Staffing Benchmarks: How Many Security Officers are Enough?

by

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Because of the unique role they fulfill within their communities, hospitals often serve as a hub of human activity. In the U.S., hospitals employ over 5,000,000 individuals, making it the second largest source of private sector jobs in the country (AHA 2012). In 2008, hospitals in the U.S. treated 123,000,000 people in their emergency departments, provided care for 624,000,000 outpatients, performed 27,000,000 surgeries, and delivered 4,000,000 babies (AHA 2012). Unfortunately, accompanying this massive amount of human activity is a variety of security risks. Recent government reports also indicate that the both the frequency and severity of criminal activities occurring within hospitals is on the rise or as the Joint Commission stated, "Once considered safe havens, health care institutions today are confronting steadily increasing rates of crime, including violent crimes such as assault, rape and homicide" (Joint Commission 2010). Although security risks can vary from hospital to hospital and region to region, it becomes the job of the hospital executives to determine the amount of resources that must to be diverted from the primary mission of patient care to support the security function.

The challenge of determining the amount of security resources that are appropriate for any particular organization is made particularly difficult because the security profession functions largely in the realm of prevention – put simply: "on a good day, nothing bad happens." So the question becomes "what amount of resources is needed to make nothing happen?"

Hospitals have individual security needs and face unique security risks. Comparing one hospital to another, even to those of similar size and in the same geographic area, illustrates the disparity in security measures. Security staffing levels, in particular, can vary dramatically from hospital to hospital. The need for *boots on the ground* is easy to justify. The number of boots needed, on the other hand, is the real challenge and one that becomes increasingly more difficult each budget season. Like all security measures and prevention efforts, the value of and return on investment from Security Officers is difficult if not impossible to quantify on a risk basis. And in fact, surrogate factors are often cited as performance metrics. For example, customer service levels or patrol frequency are surrogate factors that may be used as metrics to judge performance. Hospitals also benchmark their security programs against other hospitals. How often do we draw comparisons such as "Hospital X has metal detectors and so should we."

What works at one hospital may not work at another. Cultural fit, cost, and convenience must be taken into account when determining what security measures are appropriate for a given hospital. However, there are some security measures that are worth and benchmarking. Security staffing levels is one such measure and is addressed in this article. Because hospitals have unique security risks, this study does not attempt to identify the appropriate security staffing level for a particular hospital. Alternatively, our goal is to *identify general industry benchmarks for hospital security staffing using a data driven approach*.

In the hospital environment, Security Officers can serve diverse functions depending on the hospital's needs and the Security Director's willingness to take on responsibilities that may not be within the traditional scope of work for a security department. In a non-traditional security environment, Security Officer duties can range from patrol and response, visitor management, patient observations, bank deposit deliveries, visitor and patient escorts, and parking assistance and enforcement. With few exceptions, the one consistent duty for Security Officers is patrol and response.

Despite the fact that the patrol and response duty is the one consistent function of a Security Officer, it is also the one duty in which staffing is often based on an inadequate number of drivers. Many healthcare consultants and insiders use square footage as the driving force for determining the number of Security Officers needed. Others use security call volume. And yet others use some other factor. Our research, and common sense, indicates that the use of a singular factor is insufficient.

The notion of quantifying the number of Security Officer needed is somewhat akin to the way the price is set for a used car. If asked what a particular used car is worth, most people would respond that the amount they would pay depends on aspects such as the year, make, model, mileage, condition of the vehicle, color, additional features, and so on. But if one actually collects a suitable amount of market data, one can determine that there exists a finite group of key predictors that can be used to reliably predict the value of a used car. The key term here is "group" as it is usually not a single predictor, but a combination of several predictors that allows this projection. In the case of a used car, the likely group of key predictors includes make, model, mileage, general condition. Using this same approach, one can begin to estimate or predict the industry average number of security staff for a particular hospital. The challenge is first identifying the key predictors, and then assembling the market data. Addressing these two challenges is part science and part art, but the information that can be produced from this exercise can be very useful.

The first step in the development of the envisioned security staffing model was to bring together a group of hospital security professionals to gather their insights on what characteristics and parameters drive the need for security staffing levels in the hospital environment. Given that the Texas Medical Center (in Houston, Texas) is the world's largest medical center, the assembly of such a group was not terribly difficult. The group members included:

- Geoff Povinelli, Director, Security Services
  The Methodist Hospital

- Bert Gumeringer, Director, Facilities Operations & Security Services
  Texas Children's Hospital

- Joe Bellino, System Executive, Integrated Protective Services
  Memorial Hermann Healthcare System

- Meco Choates, (former) Director, Public Safety
  The Methodist Hospital

During the initial meeting, an open discussion was held in an attempt to list the universe of aspects and characteristics that could drive the need for security in a hospital. This list is shown in Figure 1.

FIGURE 1

Aspects and Characteristics of Hospitals that may drive the need for Security	
Size Indicators	Number of Licensed Beds
	Total square footage that is covered by security program (officers or systems)
	Inpatient Clinical square footage
	Outpatient Clinical square footage
	Research square footage
	Administrative square footage
	Exterior square footage (grounds, common areas, and parking)
	Construction square footage
Risk Indicators	Security Call Volume
	Area Crime Statistics
	Campus Security Incidents

	Higher Risk Areas (ED, Trauma Center, Psych Unit, L&D)
	Area Demographics and Cost of Living
	Patient Demographics
	Payer Mix (Ratio of Public Assistance to Private Insurance)
	Unique Departments (Psychiatric/Behavioral Health, Pediatrics, Geriatric, Drug/Alcohol, Trauma Center, Nuclear Medicine, Medical Research)
	Campus Complexity (e.g. number of entrances open day and night)
	Geographic Area
	Urban v. Suburban v. Rural
Population or Traffic Indicators	Clinical Staffing Level
	Admin and Support Staffing Level
	Patient Census
	Emergency Department Visits
	Adjusted Patient Discharge / Days
	Visitor Traffic Level

Once created, the next step was to determine which of these characteristics or aspects were both quantifiable and readily obtainable. The notion of possible "interaction" was also considered. For example, the generally accepted way to convey the size of a hospital is through "bed counts." But size can also be measured by parameters such as "total inpatient clinical square footage", so an examination is needed to determine which parameters might serve as surrogates for the others and where statistical interactions might occur.

It was through subsequent discussions where the subset list was derived in Figure 1. Based on this consensus list, the pilot group participants agreed to return to their respective institutions and gather this information for compilation and analysis. Armed with the data from 15 participating hospitals during the first pilot effort, statistical

assessments were made based on reported full time equivalents[1] (FTE). The assessment indicated that the top predictor variables were:

1. Total inpatient clinical square footage
2. Total annual number of security calls
3. Total research square footage[2]
4. Total number of hospital beds
5. Presence of trauma center

The predictors seemed intuitive for predicting staffing levels. The survey results and analysis was then re-examined by the focus group. Given the small sample size, the potential for misleading statistical inferences existed, so the consensus opinion was to attempt to collect are larger set of data, based on the previously identified likely key predictors along with several others that might be useful. Armed with a working model, we were able to fairly accurately predict how many Security Officers were in place at a given hospital by identifying answers to the predictors above. More importantly, were able to narrow the list of survey questions for a second, larger pilot. In November 2011, a revised survey was distributed electronically using Survey Monkey to the membership of the International Association of Healthcare Safety and Security (IAHSS), asking for eight items:

1. Number of FTE's[3] assigned to:
    a. fixed posts
    b. patrol/response functions
2. Total interior square footage
3. Number of licensed hospital beds
4. Total inpatient clinical square footage
5. Total research square footage
6. Total number of security calls in 2011
7. Presence of a trauma center (yes or no, and what level)
8. Presence of a specialist unit such as:
    a. Psychiatric/behavioral health
    b. Pharmacy
    c. Retail pharmacy
    d. Labor and delivery
    e. Emergency department
    f. Nuclear medicine
    g. Medical records department

[1] For the first pilot, we defined FTE as the number of full-time equivalents authorized by hospital security department to work 40 hours per week, including contract and proprietary off-duty police, unarmed security officers, armed security officers, dispatchers, and operators.
[2] Note that medical research is a common activity in the Texas Medical Center and as hypothesized, research space was a top predictor.
[3] For the second pilot, we defined FTE as the number of full-time equivalents authorized by hospital security department to work 40 hours per week, including contract and proprietary off-duty police, unarmed security officers, and armed security officers. We excluded dispatchers and operators this time.

The second pilot yielded 94 responses to the revised survey by January 2012. This pilot also uncovered an issue in predicting the number of FTE's dedicated to fixed posts for two reasons. First, many hospitals do not have fixed posts as was the case with our survey respondents. Second, fixed posts vary by hospital depending on several factors including specialized posts, visitor management, reception functions, etc. So our focus shifted from total FTE's in the first pilot to total FTE's and total FTE's dedicated to patrol and response in the second pilot.

The regression analysis[4] of the 94 responses indicated a somewhat revised set of top five predictors of total security FTE's:

1. Presence of psychiatric or behavioral health unit
2. Total annual number of security calls
3. Presence of level I trauma center
4. Number of hospital beds
5. Presence of level IV trauma center

Regression Analysis of Reported Hospital Security FTE's and Various Predictors

Predictor Variable	R^2 value in single linear regression	Overall R^2 value in multiple regression with this variable added to the model
Psychiatric or behavioral health unit	14.33	14.33
Total security calls	14.29	26.73
Level one trauma center	14.08	37.86
Total hospital beds	13.31	40.63
Level four trauma center	13.09	46.36
Overall p-value = 0.0000		

[4] "In statistics, regression analysis includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables. More specifically, regression analysis helps one understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed" (http://en.wikipedia.org/wiki/Regression_analysis).

We are now able to predict the total FTE's at a hospital with these predictors using the following formula:

> Total FTEs = e^[0.388704 (Psych/behavioral health unit) + 2.32×10^{-6} (Security call volume) + 0.6285178 (Level one trauma center)+ 0.0002007 (Hospital beds) – 1.207758(Level four trauma center) + 2.602291]

As expected, the top predictor variables for identifying the FTE's dedicated to patrol and response is similar to the variables for predicting total FTE's:

1. Total security calls
2. Total hospital beds
3. Presence of level I trauma center
4. Presence of a psychiatric/behavioral unit

Regression Analysis of Reported Hospital Security FTE's Assigned to Patrol and Response and Various Predictors

Predictor Variable	R^2 value in single linear regression	Overall R^2 value in multiple regression with this variable added to the model
Total security calls	22.19	22.19
Total hospital beds	18.04	30.63
Level one trauma center	12.86	42.75
Psychiatric/behavioral health unit	11.92	47.18
Overall p-value = 0.0000		

Using a slightly different formula, we can also predict the FTE's dedicated to patrol and response:

> Total FTEs = $[7.65 \times 10^{-6}$ (Security call volume) + 0.0006511 (Hospital beds) + 1.5773 (Level one trauma center) + 1.0259 (Psych/behavioral health unit) + $2.69056]^2$

As seen in the list of predictors, square footage was no longer a significant predictor as commonly believed. Using the updated model, our ad hoc tests have proven successful when predicting staffing levels at hospitals including those that that did *not* respond to the first or second survey. If a hospital Security Director provides answers to the four predictor questions above, we can now provide them with a predicted staffing level for FTE's dedicated to the patrol and response function. For example, in a hospital with 100,000 security calls, 600 beds, a Level 1 trauma center, and a psychiatric unit, the model tells us that the benchmark is 41.6 FTE's dedicated to the patrol and response function.

However, it is important to understand the limitations of any method used for predicting "industry averages." The model developed thus far from this exercise merely assists with answering the question, "for a facility with certain characteristics, what would be the industry average number of security FTE's?" There are many seasoned security professionals who could rely on their knowledge and experience to come up with a number, but through the use of multiple regression analysis using actual field data, a more objective means of making this determination is possible. The information represented by the model could be of tremendous use to hospital executives who are considering adjusting the security staffing levels at their organizations. It is also important to underscore that the model in no way speaks either the performance of the security force or to security outcomes.

While the model has developed significantly over the past two years, this is not the end of the analysis. The model is a guide and nothing more. Unique factors at each hospital may drive staffing levels up or down. Moreover, the model will likely change as we collect more data.

The next step for this project is to develop a third pilot by revising the survey based on feedback received at the 2012 IAHSS conference and gathering additional survey responses. The more responses received, the more accurate the model becomes. So when you see the email requesting your help with the survey, please respond. In the meantime, if you'd like to know what the model says for your hospital, feel free to email Karim Vellani at kv@threatanalysis.com.

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