Hitting the $40,000 Threshold: A Critical Policy Analysis of Indiana Competitive Teacher Pay Legislation

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Abstract: Across the United States, there is a push to improve teacher pay. This study focuses on an Indiana state policy increasing minimum teacher salaries to $40,000 (Ind Code § 20-28-9-26). I explore how this one-size-fits-all policy varies in implementation across the urban-rural continuum through multivariate and spatial analyses. While findings illustrate a 99% success rate in hitting the minimum, results indicate this policy not only raised the floor but also raised the ceiling and disparities present before the policy were present after policy implementation. Moreover, this compensation policy created progress towards adequacy but maintained inequity, raising questions for future teacher salary policy.
Keywords: teacher salaries; compensation policy; adequacy; equity; rural schools; urban schools

Alcanzar el umbral de los 40.000 dólares: Un análisis crítico de políticas sobre la legislación de Indiana en materia de salarios docentes competitivos
Resumen: En todo Estados Unidos existe un impulso por mejorar los salarios del profesorado. Este estudio se centra en una política del estado de Indiana que incrementa el salario mínimo docente a 40.000 dólares (Ind Code § 20-28-9-26). Se analiza cómo esta política de enfoque uniformed se implementa de manera diferenciada a lo largo del continuo urbano-rural mediante análisis multivariados y espaciales. Si bien los resultados muestran una tasa de éxito del 99 % en

el cumplimiento del salario mínimo, también indican que la política no solo elevó el piso salarial, sino también el techo, y que las desigualdades existentes antes de la política persistieron tras su implementación. Además, esta política de compensación generó avances hacia la suficiencia salarial, pero mantuvo la inequidad, lo que plantea interrogantes para el diseño de futuras políticas salariales docentes.
Palabras clave: salarios docentes; política de compensación; suficiencia; equidad; escuelas rurales; escuelas urbanas

Atingindo o patamar de US$ 40.000: Uma análise crítica de políticas da legislação de Indiana sobre remuneração docente competitiva
Resumo: Em todo os Estados Unidos, há um movimento para melhorar a remuneração dos professores. Este estudo concentra-se em uma política do estado de Indiana que elevou o salário mínimo docente para US$ 40.000 (Ind Code § 20-28-9-26). Analisa-se como essa política de abordagem única é implementada de forma diferenciada ao longo do contínuo urbano-rural, por meio de análises multivariadas e espaciais. Embora os resultados indiquem uma taxa de sucesso de 99 % no alcance do salário mínimo, eles também revelam que a política não apenas elevou o piso salarial, mas também o teto, e que as desigualdades existentes antes da política permaneceram após sua implementação. Além disso, essa política de remuneração promoveu avanços em direção à suficiência salarial, mas manteve a inequidade, levantando questões importantes para futuras políticas de salário docente.
Palavras-chave: salários docentes; política de remuneração; suficiência; equidade; escolas rurais; escolas urbanas

Hitting the $40,000 Threshold: A Critical Policy Analysis of Indiana Competitive Teacher Pay Legislation

Numerous conversations are taking place across the nation surrounding teacher pay and teacher shortages (e.g. Natanson, 2022). Governors are ringing the alarm bells surrounding their states' teacher shortages (e.g., Hochul Press Office, 2022; Hill, 2023), and many states have put together task forces to address these issues of recruitment and retention (e.g., Indiana, South Carolina). Improving teacher compensation has been a common approach to this issue, as many state leaders have proposed and passed legislation to raise teacher pay (Aranda-Comer, 2023; Thymianos & DiMarco, 2024). States have taken different legislative approaches to increasing pay, with some states pushing to raise the base pay of all teachers while others are focusing on minimum salaries (Aranda-Comer, 2023). As conversations take place in popular press and bills are introduced at the state level, it is important to ask how these policies play out across districts.

This analysis utilizes Indiana as a case study, examining its implementation of a minimum salary policy in the 2022-23 school year. The state's approach to raising minimum teacher salaries mirrors strategies recently adopted by many states (Aranda-Comer, 2023; Thymianos & DiMarco, 2024), making it a representative case from which to draw lessons for application in other contexts. In 2021, Indiana passed a new teacher compensation policy requiring all public school districts to pay their full-time teachers a minimum of $40,000 by the 2022-23 school year (Ind. Code § 20-28-9-26). Using a critical policy analysis lens with attention to spatial inequality, I explore how a seemingly neutral state-level education policy varies in implementation across districts, with particular attention to rural and urban districts. While the

policy did not explicitly account for cost-of-living differences, state funding structures that target additional resources to districts with higher needs, in theory, should account for some market differences. Moreover, I am interested in how the state leverages this policy to address multiple competing interests across populations while balancing questions of equity and adequacy.

   This research is motivated by the question: *What is the spatial distribution of minimum salaries across and within locales before and after the implementation of the minimum salary policy and how does this relate to a larger policy context that often marginalizes rural and urban districts?* Because the data is not experimental, I cannot test the direct impact of the policy and make claims surrounding causality. Therefore, to answer this question, I conduct descriptive, bivariate, and multivariate analyses, in addition to a spatial model, exploring minimum salaries before and after the policy and situating the results within a broader narrative surrounding rural and urban districts, equity and adequacy, and teacher compensation reforms. This examination is the initial analysis of a larger mixed methods project analyzing the implementation and impact of Indiana's $40,000 minimum teacher salary policy. Forthcoming analysis examining interviews conducted with superintendents across the state goes deeper into the implementation process at the local level.

Conceptual Framework and Literature Review

Critical Policy Analysis and Spatial Inequality

   This paper utilizes a critical policy analysis framework to explore the spatial distribution of this policy. This type of analysis moves beyond simply asking if the policy works and questions the power structures in place that influence and underpin these education policies (Brenner, 2022; Butler & Sinclair, 2020; Young & Diem, 2018). Moreover, because resources and opportunities are uneven across geographies (i.e., jobs, amenities, internet access, etc.) with more advantaged areas having greater access than less advantaged areas (Curtis et al., 2022; Soja, 2010; Tieken & Auldridge-Reveles, 2019), it is crucial to examine the varying impact of policies across geographies. Most policies have a one-size-fits-all approach and assume the impact will be equal across places (Brenner, 2022). However, spatially neutral policies can create unequal outcomes (Tieken & Auldridge-Reveles, 2019), and an exploration of the geographic distribution and spatial inequality of an education policy offers a critical examination of the power structures that shape these inequities (Butler & Sinclair, 2020).

   Researchers take varied approaches to examining inequality across the urban-rural continuum. Brenner (2022) recommends applying a rural critical policy analysis that questions the assumption of neutrality and distribution of a policy. Johnson and Howley (2015) argue that contemporary education policy is made by "policymakers with largely metropolitan experiences and neoliberal commitments" which lead to policies that overlook and disadvantage rural places, pushing for rural-focused analyses. Similarly, Anglum and colleagues (2024) stress the importance of scrutinizing education policies with a geographic and racial equity lens, but they also argue for particular attention to urban and suburban contexts that often house the most racially and ethnically diverse students and teachers. Others underline the value in exploring urban and rural spaces, not as disconnected phenomena, but rather, as sharing similar policy outcomes (Tieken, 2017; Tieken & Auldridge-Reveles, 2019). Tieken (2017) argues that a careful reexamination of rural inequities, such as high-poverty rates, in relation to urban disadvantages highlights shared issues among the two spaces that are "embedded and maintained through geography" (p. 397). Urban and rural schools often experience similar issues (i.e., enrollment loss) even though they may play out differently in their unique contexts. Studying the two events as separate phenomena would mitigate the magnitude and complexity of issues such as school

closures (Tieken & Auldridge-Reveles, 2019). For this reason, exploring how a neutral policy impacts different geographies, and places within those geographies, can shed light on unintended consequences of a policy that contribute to what Soja (2010) calls spatial injustice.

Teacher Compensation Policy

Legislation surrounding teacher salaries provides a useful policy arena to analyze geographic inequities due to varying costs of living, regional labor markets, and competition for a select workforce. Teacher compensation policy has steadily received attention since the 1980s. After the release of A Nation at Risk and former-president Ronald Reagan's call to action to promote better pay for high quality teachers, there was a large spike in efforts to improve teacher compensation (Springer, 2009). Since then, teacher salary legislation has repeatedly resurfaced as a commonly discussed issue and a focus of educational reform efforts (Conley et al., 2002; Koppich & Esch, 2012).

Recently, teacher compensation is once again at the forefront of educational policy discussions due to teacher shortages that pre-existed the pandemic (Hawksworth-Lutzow & Rose, 2023) and caught the attention of many governors after the pandemic (Jamieson & Perez, 2023; Shen-Berro, 2023). States have taken varied approaches to addressing teacher pay. For example, Missouri created multiple grant programs for districts to apply for funding to improve teacher pay (Anglum et al., 2024). Specifically, the "Teacher Baseline Salary Grant" (TBSG) program incentivizes districts with starting teacher salaries below $38,000 to apply for partial funding to boost their lowest teachers' pay and the "Career Ladder Program" provides grant funding to compensate teachers for additional work (Anglum et al., 2024). Taking a different strategy, Arkansas' Gov. Huckabee Sanders signed the LEARNS Act into effect in 2023, providing state funds to raise minimum teacher salaries to $50,000 and guaranteeing all teachers a minimum raise of $2,000 (Zamarro et al., 2024). Additionally, some states' teacher salary reforms account for cost of living (Sun et al., 2024), while others, for example in England, set a flat wage across heterogenous labor markets (Britton & Propper, 2016). Other states like California have increased overall state funding and targeted additional increases to high poverty districts but have not specified how districts must spend their funds (Hawksworth-Lutzow & Rose, 2023). As these policy examples highlight, states take different approaches to salary policy and funding distribution, raising important questions regarding the goals of these types of policies.

Public school finance policy has a long history of balancing the goals of equity, adequacy, and efficiency (Gutherie et al., 1988; King Rice, 2004; King Rice et al., 2020). And when considering how a policy addresses an entire state or specific geographies, it is crucial to examine the values embedded in the legislation. Put simply, equity refers to the fairness in the (re)distribution of resources (King Rice et al., 2020), adequacy is defined as an absolute threshold of inputs or outputs (Ladd, 2008), and efficiency refers to the costs related to the outputs (Guthrie et al, 1988; Wirt & Kirst, 2001). Focusing on inputs, an equitable policy provides an unequal number of resources to school districts according to district need, with those districts with greater needs receiving greater resources (Baker & Green, 2015). In comparison, an adequate funding policy determines a single level of funding adequacy and distributes resources accordingly (Reich, 2008). Lastly, a policy that values efficiency will aim to keep costs (time, money, resources) to a minimum while also achieving the best set of outcomes (King Rice et al., 2020). These values, at their core, are "inconsistent and antithetical," meaning that pursuit of one goal inherently opposes the others (Guthrie et al, 1988, p. 23; King Rice et al., 2020; Wirt & Kirst, 2001). For example, a school finance policy that provides efficient and adequate funding to school districts inherently decreases the equity of the policy, as distributing

equal inputs to all school districts takes less time and effort than distributing unequal inputs across districts according to district need. To apply this example to salary policies, in England, an adequate wage was set for teacher salaries across labor markets (Britton & Proper, 2016) while in Washington, salary reform accounted for cost of living, attempting to provide equitable funding to heterogeneous labor markets (Sun et al., 2024). In sum, it can be argued that wage setting across places is more efficient than distributing unequal funding across places, albeit less equitable. Because resources and opportunities are uneven across geographies, it is important to examine the goals of compensation policy and state funding to understand whose interests are prioritized.

Indiana Case Study

State Makeup

Indiana is a largely rural state. More than half of the public school districts are classified as rural (52%), followed by town districts (21%), suburban districts (18%) and urban districts (9%). Districts across the state, overall, are losing enrollment, with an average of 6% enrollment loss over the past 10 years. However, enrollment change significantly varies by locale, with suburban districts gaining 2% enrollment during the past 10 years, on average, and urban, town, and rural districts decreasing enrollment by 7%, 8%, and 7% respectively. Regarding minimum salary, at the time the $40,000 legislation was recommended (2019-20 school year), 77% of districts were below the minimum requirement—40% of urban districts, 27% of suburban districts, 85% of town districts, and 95% of rural districts.

Teacher Shortages

School districts across the state have reported teaching shortages over the years. According to a 3-year survey conducted by researchers at Indiana State University from 2015 to 2017, 92%-95% of Indiana school districts reported experiencing teacher shortages from year to year (McDaniel, 2018). Researchers in Purdue University's College of Education provide context to this shortage, explaining that less students are exiting higher education to be teachers than the amount of teacher vacancies across Indiana (Purdue University News, 2023). This creates an environment in which there is immense competition for teachers across the state. In a separate analysis by the author, rural superintendents spoke to this vast competition for qualified instructors. In particular, superintendents in rural districts bordering suburban districts described great competition with their neighbors, explaining that they are at risk of losing highly qualified teachers to surrounding suburban districts that can often pay more. Moreover, a district's ability to competitively pay teachers is a crucial factor in attracting and retaining a qualified workforce amid teacher shortages.

Teacher Salary Policy

In February 2019, the Next Level Teacher Compensation Commission was formed by Indiana's former-governor Eric Holcomb to improve the state's teacher pay. In a report delivered in December 2020, the commission found that Indiana ranked 38th in the US for average teacher salary in the 2018-19 school year (Next Level Teacher Compensation Commission, 2020). With the goal of combatting the challenges the state faced in recruiting and retaining qualified teachers and determining what should be considered competitive teacher compensation, the commission offered recommendations that resulted in three pieces of legislation in 2021. These policies stated that school districts must 1) meet a minimum salary requirement of $40,000 for all full-time equivalent (FTE) teachers; 2) establish a funding floor

for the amount spent on teacher salaries in a year[1]; and 3) expend 45% of state aid on teacher salaries (Ind. Code § 20-28-9-26, 20-28-9-27, and 20-28-9-28). This paper focuses on the $40,000 minimum teacher salary policy (Ind. Code § 20-28-9-26).

This legislation stated that districts must meet a minimum salary requirement of $40,000 by the 2022-23 school year or submit a report explaining why the school corporation could not meet the threshold (Ind. Code § 20-28-9-26). The state set a goal of $35,000 in the 2021-22 school year to set districts on the path to hitting the $40,000 minimum in the 2022-23 school year. Districts were prompted to meet the requirement through an influx of state aid over the first two years of this policy (2021-22 and 2022-23). In 2021, Indiana had a surplus budget, allowing legislators to increase per pupil funding by 4.6% in the 2021-22 school year and 4.3% in the 2022-23 school year (IDOE, 2022a, 2022b).

Indiana Funding Mechanisms

In Indiana, public school teacher salaries are almost exclusively funded by the state in the form of state tuition support. This state aid is allocated mostly based on district enrollment. The state funding formula is largely made up of three elements: average daily membership (ADM; synonymous with enrollment), a foundation level, and a "complexity index" which provides additional per pupil funding for a district's population of economically disadvantaged students (Hirth & Eiler, 2012, IDOE, 2022b; Michael et al., 2009). Therefore, the funding formula ensures that the state allocates additional funding to high need districts and positions enrollment as the primary factor driving funding allocation (Michael et al., 2009). This means that districts gaining enrollment are set to gain state aid and districts losing enrollment are at risk of losing state aid, as Indiana has no funding protections in place to provide districts with a set amount of state aid when facing declining enrollment.[2]

Because state aid is largely determined by enrollment, I predict that districts experiencing large losses in enrollment may not have benefitted from this per pupil increase in state aid as the ~4.5% increase may not have offset the financial loss associated with losing per pupil state aid. On the other hand, for the roughly one-quarter of the districts already at or above the $40,000 threshold at the time the legislation was recommended, the policy does not explicitly address what these districts must do with their minimum salary. Therefore, I hypothesize that districts at or above $40,000 would have the liberty to increase their salaries according to their districts' needs.

Larger Context (COVID-19)

Contextually, this legislation was introduced and implemented during a time when COVID-19 severely impacted the operation of school districts. School districts were facing extreme obstacles in keeping students and staff safe while also continuing to deliver meaningful instruction. Teachers undoubtedly faced new and unexpected stressors (Walter & Fox, 2021), and major news outlets featured multiple stories discussing the pandemic's impact on teacher burnout, saying that it led to a "mass exodus" of teachers (Goldhaber & Theobald, 2022). No matter the accuracy of this narrative, school districts may have felt pressure to improve teacher compensation during this difficult time, adding another potential motivating factor for school districts to raise minimum salaries. Additionally, districts received unprecedented federal relief through Elementary & Secondary School

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[1] There is no hold harmless provision for the amount of funding a district receives in Indiana. Rather, the state is now imposing a funding floor for the amount that district must spend on teacher salaries. Districts losing enrollment are exempt from this funding floor policy.

[2] Indiana previously had a Hold Harmless provision, restricting declines in funding as a result of enrollment loss despite funding formula calculations (Hirth & Eiler, 2012), but the state removed that provision in 2006.

Emergency Relief (ESSER) funds at this time (Boughton et al., 2021; U.S. Department of Education, 2021). These funds were sent in three waves to states and districts from late March 2020 to March 2021. Early examination of districts' spending priorities illustrates that most districts seemed to avoid long-term budget commitments due to the temporary nature of the funds (Dusseault & Pillow, 2021). However, some districts discussed commitments to salary increases through one-time bonuses with relief funds (Dusseault & Pillow, 2021). Moreover, the larger context of COVID-19 cannot be overlooked, although definitive data on the spending of these funds was not yet readily accessible at the time of this analysis and therefore is not included.

Data and Methods

Data sources for this study include primary documents, data reported by the Next Level Teaching Compensation Commission, the Indiana Department of Education (IDOE), Indiana Gateway, the National Center for Education Statistics (NCES) Common Core of Data (CCD) and US Census TIGER Shapefiles.

To explore the context in which this policy was established I examined text from Indiana Code § 20-28-9-26 and the Next Level Teaching Compensation Commission report as primary documents. I procured state aid figures from two iterations of the "Indiana K-12 State Tuition Support Annual Report" (FY2017-2021 and FY2018-FY2022) and the "Digest of Public School Finance in Indiana: 2021-2023 Biennium." The IDOE Data Center provided enrollment and demographic data at the district level for the 2021-2022 and 2022-2023 school years in addition to the 2012-2013 school year to calculate a 10-year change in enrollment. The IDOE includes Pre-K through Grade 12+/Adult in its calculation for total enrollment. However, the school funding formula uses Average Daily Membership (ADM) to determine funding of its Basic Grant which only includes K-12 students (IDOE, 2022a). Because I am interested in the distribution of state aid to fund teacher salaries, I used the ADM count for enrollment. In this paper, I will use the terms enrollment and ADM interchangeably.

I collected recent minimum salary data from Indiana Gateway (https://gateway.ifionline.org/). I accessed the 2021-22 and 2022-23 full-time equivalent (FTE) minimum teacher salaries of all regular public school districts through the site's Collective Bargaining Agreement Uploads Report. To reiterate, this salary policy applies to FTE teachers only. The years 2021-22 and 2022-23 are the only date ranges for which minimum salary is reported on this site. Minimum salary for the 2019-20 school year is obtained from the Next Level Teaching Compensation Commission report.

I attempted to adjust salaries according to cost of living; however, this caused over-controlling of the dependent variable (minimum teacher salary). To examine comparable salaries in early analyses, I utilized the Comparable Wage Index for Teachers (CWIFT) to adjust minimum salaries across geographies. This index, created by the NCES based on data from the American Community Survey (ACS), is calculated by "identify[ing] geographic variation in wages for college-educated workers outside of the education field after controlling for job-related and demographic characteristics," (NCES, 2018, p. 2). When running an OLS regression with the CWIFT adjusted minimum salary as the dependent variable, this model reported an *R* squared below 0.10, indicating that all independent variables in my model were already captured in the dependent, comparable minimum salary variable. Accordingly, utilizing the adjusted minimum salary did not appear to strengthen my model but instead, led to an over-controlling of the dependent variable.

Further, while comparable wage indices are reported to be an improvement compared to cost-of-living adjustments (Stoddard, 2005), comparable wage indices also have their disadvantages as they can reinforce economic disparities by relying on private sector wages to finance schools

(Baker, 2008). Further, Baker (2008) argues that cost of living adjustments and comparable wage indices are more likely to benefit wealthier, more advantaged districts when it comes to recruitment and retention (i.e., wealthy suburbs in comparison to their poor urban counterparts). Moreover, if the goal of cost-adjustments is to promote equity for students and teacher quality (Baker, 2008), then any cost-adjustment that does not further this goal should not be utilized. Lastly, the Indiana policy does not adjust for cost of living, so neither do I in my multivariate analysis. Nonetheless, cost-of-living differences across the urban-rural continuum are a factor that cannot be overlooked. Therefore, in the bivariate portion of this analysis, I explore the relationship between cost of living and salaries to provide further context.

Lastly, I utilized the NCES CCD data for district and locale classifications. Data is from the most recent year available: 2020-21. I utilize NCES locale classifications (see Appendix A), despite their shortcomings, as they are argued to be the "most rationally defensible" local classification system (Kettler et al., 2016, p. 253). For the purposes of this analysis, I combined the 12 level categories into 4 level categories labeled as *urban*, *suburban*, *town*, and *rural*.

All datasets were merged on the corporation ID. I kept only regular public school districts[3] that had salary data for 2019-2020, 2021-22, and 2022-23. This resulted in 284 out of 290 total school districts. Once the data was merged and cleaned in Stata, I merged the dataset with the school district TIGER shapefiles in Stata for the spatial portion of this analysis. I also uploaded the variables into QGIS and merged the school district data with TIGER shapefiles to create the maps used for analyzing the distribution of this policy.

For the purposes of this analysis, I examined data from the 2019-20 school year and the 2022-23 school year to compare the year the legislation was recommended to the year that the legislation took effect. I chose not to include results for the 2021-22 school year in the multivariate analysis, as districts raised minimum salaries at different speeds. Accordingly, I was interested in pre-implementation salaries and post-implementation salaries. Including the 2021-22 salaries would have captured part of the implementation process, without including crucial context for how local districts chose to raise their salaries over the years.

Variables for this analysis include minimum FTE teacher salary, short-term and long-term enrollment (ADM) changes, and locale classification, in addition to percent free and reduced-price lunch (FRPL) status as a proxy for economic disadvantage and percent white students as a proxy for diversity at the school district level. Two additional variables were pulled from the 2021-22 school year: percent change in Basic Grant support from the state and percent change in State Tuition Support. To support salary increases, state aid increased the year the legislation took effect (2022-23) and the year prior (2021-22). Per pupil Foundation Grant support increased from $5,703 in FY21 (20-21) to $5,995 in FY22 (21-22) to $6,235 in FY23 (22-23). To clarify, the Foundation Grant is part of the Basic Grant. The Basic Grant also includes a Complexity Grant that adjusts according to the population of students from low-income families. This measure is a useful estimate to examine how enrollment relates to state funding. State Tuition Support includes all funds distributed to school districts according to statutory funding calculations (IDOE, 2022a; IDOE, 2022b). To calculate the increase in state aid by district, I used the most recent year of data available (2021-22). Although this isn't the most recent school year, it can be used as a proxy for state aid over the two years of the increase.

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[3] I included only districts labeled by the NCES as "1-Regular local school district that is NOT a component of a supervisory union." This does not include charter schools.

Findings

When examining the policy in its totality, I ask the question: Did the policy work? The short answer to this question is yes. On average, the minimum salary across Indiana districts increased from the time the legislation was recommended to the time the legislation took effect. The average minimum salary was $37,693.82 in the 2019-2020 school year and $42,656.67 in the 2022-2023 school year. Additionally, 281 out of 284 districts (98.9%) met the $40,000 requirement.[4] However, this functionalist analysis of the policy neglects to explore potential unintentional outcomes of the policy. To do so, I apply a critical policy analysis and explore how this policy impacted the distribution of salaries across districts in different locales to highlight the differential and potentially inequitable impact of the policy.

In this section, I explore the spatial distribution of minimum salaries across and within locales before and after the $40,000 legislation took effect, concluding in multivariate and spatial analyses to explore which factors have the greatest impact on the dependent variable minimum salary. To begin, descriptive statistics for the variables utilized can be seen in Table 1. I found four outlying school districts and removed them from the data. These four school districts have a virtual school component that led to large variations in enrollment changes, skewing the data. Future research should investigate the implications of virtual enrollment on state funding, but for the purposes of this study, these districts were removed. This resulted in a final *N* of 280.

Table 1

Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
2020 % Free & Reduced-Price Lunch	280	46.48	14.60	5.19	99.98
2023 % Free & Reduced-Price Lunch	280	48.39	14.26	6.44	85.60
2020 % White	280	81.52	19.65	1.26	98.27
2023 % White	280	79.98	20.57	1.37	97.76
10 Year ADM Change	280	-5.56	13.31	-54.04	39.68
20-21 to 21-22 % ADM Change	280	-0.20	2.89	-10.00	8.37
21-22 to 22-23 % ADM Change	280	-0.32	3.47	-10.32	35.42
21-22 to 22-23 % Basic Grant Change	280	4.93	3.32	-10.06	18.14
21-22 to 22-23 % State Tuition Change	280	5.35	3.35	-7.86	20.21
2019-20 Minimum Salary	280	37,728.98	2,658.72	32,199.00	48,000.00
2022-23 Minimum Salary	280	42,634.19	3,057.96	38,000.00	57,000.00
Comparable Wage Index (CWIFT)	280	0.84	0.05	0.75	0.96

To examine the change in the range of salaries before and after the legislation, I created a box and whisker plot. As seen in Figure 1, the spread between salaries decreased from 2019-20 to 2021-22, but this spread grew again in 2022-23. Moreover, the gap between highest and lowest minimum salaries did not decrease after the policy was passed. This begins to suggest that the new policy did not level out disparities in salaries but rather, minimum salaries increased across the board from 2019-20 to 2022-23. Additionally, among the outliers (represented by circles in the figure) in the 2021-22 and 2022-23 school years, suburban districts represent 70% of the districts above $45,000 in 2021-22 and 83% of the districts above $50,000 in 2022-23.

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[4] This number represents the number of regular public school districts that had data available for every year.

Figure 1

Minimum Salary Ranges by Year
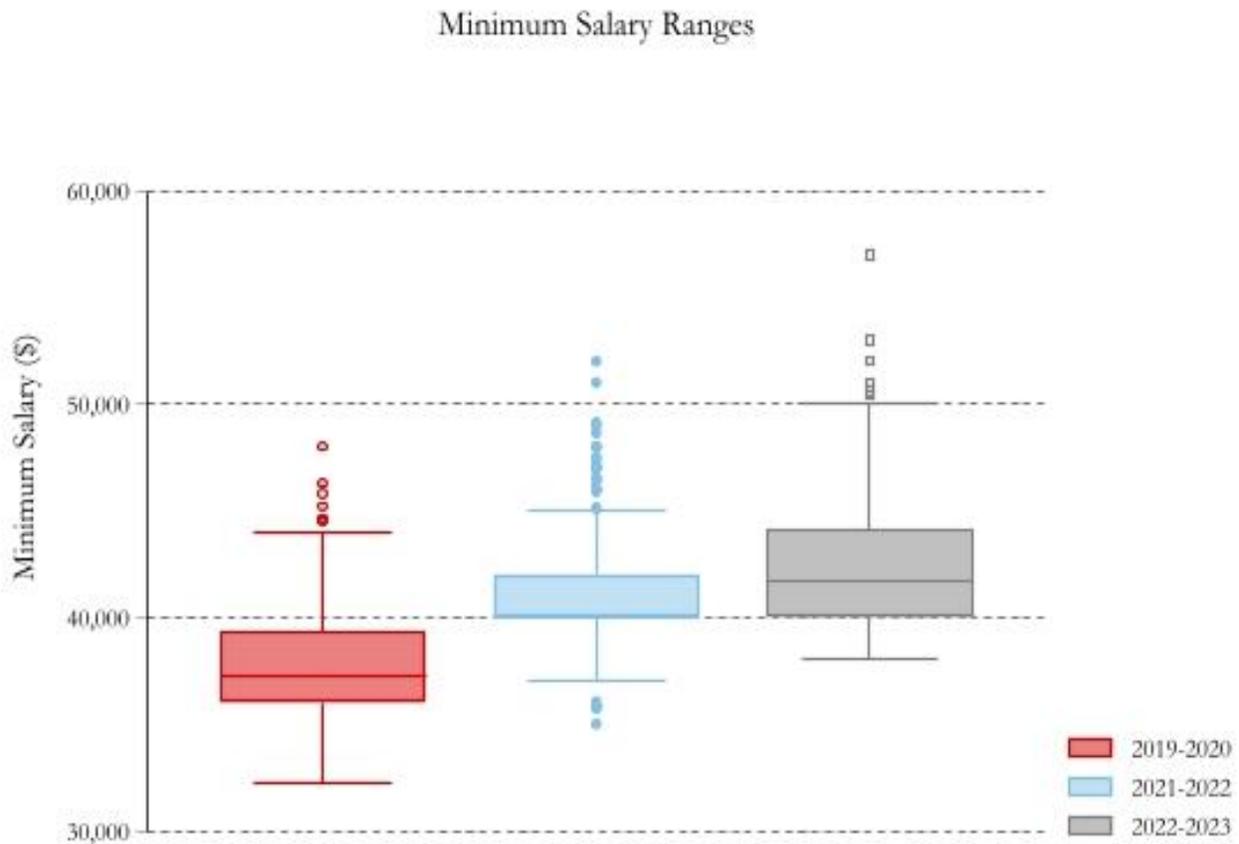
Bivariate Statistics

To examine how all variables relate to each other, I ran a pairwise correlation. The strongest relationship amongst independent variables, not including variations across years, was between the percent white variable and the urban and rural variables. Across both years, urban districts were significantly negatively related to the percentage of white students (~ -0.50) and rural districts were significantly positively related to the percentage of white students (~0.50). Urban and rural districts also displayed opposite relationships with the percentage of free and reduced-price lunch students, with urban districts being positively, significantly correlated (~0.23) and rural districts showing a negative, significant relationship (~ -0.21). Tables including the correlations between all dependent and independent variables can be found in Appendix B.

Across the four locales, being classified as a suburban district and a rural district has the strongest relationship to 2022-23 minimum salary. Suburban districts have a moderate, positive, significant relationship (0.53), and rural districts have a moderate, negative, significant relationship (-0.41). This relationship did not appear to change substantially or significantly between 2019-20 and 2022-23. Long-term enrollment change is positively related to minimum salary (0.29), but short-term enrollment change is not significantly related. It should also be noted that changes in state aid the year before the salary policy took effect (2021-22) were not related to the minimum salary in 2022-23. Lastly, the relationships in the 2019-20 school year mirror that of the 2022-23 school year. All

relationships were similar in strength and direction. This continues to indicate that the neutral increases in state support and the new minimum salary policy did not address salary disparities that were already present.

Regarding cost of living, the comparable wage index estimate has a significant, positive, and moderate relationship (0.51 and 0.43) to minimum salary across the years, indicating that districts with higher costs of living have higher salaries. Additionally, the change in salary before/after policy implementation has a significantly positive, moderate relationship (0.52) with 2022-23 minimum salary, indicating that as district salary increases, the change in salary also increases. However, after running an ANOVA (not shown) between salary change and locale, it should be noted that salary change is not significantly related to locale. Moreover, salaries did not rise at different rates according to locale type, suggesting all locales increased their starting salaries at the same rate. Change in salaries is not significantly related to any of the independent variables. To take this one step further and continue to explore cost of living differences, I also ran an ANOVA (not shown) exploring the relationship between comparable wage index and locale. I found there to be no significant difference in cost of living between urban and suburban locales, nor between town and rural locales. Because of these similar costs of living, I might predict that minimum salaries for suburban and urban districts will not differ significantly nor will minimum salaries for rural and town districts.

To test this relationship, I ran ANOVAs for each year's minimum salary. There are significant differences in salaries between all locales except between urban ($40,254 in 2019-20; $44,566 in 2022-23) and suburban districts ($40,706 in 2019-20 and $46,127 in 2022-23) and between town districts ($36,835 in 2021-22; $41,886 in 2022-23) and rural districts ($36,666 in 2021-22; $41,438 in 2022-23) for both years of data. This supports the bivariate findings exploring the relationship between cost of living and locale and indicates that we should expect no significant difference in minimum salaries between urban and suburban districts and town and rural districts in the multivariate analyses.

Multivariate Analysis

I run various multivariate models to explore how minimum salary varies across and within locales from year to year. Based on the bivariate results, I kept only the variables that were significantly related to minimum salary for the regression analysis. Despite my hypothesized relationship of short-term enrollment change and state aid to minimum salary, the bivariate analysis did not indicate a statistical relationship, calling for additional qualitative exploration.[5]

Table 2 displays the results of the first OLS regression analysis for the two years of data. Because they are two separate models with different dependent variables, I am only able to qualitatively compare the two years of data. Further, while this is an implicitly causal analysis, examining salaries before and after policy implementation, I am not able to isolate the effect of the policy from other events (i.e. COVID-19 impacts on teacher salary). Therefore, while I do not claim that this policy was the only force that contributed to these changes, I argue it had a major role in increasing salaries. Lastly, while I could have run a model with panel data, my variables of interest (locale type) are time-invariant, making this model implausible. As a work around to this obstacle, I turned the data into a panel data set and ran a regression with all variables interacting with the year variable. Results are discussed below.

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[5] While this statistical analysis did not capture a significant relationship, interviews with superintendents across the state indicate a qualitative relationship between enrollment loss and difficulty raising salaries (LeBeau, in preparation).

Table 2

OLS Regression Results

Dependent Variable: Minimum Teacher Salary	2019-20		2022-23	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Rural	-2469.34**	383.79	-3049.05**	484.71
Urban	-369.32	488.52	-1504.24**	602.82
Town	-2113.84**	424.81	-2454.47**	529.13
ADM 10 year	20.13*	9.74	15.54	11.85
%FRPL 20/23	-57.12*	10.49	-61.22**	12.90
%White 20/23	-56.38*	9.16	-55.88**	10.97
Constant	46865.45	964.92	52402.22	1160.73
R Squared	0.52		0.44	

Note: Significant *p*-values are denoted by * 0.05; ** 0.01.

Percent FRPL & White 20/23 indicates that the variable year corresponds with the salary year.

I included binary variables for urban, town and rural districts in the model, with suburban districts as the comparison. The effect of being urban, town, and rural in comparison to being a suburban district is the most substantial relationship to salaries, above and beyond all other factors, as is evidenced in the size of their coefficients. The most substantial change in minimum salary from 2019-20 to 2022-23 is the increase in locale coefficients. Rural districts, on average, had a minimum salary that was $2,469 less than suburban districts in the 2019-20 school year. That gap increased to $3,049 in the 2022-23 school year. Additionally, urban districts did not have significantly different salaries than suburban districts in 2019-20, but this relationship became significant in 2022-23. Urban districts went from $369 less than suburban districts in 2019-20 to $1,504 less in 2022-23. The difference in salary between suburban and town districts is significant across both years, and this gap increased by approximately $340 from 2019-20 to 2022-23. The percentage of free and reduce priced lunch (FRPL) students and white students were significant across both years, and their coefficients stayed consistent—negatively related to salary. In comparison to the coefficients of the locales, these two variables' coefficients were substantially smaller, but because these variables have unit increases of one percentage point, differences between districts become substantial when examining large gaps in percentages. For example, in 2019-20, a district with 0% FRPL students is estimated to have a minimum salary that is $5,712 greater than a district with 100% FRPL students. Additionally, the FRPL coefficient went from -$57 to -$61, indicating an increase in disparity according to percentage FRPL pre- and post-policy. Lastly, long-term enrollment change was significantly related to salary in 2019-20, but this relationship was no longer significant in 2022-23, after legislation.

Because my locale variables are time-invariant and cannot be part of a fixed effects regression model, I ran a regular regression with the data in panel form, interacting with year. In doing so, I found there to be no significant interactions with year. This indicates that although there qualitatively appears to be increased gaps between suburban salaries and all other districts, this increase in coefficients does not appear to be statistically significant.

Locale and Free & Reduced-Price Lunch Interaction

To take this analysis one step further, I introduce an interaction term between locale and FRPL students to examine differences *within* locales. Bivariate statistics displayed opposite relationships with percent FRPL students for urban and rural districts, calling for an exploration of

the variation in this term. Table 3 displays the results of the updated regressions over the two years of data. It should be noted that after running tests for multicollinearity, I found that this model displayed high VIF statistics (see Appendix C). While this is associated with the use of interaction terms, the model also displays high standard errors for the locale variables (see Table 3). Due to the small sample size, this is to be expected, however, it should be noted.

Table 3

Regression with Locale & FRPL Interaction

Dependent Variable: Minimum Teacher Salary	2019-20		2022-23	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Locale				
Urban	-3390.61*	1427.08	-5752.21**	1977.41
Town	-3698.34**	1455.19	-4616.45**	1851.73
Rural	-3191.22**	885.89	-3815.19**	1145.34
% FRPL 20/23	-77.22**	16.63	-83.83**	20.14
Locale * % FRPL				
Urban	55.86*	24.52	75.07*	33.02
Town	34.40	28.57	44.13	35.02
Rural	17.28	20.00	17.06	24.58
ADM10yr	19.17*	9.80	13.68	11.90
% White 20/23	-57.22**	9.57	-56.54**	11.34
Constant	47779.35	1202.81	53467.25	1448.20
R Squared	0.53		0.46	
Akaike info criterion	5017.88		5137.60	

Note: Significant *p*-values are denoted by * 0.05; ** 0.01.
Percent FRPL & White 20/23 indicates that the variable year corresponds with the salary year.

Urban districts are the only locale displaying a significant interaction with percent FRPL students. Additionally, the main effect of urban districts becomes significant with the addition of the interaction term in 2019-20. The main effect of FRPL remains significant and negative. In the 2019-20 school year, the main effect of percent FRPL is -$77 and the interaction between urban and FRPL is a positive $56, resulting in a net difference of -$22. In comparison, in the 2022-23 school year, the main effect of percent FRPL is -$84 and the interaction between urban and FRPL is a positive $75, resulting in a difference of -$9.

In the 2019-20 school year, the minimum salaries in all locales display a negative relationship with percent FRPL. Put differently, as percent FRPL increases, minimum salary decreases. This disparity is the least pronounced in urban districts, and in the 2022-23 school year, this disparity is seemingly non-existent, as the difference in the main effect and interaction effect goes from -$22 to -$9 pre- and post-policy. Moreover, in this model, minimum salaries in urban districts do not vary substantially by percent FRPL students.

Spatial Error Model

Because school districts are a part of regional labor markets and compete with surrounding districts for high quality teachers, I also examined the data to determine if a spatial factor was prevalent. Mapping the dependent variable suggested spatial clustering of minimum teacher salary

(see Appendix D), and the calculation of Moran's *I* confirmed this was the case. In 2019-20, the univariate Moran's *I* statistic for minimum salary was 0.48 and in 2022-23, the Moran's I was 0.49—both statistically significant at the 0.001 level.[6] For reference, a Moran's *I* close to 0 suggests that there is no spatial pattern—the spatial distribution of minimum salaries is random. However, a positive and significant Moran's *I*, between 0 and 1, indicates spatial clustering in which similar values are clustered together. Because of the visual presence of this clustering along with the significant clustering indicated by the Moran's *I* statistic across both years of data, I proceeded to run a spatial multivariate model. This type of model differs from the previous OLS regressions by accounting for localized differences. While the OLS model assumes that relationships are similar across space and observations are independent of each other, the spatial model accounts for the fact that nearby places (in this case, school districts) might influence each other.

Recent literature has argued for the use of Spatial Durbin Models (SDM) and Spatial Durbin Error Models (SDEM) over the commonly used spatial autoregressive and spatial error models (SEM) for regional science practitioners (LeSage, 2014; Rüttenauer, 2022). After creating lagged variables and running a SDEM, I found that none of the lagged variables were significant in the 2022-23 model, and only the lagged urban variable was significant in the 2019-20 model. Further, the Akaike info criterion (AIC) was lower in the SEM, confirming my decision to run the spatial error model over the spatial Durbin error model. Table 4 shows the results of the spatial error model.

Table 4

Spatial Error Model

Dependent Variable: Minimum Teacher Salary	2019-20		2022-23	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Locale				
Urban	-3420.04**	1292.28	-4502.55**	1716.59
Town	-3210.68*	1362.36	-3871.28*	1630.41
Rural	-3344.51**	854.13	-4370.90**	1067.88
% FRPL 20/23	-77.45**	16.41	-96.90**	19.31
Locale * % FRPL				
Urban	52.96*	22.13	60.59*	28.63
Town	28.06	26.95	43.39	31.31
Rural	22.97	19.40	40.32	23.26
ADM10yr	15.13	9.29	11.58	10.80
% White 23	-55.62**	10.12	-53.82**	12.01
LAMBDA	0.34**	0.08	0.46**	0.07
_cons	47534.02	1248.01	53344.06	1487.08
R Squared	0.57		0.54	
Akaike info criterion	5004.58		5104.71	

Note: Significant *p*-values are denoted by * 0.05; ** 0.01.

Percent FRPL & White 20/23 indicates that the variable year corresponds with the salary year.

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[6] I also calculated a Local Indicator of Spatial Association (LISA) to test for regional clustering and significance in clustering using a queen's contiguity weighted matrix and confirmed the presence and significance of clustering.

As stated before, and seen in this model, salaries increased over time, indicating success in the policy. However, this model also captures the disparities illustrated in previous models. In particular, disparities in salaries according to percent FRPL continue to be highlighted in this model.

Despite similarities to previous models, this spatial analysis differs in one key area. In prior models, disparities across FRPL populations in urban districts appeared to improve from one year to the next. However, when accounting for the spatial component, this does not appear to be the case. Rather, the difference between the FRPL coefficient is -$24.49 in the 2019-20 school year and -$36.21 in the 2022-23 school year, representing an increase in disparities from one year to the next. This suggests that the leveling out of salaries across FRPL is not related to the policy but rather some unobservable spatial quality. In other words, the original OLS regression was misattributing the spatial influence to other variables, and the SEM adjusts for the spatial element, producing more reliable estimates. This means I cannot definitively say that when the $40,000 minimum salary policy is implemented in an urban district, it guarantees that there will be no disparities in salary across FRPL rates. Rather, it just means that the policy interacts with spatial relationships, resulting in equitable salaries across FRPL. Moreover, spatial modeling provided more complex results, challenging my initial, simplified findings.

Discussion and Conclusion

The intention of the $40,000 minimum teacher salary policy (Ind. Code § 20-28-9-26) was concise in its goals to raise the lowest teacher salaries. By these standards, the policy was successful in that it raised minimum salaries on average, with roughly 99% of districts hitting the $40,000 by the 2022-23 school year. In doing so, the state achieved their goal by creating an *adequate* minimum salary level across the state.

However, districts started at different salary levels and legislation did not target districts with the lowest salaries, as has been the strategy in other states (e.g. Missouri, Anglum et al., 2024). Instead, a neutrally *adequate* level of state increases in support was *efficiently* distributed to all districts at a rate of ~4.5% per pupil over two years, and districts above the $40,000 at the time of legislation were not given explicit instructions for how to spend the increase in state aid, as long as they met all three policy requirements (including the funding floor policy; Ind. Code § 20-28-9-27 & 45% policy; Ind. Code § 20-28-9-28). As a result, the minimum salary policy, in conjunction with the other two teacher pay policies, raised minimum salaries for districts below the $40,000 threshold and pushed other districts beyond the $40,000 minimum. In effect, it raised the floor while also raising the ceiling.

In completing this narrow goal, the state did not address disparities between districts, falling short of achieving *equity* in salaries across and within locales. Suburban districts had the highest minimum salaries, on average, before policy implementation, and they maintained the highest minimum salaries after policy implementation, despite having statistically similar costs of living to urban districts. Further, before policy implementation, urban and suburban districts had statistically similar minimum salaries, but after policy implementation, suburban districts achieved statistically *higher* minimum salaries than their urban counterparts. Additionally, districts with the highest percentages of FRPL students had the lowest salaries, on average, before policy implementation, and these districts maintained this salary gap after policy implementation, despite receiving additional funding through the state's funding formula. This disparity is most pronounced in suburban districts and least pronounced in urban districts. Rural and town salaries also display this negative relationship with FRPL, but across the spectrum of FRPL, rural districts maintain the lowest salaries.

Policy Implications and Literature Contribution

Examining Indiana's policy in contrast to other state compensation policy reforms provides valuable context for both future policy and corresponding literature. Indiana's efforts to set an adequate minimum teacher salary across all districts and their efficient and neutral distribution of state funding draw interesting comparisons to recent policies in Missouri and Arkansas. Arkansas took a similar approach to Indiana in setting an adequate minimum salary at $50,000 but took a slightly different funding approach by specifically attaching state funding to this policy to raise salaries (Zamarro et al., 2024). Missouri also targeted minimum salaries but took a different policy approach by providing districts with salaries below $38,000 with the opportunity to apply for grants to raise salaries—in effect targeting funding opportunities to rural and town districts (Anglum et al., 2024). In comparison to these two states, Indiana did not alter their funding formula or attach funding to this policy directly. Conversely, because Arkansas targeted money into districts to ensure these increases, Zamarro and colleagues (2024) found a narrowing of the salary gap between rural districts and their urban counterparts and high poverty districts and their low poverty counterparts. As a result, teachers in rural and high poverty districts now face less of a "salary penalty" in Arkansas (Zamarro et al., 2024), which was not the case in Indiana. Anglum and colleagues (2024) saw similar gains for rural districts in Missouri due to the targeted opportunity for funding into districts with salaries below $38,000. However, the researchers argue that this is both a win and a loss. While increases in salaries to rural areas is seen as a crucial improvement in the state's teacher compensation practices, Anglum and colleagues (2024) found that many urban and suburban districts and teachers and students of color were largely excluded from the funding opportunity. By targeting the reform and the money to rural districts, the researchers argue that the compensation policies did not properly take regional wages into account, hindering urban and suburban district's ability to competitively pay teachers (Anglum et al., 2024).

Comparing Indiana's salary reform to similar reforms in Arkansas and Missouri raises important questions surrounding the goals of a policy. How can state governments strike a balance between creating policy that supports the entire state and creating policy that targets specific populations in need? An important first step is critically examining the policy with attention to spatial inequities—positioning urban and rural districts, not as disconnected phenomena, but as locales in need of equal attention (Tieken, 2017; Tieken & Auldridge-Reveles, 2019). Yet, it is also important to compare policy reforms and their outcomes across states. Teacher compensation reforms did not start here, nor will they end here.

States like Indiana have appeared to make a commitment to raising teacher salaries through the passing of multiple pieces of legislation, and I encourage them to continue on this path. The state was successful in raising salaries across the state to a level deemed adequate; however, disparities still exist, and important questions remain. For instance, this analysis does not explore veteran teacher salaries. How were teacher salaries above $40,000 impacted? And how did the makeup of the local teacher's union (e.g., veteran teachers vs. beginning teachers) impact collective bargaining discussions? Contract negotiations are a crucial aspect of the power structure at the local level that were not explored in this analysis. Additionally, while 99% of districts hit the minimum, did the effort it took for school districts to raise salaries vary across districts according to local fiscal situations and enrollment changes? And did other state education policies and funding structures interact with the implementation of this policy, constraining some superintendents in their ability to make the best financial decisions for their districts? While I did not find a statistical relationship with enrollment loss, this quantitative analysis cannot examine the difficulty with which districts losing enrollment implemented the policy nor can it determine what motivated districts above $40,000 to raise their salaries even higher. Moreover, a more in-depth examination into local decision making

(e.g., collective bargaining discussions; recalibration of local salary schedules; etc.) is crucial for better understanding the implementation process at the local level. Forthcoming studies by the author examine these questions through qualitative analyses, indicating relationships with these very indicators. Nevertheless, with this current analysis, I argue for continued state aid increases for all districts to ensure maintenance of these adequate salaries, in addition to the exploration of policies that target disparities across districts in pursuit of more equitable teacher compensation legislation.

Acknowledgements

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