Appendix E

Additional Information on the Nature of OTA's Review and Methodological Characteristics of Studies Reviewed

Additional Information on the Nature of OTA's Review

Literature Search. An initial literature search was performed by OTA's contractors using a combination of techniques that included using computerized searches and tables of contents services from Boston-area universities; scanning the bibliographies of articles; collecting reports generated from major health care utilization surveys published by the Federal Government and other sources; and polling experts in the field. The principal computerized search was performed using Paperchase, a system that tracks all health and medical care publications included in both the Medline database and in the entire Health Planning and Administration database. Epstein and Weissman included all English-language articles published since 1980. The keywords uninsured, medical indigency, Medicaid, uncompensated care, managed care, deductibles and coinsurance were "crossed" with delivery of health services, health care rationing, personal health services, hospitalization, length of stay, quality of health care, consumer satisfaction, health services accessibility, hospital use, pharmaceutical use, primary care, preventive, process and outcomes of care, and several others to produce a list of approximately 1,200 references that were scanned by the contractors for inclusion in the review. A supplementary search was performed using a similar strategy by the Group Health Association of America's Library Reference Service (178).

Study Selection. OTA focused its review on studies that have statistically adjusted, or otherwise attempted to correct, for competing alternative explanations for results.

Synthesis and Presentation of Study Findings. Study findings were analyzed, and are presented, in two ways. First, findings of all multivariate studies reviewed by OTA are roughly summarized as to their findings regarding the relationships among insurance coverage and utilization, process, and health outcomes of health care, for relevant comparison groups, on the indicators specified. This type of analysis is sometimes termed a "box score" synthesis. Second, OTA examined the magnitude of the relationships between insurance coverage status and utilization, process, and health outcomes.

"Box score" study findings are coded in terms of whether they support the overall hypothesis that those individuals with no or with "poorer' insurance coverage (e.g., Medicaid coverage) fare potentially worse than those with private insurance coverage. In the initial presentation of study results, a "+" indicates that uninsured (or poorly covered) individuals were in fact found to fare potentially worse[1] than the comparison group on the measure specified (e.g., number of physician visits, use of preventive care, greater intensity of resource use, higher rate of in-hospital death, episodes of inpatient care). A "-" indicates that the study found that, contrary to expectations, individuals without insurance, or with relatively poor insurance coverage, had a potentially better outcome than those with relatively better insurance coverage. A "O" indicates that the study found no significant differences between comparison groups. An "M" indicates that study results were mixed. The notation "n.a." indicates that the study did not examine the outcome specified for a particular comparison (e.g., uninsured vs. privately insured individuals).

For purposes of public or private policymaking, it may be important to consider not just whether insurance coverage makes a statistically significant difference in access, process, and outcomes but the magnitude of, and variation in, relationships. Information about, the magnitude of differences can help to predict, all other things being equal, changes in the use of health care services and even in health status should those who are currently uninsured become covered. Alternatively, if the impact of insurance on these factors is insubstantial, some would argue that a major disruption in the health care system solely for the purposes of expanding health insurance is unwarranted.

Although important, judging magnitude and variation is a very difficult thing to do because of the wide variety of study methods used and because of the methodological flaws characteristic of this field of research.[3] Of necessity, research in this field has used different indicators of utilization, process and outcome; considered varying patient conditions; used different measures of baseline health status; and used data from different periods of time, geographical areas, and provider types; employed differ-

[1] OTA uses the phrase "potentially worse" for two reasons: 1) the study findings must be regarded as somewhat tentative; and 2) in some cases it is not clear whether the endpoint measure is in fact a "worse" outcome for the more poorly insured (e.g., greater use of certain procedures).

[2] Statistical significance is a judgment, based on commonly agreed to statistical principles, that there is relatively little likelihood (typically from below 1 to below 5 percent) that an observed relationship between or among the variables examined in the analysis has occurred by chance.

[3] A general discussion of methodological issues in this field is included in appendix C, "Conceptual Framework," of this background paper. Metrological flaws common to many of the studies include incomplete data sources and no commonly accepted way to measure baseline health status.

ent methods of data analysis; and presented study results in different ways (see table E-l). In some ways, these variations across studies can be considered an overall strength. Greater confidence can be placed in study results that are roughly consistent across time, place, patient income, race, gender, and medical condition. However, studies applied adjustments for these factors inconsistently (tables E-2 and E-3). Short of a very time-consuming and costly secondary analysis of the data sets on which these analyses were performed, it is impossible to construct a completely valid way to synthesize quantitatively the results of the studies on a common scale. Further, even a reanalysis of past research aimed toward constructing a common scale to measure the results may not answer today's most important policy-related questions.

As an interim step, in estimating magnitude and variation, OTA manipulated published data in order to present study findings in terms of a ratio. For example, figure 5, shown earlier in this background paper, presents the ratio of uninsured individuals to privately insured individuals lacking a usual source of care, as reported in particular studies. If a study did not initially present its quantitative findings in terms of a ratio, the findings were converted to a ratio when possible. In some cases when OTA was not able to discern needed information from data published in the studies, OTA contacted the authors of the study and obtained data usable in OTA's analytic approach. Not every analysis in every study was converted to a ratio.

Because of recent theoretical and methodological advances in health services research, and to ensure that study findings are more relevant to the current situation in terms of potential access, OTA limited its examination of the magnitude of relationships among insurance coverage and utilization, process, and health outcomes to those studies using data collected in 1980 or more recently.

Table E-l—Methodological Features of Studies Examining Relationships Between Insurance Coverages, Utilization, Process, or Outcomes of Health Care

Study author(s) and year of publication	u, P or O[a]	Year and source of study data	Indicator	Condition or procedure	Number of cases and study population	Insurance status comparison(s)
* Aday and Andersen, 1984	u	1982, national telephone survey	Percent reporting that they needed help but did not get it	All	6,610 adults and children	Private; public; no insurance
Becker and Sloan, 1983	P	1974, case abstracts of hospital discharges (CPHA);AHA survey data; county-level area characteristics	Mean LOS; mean tests, cultures, consultations, functions per patient	All	397 hospitals	Private=BC and commercial, other; Medicaid; self-pay
Billings and Teicholz, 1990	o	1988, DC hospitals	Percent avoidable/preventable hospitalizations	All except trauma and obstetrics	955 patients	Insured vs. Medicaid vs. not insured or self-pay
• Braveman et al., 1989a	0	1982-86, 8 CA counties	Prolonged hospital stay, or transfer to another hospital or long-term care facility, or death, LBW	Births	118,123 patients	Private insurance vs. none
* Braveman et al., 1991	P	1987, CA civilian acute care hospitals	LOS; total charges excluding physicians' fee; charges per day		29,751 newborns discharged with evidence of serious problems	Private insurance vs. Medicaid vs. uninsured ("self-pay" or indigent)
• Burstin et al., 1991	P	1984, nonfederal, acute care, NY hospitals	Negligent adverse events	All except psychiatric	31,429 records	Private insurance, Medicaid, Medicare,[b] uninsured, and other
.Chen and Lyttle, 1987	u, P	1982, RWJF National Access Survey	Hospital admission vs. not; mean (logged) hospital days; saw physician vs. not; mean visits for those who saw a physician; receipt of various preventive services; satisfaction with most recent visit	Any	3,000 families, including 1,800 low-income families	Private only; public and private; none
* Cornelius, 1991		1978-81, CHAS evaluation of RWJF CHP	Hospital admission		1,150 individuals 65 with an episode of illness and a condition causing them the most worry, or who had 3 or more disability days	Any private; public (Medicare, Medicaid, County Aid); uninsured

NOTE: *=study is included in graphs with estimates of magnitude and variation.
[a]Study was used in this review to examine the relationships among insurance status and utilization (U), process (P), and/or health outcome (O).
[b]The impact of Medicare coverage is not discussed in this background paper.

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Table E-l—Methodological Features of Studies Examining Relationships Between Insurance Coverages, Utilization, Process, or Outcomes of Health Care-Continued

Study author(s) and year of publication	u, P or O*	Year and source of study data	Indicator	Condition or procedure	Number of cases and study population	Insurance status comparison(s)
Dowd et al., 1986	P	1982, UHDDS for community hospitals in St. Paul and Minneapolis	Percent above or below mean LOS for commercially insured patients	7 DRGS (e.g., delivery, hysterectomy, stomach disorder, back problems, psychoses)	51,786 cases among Twin Cities residents	Private=prepaid group, I PA, BC, commercial; public= Medicaid, Medicare; other insurance=workers' compensation; uninsured= self-pay, no charge or charity
Duncan and Kilpatrick, 1987	P	1984, 130 FL hospitals	ALOS	Not specified	14,563 patients likely to incur uncompensated charges (e.g., uninsured or unemployed or high cost hospital stays)	No coverage vs. some coverage
•Epstein et al., 1990	P	1987, interviews with patients admitted to 5 MA hospitals	ALOS	All except obstetric and psychiatric	16,908 adult patients	Medicaid vs. "Other' insurance"
Freeman et al., 1987	U	1986, RWJF national access telephone survey	Percent of those with 1 or more physician visits in year with serious symptoms who did not see or contact a physician	All	10,103 total sample	Uninsured vs. all other
Friedman et al., 1973		1970, MA tumor registry and hospital reimbursement data	Stage at diagnosis: localized vs. regional vs. distant	Breast cancer	202 patients	Private (excluding BC/BS) vs. Medicaid and uninsured combined
Goldfarb etal., 1983	P	1970, sample survey of medical and financial records, New England hospitals	LOS, "real" ancillary services	5 narrowly defined common medical and surgical procedures	63 hospitals	BC/BS, commercial, VWlfare, self-payment, Medicare
Greenberg et al., 1988	P, O	1973-76, NH and VT Central Tumor Registry; hospital records	Odds of undergoing surgery vs. radiation and/or chemotherapy; mortality due to all causes	Non-small-cell lung cancer	1,808 hospital charts	Private vs. other or none
•Haas et al., 1991	0	1984 and 1987; MA hospital discharge abstracts and vital statistics records (linked)	LBW (2,500,500grams) orprematurity (ICD-9-CM code 764.0-765.1)	Inhospital, single gestation births	57,257 (1984) and 64,346 (1987)	Privately insured vs. Medicaid vs. uninsured

•Hadley et al., 1991	P, O	*1987,* private national hospital discharge abstracting service	ALOS; probability of specific diagnosis-related procdures; probability of a high-cost and/or high discretion procedure; probability of a "not abnormal" biopsy result; RAMI value; probability of a weekend (i.e., emergency) admission	Various, and all	*592,598* discharges, 1,200 hospitals	Private=BCor insurance company; uninsured=no charge or self-pay
Hand et al., 1991	0	1988, IL hospitals with cancer registries	Late stage (Stages IIb through IV) at diagnosis	Breast cancer	9 hospitals	"All other" insured vs. Medicaid and uninsured combined
* Hayward et al., 1988	u	1986, RWJF national access survey interviews	Whether (all) patients had a regular or usual source of care; whether serious or chronically medically ill patients needed but could not get care	All, and serious or chronic medical illness	5,920 adults ages 22 to 64; 2,927 adults >22 with chronic or serious medical problems	Insured=government or private; uninsured
Howell et al., 1991	u, P, o	1983, Medicaid tape-to-tape data, CA birth-death cohort file, census data	Probability of late initiation of prenatal services, birthweight	Prenatal care, birth	13,010 deliveries	Short-term Medicaid enrollees vs. long-term Medicaid enrollees;non-MedicaWovwed mothers in low-income areas vs. high-income areas
•Hubbell et al., 1989	u	Oct. 1987-Jan. 1988 telephone survey of low-income households, Orange County, CA	Regular source of care; physician visit vs. not; preventive services	Not specified	652 low-income adults and their families, including 231 children <18 years	Insured vs. not
Kelly, 1985	P	1977, NCHSR Hospital Studies Program data	ALOS, average number of procedures	All	246,637 patients	Private insurance vs. Medicaid vs. "no charge"
Krieger et al., 1992	o, P	July 1983-Sept. 1988, WA Medicaid eligibility files and birth certificate files	initiation of prenatal care, adequacy of prenatal care; % of LBW (<2,500 grams) infants in group	Births	10,631 pregnant women	Medicaid managed care vs. Medicaid FFS vs. non-Medicaid managed care
Martin et al., 1984	P	1978, New York State Case Mix Study data from NY hospitals	Average total cost per patient; average routine cost per patient; average ancillary cost patient[c]; ALOS in days	All	296,000 patients in 28 hospitals	Medicare vs. Medicaid vs. Blue Cross vs. all payers combined
•Melnickand Mann, 1989	P,O	1982, NJ hospital patient discharge data	Direct patient care costs per cased; LOS	All	269,510 discharges	Private=BC and commercial; public= Medicaid, Medicare; uninsured= self-pay; and other

[c]First, costs from all non-revenue-producing general service department (e.g., laundry) were allocated to revenue-producing ancillary departments (e.g., radiology) and to clinical services (e.g., pediatrics). These departmental costs were then assigned to patients. A patient's total ancillary costs were calculated by multiplying each patient's charges within each department by the departmental costs-to-charge ratios obtained from the facility's Uniform Financial Report. Routine costs were calculated from the days spent in each clinical service multiplied by that service's routine costs per day. For purposes of the analysis, "full costs" were based on actual inpatient costs, and "leveled full costs" were adjusted to reflect differences in salaries and utility costs between hospitals because of geographic location. Outliers, defined as cases within a DRG whose length of stay exceeds the DRG mean by 2 standard deviations or more, were excluded from most (number unspecified) comparisons of average costs.

[d]Direct patient care costs exclude overhead (or indirect costs), capital, direct teaching, and other nonpatient care costs. Some error was introduced by the allocation of joint costs, which occurred in calculating the departmental cost-to-charge ratios.

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Table E-l—Methodological Features of Studies Examining Relationships Between Insurance Coverages, Utilization, Process, or Outcomes of Health Care-Continued

Study author(s) and year of publication	u, P or 0[e]	Year and source of study data	Indicator	Condition or procedure	Number of cases and study population	Insurance status comparison(s)
.Needleman et al., 1990	u	1980, NMCUES aged to depict 1988 using the Health Benefits Simulation Model	Average number of visits per person; hospital inpatient admissions per 1,000 persons; hospital outpatient visits per 1,000 persons; reports of not receiving needed care	All	Approximately 6,600 households consisting of 17,900 persons	uninsured vs. insured
Oberg et al., 1991	P	Feb. -Jun. 1988; interviews with a sample of women who recently delivered at 6 hospitals in Minneapolis, MN	Satisfaction (with continuity of providers, waiting times at prenatal visits, and the way in which treated by provider)	Delivery/pre-natal care	149 women (50 in each insurance group)	Uninsured vs. Medicaid vs. privately insured
Norris and Williams, 1984	o	1968 and 1978; CA vital statistics and hospital claims data	Birthweight and perinatal mortality	Delivery	695,442 births	Private=high-income women not covered by Medi-Cal; public= Medi-Cal; uninsured=low-income not covered by Medi-Cal
.Robert Wood Johnson Foundation, 1987	P	1986; National Access Survey via telephone interviews	Satisfaction (with most recent ambulatory visit, emergency visit, or hospital stay) among those who had such visits or stays	All	10,130 adults 18 and over	Uninsured=lacking coverage under an HMO, Medicare, Medicaid, other government health insurance, self-paid health insurance or employer-paid health insurance
.Rosenbach, 1985	u	1980 NMCUES; ARF data on supply of PCPS and ERs; State-level price data	Regular source of care	All[e]	1,409 children ages 1 through 17 living in families below150 percent of the Federal poverty level	Medicaid vs. private insurance vs. no insurance
.Rosenbach, 1989	u	see Rosenbach, 1985	Any physician visit, number of physician visits per child, physician visits per child with visit, differentiated by setting (any vs. office)	see Rosenbach, 1985	see Rosenbach, 1985	see Rosenbach, 1985
" Short and Lebfkowitz, 1991	u	1987 NMES	Any visit; probability of a well-child visit; adherence to the MP schedule for well-child visits[g]	All	2,695 preschool children ages 1 through 4	Uninsured all year vs. privately insured all year vs. Medicaid all year (and no private insurance)

[e]The study also differentiates between children with excellent/good health and no activity limitation, and children in fair/poor health or with an activity limitation.
[f]For most children, parents were interviewed as proxies.
[g]Only the findings for the probability of a well-child visit is included in this background paper.

Soumerai et al., 1991[h]	O	July 1980-June 1983; NH and NJ Medicaid Management Information System and enrollment files for Medicaid- and Medicare-covered patients	Admissions to nursing home or hospital	Diabetes heart disease, chronic obstructive pulmonary disease and asthma, seizures, or conditions requiring the use of anticoagulants	1,786 patients age 60 and older using 3 or more drugs with potential for institutionalization as a result of sudden withdrawal	Before and after cap imposed on prescription drug payment; and comparison of NH admissions to NJ admissions during study period
•Stafford, 1990	P	1986, all CA nonmilitary hospitals	Cesarean section; repeat C-section	Delivery	461,066 deliveries	Private= BC/BS and other private, Kaiser Permanence, other HMOs; pubiic=Medi-Cal; uninsured=self-pay, indigent services; other= Medicare, workers compensation, Title V,[i] other government other nongovernment, and no charge[d]
•Stafford, 1991	P	see Stafford, 1990	Repeat C-section	Delivery	45,425 women with previous C-sections	see Stafford, 1990 above
U.S. Government Accounting Office, 1987	u	1 986-87, personal interviews with women in hospitals in 8 States[k]	Women's self-reports of when prenatal care was started, how many prenatal care visits were received, and what barriers prevented women from getting prenatal care earlier or more often	Delivery/pre-natal care	1,157 women (in 39 hospitals, in 32 corm munities, in 8 States)	Medicaid and uninsured
•Weissman and Epstein, 1989	P,o	1983, data on patients in Boston, MA, metropolitan area nonfederal hospitals, as listed in MA Rate Setting Commission discharge abstracts	LOS, number of procedures, case-mix severity index	All	65,032 patients at 52 hospitals	Private=BC; public= Medicaid; uninsured= self-pay or free care

[h]The data i, Soumerai et al.'s study were collected in 1980 or after, but results of the study are not included in the bar graphs used to suggest magnitude and variation because of the unusual nature of the study and because many patients were 65 and older.
[i]Title V of the Social Security Act covers the Maternal and Child Health Block Grant Program, administered by USDHHS.
[j]In most studies, patients whose records marked "no charge" are considered uninsured. "No charge" accounted for 1,292 deliveries in Stafford's study.
[k]The States were Alabama, California, Georgia, Illinois, Maine, Massachusetts, New York, and Virginia. States were selected in order to represent States with large Medicaid programs, to cover most regions of the country, and to obtain a mix of Medicaid programs in terms of eligibility and benefits.

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Table E-l—Methodological Features of Studies Examining Relationships Between Insurance Coverages, Utilization, Process, or Outcomes of Health Care

Study author(s) and year of publication	u, P or O[a]	Year and source of study data	Indicator	Condition or procedure	Number of cases and study population	Insurance status comparison(s)
.Weissman, Gatsonis, and Epstein, 1991	0	1987, MA hospital discharge abstracts from the MA Health Data Consortium; MD data from Managed Health Care Services; 1988 CPS March supplement for number of residents by insurance status by State in 1987	Population-based rates of admission for 12 avoidable hospitalizations as identified by a physician panel	See note for list of Conditions[l]	Patients up to 64 years; sample sizes not given	Private=all group health insurers, BC, commercial; Medicaid; uninsured= expected to be self-pay or free care
Weissman, Stern, Fielding, et al., 1991	u	1987, personal interviews; at or shortly after admission of patients who had been hospitalized in eastern MA	Delays in receiving care as a reason for hospitalization	All except obstetrics and psychiatry	12,068 consecutive adult patients (mean age 55) in 5 hospitals	Private=BC, HMO, or commercial; public= Medicaid, Medicare; uninsured
* Wenneker et al., 1990	P	1985, MA general acute care hospitals; discharge data submitted to the MA Rate Setting Commission	Use of 3 cardiac procedures	Patients diagnosed with circulatory disorders or having chest pain[m]	37,994 MA residents ages 35 to 64	Private=BC/BS, commercial; Medicaid; uninsured=self-pay or free care
.Woolhandler and Himmelstein, 1988	u	1982 NHIS	Inadequate receipt of preventive(early detection) services[n]	Hyptertension; Pap smear; clinical breast examination; glaucoma test	10,653 women aged 45 to 64	Insured=covered by a private plan, Medicaid or other public assistance program, Medicare, or military health insurance; uninsured=all others
Yelin et al., 1983	u	1976 NHIS	Total number of physician visits; total number of hospitalizations	9 discrete conditions (for 7,612 individuals)	7,612 individuals with 9 discrete conditions and 2,000 randomly selected respondents	Some vs. no insurance coverage

[l]Ruptured appendix, asthma, cellulitis, congestive heart failure, diabetes, gangrene, hypokalemia, immunizable conditions, malignant hypertension, pneUmOnia, pyelonephritis, bleeding ulcer.
[m]Receiving coronary arteriography, coronary artery bypass graft (CABG), or coronary angioplasty was deemed equivalent to having chest pain.
[n]Inadequate was defined as a screening interval of 1 year or more longer than the optimal, as defined by various expert panels on the adequacy Of Screening.
[o]The 9 conditions were rheumatoid arthritis, osteoarthritis, tendonitis, lower back pain, angina pectoris, chronic ischemic heart disease, hypertension, emphysema, and diabetes.

Yergan et al., 1988	P, O	1970-73, data 17 hospitals with sufficient patient loads, randomly selected from PAS database	Number of radiographic procedures, consultations, and surgical procedures, LOS, inhospital death	Pneumonia	4,369 patients	BCvs. Medicare vs. Medicaid vs. self-pay
● Young and Cohen, 1991	O	1987, discharge abstracts from MA nonfederal hospitals	Inhospital mortality and deaths within 30 days of discharge	Emergency admission for AM I (heart attack)	4,972 patient discharges	FFS private insurance (BC or commercial) vs. HMO enrollees; vs. "self-pay" or "free care" as anticipated source of payment

NOTE: *=study is included in graphs with estimates of magnitude and variation.

KEY:

AAP=American Academy of Pediatrics
AHA=American Hospital Association
AHCPR=Agency for Health Care Policy and Research (USDHHS)
ALOS=average length of stay
AMI=acute myocardial infarction
ARF=Area Resource File (county level data collected and supplied by the USDHHS)
BC=Blue Cross
BS=Blue Shield
CA=California
CHAS=Center for Health Administration Studies
CHP=Community Hospital Program (RWJF)
CPHA=Commission on Professional and Hospital Activities
CPS=Current Population Survey (U.S. Department of Commerce, Bureau of the Census)
DC= District of Columbia
DRG=diagnosis related group
ER=emergency room
FFS=fee-for-service (reimbursement for health care)
FL=Florida
HMO=health maintenance organization
IL=Illinois
IPA=independent practice association
LBW=low birthweight
LOS-length of stay
MA=Massachusetts
MD=Maryland
MN= Minnesota
NCHSR=National Center for Health Services Research (now AHCPR)
NH=New Hampshire
NHIS=National Health Interview Survey (USDHHS)
NJ=New Jersey
NMCUES=National Medical Care Utilization and Expenditure Survey (USDHHS)
NMES=National Medical Expenditure Survey (USDHHS)
NY=New York
PAS=Professional Activity Service (CPHA)
PCP=Primary care physician
RAMI=Risk-Adjusted Mortality Index
RWJF=Robert Wood Johnson Foundation
UHDDS=Uniform Hospital Discharge Data Set
USDHHS=U.S. Department of Health and Human Services
VT-Vermont
WA-Washington

SOURCE: Office of Technology Assessment, 1992, based on studies indicated. Full citations can be found in the list of references at the end of this background paper.

Table E-2—Patient Factors Commonly Adjusted for Statistically in Selected Studies[a]

	Individual demographic factors						Individual health factors	
Study	Age	Gender	Race	Education	Income	Marital status	Physiological health status[b]	Comorbidities
Braveman et al., 1989	—	—	X	—	—	—	X	X
Braveman et al., 1991	—	—	X	—	—	—	X	X
Burstin et al., 1991	X	X	X	—	X	—	—	—
Chen and Lyttle, 1987	X	X	X	X	X	—	X	—
Cornelius, 1991	X	X	X	X	X	—	X	—
Epstein et al., 1990	—	—	—	X	X	—	X	—
Haas etal., 1989	X	—	X	X	X	X	—	—
Hadley etal., 1991	X	X	X	—	—	—	X	X
Hayward et. al., 1988	X	X	X	—	X	—	X	—
Hubbell et al., 1989	—	—	X	—	X	—	—	—
Melnick and Mann, 1989	X	X	—	—	—	—	X	—
Needleman etal., 1990	X	—	—	—	—	—	X	—
Robert Wood Johnson, 1987	—	—	—	—	—	—	X	—
Rosenbach, 1985	—	—	—	—	—	—	—	—
Rosenbach, 1989	X	—	X	X	X	—	X	—
Short and Lefkowitz, 1991	X	X	X	X	X	—	X	—
Stafford, 1990	X	—	X	—	—	—	—	X
Stafford, 1991	X	—	X	—	X	—	—	X
Weissman and Epstein, 1989	X	X	—	—	—	—	X	X
Weissman, Gatsonis, etal., 1991	X	X	X	—	X	—	—	—
Weissman, Stern, etal., 1991	X	—	—	X	X	—	X	X
Wenneker et al., 1990	X	X	X	—	X	—	X	—
Woolhandler and Himmelstein, 1988..	—	—	X	X	X	—	X	—
Young and Cohen, 1991	X	X	X	—	X	—	X	X

KEY: X = factor was controlled in some way in study. —= factor was not controlled in study.

[a]Not all factors adjusted for statistically in each study are shown. For example, some studies adjusted for patient's residence and level of employment (e.g., 27). Studies also defined and grouped factors indifferent ways. For example, race could be categorized as white vs. nonwhite or in five independent categories (black, white non-Hispanic, Hispanic, Asian, other).

[b]In general, studies used proxies for physiological health status (e.g., perceived health status, number of days in bed in past year).

SOURCE: Office of Technology Assessment, 1992, based on studies cited. Full citations can be found in the list of references.

Table E-3—Institutional Factors Commonly Adjusted for Statistically in Selected Studies[a]

		Hospital characteristics						
Study	Location	Teaching status	Ownership[b]	Size	Specialized unit available	Volume of service	Hospital charges	ALSO[c]
Braveman et al., 1989	—		X	—	—	—	—	—
Braveman et al., 1991	—	X	X	—	X	—	—	—
Burstin et al., 1991	X	X	X	—	—	—	—	—
Chen and Lyttle, 1987	—	—	—	—	—	—	—	—
Cornelius, 1991	—	—	—	—	—	—	—	—
Epstein et al., 1990	—			—	—	—	—	—
Haas et al., 1989	—			—		—	—	—
Hadley etal., 1991	X	X	X	X		—	—	—
Hayward et. al., 1988	—	—	—	—	—	—	—	—
Hubbell et al., 1989	—	—	—	—	—	—	—	—
Melnick and Mann, 1989	X	X		—		—	—	—
Needleman et al., 1990	—			—		—	—	—
Robert Wood Johnson, 1987	—		—	—	—	—	—	—
Rosenbach, 1985	—	—	—	—	—	—	—	—
Rosenbach, 1989	—	—	—	—	—	—	—	—
Short and Lefkowitz, 1991	—			—		—	—	—
Stafford, 1990	—			—		—	—	—
Stafford, 1991	—	X	X	—	X	X	—	—
Weissman and Epstein, 1989	—	—	—	—	—	—	—	—
Weissman, Gatsonis, et al., 1991	—	—	—	—	—	—	—	—
Weissman, Stern, et al., 1991	—			—		—	—	—
Wenneker et al., 1990	—	X		—		—	—	—
Woolhandler and Himmelstein, 1988..	—	—	—	—	—	—	—	—
Young and Cohen, 1991	—	X	X	—	X	—	—	—

KEY: X = factor was controlled in some way in study. — = factor was not controlled in study.
[a]Not all factors adjusted for statistica lly in each study are shown. For example, some studies made adjustments forthe overall level of hospitals' socioeconomic characteristics (e.g, proportion of patients covered by Medicaid or uninsured) (25), or the availability of health services in a geographic area (124).
[b]Ownership means, for example, public vs. private, or for-profit VS. not-for-profit.
[c]Average length Of stay.

SOURCE: Office of Technology Assessment, 1992, based on studies cited. Full citations can be found in the list of references.