

## The CPI for hospital services: concepts and procedures

*In publishing the Consumer Price Index for hospital care, BLS aims for a measure that is sufficiently flexible to flow with rapid industry changes, and sufficiently defining to provide some certainty about item descriptions and types of reported prices*

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The rising costs of health care have focused many eyes on the medical care components of the Consumer Price Index (CPI). In 1988, the hospital component of the CPI posted an 11-percent increase. This was well above the increase in the CPI for all items, and was even greater than the rises for other medical care components such as Prescription Drugs and Physicians' Services. (See chart 1.) Although the rate of growth in the Hospital and Related Services index has since slowed—it was 4.6 percent in 1995—it is still above that of the overall CPI and other medical care components.

Interest in the movements of the hospital index has generated an abundance of commentary on their significance. While this attention has kept the issue from becoming dormant, it also has propagated subtle misperceptions about the foundations, design, and data collection procedures for the CPI Hospital and Related Services Index. Design and data collection, areas with detail not routinely documented for the public, have been particularly vulnerable to misinterpretation.

This article provides the background needed to interpret the CPI Hospital and Related Services Index. Following a description of sample selection and data collection for hospitals in the CPI sample is a discussion of some index construction basics: definitions of out-of-pocket hospital costs paid by

urban consumers, and clarifications of the concepts of hospital reimbursement and the transaction price. The article concludes with an overview of two issues critical to improving the CPI for Hospital and Related Services.

This article does not cover the upcoming changes to the structure of the Hospital Services component of the CPI, which will take effect with the CPI for January 1997. The structural change, which is an early part of the 1998 CPI Revision, will be explained in future articles in the *Review*.

### The current pricing method

The current CPI method for pricing hospital services evolved from a time when people went to the hospital only out of dire necessity, when most workers did not receive health care coverage from their employers, when a smaller proportion of the population was elderly, and when medical technology was only preparing for its more recent launch into new frontiers. During this era, more than 30 years ago, hospital room and board was the primary fee for hospital services and was all that the CPI tracked. Since then, the Bureau of Labor Statistics (BLS) has made many changes to its hospital pricing model. For example, BLS has rebuilt the CPI item structure to include Medical Care as a major group (it was previously a com-

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ponent of "Health and Recreation"); revised the way in which the CPI prices health care insurance; moved from monitoring price changes in three specific hospital services, to tracking developments for ten different services, and then to pricing virtually any combination of services; and devised a probability-proportional-to-size (PPS) method for both selecting outlets, such as hospitals, based on consumer expenditures, and making selections of items within the outlets, based on "outlet-specific" revenues and purchase patterns.

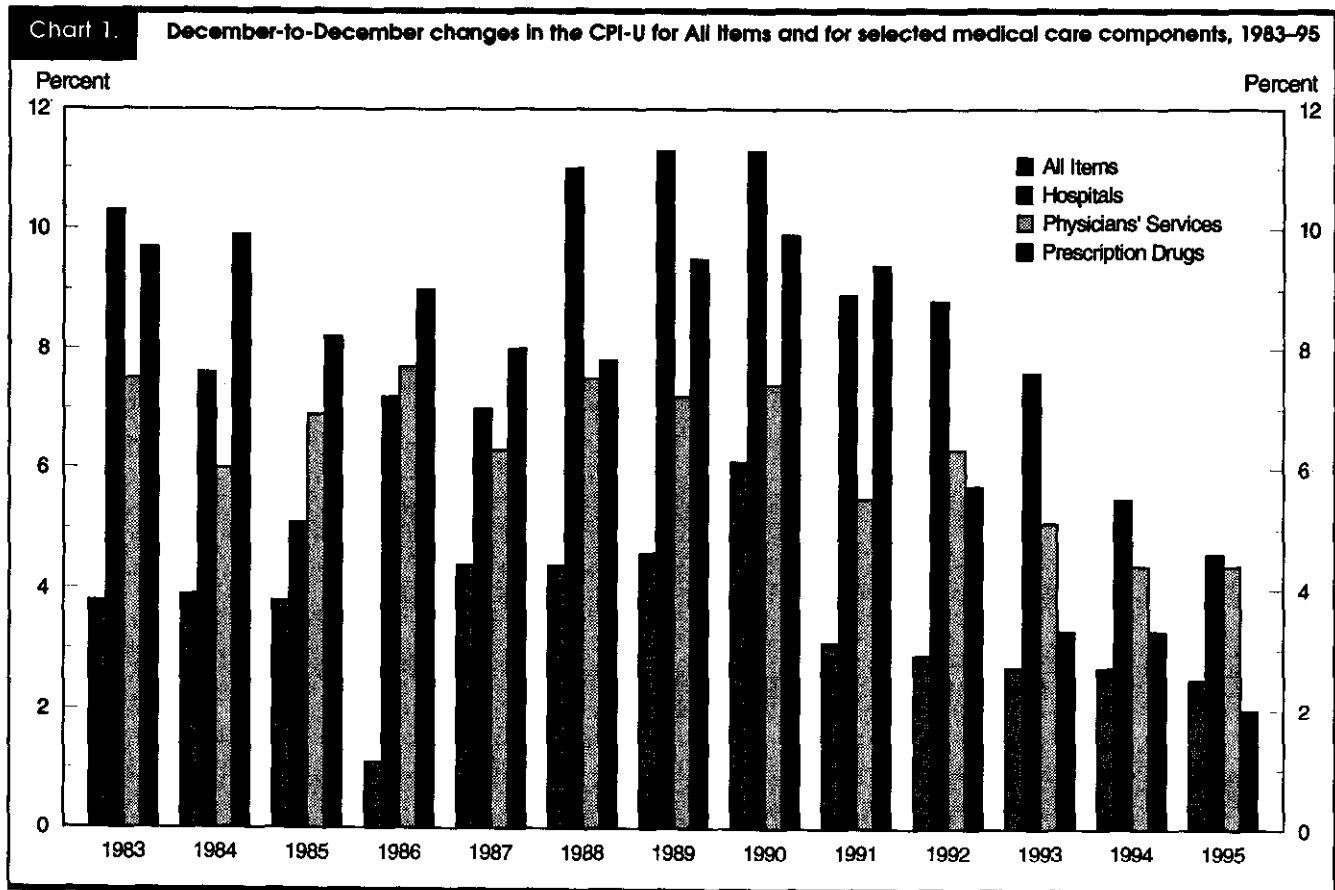
In the current CPI model of hospital services, the targeted unit of service is not just "one day in a hospital room," although this commonly is believed. Thirty-three percent of the observations in the sample for hospital services are for hospital rooms, while 67 percent of the observations represent items ranging from explicitly defined services, such as a urinalysis, to more broadly defined services, such as anesthesia or operating room including essential supplies and drugs. Other examples of larger service bundles in the current sample include full treatment paths as defined by diagnosis related groups (DRG's),<sup>2</sup> and more standardized and routinely performed procedure packages, such as a tonsillectomy. None of these is measured on the basis of a daily hospital room rate.

Because it has long been a component of the CPI, the Hospital Room index occasionally is misused as a benchmark for

the whole of hospital price movement. But the Hospital Room index, by itself, is composed primarily of changes in published room charges, and thus may be a reflection of cost-shifting from the regulated and sometimes less well reimbursed medicare and medicaid sectors to the private insurer and self-paying patient markets, in which the price more often is unregulated. Today, the complete Hospital and Related Services Index, which includes room and inpatient and outpatient services, is a much better measure of the change in costs for 1) members of conventional fee-for-service plans (still accounting for roughly 40 percent of enrollees), and 2) uninsured self-paying patients (now approximately 15 percent of the population<sup>4</sup>).

The CPI approach to defining and pricing services has been that used by the industry for so many years—a retrospective or fee-for-completed-individual-service approach. Today, the insurance and hospital industries are rapidly moving toward a prospective, or prepayed, prenegotiated fee approach to reimbursement and provision of hospital services, based on a broad spectrum of data.

*Basics of the CPI item structure.* The identification of item categories and their relative importance (or weight) in the CPI market basket are derived from the results of the comprehen-



sive Consumer Expenditure Survey.<sup>5</sup> There are seven *major product groups* of items represented in the CPI: Food and Beverages; Housing; Apparel and Upkeep; Transportation; Medical Care; Entertainment; and Other Goods and Services. The major groups further divide into 69 *expenditure classes*, which in turn, subdivide into 207 *item strata*. The strata are the level at which the CPI is calculated, and at which the CPI sample is “fixed.” The strata subdivide, as well, into a total of 364 entry level items. Some strata contain only one entry level item, and others contain several.

The Medical Care major product group subdivides into five expenditure classes, of which one is Hospital and Related Services. The Hospital and Related Services expenditure class consists of three strata: Hospital Room, Other Inpatient Services,<sup>6</sup> and Outpatient Services. Field staff regularly collect the prices of services in the three hospital strata, ranging from 1 day in a hospital room, to a cardiac catheterization, to treating a broken ankle in the emergency room.

The service categories delineated in the set of entry level items reflect expenditure classifications used in the Consumer Expenditure Survey to target specific medical care payments. Doctors’ fees for performing the procedures typically are not covered under the Hospital and Related Services CPI component, but are instead covered in the Professional Medical Services component. The hospital index includes only fees actually billed by the hospital. Most items in the hospital service groupings are the components of medical treatments, and thus do not represent a full hospital visit or a treatment for an illness.

**Outlet sample selection.** The sample of hospitals included in the Hospital and Related Services CPI component is selected through the Continuing Point of Purchase Survey. The Census Bureau conducts the point of purchase survey for BLS on a yearly rotating basis in the one-fifth of the CPI pricing areas (called Primary Sampling Units, or PSU’s) designated to have their samples redrawn during the next 18 months.<sup>7</sup> Families interviewed for the survey answer questions on the amount of item expenditures in a list of broad categories (POPS categories) and on where they made these purchases. Their responses literally provide the “point of purchase” for most of the items in the CPI market basket of goods and services.<sup>8</sup> Based on a probability-proportional-to-size (PPS) approach, wherein the probability that a hospital will be selected is proportional to its share of all hospital expenditures recorded in the Point of Purchase Survey for a sampling area, a sample of specific outlets is selected for the initiation of items to be priced by CPI field staff. Hospitals stay in the CPI sample for 5 years.

**Price data collection.** The entry level item (ELI) is the category level at which the field staff select and price items for the CPI. When pricing commodities and services, BLS data collectors use a probability technique to select a unique item in each entry level category assigned to each selected outlet.

They follow changes in the price of the selected unique item or service over the next 5 years. When trained field staff arrive for their initial visit at the chosen hospitals, they first establish the hospital’s eligibility for the CPI based on the proportion of “paying” or nonmedicaid, noncharitable patients. (Although medicare hospital prices are not used in the CPI because medicare Part A for hospital coverage is regarded as “transfer payments,” for purposes of a hospital’s survey eligibility, medicare patients are counted as paying patients.)

After ensuring that the hospital is eligible for the survey based on percent of paying patients, field staff begin the process of selecting the actual items or specific services to price until a new sample of outlets is selected. An economic assistant employs a PPS sampling technique called disaggregation to select the specific service. The disaggregation process involves working with a respondent to estimate dollar-volume sales of subcategories of item types, successively breaking down larger categories into their price-determining components, and characterizing a hypothetical item with each descriptor selected until the portrait of a service has been assembled from its essential features. The description, built on the sequential selection of identifying characteristics through the steps of disaggregation, depicts a “unique item” when the respondent is able to associate with it an explicit and unambiguous price for future reference and comparison.

A hospital disaggregation example using current procedures would include steps similar to those shown in exhibit 1 for the category Hospital Inpatient Services Other Than Room:

1. Asking the respondent for revenue data on specific payors or payor types;
2. Listing percent of dollar sales information for each payor noted;
3. Running a cumulative total of the listed percents of dollar sales, to create a series of percent intervals;
4. Assigning a random number to its correct percent interval and selecting the Blue Cross payor that, in this case, reimburses by fee-for-service;
5. Moving to Inpatient Services Other than Room as an umbrella group and listing which of the 10 listed subsets of services the hospital provides;
6. Recording percent of dollar sales information on those departmental service subsets performed by the hospital;
7. Running a cumulative total of the percents of dollar sales, and assigning a random number to the correct interval;
8. Taking dollar sales information on the selected subset—in this case, the variety of lab services offered—and selecting chemistry tests using the above process;
9. Taking dollar sales on the various types of chemistry lab tests, and, finally, using the process to select glucose tolerance as the specific test to be priced.

Field staff ascertain if there are yet further price-determin-

**Exhibit I. Sample disaggregation to select a service for the Hospital Inpatient Services Other Than Room component of the CPI medical care index**

BUREAU OF LABOR STATISTICS  
CONSUMER PRICE INDEX  
COMMODITIES AND SERVICES DISAGGREGATION WORKSHEET

U.S. DEPARTMENT OF LABOR

THE INFORMATION COLLECTED ON THIS FORM BY THE BUREAU OF LABOR STATISTICS WILL BE HELD IN CONFIDENCE AND WILL BE USED FOR STATISTICAL PURPOSES ONLY.

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OHS 1220-0039  
EXP. 5/31/93

OUTLET NUMBER: 7654321 | FLT NUMBER: 57021 | QUOTE CODE: 003 | FIELD REP CODE: 00013

LIST OF UNITS FOR SELECTION (A)	WORK SPACE (B)	RANK (C)	PERCENT OF SALES (D)	RUNNING TOTAL (E)	SAMPLING PATTERN (F)
Commercial Ins. Contracts	Eligible		55 (2)	55	
→ BCBS (Fee-for-Service) (4)	Payors		30	85 (3)	66 (4)
Other			15	100	
<hr/>					
Pharmacy	Inpatient		15 (6)	15	
Radiology (5)	Ancillary		10	25 (4)	
→ Lab	Services		15	40 (4)	40 (7)
Anesthesia	Available		10	50	
O.R. & Treatmt Cntrs	in hosp.		20	70	
Neurology & Cardiology			20	90	
Other			10	100	
<hr/>					
Microbiology	Inpatient		20	20	
→ Chemistry (8)	Lab		30	50	32
Hematology	Services		15	65	
Pathology			20	85	
Other			15	100	
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B.U.N. (9)	Inpatient		50	50	
→ Glucose Tolerance	Chem Tests		40	90	64
Other	(BCBS Payor)		10	100	

RANDOM NUMBER TABLE

LINE NO.	(1)	(2)	(3)	(4)
1	66	49,99	2,36,69	14,39,64,89
2	40	44,94	12,46,79	4,29,54,79
3	32	39,89	15,49,82	21,46,71,96
4	64	18,68	22,56,89	23,48,73,98
5	10	42,92	9,43,76	6,31,56,81
6	50	6,56	12,46,79	3,28,53,78
7	79	39,89	3,37,70	22,47,72,97
8	55	12,62	17,51,84	1,26,51,76

RANKING TABLE

RANK OF ITEMS	1	2	3	4	5	6	7	8	9	10
1	60	50	40	35	30	25	25	25	25	25
2	40	30	30	25	25	20	20	20	15	
3		20	20	20	20	15	15	10	10	
4			10	10	10	10	10	10	10	
5				10	10	10	10	10	10	
6					5	10	10	10	10	
7							5	5	5	
8								5	5	
9									5	
10										5

EQUAL PROBABILITY TABLE

NUMBER OF ITEMS	POST IN	POST IN	POST IN	POST IN
ITEMS	COL	COL	COL	COL
2	50	50	100	
3	33	33	67	100
4	25	25	50	75
5	20	20	40	60
6	16	17	33	50
7	14	14	29	43
8	12	13	25	38
9	11	11	22	33
10	10	10	20	30

BLS 3400A.2 (REVISED MAY 1986)

ing factors or descriptors and disaggregate among them as applicable to arrive at the "unique item," the hospital service with all its elements described in sufficient detail to allow for future identification of that exact service and its accurate price. A similar process occurs for each of the assigned items in that hospital or outlet. In a typical CPI hospital assignment, the field representative selects, and describes through disaggregation, five quotes or services among the three hospital strata for future pricing.

Even after selecting the specific services, the field agent still must be able to collect accurate and timely information on an ongoing basis for the next 5 years. *It is this ongoing pricing process that is critical to the success of the data collection program for the CPI.*

For the process of monthly data collection, the field representative requests the current prices of the original items using the descriptions developed during disaggregation. The field agent asks the respondent to match each printed description with a specific service currently offered in the hospital and to report its current price. In the event that the item is no longer offered as originally described or is no longer available, field staff must determine if a similar item or service can replace it in the survey. Then, following the rules for the substitution process, the field agent must describe the new item and report a price for it. The basic pricing rule in the CPI is to price an item until it is discontinued or is rotated out when a new sample is initiated.

The interaction between the field staff and the respondent occurs in the context of an unstructured, open-ended, on-site or telephone interview. The instrument of the interview is the "pricing schedule," a computer-generated form containing the item description for each observation and space to record the current information about it. The intensity of its ongoing field-based activities, including regular personal contact with respondents, is a distinguishing feature of the CPI program.

Full-time and part-time field staff collect CPI data on either a bimonthly or monthly schedule for almost all CPI items except rent and owners' equivalent rent. In the five largest sampling areas, field staff update price and description information on a monthly basis during the first through third weeks of each month. The remaining Primary Sampling Units undergo pricing on an odd or even bimonthly cycle. New York, Philadelphia, Chicago, San Francisco, and Los Angeles, the five largest Primary Sampling Units, represent approximately one-fourth of all Hospital and Related Services expenditures among the total 85 sampling areas, and account for approximately 20 percent of the hospital price quotes. Distributed among the rest of the sampling areas, the remaining quotes are priced on a bimonthly schedule, also spread out over the first 3 weeks of the month. Quotes are generated in paper form and sent to the field according to the assigned odd or even month pricing cycle.

For most quotes, including those from hospitals, expenditure levels in a Primary Sampling Unit's "off-cycle" month are held constant at their most recently captured "on-cycle" levels. For the current sample, this signifies that individual price changes for approximately 59 percent of all 3,637 hospital quotes (January 1996), representing expenditures from the monthly cities plus the on-cycle bimonthlies, drive the aggregate price change during any given month. In addition, although prices for the off-cycle bimonthly quotes do not figure into the aggregate average price change, the expenditure weights for off-cycle quotes are included when each month's index is calculated.

From the field, monthly and bimonthly data arrive in Washington, where industry analysts review them for comparability and usability in the CPI. The Bureau's medical care analysts also watch for trends in industry movement that may have future impact on how data should be collected and evaluated.

### **"Out-of-pocket" vs. "reimbursement"**

In the Medical Care component, as in all parts of the Consumer Price Index, the scope is limited to items for which there is an out-of-pocket expenditure. The Consumer Expenditure Survey determines household out-of-pocket costs and, to a major extent, provides the foundation for the item structure of the CPI. Basic weights of the item categories in the CPI are derived from these household expenditure data. The expenditure survey actually consists of two surveys, the Diary Survey and the Interview Survey. The Diary is a record of all household expenditures in a 2-week period, while the Interview consists of five quarterly visits with a consumer unit, each lasting approximately 2 hours. During these interviews, census expenditure survey staff ask both demographic (included in the first two visits) and expenditure questions.

While questions on expenditures for medical care in the Diary are broad, the Interview requires very detailed information on the types of medical care services for which the consumer unit made any payments during the previous quarter year. The detail in the questions is a critical aspect of the medical care portion of the expenditure survey. The questions cover the service received, which member (or nonmember) of the consumer unit received it, and the amount of the payment made for the service. Another series of questions seeks data on any health insurance reimbursements for medical services received by a member of the household. BLS processes these expenditures so that reimbursements to the consumer are netted out from total amounts the consumer paid to arrive at the amount of consumer out-of-pocket medical expense. The total amount for medical care expenditure, however, also includes out-of-pocket insurance premium payments. These net out-of-pocket expenditures are allocated among the medical care categories, including hospital ser-

## Glossary of terms

Term	Definition <sup>1</sup>
Book rate	"List" or published price for hospital services.
Capitation	Payment method in which the insurer pays (often prepays) a fixed per capita amount to the hospital, regardless of actual services provided.
Chargemaster	Published list of fees or book rates for services.
Copayment	Small payment made by plan member each time a service is required.
Coinsurance	Plan in which both the insured and insurer share covered losses in a specified ratio; percentage of expenses for which the patient is responsible.
Deductible	Amount of expense, usually on an annual basis, that enrollees must pay before they are eligible for benefit payment.
DRG's —Diagnosis related groups	System that reimburses hospitals fixed amounts for all care given in connection with standard diagnostic categories.
Fee-for-service	Plan paying for procedures as expenses are incurred. Participants usually pay annual deductibles and coinsurance.
HMO—Health maintenance organization	Plan providing a prescribed set of fully covered benefits for a fixed premium payment. Enrollees often are restricted to specific care providers.
Per diem	A fixed daily rate paid to the hospital regardless of the actual number and nature of services provided for a patient.
PPS—Probability proportional to size	Method of selecting units to represent a group based on their relative size in the group.
Prospective payment	An advancement of payment for health care charges that are likely to occur.
Provider	An individual or an organization that furnishes health care services to patients.
Published charge	Fee for a hospital service shown in the hospital chargemaster; the hospital book rate or list price.
Reimbursement	Total payments received by the hospital from insurers and patients for services provided.
Retrospective	Payment for health care services after they have been provided, or as expenses occur.
Substitution	Process whereby a discontinued item or service in the CPI sample is replaced by one that is comparable.
Third party payor	In health care, the insurer that pays all or most of the bill for medical services; the third entity involved in a medical care transaction after the patient and the provider of the service.

<sup>1</sup> Definitions synthesized primarily from information from the U.S. Department of Health and Human Services and the Health Insurance Association of America.

vices, in the amounts indicated by the collected data. Thus, each item group is represented only by its net out-of-pocket expenditures. BLS then takes these data to build its CPI market basket of medical goods and services.

*Consumer out-of-pocket expenditures.* Each hospital maintains a book of list prices called its "chargemaster." Although a standard hospital bill reflects the chargemaster, or book, rate for all the services provided, most patients do not pay "out-of-pocket" the amounts shown on the bill. A patient who is uninsured, but able to pay, may be responsible for the entire chargemaster amount, or may be excused a portion of the bill by the hospital. The typical insured patient (70.1 percent of the population excluding those covered by medicaid<sup>9</sup>) may pay a small portion of the total, or none of the total, depending on the contract the insurer has negotiated with the hospital. Therefore, the amount paid out-of-pocket by the patient may relate only distantly to the charges on the official hospital bill. It is allied more closely with the particular contract between the hospital and the patient's insurer.

Health maintenance organizations (HMO's) continue to increase their share of the market place in the 1990's. Many insured patients in the United States are members of HMO's, some of which are large enough to maintain their own hospitals. Usually, an HMO member pays out-of-pocket to the provider a small copayment for medical professional services, but may pay nothing directly for a hospital stay. In traditional fee-for-service insurance plans for both professional services and hospital services, a patient may be required to meet a deductible amount directly out-of-pocket before insurance coverage is activated. Afterwards, a patient's plan will pay only a portion of the expenses incurred during a hospital stay, and the patient may be required to pay the balance to the provider, depending on the insurer's contract with the hospital.

Medicare is an entitlement paid for through payroll taxes, and medicaid is direct government payment for health care. Under the medicaid program, State governments (using Federal matching funds) pay hospitals well below chargemaster prices for most services rendered to the indigent. The Federal Government itself assumes responsibility for most of the hospital needs of those eligible for medicare. Prices for hospital services delivered to medicare<sup>10</sup> or medicaid patients are not eligible for the CPI. Both programs use tax revenues to provide government subsidies for hospital care, and, therefore, the CPI does not include data on hospital reimbursements made by medicare or medicaid.

This overview of typical out-of-pocket payments made directly to hospitals by patients shows that there is a variety of arrangements among insurers, providers, and patients, and that most dollars spent on hospital care do not travel directly out of the patient's pocket into the hospital's cash register, but come from a third party. While "out-of-pocket" payments do move directly from the patient to the hospital, the lion's

share of the dollars paid proceeds to hospitals from insurers (including the government), not from the immediate consumers of provided services. Today's predominance of the third party payor's role in payments made to hospitals for services provided to patients, has required that the CPI make a "paradigm shift" in tracking hospital price inflation—from a focus on what the consumer actually pays out of pocket for a service (the focus of the rest of the CPI), to a focus on what the provider of the service, the hospital, receives from eligible sources, namely, the patient and nongovernment insurance.<sup>11</sup> This shift in focus actually began in 1990 with the first inclusion of State-regulated hospital fees based on entire hospital treatments of specific illnesses in Connecticut, New Jersey, and New York, and has advanced to a new initiation process fielded in May 1996.

*The reimbursement concept.* Hospitals receive payments or reimbursements for treating a patient from several possible sources, or payors:

- the patient;
- the primary insurer;
- a supplemental insurer;
- the municipal, State, or Federal government; or
- a charitable institution.

For the CPI hospital component, only the patient and his or her nongovernment insurers are eligible sources of reimbursement. Therefore, the reimbursement to the hospital that is used in the CPI should encompass only payments the hospital receives from insurers, plus any payments received from the patient. In traditional *fee-for-service* health insurance programs, amounts of reimbursement are fairly clear cut, involving a negotiated standard discount to the insurer off the hospital chargemaster, leaving the patient responsible for the balance of the fee. Other insurance arrangements may be less well defined in terms of reimbursement for specific services because they are not chargemaster-based. The variety of contract terms documented between insurance companies and health care providers is extraordinarily diverse. Below are a few of the more common configurations.

Some nonmedicare payors reimburse the hospital based on a *diagnosis related group (DRG)* system through which the hospital receives a preset fee for the patient's stay based on a particular diagnosis code. The specific amount of the payment associated with the code depends on the treating physician's choice of diagnosis. Data on the average level of resources expended by hospitals for the typical treatment of that illness are used to derive the fixed payment assigned to each diagnosis code. Patient characteristics such as age and severity of illness also may play a role in patient assignment to a particular DRG classification in a nonmedicare DRG system. The set fee may reflect price and quality factors such as capital funding requirements, malpractice insurance, average

length of stay, and range of stay, depending on the specific formula used, but the details of the actual treatment may be less important. In a DRG system, the hospital will absorb the marginal costs for treating the patient beyond the preset parameters. "Case-rate" is an umbrella term referring to other similar reimbursement methods.

Another distinct arrangement involves a flat *per diem* rate, whereby the payor allocates a prenegotiated sum per hospital day inclusive of all supplies, procedures, and ancillary services, regardless of the treatment. The contract may include a per-patient or per-group reimbursement ceiling. In a "capitated" agreement between payor and provider, a payment ceiling limits the amount of expenditure per capita per contract period, usually a year. One variation of *capitation* entails monthly prepayment to the provider of an agreed upon dollar amount per patient or group, holding a portion of the payment in a buffer or escrow account for final settlement of actual versus budgeted claims at the end of the contract period. Numerous variations exist within each of these basic systems for paying hospitals. Additionally, the hospital retains (and frequently exercises) the prerogative to excuse portions of the total bill or to discount more deeply the insurer's part of the billed amount, on a case-by-case basis.

Clearly, a specific amount of payment for an explicit procedure, service, or treatment, is not the most common scenario at hospitals today. Further, on-the-spot negotiations between the provider and various payors, including the patient, may play a significant role at any step in the reimbursement process. In today's market, reimbursement dollars often correlate more specifically with the payor contract terms than with the specific service provided to the individual patient. Thus, the question becomes: How can the CPI best track hospital price increases while remaining faithful to its principles, given the idiosyncrasies of medical care reimbursement methodology?

## Data collection issues

This segment of the article examines a pair of concepts central to the improved collection of hospital prices and the measurement of hospital price change: the type of reported price and the unit of description. Viewed through the double lens of the current process for CPI hospital data collection and the characteristics of medical care reimbursement, both discussed above, these two aspects have given rise to most of the questions about how to improve the CPI hospital index.

*The price collected.* For every item in the CPI sample, BLS analysts try to observe a transaction price. A transaction price represents "the price a customer in the CPI population actually pays for an item in the CPI market basket." The transaction price may include the value of a bonus on a grocery item, or may be minus the value of an eligible coupon, minus the

average amount of automobile concessions for the selected model over the last 30-day period, or minus the amount of a utility refund recently implemented by the local power company. However, with most items in the CPI, when the consumer pays, the cost for the item actually is out-of-pocket: whether by cash, check, or credit card, the consumer has agreed to pay that price.

In the case of medical care, and particularly for hospitals, obtaining transaction prices presents a special challenge. As a rule, a party other than the consumer, such as an insurer, directly pays the hospital for all or most of the medical treatment provided. In light of this industry feature, the focus for determining the price to use, and the source of payment, should be the payments that the provider has received from all non-government sources, rather than the amount that the consumer has paid out-of-pocket to the provider.

Additionally, the current method for handling health insurance<sup>12</sup> in the CPI favors a reimbursement approach to pricing. The CPI program does not price health insurance directly. The weight for health insurance premiums, as determined through the Consumer Expenditure Survey, is allocated among the medical care strata, including the stratum for hospitals. It is important that the prices applied to these weights reflect the industry's payment patterns. Thus, the CPI transaction price for hospitals must reflect all reimbursements received from all CPI eligible parties, specifically, the insurer(s) and the patient.

Prior to 1983, the majority of health care plans were non-HMO coinsurance plans. Under these arrangements, the insurer and the patient each paid a portion of the amount billed, the total often equaling the published charge. The published charge or book rate *was* the transaction price. Given this history, the Hospital and Related Services Index of the CPI reflected only published charges or book rates until 1990.

In the 1982-1984 CPI base period for consumer expenditures, published charges still provided a reasonable approximation of the reimbursements received by hospitals for services. In 1984, however, numbers of both managed care organizations and their enrollees began to increase at a much faster pace than previously. The number of HMO's operating in the United States jumped from 304 in 1984 to 623 in 1986.<sup>13</sup> Due to consolidation within the industry, HMO's experienced a decline in numbers (but not enrollees) during the late 1980s,<sup>14</sup> subsequently stabilizing below 600 in number in the early 1990s. Complicating the situation was the advent of diagnosis related groups (DRG's), first introduced in New Jersey, and later phased into the Federal Medicare program between 1983 through 1987. When, by 1988, three States and a growing number of health insurance contracts had begun using DRG's, it became increasingly clear that the CPI must make new accommodations to the rapidly evolving medical care marketplace. HMO's, regarded and treated as health insurance in the CPI, are indirectly factored into monthly inflation rates.<sup>15</sup> However, DRG's, which were new to most of the nongovernmental



market place in the late 1980s, came into the index in 1990 through disaggregation by field agents using specially developed specification sheets and instructions.

Today's focus in CPI hospital pricing is on amounts of reimbursement for services rendered. Since early 1993, field staff in designated metropolitan areas (Primary Sampling Units in the CPI program) have pursued reimbursed rates for specific payors when redrawing outlet and item samples. They have done so by asking the respondent up-front to provide information on revenues generated by eligible payors or payor types before following through with the rest of the disaggregation process. (See the example on page 35.) The purpose in asking additional questions has been to increase the small numbers of identifiable transaction prices in the hospital index.<sup>16</sup> This further step to the procedure for bringing in new hospital quotes has netted not only additional transaction prices, where they were available and the respondent was willing to work with field staff, but also different types of descriptions or pricing units, such as per diems and packages, to add to the current inventory of individual treatment components and New York State DRG's. Employing the sample rotation construct as the vehicle for increasing the number of transaction prices in the CPI, however, has yielded slow progress to date.

*Pricing unit.* Choosing how to define and describe hospital services items has proved to be an area of considerable debate for the CPI program. Critical features of a description have been: A clearly defined unit of price; the ability to detect quality and quantity changes in the interests of a fixed quantity, fixed quality index; identification of a specific payor and attendant discounts; the ability to collect the transaction price, including applicable patient payments, based on the description; and a limited respondent burden. Currently, the pricing units in the Hospital and Related Services Index are individual components of a hospital visit or treatment. In addition to hospital room, the ancillary services category of Other Inpatient Services covers 10 different subsets of possible services: Anesthesia, Operating Room and Other Treatment Centers, Radiology, Pharmacy, Laboratory Tests, Neurology and Cardiology, Nuclear Medicine, Blood Bank, Physical Therapy, and Inhalation or Respiratory Therapy. Outpatient Services covers a similar set of choices, including Emergency Room Treatment in place of Pharmacy.

Current item descriptions in the hospital survey cover a wide variety of services ranging from components of treatments, or discrete services, to service bundles that do not constitute full treatments, to entire visits to the hospital. The numerous descriptions in the "anesthesia" and "operating room" classifications include commonly used pharmaceuticals and supplies; equipment and set-up; and technologists and nurses required, in addition to the anesthesia or room fee for procedures such as cardiac catheterization, or total hip replacement surgery. These latter examples lean toward the

full treatment, rather than discrete services, concept but still do not encompass the entirety of the hospital visit.

More "packages" have made their way into the index, as hospitals restructure prices and reorganize their services for greater efficiency and effectiveness. Services or procedures conducive to packaging, such as an appendectomy, a tonsillectomy, or cataract surgery, consist of highly standardized and tightly defined components and risk factors. The package concept bears some resemblance to a diagnosis related group (DRG) treatment path. In a package, however, the treatment or procedure fits a standard medical protocol, while a DRG treatment path can be wide-ranging, contingent upon the treating physician's approach. In both scenarios, the insurer establishes a global price to cover the entire hospital visit, usually excluding doctors' fees.

The CPI has included nonmedicare DRG prices since 1990, specifically for the States of New York, Connecticut, and New Jersey. Since then, Connecticut and New Jersey have terminated their State-regulated DRG programs. On his or her first visit to a hospital that uses DRG's to define nonmedicare reimbursed services, the CPI field agent selects a DRG through disaggregation, based on dollar revenue. Included in a description of the DRG are key price factors, some of which reflect quality, such as the allowable range of days in the hospital, the average length of stay for the illness, the DRG weight based on average costs for treating the illness, and the identity of the payor.

In New York State, the source of most of the DRG observations in the CPI, the service intensity weight—a measure related to the intensity of utilization of resources—is closely monitored for changes. This factor, along with the range of the hospital stay, indirectly signifies a level of quality for the treatment provided. On return visits, the CPI field agent tracks all the price factors listed in each description, reporting the current reimbursement amount for the DRG, given the specific payor. When a change in one of the factors alerts the analyst to a potential change in quality, the affected quote and its price change are not included in the various aggregations of data used to calculate the CPI for hospitals, but are instead set up to start a new series of price comparisons. Because the quality change, which has been tagged but remains unidentified, cannot be measured, and therefore cannot be adjusted for, the two prices cannot be directly compared in this situation.

In general, the CPI does not adjust for quality changes in the hospital services component. "Ideally, we would like to obtain the market value of the quality difference between an item [or service] and its substitution. Then we can adjust the price of the old item directly for the quality change and compare the current price with the quality-adjusted price to measure price change. The market value of the quality difference is not frequently available."<sup>17</sup> A short list of hospital indus-

try "report card" measures indicating various aspects of service quality might include levels of patient satisfaction; monitors of performance such as frequency of death, frequency of return to the hospital, and frequency of postoperative infection; patient functional health status; and measures of cost to the hospital and intensity of resource utilization. No single area mentioned can, by itself, offer a measure of the quality of a hospital service. Because the variables involved in the perception of quality in a hospital stay are many and sometimes nebulous, CPI analysts have found no sure or consistent measure with which to work in assigning dollar value to service components in item descriptions.

Changes in quantities of services provided during a specified time frame might point to changes in quality. But even this seemingly concrete, although indirect, approach to evaluating quality offers little methodological promise in the environment of multipage hospital bills and third-party payor negotiations. As hospital reimbursers continue to move away from measurable chargemaster-based (fee-for-service) payment plans toward treatment paths, DRG's, per diems, and other forms of global prospective reimbursements, assigning and comparing the values of quantities of resources used in a service remains as unfulfilling a solution to the quality riddle as trying to measure patient satisfaction alone. With none of the available measures translating into specific market values for identifiable changes in the composition or effectiveness of a service, BLS analysts will continue to encounter obstacles in comparing the quality of a replacement service with that of the original. Further, from the vantage point of these increasingly popular global approaches, the details of the hospital treatment provided actually may diminish in consequence.

Despite the above problems relative to changes in quantity and quality, DRG's (and other case-rate scenarios) have several advantages as an approach to service description: 1) Although there is some variation among existing State and hospital systems, they remain fairly consistent in diagnosis classification and are known to most hospital administrators because of their use in the medicare program. 2) They include factors relating to the specific payor and its discounts, be it commercial insurance, Blue Cross/Blue Shield, or a self-paying patient. 3) Hospital care is described as the patient actually experiences it—in terms of a full treatment or a hospital visit, as opposed to a portion of a treatment. 4) Embedded in the allowance for variation of the treatment path within each DRG is the seed for the concept of pricing the medical care outcome, a future-oriented patient-centered approach, versus pricing quantities of treatment inputs, a provider- or physician-centered approach.

The primary hazard of the case-rate as a pricing unit for a Laspeyres hospital index is its global and, in many cases, amorphous nature, which prohibits both the direct comparison of quantities over time and the assessment of quality, be-

cause of the potentially great diversity of treatment paths for a single illness or diagnosis code. On the one hand, the medical community is fast advancing toward standardized protocols for the treatment of many illnesses.<sup>18</sup> The future incorporation of such protocols into the handling of DRG-classed patients could provide one solution to the fixed quantity and fixed quality dilemmas inherent in the use of DRG's in today's CPI. However, the research process through which such protocols are established is cumbersome, time-consuming, and costly. On the other hand, hospitals themselves are wrestling with other treatment-focused descriptions of their products for use in such price-setting practices as package pricing, episode-based pricing, and performance-based pricing.<sup>19</sup> The DRG is primarily a cost-based measure, although its characteristic and systemic latitude vis-a-vis the chosen treatment path and quantities of resources does hold some promise for the development of outcome-related and other approaches.

Although many insurance companies employ DRG's for reimbursement purposes today, many others use alternative approaches. For example, use of a per diem rate is widely distributed. Per diem includes all services, plus room and board, at the hospital, no matter what the admitting diagnosis. In some plans, there is a differentiation among patients by medical specialty (surgical, medical, Intensive Care Unit, obstetric, pediatric, and so forth), which leads to a set of per diem rates, rather than one all-inclusive rate. Using per diem as the pricing unit poses a problem similar to that of the DRG—there is no way to measure changes in quality—because the method of payment often is not associated with a specific service. One possible formula for making a per diem more meaningful as an item description is to monitor the per diem rate of a specific plan, along with a hospital average length of stay for a specified type of patient and nurse-to-patient ratio, when available. This method has the potential to alert price analysts that the quality of the service or the intensity of the utilization of resources may have changed when the average length of stay changes.

Insurers also employ per capita methods, somewhat related to per diem. They negotiate yearly lump sums of reimbursement per patient or group size, based on previous expenditures multiplied by an array of quality factors, and then prepay the hospital on a periodic basis, such as monthly, semi-annually, or annually. Prior to negotiation of the next year's contract, the insurer and the provider may "settle up" as needed. This payment method, known as capitation, is clearly gaining in popularity, because it places the relationship between the payor and the provider more firmly within the context of a business contract, with concomitant accountabilities and responsibilities for efficiency and efficacy. In essence, the trend in reimbursement over the last 15 years has been to shift the assumption of risk away from the payor toward the provider, and even the patient. Indeed, with capitation, the

provider assumes the majority of the risk in areas with well-documented risks and expected outcomes. Although it would be troublesome at this point to pin down a unit of price under such a reimbursement policy, it is important to continue to search for a method of pricing capitated health insurance contracts with hospitals. Some industry experts speculate that capitation will represent close to 100 percent of reimbursement strategy by the year 2005.<sup>20</sup>

Overall, the area of study with the most potential conceptual is that of outcomes research. Viewed from the perspective of the patient-centered outcome, the hospital service unit of price becomes the visit, and the level at which the item is fixed becomes the outcome as it relates to consumer utility. Another, more practicable research area is that involving health insurance benefit packages and premiums.

THE LIST OF IDEAL FEATURES of a hospital pricing model and consumer price index is long, and some of it will be long in coming. Given the continuing interest in health care reform and the attendant public need for reassurance that economic indicators are up-to-date, some items on the list may represent trade-offs among economy, simplicity, and greater correlation with the consumer's experience of hospital services. In the case of the hospital index, the search essentially is for a measure of price change that will be both sufficiently flexible to flow with rapid industry advances and changes, and sufficiently defining to provide some certainty about item descriptions and types of reported prices. □

## Footnotes

<sup>1</sup> The 1995 December-to-December price change, 4.6 percent, was the smallest increase posted in any year since the index was first published in 1978.

<sup>2</sup> A system that reimburses health care providers fixed amounts for all care given in connection with standard diagnostic categories.

<sup>3</sup> *Source Book of Health Insurance Data, 1995* (Health Insurance Association of America, 1995), table 2.2, "Percent of Americans enrolled in FFS, HMO, and PPO health plans in selected metropolitan areas, 1994," p. 37.

<sup>4</sup> *Health, United States, 1995*, PHS 96-1232 (U.S. Department of Health and Human Services, March 1996), table 148, "Persons without health care coverage," p. 274.

<sup>5</sup> The Consumer Expenditure Survey is an ongoing examination of household expenses conducted by the Census Bureau for BLS.

<sup>6</sup> This stratum includes Nursing and Convalescent Home Care.

<sup>7</sup> Each year, one-fifth of the city areas are resampled to replenish outlets lost to closings and refusals, to bring new items into the index, and to update local shopping patterns.

<sup>8</sup> There are several recall periods into which purchases may fall—from 1 week for gasoline and some food items, to 5 years for big-ticket items or infrequently purchased goods and services, such as funeral services and automobiles. Most of the medical care categories use a 1-year recall period.

<sup>9</sup> Including participants in medicare, medicaid, and the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), 84.8 percent of the 1994 population of the United States was covered by some sort of private or public health insurance. See *Health, United States, 1995*, table 148, "Persons without health care coverage," p. 274.

<sup>10</sup> Medicare Part A is a Federal entitlement program covering hospital care. Medicare Part B, a program requiring the enrollee to pay a premium in order to be covered for physicians' services, is eligible for and included in the CPI.

<sup>11</sup> With a few exceptions for specific items for which a government agency charges a fee related to its cost, such as medicare Part B, government-provided services are ineligible for inclusion in the CPI.

<sup>12</sup> For an explanation of how the CPI handles health insurance, see Ina K. Ford and Phil Sturm, "CPI revision provides more accuracy in the medical care services component." *Monthly Labor Review*, April 1988, pp. 17-26.

<sup>13</sup> *Health, United States, 1989*, PHS 90-1232 (U.S. Department of Health and Human Services, March 1990), table 123 "Health maintenance organizations and enrollment," p. 252.

<sup>14</sup> *Source Book of Health Insurance Data, 1995*, pp. 28-34. There were 574 HMO's at the end of 1994.

<sup>15</sup> Ford and Sturm, "CPI revision provides more accuracy," pp. 18-20.

<sup>16</sup> In New York State and a handful of individual hospitals in various cities, nonmedicare DRG's are used to describe the selected service and the formula for its price. The reimbursement rate is explicit in the DRG. These are transaction prices. In September 1992, approximately 6 percent of CPI hospital quotes consisted of DRG descriptions.

<sup>17</sup> Paul Armknecht and Daniel Ginsburg, "Improvements in Measuring Price Changes in Consumer Services: Past, Present, and Future," in Zvi Griliches, ed., *Output Measurement in the Service Sectors* (Chicago, University of Chicago Press, 1992), p. 112.

<sup>18</sup> The Agency for Health Care Policy and Research of the U.S. Department of Health and Human Resources has developed and released 18 medical care protocols or guidelines.

<sup>19</sup> Mary Ann Stump of Blue Plus of Minnesota, Presentation before the National Congress on Health Outcomes and Accountability, Dec. 13, 1994.

<sup>20</sup> Giselle Bleecker of Health Technology Associates, Presentation before the National Congress on Health Outcomes and Accountability, Dec. 13, 1994.