Policy Analysis: Impact of Legislative Policy on Infant Mortality

Aimee T. Dunnam
The University of Texas at Arlington
School of Nursing

In partial fulfillment of the requirements of
N6221 DNP Practicum II
Sharolyn K. Dihigo, DNP, RN, CPNP-PC
Judy LeFlore PhD, RN, NNP-BC, CPNP-PC&AC, ANEF, FAAN
November 8, 2014
POLICY ANALYSIS: IMPACT OF LEGISLATIVE POLICY ON INFANT MORTALITY

Table of Contents

Abstract .................................................................................................................................................. 3
Introduction .......................................................................................................................................... 4
Statement of the Problem ...................................................................................................................... 7
Research Questions ............................................................................................................................... 8
Review of Literature ............................................................................................................................. 8
Policy Analysis Framework .................................................................................................................. 15
Goals and Objectives ............................................................................................................................ 19
Design .................................................................................................................................................. 20
Population and Sampling ...................................................................................................................... 21
Method ................................................................................................................................................ 22
Data Analysis ....................................................................................................................................... 22
Results/Findings ................................................................................................................................... 23
Discussion ........................................................................................................................................... 24
Conclusion ........................................................................................................................................... 25
Limitations ........................................................................................................................................... 26
Implications ......................................................................................................................................... 27
References .......................................................................................................................................... 30
Appendices ......................................................................................................................................... 39
   IRB Approval Human Subjects Classification .................................................................................. 40
   Tables ............................................................................................................................................... 41
   Permission to Use .............................................................................................................................. 47
Abstract

This study examined the impact of health policy on infant mortality. Public Use Data Files were used to assess differences in groups before and after the initiation of health policy as law. House Bill 1983 restricted the delivery of infants before 39 weeks gestation when born by elective induction or elective cesarean section. Infants born prematurely are at higher risk for adverse outcomes. A total of 3,078 identified infants were included in the sample. Infants were categorized according to their gestational age of 33-34 weeks, 35-36 weeks, and greater than 37 weeks. Data analyzed showed no statistical significance in the number of births within these categories or any association between groups before or after the bill became law. Pearson’s Chi Square was used to identify differences in geographical areas and was found to be statistically significant ($\rho = .000$) with the greatest differences in large metropolitan areas within the State of Texas. Infant outcomes were noted as death or discharge. Ninety-seven percent ($n=2980$) of infants were discharged home and less than 0.5% ($n=13$) expired during the hospital stay. Inferences as to whether death occurred following discharge home could not be made based on the analysis of the data.
Infant mortality is defined as death between birth and age 1 year. The death rate and global rank vary depending on geographic region and race (UNICEF, 2012). As of 2010, the United States infant mortality rate (IMR) was 6.14 per 1000 live births, falling short of the Healthy People 2010 goal at that time. In addition, goals surrounding an increase in breastfeeding, reduction in maternal cigarette smoking and alcohol use during pregnancy also fell short (U.S. Department of Health & Human Services, 2010; Mathews & McDorman, 2013). In 2008, the United States ranked 31st among industrialized nations in infant mortality with most deaths due to prematurity. This rate translates to approximately 1 in 8 babies who die before their first birthday (Heisler, 2012; MacDorman & Mathews, 2009). Recent statistics from the Centers for Disease Control and Prevention (CDC) reveal an overall lower infant mortality rate of 5.25 per 1000 live births for the U.S. Hispanic population with premature births responsible second only to congenital abnormalities. Mortality rates increase depending on the subpopulation of the Hispanic population. However, infant mortality rates in Black Americans are higher than Hispanics at a rate of 11.46 per 1000 live births with premature birth the major reason for death (Mathews & McDorman, 2013).

Premature birth and congenital abnormalities of the newborn are the leading causes of infant mortality nationally and globally (Heisler, 2012). According to the CDC, prematurity is defined as birth occurring three weeks in advance of full term or 37 weeks gestation. Causation of infant mortality is multifactorial. Risk factors for having a premature infant include multiple gestation, intrauterine infection, and abnormal uterus. In addition, a history of a previous preterm infant, maternal hypertension, diabetes, clotting disorders, smoking, stress, and caffeine intake have been cited as negatively impacting the delivery of a healthy term infant (U.S. Department of Health and Human Services, 2010). In a study of infants born at preterm and small for
gestational age, those with Hispanic ethnicity had the greatest risk for death (by as much as 29%) in comparison to their identical Black and White infant counterparts indicating an ethnic cause of infant mortality (Nembhard, Salemi, Ethen, Fixler & Canfield, 2010).

Socioeconomic status also contributed to earlier gestational age infants. Between the decades of 1992 to 2002, a shift was seen in the volume of infants delivered at 34-39 weeks gestation by medical intervention. Less spontaneous births were noted and a shift in the gestational age of those infants delivered due to premature rupture of membranes was roughly 39 weeks gestation rather than 40 weeks or beyond. Of the noted reasons for medical intervention, cesarean section was the prominent reason. By race and gestation, the largest increase in infants delivered by cesarean section was at a gestational age of 34-36 weeks born predominantly to Whites. The authors concluded that changes in practice management of late term deliveries and possibly the influences of patient preferences, health risks, scheduled deliveries, and policies affecting vaginal delivery after cesarean have led to the increased prevalence of medical intervention deliveries and earlier gestation infants. This in turn has contributed to the infant mortality rate in the United States given the high-risk nature of these neonates based on prematurity and associated co-morbidities (Davidoff et al., 2006; Committee on Obstetric Practice, April, 2013).

Birth defects due to maternal conditions such as diabetes, hypertension, and ingestion of drugs known to cause defects have been identified (Rosamond et al., 2007). Maternal ingestion of drugs such as opioids during the first trimester are associated with development of congenital heart disease in the infant (Broussard et al., 2011). Congenital heart defects (CHD) are the most common cause of death from birth defects diagnosed in 1% of the population. CDH accounts for over 29% of infant deaths notably highest among term Black males as compared to their White
counterparts (Broussard et al., 2011; CDC, 2011). Annually, estimates of affected infants are 9 per 1000 live births or 36,000 infants in the United States (Rosamond et al., 2007).

Lifestyle behaviors and environmental exposure lead to birth defects and can affect infant mortality. Modifiable health behaviors include reduction in caffeine intake, alcohol, and cigarettes as well as cessation of illicit drugs from the preconception period to delivery of the fetus (Jenkins et al., 2007). Cigarette smoking, in particular, is a common but hazardous exposure and has definite links to low birth weight infants, negative developmental outcomes, and increased risk of behavioral disorders (Knopik, Maccani, Francazio & McGerar, 2012). Cigarette smoking is also linked to congenital heart disease. Environmental modifications include avoidance of organic solvents such as chemicals, herbicides, pesticides, water contamination, poor air quality, and water chlorination by-products (Jenkins et al., 2007; Walker et al., 2011).

On average, the cost for a premature infant to reach the first birthday is $50,000 with an average of 21 medical outpatient visits for various health reasons. Comparatively, the average newborn infant cost is $4,500 with an average of 14 visits during the first year of life. Hospital stays for infants with Medicaid, the payer in 48% of all infant stays, totaled $45,900 by the first birthday (Fleischman, 2010). Total costs for a neonate in the intensive care unit may run as much as $300,000 (Lantos & Meadow, 2011). The cost for infants with complications of prematurity can run from $116,000 to as much as $375,000 depending on gestational age at birth, medical course, and may even include variances between states, insurance companies, and accounting methods. Premature infants with an intraventricular hemorrhage may cost an average cost of $76,000 and those with necrotizing enterocolitis approximately $100,000 again depending on associated co-morbidities and gestational age (Russell et al., 2007). Once an infant
has survived a premature delivery and neonatal intensive care visit, costs for care beyond the initial visit increase. Infants with complex medical needs require programs and services for developmental care and special care such as ventilators and tube feedings due to co-morbidities associated with prematurity (Lantos & Meadow, 2011). In fact, total costs for Early Intervention Services and Special Education Services alone result in $1,711,000,000 annually (Fleischman, 2010).

**Statement of the Problem**

Leading causes of infant mortality in the state of Texas are birth defects, preterm birth, and low birth weight (Mathews & MacDorman, 2011). Early preterm infants are those born earlier than 31 weeks gestation while late preterm infants are those born between 34-36 weeks gestation. The CDC has indicated that preterm infant deaths account for 33% of all infant deaths (CDC, 2011). In addition, those born at preterm gestational ages are less likely to survive, and those who do are more likely to have associated co-morbidities (Martin, 2011).

In the State of Texas, overall IMR has remained lower than the national rates for the past decade; however, IMR for black infants has remained higher by nearly two times that of their White and Hispanic counterparts (Mathews & McDorman, 2013). The preterm birth rates have remained elevated for the past decade with a 2012 rate of 12.4 percent of births. Black infants have the highest rate of preterm birth (17%) than other minorities categorized as both early (6%) and late preterm (11.5%) (March of Dimes, 2013; Texas Department of State Health Services, 2013). The Healthy People 2020 goal for preterm infant births is less than 11.4 percent. All regions within the State of Texas with the exception of one are above the Healthy People 2020 goal (Texas Department of State Health Services, 2013). Because of the status of infant mortality
within Texas, lawmakers met to discuss and collaborate with stakeholders on methods to improve infant mortality.

House Bill (H.B.) 1983 passed in the 82nd Texas Legislative Session was created to address the issue of non-medically necessary inductions and cesarean sections without a trial of labor before 39 weeks gestation in Medicaid recipients. According to H.B. 1983, hospitals providing obstetrical services to Medicaid recipients were required to develop quality initiatives in order to reduce the number of infants born by induction and/or cesarean section prior to 39 weeks gestation. In addition, information was to be gathered related to the number of infants born by induction and/or cesarean section as well as infant health and outcomes. No later than December 1, 2012 a report was to be submitted detailing the specific findings and measurements of bill (H.B. 1983, 2011).

Research Questions

1. Is there a difference between the total number of infants born before 39 weeks gestation in black infants of mothers on Medicaid residing in the State of Texas before and after the enactment of Texas House Bill 1983?

2. Is there an association between the total numbers of infants born before 39 weeks gestation in black infants of mothers on Medicaid residing in the State of Texas with the enactment of Texas House Bill 1983?

3. Are there geographical differences within the State of Texas following the enactment of Texas House Bill 1983?

Review of Literature

A review of literature was conducted on determinants of health affecting infant mortality rates. Search engines included EBSCO Host Academic Search Complete, Wiley Online Library,
Determinants of Health

Disparities.

Types of disparities in general are not exclusive of one another and in fact appear to be closely linked in relationship to health, socioeconomic status, and race/racial types. Health is fundamental for life as well as the investment in family, society, and work. Disparities in health may be influenced by the social position of the individual and understandably can vary depending on life situations such as economic status (Elo, 2009). In addition, location in terms of rural versus urban affects the ability of a population to obtain access to needed services thereby altering outcomes to disease (Committee on Health Care for Underserved Women, February 2014). There is relevance in knowing whether early life health-related experiences alone results in later health-related problems and mortality versus those related to social class inequalities (Elo, 2009). In the case of children, as they age, their development is greatly enhanced by the social environment including socioeconomic status, crime, environmental toxins, and traumatic events (Furumoto-Dawson, Gehlert, Sohmer, Olopade & Sacks, 2007; Case & Paxson, 2013).

A health disparity is defined globally according to the differences within socially disadvantaged groups that are adversely affected. More so, these are avoidable health differences within a population’s race/ethnicity, religion, socioeconomic status (SES), gender, age, illness and political affiliation (Braveman et al., 2011). Health disparities related to social status and class have been linked to various reasons including education, income, and wealth. Educational attainment has been used in some countries as an indicator of SES. In addition, income and
wealth have been used as an indicator of SES along with occupation leading to difficulty in clearly defining the measurement of SES. The inability to capture these defining measurements leads to difficulty in creating public policy interventions to address SES-related inequalities (Elo, 2009; Mechanic, 2007). In the case of mothers and infants, who are most vulnerable, those from disadvantaged socioeconomic status (SES) living in unsafe or unsupportive conditions, and those with little support have less desirable outcomes (Aday, 2003).

According to Pachter and Coll (2009), racial and ethnic health disparities can be defined as “differences in illness and disease, health outcomes, access to health... between minority and non-minority populations” (p. 255). Factors that contribute to racial and ethnic health related disparities included access to preventive care, genetic risk, and environmental risk factors (Pachter & Coll, 2009). Health disparities have been noted across social classes, but most oftentimes by race. Health disparities between races (Black and White) between 1950 and 2000 demonstrated a propensity for greater mortality in black infants. Of these disparities, parent education and income reflect discrimination within race and SES. Between 1940 and 1970, health disparities were positively influenced by the migration of Blacks from southern to northern areas, and economic growth of the country. This was due to increased access to education and medical institutions as a result of the civil rights movement (Mechanic, 2007; Williams, Mohammed, Leavell & Collins, 2010).

**Policies.**

Historical reflections on maternal care and infant mortality revealed poor access to services associated with low socioeconomic status and infant mortality. In 1900 infant mortality rates as high as 180 per 1000 live births were noted in some U.S. industrial cities. In 1909, the first White House Conference on Children was held by President Theodore Roosevelt.
Recommendations from this conference resulted in the formation of the Mother’s Aid Movement and the American Association for the Study and Prevention of Infant Mortality. Both entities were created to bring about public awareness to the issues of keeping children in the home allowing them to be cared for by their mothers versus the soon to be unlawful use of children as laborers and the extreme rate of infant mortality. The National Birth Registry was created in 1915 because of the Child Bureau program, the result of congressional meetings regarding the appropriate use of and death rate of children (Margolis, Cole & Kotch as cited in Kotch, 2005; Margolis & Kotch as cited in Kotch, 2013).

By 1921, child welfare was established. The Maternity and Infancy Act, also known as the Sheppard-Towner Act, outlined specifics regarding allowances of enforcement of children to be evaluated in their homes and removed without explicit permission from the family. Much debate ensued with a vocal response from the American Medical Association after which the Maternity and Infant Act failed to pass renewal in 1929. From this debate, however, the American Academy of Pediatrics was formed in 1930 (Lemons, 1969; Margolis, Cole & Kotch as cited in Kotch, 2005).

In 1932, under the presidency of Franklin D. Roosevelt, Title V Part 1 of the Social Security Act made provisions for Maternal and Child Health services as an expansion of the Sheppard-Towner Act that would support the creation of services for women and children within state health departments (Lemons, 1969; Margolis, Cole & Kotch as cited in Kotch, 2005). As President John F. Kennedy took office in 1962, the U.S. administration expanded Title V to provide grants to fund programs specific to maternity services such as prenatal, intrapartum, and postpartum care, and hospitalizations. By the early 1970’s, one hundred thousand impoverished
women had been served by the creation of 53 different programs (Margolis, Cole & Kotch as cited in Kotch, 2005).

Improvements in medical access to care as a result of social legislation were noted in the years 1965 and beyond (Mechanic, 2007). The Medicaid program was enacted as Title XIX of the Social Security Act of 1965. Under the direction of President Lyndon B. Johnson, the Medicaid program underwent revisions that included preventive services and early screenings in contrast to the initial Medicaid program aimed at acute care services and coverage for hospitalization. As early as 1967, states were actively enrolling Medicaid-eligible participants in the program. The Head Start program was created in 1965 to support the development of children in centers across America followed by the Women’s, Infants and Children (WIC) program in 1972 to support the nutrition of the mother and infant. Both these programs remain in existence to date. Pregnant women living at 185% below the poverty line were eligible to receive coupons through WIC to support nutrition for themselves, their infants and children. The introduction of President Ronald Reagan into office in 1980 demonstrated changes in the Medicaid program and Title V. Twenty-one programs were revised or combined and federal funding decreased in order to allow state governments to manage these programs more efficiently (Margolis, Cole & Kotch as cited in Kotch, 2005).

The Omnibus Budget Reconciliation Act (OBRA) of 1989 set mandates for Medicaid eligibility, and by the early 1990’s Medicaid was extended to those pregnant women and children up to age six who were 133% below the federal poverty level. OBRA 1989 also provided flexibility in scheduling eligibility screening for Medicaid patients in an effort to increase access (Margolis, Cole & Kotch as cited in Kotch, 2005). In 1991, the federally funded Healthy Start program was launched during a time when Black infants were dying at twice the
rate of their White counterparts. The mainstay of the program was active community involvement, as a consortium of partners, with a stake in the reduction of infant mortality (Minkler, Thompson, Bell & Rose, 2001).

In the late 1990’s to early 2000, Medicaid managed care programs were instituted in the hope that they would offer better access as well as preventive health care services to patients. By 1996, President Clinton signed into law the Personal Responsibility and Work Opportunity Reconciliation Act (PWORA) that enforced child support, kept teenage mothers living at home with parents and in school, and limited eligibility for noncitizens (U.S. Department of Health and Human Services, 1996). In 1997, the Balanced Budget Act provided for the State Children’s Health Insurance Plan (SCHIP) to support the health of children (Margolis, Cole & Kotch as cited in Kotch, 2005).

Despite programs created to improve the overall health and wellbeing of those deemed most in need, IMR continued to rise. In 2001, President George W. Bush responded with an increase in federal funding aimed at providing preventive services to impoverished pregnant women and children. Revisions were made in the Healthy Start program to address infant mortality by including perinatal outreach and family violence services. With an increase in the volume of impoverished women and children, Medicaid utilization increased as well as costs. In addition, access to care became difficult. In March of 2009, President Barak Obama signed into law the Patient Protection and Affordable Care Act to provide populations with access to affordable health insurance (H. R. 3590, 2009). Components of the law included provision of quality care as well as prevention of disease. A selling point for many was the portability of health disease and covered annual preventive services. Because the bill was to be enacted over a period of several years, provisions contained within the law and how those might best be
managed for the benefit of the population at risk are still being uncovered (Larrat, Marcoux, & Vogenberg, 2013).

**Quality Initiatives.**

In 2010, the Joint Commission established a new perinatal care core measure set aimed at improving the overall health of the newborn infant. The core measures examined were elective deliveries including cesarean section, the use of antenatal steroids, bloodstream infections in the newborn, and exclusive breast milk feedings. Beginning January 1, 2013, this initiative required documentation on all elective deliveries is submitted to the Centers for Medicare and Medicaid as a method of data collection, verification, and justification for these deliveries (National Perinatal Information Center, 2013).

**Healthy People 2020.**

The Healthy People 2020 initiative builds upon previous health promotion and disease prevention strategies dating back to the 1970's. The overall goal of the Healthy People initiatives is improving the overall health of a nation through various programs and policies at the state and federal levels (U.S. Department of Health and Human Services, 2011). The Healthy People 2020 initiatives include maternal and infant quality outcomes with a target of a ten percent improvement from baseline. The target for the Healthy People 2020 is 5.6 – 6.0 per 1,000 live births for those infants who die within the first year of life (U.S. Department of Health and Human Services, 2014a).

Texas H.B. 1983 targets late preterm infants born at 34-36 weeks gestation. Current baseline for this category of infants is 9.0 percent with a target of 8.1 percent (U.S. Department of Health and Human Services, 2014b). Infants who are born prematurely (34-36 weeks gestation) are three times more likely to develop cerebral palsy. In addition, infants in this
Policy Analysis Framework

A policy is defined as a proposal or program and may be one of several categories such as public, private or health. In general, policies are created to achieve a particular goal. Health policies may be written by those within the public (government) or private sectors. The power to create health policy may rest with an individual, organization, or special interest group within these public or private sectors. These policies are crafted from influences related to politics and those who are involved in them. The concepts of politics and health policy are inseparable. Health policy changes may require legislation, regulation, and/or incentives to be accomplished (Buse, Mays & Walt, 2012).

According to Buse, Mays and Walt (2012), in 2010 lobbyists within the U.S. spent $512 million to influence congressional members regarding health policy. Pharmaceutical companies and those industries producing healthcare products spent a majority of the aforementioned dollars. Public policies are subject to the power of these special interest groups. Power is defined as the ability to influence others and manage resources. Political parties also offer a portion of the power, preferences, and perceptions created (Buse, Mays & Walt, 2012).

Policy Triangle

According to Walt and Gilson (1994), there is historically an increased amount of attention placed on the content of a policy rather than the actors, context, and process under
which the policy was created. The result is a lack of focus on the desired outcomes. Retrospective or prospective analysis of policy can be achieved using the Health Policy Triangle, a model that depicts the concepts of context, process, content, and actors. The concepts and make-up of the model are interrelated to one another and affected by internal and external factors within the political arena (See Figure 1) (Walt & Gilson, 1994).

In order to understand the concepts that make up the model, definitions are provided. The first two concepts are actors and context. Actors may be special interest groups, professional organizations, or individuals who are influenced by the world around them at both the macro and micro levels. They may desire to influence the policy; however, this is related to the amount of
formal versus informal power they possess. Power is dependent on the wealth of the actor, access to knowledge, and authority or personality. These are ultimately related to the position one holds in the organization. The context in which a policy is created can be defined by the actors, the influence of a political regime, or socialist ideology. Context includes various structural and cultural factors. Structural factors are static elements of society such as the political system, economy and employment. Cultural factors may be related to the societal hierarchies of a country whereby the individual or group understanding of any given public health policy was created – whether from an actual or perceived need (Buse, Mays & Walt, 2012; Walt & Gilt, 1994).

The final two concepts of the triangle are content and process. The content of the policy triangle includes the policy description which includes such questions as ‘what it is’, ‘what does it do,’ ‘how will it achieve its goal,’ and ‘is it achievable.’ In essence, the content is made up of all concepts of the triangle (Buse, Mays & Walt, 2012; Walt & Gilt, 1994). Process is defined in relationship to policy and speaks to the way in which they are “initiated, developed or formulated, negotiated, communicated, implemented and evaluated” (Buse, Mays & Walt, 2012, pg. 13). The process of policymaking is subject to the actors involved and how the policy made it to the agenda. This can be deeply affected by an actor’s power position and experiences as well as the values about a particular subject.

Policy Process.

A majority of policymaking is the result of politics as usual as a response to the everyday problems present in society. Officials are generally elected by the people and should represent the issues relevant to them; however, this is not necessarily how it works. There are more problems than can be properly assessed (Buse, Mays & Walt, 2012).
There are four stages to the policy process: policy identification and issue recognition, policy formulation, policy implementation, and policy evaluation. Policy identification/issue recognition is the first stage of exploring how issues are identified and survive to policy agenda versus those that do not. The way in which an issue is framed is related to the legitimacy, feasibility and support for the problem. Issues with high legitimacy, feasibility and stakeholder support will oftentimes make its way to the agenda in lieu of those who fall short of this mark (Buse, Mays & Walt, 2012).

Policy formulation, the second stage in the policy process, includes exploration of who involved in the formation of policy and how. The way in which the government is formed and the power of each branch influences the way issues make it to the policy formation. In addition, the difference in beliefs or running threads of various political parties can influence policy formation (Buse, Mays & Walt, 2012).

Policy implementation is the third stage and the one most frequently neglected in the policy process; however, it is the most important stage and determines the outcome of the policy from the standpoint of the originator. Policy tools and instruments to implementation may include forms of education, research and training as information and persuasion in order to change the behaviors involved in implementation. Another policy tool is regulation that requires applied sanctions for failure to comply with policy changes in altering behaviors associated with implementation. Lastly, a third policy tool may be performance-based funding that requires meeting targets for care through performance criteria. Failure to meet the performance criteria results in lack of reimbursement or funding. The careful weighing of political, financial, managerial and technical resources may mitigate barriers to success in pursuit of closing the gap between policy implementation and the intended result (Buse, Mays & Walt, 2012).
Lastly, policy evaluation explains the *what* of the process including ongoing monitoring of the implemented policy and any consequences noted. A summative evaluation is used to provide a verdict of the policy in relationship to the intended outcomes, impact and cost. Advocates of research embrace the usefulness in drafting policy from the standpoint of evidence about a problem rather than solely on one’s convictions. However, this approach would assume that research precedes policy development about a problem along with the assumption that research and policy are linear (Buse, Mays & Walt, 2012).

Moving beyond the barriers between researchers and policy makers requires researchers to be able to analyze policy in the area of focus along with identification of advocacy coalitions who share core beliefs and values. Researchers should be actively involved with identified advocacy coalitions in order to influence the policy process. In addition, researchers must be able to communicate the findings and the potential impact on policy in a manner easily understood by policy makers (Buse, Mays & Walt, 2012).

**Goals and Objectives**

House Bill 1983 represents an intervention in the form of a policy that supports the Healthy People 2020 initiatives of preventing premature death, improving health, and promoting healthy development across the stages of life. This project represents the following goal and objective:

**Goal**

To evaluate the effectiveness of health policy on infant mortality.

**Objective**
To determine the impact of H.B. 1983 on infant outcomes by analyzing pre and post intervention data to examine infants born to Medicaid recipients, method of delivery, gestational age, race and disposition as death or discharge.

**Design**

The study design was a retrospective design using data from a period prior to and after the initiation of the health policy restricting elective delivery of late preterm infants. Data was available using Texas Health Care Information Collection (THCIC) and the Texas Department of State Health Services (TDHHS). The THCIC was created in 1995 by the Texas Legislature (Chapter 108 Texas Health and Safety Code) to help consumers make healthcare decisions based on quality indicators developed by the federal government. This collection of hospital data is based on all state licensed hospitals with the exception of those with a population of less than 35,000 or a county with fewer than 100 licensed hospitals in an urbanized area as defined by the U.S. Bureau of Census (Texas Department of State Health Services, 2011a; Texas Department of State Health Services, 2011b; Texas Department of State Health Services, 2013a; Texas Department of State Health Services, 2013b).

Large databases such as the Public Use Data File (PUDF) are the composition of data from inpatient hospital stays as supplied by each qualified hospital after validation of data for accuracy and completeness. Patient information was de-identified by suppressing certain data points that may include gender, diagnosis, and zip code. The THCIC provided multiple data points derived from billing information regarding the patient’s hospital stay activity such as mortality, cost, age, diagnosis, and many others. Comparative data points could be made between like facilities to identify similar characteristics and outcomes (Texas Department of Health and Human Services, 2011a; Texas Department of Health and Human Services, 2011b; Texas
Department of Health and Human Services, 2013a; Texas Department of Health and Human Services, 2013b).

**Population and Sampling**

The THCIC database from two quarters prior to and after the initiation of the bill was selected for analysis. Data included patients admitted to Texas hospitals between January 1, 2011 and June 30, 2011 and again between January 1, 2013 and June 30, 2013. Inclusion criteria included female patients, diagnosis codes related to delivery or labor, race, Medicaid insurance, method of delivery, infant gestational age, infant length of stay, and infant disposition noted as death or discharge. Exclusion criteria included male patients, admission for diagnosis other than pregnancy or pregnancy related, and private pay insurance. This allowed for an in-depth analysis of patient characteristics and outcomes important to the health policy initiative (Texas Department of Health and Human Services, 2011a; Texas Department of Health and Human Services, 2011b; Texas Department of Health and Human Services, 2013a; Texas Department of Health and Human Services, 2013b).

Approval to conduct the study was not required from the university’s Institutional Review Board and did not meet requirements of Section 45 CFR part 46 of the U.S. Department of Health and Human Services regulations due to lack of activity related to the research of human subjects (See Appendix) (U.S. Department of Health and Human Services, 2004). Consent to conduct the study was obtained from the Project Advisor. After consent was granted, a signed agreement titled “Data Use Agreement Inpatient and Outpatient Public Use Data File” from the THCIC Center for Health Statistics was completed along with an order form for the data bearing the date and quarters intended for the study. Completion of this agreement allows
Method

The process of data analysis involved several steps in order to arrive at a conclusion regarding the outcomes of the study. The first step involved the preparation of a codebook for use in identifying the various types of data contained within the data set. The Public Use Data File Manual prepared by THCIC and corresponding to data from each particular year was used as the codebook for this study. In addition, identification of International Classification of Diseases (ICD) version 9 and Current Procedural Terminology (CPT) codes related to inclusion criteria were prepared for use in this study (see Table 1 and 2). Preparing data files was an essential next step as identification of variables, data entry or upload, and modification of data was all or in part necessary. This study utilized a prepared text file that was uploaded using the Statistical Package for Social Sciences (SPSS) followed by extraction of the data. A logbook of any changes to the data was kept in order to identify added or deleted data (Burns & Grove, 2009; Pallant, 2010).

Data Analysis

Data relevant to the study research questions was isolated through use of selection, sorting, and deleting to create a unique data set. Initially frequencies were then performed on the data to determine the number of subjects in each category (race, age in years, gestational age at birth, and method of delivery) by year. Missing data was identified through this initial stage. Further descriptive statistics included number of deliveries, induction use, and maternal ages of each selected population. In addition, to these variables, correlations between inductions, spontaneous or planned deliveries, and gestational age were also explored in relationship to risk
of mortality. In order to answer the study questions, a non-parametric statistical technique, Pearson’s Chi Square, was used with a two-tail test. This provided detailed information about statistical significance of any differences noted within the population. Non-parametric techniques were chosen for this study due to the small sample size, use of categorical scales, and lack of assumptions about the population (Pallant, 2010).

Results/Findings

A total of 17,819 cases (2011=8734; 2013=9085) were identified within the unique data set which included only Black infants and mothers (ethnicity not excluded) with insurance listed as Medicaid and ICD 9 or CPT codes reflective of either a delivery code, labor code, or gestational age category. Categories of delivery methods and induction showed a total of 11,354 cases within the study sample, a majority noted as inductions (2011=3225; 2013=4359) (see Table 3). Maternal ages in the data set ranged from 10-44+ years with a majority of women age 18-24 (2011=565; 2013=660). Infants were categorized by gestational age at birth. For the purpose of this study, only gestational ages of 33 weeks to greater than 37 weeks were identified (see Table 4).

Research Question 1:

Is there a difference between the total number of infants born before 39 weeks gestation in Black infants of mothers on Medicaid residing in the State of Texas before and after the enactment of Texas House Bill 1983? A total of 3,078 infants with an identified associated gestational age were included in the data analysis (2011=1609; 2013=1469). Using Pearson Chi-Square statistical technique there was no difference between the total number of infants born before 39 weeks gestation during the study period.

Research Question 2:
Is there an association between the total numbers of infants born before 39 weeks gestation in Black infants of mothers on Medicaid residing in the State of Texas with the enactment of Texas House Bill 1983? Associations between gestational ages before and after the new law also indicated no significant differences.

Research Question 3:

Are there geographical differences within the State of Texas following the enactment of Texas House Bill 1983? The geographical location of infants born within the State of Texas was noted according to the Public Health Region in which the patient listed as their place of residence. Differences in these regions were statistically significant ($p = .000$) with the greatest significance in Public Heath Regions 3, 5, 6, and 8 before and after the initiation of the law (see Table 5).

Discussion

The objective of the study was to determine the impact of H.B. 1983 on infant outcomes through analysis of data related to gestational age, method of delivery, and disposition as death or discharge. Cases included in the sample were of Black race with a listing of Medicaid as the primary source of insurance during the selected quartiles before and after the initiation of the new law. The purpose in studying this particular group of infants was due to the overall infant mortality rate, both nationally and locally, due to prematurity. Components of H.B. 1983 limit reimbursement to hospitals for non-medically necessary induction or cesarean section as a method of delivery.

The results of this study showed no significant difference in the number of infants born by gestational age, and no association between groups, before or after the initiation of H.B. 1983. Differences were noted in births of infants in various Public Health Regions throughout the state;
mostly notably regions 3, 5, 6, and 8 (see Figure 2). Of the total number of infants included in the sample, 97% (n=2980) were discharged home and less than 0.5% (n=13) expired during the hospital stay. Inferences cannot be made as to the survival of any infant after discharge from the hospital.

**Conclusions**

Data analyzed using the THCIC bank is useful in identifying cases that meet the criteria for studying the impact of a new policy on the intended population. Data analyzed did not show a significant difference or associations between groups before and after the new law took effect; however, there was a significant difference in regions between the groups noted within the major Texas metropolitan areas of Dallas-Fort Worth, Houston, and San Antonio. THCIC data is rich in the collection of data from hospitals within the state and does provide an opportunity for further studies using the data sets including a review of cost, length of stay, and outcomes by birth method and gestational age.

Activities related to the new law will penalize hospitals for birth outcomes without appropriate justification for infants delivered prior to 39 weeks. Planned initiatives in the 2014-2015 year include the creation of opportunities for reinvestment of savings to providers who improve births outcomes by lowering cesarean section and induction rates, lowering preventable complications of early delivery, and lowering the use of NICUs for infants electively delivered too early. The creation of a payment bundle to cover services such as prenatal care, labor and delivery of the infant and assistance in Medicaid enrollment of those mothers with a previous preterm birth are set to promote overall improved birth outcomes (Texas Senate Committee, 2012). These initiatives and activities are aimed at improving birth outcomes, including mortality, as well as cost savings initiatives for those receiving Medicaid benefits.
Limitations

Limitations to the study prevent generalization to other samples due to the sample size, character of the input by hospital coders, correct assignment of codes associated with diagnoses, completeness of the coding input, cost, and accessibility of the data sets. The sample size in this study was small in comparison to what was anticipated given the historical number of births of Black infants and their outcomes versus their White counterparts. In addition, the data sets for the quarters studied contained over 500,000 cases each so there was a total of over 2 Million cases that required sorting and selecting. The possibility of errors in data selection was increased due to the number of cases in the original sample and location of selected sample population.

The ability to identify births based on ICD9 and CPT codes was difficult and required meticulous care in selecting the population for study. The selected sample was only as good as the quality of the codes entered by the birth hospital at the time of discharge. Missing or inaccurate codes have the potential to skew the results. Because the cases have been de-identified, there is little possibility of correction once the data is sent and accepted by the THCIC. The ability to use the data sets for the study was easily achieved by affiliation with the university; however, the ability to select and use recent data was costly if not for the affiliation.

Additional limitations of the project were focused almost exclusively on the data analysis and the manipulation of data within a very large data set. At the time of project commencement, data was reflective of current law and the criterion for data was reflective of that time. In the case of studying infants born at 39 weeks gestation or greater, the data was not reflective of the new law and hence makes it difficult to interpret the results. The THCIC will need to change the definition and/or criteria for hospitals submitting data related to gestational age at birth in order
to determine if the new law result in an increase of term infants versus those born before 39 weeks gestation.

**Implications**

The study and analysis of public policy is necessary to determine if implemented policies create the intended outcomes. This holds true for policy applicable at the local, state, and national levels. Although this study was inconclusive in showing the outcomes of the intended new policy, with changes to the criteria for births and a more robust quality to the entered data, there is greater potential to define and analyze the policy in a more accurate and complete manner.

**Implications for Practice**

The Doctorate of Nursing (DNP) - prepared advanced practice nurse (APN) has a global opportunity to immerse oneself in policy as a form of advocacy for their patients. Policies born of evidence-based practice and advocated by APNs are crucial in mitigating the health disparity noted in populations such as neonates born prematurely.

**Advocacy**

Advocacy is an essential component of advanced nursing practice and can be achieved through care of the patient and participation in agenda setting in the legislative arena. Incorporating policy into practice as a product of patient advocacy is essential. Advocacy is typically associated with a legal or political view. In advanced practice nursing, advocacy can translate to legal, political and clinical services and support for patients receiving or in need of medical care. Advanced practice nurses are found in communities working alongside other members of medical and nursing teams to diminish social determinants of health affecting individuals and populations at risk (Priest as cited in Mason, Leavitt & Chafee, 2012). Advocacy
in health and politics is noted as contributing to the makeup of the American Association of Colleges of Nursing (AACN) Essentials of Doctoral Education for Advanced Nursing Practice (AACN, 2006; Mund, 2011).

**Evidence-Based Practice**

Policies embedded with evidence-based medicine may offer a framework for resolving health disparity among populations at risk; however, this is not necessarily the case in all policy development. In a study of Texas legislators, interviews were conducted to specifically address the question of whether evidence-based practice (EBP) was important to policy. This group of legislators had sponsored either fully or in part a particular bill. A majority of the legislators indicated that a particular bill was sponsored to solve an issue with a systems problem and they were more likely to listen to advocates and lobbyists in reference to their sponsored bill. Only when asked about whether EBP was important to policy making was there an affirmative response which had not been offered independently in initial questioning (Cochran, Montgomery & Rubin, 2010). This supports at least in part the need to influence policy makers as constituents and providers while maintaining the use of and spreading the word about evidence-based medicine.

**Implication for Policy**

DNP leaders are in a unique position through academics and training to become involved in the creation and implementation of policies that will affect populations in need. Learning about policy and the legislative process is essential in positioning oneself to lobby for a particular cause (Mund, 2011). Whether the effort is grassroots “bottom up” or an executive “top down”, advocacy in public policy is necessary in reducing disparities in the health and social determinants of populations (Teater, 2008). In particular, policy may contribute to the reduction
in disparities in the outcomes of infants delivered early due to social, financial or other incentives and which ultimately affect the long-term health of citizens.

Ways in which to incorporate policy into practice is through lobbying in an effort to impact health determinants of the mothers and babies. The use of evidence-based medicine and education of the public through research and publication is an essential component of the DNP as a policy advocate. In addition, creating a meaningful relationship with legislators within ones district is essential in helping them to understand how to advocate for select populations at local, state, and national level (Priest as cited in Mason, Leavitt & Chafee, 2012).
References


H. R. 3590, 111th Congress, 1st section, 2009 (enacted).


POLICY ANALYSIS: IMPACT OF LEGISLATIVE POLICY ON INFANT MORTALITY


Teater, Barbara. (2008). "Your agenda is our agenda": State legislator’s perspectives of interest groups influence on political decision making. *Journal of Community Practice, 16*(2), 201-220.


Walt, G. and Gilson, L. (1994). Reforming the health sector in developing countries: The


APPENDIX
Chart 1: Is an Activity Research Involving Human Subjects Covered by 45 CFR part 46?

September 24, 2004

Start here.

Is the activity a **systematic** investigation *designated* to develop or contribute to **generalizable** knowledge? [45 CFR 46.102(d)]

- **NO** Activity is not research, so 45 CFR part 46 does not apply.

- **YES** Activity is research. Does the research involve **obtaining information about living individuals**? [45 CFR 46.102(f)]

- **NO** The research is not research involving human subjects, and 45 CFR part 46 does not apply.

- **YES** Does the research involve **intervention or interaction** with the individuals? [45 CFR 46.102(f)(1), (2)]

- **NO** Is the information **individually identifiable** (i.e., the identity of the subject is or may readily be ascertained by the investigator or associated with the information)? [45 CFR 46.102(f)(2)]

- **YES** Activity is research involving human subjects. Is it **conducted or supported by HHS**? [45 CFR 46.101(a)(1)]

- **NO** Unless exempt under 45 CFR 46.101(b), 45 CFR part 46, subpart A requirements apply to the research. As appropriate, subpart B, C, and D requirements also apply.

- **YES** Go to Chart 2

Is the research **private**? (About behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, or provided for specific purposes by an individual and which the individual can reasonably expect will not be made public.) [45 CFR 46.102(f)(2)]

**BUT** Other Federal, State and local laws and/or regulations may apply to the activity. [45 CFR 46.101(f)]

*Note.* Section 45 CFR part 46 of the U.S. Department of Health and Human Services regulations on research of human subjects. Research activity does not involve interaction with individuals.
### Table 1

**Obstetric and Neonatal International Classification of Diseases Version 9 (ICD) Codes, 2011 and 2013**

<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
<th>Sub-Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery of fetus-method</td>
<td>650</td>
<td>659.0-659.13</td>
<td>Other indications for care or intervention related to labor and delivery not elsewhere classified</td>
</tr>
<tr>
<td></td>
<td>659</td>
<td>659.0-659.13</td>
<td>Failed mechanical induction of labor delivered</td>
</tr>
<tr>
<td></td>
<td>659.01</td>
<td></td>
<td>Failed medical or unspecified induction of labor delivered</td>
</tr>
<tr>
<td></td>
<td>659.11</td>
<td></td>
<td>Failed medical or unspecified induction of labor antepartum</td>
</tr>
<tr>
<td>Age at birth</td>
<td>765.27</td>
<td></td>
<td>33-34 completed weeks of gestation</td>
</tr>
<tr>
<td></td>
<td>765.28</td>
<td></td>
<td>35-36 completed weeks of gestation</td>
</tr>
<tr>
<td></td>
<td>765.29</td>
<td></td>
<td>37 or more completed weeks of gestation</td>
</tr>
<tr>
<td>Labora</td>
<td>649.81</td>
<td></td>
<td>Onset (spontaneous) of labor after 37 completed weeks of gestation, with delivery by (planned) cesarean section, delivered, with or without mention of antepartum condition</td>
</tr>
<tr>
<td></td>
<td>649.82</td>
<td></td>
<td>Onset (spontaneous) of labor after 37 completed weeks of gestation, with delivery by (planned) cesarean section, delivered, with mention of postpartum complication</td>
</tr>
</tbody>
</table>

*Note:* Obstetric ICD9 codes identified according to type of delivery, and in particular, spontaneous versus elective/induced, and vaginal or cesarean section deliveries. Gestational age of the infant at birth was included if greater than or equal to 33 weeks.

*After H.B. 1983 was passed into law, new ICD9 labor codes were identified that complied with new requirements for reimbursement.*
### Table 2


<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
<th>Sub-Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor-Delivery</td>
<td>731</td>
<td></td>
<td>Induction of labor – Other</td>
</tr>
<tr>
<td></td>
<td>734</td>
<td></td>
<td>Medical inductor of labor</td>
</tr>
<tr>
<td></td>
<td>740</td>
<td></td>
<td>Classical cesarean section</td>
</tr>
<tr>
<td></td>
<td>741</td>
<td></td>
<td>Low cervical cesarean section</td>
</tr>
<tr>
<td></td>
<td>744</td>
<td></td>
<td>Cesarean section of other type</td>
</tr>
<tr>
<td></td>
<td>730.1</td>
<td></td>
<td>Induction of labor by artificial rupture of membranes</td>
</tr>
<tr>
<td></td>
<td>730.9</td>
<td></td>
<td>Other artificial rupture of membranes</td>
</tr>
<tr>
<td></td>
<td>749.9</td>
<td></td>
<td>Other cesarean section of unspecified type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>delivery by (planned) cesarean section, delivered, with or without mention of antepartum condition</td>
</tr>
</tbody>
</table>

*Note:* Obstetric CPT codes identified according to the method and type of delivery in Black women with Medicaid insurance listed as the primary insurance carrier.
**Table 3**

*Maternal Obstetric Indicators Identified by ICD9 and CPT Codes for Study Period 2011 and 2013*

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>2011</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous Delivery¹</td>
<td>1123</td>
<td>1210</td>
</tr>
<tr>
<td>Induction²</td>
<td>3225</td>
<td>4359</td>
</tr>
<tr>
<td>Cesarean Delivery³</td>
<td>212</td>
<td>225</td>
</tr>
</tbody>
</table>

*Note:* ¹ includes obstetric Common Procedural Terminology (CPT) codes 650 defined as a spontaneous delivery. ² includes CPT codes 731, 734, 7301, 7309, 65901, 65911, and 65913 that reflect failed inductions, medical inductions, and artificial rupture of membrane as a type of induction. ³ includes CPT codes 740, 741, 744, 7499 that reflect types of cesarean sections.
### Demographic Variables

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>2011</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td><strong>Age (days &amp; years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth to 28 days of age</td>
<td>1609 (52%)</td>
<td>1469 (48%)</td>
</tr>
<tr>
<td>10-17 years of age</td>
<td>81 (7%)</td>
<td>72 (6%)</td>
</tr>
<tr>
<td>18-24 years of age</td>
<td>565 (52%)</td>
<td>660 (55%)</td>
</tr>
<tr>
<td>25-34 years of age</td>
<td>392 (36%)</td>
<td>427 (35%)</td>
</tr>
<tr>
<td>35-44 years of age</td>
<td>47 (4%)</td>
<td>51 (4%)</td>
</tr>
<tr>
<td>Greater than 44 Years of Age</td>
<td>3 (0.3%)</td>
<td></td>
</tr>
<tr>
<td><strong>Gestational Age (weeks) at Birth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33-34 Weeks Gestation</td>
<td>337 (21%)</td>
<td>315 (21%)</td>
</tr>
<tr>
<td>35-36 Weeks Gestation</td>
<td>698 (43%)</td>
<td>716 (49%)</td>
</tr>
<tr>
<td>Greater than 37 Weeks Gestation</td>
<td>574 (36%)</td>
<td>438 (30%)</td>
</tr>
</tbody>
</table>

*Note: Greatest number of Black women with Medicaid insurance per category per year was age 18-24. Difference in the number of Black infants age birth to 28 days before and after H.B. 1983 became law was not significant.*
### Public Health Regions, Texas

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>2011 n</th>
<th>2013 n</th>
<th>Residual(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health Region 1</td>
<td>31</td>
<td>18</td>
<td>5.3/-5.3</td>
</tr>
<tr>
<td>Public Health Region 2</td>
<td>19</td>
<td>16</td>
<td>.6/-6.6</td>
</tr>
<tr>
<td>Public Health Region 3</td>
<td>501</td>
<td>433</td>
<td>11.1/-11.1*</td>
</tr>
<tr>
<td>Public Health Region 4</td>
<td>67</td>
<td>57</td>
<td>2.0/-2.0</td>
</tr>
<tr>
<td>Public Health Region 5</td>
<td>204</td>
<td>79</td>
<td>55.5/-55.5*</td>
</tr>
<tr>
<td>Public Health Region 6</td>
<td>540</td>
<td>583</td>
<td>-49.1/49.1*</td>
</tr>
<tr>
<td>Public Health Region 7</td>
<td>165</td>
<td>139</td>
<td>5.5/-5.5</td>
</tr>
<tr>
<td>Public Health Region 8</td>
<td>57</td>
<td>109</td>
<td>-30.1/30.1*</td>
</tr>
<tr>
<td>Public Health Region 9</td>
<td>12</td>
<td>7</td>
<td>2.0/-2.0</td>
</tr>
<tr>
<td>Public Health Region 10</td>
<td>9</td>
<td>6</td>
<td>1.1/-1.1</td>
</tr>
<tr>
<td>Public Health Region 11</td>
<td>7</td>
<td>14</td>
<td>-4.0/4.0</td>
</tr>
</tbody>
</table>

*Note: Residual defined as the difference in observed frequency and expected frequency.\(^a\) shown as years 2011/2013 difference between regions.*

*Most significant difference between years is shown in regions 3, 5, 6, and 8 representing the large metropolitan areas (Dallas-Ft. Worth, Houston, and San Antonio) within the State of Texas.
Table 6

Differences in State of Texas Public Health Regions

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>P</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>81.862*</td>
<td>10</td>
<td>.000*</td>
<td></td>
</tr>
<tr>
<td>Pearson’s R</td>
<td>.066</td>
<td></td>
<td>.000</td>
<td>.018</td>
</tr>
<tr>
<td>Spearman Correlation</td>
<td>.072</td>
<td></td>
<td>.000</td>
<td>.018</td>
</tr>
</tbody>
</table>

Note: * shows the minimum expected cell count. Count was less than 5 with an expected count of 7.13. df = degrees of freedom. Differences in public health regions within the State of Texas were statistically significant between years as demonstrated by *p < .05.
STANDARD TERMS AND CONDITIONS FOR REPRODUCTION OF MATERIAL FROM AN OXFORD UNIVERSITY PRESS JOURNAL

1. Use of the material is restricted to the type of use specified in your order details.

2. This permission covers the use of the material in the English language in the following territory: world. If you have requested additional permission to translate this material, the terms and conditions of this reuse will be set out in clause 12.

3. This permission is limited to the particular use authorized in (1) above and does not allow
apply to quotations, images, artistic works etc that have been reproduced from other sources which may be part of the material to be used.

4. No alteration, omission or addition is made to the material without our written consent. Permission must be re-cleared with Oxford University Press if/when you decide to reprint.

5. The following credit line appears wherever the material is used: author, title, journal, year, volume, issue number, pagination, by permission of Oxford University Press or the sponsoring society if the journal is a society journal. Where a journal is being published on behalf of a learned society, the details of that society must be included in the credit line.

6. For the reproduction of a full article from an Oxford University Press journal for whatever purpose, the corresponding author of the material concerned should be informed of the proposed use. Contact details for the corresponding authors of all Oxford University Press journal contact can be found alongside either the abstract or full text of the article concerned, accessible from www.oxfordjournals.org Should there be a problem clearing these rights, please contact journals.permissions@oup.com

7. If the credit line or acknowledgement in our publication indicates that any of the figures, images or photos was reproduced, drawn or modified from an earlier source it will be necessary for you to clear this permission with the original publisher as well. If this permission has not been obtained, please note that this material cannot be included in your publication/photocopies.

8. While you may exercise the rights licensed immediately upon issuance of the license at the end of the licensing process for the transaction, provided that you have disclosed complete and accurate details of your proposed use, no license is finally effective unless and until full payment is received from you (either by Oxford University Press or by Copyright Clearance Center (CCC)) as provided in CCC's Billing and Payment terms and conditions. If full payment is not received on a timely basis, then any license preliminarily granted shall be deemed automatically revoked and shall be void as if never granted. Further, in the event that you breach any of these terms and conditions or any of CCC's Billing and Payment terms and conditions, the license is automatically revoked and shall be void as if never granted. Use of materials as described in a revoked license, as well as any use of the materials beyond the scope of an unrevoked license, may constitute copyright infringement and Oxford University Press reserves the right to take any and all action to protect its copyright in the materials.

9. This license is personal to you and may not be sublicensed, assigned or transferred by you to any other person without Oxford University Press’s written permission.

10. Oxford University Press reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC’s Billing and Payment terms and conditions.

11. You hereby indemnify and agree to hold harmless Oxford University Press and CCC, and their respective officers, directors, employs and agents, from and against any and all claims
their respective officers, directors, employees and agents, from and against any and all claims arising out of your use of the licensed material other than as specifically authorized pursuant to this license.

12. Other Terms and Conditions:

v1.4

If you would like to pay for this license now, please remit this license along with your payment made payable to "COPYRIGHT CLEARANCE CENTER" otherwise you will be invoiced within 48 hours of the license date. Payment should be in the form of a check or money order referencing your account number and this invoice number 501299564. Once you receive your invoice for this order, you may pay your invoice by credit card. Please follow instructions provided at that time.

Make Payment To:
Copyright Clearance Center
Dept 001
P.O. Box 843006
Boston, MA 02284-3006

For suggestions or comments regarding this order, contact RightsLink Customer Support: customercare@copyright.com or +1-877-622-5543 (toll free in the US) or +1-978-646-2777.

Gratis licenses (referencing $0 in the Total field) are free. Please retain this printable license for your reference. No payment is required.