



Health Impact Review

Financial Incentives to Attract Excellent Teachers for Hard-to-Staff Schools and Subjects

February 1, 2007

Executive Summary

Background and Introduction: The Office of Superintendent of Public Instruction (OSPI) seeks funding for Financial Incentives to Attract Excellent Teachers for Hard-to-Staff Schools and Subjects. The program goal is to improve students' scores by improving the pool of experienced teachers in areas in which students are under-achieving. The program would expand the Future Teachers Program to provide conditional loans and scholarships to future teachers who teach in hard-to-staff schools. The program would also provide salary incentives to teachers with Professional and National Board Certification who teach in hard-to-staff subjects or hard-to-staff schools. The purpose of this review is to analyze the Financial Incentives Program to determine if its implementation would have an impact on health disparities in Washington State.

Methods: To conduct this review, we relied on discussions and information provided by staff from OSPI and the Department of Health, conversations with community health advocates interested in the health and education of minority populations, data from the OSPI website, limited analyses of OSPI data, and a limited review of the literature. In addition, a conceptual model was developed that illustrates how the program may ultimately impact health disparities.

Results and Discussion: We found limited and conflicting evidence in the literature to support the notion that teacher salary incentives and teacher certifications have a direct impact on improving student achievement. However, salary incentives may serve as retention incentives, which may lead to improved student achievement. There is a growing body of literature substantiating the link between length of education and improved health outcomes. Therefore, if the Financial Incentives Program is successful in improving student achievement, the program may lengthen the education of effected students, which may have a positive impact on the health of the students served by the program. To reduce disparities in health based on race and ethnicity, the program would need to successfully improve teacher quality in classrooms and schools with a disproportionate number of minority students. Financial incentives for teaching in hard-to-staff schools would help target the program toward minority students because students of color are disproportionately represented in these hard-to-staff (i.e., low income) schools. Financial incentives for teaching in hard-to-staff subjects targets the program toward minority students in some subjects; specifically, minority students are disproportionately represented in special education and English Language Learner (ELL) programs.

Conclusions: The Financial Incentives proposal has some potential to decrease health disparities in Washington. The program is most likely to reduce health disparities if the salary incentives work as retention incentives in areas with high proportions of minority students. However, the expansion of the Future Teachers Program appears to place inexperienced teachers in hard-to-staff schools, which may decrease teacher quality in these schools.

I. Introduction

In 2006, the Washington State Legislature passed Second Substitute Senate Bill 6197, authorizing the State Board of Health to conduct health impact reviews. A health impact review is a review of a legislative or budgetary proposal that analyzes the extent to which the proposal is likely to have a positive or negative impact on health disparities. The State Board of Health completed this review in response to a January 5, 2007, request. This is a review of a budget proposal from the Office of Superintendent of Public Instruction (OSPI) to offer financial incentives to attract teachers to hard-to-staff schools and subjects.

The term health disparities describes the disproportionate burden of disease, disability, death, and other adverse health conditions that exist among specific populations or groups. Health disparities based on race, income, gender, education, and sexual orientation are well documented.¹ Many factors interact to produce the health disparities experienced by communities of color; biological/genetic factors do not explain these disparities in health.² For example, the infant death rate for American Indians, Alaska Natives, and African Americans is double the infant death rate for Whites.³ The death rate for all cancers is 30% higher for African Americans than it is for Whites.⁴ Asian/Pacific Islander populations likely make-up a large percentage of persons with chronic hepatitis B infection in the United States.⁵ Further, Hispanics in the United States are almost twice as likely to die from diabetes as are non-Hispanic Whites.⁶

The purpose of this review is to analyze the Financial Incentives to Attract Excellent Teachers for Hard-to-Staff Schools and Subjects budget proposal to determine if its implementation would either increase or decrease health disparities in Washington State.

II. Background

Program Description⁷

Short Summary of Program

The OSPI proposal will operate through the expansion of an existing recruitment program and salary incentives. First, it will provide incentives for students and paraprofessionals to become teachers in hard-to-staff schools through the Future Teachers Conditional Scholarship and Loan Repayment Program. Second, the program will provide one or two percent salary increases to specific groups of teachers as an incentive to teach in hard-to-staff schools and/or subjects. A school is defined as hard-to-staff if more than 60% of its students are eligible for free or reduced lunch prices. Subjects with a shortage of teachers are secondary mathematics and science, English language learner (ELL) programs, and special education.

Ultimate Impact

The program is designed to improve students' scores by improving the pool of experienced teachers in areas in which students are under-achieving.

Agency Justification

OSPI asserts that schools in high poverty areas have high proportions of under-qualified and inexperienced teachers and that it is crucial to address this issue to meet standards for student

learning and accountability. To address the issue, outstanding individuals must be recruited and retained as teachers. OSPI states that teacher salaries in Washington are becoming less competitive when measured against salaries in other fields. As a result, fewer individuals choose the teaching profession, which means teachers can be more selective about their teaching locations. It is especially difficult to attract highly qualified teachers to certain subject areas, such as secondary math and science, English language learner programs, and special education.

Program Operation

This program has three main components:

(1) This program will expand the Future Teachers Conditional Scholarship and Loan Repayment Program. Currently, the program provides conditional scholarships and loans to students who agree to teach in hard-to-staff subject areas. This proposal would expand the program to provide loans and conditional scholarships to students who agree to teach in hard-to-staff schools.

(2) The program will provide a one-percent (1%) salary increase to teachers with a Professional Certification who teach in hard-to-staff schools or in a hard-to-staff subject. Teachers in non-poverty schools can receive the increase if they spend at least 50% of their time teaching a hard-to-staff subject.

(3) The program will provide an additional two-percent (2%) salary increase to teachers with a National Board Certification in a hard-to-staff subject or to National Board Certified teachers who teach in hard-to-staff schools. Teachers in non-poverty schools can receive the increase if they spend at least 50% of their time teaching a hard-to-staff subject.

Note: This program anticipates the implementation of OSPI's budget request for Knowledge and Skills Based Pay. The Knowledge and Skills proposal will increase salaries for teachers who attain Professional Certification or National Board Certification. The salary increases in the Financial Incentives Program, the subject of this health impact review, will be in addition to increases given under Knowledge and Skills Based Pay.

Budget

Future Teachers Conditional Scholarship and Loan Repayment Program:

OSPI estimates that the number of students in the Future Teachers Program will expand from about 70 students to 200 students. The cost of expansion for 2008-2010 will be \$4,877,249. Four million dollars will go to increased funding to meet the costs of the additional loans and loan repayment obligations. The remainder will add staff support to the Higher Education Coordinating Board to handle the increased work load.

Salary Incentives for Teachers:

The total estimated cost of the 1% salary increase for teachers with a Professional Certification for the 2007-2009 biennium is \$714,950. The total estimated cost of the 2% bonus for National Board Certified Teachers for the 2007-2009 biennium is \$1,373,867.

All Three Components:

The total cost for all three components for the 2007-2009 biennium is \$4,478,136. The estimate is reached using the cost of the Future Teachers Program in the 2007-2009 biennium, which is

\$2,389,319. The estimate of the Future Teachers Program above gives the cost of the program from 2008-2010.

III. Methods

The State Board of Health received a request to complete a health impact review on the Financial Incentives Program to determine whether it will increase or decrease health disparities in Washington. Board staff conducted this review using only the program information in the OSPI decision package; staff did not consider legislation that may have incorporated components of this decision package.

To conduct the review, we relied on the information presented to us in the OSPI decision package, discussions with OSPI staff, data from the OSPI website, and a limited literature review. Internet search engines and database searches were used to conduct the literature review, including Google Scholar, ERIC, JSTOR, ProQuest, and PubMed.

In addition, two professionals in the health field were consulted. One professional works for a health nonprofit. The other professional is experienced in both the health and education fields and is knowledgeable about health disparities in minority communities. Board staff also received an evaluation of the program from the Department of Health.

Demographic data by school for the 2005-2006 school year was obtained from OSPI's website at <http://reportcard.ospi.k12.wa.us/DataDownload.aspx>. Hard-to-staff schools were defined as schools in which 60% or more of the student population is eligible for free or reduced-priced meals. There were 2,160 schools in this data set. Information on the proportion of students that qualify for free or reduced lunch was not available for 28 of these schools. After the 28 schools were removed from the data, 411 were identified as hard-to-staff and 1,721 were identified as not hard-to-staff.

The numbers for the students in special education were obtained through a data request to OSPI's Special Education Operations. This data is from a December 2005 Federal Count.

A logic model was developed to focus the research for this review, see Figure 1. The far left side of the logic model shows the policy and the inputs of the enacted program. The next section shows short term outcomes of the program if it accomplishes its intent. The boxes to the right of short term outcomes show the steps that must occur if the program is to reduce health disparities in Washington. Research was conducted on each of these arrows to determine the validity of each assumption. The discussion that follows is based on each of the links in logic outlined in the conceptual model.

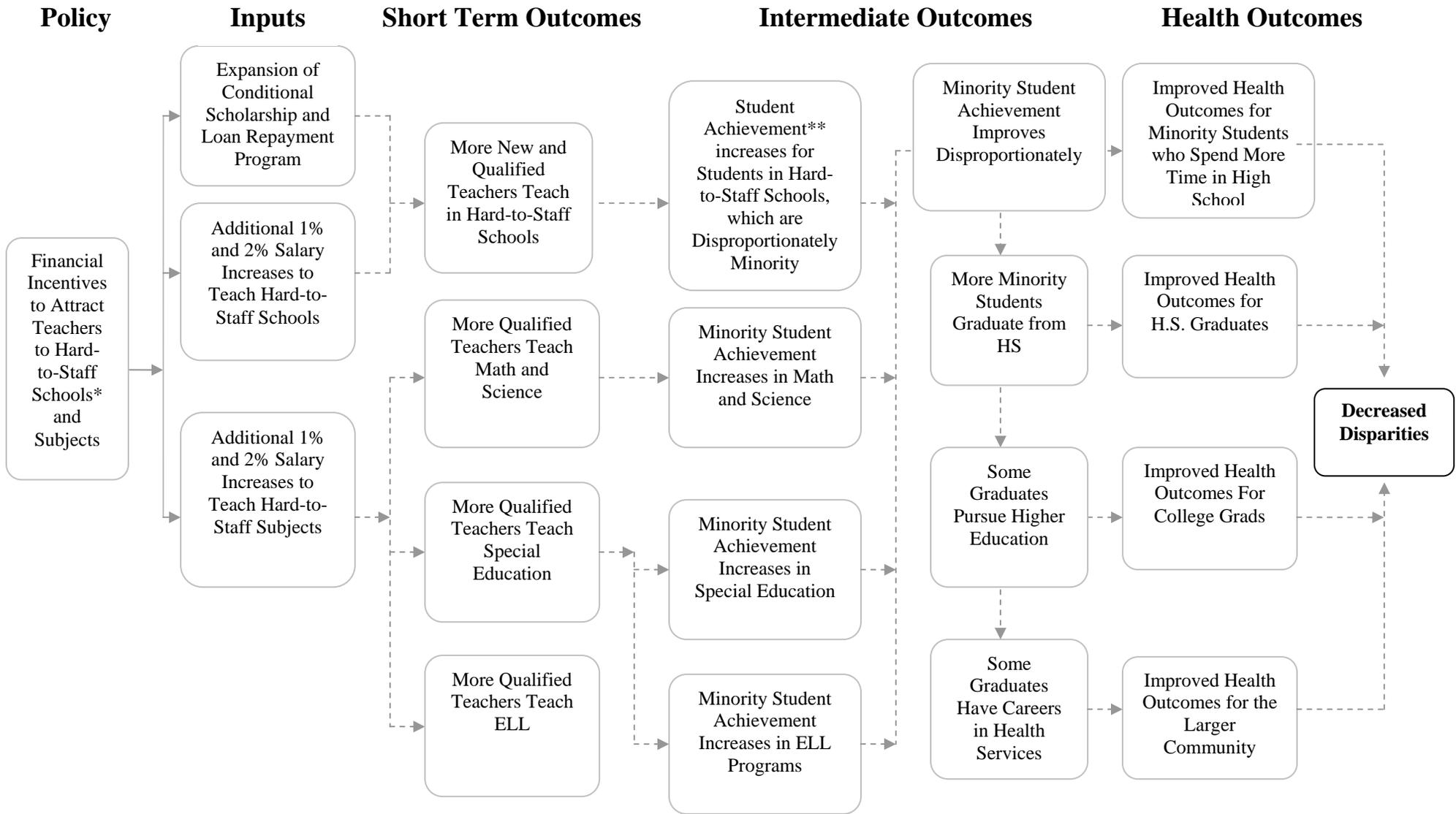


Figure 1: Financial Incentive Program Logic Model

* Hard-to-Staff Schools are schools in which more than 60% of the students are eligible for free or reduced lunch prices.

**Student Achievement means an improvement in grades, attendance, and test scores.

IV. Findings and Discussion

The Financial Incentives Program uses salary, loan repayment, and scholarship incentives to attract and retain teachers. The salary incentive component of the program is meant to improve the quality of teachers in certain areas by attracting teachers with Professional Certification and Board Certification. In the first section below, there is a review of literature on whether salary incentives are associated with student achievement and what observable characteristics of teachers can be used as indicators of teacher quality.

In the second section below, there is a discussion on each of the target areas of the Financial Incentives Program. These target areas are hard-to-staff schools and each of the hard-to-staff subject areas. There is a discussion of whether the salary, loan repayment, or scholarship incentives will successfully improve teacher quality to increase student achievement in each area. More importantly, there is discussion about whether any improvements in student achievement will disproportionately impact minority students. This piece is very important because the program must disproportionately lengthen education for minority students as compared to White students to decrease health disparities.

In the third section, there is a review of the literature that links education to health outcomes. In the fourth section, there is a discussion about the potential impacts of the Financial Incentives Program on minority health and health disparities. In the fifth section, there is a short discussion about the limitations of the review. Finally, there is a discussion about policy considerations.

A. Effect of Salary Incentives on Teacher Quality and Student Achievement & Characteristics of a Quality Teacher

There is conflicting evidence in the literature on whether salary incentives are associated with student achievement. For example, a study that compared data from nine states did not find a relationship between teacher salaries and the National Assessment of Education Progress (NAEP) math scores for 4th and 8th graders.⁸ However, another study did find a relationship between salary incentives and student achievement.⁹ In this study, salary incentive is defined as the difference in the pay scale between a starting salary for a teacher with a master's degree and the final salary for this teacher. In high schools, the study found a direct relationship between higher incentives and student achievement. For elementary schools, the effect of the salary incentive is less direct; the study found a relationship between student achievement and the percent of teachers with a master's degree. The authors acknowledged that the level of salary incentives in a district are largely determined by the number of students enrolled in a district and the median family income in the district.¹⁰ Therefore, the findings of the study should be taken with caution because these factors may influence student achievement in ways unrelated to the level of salary incentives.

The literature identified in this review does indicate that teacher quality has an impact on student achievement;^{11 12} however, there is disagreement about what indicators can be used to determine the quality of a teacher. For example, there are studies with conflicting results on the relationship between teachers' National Board Certified status and student achievement.¹³ In addition, there are studies with conflicting findings on whether teachers' attainment of master's

degrees is associated with student achievement. The study discussed in the paragraph above found a relationship between student achievement and the percent of teachers with a master's degree for elementary schools. The study discussed below found that many observable characteristics, such as attainment of master's degrees, do not have a relationship with student achievement.

A study conducted in Texas schools used longitudinal information on individual student achievement during the mid-1990s.¹⁴ Using multiple cohorts, researchers were able to make repeated observations of 500,000 students in grades three through seven in 3,000 schools. The study used test scores to measure achievement. The study found substantial differences in teacher quality among those with similar observable backgrounds. For example, this study found no evidence that teachers with master's degrees have better teaching skills. The researchers remarked that raising certification standards or education levels may not raise teacher quality.

The Texas study did find that some observable factors are associated with student achievement. For example, there are significant gains in teaching quality during the first year of teaching with smaller gains in the second and third years. Subsequently, the estimated benefits of additional years of experience are small in both reading and mathematics. From these findings, the researchers raise the concern that low-income students and minority students are more frequently taught by beginning teachers.¹⁵

The Texas study found that teacher turnover is another observable factor that relates to student achievement. Results from the study show that differences in mathematics and reading achievement gains are strongly related to teacher turnover. Within school variations in student outcomes increases in schools with higher teacher turnover, and mean student achievement is lower in schools with higher teacher turnover.¹⁶ In addition, the researchers suggest that policies be designed to reduce teacher turnover.

Financial Incentives to Attract Excellent Teachers for Hard-to-Staff Schools and Subjects provides a salary incentive to teachers who teach in hard-to-staff schools and subjects. Teachers will lose this incentive if they decide to no longer teach in a hard-to-staff school or subject. In this way, the salary incentive operates similarly to a retention bonus. Given the evidence that shows reducing teacher turnover improves student achievement, such an incentive might improve student achievement. In addition, there is precedent for giving such a bonus or incentive. There are thirty-four states and the District of Columbia that give retention bonuses to experienced or skilled teachers.¹⁷ Five states, including California and New York, use retention bonuses to keep teachers in high-need schools.¹⁸

In summary, there is conflicting evidence in the published literature about whether teacher credentials, such as a master's degree, improve student achievement. Other factors, such as reducing teacher turnover, may be promising practices for improving student achievement.

B. Target Areas of the Financial Incentives Program

1. Hard-to-Staff Schools

Financial Incentives to Attract Excellent Teachers to Hard-to-Staff Schools and Subjects has two components to attract teachers to Hard-to-Staff Schools. First, it will expand the Future Teachers Conditional Loan and Scholarship Program to teachers who agree to teach in hard-to-staff schools. OSPI estimates that the expansion will triple the number of participants in the program to about 200.¹⁹ Second, it is designed to attract teachers to hard-to-staff schools by providing a salary increase of 1% for Professional Certified teachers and a 2% salary increase for National Board Certified teachers that teach in these schools. Teachers working with students in hard-to-staff schools work with students who are disproportionately minority. In fact, minorities are 61% of the population in hard-to-staff schools, but only 23.6% of the population in not hard-to-staff schools. See Table 1 below.²⁰

Table 1
Number and proportion of students by race/ethnicity for all schools, hard-to-staff schools and schools not identified as hard-to-staff

School Category	Number (%) Asian Pacific Islander Students	Number (%) American Indian or Alaskan Native Students	Number (%) Black Students	Number (%) Hispanic Students	Number (%) Minority Students Combined	Number (%) White Students
All Schools	80,003 (7.8%)	28,136 (2.8%)	57,783 (5.7%)	137,335 (13.5%)	303,257 (29.7%)	689,581 (67.5%)
Hard-to-Staff Schools	12,071 (7.3%)	8,479 (5.1%)	16,920 (10.2%)	63,244 (38.3%)	100,714 (61.0%)	62,020 (37.6%)
Not Hard-to- Staff Schools	67,840 (8.0%)	19,410 (2.3%)	40,779 (4.8%)	72,533 (8.5%)	200,562 (23.6%)	624,421 (73.4%)

One goal of the Financial Incentives Program is to recruit experienced teachers to hard-to-staff schools, which have high proportions of under-qualified and inexperienced teachers.²¹ From the limited literature collected for this review, there is conflicting evidence on the potential effectiveness of the different incentives to attract qualified teachers to hard-to-staff schools.

It is not clear that expanding the Future Teachers Loan and Conditional Scholarship Program will improve the quality of teachers in hard-to-staff schools. The goal of the Future Teachers Program is to recruit outstanding students and paraprofessionals into the teaching profession.²² The Future Teachers Program does have an application process that includes considering the academic achievement of the candidate among other qualities, but it is unclear whether this program provides better quality teachers. The evidence does show that the quality of teachers is low during their first three years of teaching, especially during their first year.²³ It appears that this program would place the Future Teacher participants in hard-to-staff schools during their first year or years of teaching,²⁴ which may exacerbate the problem of the high proportion of inexperienced teachers at hard-to-staff schools.

The salary incentives to Professional Certified teachers and National Board Certified teachers may attract teachers with more years of teaching experience to hard-to-staff schools. In its decision package, OSPI states that hard-to-staff schools have a high proportion of under-qualified teachers. Given the evidence to show that teacher quality improves after the first three years of teaching, this incentive may work to improve teacher quality. However, there is conflicting evidence about whether the certifications themselves are indicative of teacher quality.

There is evidence that high teacher turnover is associated with decreased student achievement.²⁵ The conditional loan and scholarship program may work like a retention incentive if it requires or gives an incentive to teachers to remain at hard-to-staff schools for a specified period of time. In addition, the salary increase to Professionally Certified teachers and National Board Certified teachers may work as retention incentives because teachers will lose the incentive if they leave hard-to-staff schools. For these reasons, the two components of the Financial Incentives Program may improve student achievement by reducing teacher turnover.

If the salary incentives or the expansion of the Future Teachers Program improve teacher quality in hard-to-staff schools, or affect student achievement in another manner, minority student achievement may increase disproportionately given their disproportionate numbers in hard-to-staff schools.

2. Hard-to-Staff Subjects

Financial Incentives to Attract Excellent Teachers to Hard-to-Staff Schools and Subjects proposes a 1% salary increase to Professional Certified Teachers and a 2% salary increase to National Board Certified teachers to teach in hard-to-staff subjects, which are defined as secondary math and science, ELL programs, and special education. These teachers will receive the salary increase if they teach in any of these subjects at any school, not only hard-to-staff schools, as long as they teach the subject 50% of their time.

There is conflicting evidence in the literature as to the potential effectiveness of the incentives to attract quality teachers to teach hard-to-staff subjects. First, it is not clear whether salary incentives are associated with improved student achievement. Second, there may not be an association between teacher credentials and teacher quality. Although, in this case, the credentials may indicate that the teachers have at least a few years of teaching experience, and there is evidence to show that this level of experience is associated with teacher quality. As discussed above, the incentives may work as retention incentives, which might reduce teacher turnover, which is associated with higher student achievement.

Below are discussions about whether an improvement in teacher quality in each of the hard-to-staff subject areas will disproportionately impact minority students. To decrease health disparities, the program must disproportionately increase the length of education of minority students as compared to White students.

Secondary Math and Science

Data show that as a group, minority students, excluding Asian/Pacific Islanders, have especially low achievement in math and science. OSPI's adequate yearly progress summary (AYP) reports whether groups of students by race/ethnicity have met the proficiency standards. A report from 2006 shows that Black, American Indian, and Hispanic students in 4th, 7th, and 10th grade, which are all of the grades reported, did not meet the proficiency goal in math.²⁶ White and Asian students in all of these grades met the math proficiency goal. Black, Native American, and Hispanic students all met the reading proficiency goal in each year with the exception of 7th grade Hispanic students.

Washington Assessment of Student Learning (WASL) scores for 10th grade students reflect this achievement gap in math.²⁷ Table 2 shows the percentage of 10th graders who met the WASL standard in reading, writing, and math by race/ethnicity on the spring 2006 exam.²⁸ Student success on the WASL is largely driven by whether the student meets the standard in math.

About 83% of all students who were slated to take the WASL completed all three subject areas. However, the rate of completion varied by race/ethnicity. Almost 90% of White and Asian students completed all three subject areas; however, only 75% of Black and Hispanic students and 72% of Native American students completed all three subject areas.

Note: Aggregating students into broad categories such as Asian/Pacific Islanders does not allow for the identification of subpopulations, such as Southeast Asian students, who may perform differently than the larger group.

Table 2
Percentage of Students (10th Graders) who Met the Standard in Reading, Writing, and Math by Race/Ethnicity on the Spring 2006 WASL

	% of Asian Students	% of White Students	% of Hispanic Students	% of Black Students	% of American Indian Students
Reading	88	91	70	76	79
Writing	88	88	67	75	75
Math	63	61	30	27	37

Assuming the Financial Incentives Program succeeds in improving the quality of secondary math and science teachers, it is not possible to draw conclusions on how the improvement would impact minority student achievement. First, it is possible that teachers who receive the salary incentive will not work with classes that have disproportionate numbers of minority students because teachers can receive the salary increase for teaching a hard-to-staff subject in any school. Second, even if these teachers are evenly distributed in all schools, it is not possible to tell if the improved teacher quality will disproportionately impact minority students even though minority students have lower achievement in math.

ELL

There are 191 languages spoken by 92,405 students in ELL programs in Washington.²⁹ The majority of the students, 65.7%, speak Spanish. Spanish speaking students are followed in number by 5,734 students who speak Russian. These two groups are followed in number by students who speak Ukrainian, Vietnamese, Korean, and Somali. Data on the racial composition of ELL programs in Washington were not available, but from these numbers an assumption can be made that a very large percentage of students in ELL programs are Hispanic.

If the salary incentives are successful in improving teacher quality in ELL programs, the achievement of Hispanic students may disproportionately increase given that Hispanic students are the majority of students in ELL programs.

Note: Input from stakeholders suggests that many commonly used ELL programs are not as effective as dual-language programs. This observation appears to be supported by information on the OSPI website.³⁰ A limitation of this review is that it does not consider the effectiveness of different ELL programs or the benefits of requiring teachers certified in ELL to be bilingual.

Special Education

Black and Native American students are represented at somewhat higher rates in special education programs, see Table 3.³¹ If the salary incentives successfully increase teacher quality in special education programs, Black and Native American student achievement may be disproportionately impacted. Table 3 shows the number and percentage of students by race/ethnicity in special education compared to all programs.

Table 3
Number and Percentage of Students by Race/Ethnicity in Special Education and All Programs

School Category	Number (%) Asian Pacific Islander Students	Number (%) American Indian or Alaskan Native Students	Number (%) Black Students	Number (%) Hispanic Students	Number (%) White Students
All Programs	80,003 (7.8%)	28,136 (2.8%)	57,783 (5.7%)	137,335 (13.5%)	689,581 (67.5%)
Special Education	5,868 (4.7%)	4,677 (3.8%)	9,300 (7.5%)	16,927 (13.6%)	87,720 (70.5%)

Summary of Hard-to-Staff Subjects

If the salary incentives successfully improve teacher quality in each of these target subject areas, minority student achievement may disproportionately improve in some of the subject areas. For example, Hispanic student achievement may disproportionately improve if the quality of ELL teachers improves because it appears that Hispanic students are disproportionately represented in

these programs. In addition, Black and Native American student achievement may disproportionately improve if the quality of special education teachers improves because these students are overrepresented in this program. However, the numbers of students in ELL and special education programs may be too small to affect the achievement gap of the group as a whole. It is not possible to draw a conclusion about whether salary incentives for secondary math and science could disproportionately improve minority student achievement.

C. The Relationship of Education and Health

A large body of literature has documented the connection between health and education.^{32 33} The literature demonstrates that those with more education are in better health, whether health is measured by mortality, self-reported health measures, or morbidity rates.³⁴ The link between education and life expectancy has been documented within many countries and regions of the world, including Western and Eastern Europe, Canada, Israel, China, Bangladesh, and Korea.³⁵

High school graduates have higher life expectancies and lower age-specific death rates than those without a high school diploma, with further benefits seen for college graduates.³⁶ For example, individuals with a college education have a life expectancy of six more years than individuals with less than a high school education.³⁷ However, the health benefits of education are likely tied to per year of education, not just to the attainment of a diploma.³⁸ Further, while life expectancy is improving for everyone in the United States, the disparity in life expectancy based on education may be widening.³⁹

The benefits of education may not diminish as life progresses. For example, for the elderly, a higher level of education is associated with the prevention of functional limitations.⁴⁰ A higher income is associated with both prevention and delayed progression of functional decline.⁴¹

The relationship between health and education also exists between the education of a mother and the health of her infant. The infant mortality rate is almost double for infants of mothers with less than 12 years of education compared to infants of mothers with 13 or more years of education.⁴² In addition, more educated mothers are less likely to have low birth weight babies.⁴³

The Centers for Disease Control and Prevention (CDC) has looked at the relationship between education and health in terms of leading health indicators, rather than mortality rates. For example, the CDC found that individuals with lower incomes and less education are not as physically active as those with higher incomes and more education.⁴⁴ In addition, the percentage of people 25 years and older with less than 12 years of education who currently smoke is nearly three times the rate for the same age group with 16 years or more of education.⁴⁵ Other research on self-reported health outcomes⁴⁶ also indicates a relationship between health and education. More educated people report lower rates of the most common acute and chronic diseases.⁴⁷ In addition, the more educated report healthier behaviors.⁴⁸

There are many possible explanations for the relationship between health and education. The literature clearly supports the correlation between health and education,⁴⁹ and it recognizes the issue of causation.⁵⁰ For example, it may be that because income and education are so closely correlated,⁵¹ it is really greater income that leads to better health. However, the correlation

between health and education is strong and significant even when other factors such as income and race are controlled.⁵² It is also possible that poor health may lead to lower levels of education. However, there are longitudinal studies that indicate that low education often predicts a decline in health.⁵³ In considering the results of this brief literature review, the question of why education causes better health is not clearly explained in the literature.⁵⁴

D. The Potential Impact of Financial Incentives on Minority Health and Health Disparities

If the Financial Incentives Program is able to increase teacher quality or reduce teacher turnover for each of its target areas discussed above, it would reach the short term goals as outlined on the conceptual model. Improved teacher quality may in turn improve student achievement. Because minority students will disproportionately benefit from the improved quality in some of the targeted areas, the program may disproportionately improve minority student achievement, which is an intermediate outcome on the conceptual model. In this way, the program may reduce the achievement gap between minority and White students in education.

Research shows that health improves with an increase in education. If the program can succeed in helping minority students stay in school longer than they otherwise would have, the program is likely to have a positive impact on the health of these students.

The goal of the financial incentives program is to improve teacher quality, which would impact student achievement. However, if the program succeeds beyond its goal, it may increase graduation rates, especially for minority youth who are disproportionately impacted. This would have an even greater impact on the health of minority students because research shows that high school graduates experience an increased life expectancy and healthier behaviors than those who do not graduate. The program would have the most impact on the health of minority students if students who would have otherwise dropped out of high school go on to graduate from college.

In addition, minorities who graduate from high school or college would now have the opportunity to enter the health services field and obtain graduate training in a health profession. In this case, the increased health benefits of their education would have secondary benefits for the health of minority communities; literature indicates that an increase in minority health providers will have a positive impact on the health of minorities in the given community.⁵⁵ Moreover, society benefits as a whole when the health of any population within it improves.

If the program succeeds in lengthening the education of a disproportionate number of minority students, it would have a disproportionately positive impact on the health of minority students compared to the health of White students. Logically, such a disproportionate impact would decrease health disparities in Washington.

E. Limitations

The most significant limitation in this review is the amount of time that we had to complete the review. The short amount of time limited the thoroughness of the literature review and our ability to obtain all of the data we needed to compare the proportion of minority groups in the

target areas of the program. In addition, we had to rely on some of the assumptions in the decision package, although we attempted to evaluate as many assumptions as time allowed.

F. Policy Considerations

The Financial Incentives Program is most likely to disproportionately increase minority student achievement if the salary incentives operate as retention incentives to retain quality teachers in hard-to-staff schools.

The expansion of the Future Teachers Program appears to place inexperienced teachers in hard-to-staff schools, which may decrease teacher quality in these schools. However, it may be possible to design the program to require or encourage new, inexperienced teachers to remain in hard-to-staff schools beyond their initial three years of teaching.

V. Conclusion

The Financial Incentives to Attract Excellent Teachers to Hard-to-Staff Schools and Subjects proposal has some potential to decrease health disparities in Washington. For this to occur, the program must first succeed in improving the quality of teachers in its target areas, many of which contain high proportions of minority students. The improvement in teacher quality must lead to a disproportionate improvement in minority student achievement, thereby increasing the length of time minorities spend in school. If the length of time minority students spend in school disproportionately increases, the health outcomes of minority students would be disproportionately impacted as a result of the relationship between health and education. If all of these conditions occur, the result of the program would be a decrease in health disparities in Washington.

¹ U.S. Department of Health and Human Services. (2000) *Healthy People 2010: Understanding and Improving Health*. (2nd ed.). Washington, DC: U.S. Government Printing Office. P. 11-16. See also, Recommendations from the Joint Select Committee on Health Disparities (November 2005), Washington State Legislature, Olympia, WA.

² U.S. Department of Health and Human Services. (2000) *Healthy People 2010: Understanding and Improving Health*. (2nd ed.). Washington, DC: U.S. Government Printing Office. P.12.

³ *Id.* at 12.

⁴ *Id.*

⁵ Centers for Disease Control, MMWR Weekly, May 12, 2006.

⁶ *Id.*

⁷ OSPI Decision Package available at www.k12.wa.us/LegisGov/2007Documents/FinancialIncentivesAttractExcellentTeachers2007-09.pdf. This program description is based only on information in this decision package; it is not based on any piece of legislation that may have incorporated components of this decision package.

⁸ Miller, E. (2000). An Examination of Teacher Salary and Student Performance. Paper Presented at the Annual Meeting of the Mid-South Education Research Association.

⁹ Kroc, R. & Hoover, J. (1986). Policy Strategies, Teacher Salary Incentive, and Student Achievement: An Explanatory Model. *Educational Researcher*. V. 15 n. 3.

¹⁰ *Id.*

¹¹ Rivkin, S, Hanushek, E, Kain, J. (2005, March). Teachers, Schools, and Academic Achievement. *Econometrica*. 73(20). P. 434.

¹² Sanders, W & Rivers, J. (1996) Cumulative and Residual Effects of Teachers and Future Student Academic Achievement. University of Tennessee Value-Added Research and Assessment Center.

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