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1. Thousand Oaks,
ations; 1997.
ural care of Philippine
can nurses in hospital
nger MM, ed. *Culture*
& Universality: A
g. Boston, MD: Jones
shers; 2001:119-146.
ir R. Conflict man-
of Asian and Asian
implications for the
Health Care Manag.

lividualism and Col-
ler, CO: Westview

LH. Does interna-
cruitment influence
n U.S. hospitals? *J*
2002;31:67-73.
challenges of Asian
gn health care envi-
Health Care Manag
92-494.
Overcoming strange-
nication barriers: a
study of becoming
Int Council Nurses.

A. *We Need Respect:*
Internationally Re-
the UK. London:
Nurses; 2003.

Revisiting Nurse Turnover Costs

Adjusting for Inflation

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Organizational knowledge of nurse turnover costs is important, but gathering these data frequently may not always be feasible in today's fast-paced and complex healthcare environment. The author presents a method to inflation adjust baseline nurse turnover costs using the Consumer Price Index. This approach allows nurse executives to gain current knowledge of organizational nurse turnover costs when primary data collection is not practical and to determine costs and potential savings if nurse retention investments are made.

Almost 10 years since the inception of a national nursing shortage, nurse turnover and its consequences continue to challenge nurse executives, healthcare leaders, and workforce researchers. On one hand, it is hard to recruit nurses from a pool that has been limited by shortage, and on the other, today's complex, high-stress healthcare system often creates conditions that stress and challenge even the most experienced nurses. Staff shortages and organizational vacancies also provide opportunities for nurses to easily change employers and for nurses with no intention of changing jobs to consider doing so. Nurse turnover actually perpetuates—or begets—additional turnover.[1] When these situations are conflated, controlling turnover by retaining nurses becomes a high priority for nurse and healthcare leaders.

Or does it? A recent report suggests that nurse workforce and staffing issues, including turnover,

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were ranked only seventh in importance by a sample of healthcare executives from 237 healthcare organizations (HCOs), including chief nursing officers, chief executive officers, chief operating officers, and other organizational leaders.[2] The report characterizes the workforce as an "afterthought" for healthcare executives, who ranked reimbursement issues, government regulations, quality of care, and uncompensated care as more important than the nursing workforce.

Interestingly, however, information cited in the report suggests that the workforce *is* perhaps of higher priority than executives might attest on the surface. For example, the report cited that the use of temporary staff is not at all temporary, but rather a permanent solution or "way of life" for many hospitals. Executives responding to this survey reported that approximately 5% of nursing care hours in their facilities was provided by temporary staff. This represents a costly expenditure that executives may not directly equate with nurse turnover, yet one that is typically incurred when nurse turnover vacancies cannot be filled by permanent staff.

The report also estimates that organizations spend $300,000 annually in nurse turnover costs for every 1% increase in turnover. Finally, the report suggests that "hospital leaders are in a state of denial about nurse dissatisfaction," a factor that may impact nurses' decisions to leave. That is, healthcare executives recognize that nurse dissatisfaction is a problem at large, but they report that nurse dissatisfaction is not a problem in their own organization.

The missing connection that is often overlooked is that nurse turnover is costly in many ways that are not typically associated with nurse

turnover. In fact, nurse turnover can be costly for some of the very reasons cited by healthcare executives as being more important than the nurse workforce, particularly reimbursement and quality of care. For example, nurse turnover may compromise quality of care if staff shortages force high nurse-to-patient ratios. Several studies documented the relationship between nurse staffing and nurses' perceptions of burnout and dissatisfaction, and quality of care.[3,4] Because nurse turnover influences nurse staffing decisions, it is logical to expect that nurse turnover might also affect quality of care.[1] Nurse turnover also contributes to higher organizational costs in the form of productivity losses and organizational inefficiencies that result from staff instability, and in the form of human capital losses that result when high-performing nurses leave and have to be replaced. Finally, nurse turnover diverts leaders' attention away from and consumes resources that could be directed toward core business initiatives.[1]

Several recent studies of nurse turnover costs suggest that nurse turnover contributes to greater organizational costs and that nurse turnover may compromise quality of care.[5-9] Findings from these studies also indicate that there is great variability in nurse turnover cost estimates, from approximately $22,000 to more than $64,000 per nurse turnover, primarily because some studies capture the less obvious costs of nurse turnover such as productivity losses. This variability makes it difficult to compare nurse turnover costs across studies or to fully appreciate the origins and magnitudes of nurse turnover costs. Nonetheless, all these studies agree that the costs of nurse turnover are considerable, which indicates that methods and systems are needed to facilitate more routine monitoring of nurse turnover costs in HCOs.

Many HCOs do not typically track the costs of nurse turnover, which makes the contribution of nurse turnover costs to other organizational priorities less obvious for nurse and healthcare executives. The opacity of nurse turnover costs masks organizational costs and presents a challenge when organizational decision makers are budgeting and allocating scarce resources according to organizational priorities. Without a clear estimate of nurse turnover costs, it becomes difficult to adequately include these costs in departmental and organizational budgets. To address this issue, some HCOs estimate gross nurse turnover costs based on readily available data (eg, advertising and recruiting costs) or on nurse salaries (eg, as 1 to 2 times a nurse's salary[10] or as 1.3 times a nurse's salary[6]) because gathering in-depth data, although ideal,

may not be carried out. A better solution for HCOs may be to routinely gather in-depth nurse turnover cost data at set intervals and then update or adjust these costs using certain nationally available economic indicators.

This article uses nurse turnover cost data from a previous study to demonstrate how nurse turnover costs can be adjusted using relevant data from the Consumer Price Indices (CPIs). A previously developed method[11] was modified to reflect current practices in HCOs as well as changes in CPI data calculation procedures. The method used to adjust nurse turnover costs will be described, along with the study upon which cost estimates are based. The application of this method can provide nurse and healthcare decision makers current information on the costs of nurse turnover, which can be used to compare nurse turnover costs with other organizational costs and priorities. It can be used also to evaluate the costs of nurse turnover relative to organizational performance indicators to determine whether the organization's resources are being spent wisely. Finally, this method can inform organizational decision making and help shed light on the costs and potential savings of nurse retention investments.

Baseline Nurse Turnover Cost Study

The basis for the nurse turnover cost adjustments presented here is a study that reported registered nurse (RN) turnover costs for fiscal year (FY) 2002 (July 1, 2001-June 30, 2002).[6] This study involved an extensive data collection effort with the nurse executives of 3 service lines and the associate chief nurse with fiscal responsibilities for the nursing organization of a large, acute care hospital. Data were gathered retrospectively, after the close of the FY. The nurse turnover rates reported in the study were 19.4% for the 3 service lines and 18.5% for all of the nursing services. Turnover costs were determined by using the Nursing Turnover Cost Calculation Methodology, which divides the costs of nurse turnover into the 2 major cost categories of prehire and posthire costs. Each of these major categories contains several cost subcategories: Prehire costs include advertising/recruiting costs, vacancy costs, and hiring costs; posthire costs include orientation and training costs, newly hired RN productivity losses, preturnover productivity losses, and termination costs.[1]

The per RN turnover cost in the study ranged from approximately $62,000 to $67,000, whereas the total nurse turnover cost ranged from approximately $5.9 million to $6.4 million. The range for

both the per RN and total nurse turnover costs reflects the range of new-RN productivity costs when RN turnover vacancies are filled by experienced nurses (ie, the low end) versus nurses with less than 1 year of experience (ie, at the high end).

By far, the largest nurse turnover cost category in this particular study was that of vacancy costs, followed by orientation and training costs, newly hired RN productivity costs, and advertising and recruiting costs. These 4 cost categories combined represented more than 90% of nurse turnover costs in the study. The remaining cost categories—hiring costs, preturnover productivity costs, and termination costs—represented small proportions of overall turnover costs.

Methods for Adjusting Baseline Nurse Turnover Costs

Although gathering primary nurse turnover cost data on an ongoing basis is ideal, many HCOs have not automated and integrated the necessary data collection process and may calculate nurse turnover costs on an infrequent basis. Adjusting historic nurse turnover cost data to present dollar values using economic indicators is a means of overcoming this problem.[11]

The adjustment method presented here to adjust the FY 2002 nurse turnover costs is based on a previously reported approach[11] and uses CPI data to adjust for price changes over time, including regional price variations. The primary CPI measure and a widely accepted measure of inflation is the CPI-U (CPI for All Urban Consumers). This index reflects the average change over time in prices paid by all urban consumers in the United States for a wide variety of goods and services.[12] Information on this index is available online and updated monthly, making this a readily available and current index for updating historical costs.

The CPI is composed of 8 major components representing goods and services purchased by consumers, one of which medical care.[12] The Medical Care Index is divided into Commodities and Services (Figure 1). The adjustment method described here uses the CPI-U and several of the Medical Care Indices to update nurse turnover costs to current dollars.

Recent changes in the CPI also allowed for improvements to be made to the turnover cost adjustment methods reported previously.[11] The original nurse turnover cost update method used 3 indices: the CPI-U, the Other Medical Professionals Index, and the Hospital and Related Services Index. The current adjustment method

also uses 3 indices, 2 of which are different from those used in the prior update: the CPI-U, the Hospital Services Index, and the Professional Services Index. These changes were made to gain the greatest level of detail relevant to the specific turnover costs adjusted.

The updated method uses the Hospital Services Index in lieu of the Hospital and Related Services Index. The Hospital Services Index, first published in 1997, measures prices paid by consumers for services received in hospitals, ambulatory surgical centers, or similar settings.[13] This index was not available when the original nurse turnover cost update method was developed but is used here because it better isolates and captures costs specific to hospital nurse turnover and because it is consistent with the sample used in the baseline study. Also, the Hospital and Related Services Index used previously is much broader than the Hospital Services Index and includes hospital costs and costs for nursing home and adult day care services.

The Professional Services Index now is used in lieu of the Other Medical Professionals Index to adjust nurse labor costs (ie, nursing labor components of vacancy, orientation and training, newly hired RN productivity, and preturnover productivity cost categories). Because none of the published CPI indices isolate nurse-specific labor costs, a comparison was made between trends in RN wages and several CPI indices to determine the specific index that would best approximate RN wages. Trends in RN wages over the period 1988 to 2004 were analyzed using data from the National Sample Survey of Registered Nurses.[14] Trends in several of the medical care-related CPI indices were then compared to RN wage trends. Of all the indices, the Professional Services Index trends most closely approximated RN wage trends. Thus, this index was believed to be the best choice for adjusting those turnover costs most dependent on RN labor costs. Table 1 summarizes the CPI indices used in the original nurse turnover cost update[11] and the current adjustment method.

The next step required the calculation of CPI indices for the baseline nurse turnover costs. Because the baseline costs were incurred over FY 2002, monthly CPI values were averaged over the same period of time and used as the basis of comparison with July 2007 index values. The FY 2002 and July 2007 index values are shown in Table 2, along with the ratios of the indices, which were used to adjust baseline turnover costs for inflation.

Finally, one other adjustment was required. Changes in the CPI indices over time reflect average price changes for the United States at large,
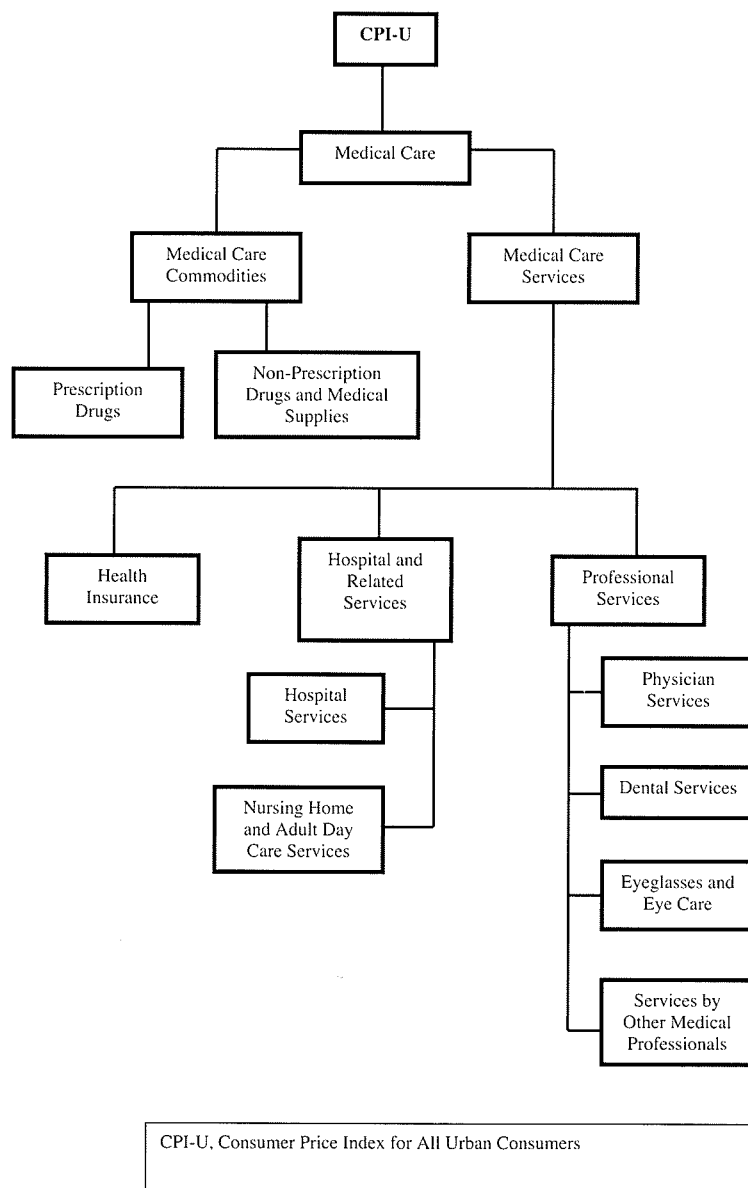
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Health Insurance

Hospital and Related Services

Professional Services

Hospital Services

Nursing Home and Adult Day Care Services

Physician Services

Dental Services

Eyeglasses and Eye Care

Services by Other Medical Professionals

CPI-U, Consumer Price Index for All Urban Consumers

Figure 1. Consumer Price Index and medical care components.[13]

and not all regions and cities experience the nationwide average rate of inflation; thus, an adjustment was required to account for regional and city size effects. The most appropriate region and city size adjustment for the sample used in the 2002 study would be southern, city size class B/C (population size 50,000-1,500,000).[12] This regional/city size adjustment is available for the CPI-U but not for the other indices listed in the right column of Table 1. The Professional Services Index can be adjusted using a south, urban adjustment or with a nationwide city size class B/C adjustment. The latter was used in the adjustment reported here. There is no region or city size adjustment available for Hospital Services, or for its parent category, Hospital and Related Services.

Moving up another step in the hierarchy shown in Figure 1, there are region and city adjustments available for Medical Care Services (south, urban; or nationwide, city size class B/C), and a south, urban adjustment was applied. Table 3 summarizes the regional and city size adjustments applied in the update.

Results of Inflation Adjustments for 2002 Baseline Nurse Turnover Costs

The 2007 nurse turnover costs were calculated as follows:

$$July\ 2007\ cost = FY\ 2002\ cost + \{[(\ Index\ ratio \times FY\ 2002\ cost)$$
$$- FY\ 2002\ cost] \times region/city\ adjustment\}$$

Table 1. Comparison of CPI Indices Used in the Original and the Current RN Turnover Cost Adjustment

Turnover Cost Category	CPI Indices Used in the Original Method[11]	CPI Indices Used in the Current Method[a]
Prehire costs[b]		
Advertising/recruiting	CPI-U	CPI-U
Vacancy[c] (closed beds and patient deferrals)	Hospital and Related Services	Hospital Services
Vacancy[c] (temporary RNs, overtime, productivity losses, etc)	Other Medical Professionals	Professional Services
Hiring	CPI-U	CPI-U
Posthire costs[d]		
Orientation/training	Other Medical Professionals	Professional Services
New-RN productivity	Other Medical Professionals	Professional Services
Preturnover productivity[e]	—	Professional Services
Termination	Other Medical Professionals	CPI-U

Abbreviations: CPI, Consumer Price Index; CPI-U, Consumer Price Index for All Urban Consumers; RN, registered nurse.
[a]See Figure 1 for index hierarchy.
[b]"Direct cost" category in original method.
[c]"Unfilled positions" in original method.
[d]"Indirect cost" category in original method.
[e]Cost not included in original update.

The FY 2002 per RN and total turnover costs expressed in July 2007 inflation–adjusted dollars are shown in Table 4. All things being equal (eg, similar nurse turnover rates, similar use of temporary staff and overtime, and similar numbers of closed beds and patient deferrals due to staffing shortages), this table indicates that the FY 2007 per RN turnover cost would range from approximately $82,000 (ie, if turnover vacancies are filled by experienced RNs who have a shorter new-employee learning curve) to $88,000 (ie, if vacancies are filled by new RNs who have a longer learning curve). The total nurse turnover costs ranged from approximately $7,875,000 to $8,449,000.

Consistent with the baseline study, the most costly 2007 RN turnover cost category is that of vacancy costs, which includes the use of temporary nurses, staff overtime, closed beds, and patient deferrals. The overall percentage increase in per RN turnover costs was approximately 32% over the FY 2002 to July 2007 period, as compared with a 17% increase in CPI-U during the same time period. Each cost category increased by approximately 17% to 20% over the period, except for closed beds and patient deferral costs, which increased by approximately 39%.

Discussion

Updating nurse turnover costs using an approach similar to the one proposed here requires acknowledgment of certain assumptions, namely, that between the baseline year and the update year, turnover rates remain relatively unchanged, the use of temporary staff and overtime does not change, the number of closed beds and patient deferrals due to

staff shortages remains approximately constant, and the number of nurses hired remains relatively constant. For these reasons, nurse and healthcare leaders must use caution when applying these methods to adjust any costs, in general, and certainly nurse turnover costs, in particular. However, when baseline nurse turnover costs are known and gathering new data to recalculate those costs is not feasible, the approach outlined here is a relatively simple way to discern present costs using historical data.

Another word of caution is that the nurse turnover costs reported in the baseline study and adjusted here for inflation do not represent *all* of the costs associated with nurse turnover. These, in essence, represent those nurse turnover costs that we have the ability to quantify or estimate at this point in time. Other costs are obvious. For example, unpublished qualitative data from nurse executives in the baseline study that was updated here reported that turnover was also concerning—and costly—in ways that were difficult to pinpoint: lapses in continuity of care, increasing patient length of stay, inefficient discharge planning, inconsistent use of policies and procedures, communication problems (between nurses and between nurses and other healthcare professionals), nurse fatigue and burnout, and errors (C. B. Jones, unpublished data, 2002). In other words, RN turnover is detrimental not only to organizational costs and performance but also, potentially, to patients and staff.

Building a Business Case for Nurse Retention Redux

The idea of building a business case for nurse retention is not new.[6,15,16] In addition to the

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Table 2. *CPI Values: FY 2002 Average and July 2007*

CPI Category	FY 2002	July 2007	July 2007–FY 2002 Index Ratio
CPI-U	178.2	208.028	1.167
Professional Services	250.1	300.785	1.203
Hospital Services	128.7	183.876	1.429

Abbreviations: CPI, Consumer Price Index; CPI-U, Consumer Price Index for All Urban Consumers; FY, fiscal year.

recommendations made in the baseline nurse turnover cost study that this study is based on,[6] there are certain data pertaining to nurse turnover and retention that nurse executives need to build such a business case in their organizations. For example, executives need to know nurse turnover rates and trends and a detailed breakdown of nurse turnover costs. They also need the following turnover-specific information,[17] some of which are not easy to determine:

- Who is leaving?
- When did they leave?
- Are the nurses who are leaving employees we want to keep?
- How long has each nurse worked here?
- How long has each nurse worked in nursing (ie, how much nursing experience do they have)?
- Why are they leaving?
- What knowledge—general nursing knowledge and organization-specific knowledge—does each nurse who leaves take with him or her?

Healthcare organizations need, but generally do not gather, information specific to nurse retention. For example, a measure that is often assumed to represent retention is the inverse of the turnover rate (eg, if the turnover rate is 15%, then the retention rate is 85%), but this is a gross measure that does not reveal the specific nuances of retention. In fact, Waldman and Arora[17] point out that examining retention rather than turnover requires a different perspective. Specifically, nurse retention should be examined by employee group and unit (eg, RNs on a specific unit), and retention rates should be determined based on an individual's year of hire. Retention rates necessarily decline over time (unless an organization has no turnover), are unaffected by the number of nurses hired, and unlike turnover rates, can never exceed 100% and

are not confined to a 1-year period.[17] Other questions to consider are the following:

- Who is staying?
- Are these the individual nurses we want and need to keep?
- Why do they stay?

Long-term, organizations need to take a critical look at their human resource management practices that pertain specifically to new employee on-board, professional development and career advancement opportunities for new and seasoned employees, and nurse compensation packages. There are specific questions that need be addressed objectively:

- Are we hiring the right people (ie, is there a good fit between the nurse's and the organization's values and beliefs)?
- Do our orientation, training, and mentoring programs encourage new hires to stay?
- Do we offer opportunities to encourage nurses to learn and grow?
- Do we offer opportunities for nurses to assume greater responsibility and accountability?
- Are our salaries and benefits competitive in our market area?
- Do we treat our employees equitably?
- Are we a place where other nurses want to be employed?

Equipped with this information, nurse executives can then determine whether specific programs and policies are effective, whether the organization is allocating its resources efficiently and strategically, whether staff are being appropriately employed to meet patient and community needs, what specific units and individuals are at risk of turnover, and what length of time it will take to see the financial payoff from retention efforts. This

Table 3. *Regional and City Size Adjustments*

Regional/City Size Adjustment	Adjustment to Nationwide Index
CPI-U: south, city size B/C[a]	0.987
Professional Services: south, urban[b]	0.960
Medical Care Services: south, urban[c]	0.903

Abbreviation: CPI-U, Consumer Price Index for All Urban Consumers.
[a]Applied to the following cost categories: hiring, advertising/recruiting, and firing.
[b]Applied to the following cost categories: other vacancy costs, orientation/training, newly hired registered nurse productivity, and preturnover productivity.
[c]Applied to the closed beds and patient deferral vacancy cost category.

Table 4. 2007 Inflation-Adjusted per RN Turnover Costs

Cost Category	FY 2002 per RN Turnover Cost, $[a]	CPI Index Used	July 2007–FY 2002 Index Ratio	Regional/City Size Adjustment	July 2007 per RN Turnover Cost, $[a]
Prehire					
Advertising/Recruiting	2,900	CPI-U	1.167	0.987	3,378
Vacancy					
Closed bed/patient deferrals	41,500	Hospital Services	1.429	0.903	57,577
Labor (temporary staff, overtime, productivity losses, etc)	6,800	Professional Services	1.203	0.960	8,125
Hiring	2,300	CPI-U	1.167	0.987	2,679
Subtotal	53,500				71,759
Posthire					
Orientation/Training	5,300	Professional Services	1.203	0.960	6,333
Newly hired RN productivity	6,000-1,000[b]	Professional Services	1.203	0.960	7,169-1,195[b]
Preturnover productivity	2,200	Professional Services	1.203	0.960	2,629
Termination	100	CPI-U	1.167	0.987	116
Subtotal	13,600-8,600[b]				16,247-10,273[b]
Total	67,100-62,100[b]				88,006-82,032[b]

Abbreviations: CPI, Consumer Price Index; CPI-U, Consumer Price Index for All Urban Consumers; FY, fiscal year; RN, registered nurse.
[a]All costs are rounded to the nearest dollar.
[b]Range represents costs for new and experienced RNs, respectively.

information can be used by the nurse executive to gain attention and buy-in from organizational leaders by expressing nurse turnover costs and retention in financial terms through the use of break-even analyses, rate-of-return analysis, returns on investment, and even cost-benefit or cost-effectiveness analyses.[15] Using nurse turnover and retention cost in formation for these kinds of management decisions helps to highlight not only an organization's competitive advantages but also patient safety through nurse retention.

Implications and Conclusions

In the widely publicized 2004 Institute of Medicine report,[18] recommendations were made to HCOs and their leaders, the healthcare industry, and national policy makers for transforming the work environment for nurses by implementing numerous strategies that value nurses and what they contribute to the care environment. Calculating a baseline nurse turnover cost evaluation and keeping those costs current using the approach shown here also have several micro-level implications for HCOs and their leaders, as well as macro-level implications for the healthcare industry at large. At the micro-level, the first and most obvious implication is that by creating an environment that mitigates nurse turnover and boosts nurse retention, the organization will save money. These savings come not only in the form of turnover costs saved but also in ways that cannot be easily quantified, such as improved staff satisfaction, improved patient safety, improved patient or customer satisfaction, and in turn, return visits from previous customers when future health services are needed. The savings come also in the form of gaining a competitive edge in the local market and likely providing the organization and staff greater flexibility.

At the macro-level, knowledge of nurse turnover costs and the way those costs change plays a role in the broader understanding of how nurses and nurse staffing contributes to quality.[16] Because nurse turnover is exacerbated during times of nurse shortages,[1] addressing nurse turnover and its costs by retaining nurses at the micro-level has the potential to help the industry, at large, address the chronic shortage of nurses by retaining nurses in the profession and attracting new entrants to the profession. At a societal level, interventions to mitigate nurse turnover can also improve patient access to nursing services, one of the primary reasons that patients are admitted to hospitals. When nurse turnover is high and nurse staffing shortages force high patient-to-nurse ratios or limit an organization's capacity, patients may be denied the access to the nursing services they need. Within this context, individual HCOs and systems should consider the steps they take to address nurse turnover and its costs and the impact of their decisions on the industry and society, at large.

References

1. Jones CB. The costs of nursing turnover, Part I: an economic perspective. *J Nurs Adm*. 2004;34:562-570.
2. PricewaterhouseCoopers. *What works: healing the healthcare staffing shortage*. 2007. http://www.pwc.com/extweb/pwcpublications.nsf/docid/674D1E79A678A0428525730D006B74A9. Accessed August 1, 2007.
3. Kane RL, Shamliyan T, Mueller C, Duval S, Wilt T. *Nursing Staffing and Quality of Patient Care*. Rockville, MD: Agency for Healthcare Research and Quality; 2007. Evidence Report/Technology Assessment No. 151. AHRQ Publication No. 07-E005.
4. Lankshear AJ, Sheldon TA, Maynard A. Nurse staffing and healthcare outcomes: a systematic review of the international research evidence. *Adv Nurs Sci*. 2005;28(2):163-174.
5. Advisory Board Company. A misplaced focus: reexamining the recruiting/retention trade-off. *Nurs Watch*. 1999;11:1-14.
6. Jones CB. The costs of nursing turnover, Part II: application of the nursing turnover cost calculation methodology. *J Nurs Adm*. 2005;35(1):41-49.
7. O'Brien-Pallas L, Griffin P, Shamian J, et al. The impact of nurse turnover on patient, nurse and system outcomes: a pilot study and focus for a multicenter international study. *Policy Polit Nurs Pract*. 2006;7(3):169-179.
8. Stone PW, Duffield C, Griffin P, et al. An international examination of the cost of turnover and its impact on patient safety and nurse outcomes. In: *Proceedings of the 37th Biennial Convention*. Sigma Theta Tau International, Toronto, Canada; 2003.
9. Waldman JD, Kelly F, Sanjeev A, Smith HL. The shocking cost of turnover in health care. *Health Care Manage Rev*. 2004;29(1):2-7.
10. McConnell CR. Staff turnover: occasional friend, frequent foe, and continuing frustration. *Health Care Manag*. 1999;8:1-13.
11. Jones CB. Calculating and updating nursing turnover costs. *Nurs Econ*. 1992;10(1):39-45, 78.
12. US Department of Labor, Bureau of Labor Statistics. Consumer price index: frequently asked questions. http://www.bls.gov/cpi/cpifaq.htm#Question_1. Accessed September 1, 2007.
13. US Department of Labor, Bureau of Labor Statistics. Measuring price change for medical care in the CPI. http://222.bls.gov/cpi/cipfact4.htm. Accessed September 1, 2007.
14. US Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions. The registered nurse population: findings from the March 2004 National Sample Survey of Registered Nurses. ftp://ftp.hrsa.gov/bhpr/workforce/0306rnss.pdf. Accessed September 1, 2007.
15. Needleman J, Buerhaus PI, Stewart M, Zelevinsky K, Mattke S. Nurse staffing in hospitals: is there a business case for quality? *Health Aff*. 2006;25(1):204-211.
16. Jones CB, Gates M. Costs and benefits of nurse turnover: a business case for nurse retention. *Online J Issues Nurs*. 2007;12(3). www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume122007/No3Sept07/NurseRetention.aspx. Accessed November 20, 2007.
17. Waldman JD, Arora S. Measuring retention rather than turnover: a different and complementary HR calculus. *Human Resour Plan*. 2004;27(3):6-9.
18. Page A. *Keeping Patients Safe: Transforming the Work Environment of Nurses. Institute of Medicine (US) Committee on the Work Environment for Nurses and Patient Safety*. Washington, DC: National Academies Press; 2004.