%
MARRIED	-2.37%	-5.89%
P_CERT	-2.41%	-3.00%
STAFF RN	-13.65%	-20.12%
ADD_ED	-0.99%	-0.80%
ACUTE CARE	0.00%	0.00%
S_CERT	5.61%	3.75%
URBAN	8.77%	4.27%
FEMALE	0.69%	1.48%
DIPLOMA	18.80%	26.76%
BSN	-0.60%	3.98%
UNION	9.74%	8.63%
USEXP	-30.71%	-23.46%
USEXP2	0.00%	0.00%

The BO detailed decomposition was used to locate the remainder of the difference in wages as related to either skills or other observable characteristics or that remained unexplained by those characteristics. The BO decomposition differentiates

between differences that can be explained by individual characteristics and human capital endowments and those that are unexplained and attributed to discrimination. For this sample, the BO detailed decomposition was unable to explain the full difference between log wage hourly earnings of white and nonwhite IENs. Overall, the statistical analysis failed to find support for either the null or the alternative hypotheses. However, evidence was found to support a counterfactual hypothesis stating that nonwhite IENs earn a higher wage than white IENs.

### **Relationship of Gender, Race, and Wages**

The Bureau of Labor Statistics calculated the average wage for an RN working in the United States in 2008 was \$31.31 (2009). Wages for all groups except white female IENs were significantly different from the wage earned by the average RN in 2008 ( $p \leq .003$ ). Nonwhite male, nonwhite female, and white male IENs earn an hourly wage that is higher than the average hourly earned reported for RNs at that time; this difference is statistically significant. White female ENs earned an hourly wage that was not statistically different from the average reported wage (\$31.31).

The effect size quantifies the magnitude of the difference between two groups.). According to the scale established by Cohen (1988) (Munro, 2005), the difference with the largest effect was the difference between wages of white male and white female IENs. White female IENs earned an average of \$8.01 less than white male IENs with an effect size of .808, meaning that the lack of similarity between the two groups was large. A white female with an hourly wage that placed her in the first quartile is equivalent to the average white male earner in the second quartile (Coe, 2002). The effect size

quantifies the magnitude of the difference between the two groups. In contrast, Nonwhite IENs of both genders, experience a moderate effect of the difference in wages when compared with white males, meaning that there was greater overlap in wages between members of those groups.

Table 24

*Means Wages of Sample Compared to Average Wage of RN in 2008 (\$31.31)*

Group	n	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	95% CI	
									Lower Bound	Upper Bound
NWM	61	36.86	9.83	1.258	4.409	60	0.000	5.55	3.03	8.06
NWF	537	35.85	10.68	0.461	9.861	536	0.000	4.54	3.64	5.45
WM	15	40.51	9.79	2.528	3.64	14	0.003	9.20	3.78	14.62
WF	144	32.5	10.04	0.837	1.425	143	0.156	1.19	-0.46	2.85

Note. Hourly RN wage in 2008 as reported by BLS; Single sample *t* Test; Equal Variances Assumed

Table 25

*Mean Wage for Sample Compared to Mean Hourly Wage of White Male IENs (\$40.51)*

Group	n	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	95% CI		Effect Size <i>r</i>	Cohen's <i>d</i>
									Lower Bound	Upper Bound		
NWM	61	36.86	9.83	1.258	-2.902	60	0.005	-3.65	-6.17	-1.14	0.183	0.372
NWF	537	35.85	10.68	0.461	-10.103	536	0.000	-4.66	-5.56	-3.75	0.222	0.455
WF	144	32.5	10.04	0.837	-9.573	143	0.000	-8.01	-9.66	-6.35	0.375	0.808

Note. Single sample *t* Test; Equal Variances Assumed

Nonwhite IENs did not pay a wage penalty related to being female and realized gains from years of U.S. work experience, working in an urban location, and being represented by a union. While both white and nonwhite IENs faced a wage penalty for holding a staff nurse position, nonwhite IENs paid less of a penalty than white IENs.

Both white and nonwhite IENs working in tertiary care settings earned more than those who worked in other settings. However, while white IENs earned more than nonwhite IENs, the favorable treatment was not enough to offset the gender wage penalty faced by white female IENs. However, the additional 29 cents per hour earned by nonwhite IENs accounted for only 10.7% or \$2.70 of the difference in hourly mean wages (see Table 25).

Unionization had a significant impact on nonwhite female and white male IENs (see Table 26). Nonwhite females who were unionized earned an average of \$3.67 more than nonwhite females without union representation. The effect size of the difference was moderate, meaning that there was a fair amount of overlap between the two groups. However, unionization had a great impact on white male IENs, with unionized males earning \$13.85 per hour less than white male IENs who were not represented by a union. The effect size of the difference in hourly wage was quite large (1.458) with non-unionized white males earning hourly wages 1.5 standard deviations above those who were represented by a union). Nonwhite females earned \$3.67 per hour more than nonwhite female IENs when represented by a union. This difference was statistically significant. The impact of union representation for nonwhite males and white females was not statistically significant.

Table 26

*Mean Hourly Wages of Nonwhite Female IENs Represented by a Union*

Group	n	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		Effect Size r	Cohen's d
										Lower Bound	Upper Bound		
Union	26	38.46	8.78	1.722									
NonUnion	35	35.67	10.51	1.776									
Pooled	61	37.065			3.674	535	0.000	3.673	1.00	1.709	5.636	0.143	0.288

Note. Single sample *t* Test; Equal Variances Assumed

Working in a tertiary care setting produced statistically significant wage differences only for white and nonwhite females (see Tables 27 and 28). The greatest difference related to working setting was between white females working in tertiary care as opposed to other settings. White females in tertiary care settings earned \$5.04 more than white female nurses in other settings, while nonwhite females earned \$2.71 more working in tertiary care than they did in other settings. The effect sizes for white and nonwhite females (.526 and .259, respectively) demonstrated that the two groups of white female IENs had greater differences than the two groups of nonwhite IENs. White female IENs working in tertiary care earned an average of \$5.04 per hour more than white female RNs who worked in other settings. Nonwhite females working in tertiary care earned \$2.71 more per hour than nonwhite females who worked in other settings. These differences were statistically significant.

Table 27

*Differences in Mean Hourly Wage of White Females Working in Acute Care*

Group	n	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		Effect Size r	Cohen's d
										Lower Bound	Upper Bound		
Acute Care	100	34.04	10.123	1.012									
Other	44	29	9.01	1.358									
Pooled	144	31.52			2.841	142	0.005	5.036	1.773	1.532	8.541	0.254	0.526

Note. Single sample t Test; Equal Variances Assumed

Table 28

*Differences in Mean Hourly Wage of Nonwhite Females Working in Acute Care*

Group	N	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		Effect Size r	Cohen's d
										Lower Bound	Upper Bound		
Acute Care	384	36.63	10.816	0.552									
Other	153	33.92	10.10	0.817									
Pooled	537	35.275			2.668	535	0.008	2.705	1.015	0.714	4.702	0.128	0.259

Note. Single sample t Test; Equal Variances Assumed

Significant wage differences were found between IENs working in staff RN positions. Only nonwhite female IENs had significantly different mean hourly wages when working as a staff RN. Staff RNs who are nonwhite female IENs earn \$2.77 less than nonwhite female RNs holding non-staff RN positions in an organization. The difference in wages between staff and non-staff nonwhite female IENs had a large effect size (.526) indicating that while the monetary difference was low, the difference between the groups was large. A nonwhite female IEN who is not a staff nurse had an average wage that was .5 standard deviations above the average nonwhite female IEN in a staff RN position. Nonwhite female staff RNs earned \$2.77 per hour less than nonwhite females who are not staff RNs. This difference is both statistically and practically significant.

Table 29

*Differences in Mean Hourly Wage of Nonwhite Female Staff and Non-Staff Nurses*

Group	n	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		Effect Size r	Cohen's d
										Lower Bound	Upper Bound		
Staff RN	420	35.25	10.72	0.523									
Others	117	38.02	10.28	0.951									
Pooled	537	36.64			-2.491	535	0.013	-2.77	1.111	-4.949	-0.584	-0.254	-0.526

Note. Single sample *t* Test; Equal Variances Assumed

Working in an urban location produced statistically significant differences in wages for nonwhite female IENs, with those in urban locations earning \$5.31 per hour more than nonwhite female working in nonurban locations. The effect size of this difference was large (.468), indicating that nonwhite female IENs working in urban locations earned hourly wages that were roughly .5 standard deviations above those working in non urban locations (see Table 30). Nonwhite females working in an urban location earned \$3.89 per hour more than nonwhite female IENS working in nonurban locations. This difference was statistically significant and has practical implications for the nursing profession and healthcare industry.

Table 30

*Differences in Mean Hourly Wage of Nonwhite Females IENs in Urban Locations*

Group	n	Mean	Std Dev	SEM	t	df	sig (2 tailed)	Mean Diff	SE Diff	95% CI		Effect Size r	Cohen's d
										Lower Bound	Upper Bound		
Urban	507	36.15	10.526	0.467									
Not Urban	30	30.84	12.12	2.214									
Pooled	537	33.495			2.66	535	0.008	5.306	1.995	1.387	9.226	0.228	0.468

Note. Single sample *t* Test; Equal Variances Assumed



The results of the regression analysis, coupled with the post hoc examination of differences between means found evidence of statistically significant differences in wages earned by IENs based on race and gender.

### **Summary**

The chapter presented the results of the statistical analysis of data to answer the questions about equality of wages earned between IENs. Collection, cleaning, and treatment of data were presented, along with a discussion of how the constructs of the study were represented by the variables selected for inclusion. Descriptive statistics representing the sample were presented. The four research questions and their associated hypotheses were tested and the results presented.

The null hypothesis of no wage differences among IENs based on skin color was rejected, with the finding that there is a difference in wages earned between white and nonwhite IENs. The alternative hypothesis was also rejected because the group earning higher wages was the nonwhite group. The source of this difference was found in the regression analysis, rather than the BO detailed wage decomposition. In this sample, white nurses were paid a premium (\$0.22/hr.) for working in a tertiary care setting. However, this favorable treatment was not enough to overcome the penalties these nurses paid for being female (- \$0.20/hr) and holding a staff nurse position (-\$0.16/hr.). The total penalties paid by white IENs resulted in a net loss of \$0.14 per hour when compared to nonwhite female IENs.

Nonwhite IENs also paid a penalty for holding staff nurse positions, but the penalty was less than that of their white IENs coworkers (-\$0.09/hr.). While nonwhite

IENs who worked in tertiary care settings also earned more, on average, than nonwhite IENs who worked in other settings, they earned less than half the premium of their white IEN coworkers (\$0.10/hr.). Nonwhite IENs also realized gains from being represented by a union (\$0.10/hr.) and working in an urban location (\$0.17/hr.). The total advantage gained by nonwhite IENs represents \$0.29/hr., while white IENs earned \$0.14/hr. less because of their observed characteristics. White IEN males were the economically favored group in this sample, followed by nonwhite males and nonwhite females. White females were the least advantaged in this sample.

In the concluding chapter, I interpret the findings of the study within the context of the current literature. Limitations of the study will be presented, followed by recommendations for future study. The implications of the study for the health care industry IENs, and the nursing profession and the contribution of the study to positive social change conclude the paper.

## Chapter 5: Discussion, Conclusions, and Recommendations

This study explored differences in wages among IENs working in the U.S. healthcare system and was grounded in the conceptual frameworks of Becker's theory of discrimination and Mincer and Becker's work on human capital investment. The study was designed to determine the impact of individual attributes (race, and gender) human capital investment (country of nursing education, initial level of RN preparation, professional and technical certifications, and years of experience working in the United States), and market attributes (tertiary care setting, urban location, position, and union representation) on wages earned by IENs working in the United States. Data collected by HRSA was used to analyze wages of IENs working full time in the United States. The sample consisted of 757 IENs who responded to the 2008 NSSRN survey questionnaire. Variables selected for inclusion were supported by the literature on nurses, women, immigrants, and guest workers. OLS regression was followed with a BO wage decomposition to determine the significance and impact of selected variables on wages earned by IENs. Following analysis using OLS regression and the BO decomposition of wages, differences of mean wages for groups defined by race and gender were tested using *t* tests and interpreted using Cohen's *d*.

Empirical evidence in the literature points to a decreasing gap in wages between men and women across occupations; however, there has been increasing interest in the wage differences between IENs and USENs. Recent findings that IENs earn more than USENs have not reported on the sources of those differences. In this study I analyzed data from the 2008 NSSRN to explore possible reasons for reported wage differences.

Using OLS regression and the BO wage decomposition to analyze the data, I asked if there were differences in wages paid to IENs based on race. I determined that nonwhite IENs earn a greater wage overall, but the primary source of the premium resides in a gender penalty paid by white female IENs. Nonwhite female IENs do not receive preferential wages *per se*, but they are not penalized for being female. I did not accept the null hypothesis; however, in the alternative hypothesis I posited that white IENs earned a higher wage than nonwhite IENs. This hypothesis was rejected as well because the direction of the difference was not supported. Nonwhite IENs earn a greater wage than white IENs.

The analysis of data supported findings in the literature in that nonwhite IENs earn more, on average, than white IENs. Descriptive statistics and examination of mean differences also provided support for employers' favorable treatment of white males over all other groups of workers. My analysis also supported queuing theory in gender-segregated occupations in that nonwhite females followed nonwhite males and preceded white females in employers' preferences (Toney, 2005).

It was of note that the attainments of additional education, professional certification, or technical skills that signal human capital investment were not statistically significant nor did they figure into the BO decomposition in any meaningful way. These investments, highly prized by the nursing profession, earn IENs no premiums in terms of salary gains in this sample. Also noteworthy is that a year of U. S. work experience contributes to wages of nonwhite IENs but not to IENs who are white. Within the context of the BO detailed decomposition, this variable had no effect on either white or nonwhite

IENs earnings; however, the regression analysis showed that nonwhite IENs earn a premium for years of U. S. experience (albeit negligible) while white IENs did not benefit.

This study was important for reasons of social justice and pay equity. However, it is also important to determine the impact of race on wages of immigrant nurses working in the United States because of recent evidence demonstrating the unethical treatment of immigrant nurses globally. The United States legislates uses legislation to prevent discriminatory wage setting based on race, gender, and other innate characteristics or beliefs held by individuals. It is important to know if these protections have, in fact, eliminated pay race or gender based wage discrimination. Because nursing is a gender-segregated profession, it is important to understand how nurse wages are set. Additionally, it is important for the nursing profession to understand if the locus of the difference is related to country of education. Finally, if employers pay IENs more favorably than USENs, do differences and thus signals a devaluation of a domestic nursing education?

### **Interpretation of Findings**

I hypothesized those findings in recent literature showing that IEN wages were higher than USEN wages might be explained by a phenomenon within the IEN nursing population. Because there have been no studies examining wages among IENs, it seemed possible that a subgroup of the IEN population was receiving preferential wages large enough to influence the wages of all IENs. If this was so, then IENs might not, as a

group, earn more than USENs. Therefore, decomposing wages within the IEN population should be able to shed light on the source of wage differences.

In 2008, the mean annual RN wage was \$65,130 (\$31.31 per hour) (BLS, 2009). The mean annual wage for IENs in this study was \$73,611 (\$35.39 per hour) resulting in an annual wage difference of \$8,481 (\$4.08 per hour). Thus, in 2008, the estimated mean wage for all RNs was 88% of the wages earned by this sample of IENs. This is the wage difference between nonwhite IENs and white IENs in the sample (see Table 5).

In the review of literature, four major findings about nursing wages were presented. First, women earn less than men do, regardless of race (Durden & Gaynor, 2000; Kalist, 2002; Hayden, 2004; Jones & Gates, 2004; Hirsch & Schumacher, 2005). Second, IENs earned higher wages than USENs (Huang, 2011). Third, black female RNs earn more than white female RNs (Fisher & Houseworth, 2009; McGregory, 2011). Finally, Buhr (2010), Hersch (2010), and Schumacher (2010) found that wages are related to skin color. However, while. This study demonstrated support for all four findings. Additionally, this study supported the findings of McGregory (2011) and Toney (2005) demonstrating that queuing order in nursing is different from runs counter to queuing order in mixed gender occupations.

There was evidence for wage discrimination based on the interaction of gender and race in the sample. For each dollar per hour earned by a white male IEN, a white female IEN earned \$0.80, a nonwhite female IEN earned \$0.89, and a nonwhite male IEN earned \$0.91. Findings from the regression analysis demonstrated that white female IENs paid a gender penalty of \$0.20 per hour, while nonwhite IENs neither earned a premium

nor paid a penalty related to gender. The wage difference between male and female IENs in this study was 94%, with women earning \$0.94 for each dollar earned by men. While the difference did not reach statistical significance, the finding is of practical importance; and supports the flattening of wages reported by Jones and Gates (2004) and suggests that the gender wage gap found by Kalist (2002) and Hayden (2004) persists. Previous studies used data from the 2000 and 2004 NSSRN and looked only at differences in wages earned by male and female nurses. It is important that this finding appears within the 2008 IEN population as well, indicating the global and persistent nature of gender discrimination in the nursing profession.

Additionally, evidence of discrimination was found in wages for IENs working in tertiary care settings. White IENs earned an additional \$0.22 per hour when working in tertiary care while nonwhite IENs earned \$0.10 per hour (Table 18). Finally, the study found support for assimilation theory in wages earned by IENs. For this population, nonwhite IENs earned an additional penny per hour for each year of U.S. work experience. White IENs earned no return on their U.S. work experience. It is possible that because white IENs are from Canada or the United Kingdom their difference is less visible and therefore, assimilation is not as big an issue for white IENs. This would provide additional support for racial discrimination.

The conceptual model presented in Chapter 2 (Figure 1) was supported in that the most significant predictors for wage in a period of high demand were market attributes. The model indicated that market attributes would be the primary driver of wages earned by RNs. According to the model, under conditions of labor market equilibrium or an

oversupply of nurses in the labor market, employers' preferences for professional and individual attributes would mediate hiring and wage setting. However, when demand is high and supply is low, or market competition is strong, employers' preferences will not mediate hiring and wage setting and will be considered a luxury.

Union representation, a tertiary care setting, and an urban location were all statistically significant predictors of wage while initial educational preparation as an RN, additional higher education, technical skills, and professional certifications did not predict wages. The only individual characteristics with predictive power were gender and skin color. Gender was significant only for white female IENs. In the pooled sample, a wage penalty was paid for preparation at the diploma level but this difference disappeared when the sample was divided by skin color. It is interesting to note that while some diploma nurses paid a wage penalty, no premium was paid to IENs holding a BSN, however, preparation as a BSN explained 3.98% of the wage for a nonwhite IEN. A white IEN was less likely to hold a BSN as an initial preparation and this variable was not helpful in explaining wage differences.

Another implication of the findings of this study is the return on human capital investments made by IENs. Mincer (1958) asserted that productivity in jobs requiring higher amounts of training is greatly influenced by levels of experience. Mincer (1958) went on to theorize that in professions, experience extends formal training and that gains increase with age as experience in the field is obtained. Therefore, it is reasonable to assume, given human capital theory, that in professions such as nursing, increased investments in skills training would yield positive returns. However, in this study, returns



on educational investment and experience were not statistically significant. The study did support Mincer's assumption that the income paths for groups in highly trained professions yield higher income differences within the group than when compared to differences in groups requiring less training. The findings of this study support Mincer's assumption, in that the between group differences in wages appeared to vary widely and, although the statistical significance of those differences was not examined, the practical impact of the differences suggests the expected wage dispersion due to increased experience (and age), was not evident in this sample. The analysis of data indicated that none of the human capital investments made by IENs in the sample were significant predictors of wages for all IENs with the exception of the initial choice of to become an RN. Years of experience working in the United States were the only exception, and this variable yielded an additional penny per hour per year of experience for nonwhite IENs. Finally, the findings from this study support the contention that female IENs, especially white IENs, because of their lower wage structure, disproportionately bear the burden of health care sector inefficiencies.

### **Implications for Social Change**

In 2008, roughly 165,659 RNs were educated outside the United States and its territories. Many IENs come from countries that are considered less developed (LDC), are predominately women, and are nonwhite (Aiken et al., 2004; Brush, 2002, 2008; Polsky et al., 2007). These groups have historically experienced economic and social discrimination in the United States based on class, gender, nativity, and race. This sample consisted of 89% women ( $n = 681$ ) and 11% men ( $n = 76$ ) from predominately LDCs ( $n$

= 630, 80%). The white males in this sample ( $n = 15$ ) came from Canada ( $n = 10$ ), the United Kingdom ( $n = 2$ ), and other unspecified countries ( $n = 3$ ). The distribution of these 15 IENs in terms of educational level, work setting, union representation, holding a staff RN position, or working in an urban location was not different from the distribution of the sample as a whole. This finding leads to the conclusion that there is inequality based on a preference for white male IENs. This inequality is an issue of social justice. Correction of this inequity provides for greater social justice. Unequal pay for equal work and equal skills based only on skin color and/or gender is an avoidable exploitation of immigrant nurses.

Positive social change can be accomplished when healthcare leaders are aware of, and pay attention to, pay distribution among their staffs. One of the major criticisms of Becker's theory of discrimination is its silence on why a capitalist would prefer to pay a higher wage. Regardless of the economic irrationality of such an action, healthcare employers obviously pay white male IENs favorably in comparison to nonwhite male and female IENs. However, the major economic insult is felt by white female IENs, who earn only 80% of the wages paid to white male IENs. Therefore, despite wage protections put in place by the government of the United States, wage discrimination persists in the healthcare industry; intimating that the intrinsic worth of individuals who are not white males is somehow less. Bringing wages of all IENs into line with those of white male IENs will reflect the value of an individual beyond that of race or gender, neither of which is an earned benefit or human capital investment.

Dooley (1997) contended that CAS brings clarity to wicked problems by bringing together components of information processing, population ecology, and systems theory (p. 69). Walby's (2007) theory of intersectionality encourages social scientists to look at issues of inequality within the context of a wicked problem that cannot be solved from a single perspective because its root cause is situated at the crux of multifaceted and multidimensional interactive systems that exist across multiple contexts (Rittel & Webber, 1973) among nonlinear relationships (Eriksson, 2007; Timmermans, 2008). Through the application of CAS to address the multifaceted issue of wage inequality, those interested in social justice will be able to effect positive social change through a holistic approach. Wicked problems can be effectively addressed through incremental changes that eventually affect the whole. Currently, healthcare leaders are attempting to address issues of IEN exploitation through ethical recruiting initiatives (Buchan, 2006; Drevdahl & Dorcy, 2007; Smith & Mackintosh, 2007; Sparacio, 2007); however, these initiatives assume that wage differences are not, in and of themselves, evidence of discrimination and inequality post migration. For real social change to occur, health care leaders and legislators must understand the determinant of wages and the ways in which they are disproportionately applied at the individual level.

### **Limitations of the Study**

One limitation is that the current study tested only the influence of the professional attribute of country of education and the individual attributes of race and gender on wages of IENs while holding constant all other human capital, individual, and market attributes. Other variables such as native language, fluency in English, and

cultural differences were not tested. Another limitation of the study was that a BO detailed decomposition could not be conducted for male and female IENs because the required number of males (100) was not achieved. A third important limitation was the lack of adjustment for purchasing power across the periods of study (Lacey & Nooney, 2006). As a result wage differences between the groups may be understated. Taken together, these limitations may contribute to an incomplete understanding of wage differences among IENS. A final limitation involves queuing theory. While this study supports a previous finding that queuing theory operates differently in gender-segregated profession than in other occupations, no explanation of why this labor market operates differently can be inferred. Based on identified gaps, these findings may reflect omitted variables rather than demonstrate reverse discrimination.

Wages for this study were limited to self-reported base annual earnings for the primary nursing position held by a respondent. Information about shift differentials or shift commonly worked was not collected. Lack of this information has been a hallmark of wage studies leading to the limitations of studies about nursing wages. It is unknown if these nurses reported their base wage or included shift differentials because backing them out was cumbersome or added a burden to their responses. Therefore the full impact of earnings may be understated for some respondents and overstated for others.

The study population was delimited to IENs who reported working full time (at least 36 hours per week) in a primary position that required an active nursing license ( $n = 757$ ). This requirement eliminated 49% of the IEN respondents to the NSSRN survey questionnaire ( $n = 1,548$ ). It is possible that the respondents selected into the study

represented a specific subset of the IEN population that is not comparable to the IENs not meeting selection criteria. In addition, this sample contained almost twice the number of male nurses (11%) than is found in the profession in general (5%). Because of the specificity of the selection criteria and the gender concentration in the sample, the findings from this study cannot be generalized to other IENs such as those working part time, working outside the nursing profession, or to other immigrant or guest worker groups. Finally, in terms of human capital investments made by IENs, this study did not incorporate occupational rank and thus, was unable to fully address intra-occupational human capital theory as theorized by Mincer.

### **Recommendations for Action**

Recommendations for action involve dissemination of research results and findings within the nursing profession and healthcare industry. Presentation of findings at professional conferences will also help raise awareness and understanding of this problem. Additionally, more closely aligning the issue of nursing wages to the equal pay initiatives will help educate both employers and nurses. If nurses are aware of the difference in wages, they may be more inclined to act on an individual basis in their salary negotiations with employers (or perhaps will be encouraged to negotiate). Dissemination of results in the field of health economics may encourage additional studies on human capital investments made by nurses and their impact on nursing wages.

One course of action would be for nurse researchers, educators, and leaders in the nursing profession and health services to reconcile the incongruence between the push for greater human capital investments for nurses and the lack of return on those investments.

Currently, hospitals receive magnet status for the increased human capital investments made by the nurses working in the organization and for additional professional activities such as clinical research. However, if human capital investments yield no return for the nurses individually, there is opportunity for additional exploitation of nurses by their employing organizations. Encouraging individual nurses to invest in human capital without any return on their investment is ethically questionable. While an argument can be made that patient safety increases because of these individual investments, it is economically untenable for individual nurses to pay for those investments out of their own pockets. In economic terms, the decision to do so would not represent a rational choice by the nurses but free ridership for the organization. In economic terms, the decision to make human capital investments does not represent a rational choice by the nurses but free ridership for the organization. Therefore, another course of action would be to share the results of this study with the American Nurses Credentialing Center (ANCC), the body that grants magnet status, so that they might add ethical economic treatment for nursing professionals to their criteria for magnet status. Sharing the findings of the study with advocacy groups and unions will provide those groups with data they need to add remedies for wage inequality within the nursing profession and for IENs in particular, to their action items.

### **Recommendations for Further Study**

Recommendations for further study include an analysis of within and between group wages differences as well as expanded detailed wage decomposition. An analysis using MANCOVA to provide a more sensitive study at the relationship between U.S.

experience and wage might be productive. Likewise, an analysis of data using a regression analysis time series (RATS) approach might provide a more powerful analysis of the data and yield a more complete understanding of the predictors of nursing wages and the relationship of nursing wages in response to secular events and cycles of high and low demand for nursing labor.

A model that includes a more robust set of variables could be used with the full dataset from the 2008 NSSRN. Analysis of the county level data file with a cross-reference to cost of living data (COL) within the context of wage differences is needed to account for differences between regions. Wages between high and low cost of living areas will result in differences in wages for nurses working in those regions but not differences in purchasing power (Lacey & Nooney, 2006). Addition of a geographic or regional component to future studies also allows researchers to explore the role of institutionalized discrimination based on gender or race (Charles & Guryan, 2008). Impacts of institutionalized discrimination might also be linked to devaluation theory proposed by Macpherson and Hirsch (1995) and pollution theory (Goldin, 2002). A perception of the nursing profession as deskilled, or proletarianized, may lead employers and the public to undervalue nurses based on class. Therefore, any future studies exploring institutionalized discrimination in the healthcare industry may find that there is an intersection between class, gender, and race for both IENs and USENs.

Kalist et al. (2010) found that a 1% increase in the proportion of IENs in an area increased wages by 1.3% for all RNs. Therefore, looking at wage differences within the context of the penetration or density of IENs in a market would shed additional light on

differences in wages between nurses in those areas. A study such as this might be coupled with a study on migration networks allowing researchers to explore specific subsets of IENs such as Filipina or Indian nurses who tend to create migration networks or capitalize on networks already in place. Looking at diaspora networks helps researchers understand how additional migration patterns might affect wages.

Because roughly 71% of respondents in this study consisted of nurses from the Philippines ( $n = 537$ ), an in-depth analysis of wages earned by Filipina IENs nurses who migrated from the Philippines might be illuminating. There are significant differences in the way the Philippines educate and market their overseas workforce that may affect employers' preferences. While the regression analysis failed to include education in the Philippines as a predictor of wage, post hoc  $t$  tests demonstrated a significant difference in mean wages earned by nurses educated there than in other countries. A case study analysis or comparison of nurse preparation and exportation practices of other countries might provide some additional insight on how wages are affected by country of education/nativity.

A mixed methods approach would provide researchers with a way to understand the impact of IENs on a healthcare organization aside from the economic ramification. There may be some experiences attitudes, and behaviors shared by IENs that might qualitatively explain differences in wages or uncover other differences in the way IENs are treated by U.S. healthcare organizations. Inclusion of nursing and human resource directors who actively recruit from abroad would add considerably to the knowledge base about nurse migration in general and wage in particular. Additionally, a mixed methods



approach might shed more light on the relationship of skin color and gender on wages of nonwhite female USENs and IENs.

Another recommendation for future study would be a factor analysis of characteristics of IENs. Using a factor analysis would permit researchers to develop group membership profiles or an index of characteristics that could be then be used to predict wages. Such an index would provide a meaningful predictor variable for nursing wage studies because the synergistic actions of individual and human capital investments in individual performance could be captured, described, and quantified.

### **Conclusion**

This paper reported on a quantitative cross sectional study of wage differences within a sample of IENs drawn from the 2008 NSSRN. Using OLS regression and detailed wage decomposition, differences in wages between white and nonwhite male and female IENs were identified and quantified. Based on a review of literature on immigrant wages, nursing wages, and human capital and discrimination theory, variables likely to serve as predictors of wage were identified and used to predict hourly wages of IENs working full time as nurses and who responded to the 2008 NSSRN survey questionnaire. Wage differences were identified between white and nonwhite IENs, male and female IENs, and IENs grouped by both race and gender. Evidence of unexplained wage differences was found, indicating the presence of wage discrimination.

This study makes four unique contributions to the literature on IEN wages in the United States. First, the study included a variable for the role of assimilation in earnings (USEXP). Second, the study was limited to only IENs working in the United States.

Third, the study provided support for the conceptual model demonstrating that market variables play a more central role in nursing wages than human capital investments in times of high demand for nursing labor. Finally, the study located the source of wage difference between white and nonwhite IENs as a gender penalty paid by white female IENs but not IENs of color.

An additional finding, not previously reported in the literature on nursing wages, is that white male IENs receive unearned benefits because of their gender and race. Examination of wages earned by IENs in the U.S. unpacked an “invisible knapsack” (McIntosh, 1988) of unearned benefits that accrue to some IENs because of their gender. By bringing little understood examples of discrimination to light, we are better prepared to address and counter examples of economic inequality and social injustice.

## References

- Aiken, L. H., Buchan, J., Sochalski, J., Nichols, B., & Powell, M. (2004). Trends in international nurse migration. *Health Affairs, 23*(3), 69–77. doi: 10.1377/hlthaff.23.3.69.
- Aiken, L. H., Clarke, S., Sloane, D., & Sochalski, J. (2001). An international perspective on hospital nurses' work environments: The case for reform. *Policy, Politics, & Nursing Practice, 2*(4), 255–263. doi: 10.1177/152715440100200402.
- Arends-Kuenning, M. (2006). The balance of care: Trends in the wages and employment of immigrant nurses in the US between 1990 and 2000. *Globalizations, 3*(3), 333–348. doi: 10.1080/14747730600870100.
- Arrow, K. J. (1998). What has economics to say about racial discrimination? *Journal of Economic Perspectives, 12*(2), 91–100. doi: 10.1257/jep.12.2.91.
- Babbie, E. (2004). *The Practice of Social Research* (10th ed.). New York: Thompson Wadsworth.
- Balkin, R. S. (2004). *Course notes: Multiple regression*. Course notes. Walden University.
- Becker, G. S. (1971). *The economics of discrimination* (2nd ed.). Chicago, IL: University of Chicago Press.
- Becker, G. S. (1994). *Human capital: A theoretical and empirical analysis with special reference to education* (3rd ed.). Chicago, IL: University of Chicago Press.
- Becker, G. S. (2002). *The age of human capital*. Retrieved from <http://economics.dlut.edu.cn/uploadfiles/20081106200614853.pdf>.

- Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *Journal of Human Resources*, 8(4), 436–455. doi: 10.2307/144855.
- Borjas, G. J. (1986). *The impact of assimilation on the earnings of immigrants: A reexamination of the evidence*. Retrieved from <http://ssrn.com>
- Borjas, G. J., Freeman, R. B., & Katz, L. F. (1996). *Searching for the effect of immigration on the labor market*. Paper presented at the SSRN eLibrary.
- Brush, B. L. (1999). Has foreign nurse recruitment impeded African American access to nursing education and practice? *Nursing Outlook*, 47(4), 175–180. doi: 10.1016/S0029-6554(99)90093-3.
- Brush, B. L. (2002). Sending for nurses: Foreign nurse migration, 1965-2002. *Nursing and Health Policy Review*, 1(2), 103–115. ISSN: 1533-208X
- Brush, B. L. (2008). Global nurse migration today. *Journal of Nursing Scholarship*, 40(1), 25. doi: 10.1111/j.1547-5069.2007.00201.x.
- Buchan, J. (2001). Nurse migration and international recruitment. *Nursing Inquiry*, 8(4), 203–204. doi: 10.1046/j.1440-1800.2001.00112.x.
- Buchan, J. (2004). International rescue? The dynamics and policy implications of the international recruitment of nurses to the UK. *Journal of Health Services Research & Policy*, 9(Suppl 1), 10–16. doi: 10.1258/135581904322724086.
- Buchan, J. (2006). The impact of global nursing migration on health services delivery. *Policy, Politics, & Nursing Practice*, 7(3, suppl), 16–25. doi: 10.1177/1527154406291520.

- Buhr, K. J. (2010). Do immigrant nurses in Canada see a wage penalty? An empirical study. *Business Economics*, 45(3), 210–223. doi: 10.1057/be.2010.23.
- Bureau of Labor Statistics (n.d.). What is a Registered Nurse? Retrieved from <http://www.bls.gov/ooh/Healthcare/Registered-nurses.htm>
- Bureau of Labor Statistics. (2009, May). Occupational employment and wages, May 2008 29-11 registered nurses. Retrieved from Occupational Employment Statistics <http://www.bls.gov/oes/2008/may/oes291111.htm>
- Chang, Y. M., & Walia, B. (2007). Wage discrimination and partial compliance with the minimum wage law. *Economics Bulletin*, 10(4), 1–7. Retrieved from <http://www.accessecon.com/pubs/EB/2007/Volume10/EB-07J40001A.pdf>.
- Charles, K. K., & Guryan, J. (2008). Prejudice and wages: An empirical assessment of Becker's *The Economics of Discrimination*. *Journal of Political Economy*, 116(5), 773–809. doi: 10.1086/593073.
- Chiswick, B. R. (2003). *Jacob Mincer, experience and the distribution of earnings*. Bonn: Institute for the Study of Labor (IZA).
- Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, MA: The Belknap Press of Harvard University Press.
- Cotton, J. (1988). On the decomposition of wage differentials. *Review of Economics and Statistics*, 70(2), 236–243. doi: 10.2307/1928307.
- Dooley, K. J. (1997). A complex adaptive systems model of organization change. *Nonlinear Dynamics, Psychology, and Life Sciences*, 1(1), 69–97. doi: 10.1023/A:1022375910940.

- Drevdahl, D. J., & Dorcy, K. S. (2007). Exclusive inclusion: The violation of human rights and US immigration policy. *Advances in Nursing Science*, 30(4), 290–302. doi: 10.1097/01.ANS.0000300179.64101.81.
- Durden, G., & Gaynor, P. (2000). Relative changes in gender and race-based earning costs, 1970–1995. *Applied Economics Letters*, 7, 401–404. doi: 10.1080/135048500351357.
- Eriksson, D. (2007). Phenomeno-semantic complexity: A proposal for an alternative notion of complexity as a foundation for the management of complexity in human affairs. *Emergence: Complexity and Organization*, 9(1–2), 11–21. ISSN: 1521-325.
- Fisher, J. D., & Houseworth, C. A. (2009). The reverse wage gap among educated White and Black women. *Journal of Economic Inequality*, 10(4). doi: 10.1007/s10888-011-9167-2.
- Flynn, L., & Aiken, L. H. (2002). Does international nurse recruitment influence practice values in U.S. hospitals? *Journal of Nursing Scholarship*, 34(1), 67–73. doi: 10.1111/j.1547-5069.2002.00067.x.
- Friedman, L. S. (2002). *The microeconomics of public policy analysis*. Princeton, NJ: Princeton University Press.
- Fritz, M., DiGaetano, R., Green, J., & Clark, J. (2010). *Multiple frame sample design and estimation for the 2008 National Sample Survey of Registered Nurses: Theory, implementation, and assessment*. Paper presented at the Joint Statistical Meeting 2010, Vancouver, Canada. Retrieved from

[http://www.amstat.org/sections/SRMS/proceedings/y2010/Files/307258\\_58175.pdf](http://www.amstat.org/sections/SRMS/proceedings/y2010/Files/307258_58175.pdf).

Gidwani, V., & Sivaramakrishnan, K. (2003). Circular migration and the spaces of cultural assertion. *Annals of the Association of American Geographers*, 93(1), 213. doi: 10.1111/1467-8306.93112.

Goldin, C. (2002). A pollution theory of discrimination: Male and female wage differences in occupations and earnings. *NEBR Working Paper Series*, (Working Paper 8985), 42. Retrieved from <http://www.nber.org/papers.html>.

Hayden, S. A. (2004). *Wage discrimination among US and internationally educated registered nurses*. Original research. PhD Program in Public Policy. University of North Carolina, Charlotte.

Hayden, S. A. (2005, November). *Gender wage discrimination in nursing*. unpublished.

Health Resources and Services Administration. National Sample Survey of Registered Nurses—downloadable data. Retrieved from <http://datawarehouse.hrsa.gov/nursingsurvey.aspx>

Hegewisch, A., Liepmann, H., Hayes, J., & Hartmann, H. (2010). *Separate and not equal? Gender segregation in the labor market and the gender wage gap*. Retrieved from <http://www.iwpr.org>.

Hersch, J. (2010). *The persistence of skin color discrimination for immigrants*. (Working Paper 1032). Retrieved from <http://ssrn.com>.

- Hirsch, B. T., & Schumacher, E. J. (1995). Monopsony power and relative wages in the labor market for nurses. *Journal of Health Economics*, 14(4), 443-476. doi: 10.1016/0167-6296(95)00013-8.
- Hirsch, B. T., & Schumacher, E. J. (2005). Classic or new monopsony? Searching for evidence in nursing labor markets. *Journal of Health Economics*, 24(5), 969-989. doi: 10.1016/j.jhealeco.2005.03.006.
- Hirsch, B. T., & Schumacher, E. J. (2008). Underpaid or overpaid? Wage analysis for nurses using job and worker attributes. *Discussion Paper Series*, (3833). Retrieved from <http://www.iza.org>.
- Huang, S. (2011a). *An evaluation of skilled immigration in the United States*. PhD Dissertation, University of Kansas. Retrieved from <https://kuscholarworks.ku.edu/dspace/handle/1808/7831>.
- Huang, S. (2011b). The international transferability of human capital in nursing. *International Journal of Health Care Finance and Economics*, 1-19. doi: 10.1007/s10754-011-9094-6.
- Iredale, R. (2001). The migration of professionals: Theories and typologies. *International Migration*, 39(5). doi: 10.1111/1468-2435.00169.
- Jarrell, S. B., & Stanley, T. D. (2004). Declining bias and gender wage discrimination? A meta-regression analysis. *Journal of Human Resources*, 39(3), 828-838. doi: 10.2307/3558999.



- Jones, C. B., & Gates, M. (2004). Gender-based wage differentials in a predominately female profession: Observations from nursing. *Economics of Education Review*, 23, 615-631. doi: 10.1016/j.econedurev.2004.06.001.
- Kalist, D. (2002). The gender earnings gap in the RN labor market. *Nursing Economics*, 20(4), 155-162. PMID: 12219436.
- Kalist, D., Spurr, S., & Wada, T. (2010). Immigration of nurses. *Industrial Relations*, 49(3), 406-428. doi: 10.1111/j.1468-232X.2010.00607.x.
- Kaufman, B. E. (2008). Jacob Mincer's contribution to modern labor economics: A review essay *W. J. Usery Workplace Research Group Paper Series: Andrew Young School of Policy Studies*. Retrieved from <http://aysps.gsu.edu/publications/2008/downloads/08-29%20Kaufman-JacobMincersContributions.pdf>
- Kingma, M. (2001). Nursing migration: Global treasure hunt or disaster-in-the-making? *Nursing Inquiry*, 8(4), 205-212. doi: 10.1046/j.1440-1800.2001.00116.x.
- Kingma, M. (2006). *Nurses on the move: Migration and the global health care economy*. Ithaca, NY: IRL Press.
- Lacey, L., & Nooney, J. (2006). Which pasture is really greener? A research note on salary studies. *Nursing Economics*, 24(3), 131-134. ISSN: 0746-1739.
- Macpherson, D. A., & Hirsch, B. T. (1995). Wages and gender composition: Why do women's jobs pay less? *Journal of Labor Economics*, 13(3), 426-471. doi: 10.1086/298381.

- Madden, D. (2000). Towards a broader explanation of male-female wage differences. *Applied Economics Letters*, 7, 765-770. doi: 10.1080/135048500444769.
- Marshall, R. (1974). The economics of racial discrimination: A survey. *Journal of Economic Literature*, 849-871. Retrieved from <http://www.jstor.org/stable/2721701>.
- McElmurry, B. J., Solheim, K., Kishi, R., Coffia, M. A., Woith, W., & Janepanish, P. (2006). Ethical concerns in nurse migration. *Journal of Professional Nursing*, 22(4), 235. doi: 10.1016/j.profnurs.2006.03.006.
- McGregory, R. C. (2011). An analysis of Black-White wage differences in nursing: Wage gap or wage premium? *The Review of Black Political Economy* (online). doi: 10.1007/s12114-011-9097-z.
- Milton, C. L. (2007). The ethics of nurse migration: An evolution of community change. *Nursing Science Quarterly*, 20(4), 319-322. doi: 10.1177/0894318407306528.
- Mincer, J. (1958). Investment in human capital and personal income distribution. *The Journal of Political Economy*, LXVI(4), 281-303. doi: 10.1086/258055.
- Mincer, J. (1974). *Progress in human capital analyses of the distribution of earnings*. Stanford, CA: Center for Economic Analysis of Human Behavior and Social Institutions.
- Muula, A. S., Mfutso-Bengo, J. M., Makoza, J., & Chatipwa, E. (2003). The ethics of developed nations recruiting nurses from developing countries: The case of Malawi. *Nursing Ethics*, 10(4), 433-438. doi: 10.1191/0969733003ne636oa.

- Neumark, D. (1988). Employer's discriminatory behavior and the estimation of wage discrimination. *Journal of Human Resources*, 23, 279-295.
- Nopo, H. (2008). Matching as a tool to decompose wage gaps. *Review of Economics & Statistics*, 90(2), 290-299. doi: 10.1162/rest.90.2.290.
- O'Neil, K. (2003). *Using remittances and circular migration to drive development*. Retrieved from <http://www.migrationinformation.org/USfocus/print.cfm?ID=133>.
- Oaxaca, R. L. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, 14(3), 693-709. doi: 10.2307/2525981.
- Oaxaca, R. L., & Ransom, M. R. (1994). On discrimination and the decomposition of wage differentials. *Journal of Econometrics*, 61(1), 5-21. doi: 10.1016/0304-4076(94)90074-4.
- Petersen, T., & Saporta, I. (2004). The opportunity structure for discrimination. *American Journal of Sociology*, 109(4), 852-901. doi: 10.1086/378536.
- Phelps, E. S. (1972). The statistical theory of racism and sexism. *The American Economic Review*, 62(4), 659-661. Retrieved from [http://www2.econ.iastate.edu/classes/econ321/orazem/Phelps\\_stat-discrimination.pdf](http://www2.econ.iastate.edu/classes/econ321/orazem/Phelps_stat-discrimination.pdf).
- Pittman, P., Folsom, A., Bass, E., & Leonhardy, K. (2007). *US-based international nurse recruitment*. Washington, DC: Academy Health.
- Polsky, D., Ross, S. J., Brush, B. L., & Sochalski, J. (2007). Trends in characteristics and country of origin among foreign-trained nurses in the United States, 1990 and

2000. *American Journal of Public Health*, 97(5), 899. doi: 10.2105/AJPH.2005.072330.
- Ransom, M. R., & Oaxaca, R. L. (2010). New market power models and sex differences in pay. *Journal of Labor Economics*, 28(2), 267-289. doi: 10.1086/651245.
- Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155-169. doi: 10.1007/BF01405730.
- Schumacher, E. J. (2010). Foreign born nurses in the US labor market. *Health Economics*, 20(3), 362-378. doi: 10.1002/hec.1595.
- Schumacher, E. J., & Hirsch, B. T. (1997). Compensating differentials and unmeasured ability in the labor market for nurses: Why do hospitals pay more? *Industrial & Labor Relations Review*, 50(4), 557-579. doi: 10.2307/2525262.
- Shulman, S. (1996). The political economy of labor market discrimination: A classroom-friendly presentation of the theory. *Review of Black Political Economy*, 24(4), 47-65. doi: 10.1007/BF02690042.
- Singh, J. A., Nkala, B., Amuah, E., Mehta, N., & Ahmad, A. (2003). The ethics of nurse poaching from the developing world. *Nursing Ethics*, 10(6), 666-670. doi: 10.1191/0969733003ne655oa.
- Soper, D. (n.d.). Statistics Calculators version 3.0 beta. Accessed at <http://www.danielsoper.com/statcalc3/calc.aspx?id=1>.
- Smith, P., & Mackintosh, M. (2007). Profession, market and class: Nurse migration and the remaking of division and disadvantage. *Journal of Clinical Nursing*, 16(12), 2220. doi: 10.1111/j.1365-2702.2007.01984.x.

- Sparacio, D. C. (2005). Winged migration: International nurse recruitment -- friend or foe to the nursing crisis? *Journal of Nursing Law*, 10(2), 114. doi: 10.1891/107374705780946570.
- Spetz, J., Ash, M., Konstantinidis, C., & Herrera, C. (2011). The effect of unions on the distribution of wages of hospital-employed registered nurses in the United States. *Journal of Clinical Nursing*, 20(1-2), 60-67. doi: 10.1111/j.1365-2702.2010.03456.x.
- Spratley, E., Johnson, A., Sochalski, J., Fritz, M., & Spencer, W. (2000). *The registered nurse population: Findings from the 2000 national sample survey*. Washington D.C.: U.S. Department of Health and Human Services Health Resources and Service Administration Bureau of Health Professions.
- SPSS. (2011). *SPSS V21.0 (Version 21.0)*. Retrieved from <http://www-01.ibm.com/software/analytics/spss/>
- Stanley, T. D., & Jarrell, S. B. (1998). Gender wage discrimination bias? A meta-regression analysis. *The Journal of Human Resources*, 33(4), 947-973. doi: 10.2307/146404.
- Stewart, Q. T., & Dixon, J. C. (2010). Is it race, immigrant status, or both? An analysis of wage disparities among men in the United States. *International Migration Review*, 44(1), 173-201. doi: 10.1111/j.1747-7379.2009.00802.x.
- Stiglitz, J. E. (1973). Approaches to the economics of discrimination. *The American Economic Review*, 63(2), 287-295. Retrieved from <https://cowles.econ.yale.edu/P/cp/p03b/p0394.pdf>.

- Stilwell, B., Diallo, K., Zurn, P., Dal Poz, M. R., Adams, O., & Buchan, J. (2003).  
 Developing evidence-based ethical policies on the migration of health workers:  
 Conceptual and practical challenges. *Human Resources for Health, 1*(8).  
 Retrieved from <http://www.biomedcentral.com/content/pdf/1478-4491-1-8.pdf>.
- Teitz, M. B., & Chapple, K. (1998). The causes of inner-city poverty: Eight hypotheses in  
 search of reality. *CityScape: A Journal of Policy Development and Research,*  
*3*(3). doi: 10.2139/ssrn.156911.
- Timmermans, J. (2008). Punctuated equilibrium in a non-linear system of action. *Comput  
 Math Organ Theory, 14*, 350-375. doi: 10.1007/s10588-008-9031-5.
- Toney, E. (2005). *The earnings of nurses*. PhD Dissertation, The University of Georgia,  
 Athens, GA. Retrieved from  
<http://athenaeum.libs.uga.edu/handle/10724/8093?show=full>
- US Department of Health and Human Services, & Health Resource and Services  
 Administration. (2010). *The registered nurse population: Findings from the 2008  
 national sample survey of registered nurses*. Retrieved from  
<http://bhpr.hrsa.gov/healthworkforce/rnsurvey>.
- Vargas, E. (2005). The influence of country of birth and other variables on the earnings  
 of immigrants: The case of the United States in 1999. *The American Journal of  
 Economics and Sociology, 64*(2), 579-607. doi: 10.1111/j.1536-  
 7150.2005.00380.x.
- Varian, H. R. (1992). *What use is economic theory?* Paper presented at the Is Economics  
 Becoming a Hard Science? Conference, Paris, France.

- Walby, S. (2007). Complexity theory, systems theory, and multiple intersecting social inequalities. *Philosophy of the Social Sciences*, 37(4), 449-470. doi: 10.1177/0048393107307663.
- Willis, R. J. (1986). Wage determinants: A survey and reinterpretation of human capital earnings functions. In O. Ashenfelter & R. Layard (Eds.), *Handbook of Labor Economics* (Vol. 1). Amsterdam: Elsevier Science.
- Xu, Y., & Zhang, J. (2005). One size doesn't fit all: Ethics of international nurse recruitment from the conceptual framework of stakeholder interests. *Nursing Ethics*, 12(6), 581. doi: 10.1191/0969733005ne827oa.
- Yap, M. (2010). Slicing and dicing the gender/racial earnings differentials. *International Journal of Manpower*, 31(4), 466-488. doi: 10.1108/01437721011057038.
- Zhao, B. B., & Shyr, Y. (2009). Discrimination or differing model structures? *Journal of Economic and Social Measurement*, 34, 159-179. doi: 10.3233/JEM-2009-0320.

## Appendix A: Data Use Agreement

### Data Use Agreement for Public Use Files

Individual identifiers have been removed from the data file. Nevertheless, under section 308 (d) and 903 (c) of the Public Service Act (42 U.S.C. 242m and 42 U.S.C. 299 a-1), data collected by the Bureau of Health Professions (BHP), Health Resources and Services Administration (HRSA), may not be used for any purpose other than for the purpose for which it was supplied; any effort to determine the identity of any reported individual, is prohibited by Law.

Therefore, in accordance with the above Federal Statute, it is understood that:

- No one is to use the data in this data set in any way except for statistical reporting and analysis; and
- If the identity of any person or establishment should be discovered inadvertently, then (a) no use will be made of this knowledge, (b) The Bureau of Health Professions will be made aware of this incident, (c) the information that would identify that individual will be safeguarded or destroyed, as requested by the Bureau of Health Professions, and (d) no one else will be informed of the discovered identity.

No one will attempt to link this data set with individual identifiable records from any data sets other than the National Sample Survey of Registered Nurses (NSSRN).

By using this data you signify your agreement to comply with the above Stated statutorily based requirements with the knowledge that deliberately making a false Statement in any matter within the jurisdiction of any Department or agency of the Federal Government violates 18 U.S.C. 1001 and is punishable by a fine of up to \$10,000 or up to 5 years in prison.

HRSA/BHP requests that users cite HRSA/BHP and the National Sample Survey of Registered Nurses as a data source in any publications or research based upon these data.



## Appendix B: Literature Matrix

Table B1

*Literature Matrix*

Author	Year	Data Source	Sample	Methodology	Findings
Huang	2011	1988-2004 NSSRN	87063 RNs	Mincerian Human Capital formula with OLS Regression	Foreign education earns higher return than US Education. Foreign experience earns lower return than us experience. 1 year of US experience increases wages by 2-2.5%
McGregory	2011	1994-2006 CPS-ORG	20842 RNs	OLS Regression with 2-step Heckman-Lee technique to control for bias	White RN union members earn 11.48% more than WRNs that are non-union. BRN union members earn 0.85% less than WRN union members do; BRN nonunion members earn 7.57% less than WRN nonunion members do. Overall, RN union members earn 12.18% more than nonunion RNs.
Schumacher	2010	September 95 - June 2008 CPS-ORG; 1998 - 2004 NSSRN	222900 RNs from NSSRN; 26907 RNs from CPS-ORG; 160563 college educated women from CPS-ORG	Human Capital Mincerian Earnings Equation	Foreign RNS face a 4.5% wage penalty except for RNs from Canada. With 6 years work experience in the US the wage penalty is reduced to 0. Small decrease in wages for US RNS with entry of Foreign RNs in the market.
Spetz, Ash, Konstantinidas, & Herrera	2010	2003-2006 CPS	4234 RNs	OLS Regression Analysis	Nonunion black and immigrants RNs face wage penalties while union RNS face no wage penalties.

*(Table continued on next page)*

Hegewisch, Liepmann, Hayes, & Hartmann	2010	2009 CPS-PUMS all workers 25-64 years old	no <i>n</i> reported	OLS Regression Analysis; Index of Dissimilarity	Median weekly income in F dominated, highly skilled occupations (including RNs) is 66.9% of M dominated occupations. Higher F penetration of an occupation leads to an increased wage gap; the gap being highest in highly skilled occupations.
Kalist, Spurr, & Wada	2010	1980 & 2000 NSSRN	30805 RNS	OLS Regression Analysis	1% increase in proportion of Foreign RNs increased wages by 1.3%. Immigration of RNs into an area positively increases earnings of native RNs.
Buhr	2010	2001 Canadian Census on Individuals	48690 RNs	Human Capital Mincerian Earnings Equation	RNs educated outside Canada experience a wage penalty of 9%. Self-identified minorities experience wage penalties of 11-13%.
Fisher & Houseworth	2009	2004 NSSRN; 2004 & 05 ACS	35724 RNs; 568000 K-12 teachers (04); 1.9 M K-12 teachers (05)	OLS Regression and BO Wage Decomposition; Heckman (1979) to control for bias	Black Female RNs earn 9% more at mean and median than White Female RNs; BF teachers earn 7% more at median than WF teachers. BF with graduate degrees earn 8% more than WF.
Hirsch & Schumacher	2008	CPS data from May 2005-June 2008; O*NET job attributes	CPS data: RNs: 11514; Control: 190119; Men: 100037; Women: 90082. O*NET RN: 8292; Control: 135593; Men: 64565; Women: 71028.	OLS Regression Analysis (Mincerian Wage equation) and Propensity Score Matching	RNs have a wage advantage of .22 log points when compared to the control of Male & female college educated workers using CPS data. When using O*NET data the gap decreases to 0.08. Shiftwork overstates the wage gap. Use of the standard log wage overstates the gap by 11%. There is an unadjusted wage advantage of .306 points relative to women and .660 relative to men. Increases in skills decrease the wage gap.
Polsky, Ross, Brush, & Sochalski	2007	5% Public Use Microdata (PUMS) from 1990 & 2000 US Census	1990 21797 RNs 2000 19030 RNs.	OLS Regression Analysis	Foreign trained RNS earn higher salaries than US educated RNs.
Arends-Kuenning	2006	1990 & 2000 US Census PUMS	1990: 193,472 2000: 218,229	Descriptive Study of 1999 Wages	Foreign born health workers earn higher wages than US born in CNA through RN worker categories. 63% Foreign RNs have BSN while 50% US RNs have BSN. Male RNs make up 10% of foreign nurse population.

Toney	2005	2000 NSSRN	15,100 RNs	OLS Regression Analysis testing Human Capital, Neoclassical Economic, and Queuing Theories	Women RNs earn 11% less than male counterparts. Foreign RNs earn 10% more than US counterparts. Male RNs are preferred over female RNs, followed by native minority and foreign RNs. Employers least Prefer white female RNS. <i>(Table continued on next page)</i>
Jones & Gates	2004	2000 NSSRN	24,071 RNs	FGLS Regression with BO Wage decomposition	The regression analysis showed that male nurses ( $n = 1518$ ) were paid a premium of 2.7% over female nurses ( $n = 22553$ )( $p < 0.01$ ); nonwhite women received 6% ( $p < 0.01$ ) more pay than white women while IENs earned 3% higher wages than USENs ( $p < 0.05$ ). Lower levels of education were negatively associated with earnings ( $p < 0.01$ ) as was experience squared ( $p < 0.01$ ). Market region in regression analysis showed, all the mid-Atlantic was not significant but all others were significantly negatively related to wages ( $p < 0.01$ ) except for the Pacific which was positively related to higher wages ( $p < 0.01$ ). The model explained 29% of the variance in wages for the pooled sample ( $F = 199.71$ ); 37% of the variance for males ( $F = 19.86$ ); and 28% of the variance for females ( $F = 184.91$ ).

*(Table continued on next page)*

Kalist	2002	1992 - 1996 NSSRN	28,955 RNs	T test OLS Regression with BO Wage Decomposition	<p>Unexplained gap of \$4825 (almost 90% of the gap) between salaries of male and female nurses. Male nurse salaries grew 4-6% faster than their female counterparts did. Using data from 1992, Kalist used a <i>t</i> test to find gender differences in earnings. He found that there was a statistically significant difference in the natural log salary, the independent variable (<math>p &lt; 0.01</math>, <math>n = 28,955</math>). Human capital endowments that had statistically significant differences between the two groups were having an associate degree in Nursing (ASN), years of experience (and experience squared), being married, and self-employment (<math>p &lt; 0.01</math>). Kalist reported that three work settings, acute care, long term care, and ambulatory care had significant differences (<math>p &lt; 0.01</math>). Organizational positions also showed statistically significant differences between the groups with administrative, middle management and staff positions being significant at <math>p &lt; 0.01</math>. Earnings regressions for 1992 demonstrated that the human capital categories of education level, coupled with work setting and organizational position explained 42.8% of the variance for the pooled sample (<math>F = 271.92</math>, <math>n = 28955</math>) and 41.5% and 57.7% for females (<math>F = 243.08</math>, <math>n = 26990</math>) and males respectively (<math>F = 34.89</math>, <math>n = 1965</math>). When decomposed using the BO decomposition equation, independent variables contributed 11.63% to differences in earnings between the two groups.</p>
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### Appendix C: Calculation of Dependent Variable

All data were drawn or derived from Questions from the 2008 NSSRN Survey Instrument.

DV: hourly pre-tax wage for regular hours paid to an RN for the primary full time position in nursing (W)

Q30: pre-tax yearly income for primary position in Nursing including overtime (OT)

Q26: # months worked/yr in primary position

Q27a: Total # hours worked including on-call & excluding stand-by

Q27b: Total # hours in Q27a worked from call-back

Q27c: # hours in Q27a paid as OT (assumes a time and a half rate)

Q27e: # hours in Q27c paid as stand-by

Q27f: # hours in Q27e paid or unpaid as on-call or stand-by

Total regular hours worked in primary position in Nursing/week (HRS)

$$\text{HRS} = \text{Q27a} - \text{Q27c}$$

$$\text{Total Monthly Wage (TMW)} = \text{Q30}/\text{Q26}$$

$$\text{Total Weekly Wage (TWW)} = \text{MW}/4$$

$$\text{Total Hourly Wage} = \text{THW}/\text{Q27a}$$

$$\text{Total Hourly OT Wages (OTW) per week} = 1.5 \text{ times the THW} * \text{Q27c}$$

$$\text{Total REGULAR wages/week (W)} = \text{THW} - \text{OTW}$$

## Appendix D: Data Dictionary

Table D1

*Data Dictionary*

Variable	Label	Measurement Level	Labels
COUNTRY	Country where initial RN education program located	Scale	1: Philippines 2: Canada 3: United Kingdom 4: Nigeria 5: Other 6: India 10: Korea/S. Korea
BREAKS	Left nursing 1 or more years since becoming RN	Nominal	0: No 1: Yes
WAGE	<none>	Scale	
LnWAGE	<none>	Scale	
SKIN_COLOR	WHITE	Nominal	0: Nonwhite 1: White
MAR_STAT	MARRIED	Nominal	0: Currently single 1: Married or in partnership
CERT	PROFESSIONAL CERTIFICATIONS	Nominal	0: Board certified 1: Not board certified
POSITION	STAFF RN	Nominal	0: All other positions 1: Staff RN position
HIGHER_ED	ADDITIONAL EDUCATION	Nominal	0: No education after initial RN degree 1: Earned at least 1 additional degree after RN
SETTING	ACUTE CARE	Nominal	0: All other settings 1: Acute care
SKILLS	SKILL CERTIFICATIONS	Nominal	0: No skill certifications 1: At least 1 skill certification
LOCATION	<none>	Nominal	0: Not urban 1: Urban
GENDER	<none>	Nominal	0: Male 1: Female
DIPLOMA	DIPLOMA	Nominal	0: All other types of RN ed 1: Initial preparation Diploma
ASN	<none>	Nominal	0: All other types of RN ed 1: Initial preparation as ASN
BSN	<none>	Nominal	0: All other types of RN ed 1: Initial preparation as BSN
UNION	<none>	Nominal	0: Not represented by union 1: Represented by union

*(Table continued on next page)*

USEXP2	<none>	Scale	0: Less than one year
USEXP	Years worked as RN (since 1st U.S. RN license)	Scale	0: Less than one year
filter_\$	SKIN_COLOR = 0 (FILTER)	Nominal	

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Source: SPSS v 21®

## Appendix E: Original NSSRN Survey Instrument Questions Used in Study

Table E1

*Original NSSRN Survey Instrument*

	Text	Response
Q 3	What type of nursing degree or credential qualified you for your first U.S. nursing license (Mark one only).	Diploma program Associate Degree Baccalaureate Degree Master's Degree Doctorate Other
Q 5	In which U.S. State (including the District of Columbia), U.S. Territory, or foreign country was this program located?	State abbreviation Philippines Canada United Kingdom Nigeria Other Specify (free text)
Q 13	Did you earn any additional academic degrees <u>after</u> graduating from your initial registered nurse education program you described in question 3? Do not include degrees you are currently working toward.	Matrix of educational degrees in nursing and non-nursing fields
Q 21	Where was the location of the <u>principal</u> nursing position you held on March 10, 2008?	Free text entry for city, county, state, zip+4 Coded as MSA in Appendix F
Q 23	Which one of the following <u>best</u> describes the setting of the <u>principle nursing position</u> you held on March 10, 2008?	10 settings 77 sub settings free text entry
Q 24	Which one of the following <u>best</u> corresponds to the job title for the principle nursing position you held on March 10, 2008?	31 choices free text
Q 31	Were you represented by a union or collective bargaining unit in the principle nursing position you held on March 10, 2008?	Yes No
Q 50	For this question, count only the years you worked at least 50% of the calendar year in nursing. Since receiving your first U.S. RN license, how many years have you worked in nursing?	Free text: years of greater than one Less than one year
Q 51	Have you left work in nursing for one or more years since you became an RN?	Yes [specify number of years] No I have not worked in nursing for more than 1 year
Q 62	What is your gender?	Male Female

*(Table continued on next page)*



Q 64b	Which one <u>or more</u> would you use to describe your race? (Mark all that apply) Note: racial descriptions provided	White Black or African American Asian American Indian or Alaska Native Native Hawaiian or other Pacific Islander
Q 66	Which best describes you're your current marital status?	Married or in a domestic partnership. Widowed, divorced or separated. Never married
Q 70a	Do you currently have any nursing certifications?	Yes No
Q 70b	Which of the following <u>skills-based</u> certifications do you currently have? (Mark all that apply)	No skills based certifications Life Support Resuscitation Emergency Medicine Trauma Other (free text)

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*Note.* Source is the 2008 NSSRN survey instrument.

## Appendix F: Syntax

```

GET
  FILE='/Users/satanandahayden/Desktop/DATA ANALYSIS/ORIGINAL DATA
SETS/RN08_State_dataWORKING.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
RECODE EMPL_SELF (2=4) (3=1) (ELSE=Copy) INTO SELF.
VARIABLE LABELS SELF 'SELF EMPLOYED'.
EXECUTE.
RECODE Q22 (1=0) (4=2) (2 thru 3=1) (ELSE=Copy) INTO EMPLOYMENT_TYPE.
VARIABLE LABELS EMPLOYMENT_TYPE 'EMPL_TYPE'.
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (Q25=1 & GRAD_WHR=3 & SELF = 4).
EXECUTE.
SELECT IF (Q20 = 1).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (GRAD_WHR = 3).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (Q19=1).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (Q20=1).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (Q22=1).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (Q25=1).
EXECUTE.
FILTER OFF.
USE ALL.
FILTER OFF.
USE ALL.
SELECT IF (EMP_STAT=1).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (EMPL_08=1).
EXECUTE.
FILTER OFF.
USE ALL.
FILTER OFF.
USE ALL.

```

```
SELECT IF (RN_POP=2).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (EMPLOYMENT_TYPE=0).
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (Q30 <= 200000).
EXECUTE.
RECODE RACE (1=0) (4=0) (ELSE=Copy) INTO RACE_1.
VARIABLE LABELS RACE_1 'Race'.
EXECUTE.
FILTER OFF.
USE ALL.
SELECT IF (RACE_1 ~= 0).
EXECUTE.
COMPUTE HOURS=Q27A - Q27B - Q27C.
VARIABLE LABELS HOURS 'HOURS_WK'.
EXECUTE.
SELECT IF (HOURS >= 36).
EXECUTE.
COMPUTE WAGE=(Q30/52)/HOURS.
EXECUTE.
SELECT IF (WAGE >= 10).
EXECUTE.
COMPUTE LnWAGE=LN(WAGE).
EXECUTE.

FILTER OFF.
USE ALL.
SELECT IF (Q51 ~= 88).
EXECUTE.
RECODE RACE_1 (5=1) (ELSE=0) INTO WHITE.
VARIABLE LABELS WHITE 'WHITE'.
EXECUTE.

RECODE Q66 (1=1) (ELSE=0) INTO MAR_STAT.
VARIABLE LABELS MAR_STAT 'MARRIED'.
EXECUTE.
RECODE Q70A (1=1) (ELSE=0) INTO RN_CERT.
VARIABLE LABELS RN_CERT 'PROFESSIONAL CERTIFICATIONS'.
EXECUTE.
RECODE POSITION (4=1) (ELSE=0) INTO STAFF.
VARIABLE LABELS STAFF 'STAFF RN'.
EXECUTE.
RECODE Q13 (1=1) (ELSE=0) INTO HIGHER_ED.
VARIABLE LABELS HIGHER_ED 'ADDITIONAL EDUCATION'.
EXECUTE.
RECODE SETSUM08 (1=1) (ELSE=0) INTO ACUTE_VCARE.
VARIABLE LABELS ACUTE_CARE 'ACUTE CARE'.
EXECUTE.
```

```
RECODE NSKLCERT (-9=0) (-8=0) (0=0) (ELSE=1) INTO SKILLS_CERT.  
VARIABLE LABELS SKILLS_CERT 'SKILL CERTIFICATIONS'.  
EXECUTE.  
RECODE RCCC4Q21 ('1'=1) (ELSE=0) INTO URBAN.  
EXECUTE.
```

```
RECODE Q5COU (1=1) (ELSE=0) INTO PHILIPPINES.  
EXECUTE.  
RECODE Q5COU (2=1) (ELSE=0) INTO CANADA.  
EXECUTE.  
RECODE Q5COU (3=1) (ELSE=0) INTO UK.  
EXECUTE.  
RECODE Q5COU (4=1) (ELSE=0) INTO NIGERIA.  
EXECUTE.  
RECODE Q5COU (5=1) (ELSE=0) INTO OTHER.  
EXECUTE.  
RECODE Q5COU (6=1) (ELSE=0) INTO INDIA.  
EXECUTE.  
RECODE Q5COU (10=1) (ELSE=0) INTO KOREA.  
EXECUTE.  
RECODE Q62 (1=1) (ELSE=0) INTO MALE.  
EXECUTE.  
RECODE Q62 (2=1) (ELSE=0) INTO FEMALE.  
EXECUTE.  
FILTER OFF.  
USE ALL.  
SELECT IF (Q3_PUF ~= 6).  
EXECUTE.
```

```
RECODE Q3_PUF (1=1) (ELSE=0) INTO DIPLOMA.  
EXECUTE.  
RECODE Q3_PUF (2=1) (ELSE=0) INTO ASN.  
EXECUTE.  
RECODE Q3_PUF (3=1) (ELSE=0) INTO BSN.  
EXECUTE.  
RECODE Q3_PUF (4=1) (ELSE=0) INTO MSN_PHD.  
EXECUTE.  
RECODE Q31 (2=0) (ELSE=1) INTO UNION.  
EXECUTE.  
COMPUTE USEXP2=Q50*Q50  
EXECUTE.
```

```
FILTER OFF.  
USE ALL.  
SELECT IF (Q50 <= 35).  
EXECUTE.  
FILTER OFF.  
USE ALL.  
SELECT IF (MSN_PHD ~= 1).  
EXECUTE.
```

## Curriculum Vitae

### **Professional Strengths and Competencies:**

Ten years' experience as faculty in baccalaureate nursing education.

- Curriculum redesign and implementation for high student engagement
- Program evaluation (CCNE)
- Health informatics course development and integration
- Proficiency in designing and delivering content over multiple LMS
- Integration of technology across curriculum
- High fidelity patient simulation labs
- Student advisement and mentoring.

Thirty-one years clinical and management experience as a Registered Nurse with progressive leadership positions;

- Recruitment, retention, education, development, and evaluation of personnel
- Program and project planning, implementation, management, and evaluation
- Strategic Planning and facilitation of organizational excellence initiatives
- Management of healthcare organization information and process change projects
- Rehabilitation nursing clinical specialty

Seven years of executive level consulting experience in Clinical Information Systems

- Functional design, implementation, and project management of complex clinical care delivery and IT applications
- Clinical and IT department reorganization and redesign;
- Design and delivery of healthcare professional, and healthcare IT consultant education programs;
- Critical path and outcome measurement product development and implementation
- Management of large, multi-organizational, and matrix projects
- Strategic Planning for Clinical Information Technology

### **Education:**

**2013 PhD in Health Services with Public Health Policy Specialization**

Walden University College of Health Science, Minneapolis, MN

Dissertation: Wage Equality Among Internationally Educated Nurses Working in the United States.

**2007 PhD Program in Public Policy with Health Policy Specialization** (all required coursework completed)

University of North Carolina Charlotte, Charlotte, NC

**2003 Post Graduate Certificate: Nursing Education**

University of North Carolina-Charlotte, Charlotte, NC

**1997 Healthcare Informatics, post-grad course**

Wichita State University, Wichita, KS.

**1992 Health Services Administration, Post Graduate Certificate**

Division of Public Administration, University of New Mexico, Albuquerque, NM

**1991 Master of Science in Nursing (Administration) Minor: Public Administration (Health Track)**

College of Nursing, University of New Mexico, Albuquerque, NM

Capstone Project: The Practice of Nursing Administration as the Practice of Public Administration

**1990 Bachelor of Science in Nursing**

College of Nursing, University of New Mexico Albuquerque, NM

**1982 Associate of Science in Nursing**

Division of Nursing, University of Maine, Augusta, Maine.

**Registration and Certification**

R.N. License (North Carolina) 181073 (exp. 8/15)

CITI Human Subjects Certification (2006, 2010)

**Professional Experience**

8/20012 – Present **National Faculty Advisor**

Pearson Publishing

- Ready Point Live Review
- ReadyPoint LMS
- Cerner AES
- The Neighborhood

10/2012 – 01/2013 **Consulting Director of Nursing**

Kaplan College of Charlotte

- Responsible for working with the Executive Director and Director of Education and the Kaplan College Dean of Nursing to develop an application timeline, project plan, and production of applications to the North Carolina Board of Nursing and North Carolina Board of Governors for approval of the program. Included collaborate in market analysis, curriculum design and delivery, admission criteria, faculty recruitment plan, and selection of clinical placement facilities.

9/2012 – 8/2013 **Peer Mentor: Healthcare Financial Management**

Walden University

- Online one-to-one or one-to-many presentations of course material, concepts, calculations for students in the Health Services PhD and Health Administration Masters programs
- All students coming for mentoring report improved grades of one level or more.

8/2007 – 5/2012 **Assistant Professor: Queens University of Charlotte** Presbyterian School of Nursing

- Instruction and clinical supervision of pre-licensure baccalaureate nursing students; continued development and delivery of health informatics course content for baccalaureate, accelerated baccalaureate,

- RN-BSN, and graduate students; Nursing Leadership course for RN-BSN .
- Committee responsibilities: Resource Development Committee; Queens University Technology Committee, Web Design Advisory Committee. Steering Committee Center for Teaching and Learning
- 1/2007 – 5/2007 **Adjunct Faculty: Queens University of Charlotte** Presbyterian School of Nursing,
- •Instruction and clinical supervision of pre-licensure nursing students in XXX; Update and teach RN-BSN Nursing Leadership. Development of health informatics course content for RN-to-BSN students
- 1/2004 – 9/2006 **Graduate Research/Teaching Assistant**, Dr William Brandon, UNC, Charlotte
- •Evaluation of Physicians Reach Out Program for pro bono care: Impact of Primary Care on Self-reported Health of Program Participants. Responsible for database design, data collection, statistical analysis & interpretation; Taught two undergraduate health policy courses.
- 01/2002 – 12/2003 **Adjunct Faculty: UNC, Charlotte**  
College of Health and Human Services, School of Nursing
- Instruction and clinical supervision of pre-licensure BSN and RN-BSN students on campus and via distance learning in Community Health.
  - Member: Graduate Curriculum Committee.
- 5/1996 – 12/2001 **National Account Advisor** The Huntington Group; consulting division of IDX Information Systems, Boston, Mass
- Client base 250 - 600 bed hospitals, Academic Faculty Practices and large physician organizations.
  - Responsibilities include organizational excellence program development and measures; ongoing staff development and training programs; program process coordinator.
  - Internal and external clinical product and process consultation across the continuum of care.
  - Identification and development of consultation products and services for clinically related issues such as ROI, benchmarking, outcome analysis, process assessment, evaluation and redesign; work flow analysis; organizational assessment; post deployment assessment and evaluation; clinical staff training curriculum development, delivery and evaluation, and project leadership of alpha, beta and general release products.
  - Vendor Relationship Manager for multiple third party relationships.
  - HIPAA internal and external services design and implementation.
- 2/1994 - 4/1996 **Senior Consultant** HBO & Company, Charlotte, North Carolina
- Design and implementation of Nursing Outcomes and Quality Management information applications for community and facility health care providers; included the use of Nursing Diagnoses, NIC, and NOC

- patient outcomes. Patient education and home health treatment care planning, delivery, and documentation.
- Deployment of Electronic Health Record products. Responsibilities included: process reengineering for knowledge transfer strategy and materials for IT, clinical and physician staff; project management; identification of functional requirements; product evaluation and selection; clinical path (outcomes management) consultation; sales support; management of Beta site activities; and formation and maintenance of strategic third party alliances.
  - Extensive client contact with public speaking responsibilities. Client base: hospitals 250 - 600 beds.
- 5/1993 - 11/1993 **Director, Patient Care Services (Corporation acquired by Horizon Healthcare 11/93)**  
Greenery Rehabilitation Hospital,  
Dallas, Texas
- Organizational turn-around; eliminated use of agency nurses and excessive overtime
  - Eliminated nursing staff vacancies
  - Responsibilities included: Quality Improvement, Accreditation, Staff Education, management of non-nursing departments
- 1/1992 - 4/1993 **Director, Nursing Services**  
HealthSouth Rehabilitation Hospital, Albuquerque, New Mexico
- Organizational turn-around; eliminated use of agency nurses and excessive overtime
  - Eliminated nursing staff vacancies
  - Implemented shared governance
  - Responsibilities included: Quality Improvement, Accreditation, Staff Education, management of non-nursing departments
- 6/1991 - 12/1991 **Systems (Process) Analyst (temporary position; graduate school)**  
University Hospital, University of New Mexico, Albuquerque, New Mexico
- Systems process redesign; work flow redesign
  - Software utilization improvement
- 7/1987 - 7/1988 **Director of Nursing (adolescent free standing facility, Velarde, New Mexico)**  
**Nurse Manager (adult inpatient unit, Santa Fe New Mexico)**  
Recovery Centers of America
- Primary diagnoses chemical dependency units
  - Facility Start Up
  - Responsibilities included: Quality Improvement, Accreditation, Patient & Staff Education

*Clinical practice: critical care, rehabilitation, hospice, labor and delivery, childbirth educator  
Details of employment and prior to 1988 available on request*



**Publications:**

- Hayden, S.** (2007). International nurse migration: Evidence of autonomy or neocolonialism, Winter 2007 *Ethics on Call*
- Brandon, W., Narine, L., **Hayden, S.** (2004). UNC Charlotte evaluates Physicians Reach Out, *Mecklenburg Medicine* 34 (9),12.
- Smith, H., **Mahon, S.**, Piland, N., (1993) Nursing department strategy, planning, and performance in rural hospitals, *Journal of Nursing Administration*, 23(4), 23 - 34.
- Smith, H., **Mahon, S.**, Piland, N., (1993) Nursing director responses to the rural hospital environment, *Western Journal of Nursing Research*, 15(6), 752 - 769.

**Presentations:**

- Hayden, S. (Presentation) April 4, 2005 Implications of Migration of Nurses from Africa. Health in Africa and Its Diaspora Meeting Charlotte, NC
- Hayden, S. Narine, L. (Presentation) June 26, 2005 Public Policy Approaches to Issues of International Nurse Migration. AcademyHealth Annual Research Conference Boston, MA. June 25 – 29, 2005
- Hayden, S. Tong, R. (Presentation) June 27, 2005 Picking Out the Pieces: Moral and Ethical Issues of International Nurse Migration. AcademyHealth Annual Research Conference Boston, MA. June 25 – 29, 2005

**Professional Activity:**

- 2011-2012: NCNA Appointee to North Carolina Health Information and Communication Association (NCHICA)
- 2010: Health Information Technology Scholar: Advancing Health Information Technologies through Faculty Empowerment (a HRSA funded grant)
- 2008 – Present: Member, Advisory Board Center for Applied and Professional Ethics, UNC, Charlotte
- Member: ANA, NCNA; SIG: Council on Nursing Informatics (CoNI)
- Member: Sigma Theta Tau 1990- present
- Member: Health Information Management Systems Society (HIMSS) 1994-present

**University Courses taught**

- Health Assessment (BSN, RN to BSN; includes course leadership)
- Health Informatics Online (RN to BSN, MSN)
- Health Informatics Didactic (BSN, RN to BSN)
- Patient Simulation Lab: Advanced, Intermediate, and Beginning Medical Surgical Nursing; Maternity, Pediatrics
- Complex Health Problems: RN to BSN Capstone
- Senior Internship Supervision (BSN)
- Nursing Leadership Online & Didactic (BSN, RN to BSN)
- Nursing Administration (MSN)
- Research (BSN)
- Health Policy (Political Science Undergraduates, MSN)
- Function and Structure of the U.S. Health System (non-nursing undergraduates)
- Introduction to Professional Nursing: Clinical Supervision (BSN)

- Community Health Clinical (BSN)
- Community Health Didactic online (RN-BSN)

### **Workshops & Continuing Education related to Informatics and Ethics:**

- 2011: NCNA 8 CEUs Health Information
- 2010: HITS Workshop, University of Colorado, Denver. 20 CEUs
- 2010: NLN: 4 contact hours each
- Health Informatics and Quality and Safety in Nursing Education
  - e-Learning
  - Building Telehealth into the Nursing Curriculum
  - Nursing Informatics and health Information Technology Initiatives
  - Simulation
  - Integrating Health Informatics into Nursing Courses and programs
- 2010: "What have we learned from Terry Schiavo?" Workshop with Robert Veatch, PhD  
Georgetown University
- 1994 – 2001: 20 CEUs annually from Health Information Management Systems Society (HIMSS)
- 2009: Health Information Technology (HIT) Symposium: Boston (MIT)
- 2009: Certification Core Courses for CPEHR: HIT Symposium: Boston
- 2009: Adopting Technology in the Classroom Parts I & II (Webinar)
- 2009: iNET Conference, Duke University, Raleigh, NC
- 2008: What You Need to Know About HIPAA (Webinar)
- 2006: AcademyHealth Forum on International Nurse Migration: Washington DC
- 2005: CGFNS Think Tank on International Nurse Migration: Invitee
- 2004: Center for Applied Ethics, Charlotte, NC: "The Politics of Preventing Premature Death"  
Laura Purdy, PhD Wells College Department of Philosophy
- 2004: "U.S. Health Care in International Perspective: The Case for Universal Health Care Coverage." Steven H. Miles, MD, Center for Bioethics, University of Minnesota Medical School.
- 2004: "Research Integrity for Investigators and Study Staff: The Havasupai Tribe Case."  
Luncheon/workshop with Nancy King, PhD, Department of Social Medicine, Medical School, UNC Chapel Hill.

### **Unfunded Research:**

- 2011: Does Use of a 3D Virtual Reality Mental Health Simulation Increase Perceived Self-efficacy in BSN Students?
- 2006: Evidence of Wage Discrimination between Registered Nurses Educated in the United States and Registered Nurses  
Educated Internationally
- 2006: Wage Discrimination among Male and Female Nurses in the United States
- 2006: Economic, Demographic and Human Resource Factors Associated with Risk of Malaria Transmission in Selected Countries
- 2005: Using Cluster Analysis to Replicate and Validate Data Envelopment Analysis Results
- 2005: Between a Rock and a Hard Place: International Migration of Nurses and the Impact of Brain Drain on African Health
- 2005: Public Policy Approaches to International Nurse Migration

- 1999: Return on Investment of Electronic Medical Record in Ambulatory Clinical Settings
- 1993: Impact of Prospective Payment System on Nursing Administration in New Mexico
- 1988: Health Education Needs of Intermediate School Children and Their Parents in Northern New Mexico
- 1988: Birth Order and Sense of Responsibility of Registered Nurses Working in Intensive Care and Medical Surgical Units