Executive Summary Faculty Pay Equity Study
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Washington University is committed to fair and appropriate compensation for each faculty member's contributions to the University, without regard to gender, race, creed, age, sexual orientation, religion or disability. The goal is to provide an optimal working environment for all. Faculty compensation should be aligned with performance and productivity, reflecting appropriate compensation for time commitments across all areas of the academic mission consistent with the expectations of the various faculty tracks.

As one tool to evaluate those commitments, both the Danforth Campus and the Medical School have conducted periodic studies of faculty pay over the years, and both campuses have attempted to address areas highlighted by those studies as meriting further attention. The School of Medicine (WUSM) has conducted four previous pay equity studies. Partly as a response to the prior study findings, the Office of the Associate Dean for Faculty Affairs was established to emphasize and improve career development, mentoring and communication that would better enable faculty gender equity and diversity.

Multiple regression analysis is the most commonly used tool for studying pay equity among large groups. The major strength of this model lies in its ability to assess the calculated contribution of gender to pay after assessing the predictive values of other variables known to predict pay, such as medical or scientific field, highest degree, rank, etc.

The focus of the current study was to apply multivariate regression to a faculty data set for the entire Medical School faculty at rank of Assistant Professor and above, to examine the magnitude and statistical significance of differences in average male and female faculty compensation. The methodology and model specifications are in accord with many other such studies, and this study built substantially on the previous in-depth analysis of WUSM faculty pay, most recently reported in April 2004. As in the 2003-04 study of faculty pay equity, a steering committee comprised of department heads, senior administrative staff, senior faculty, representatives of the Gender Equity Committee and the Faculty Diversity Committee endorsed the study methodology.

The current study, using fiscal year 2008 total compensation amounts and other data, indicates a finding consistent with WUSM's past studies--that female WUSM faculty members as a group make less than the group of male WUSM faculty members--and the current multiple regression analysis also indicates that this average - 4.0% difference, while relatively modest overall, is statistically significant ($p = 0.014$).

The results of the current study merit the serious attention of those charged with establishing faculty compensation.

Among the Steering Committee's recommendations is that the Dean's Office be charged with reviewing the detailed results and underlying data utilized in this current study, departmental compensation plans, and other relevant information. There should be meetings as necessary with Department Chairs, Program Directors, and those with the authority and responsibility for establishing faculty compensation to review individual faculty salaries and make any appropriate adjustments.

The Committee desires that this report be used to maintain the attention to pay equity high in our collective conscience and to stimulate a review process that maintains accountability for meeting our institutional expectations while preserving the appropriate discretion necessary to govern a wide array of faculty talents, skills, needs and accomplishments.

Background and Methods

Despite passage of the Equal Pay Act in 1964, women and minorities continue to lag behind Caucasian men in compensation. This is true not just in academia but in most professions and occupations. According to US Census Bureau Statistics women working full time earn 78% of that earned by men. In Missouri, the data show earnings at 75%.

The same issues and concerns have existed, and continue to exist, within American higher education generally, and within many academic medical centers. The most recently reported AAUP data from 1231 institutions in the United States, show:

- Women Full Professors earnings at 87.9 % of Male Professors
- Women Associate Professors earnings at 93.3% of Male Professors
- Women Assistant Professors earnings at 93.0% of Male Professors

Many faculty pay equity studies have been carried out at colleges and universities across the country. Although such studies involve varying degrees of sophistication, they almost universally find that on average female faculty earn less than male faculty, both in gross average terms and even after account is taken of other legitimate predictors of pay such as educational attainment, prior experience, and academic discipline.

At the School of Medicine, the current report represents the fifth study of pay equity. The previous studies were reported in 1990, 1995, 1999-2002, and 2004. All demonstrated less compensation for female faculty than for male faculty although various conclusions were reached as to the statistical significance of those differences. The study reported in 2004 demonstrated no differences that were statistically significant (p = 0.05) level. The only previous study to consider race and ethnicity was the 2003-04 study in which no significant differences by race or ethnicity were apparent.

Key project steps in the current study included:

- WUSM Project Manager was Diana Gray, Associate Dean for Faculty Affairs. Consistent with the last pay equity study, she worked directly with Dr. Malcolm Dow, the outside labor economist consultant, to coordinate scheduling meetings and conference calls with administration and the steering committee and to determine available data to be use as independent variables in the regression.
- George Andersson, Assistant Vice Chancellor/Assistant Dean for Finance, WUSM, and Scott Altmiller, Director of Financial Reporting, WUSM were integral to the study and provided Dr. Dow with the necessary data from the Central Fiscal Database.
- Also similar to the process for the last pay equity study, a Pay Equity Steering Committee comprised of key faculty, Department Heads, and administrative leaders was constituted. The steering committee reviewed the prior study, received a briefing on planned methodology for the current study and assisted in selection of the independent variables (predictors of compensation.) After the models were developed and the study performed, the steering committee received a presentation of study results prior to the release to the Executive Faculty or to the faculty at large. The Steering Committee provided meaningful feedback and helped shape plans to address compensation issues.
- Using multivariate regression analyses, Dr. Dow conducted the study of the faculty data and developed the preliminary statistical models that were used in the study. After preliminary results were discussed with Dean Shapiro, Associate Dean Gray, Associate Vice Chancellor Stanton, and Assistant Vice Chancellor Andersson, further refinements were made and final statistical models developed.
- Associate Dean Gray and Dr. Dow presented the study results to the Steering Committee in late May 2010. Associate Dean Gray presented the results to the Executive Faculty the first week of June 2010.

Selection of Variables

A well-specified regression model that is intended to be used to evaluate equity in compensation should include the faculty attributes that are commonly used in establishing salaries and that are available in the WUSM data base. Generally these variables for faculty salary equity studies include those based on educational attainment, experience, discipline or specialty, academic rank, merit and productivity. Hence, the independent (predictor) variables for the current study were selected from among the data available through WUSM central databases. The experience variables included factors such as tenure, PI status, a leadership title, years on faculty, years in rank and % effort in the primary missions of the Medical School. Compared to the study reported in 2004, the structural variables in the current study were largely the same with the following exceptions: better allocation of effort categories in this study, all leadership designations were included as one variable, and years at rank were included. See Table 1 for a complete listing of the structural variables. The productivity measures utilized in the study were again those available at WUSM in a centralized database and included grant awards, clinical revenues labeled "average collections" and RVU's*. An average value was calculated from three years' worth of data for each of these productivity measures (Table 1).

* RVU's - relative value units, a CMS (Centers for Medicare and Medicaid Services) measure for Medicare payments based on resources used in providing physician services

Peer groups were carefully chosen after discussions between Associate Dean Gray and each Department Head. In Internal Medicine and other large departments, the division directors often were involved in choosing appropriate faculty peer groups for comparison purposes. For statistical validity attempts were made to have the N per comparison group be ≥ 5. In the end 78 peer groups were chosen for the model. These additional nine faculty peer groups represent a refinement compared to the previous faculty pay equity study reported in 2004.

The data set used in this study consisted of 1,289 faculty members, at the rank of assistant professor or above, spanning all faculty tracks and medical specialties or scientific disciplines within WUSM, working at least 50% or more of a full time equivalent (FTE) during fiscal year 2008. After first running a regression of 2008 compensation on the measured independent variables and assigned medical and scientific specialty variables, the gender and racial/ethnic variables were then added to the analysis.

Table _1_

Experience & Productivity Variables (N=15)

Experience variables	
	Tenured
	Tenure track
	PI
	Leadership appointment
	Less than 1.0 FTE during past 5 years
	Years on faculty
	Years in rank
	Years since highest degree
	Clinical/Research/Instruction/Other* – from PARS reports
Productivity variables	
	Average awards 06
	Average collections 06
	Average RVU's 06

*constitute 4 distinct variables in the regression

Results

The composition of the faculty included in the study by rank and gender can be found in Table 2 below. Of the 1289 faculty members in the study data set, 27.7% were women. This can be compared to approximately 32% of the faculty as a whole (including instructors and others excluded from this study). More women faculty members were in this study compared to that of 2003. Of the 186 additional faculty members 121 (65%) were women.

Table 2. Gender by Rank Crosstabulation

	Assistant Professor	Associate Professor	Professor	Total
Female	203	95	59	357 27.7%
Male	325	273	334	932 72.3%
Total	528	368	393	1289 100.0%

Table 3. Changes in Faculty from 2003 to 2008 by Gender and Rank

	Assistant Professor	Associate Professor	Professor	Total
Female	75	22	24	121
Male	-17	44	38	65
Total	58	66	62	186

An analysis of the **raw data** (prior to adjustment for any other factor including specialty) using the structural variables by rank and gender reveals that male faculty members lead females in most categories with the exception of % effort in instruction and having worked part-time in the last five years. For example, 17.9% of female associate professors have tenure compared to 39.6% of males.

Men have been on faculty for more years, spent more time at rank, and have more years since highest degree. This difference is striking in the leadership role category. While there is no difference at the assistant or associate professor rank for proportion of males Vs females in leadership positions, at the full professor rank women have 57% as many leadership roles compared to men (16.9% Vs 29.9%). Examining the productivity measures, one finds that for each rank, men outpace women with regard to average grant awards in dollars, average collections in dollars and average RVU's. The full professors illustrate this point well. The average grant award size for female full professors is 78% of that of their male colleagues. Average collections for women full professors are 52% of their male counterparts, and as expected, closely correlated to collections are average RVU's in which females tally 50% of the male average. Being listed as a PI reaches near equity between the genders for the associate (women are at 90% of the number of male PI's) and full professor ranks for which the proportion of women PI's represent 98% of the proportion of male PI's. Women report higher % effort in instruction (a variable which shows a negative effect on compensation in the model) than men at each rank, assistant professors 7.6 Vs 2.1, associate 5.4 Vs 3.3 and professor 7.0 Vs 3.9. Women are more likely than men to have been part-time in past five years - for assistant professors 3.6X as likely, associate professors 7X as likely and professors 2.8X as likely. However, part-time status was not associated with a negative effect on compensation.

Before controlling for all the independent variables the raw data showed that female faculty members were paid on average 77.6% of the mean total compensation for this group of 1289 faculty members. Male faculty members were paid on average 108.6% of the mean total compensation.

Regression Model Results

In table 4 below are listed the summaries of the regression model before and after the variables of interest were added. The R squared value for the regression model indicates how well all the chosen structural variables predict the variance in the dependent variable (compensation), the closer to 1.0 the better. Without including gender or race/ethnicity variables, the R^2 is 0.843 (Table 4). After the minority race or ethnic variables are added, the R^2 becomes 0.844, but this change is not statistically significant as evidenced by the last column labeled "Sig. F change, 0.390." However, when the female variable is added the R^2 value changes to 0.844, and this change is statistically significant at the conventional level (0.05 or less), p = 0.014.

Table 4. Regression Model Summaries

Regression Model	R Square	Change Statistics				
		R Square Change	F Change	df1	df2	Sig. F Change
Experience and Medical/Scientific Peer Groups	.843	.843	66.017	97	1191	.000
Experience and Medical/Scientific Peer Groups + Protected Classes	.844	.001	1.057	7	1184	.390
Experience and Medical/Scientific Peer Groups + Female	.844	.001	6.017	1	1190	.014

The regression coefficient (B) indicates the effect of a one unit change from the omitted Caucasian Male reference category to the corresponding category of interest (female in this case). When the B coefficient is multiplied by 100, it indicates the approximate percentage difference in average pay that would accompany a (hypothetical) change from the reference category to the given category. For the female variable the B coefficient is -0.040 for total compensation. This indicates that the female variable influence on predicted total annual compensation is -4.0% with all other variables in the regression model being held constant. See Table 5 below for the structural variables and their associated predictor effect (B coefficient) and significance.

Table 5. Regression of Log of Total Compensation (Base+Supplement+Bonus) on Medical/Scientific Groupings and Experience Variables. N=1289. Adjusted R^2 = .833. 78 Peer Groups.

	Unstandardized Coefficients		95.0% Confidence Interval for B		
	B	Sig.	Lo Bound	Up Bound	VIF
(includes 77 Peer Group indicator variables)					
MD/PhD	-.043	.073	-.089	.004	1.291
PhD	-.196	.000	-.255	-.136	4.687
Other degree	-.126	.083	-.268	.016	1.389
(MD)					
Assistant Professor	-.148	.000	-.193	-.102	3.226
Professor	.265	.000	.222	.309	2.575
(Associate Professor)					
Leadership Role	.184	.000	.140	.228	1.371
Years Since Highest Degree	.015	.000	.009	.021	23.756
Years Since Highest Degree Squared	-0.0003	.000	.000	.000	23.530
Years Since Appointed Faculty	-.006	.001	-.009	-.002	6.982
Years in Rank	.007	.004	.002	.011	4.411
PreFaculty WUSM Experience	-.005	.002	-.008	-.002	1.415
Tenured	.078	.001	.033	.124	2.942

Tenure Track	.052	.048	.000	.104	1.897
Less than 1.0 FTE Last 5 Years	.025	.472	-.043	.093	1.218
PI	.070	.000	.034	.106	2.090
Research %	-.002	.000	-.003	-.001	4.698
Instruction %	-.001	.112	-.003	.000	2.128
Other %	-.001	.004	-.002	.000	2.569
(% Clinical)					
avecoll$_50k	0.0001	.972	-.004	.004	13.302
avecoll$_50k_sqd	-0.00001	.725	.000	.000	6.716
aveaward$_50k	.001	.000	.001	.002	1.250
avervu$_1k	.025	.000	.016	.034	5.925
Female	-.040	.014	-.072	-.008	1.295
(Male)					

The next step was to search for factors that might be responsible for the 4% difference in compensation between males and females in the model. Although raw data showed significant differences by gender in the experience variables, none of these variables proved to be significant in the overall regression model. This was further tested by individually multiplying the female variable against the experience variables where men were leading women, e.g. Leadership role, Degree, Rank, Years in Rank; % Effort; Average RVU's, Average Awards. This interaction test showed no large or significant coefficients, meaning that these individual differences between men and women were not responsible for the 4% difference in compensation. The same interaction was tested between the female variable and all the peer groups. Again there were no large or significant B coefficients found. Finally we considered the various components of total compensation: base, supplement and bonus. All faculty members receive an appointment salary (base plus supplemental compensation), but not all faculty receive bonus compensation. Thus, when base plus supplemental compensation were subjected to regression analysis in the model, the female deficit was -2.4%, which was not statistically significant at the traditional $p \leq 0.05$ level (p= 0.110). However, when only the faculty (N = 513, 62 peer groups) who received bonus compensation in FY 2008 were considered, the deficit for women became dramatic at -26.1% (p =0.016). Hence, it seems that the majority of the deficit for women faculty in the complete dataset might be derived from compensation in this subset of faculty who received a bonus in 2008. The statistically significant variables for this regression of those receiving a bonus component were those of leadership (76%), RVU's (11%) and the female variable (-26.1%).

Conclusions and Recommendations

The findings of the current study, using fiscal year 2008 compensation amounts and other data, are consistent with WUSM's past studies— compensation for female WUSM faculty members is less than that for male WUSM faculty members, and the current multiple regression analysis also indicates that the difference, while relatively modest overall, is statistically significant.

There are many potential confounders for a study such as this. The study does not attempt to explain the rationale behind differences in compensation but serves only to find differences by gender. There are unique practices in a few medical school departments that might have contributed in small measure to idiosyncrasies in the study. However, several of these potential confounders were examined for possible influence on the results, and none were found to change the overall results. All legitimate predictors of compensation can never be included in any model. Some such variables are quantifiable such as number of publications and citation impact but are not readily available in a central database at WUSM. Other legitimate variables predicting pay are more qualitative such as reputation and citizenship contributions and therefore cannot be included in a quantitative model. However, it is assumed that the variables that could not be used in the study were equally distributed between the genders.

The results of the current study merit the serious attention of those charged with establishing faculty compensation. These results indicate that more conscious and conscientious efforts must be made to ensure that equal pay is provided for equal work, regardless of gender. Although the current study is, and was only designed to be, a School-wide analysis that demonstrates a difference in compensation and does not attribute causation, it does indicate an important directional issue. That directional difference is all the more troubling and credible because it is consistent with the results of past School studies, the current Danforth campus study and the national literature.

Among the Pay Equity Steering Committee's recommendations is that the Dean's Office be charged with reviewing the detailed results and underlying data utilized in this current study, departmental compensation plans, and other relevant information. There should be meetings as necessary with Department Chairs, Program Directors, and those with the authority and responsibility for establishing faculty compensation to review individual faculty salaries and make any appropriate adjustments. Detailed recommendations are listed below.

1. A high-level pay equity salary review workgroup in the Dean's Office (the Associate Deans for Faculty Affairs and Research, the Senior Associate Dean for Education and the Associate Vice Chancellors for Clinical Affairs, Administration and Finance and Chief Counsel) should be charged by the Dean with reviewing the detailed results of the current study, departmental compensation plans, and other relevant information, and meeting (as necessary) with department chairs, program directors and those responsible for establishing faculty

compensation to review individual faculty salaries and recommend any appropriate adjustments. Particular attention should be given to individuals who have unusually high or unusually low salaries and/or variations from the predicted compensation in the regression model.

2. Pay equity analysis should be incorporated into the regular annual reviews and budget meetings of all departments and programs, in addition to the diversity reviews that are already part of that process. Such a regular, ongoing process should attempt to include some version of the current study, or modified School, departmental or other data-driven analyses.

3. Departments should consider the context of Pay Equity when considering all faculty offers, raises and bonuses.

4. Departmental Compensation Plans should be reviewed for their clarity in establishing compensation standards.

5. Another School-wide study of this sort should be commissioned in approximately three years from this Report, to measure these individual and collective efforts and their relative success in substantially addressing these concerns.

Finally, the Committee desires that this report be used to maintain the concern for gender pay equity high in our collective conscience and to stimulate an on-going review process that maintains accountability for meeting our institutional expectations while preserving the appropriate discretion necessary to govern a wide array of faculty talents, skills, needs and accomplishments.