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Percent Effort vs. Fee-for-Service: A Comparison of Models for Statistical Collaboration

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ABSTRACT

Many statisticians are uncomfortable with discussions about the financial implications of their work. Those who are comfortable may not fully understand the policies and procedures underlying the financial operations of the department. The purpose of the present paper is twofold: first, to describe two predominant models of compensation used by statistics departments in academic medical centers today, percent effort and fee-for-service, and, second, to offer a rationale for combining the two approaches into a single comprehensive framework.

PERCENT EFFORT VS. FEE-FOR-SERVICE: A COMPARISON OF MODELS FOR STATISTICAL COLLABORATION

Communicating with investigators about financial compensation can be a difficult task, even under the best of circumstances. Statisticians are trained in methodology, with little attention given to the fiscal implications of their work. Yet it may actually be the fiscal viability of the department that makes the scientific merits

of their work even possible. It stands to reason, then, that statisticians should have a basic understanding of the compensation process and the policies on which that process is based before agreeing to engage in consultation.

Statisticians are collaborators in the investigative process. Roles within a given study may vary but the overall mission remains the same—to produce the best science possible in the quest to improve human health. As such, all members of the investigative team want to know that the data are well cared for and that the methods used to analyze the data represent state-of-the-art statistical science. It is indeed all about the science, yet statistical science, like all science, does not happen in a vacuum and most certainly should not happen apart from well-established cost accounting procedures (Davenport & Harris, 2007). Hence, statisticians should be able to communicate their department's policies and procedures for compensation to anyone who seeks their services. Communication is the essential link between a statistician and the investigators with whom they collaborate (Derr, 2000). When communication breaks down, trust erodes—and when trust erodes, the science suffers.

The purpose of this paper is twofold: first, to describe two predominant models of compensation used by statistics departments in academic medical centers today—percent effort and fee-for-service; and, second, to offer a rationale for combining the two approaches into a single comprehensive framework.

Compensation

Although different models exist with respect to financial compensation, two models tend to predominate in academic medical centers—*percent effort* (PE) and *fee-for-service* (FFS). Though the models share much in common, they each have their own advantages and disadvantages with respect to implementation. An explanation of these advantages and disadvantages follows.

Percent Effort Model

In very general terms, the PE model is one in which a percentage of a statistician's time is allocated to a particular department, unit, or project relative to 1.0 full-time equivalent (FTE). PE models are often associated with traditional academic units. Salary support is then placed within the context of collaborative working relationships between one academic department and another. For the purposes of this paper, the terms department and unit will be used interchangeably but can stand for any institutional entity with its own cost center.

Advantages

Protected time. Perhaps the most obvious advantage of the PE model is that it protects staff members' time for extended intervals. The model is simple and easy to apply. For example, a statistician assigned to one

department full-time or to two or more projects for large periods of time means that the statistical needs of one or more projects can be addressed with one statistician. Given a work-load that is consistent with the agreed-upon commitments, the need for administrative juggling is minimal. The more stable the time commitments, the more attractive the person is to various funding agencies.

Departmental affiliation. A second major benefit of the PE model is the potential for professional affiliation between the statistician and a scientific discipline. With a fixed commitment to a project, both the statistician and the investigator have reason to invest in one another. When such investments are nurtured, there can be many benefits—an increased knowledge base within the statistician, a stronger and more efficient project team with respect to analytical skills, and, perhaps best of all, the potential for improved science within the discipline.

Account simplicity. A third major benefit of the PE model lies in the consistency of drafts from one accounting unit to another—making the process relatively transparent. For example, if a department allocates 20% of a statistician's time to a project, then 20% of the statistician's salary *as well as* a specific amount to cover fringe benefits (e.g., health insurance, dental insurance, flexible spending accounts) will be transferred from the investigator's account to the statistics department's account on an ongoing basis. Not only can the department count on a constant flow of revenue over a specific time period, but investigators can easily predict personnel costs over that same period.

Disadvantages

Subsidized work. As long as the work load is consistent with the agreed-upon FTE, the PE model works as intended. However, when the workload does not match the budgeted agreement and salary support continues unabated for an extended period of time, a gap exists between funding and work completed. An unintended consequence of this discrepancy is that one project can end up subsidizing the work of another. The problem becomes more pronounced when the workload extends into the next fiscal year but funding does not. Administrators are hard pressed to devote resources to a project that no longer has funding support, no matter how noble the intentions or prior agreements.

Responsibility. Under the PE model, it is typically the statistician rather than the administrator who carries immediate responsibility for balancing time and effort by certifying that the effort is commensurate with what is expected. The more competitive the setting, the more likely investigators are to ask for extra hours now and fewer hours later on, to meet the next deadline. Unfortunately, "later" never seems to come for either the

over-worked project or the underserved one, and puts the statistician under enormous pressure to balance the work schedule on the backs of personal or other professional time. Additional administrative oversight and support may be needed to help reconcile competing demands with time and effort inconsistencies.

Inflexibility. Although the PE model allows for flexibility within a statistician's time, that flexibility rarely extends across statisticians to include accessing additional support during exceptionally busy times or giving up time during unusually slow periods. The culprits can be many, from accrual rates to staffing patterns to hiring policies based on *a priori* funding. The down-side to this protected time is often an inability to easily add and subtract support time to a project as workloads fluctuate.

Fee-for-Service Model

In the FFS model, invoices are sent to an investigator for a specified number of hours, for a given period of time, using a pre-established rate schedule. The FFS model shares much in common with invoicing systems used by accountants, attorneys, and other service professionals as well as independent contractors employed in the pharmaceutical and medical device industries. Although different in spirit from the PE model, the FFS model does not preclude statisticians from adopting a collaborative approach to inquiry. As a result, FFS models have gained increased acceptance in academic settings since the early 1990s (see, for example, Niland, Odom-Maryon, Lee, & Tilley, 1995).

Advantages

Effort congruence. Perhaps the most obvious benefit to the FFS model lies in the congruence between effort spent and payment requested. For example, if a statistician worked five hours on a given project during the month of May at $107/hr., then when May invoices were sent out, the investigator would be invoiced for $535. If other support personnel in the department also provided help during that period (e.g., data management for 20 hours at $60/hr.), then this effort could be included in one invoice as well. The invoice may also serve as a nice summary of progress within a project.

Potential safeguard. Congruence between effort spent and payment requested offers a second, related benefit—a safeguard against unsupported monopolizing of time. For better or for worse, certain projects demand extra attention, which often translates to higher levels of requested support. Alternatively, some investigators are just more demanding than others. It is only fair that the more demanding investigators are invoiced for extra time and attention. Investigators with overzealous appetites but little in the way of financial resources are often forced to make difficult choices with respect to statistical assistance.

Range of projects. The FFS model allows investigators the flexibility of shifting unused funds around within a project rather than tying them up exclusively with personnel costs. In addition, the FFS model allows statisticians the option of contracting with a wider range of investigators and across a wider range of projects. Administrators can encourage statisticians to adopt a *diversified portfolio* approach, one that allows for a combination of large and small projects within the statistician's caseload—which can be a tremendous safeguard against varying schedules and episodic funding cycles. Diversification in invoicing, like the stock market, can be good—with internal and external clients absorbing the fluctuations of the others in down periods of funding.

Disadvantages

Obstacles to collaboration. The last thing investigators want to worry about in their research is being invoiced for every support related activity, especially from their colleagues. Niland et al. (1995) found as many as 35% of those surveyed considered a charge-back system to be detrimental to the consulting relationship. The reason? Compensation is no longer transparent and investigators are reminded each and every month of the high cost of statistical support. Even something as necessary as learning new techniques gets defined in monetary terms at the end of the invoice period. On a practical level, the more time devoted to invoicing- and billing-related issues, the less time available for scientific research.

Fragmenting work. As the true cost of statistical support becomes known and discussions begin to shift away from collaborative support to invoiceable hours, investigators try to find ways of maximizing productivity while minimizing costs. Scaling back on the scope of the project, seeking support from less expensive statisticians, and using statisticians only as consultants or for the really difficult analyses represent some of the ways investigators balance their ever-shrinking budgets. The result for statisticians is often more projects with less time per project. Unfortunately, as time commitments decrease and projects increase, commitment to any one project necessarily suffers—a realization that is not lost on all involved.

Administrative complexity. The more dynamic the staffing patterns, the more complex the staffing process. The responsibility for scheduling and service delivery typically remains with departmental administrators. When each hour matters, procedures for reporting, verifying, and auditing remain a high priority, necessitating a strong and stable invoicing infrastructure. Yet, in an environment that values a *quid pro quo* philosophy, invoices for time and effort can easily be overlooked or dismissed altogether by investigators, requiring additional follow-up procedures. Overdue

balances and the conversations and procedures that follow do little to help the collaborative relationship.

Estimating Revenues and Expenses

Any discussion of compensation must, out of necessity, include a discussion of revenues and expenses. While it is highly desirable to operate under a balanced budget each year, doing so in a soft money environment based largely on contracts and grants brings with it a number of special challenges. These challenges are discussed below.

Estimating Revenues

One of the more difficult tasks for a departmental administrator is that of estimating revenues for the coming year. Defined simply as total income derived from the sale or distribution of goods and services for a fiscal year, estimating revenues is harder than one might imagine. At one level, revenues are based primarily on salaries, wages, and fringe benefits, which are known entities. Computationally, however, the estimates will depend heavily on the actual makeup of the staff and the invoiceable time available for the department. For example, if 100% of a statistician's time is invoiceable and the statistician is fully productive, that statistician will generate more revenue than one who is only 90% invoiceable with 10% time reserved for departmental service.

Of the two models discussed previously, PE is the easier one from which to estimate revenues. Using current PE values for existing or forthcoming grants, business managers should be able to estimate revenues for at least a portion of the pending grants. If detailed records are kept and statisticians stay in close contact with their clients, even the newly funded projects should not come as a complete surprise. Yet there will always be surprises of one sort or another that must be accommodated (e.g., newly funded grants that no one knew about, 15% budget cuts to newly funded projects, or Data and Safety Monitoring Board [DSMB] shutting a study down). Data and Safety Monitoring Boards are now required entities for NIH-sponsored clinical trials and have, as their charge, the oversight and monitoring of patient safety as well as the validity and integrity of the scientific data (U.S. Department of Health and Human Services, 2011).

The FFS model is more difficult to estimate. Similar to the PE model, departmental chairs and administrators should have access to the budget sections of current and newly funded grants for forecasting, but here invoice levels are more apt to vary based on actual work completed and shifting staffing patterns. With a heavier reliance on FFS invoicing, departments are likely to have a number of smaller projects with less precisely defined

timelines and budgets, making it much more difficult to produce estimations. For departmental administrators who are intimately tied to the budgeting process, including departments with their own invoicing procedures and detailed records of work flow patterns, the process is much more straightforward.

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A department's success in estimating revenues for the coming year depends heavily on the quality of its financial records. For example, knowing the number of projects currently being served, the staffing patterns of the projects, and the timeframes of the studies will go a long way toward assuring sound and stable estimates for the coming year. Even the knowledge that 85 of 900 grant submissions over the last several years ended up receiving statistical support of one sort or another can be informative. More importantly, though, with good time and effort reporting, stable work-flow estimates for representative staff members, and established success rates of institutional submissions, departmental administrators should be able to predict with some degree of accuracy invoiceable time for the coming year.

However, it must be remembered that not all staff time will be invoiceable. There are simply too many competing obligations within the medical center community for which invoicing is difficult if not impossible, including committee work, teaching, mentoring, and clinic support. Lesser (1996) reported that additional, noninvoiceable activities may account for as many as 222 hours per year. This does not mean, however, that staff members' time should not be fully accounted for as rates need to be appropriately estimated from an accurate understanding of *all* job related activities. For example, in a department with only three statisticians, the hourly rate may be identical across all three statisticians or it may vary based on level (see Table 1).

Table 1
Comparison of Rate Structures Across Levels of Support

Component	Ph.D.-level Statistician[1]	M.S.-level Statistician[2]	Statistical Assistant[3]
Salary (S)	107,000	80,000	35,920
Fringe (F)	26,750	20,000	8,980
Total S & F	133,750	100,000	44,900
% Available	0.80	0.90	0.95
Hours Available	1,420.80	1,598.40	1,687.20
Personnel Rate	94.14	62.56	26.61
Administrative Cost	20.00	20.00	20.00
Space Cost	5.00	5.00	5.00
Within-Institution Rate	114.14	82.56	46.61
Nonprofit Rate	119.14	87.56	51.61
For-Profit Rate	154.88	113.83	67.10

Note. [1]Median salary for Ph.D.-level statistician in a nonmanagerial government position with 0–5 years of experience as reported by the American Statistical Association (ASA) annual survey (Dias, Hall, & George, 2011). [2]Median salary for an M.S.-level statistician in a nonmanagerial government position with 0–5 years of experience as reported by the ASA annual survey (Dias, Hall, & George, 2011).[3]Median salary for Statistical Assistants from National Center for O*NET Development, Occupational Information Network based on Bureau of Labor Statistics 2009 data (U.S. Department of Labor, 2010).

In larger departments, more specialized services may be available to investigators, resulting in more tiers of support. For many departments, however, the simplest strategy may simply be to average invoice rates across staff members within a job classification level.

Allocation of effort is a function of many factors, ranging from training to experience to availability. Departmental administrators cannot rule out person-specific factors, as some biostatisticians simply work better with others in certain circumstances—some are faster than others and some are more focused than others. Moreover, the availability of support staff as well as the breadth and depth of services in key areas can have a profound impact on the range and quality of services provided (Lesser & Parker, 1995). Further, because productivity is so closely tied to revenues in the FFS model, invoicing rates may need to be tiered to meet the needs of clients with

differing relationships to the institution. Listed below is one such breakdown.

> *Nonprofit.* Institutions, corporations, or other legal entities for which there is no financial benefit to the shareholders or other individuals. Distinctions may be made for those with tax exempt 501(c)(3) status (26 U.S.C. §501, 2001).
>
> *For Profit*. Institutions, corporations, or other legal entities organized for the financial benefit of its shareholders or others (U.S. Department of Health and Human Services, 2011).

Scaled rate structures are necessary for a number of reasons—the most obvious is that research is both competitive and expensive. High personnel costs, extremely specialized equipment, and the risks of legal liability in the modern era offer potential explanations. While everyone ends up paying to support the enterprise in one way or another, no one wants to pay more than their fair share. Consequently, institutional administrators are often selective about costs that get passed on to their clients. Whereas some clients may pay a subsidized rate, others may pay a slightly less subsidized rate such as nonprofit organizations, while others may pay an unsubsidized rate such as for-profit corporations (see Tables 1 and 3).

Estimating Expenses

Revenues represent only one part of the budgetary process. Equally important are the expenses, or the costs associated with providing statistical support services to others. According to Lesser (1996), far too little attention is paid to this aspect of the budgeting process, particularly with respect to large projects and grants. While no two years will ever be truly the same with respect to expenses, there should be recognizable patterns from prior years and from which to estimate the upcoming year. Two definitions are relevant here:

> *Fixed Costs*. Costs associated with the production of goods or services independent of the number of projects or contracts (e.g., salaries, wages, fringe benefits, specific types of office space).
>
> *Variable Costs*. Costs associated with the production level of the group (e.g., contractual services, hardware/software, office supplies, travel and professional development).

Obviously, the more projects departmental staff members take on, the greater the costs for the department as a whole. A complete listing of account definitions is provided in Table 2. Yet it is actually the fixed personnel costs that represent the single largest set of ongoing expenses for a statistics department today.

Table 2
Account Definitions

Indirect Costs	Costs incurred by all research projects, such as general administrative, research administration, human resources
Direct Costs	Costs incurred by a specific sponsored project/grant, such as supplies, patient care, equipment etc.
Phone	Traditional, mobile, PDAs
Computer Software	Software purchasing and licensing, including very specialized software and upgrades
Computer Hardware	Computers (desktops and laptops), servers, printers, storage systems, monitors, all peripherals
General/Office Supplies	Furnishings, including desks, shelves, all office supplies
Postage	Stamps, express services
Duplicating/printing	Copier charges, posters for presentations
Professional Dues/Subscriptions	Professional association fees, books, journal subscriptions
Travel & Professional Development	Continuing education, professional training, professional conferences meeting, seminars, travel costs
Contractual Services	Consultants, part-time and temporary staff
Dietary/Special Functions	Departmental meals, receptions, catered services
	Flights, trains, gas, travel to professional meetings, meals, hotels, all related to recruiting
Recruiting	Staff members
Miscellaneous Other	Staff recognitions (gifts, flowers, awards), other items not otherwise covered above

Physical work space may be classified as either fixed or variable costs, depending upon the specifics, and is usually more aptly described as indirect costs that are charged back to the funding agencies. Despite their relative size, the fixed costs of a department are generally the most straightforward to estimate. The much smaller variable costs portion of the budget actually demand more time during the budgeting process.

For many departments, estimating the invoiceable portion of personnel costs represents a real challenge—the more levels a department has with which to provide support, the more difficult it is. Many administrators will simply ballpark billable time in broad strokes to get a grant in or to win a particular contract; however, a much safer approach would be to use established metrics as well as invoices from previous billing cycles. If existing records are incomplete or highly variable, a random selection of invoiceable periods for representative staff members can be used. Where none exists, administrators may wish to identify trial periods and ask staff members to record diligently their time and effort specifically for this purpose, all the while remembering that vacations, holidays, and grant deadlines can alter workflow patterns.

Next to salaries and wages, space costs represent one of the largest research investments an institution can make. While some space costs are considered to be fixed, such as a mortgage or rent, others are not and are instead considered to be much more variable in nature, such as heating, air conditioning, and maintenance costs. Physical space and all associated costs passed on to clients and funding agencies are typically agreed to with the federal government as a part of a federally negotiated rate agreement (viz., Facilities and Administrative rate [F&A] or indirect costs rate). Not surprisingly, space costs typically fall under the category of institutional support. The exception to this is when a department contracts with an outside agency engaged in proprietary research. In this case, clients should expect to pay all research-related costs, including their fair share of the space costs per hour.

Under both types of models, expenses directly associated with a particular project are generally invoiced back to the project. Whether those costs are referred to as direct costs or pass-through costs, the point remains the same—the department acquires the product(s) under the assumption that the project pays for it. Specialized equipment and software offer good examples. Things like computers and office furniture, while variable in nature, generally have multiple purposes and are not limited to a single project—hence, their costs may be distributed over multiple projects or across multiple investigators. Then there are those costs that appear to be

specific to one party but not to another (e.g., $1,000 fire/waterproof filing cabinet). Where feasible, it may be prudent to distribute the costs of certain purchases over those projects that would *most directly* benefit from their use, but not to others that would never realize the benefits. In the case of extremely expensive software/hardware (e.g., electronic data capture systems), the cost would first need to be negotiated, approved, and then absorbed by the parent institution before simply passing it on to investigators, as many projects would not be in a position to share development or infrastructure costs for other projects, no matter how worthy.

Discussion

Given the breadth and depth of statistical support services offered across institutions, it would be naïve to assume a one-size-fits-all approach to service delivery. Here we offer a combination of the two models—one that allows for the stability of the PE model but with the flexibility of hourly FFS invoicing.

Combined Model

A combined model offers the most flexibility across settings—one that allows for both mechanisms within one comprehensive framework. A simple example would be that of a Ph.D.-level statistician assigned to long-term PE projects for 50% time with 20% time available for fee-for-service projects. In this case, the FFS projects could either be a series of short-term consulting projects or a longer-term contract in which the investigator simply chooses a pay-as-you-go approach to compensation. This assumes, however, that the balance of time is supported by alternative funding mechanisms, as when research administration covers activities like departmental service (10%), grant writing (10%) and/or independent research (10%; see Table 3). While many departments are likely to have statisticians with different combinations of support, the key component here is that the model is specified *a priori,* adopted at the departmental and institutional levels and endorsed at the faculty and staff levels such that everyone knows what to expect with respect to compensation practices.

Table 3
Derivation of Fee-For-Service Rates using a Graded Alternative Support System

		Associate Professor[1]		
Component	**Fully Funded**	**Support[2]**	**Support[3]**	**Support[4]**
Salary (S)	123,800	123,800	123,800	123,800
Fringe (F)	30,950	30,950	30,950	30,950
Total S & F	154,750	154,750	154,750	154,750
% Available	1.00	0.90	0.80	0.70
Hrs. Available	1,776.00	1,598.40	1,420.80	1,243.20
Personnel Rate	87.13	96.82	108.92	124.48
Administrative Cost	20.00	20.00	20.00	20.00
Space Cost	5.00	5.00	5.00	5.00
Within-Institution Rate	107.13	116.82	128.92	144.48
Nonprofit Rate	112.13	121.82	133.92	149.48
For-Profit Rate	145.77	158.36	174.09	194.32

Note. [1]Median salary with 3 or more years of experience in the Biostatistics Department as reported by the American Statistical Association 2010 salary survey (Crank, 2011, p. 9). [2]10% departmental obligations; [3]10% departmental obligations and 10% grant writing; [4]10% departmental obligations, 10% grant writing, and 10% independent research.

Whether one formally acknowledges the support mechanisms behind activities such as grant writing or independent research, the protected, non-invoiceable time leaves less time available for FFS activities. Rate structures will need to take these other commitments into account when planning for the coming year as employment costs will need to be distributed over the total time available for compensation-related activities. In the case of an associate professor who is fully funded, the within-institution hourly rate is roughly $107.13/hr., while the same person with 30% time dedicated to other activities (e.g., grant writing, independent research) might have an hourly rate of $144.48/hr. Investigators are not likely to be charged for the additional 30% as it would be covered by other institutional support such as foundation money or indirects from other contracts/grants. Despite the difference in rates, both derive from the same annual base salary.

The scenario just mentioned could easily work with large program projects such as

the General Clinical Research Center (GCRC) or Clinical and Translational Science Awards (CTSA) program, or even specialty-based centers (e.g., Adherence Center, Cancer Center, Simulation Center). These grants afford investigators and statisticians alike the security of longstanding projects with sizeable commitments to a single project or set of projects but also the time and flexibility of working on other projects as needs arise. Similarly, departments may also absorb or defray large amounts of time to statisticians to pursue external funding for other units in the institution, or simply because the statistician's expertise is needed elsewhere. The combined model also has an element of diversification in the sense that each statistician can shift project loads between larger funded studies and smaller FFS projects as funding patterns change. No-cost extensions and disruptions in staffing patterns across the department offer examples of activities that can be accommodated using a combined model.

A combined model would also work well for larger units serving a wide range of projects with multiple statisticians. The major drawback to this approach pertains to administrative compliance with time and effort reporting, thus requiring software and administrative support to monitor the system. This limitation is not altogether different from the challenges observed in physician billing practices reported by Woodcock and Nguyen (2000), where the authors believe the hybrid model to be most responsive. From a time-and-effort perspective, compliance issues can result when invoiceable time exceeds that allowed by PE commitments. If there is much fluctuation across projects, departmental statisticians may have to have their effort adjusted to tie into actual effort devoted to each project on a monthly basis and therefore have their salary drawn from the proper accounts.

Under a combined model, both components can be well defined within the constraints of a manageable routine. High or low, FFS reporting represents what it is intended to represent—hours worked. Some statisticians may work 30 hrs./wk. while others may work 70 hrs./wk. The end result is the same. If the work was done, the invoices go out. While we recommend a fairly detailed time-and-effort reporting system for all units, regardless of size, it may actually be the larger departments that are best able to utilize a monthly billing system with varying rate structures. The time and effort required to support such a system can be very demanding, including the time needed to follow up on overdue accounts. Making the budget process as accurate and yet as simple as possible remains critically important. The perils of budget shortfalls, cost overruns, and unrecoverable expenses can undermine even the best of studies while the benefits of

sound management are experienced on many different levels (e.g., scientific integrity, administrative accountability, customer service).

When creating a budget for a sponsored study, it is important for investigators to calculate anticipated costs across all budget categories, as completely, reasonably, and accurately as possible. Estimating costs over multiple years with changing conditions makes budget estimates as much of an art as a science; therefore, reasonable (as opposed to exact) estimates based on known entities and prior work experience provide a solid foundation from which to start the estimation process. The longer a study team has worked together in a collaborative way, the more meaningful and more realistic the estimates.

Equivalence of Systems

One difficulty stemming from movement from one model to the other is the lack of equivalence between the two systems. Take, for instance, the case of an investigator wishing to recruit a Ph.D.-level biostatistician for 10% time under the percent effort model. Assuming a base rate of $123,800 per year and a fringe rate of 25%, contracting for 10% time would require $15,475, assuming no additional expenses (travel, departmental incentives, collaboration fees, etc.). However, if one were to use a fee-for-service model, the same service by the same statistician at the same salary would translate to $25,717 if the statistician were only 70% invoiceable due to protected, non-invoiceable time for grant writing (10%), departmental obligations (10%), and/or independent research time (10%) (see within-institution rate in last column of Table 3). Ten percent effort in the FFS model translates to approximately 178 hrs./yr. based on 1,776 hrs./yr. x 0.10 effort (see Table 4 for the rationale behind 1,776 hrs./yr.).

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Table 4
Total Hours Available for Compensation per Year

Number of Potential Work Hours per Year (40 hrs./wk. x 52 weeks)	2,080
Vacation time (4 weeks)	-160
Training/Professional Development (5 days)	-40
Holidays (8 days)	-64
Sick/Bereavement Days (5 days)	-40
Number of Work Hours Available for Compensation	1,776

Note. All entries assume an 8-hour workday.

Alternatively, if a client's funding limit for biostatistical support is capped at $16,000 for a given year, then the statistician who makes $123,800 per year under a PE model should have no problem agreeing to a 10% contract ($12,380 + 3,095 [fringe] = $15,475). However, the statistician with the same salary who invoices out at $107.13 per hour would only be able to agree to 149 hours over the course of a year, while the statistician who invoices out at $144.48 per hour would only be able to agree to 111 hours. Although both statisticians have the same salary, the first one is completely invoiceable while the second one must cover the cost of the protected, non-invoiceable time. Taking the clinician's point-of-view, even a small difference of 2% could easily exceed $4,000 by year's end, which could be the difference in having or not having an additional computer for support staff use. How services are defined, measured, and valued will be based on institutional policies and procedures (Parker, 2000).

Administrative Oversight

Another issue worth considering relates to administrative oversight. PE and FFS relationships typically derive from different administrative models. Very often entire departments are set up to assist with procurement of the grant and to facilitate its operations, such as a Sponsored Programs office (e.g., negotiating indirect rates). These offices often have their own business managers, grant specialists, and clerical staff to assist with day-to-day operations, lending themselves to the PE model. Fee-for-service arrangements, on the other hand, are often but not always associated with smaller projects, often of limited duration, and do not experience burdensome or overly time-consuming routine invoicing arrangements. For these projects, negotiations and administrative oversight of project specifics are generally handled at the departmental level. Projects requiring institutional support or administrative oversight will likely require

more funding support than smaller, fee-for-service projects.

If done correctly, and budgeted appropriately, the fee-for-service model should allow for inclusion of indirect costs, although through a different channel. For example, when rates include space and administrative and clerical support, they are typically covering the most relevant indirect costs to an organization. For administrative support, the same idea applies. When a departmental administrator is supported at 50% time for administrative duties, 50% of the administrator's salary should be incorporated into the hourly invoicing rate. As long as administrative supports beyond the department are not accessed for fee-for-service projects, then they would not need to be included in the estimate. This is frequently a point of contention among administrators and may need to be addressed before a fee schedule is set.

Conclusion

Different models exist for providing statistical support in academic medical centers today, yet two models tend to predominate when it comes to the fiscal sustainability of a unit—percent effort and fee-for-service. A combined PE-FFS model is proposed here as offering administrators an optimal blend of stability and flexibility. It is anticipated that the hybrid model will offer administrators and statisticians alike greater transparency with respect to many of the less obvious costs of statistical and technical collaborations.

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