

Does Fellowship Pay: What Is the Long-term Financial Impact of Subspecialty Training in Pediatrics?



WHAT'S KNOWN ON THIS SUBJECT: No studies have focused on the financial impact of fellowship training in pediatrics.



WHAT THIS STUDY ADDS: The results from this study can be helpful to current pediatric residents as they contemplate their career options. In addition, the study may be valuable to policy makers who evaluate health care reform and pediatric workforce-allocation issues.

abstract

OBJECTIVES: To (1) analyze the financial returns of fellowship training in pediatrics and to compare them with those generated from a career in general pediatrics and (2) evaluate the effects of including the newly enacted federal loan-repayment program and of changing the length of fellowship training.

BACKGROUND: Although the choice to enter fellowship is based on many factors, economic considerations are important. We are not aware of any study that has focused on the financial impact of fellowship training in pediatrics.

METHODS: Using standard financial techniques, we estimated the financial returns that a graduating pediatric resident might anticipate from additional fellowship training followed by a career as a pediatric subspecialist and compared them with the returns that might be expected from starting a career as a general pediatrician immediately after residency.

RESULTS: The financial returns of pediatric fellowship training varied greatly depending on which subspecialty fellowship was chosen. Pursuing a fellowship in most pediatric subspecialties was a negative financial decision when compared with pursuing no fellowship at all and practicing as a general pediatrician. Incorporating the federal loan-repayment program targeted toward pediatric subspecialists and decreasing the length of fellowship training from 3 to 2 years would substantially increase the financial returns of the pediatric subspecialties.

CONCLUSIONS: Pediatric subspecialization yielded variable financial returns. The results from this study can be helpful to current pediatric residents as they contemplate their career options. In addition, our study may be valuable to policy makers evaluating health care reform and pediatric workforce-allocation issues. *Pediatrics* 2011;127:254–260

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KEY WORDS

human capital, health economics, educational investment, salaries and fringe benefits, graduate medical education, training, career choice, pediatrics, residency, fellows, subspecialists

ABBREVIATIONS

NPV—net present value

AAMC—Association of American Medical Colleges

PGY—postgraduate year

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The financial returns in most primary care fields, including pediatrics, are lower than those in law, business, dentistry, or even procedure-based medical or surgical specialties.¹ Compounding this problem is the fact that many graduate medical school with significant amounts of debt. Indeed, >87% of 2008 medical school graduates had some educational debt and among those who did, the mean debt burden approached \$160 000.² These issues make the financial implications of choosing a career in pediatrics significant.

Most graduating pediatric residents either begin practice as a general pediatrician after a 3-year residency or pursue subspecialty training by entering a 3-year fellowship.³ Recently, an increasing number of graduating pediatric residents are opting to enter fellowship.³ Although the choice to enter fellowship is clearly based on many factors, economic considerations are certainly important.^{4,5}

But what are the financial implications of the decision to pursue a pediatric fellowship? Studies published previously have addressed the financial returns of fellowship training in several medical and surgical specialties.^{5–10} Results from these analyses have varied and have depended on the particular fields studied. However, we are not aware of any report that has focused on the financial implications of pediatric fellowship training. In this study we sought to analyze the financial returns of fellowship training in pediatrics and to compare these with those generated from a career in general pediatrics. We also evaluated the impact of implementing the newly enacted federal loan-repayment program and of altering the length of fellowship training.

METHODS

We obtained information on fellowship stipends, subspecialty-specific compen-

sation, general pediatric compensation, and educational debt to create a model that estimated age-specific net income for general pediatricians and for pediatric subspecialists in 11 different fields over a working lifetime. As in previous reports,^{5–10} to compare these age-specific net incomes, standard financial techniques used to analyze the values of different investments were employed, and a frequently used measure to evaluate financial returns was calculated, the net present value (NPV). This process allowed us to estimate the financial returns that a graduating pediatric resident might expect from additional fellowship training followed by a career as a pediatric subspecialist and to compare these with the returns that might be anticipated from starting a career as a general pediatrician immediately after residency.

Stipend and Compensation Data

Stipend and compensation information were obtained from 3 different sources and, as in earlier reports, we focused on mean figures.^{5,6,8–10} In addition, we used 2007 numbers, which represented the most current data from our various sources.

Similar to previously published studies,^{5,7,9,10} we used figures from the annual Association of American Medical Colleges (AAMC) Survey of Resident/Fellow Stipends and Benefits to estimate fellowship stipends for postgraduate year 4 (PGY-4), PGY-5, and PGY-6.² We assumed these year-specific stipends were the same, regardless of which fellowship was chosen.¹¹

For compensation estimates after fellowship that were subspecialty-specific and that varied with age and experience, we used information from the AAMC's Report on Medical School Faculty Salaries.¹² The data used represented mean actual annual total compensation, including bonus, before taxes

and retirement and fringe benefits of full-time faculty affiliated with Liaison Committee on Medical Education–accredited medical schools. The information was based on figures garnered from the AAMC's Faculty Salary Survey, an annual survey that has studied compensation of medical school faculty for >40 years. Our analysis included information for 4083 pediatric subspecialists. The compensation estimates we used for fellowship-trained pediatric subspecialists were based on academic salaries because nearly two-thirds of recently trained pediatric subspecialists practice in an academic environment.¹³ We assumed that, after fellowship, graduates were hired as assistant professors, where they remained for 7 years; they then were eligible to be promoted to associate professors. They remained as associate professors for 7 more years, at which time they were eligible to become professors. Compensation-by-rank data within each subspecialty were used to calculate subspecialty-specific growth rates between ranks and more modest subspecialty-specific growth rates within ranks. These growth rates were then employed to construct subspecialty-specific and age-specific net income streams that could be used for comparison.

To obtain compensation estimates for general pediatricians that varied with age, we used information from the Medical Group Management Association Physician Compensation and Production Survey,¹⁴ which is a well-regarded and often quoted annual survey that targets single and multi-specialty medical group practices. Similar to the AAMC data for pediatric subspecialists, the Medical Group Management Association figures represented mean actual annual total compensation, including bonus, before taxes and retirement and fringe

benefits. Our study included information for 2862 general pediatricians, all of whom were in private practice. We used private practice instead of academic compensation for the general pediatric group because the majority of recently trained general pediatricians enter private practice; only 15% are employed in an academic environment.¹⁵ Compensation-by-years-in-specialty data were used to create an age-specific net income stream that could be used for comparison.

Educational Debt

We assumed each career option was associated with the mean educational indebtedness of those graduating medical school at the completion of the 2007 academic year, a figure that included both the debt incurred from attending medical school as well as the debt incurred from educational activities before attending medical school. This information was obtained from the AAMC Medical School Graduation Questionnaire, which is administered annually to graduating medical students.² We assumed that loan repayment was deferred during residency and fellowship and that the accrued interest was capitalized once training was completed and employment began in the chosen field. For our analysis, we used the current annual interest rate on federal Stafford educational loans, which is a fixed rate of 6.8%.¹⁶ Finally, we assumed that, after graduation from residency or fellowship, debt was repaid over 25 years, which is reportedly the most likely repayment option chosen by today's young physicians.¹⁶

Other Assumptions

We assumed no time was taken off between high school, college, medical school, and residency. Graduating PGY-3 residents immediately started working as general pediatricians or entered fellowship and, for those pur-

suing fellowship, employment in a pediatric subspecialty began directly after training completion. We assumed graduating residents or fellows worked in their chosen careers until retirement, which, as in previous studies, occurred at age 65.^{5,8,9} Finally, we assumed pediatricians in each field worked the equivalent number of hours per year and they all worked full-time.

NPV

The NPV is the financial concept that addresses the fact that income obtained today is more valuable than income obtained in the future, because today's income can be invested at an interest rate to yield an immediate return. It allows for the comparison of different income streams over time by discounting them back to the present at a constant discount (or interest) rate. The formula for NPV is¹⁷:

$$\sum_{t=1}^n \frac{NI_t}{(1+r)^t}$$

where NI is the annual net income, which we defined as annual compensation less annual debt-repayment costs. The formula takes the sum of the annual net incomes over time (from $t = 1$ to n years) and discounts them back to the present at a discount rate (r), which, as in previous studies, was set at 5%.⁵⁻¹⁰ From this calculation, one is able to compare the current value of future net income streams.

We calculated a measure called the Lifetime Relative NPV, which we defined as the present value of the net income generated from a career in 1 of 11 different pediatric subspecialties relative to that generated from a career in general pediatrics over the working lifetime. It represented the present value of the difference in lifetime net income between a pediatric subspecialist and a general pediatrician. This calculation incorporated the concept of opportunity cost, which, in general terms, represents the value of

an option that must be foregone in order to pursue another option. For our purposes, the opportunity cost of pediatric fellowship training was the net income a graduating pediatric resident could have earned had he or she decided not to enter a 3-year fellowship and had instead started to work immediately after residency as a general pediatrician. In our model, this opportunity cost was estimated as the age-specific net income earned by a general pediatrician, and it represented the financial costs of fellowship training. The opportunity cost was the same for all subspecialties.

Sensitivity Analyses

We performed several sensitivity analyses. First, we analyzed the effect of a loan-repayment program targeted toward pediatric subspecialists. On March 23, 2010, President Obama signed into law the health care reform bill, which has a section devoted to the allocation of loan-repayment funds for physicians who pursue full-time employment as pediatric subspecialists.¹⁸ Specifically, the bill affords up to \$35 000/year in loan-repayment funds for up to 3 years to individuals who pursue the pediatric subspecialties. No loan-repayment funds are allocated to those who pursue general pediatrics. Although there are still some challenges to this bill and, thus, some uncertainty surrounding whether there indeed will be loan-repayment options available to pediatric subspecialists, this is the program we analyzed. The second sensitivity analysis performed examined the effect of decreasing the length of pediatric fellowships from 3 years to 2 years, which is a training structure favored by many current pediatric fellows, even if not by pediatric training programs.⁴

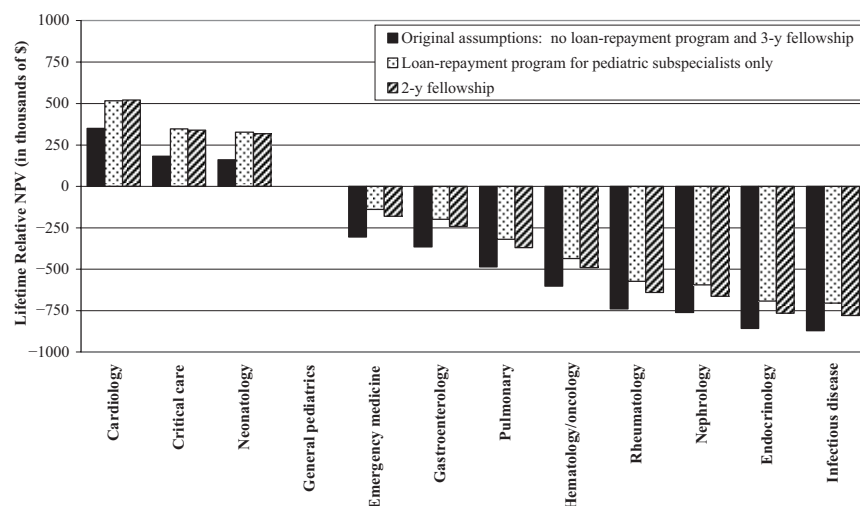


FIGURE 1
Lifetime Relative NPV.

RESULTS

Fig 1 displays the Lifetime Relative NPV of 11 different pediatric subspecialties relative to general pediatrics and is an illustration of the present value of the difference in lifetime net income between a pediatric subspecialist and a general pediatrician. As such, the Lifetime Relative NPV of general pediatrics is \$0. The solid black bars represent the Lifetime Relative NPV on the basis of our original assumptions: there is no loan-repayment program targeted toward pediatric subspecialists, and pediatric fellowships are 3 years in length. In this scenario, the largest Lifetime Relative NPV is seen in cardiology, which yields a positive \$349 532 financial return relative to general pediatrics over the working lifetime. In addition, critical care and neonatology experience positive financial returns compared with general pediatrics. Careers in the other 8 pediatric subspecialties analyzed (emergency medicine, gastroenterology, pulmonary, hematology/oncology, rheumatology, nephrology, endocrinology, and infectious disease) generate negative financial returns relative to general pediatrics over the working lifetime ranging from negative \$305 621 for emergency

medicine to negative \$870 995 for infectious disease. Stated differently, a graduating third-year pediatric resident would need to be given a lump sum payment of \$870 995 to make the decision to forego a career in general pediatrics and enter fellowship training in infectious disease financially neutral.

The second bar for each career choice in Fig 1 illustrates the effect of the provision contained in the recently enacted health care reform bill which allocates \$35 000/year in loan-repayment funds for 3 years to individuals who pursue the pediatric subspecialties; this bill allocates no loan-repayment funds to those who pursue general pediatrics.¹⁸ Comparing these polka-dotted bars to the solid bars conveys that the effect of the newly enacted pediatric subspecialist federal loan-repayment program is substantial. This is because of the fact that, in the loan-repayment scenario, while the annual debt-repayment costs for general pediatricians are the same, those for all pediatric subspecialists are greatly reduced.

The third bar for each career choice in Fig 1 shows the Lifetime Relative NPV

when pediatric fellowships are 2 years in length. Comparing these striped bars to the solid bars conveys that shortening the length of training considerably enhances the relative financial returns of pediatric subspecialization. This is because, in this scenario, although there is no change in the compensation of general pediatricians, pediatric subspecialists experience the increase in compensation associated with the completion of training 1 year earlier, and they earn this heightened level of compensation for 1 more year over the course of their careers. In addition, shortening the length of fellowship decreases the interest on educational debt that accrues during training and thereby reduces annual debt-repayment costs. It should be noted that although the effect of the loan-repayment program and the alteration in fellowship length are not large enough to change the result that only 3 subspecialties (cardiology, critical care, and neonatology) have higher Lifetime Relative NPVs than general pediatrics, they do bring the other 8 subspecialties closer to the financial returns enjoyed by general pediatricians.

DISCUSSION

We used standard financial techniques to estimate the financial returns of fellowship training in pediatrics and to compare these with those generated from a career in general pediatrics. Our analysis revealed that an investment in a pediatric fellowship generated variable returns, depending on which subspecialty fellowship was chosen. Pursuing a fellowship in pediatric cardiology, critical care, or neonatology yielded greater financial returns than pursuing no fellowship at all and practicing as a general pediatrician. However, pursuing a fellowship in the other 8 pediatric subspecialties analyzed was a negative financial decision when com-

pared with pursuing no fellowship at all and practicing as a general pediatrician.

Our results are in contrast to a recently published report that showed that, in most orthopedic subspecialties, financial returns are positive for additional fellowship training.⁶ The reasons for this difference are twofold. First, orthopedic fellowships last for only 1 year, whereas pediatric fellowships are 3 years long. Thus, the financial burdens associated with fellowship, such as lower compensation levels during training and increased debt-repayment costs after training, are much more substantial in pediatrics than in orthopedics. In fact, our analysis revealed that decreasing the length of pediatric fellowships from 3 years to 2 years considerably enhanced the relative financial returns of pediatric subspecialization.

The second reason for this difference between orthopedics and pediatrics is annual compensation. In most orthopedic subspecialties, the starting salary is much higher than the starting salary of a general orthopedist.⁶ However, in most pediatric subspecialties, even after 3 years of fellowship training, the starting salary is similar to or is indeed potentially less than the starting salary of a general pediatrician. Standard methods to calculate the financial returns on an educational investment compare the financial benefits of added training (the relative increase in compensation after training) to the costs of this training (lost earnings during training and increased debt-repayment costs after training). Yet most pediatric subspecialties never experience any financial benefits of added training because there is no relative increase in compensation after training. Indeed, our results are an illustration of the career-long effect of the relatively low compensation lev-

els that most pediatric subspecialists earn compared with general pediatricians, who themselves often earn less than those in other medical and surgical specialties.¹

In addition, our analysis provided the financial rationale for the provision contained in the recently enacted health care reform bill, which allocates loan-repayment funds for those who pursue the pediatric subspecialties. We concluded that a federal loan-repayment program targeted toward pediatric subspecialists could have a substantial impact on increasing the financial returns and, as a result, potentially the attractiveness of the pediatric subspecialties.

The results from this study may be important to those currently training in or thinking of pursuing training in pediatrics. Although trainees often do not rigorously analyze the financial implications of pursuing a fellowship, it is necessary to comprehend the financial effect of this additional training to make an educated decision regarding career alternatives. Trainees can use this analysis as a framework for formulating prudent financial decisions regarding their career plans. They can use our results to compare the estimated financial returns afforded by different career options and to help them choose which particular fellowship to enter or whether to enter a fellowship at all.

Our study also may be valuable to policy makers. We found that 8 pediatric subspecialties had negative financial returns compared with general pediatrics, which bodes poorly for the relative financial attractiveness of these fields. Differences in expected financial returns may have significant effects on the distribution of physicians.⁸ When variations in returns between fields are substantial, fewer graduating residents may opt to pursue the careers with significantly lower re-

turns. Many pediatric residents may perform an informal analysis similar to ours, and the outcome does not favor pursuing a fellowship in most pediatric subspecialties. Although the decision to enter a pediatric fellowship certainly is not solely a financial one, as our nation's economy continues to struggle and as the costs of a medical education and the debt burden associated with it continue to increase, the effect that financial incentives have on the decision to pursue a pediatric fellowship may become only more important. These trends have the potential to impact the distribution of the pediatric workforce and may lead to impaired patient access to pediatric subspecialty care. Therefore, understanding the financial implications of fellowship training in pediatrics is essential as we seek to guarantee sufficient numbers of general pediatricians and pediatric subspecialists. As our country faces a shortage of pediatric subspecialists and an increased demand for their services,¹⁹ policy makers can use the results from this study to help quantify the current disparities in financial returns between general pediatrics and the pediatric subspecialties, disparities that may have an impact on the training and supply of future pediatric subspecialists. Those charged with guaranteeing that an adequate number of doctors are practicing in all the vital pediatric subspecialties might consider reforms that promote federal and other loan-repayment programs targeted toward pediatric subspecialists and that decrease the length of pediatric fellowship training from 3 to 2 years.

There are several reasons why our results may not match actual financial returns. First, our results are dependent on the assumptions inherent to our model. To the extent that we change our assumptions, our results might change. For instance, we as-

sumed that pediatric subspecialists were eligible for promotion after 7 years at a particular rank. Had we assumed that pediatric subspecialists were promoted, for example, after 10 years at a particular rank, those in the pediatric subspecialties would experience financial returns even lower than those reported here. In addition, our analysis is based on compensation figures for general pediatricians in private practice and pediatric subspecialists in academic practice. If, for instance, we had based our study on pediatric subspecialists in private practice, the financial returns of the pediatric subspecialties might look more attractive than those reported here because private practice compensation is generally higher than compensation in academia. However, our goal was to offer a representation of the choices faced by a majority of pediatric trainees, and we believe our assumptions allowed us to achieve this objective because most graduating pediatric residents work either as general pediatricians in private prac-

tice or as pediatric subspecialists in academic-affiliated practices. We believe our assumptions allowed us to present the most pertinent information for today's graduating pediatric residents who are evaluating different career options and today's policy makers who are contemplating health care reform and pediatric workforce-allocation issues.

Second, we do not capture every compensation and expense parameter. For instance, we do not include earnings from moonlighting. In addition, compensation disparities on the basis of geography and gender are not accounted for. Moreover, our analysis assumes that pediatricians in each field work the equivalent number of hours per year and that they all work full-time. It is possible that the differences in financial returns reported here partially reflect variations in, for example, gender-based compensation or hours worked. However, no recent or reliable data sets were found that quantified gender-based compensation or the number of hours worked by

pediatric subspecialty. In addition, even if such data had been available, it would have been extremely difficult to account for disparities between fields in overnight, weekend, and holiday work as well as in variations in the number of part-time workers.

Finally, we hope that the decision to pursue a fellowship is not based solely on financial considerations, and our analysis ignores the nonfinancial motivations that may play a role in career decisions. For example, prestige, intellectual stimulation, the interest in specific diseases or organ systems, the desire to work with certain patient populations, lifestyle issues, and research and academic aspirations certainly affect career selection.^{4,5} Our financial analysis does not account for these intangible factors because it is extremely hard to quantify their impacts. Individual residents can modify the financial returns presented here based upon the importance of these nonfinancial factors in their own lives.

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THE HUMAN TOUCH: *Last week, I was consulted in the NICU on a three-week-old infant born at 25 weeks gestation. She was mechanically ventilated, had multiple catheters, and now had evidence of necrotizing enterocolitis with perforation. Vancomycin, meropenem, and fluconazole were administered. The mother had never held her and now visited infrequently. I went from the consult in the NICU to a planning meeting for a one month visit to a NICU in east Africa. That NICU, which is in the major university teaching hospital, has oxygen but not compressed air, no serviceable ventilators or incubators, and the only antibiotics available were ampicillin and gentamicin. What could my traveling companion and I bring to the care of neonates? Clearly, this was a situation where stepping back was better than trying to bring more money or technology. Although some aspects of kangaroo care are used in the U.S., in resource limited areas, kangaroo care makes all the difference in the world. As discussed in The New York Times (December 13, 2010: Opinionator), kangaroo care uses the mother as a human incubator. The premature infant is clothed only in a diaper and cap, and placed directly on the mother's chest. All but the infant's head is covered by the mother's shirt. The direct skin contact is constantly maintained even during maternal sleep. The physiologic and emotional benefits, both for the neonate and mother, are remarkable. In areas with resources, studies have shown that kangaroo care babies have shorter hospital stays, better growth, and fewer severe infections. Mothers bond better with their infants. In areas with few resources, survival is clearly dependent on kangaroo care. Recognizing its key role, kangaroo care has been an endorsed practice by the World Health Organization since 2003. While I am happy that I can use meropenem through a central venous catheter here in the US, the old adage, "keep it simple" resonates both here and in resource limited areas. It is comforting to know that the human touch is important regardless of where one practices.*

Noted by WVR, MD

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