Chapter 3

The Prioritized List

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INTRODUCTION

Central to Oregon's proposed Medicaid demonstration project is a list of 709 health services, prioritized by relative importance considering public preferences and values. The impetus to systematically prioritize health services can be traced to the public debate following the Oregon legislature's decision in 1987 to reallocate Medicaid funds away from expensive organ transplants that benefit relatively few and toward expanded access to prenatal care. With the passage of the Basic Health Services Act in 1989, the legislature committed itself to further expansions in access to health care, and set in place a process to ''rationally' define health benefits.[1]

Oregon's efforts to prioritize health services coincide with a new national focus on health care effectiveness and outcomes research. The U.S. Agency for Health Care Policy and Research (AHCPR), for example, is supporting medical outcomes research and health care guideline development in an effort to promote quality care and identify and limit use of ineffective services (295). While AHCPR is supporting focused research on particular conditions or treatments using traditional approaches (e.g., meta-analysis, analysis of geographic variation), Oregon's appointed Health Services Commission (HSC) used a novel approach to evaluate virtually all medical treatments in less than 2 years.

Understanding the strengths and weaknesses of Oregon's prioritization of health services is important because it represents the first attempt to broadly apply cost-effectiveness analysis to health resource allocation decisionmaking. A careful analysis of the process used to generate the list and of the "reasonableness' of the relative order of specific items on the prioritized list is important because under the demonstration, the Medicaid benefit ''package' could change during the demonstration-i. e., the coverage line initially set to include the first 587 conditions and their associated treatments could move up or down the list according to the availability of resources.

The remainder of this chapter is divided into five sections. The first section provides a detailed description of the HSC's prioritization process. The second section discusses the relative importance of various steps in the process. Section three provides a critique of the process and discusses its strengths and weaknesses. The fourth section focuses on the prioritized list itself and discusses its merits, irrespective of the process used to generate it. The final section summarizes OTA's findings and conclusions.

THE PRIORITIZATION METHOD

As part of the Basic Health Services Act, a Health Services Commission* made up of health care providers and consumers was charged with preparing:

> . . . a list of health services[3] ranked by priority, from the most important to the least important, representing the comparative benefits of each service to the entire population to be served (Senate Bill [SB] 27).

The HSC was given little guidance on how to prioritize, but was directed to:

> . . . actively solicit public involvement in a community meeting process to build a consensus on the values to be used to guide health resource allocation decisions (SB 27).

The HSC completed its charge and on May 1, 1991 issued a prioritized list of 709 services, following nearly 2 years of deliberation. Several prioritization methods were considered by the HSC, and a preliminary list based on a cost-effectiveness approach issued in May 1990 reflected its work in progress.

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1 Ch. 2 includes a discussion of the Oregon legislature's 1987 transplant decision and subsequent State activities that led to the inclusion of prioritization in the Basic Health Services Act.

2 The 11 HSC members responsible for developing the 1991 prioritized list included 5 physicians (including 1 doctor of osteopathy), 4 health care consumers, a public health nurse, and a social service worker. Members are appointed by the Governor and confirmed by the Senate.

3 A health service was defined as "an intervention related to a specific condition expected to maintain and/or restore an individual's health or well-being. Each health service listed is presumed to include all necessary ancillary and supportive services' (193). Health services include: provider services and supplies, in- and outpatient hospital services, and health promotion and disease prevention services.

The HSC used both formal (e.g., collection and evaluation of data) and informal (e.g., judgment calls) methods to rank order a comprehensive list of health care treatments. Six steps were used to create and rank the list:

1. The HSC, with input from health care provider groups, created a list of 709 "condition-treatment" (CT) pairs using diagnostic and procedure codes.
2. For each CT pair, the HSC gathered information on treatment benefits and costs associated with that pair.
3. The HSC ranked 17 categories of services (e.g., acute fatal, treatment prevents death and facilitates full recovery; preventive care for children) according to societal values elicited at public meetings. It used a group consensus method to reach agreement on the category rankings.
4. The HSC put each CT pair into one service category, considering such factors as the expected outcome given treatment and whether the condition was acute or chronic.
5. Within each category, CT pairs were ranked according to the expected net benefit of treatment.
6. Finally, in a line-by-line review, the HSC examined each CT pair's public health impact, treatment-related outcome and cost, and relation to health care values expressed at community meetings. Based on this review, the HSC selectively moved items up or down the list.

Each of these steps is described in detail below. To clarify Oregon's method, an example of a CT pair from the prioritized list is provided:

> . . . chronic otitis media (i.e., inflammation of middle ear) -eustachian tubes/tonsillectomy and adenoidectomy/tympanoplasty [ranked 355 of 709 CT pairs].

Step 1: Creating the List of CT Pairs

Fifty volunteer provider groups[4] coupled disease and procedure codes[5] to generate an initial list of approximately 1,600 CT pairs to be ranked. Through the use of broad diagnostic and treatment groups, the HSC was able to reduce the original list of 1,600 CT pairs to 709 CT pairs, a selection of which is shown in box 3-A. (The full list is included in app. D.) CT pairs only include treatments because all medically reasonable diagnostic services would be covered under the demonstration.

In some cases, the HSC grouped disease codes together into one CT pair when treatment of different diseases were believed to have similar costs and outcomes. Conditions are usually broadly defined and include several specific ICD-9-CM codes.[6] For example, all forms of muscular dystrophy are included in one CT pair (line 506).

Treatments were also broadly defined. In fact, more than one-half (51 percent) of the CT pairs have the treatment specified as "medical therapy" or ''medical and surgical treatment. ' Medical therapy includes any non-procedure-related care, such as office care, general inpatient care, and ancillary services (120).[7]

Many conditions are listed multiple times with different procedures. Chronic otitis media, for example, is listed twice: once with specific procedures and again with medical therapy. The specific conditions and treatments included in the two CT pairs related to the care of chronic otitis media are shown in box 3-B.

Step 2: Gathering Information on Treatment Benefit, Duration of Benefit, and Cost

For each CT pair, the HSC gathered information regarding:

. the expected net benefit of treatment,
• the duration of treatment benefit, and

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[4] Provider groups represented most licensed practitioners in the State including, for example, the professional societies of dermatologists, surgical subspecialists, and acupuncturists (see table 3-9).

[5] The following coding manuals were used to identify conditions: *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM); and the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition* (DSMMD-3). *The Physician Current Procedural Terminology, Fourth Edition* (CPT-4) codes were used to identify treatments. The American Dental Association codes were used for dental conditions and treatments.

[6] ICD-9-CM codes classify clinical conditions and disease manifestations.

[7] Medical therapy includes ancillary services such as "hospital services, laboratory services, prescription drugs, radiology, medical supplies, therapies, vision and hearing services, medical transportation, case management, home health services, and hospice services, which are provided, if they are medically necessary to the treatment of the condition" (193).

Box 3-A—Examples of Condition-Treatment Pairs

Rank	Condition	Treatment
1	Pneumococcal pneumonia, other bacterial pneumonia, bronchopneumonia, influenza with pneumonia	Medical therapy
50	Acute myocardial infarction	Medical therapy
100	Injury to blood vessels of the thoracic cavity	Repair
150	Diabetes mellitus, Type I	Medical therapy
200	Diseases and disorders of aortic valve	Aortic valve replacement, valvuloplasty, medical therapy
250	Atrial septal defect, secundum	Repair septal defect
300	Congenital hydronephrosis	Nephrectomy/repair
350	Open wounds	Repair
400	Rheumatoid arthritis and other inflammatory polyarthropathies	Medical therapy
450	Deformities of foot	Fasciotomy, incision, repair, arthrodesis
500	Cancer of esophagus, treatable	Medical and surgical therapy
550	Dental services (e.g., insufficient room to restore tooth)	Restorative dental service
600	Absence of breast after mastectomy as treatment for neoplasm	Breast reconstruction
650	Oral aphthae	Medical therapy
700	Gynecomastia	Mastopexy
709	Anencephalous and similar anomalies and reduction deformities of the brain	Life support

SOURCE: Oregon Health Services Commission "Prioritized Health Services List," Salem, OR, May 1, 1991.

. treatment-associated costs.

These three pieces of information were initially components of a cost-effectiveness formula used to rank CT pairs on a preliminary list. (The attempt to rank CT pairs by the cost-effectiveness formula is described in box 3-C.) The initial attempt to rank CT pairs according to cost-effectiveness was abandoned and only one component of the initial formula, the expected net benefit of treatment, was important to the final ranking methodology.

Expected Net Benefit of Treatment

The HSC measured CT pair "net benefit" in terms of how treatment changes ''quality of life" for the typical patient within a CT pair. To assess treatment-related changes in quality of life, clinicians estimated the probability of dying or experiencing various ''health states" (i.e., symptoms or functional limitations) for patients treated and not treated for the specified condition. These estimates were then ''weighted' according to public opinions elicited from a telephone survey of Oregon residents. Information from clinicians and the public could be combined because they had as a common element a list of 29 health states. Clinicians described patient outcomes in terms of these health states an-d the public expressed their opinions about experiencing these same health states during the survey. A treatment's net benefit reflects both clinicians' estimates of treatment effects and consumers' perceptions of the desirability of experiencing those effects.

Clinician Outcome Information--Groups of CT pairs were assigned to one of the 50 volunteer provider groups. These groups represented most State-licensed practitioners and included the professional societies representing physicians (e.g., internal medicine, dermatology, surgery and surgical subspecialties) and other practitioners (e.g., chiropractors, acupuncturists). For each CT pair, the provider groups estimated for two hypothetical cohorts-patients with and without treatment-the probability in 5 years of being in the following five states (the probabilities adding to 1):

1. Perfect health,
2. Morbidity state 1,
3. Morbidity state 2,
4. Morbidity state 3, and
5. Dead.

Box 3-B—ICD-9-CM and CPT-4 Coding of Chronic Otitis Media Condition-Treatment (CT) Pairs

ICD-9-CM code and description	CPT-4 code and description
CT pair 355--Chronic Otitis Media	Eustachian tubes/ tonsillectomy and adenoidectomy/ tympanoplasty
381.5: eustachian salpingitis 381.6: obstruction of eustachian tube 381.7: patulous eustachian tube 382.1:chronic tubotympanic suppurative otitis media *382.2: chronic atticoantral* suppurative otitis media 382.3: unspecified chronic suppurative otitis media	42820: tonsillectomy and adenoidectomy; under age 12 69400: eustachian tube inflation, transnasal; with catheterization 69401: same as 69400, but without catheterization 69405:eustachian tube catheterization, transtympanic 69410: focal application of phase control substance, middle ear (baffle technique) 69631: tympanoplasty without mastoidectomy (including canalplasty, atticotomy and/or middle ear surgery), initial or revision; without ossicular chain reconstruction 6%32: same as 69631, but with ossicular chain reconstruction, (e.g., postfenestration) 69633: same as 6%31, but with ossicular chain reconstruction and synthetic prosthesis (e.g., partial ossicular replacement prosthesis (PORP), total ossicular replacement prosthesis (TORP))
CT pair 397--Chronic Otitis Media	Medical therapy
381.5: eustachian salpingitis 381.6: obstruction of eustachian tube 381.7: patulous eustachian tube 382.1: chronic tubotympanic suppurative otitis media *382.2: chronic* atticoantral suppurative otitis media 382.3: unspecified chronic suppurative otitis media	90000-99999: all medicine CPT codes (excludes anesthesiology, surgery, radiology, and pathology and laboratory procedures)

SOURCE: American Medical Association, *Physicians' Current Procedural Terminology, Fourth Edition, (CPT-4)* (Chicago, IL: AMA, 1990); Oregon Health Services Commission, Salem, OR, "Prioritized Health Services List," May 1, 1991; World Health Organization, *International Classification of Diseases, 9th Edition, Clinical Modifications* (Ann Arbor, MI: Edwards Brothers, Inc., 1980).

Providers described the three morbidity states using six *functional limitations* and 23 *symptoms* (box 3-D).[8]9 Children with chronic otitis media who undergo a middle ear procedure, for example, were assessed to have a much higher probability of being in perfect health in 5 years than untreated children (0.91 vs. 0.50), and to be less likely to experience functional limitations and symptoms (see box 3-E). Providers described this particular condition using one functional limitation (being limited in usual recreational activities) and two symptoms (having pain in ear or trouble hearing, and having trouble learning, remembering or thinking clearly).

Public Opinion About the Functional Limitations and Symptoms—Public opinions regarding the health states (i.e., the six fictional limitations and 23 symptoms) were obtained through a random-digit-dialed telephone survey of 1,001 Oregon residents. Survey respondents were asked to imagine themselves to be *permanently* affected by the functional limitations or symptoms and to rate the

[8] The fictional limitations and symptoms were adapted from those on a quality of well-being instrument developed by R.M. Kaplan and colleagues (106).

[9] Providers could select up to one symptom and three functional limitations (one from each category—mobility, physical, social) for each morbidity state. If more than one symptom could be assigned to the morbidity state, providers selected the chief complaint associated with the condition.

Box 3-C--Prioritization Using a Cost-Effectiveness Formula

A "cost-effectiveness" formula was used to order a preliminary prioritized list in May 1990:

C/(NB X D),

where C = treatment cost; NB = net benefit of treatment or the expected change in patients' "quality of life" with treatment; and D = expected duration of treatment benefit (in years).

Treatment Costs

Estimates of the costs associated with a given condition-treatment (CT) pair (e.g., hospital, ancillary services, pharmacy, etc.) were based on information from the Oregon Medicaid Management Information System. Clinicians provided additional cost data as needed. Cost estimates were usually intended to include those anticipated over the remaining life of the patient. For treatments without a lifetime benefit, costs were estimated for the expected duration of the treatment benefit (e.g., hip replacements confer a benefit for about 10 years). Each CT pair was assigned a cost, which was the midpoint of 1 of 14 cost ranges.

Treatment Net Benefit

A treatment's net benefit was estimated using clinical prognostic data and public opinions regarding a set of functional limitations and symptoms. (See description in text.)

Duration of Treatment Benefit

The duration of benefit was expressed in years. If a treatment had a lifetime benefit, the duration of benefit would be the remaining life expectancy (life expectancy was set at 75 years). If a treatment's effect was short-term, benefit duration was defined as the period until the next treatment would be required (e.g., hip replacements confer benefit for about 10 years). Provider panels estimated the median age range of diagnosis for each condition and the midpoints of the ranges were used in estimating duration of benefit.

Applying **the** Cost-Effectiveness Formula

The cost-effectiveness formula values for the "chronic otitis media-eustachian tubes/ tonsillectomy and adenoidectomy/tympanoplasty" CT pair areas follows:

Formula terms	*Formula values*
Treatment cost (C)	$1,500
Net benefit of treatment (NB)	.241
Duration of treatment benefit (D)	*69 years*

According to the formula, C /(NB X D), the value for "chronic otitis media--eustachian tubes/tonsillectomy and adenoidectomy/tympanoplasty" would be 90.20 (i.e., $1,500 per 16.63 quality-adjusted life years). The value 90.20 can be interpreted as the cost of adding 1 quality year of life associated with procedures for chronic otitis media.

SOURCE: **Office** of Technology Assessment 1992.

limitation/symptom on a scale from zero, which is "as bad as death," to 100, which represents ''good health."[10] Early in the interview, respondents were asked to rate a "best" health state described as "having no restrictions on movement or activity, and no health problems.''11 *Weights* for each symptom[12] were calculated as an average of the difference between ratings of the "best" health state and each symptom. If, for example, an individual rated the "best" health state as 90 and rated "trouble talking' as 72, the difference between the "best" health state and a health state including "trouble talking" would be 18 (i.e., 90 – 72). This value represents one individual's perception of the amount taken away from "best" health if he or she had trouble talking. The weights for each health state are shown inbox 3-D. (As shown in the box, the average ratings were divided by 100 so that they could be

[10] Symptoms were presented t. respondents one at a time, but functional limitations were presented in combination (e.g., respondents may have been asked to rate simultaneously having a mobility, physical activity, and a social activity functional limitation).

[11] Seventy-eight percent of respondents gave a value of 100 to the best health state.

[12] Functional limitation and symptom weights were calculated somewhat differently. Functional states were presented to the respondents in a nested format-respondents rated having three functional limitations, then two of the three, and then just one. The weight for functional state C, for example, was calculated by subtracting the value for having functional states A and B from the value of having functional states A, B, and C.

Box 3-D-Weights Associated With Functional Limitations and Symptoms Included on Oregon's Telephone Survey

Survey item		Weight
Functional limitations		
Mobility		
M1.	Have to stay at hospital or nursing home	-0.049
M2.	Cannot drive a car or use public transportation	-0.046
Physical activity		
P1.	Have to be in bed or in a wheelchair controlled by someone else	-0.560
P2.	Have to use a walker or wheelchair under your own control	-0.373
Social activity		
S1.	Need help to eat or go to the bathroom	-0.106
S2.	Are limited in the recreational activities you may participate in	-0.062
Health states/symptoms		
H1.	Have losses of consciousness from seizures, blackouts, or coma	-0.114
H2.	Have a bad burn over large areas of your body	-0.372
H3.	Have drainage from your sexual organs and discomfort or pain	*-0.325*
H4.	Have trouble learning, remembering or thinking clearly	*-0.367*
H5.	Have difficulty in walking because of a paralyzed or broken leg, but you have no other limitations on activity	*-0.253*
H6.	Have a painful or weak condition of the back or joints	*-0.253*
H7.	Have pain while you are urinating or having a bowel movement	*-0.299*
H8.	Have stomach aches, vomiting or diarrhea	*-0.370*
H9.	Experience a lot of tiredness or weakness	*-0.275*
H10.	Cough, wheeze or have trouble breathing	*-0.318*
H11.	Are often depressed or upset	*-0.326*
H12.	Have headaches or dizziness	*-0.305*
H13.	Have an itchy rash over large areas of your body	*-0.297*
H14.	Have trouble talking, such as a lisp, stuttering or hoarseness	*-0.188*
H15.	Have pain or discomfort in your eyes or vision problems that corrective lenses can't fix	*-0.248*
H16.	Are overweight or have acne on your face	*-0.215*
H17.	Have pain in your ear or trouble hearing	-0.217
H18.	Are on prescribed medicine or a prescribed diet for health reasons	—[1]
H19.	Wear glasses or contact lenses	***-0.055***
H20.	Have trouble falling asleep or staying asleep	***-0.248***
H21.	Have trouble with sexual interest or performance	-0.276
H22.	Can't stop worrying	-0.215
H23.	Have trouble with the use of drugs or alcohol	-0.455

[1] The HSC assigned a value of 0 to this health state because it thought its use double-counted morbidity associated with conditions and because it did not consider taking medications a serious problem (243). The weight as calculated from the survey was -0.123.

SOURCE: Oregon Health Services Commission, Salem, OR, "Prioritized Health Services List," May 1, 1990.

Box 3-E-Calculating Net Benefit Using the Example "Chronic Otitis Media—Eustachian Tubes/ Tonsillectomy and Adenoidectomy/Tympanoplasty'

State	Without treatment					With treatment				
	P[a]	FL/S[b]	Weight[c]	QoL value[d]	QoL (P X value)	P[a]	FL/S[b]	Weight[c]	QoL value[d]	QoL (P X value)
1. Death	0.15	—	-1 .000	0.000	0.0000	0.01	—	-1.000	0.000	0.0000
2. Morbidity state 1	0.25	S2 H4	-0.062 -0.367	0.571	0.1428	0.05	S2 H4	-0.062 -0.367	0.571	0.0286
3. Morbidity state 2	0.10	H17	-0.217	0.783	0.0783	0.03	H17	-0.217	0.783	0.0235
4. Morbidity state 3	—	—	—	—	—	—	—	—	—	—
5. Perfect health	0.50	—	0.000	1.000	0.5000	0.91	—	0.000	1.000	0.9100
			∑ (P x QoL value)		0.7211			∑ (P x QoL value)		0.9621

NOTE: Net benefit is the difference between the value of ∑ (P x QoL value) for patients with (.9621) and without (.7211) treatment, or .2410.

a p = probability of being instate.

b FL/S = functional limitation/symptom associated with health state (see box 3-D for description of health states).

c Weight = the weight the public assigns to the functional limitation/symptom. Can be interpreted as the amount taken away from perfect health (valued as 1) associated with the presence of a functional limitation/symptom. Weights for all telephone survey items are shown in box 3-D.

d QoL value = quality of life value = (1 + weight). When there is more than one functional limitation or symptom assigned to the state, weights are added before summing to 1. Can be interpreted as the value associated with the state on a scale from O (death) to 1 (perfect health).

SOURCE: Office of Technology Assessment, 1992, based on data from the Oregon Health Services Commission, May 1, 1991.

incorporated into the clinician outcomes data which were scaled from 0 to 1.)[13]

More detailed information on the conduct and analysis of the survey is provided in appendix C.

As shown in the example in box 3-E, the net benefit of treatment is the difference between the value of (Σ (P x QoL Value)) for patients with and without treatment for chronic otitis media, or 0.2410 (i.e., 0.9621 – 0.7211). (See table footnotes for explanation of equation variables.) Net benefit can vary from zero, indicating no benefit of treatment, to 1, indicating that treatment results in changing a patient's status from death to perfect health.

Step 3: *Ranking Categories of Health Services*

The HSC used a group consensus method to rank 17 categories of health care services (e.g., preventive care for children, comfort care) (see box 3-F), taking into consideration values expressed at public hearings and community meetings.

Public Hearings

Between September 1989 and February 1990, the HSC heard testimony from approximately 275 people at 12 public hearings held throughout Oregon (191). The HSC was charged to solicit testimony from "advocates for seniors, handicapped persons, mental health services consumers, low-income Oregonians, and providers of health care" (SB 27). The Oregon Health Action Campaign (OHAC), a coalition of organizations, provided outreach, assistance in writing testimony, and transportation to the hearings in an effort to encourage low-income persons and others most likely to be directly affected by the legislation to testify at the hearings (204).

Health care providers and administrators made up approximately one-third of those testifying at the HSC public hearings (191). This group included naturopaths, chiropractors, nutritionists, homeopaths, physicians, massage therapists, social workers, nurses, and midwives. A diverse group of 125 consumers provided testimony at the HSC hearings, often as advocates for specific services, such as organ transplants. In addition, approximately 50 representatives of advocacy and special interest groups testified in the interests of renters, migrant workers, community groups, the elderly, the disabled, and a variety of other constituencies (191).

Many offering testimony recommended that specific services should receive high priority .14 The services most frequently mentioned by consumers and providers alike were:[15]

- Preventive health care (especially well-child care),
- Mental health care services,
- Prenatal care,
- Family planning,
- Dental care,
- Chemical dependency services,
- Primary care, and
- Care for chronic, nonacute conditions.

Major topics of discussion at the public hearings included (191):

- Financial barriers to health care,
- Special health service needs of minority populations,
- Need for higher provider reimbursement,
- Effective health care delivery (e.g., case management), and
- Need for broader Medicaid coverage to increase consumer choice of nonphysician providers (e.g., midwives, naturopaths, acupuncturists).

Community Meetings

In early 1990,47 community meetings were held throughout the State to discuss what types of health care Oregonians felt might constitute a common good (91).[16] The goal of the community meetings was 'to build consensus on the values to be used by the Health Services Commission to guide health resource allocation decisions" (SB 27).

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13 The average ratings were divided by 100 (rating assigned to perfect health) even though 22 percent of respondents gave lower ratings to the "best" health state. 'The HSC incorrectly reported that individual "best" health state scores (and not 100) were used in the denominator (193). The weights shown in box 3-D are expressed as negative values because they represent the amount associated with the condition that the public thinks should be subtracted from perfect health (score of 1).

14 Few participants indicated which services should receive low priority, though some stated that they thought there were expendable medical services.

15 Other mentioned services included: nutrition therapy and counseling; HIV/AIDS services; infertility services; abortions; treatment of morbid obesity; geriatric care; medical equipment and supplies, such as eyeglasses, dentures, and hearing aids; and prescription drugs.

16 At least one meeting was held in every county in the State.

Box 3-F—The 17 Service Categories Used in the Prioritization Process

Category	Description
"Essential" services	
1. Acute fatal	Treatment prevents death with full recovery. *Example: Appendectomy for appendicitis.*
2. Maternity care	Maternity and most newborn care. *Example: Obstetrical care for pregnancy.*
3. Acute fatal	Treatment prevents death without full recovery. *Example: Medical therapy for acute bacterial meningitis.*
4. Preventive care for children	*Example: Immunizations.*
5. Chronic fatal	Treatment improves life span and quality of life. *Example: Medical therapy for asthma.*
6. Reproductive services	Excludes maternity/infertility services. *Example: Contraceptive management.*
7. comfort care	Palliative therapy for conditions in which death is imminent. *Example: Hospice care.*
8. Preventive dental care.	Adults and children. *Example: Cleaning and fluoride applications.*
9. Proven effective preventive care for adults	*Example: Mammograms.*
"Very important" services	
10. Acute nonfatal	Treatment causes return to previous health state. *Example: Medical therapy for vaginitis*
11. Chronic nonfatal	One-time treatment improves quality of life. *Example: Hip replacement.*
12. Acute nonfatal	Treatment without return to previous health state. *Example: Arthroscopic repair of internal knee derangement.*
13. Chronic nonfatal	Repetitive treatment improves quality of life. *Example: Medical therapy for chronic sinusitis.*
Services that are "valuable to certain individuals"	
14. Acute nonfatal	Treatment expedites recovery of self-limiting conditions. *Example: Medical therapy for diaper rash.*
15. Infertility services	*Example: In-vitro fertilization.*
16. Less effective preventive care for adults	*Example: Screening of nonpregnant adults for diabetes.*
17. Fatal or nonfatal	Treatment causes minimal or no improvement in quality of life. *Example: Medical therapy for viral warts.*

SOURCE: Oregon Health Services Commission Salem, OR, "Prioritized Health Services List," May 1, 1991.

The community meetings were conducted for the HSC by Oregon Health Decisions (OHD), a nonprofit organization that since 1983 has organized community forums to discuss ethical issues related to health care, including the problem of allocation of scarce resources. Trained volunteers organized meetings, provided outreach and publicity, and served as facilitators at meetings. OHD attempted to ensure that community meeting participants were representative of their counties, and that those to be affected by SB 27 participated in the meetings (91).[17] Approximately 1,000 people attended 47 community meetings, where attendance ranged from 7 to 132 participants (on average, there were 20 participants).

Meeting participants were informed that the Oregon legislature had passed three new laws which would expand access to health insurance, but that:

17 Outreach took the form of English and Spanish language flyers, posters, press releases, and radio and television spots (259).

> . . . [while] many more people will be served, there may not be enough money to provide all the services that people may want. For this reason, the law requires that health services be ranked in order of importance. In order to do this the Health Services Commission has asked for your help in telling them what values are most important to you and society (91).

Community meetings followed a standard format that included viewing a slide show presentation,[18] completing a questionnaire designed to elicit health care values, evaluating certain types of treatment, and participating in group discussions.

The questionnaire presented eight theoretical health care situations, such as the following:

- After three heart attacks, a patient is getting worse despite taking several medications daily. An operation to put in a pacemaker would probably help the heart's rhythm but not the general condition of the heart, The day to day activities of the patient may improve.
- A heavy user of crack cocaine wants help for drug addiction. Immediate treatment will help stop use. A month of intensive in-hospital treatment and outpatient treatment for a year will help stop the alcohol and drug use for the long term.

Participants also classified as essential, very important, or important nine categories of care, such as ''treatment of conditions where the health care is likely to extend life by more than two years or to improve the person's quality of life, ' and ''treatment not likely to extend life or make any big improvement in quality of life."19

Group consensus on health care values (box 3-G) was achieved following these structured activities and group discussions (91).

HSC Group Consensus

The HSC ranked the 17 health service categories according to community health care values using a modified Delphi[20] method that included five steps (194):

1. Commissioners individually rated each health service category on a scale from 1 to 10 on each of three attributes:
   - value to the society,
   - value to an individual at risk of needing the service, and
   - whether the service is essential to a basic health care package.
2. Commissioners received a report stating where their individual responses fell within the distribution of group values.
3. Commissioners met to discuss how value judgments were made.
4. Commissioners reconsidered, and sometimes adjusted previously submitted individual responses.
5. Finally, Commissioners met and reordered some categories based on their best collective judgment.

Step 4: Placing CT Pairs in Service Categories

The HSC placed each of the 709 CT pairs within one (and only one) of the 17 service categories. Eight of the categories are service-specific and include CT pairs related to such services as children's preventive care or reproductive care. The remaining nine service categories are defined by whether the condition is fatal, whether it is acute or chronic, and whether the treatment prevents death, returns patients to previous health, improves life span, or improves quality of life. Commissioners classified CT pairs as acute or chronic and then applied an algorithm based on health outcomes information to initially place CT pairs into these nine categories. "Fatal" conditions, for example, were those that without treatment resulted in at least a 1 percent mortality rate. Full recovery was defined as ''at least 90 percent of those surviving with treatment are asymptomatic or with a treatment [benefit] value of at least 0.9. ' The 'chronic otitis media--eustachian tubes/tonsillectomy and adenoidectomy/tympano-

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18 The slide show detailed the purpose of the community meetings and described the potential reduction under the Oregon Basic Health Services Act in the number of uninsured residents. Also discussed was the current system of cost-shifting in which insured individuals absorb some of the costs of uncompensated care (91).

19 Participants were instructed to place three of the nine categories of care into each of the three classification (i.e., essential, very important, or important). The results of this exercise were not tabulated.

20 The Delphi technique is used to obtain the most reliable consensus of opinion from a group of experts, Consensus is achieved after an iterative process where group members offer written individual opinions, discuss group opinion, and then revise individual opinions (227).

Box 3-G-Health Care Values Elicited at Community Meetings

- Prevention—Preventive services such as prenatal care and childhood immunizations were unanimously agreed upon as essential.
- Quality of life--Services that enhance emotional and physical well-being, as well as extend life, were generally thought to increase quality of life and should receive higher priority than those that only extend life.
- Cost effectiveness-Cost-effective treatments were given high priority, although some community members disagreed that cost alone should be a primary determinant in prioritization.
- Ability to function—The importance of independence and ability to perform daily activities was mentioned at three-fourths of the community meetings.
- Equity—Equity was described as a fundamental belief that everyone should have equal access to adequate health care. Discussions of equity raised various objections to the prioritization process-many participants, for instance, thought that health care services should be available equally to all segments of society. There ***was*** support for increased Federal funding for health care services, and some advocated the establishment of a national health insurance plan. Other equity issues discussed included increasing access to treatment services in rural communities and universal access to health care for children.
- Effectiveness of treatment-Participants agreed that treatments with proven efficacy and those that improve quality of life should be prioritized over those less likely to have successful outcomes.
- Benefits many-Services that benefit many should receive higher priority than those for whom few benefit, according to participants.
- Mental health and chemical dependency—Prevention, including drug education, was more highly valued than treatment services. While mental health and chemical dependency services were frequently discussed at meetings, there was some ambivalence regarding society's obligation to provide substance abuse services. Some participants, for example, felt that treatment was appropriate only in cases where patients were "motivated to undergo treatment, " and that recidivism needed to be considered in cases of "repeat offenders. "
- Personal choice-Some community members expressed a desire for increased choice of type of providers, while others wanted more patient and family autonomy in making medical treatment decisions.
- Community compassion—Participants indicated that society is obligated to provide treatments and services that alleviate pain and suffering (e.g., hospice care).
- Impact on society-Treatments for infectious diseases and for alcoholism or drug abuse are examples of services that yield societal as well as individual benefit (discussed at approximately half of the community meetings).
- Length of life-Prolonging life was viewed as important, but a treatment's value is limited if extending life sacrifices quality of life.
- Personal responsibility-Personal responsibility was viewed as the individual's obligation to society to seek appropriate health education and treatment services, and to generally take responsibility for one's health. Individuals taking responsibility for their health should receive priority, and those whose illnesses are related to lifestyle, such as alcohol- and drug-related conditions, a low priority if health care services are rationed.

SOURCE: R. Hasnain and M. Garland, "Health Care in Common: Report of the Oregon Health Decisions Community Meetings Process," Oregon Health Decisions, Portland, OR, April 1990.

plasty" CT pair has a treatment-associated benefit value of *0.9621* (see box 3-E) and was placed in the service category ''chronic nonfatal, one time treatment improves quality of life. '

Following this initial assignment of CT pairs into categories, the HSC extensively reviewed category placement and selectively moved some CT pairs to other categories.

Step 5: *Ranking CT Pairs Within Categories*

Within each category, CT pairs were ranked according to the treatment's net benefit (see step 2).

Step 6: *Final Line-by-Line Review of CT Pairs*

The HSC conducted a line-by-line review of the list to identify CT pairs that might be appropriately moved up or down the list (i.e., either within its

Table 3-I-Condition-Treatment (CT) Pair Rank by Category

CT pair category[a]	CT pair rank 1-300	301-587	588-709	Total
	Percent (count)			
1-9	79.2 (290)	18.6 (68)	2.2 (8)	100 (366)
10-13	3.6 (10)	77.8 (214)	18.5 (51)	100 (275)
14-17	0.0 (0)	7.4 (5)	92.6 (63)	100 (68)
Total				(709)

[a] The HSC considered categories 1-9 to be "essential," categories 10-13 "very important," and categories 14-17 "valuable to certain individuals." Total percentages may not add to exactly 100.0 due to rounding error.

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

category range or into another category range). In this final review, the HSC used professional judgment, its interpretation of community values, cost-benefit ratios, and cost alone to alter the order of CT pairs on the list.[21]

Defining "Basic Health Care"

While not required to do so, the HSC provided some guidance to the legislature on what health services it considered to constitute a ''basic" set of benefits. Basic health care was defined as "a floor beneath which no person should fall" (193). They categorized each service on the list as "essential,' ''very important,' or ''valuable to certain individuals" and recommended that all "essential" and most ''very important' services be covered (193).

The HSC, in its May 1, 1991 report, recommended that the legislature fund health services included in categories 1 through 9 (considered "essential") and most services in categories 10 through 13 (considered "very important"). CT pairs in categories 14 through 17 are considered "valuable to certain individuals but significantly less likely to be cost-effective or to produce substantial long-term gain" (193). The HSC defined "basic" health care from a societal perspective rather than from the individual's perspective and noted that:

> [W]hat is essential for the overall well-being of society may not meet the desires of specific individuals. Responding to the needs of both society and the individual may mean earmarking more funds for investment in Oregon's medical assistance programs than has previously been the case (193).

The legislature's decision to fund services through line 587 follows the coverage recommendations of the HSC. With the line drawn at *587,* covered services include all but eight "essential" CT pairs and most (81 percent; 224 out of 275) "very important" services. All but five CT pairs ''valuable to certain individuals' are listed below line 587 (table 3-l). An examination of the eight uncovered 'essential" services and the five covered "valuable to certain individuals" CT pairs shows that they probably represent CT pairs that were incorrectly placed in categories 1 through 9 or 14 through 17, respectively (box 3-H). Medical therapy for hepatorenal syndrome, for example, was placed in category 3 and was initially highly ranked on the unadjusted list (CT pair 166). However, this condition is regarded clinically by many as untreatable, and the HSC moved the CT pair down to line 606.

Future Changes to the Prioritized List

The HSC continually reviews health outcomes and effectiveness data and is to reissue a revised list every 2 years when the legislature meets. Technical amendments to the list could be made in the interim. New medical technologies or inadvertent omissions from the list could be added through such a process.[22] Mental health and chemical dependency services are to be incorporated into the 1993 prioritized list, and some services for the aged, blind, and disabled are expected to be incorporated.[23]

21 As part of this final step, each physician on the HSC was assigned about 200 CT pairs to review. The HSC reviewed the list and moved items up and down the list based on group consensus following a consideration of HSC clinician recommendations and community values (e.g., number who may potentially benefit, alleviation of pain and suffering) (120).

22 The HSC plans t. issue a revised list including technical amendments in May 1992. Any changes with significant cost implications require approval of the legislature or its emergency board (244).

23 The HSC plans to finalize an integrated list in summer 1992 (244).

Box 3-H-Listing of the "Essential"[1] Condition-Treatment (CT) Pairs Moved Below Line 587 and CT Pairs "Valuable to Certain Individuals"[2] Moved Above Line 587

Rank	Category	Condition	Treatment
"Essential" CT pairs that are not covered			
606	3	Hepatorenal syndrome	Medical therapy
607	5	Other deficiencies of circulating enzymes (alpha 1-antitrypsin deficiency)	Lung transplant
608	5	Lethal midline granuloma	Medical therapy
609	5	Amyotrophic lateral sclerosis (ALS)	Medical therapy
610	5	Cancer of liver and intrahepatic bile ducts	Liver transplant
687	2	Intraventricular and subarachnoid hemorrhage of fetus or neonate	Medical therapy
690	5	Alcoholic cirrhosis of liver	Liver transplant
691	5	Non-Hodgkin's lymphomas	Bone marrow transplant (5-6 loci match)
CT pairs "valuable to certain Individuals" that are covered			
352	*14*	Pilonidal cyst with abscess	Medical and surgical treatment
358	14	Acute conjunctivitis	Medical therapy
396	14	Infective otitis externa	Medical therapy
424	17	Ophthalmic injury: Lacrimal system laceration	Closure
434	14	Body infestations (e.g., lice, scabies)	Medical therapy

1 "Essential" CT pairs are those in categories 1-9 (see box 3-F).
2 CT pairs "valuable to certain individuals" are those in categories 14-17 (see box 3-F).

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

DETERMINANTS OF CT PAIR PLACEMENT ON THE PRIORITIZED LIST

As described in the last section, the 709 CT pairs were ranked first by service category and then by net benefit within category. The HSC then applied a ''reasonableness' test to subjectively reorder some CT pairs. This section presents analyses of CT-specific data (e.g., CT pair category assignment, net benefit values) to determine which steps of the prioritization process were most important in determining CT pair placement on the list. Finally, HSC data on such CT pair-associated characteristics as age and cost are used to describe the distribution of CT pairs on the list.

Effect of Adjustment of the List by the HSC

The HSC reported that about *25* percent of CT pairs were moved from their ranked position on the list (i.e., after being ranked frost by category and then within category by net benefit) (35,244). Inspection of CT pairs as finally ordered (i.e., adjusted) and as ordered by category and net-benefit ranking alone (i.e., unadjusted) show that almost every CT pair shifted from its original position after adjustment. Furthermore, virtually no blocks of CT pairs remain contiguous on the adjusted list, suggesting that more than *25* percent of CT pairs were selectively moved.

While a movement of one CT pair up the list shifts all CT pairs below its new placement down, this shift should often have been counterbalanced by movement of another CT pair down the list. Many of the CT pairs that were 'not selectively moved' should therefore have stayed in the same relative position. Table *3-2* shows the extent of CT pair movement resulting from adjustment. Fewer than one-half (47 percent) of CT pairs stayed within 25 lines of what would have been expected if the ranking procedure had been used without adjustment. Nearly one-quarter (24 percent) of CT pairs moved at least 100 lines up or down the list following adjustment.

Factors strongly associated with the movement of CT pairs were:

- *Category--The* most extreme movements occurred in categories 1 through *9* (essential)[24] and 10 through 13 (very important) .[25] CT pairs in categories 14 through 17 (valuable to some) tended not to move; more than three-quarters (78 percent; 52 out of 67) of category 14 through 17 CT pairs stayed within 25 lines of the unadjusted ranked position. Only five category 14 through 17 CT pairs shifted up to

24 Two-thirds (68 percent; *62 out* of 91) of CT pairs moved down 100 or more lines are in categories 1 through 9.

25 Two-thirds (67 percent; 48 out of 72) of CT pairs moved up 100 or more lines are in categories 10 through 13.

Table 3-2—Effect of List Adjustment on Location of Condition-Treatment (CT) Pairs*

Final adjusted CT pair position relative to unadjusted position	Percent (number) of CT pairs
Moved down 100 or more lines	12.9 (85)
Moved down 50 to 99 lines	5.8 (38)
Moved down 25 to 49 lines	5.0 (33)
Moved down 1 to 24 lines	18.0 (119)
Not moved	1.7 (11)
Moved up 1 to 24 lines	26.8 (177)
Moved up 25 to 49 lines	9.7 (64)
Moved up 50 to 99 lines	9.5 (63)
Moved up 100 or more lines	10.6 (70)
	100.0 (660)

NOTE: Based on analysis of 660 CT pairs; net-benefit value missing for 49 CT pairs.

a Movement of CT pairs from the position expected if ranking followed category placement and net benefit. If the adjusted position is 100 and the unadjusted position was 50, for example, the CT pair is said to have moved down 50 lines.

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

line 587 or above to be covered, and only eight category 1 through 9 CT pairs shifted down to below line 587 to the uncovered range. These 13 CT pairs are shown in box 3-H.

- Cost[26]—Most CT pairs (60 percent; 15 out of 25) associated with the highest costs (i.e., $100,000 or above) moved down the list at least 100 line spaces following adjustment. CT pairs associated with the lowest costs (i.e., less than $1,000) were more likely to move up than down (62 percent moved up; 35 percent moved down; 3 percent did not move).
- Age[27]—Nearly two-thirds (64 percent) of CT pairs that were moved down 100 or more lines affected adults (ages 19 to 70), while over one-third (35 percent) affected children or infants.[28] Nearly two-thirds (61 percent) of the CT pairs that moved up at least 100 lines affected primarily young and middle-aged adults (ages 19 to 55).

If ranking had been without HSC adjustments, 30 uncovered CT pairs would have been covered and 30 covered CT pairs would not have been covered given the line 587 cutoff point determining the initial benefit package (box 3-I). Changes in coverage would be more extensive if the coverage line were higher. At line 500, for example, 102 CT pairs change coverage status (i.e., 51 would shift above and 51 would shift below line 500).

Determinants of Final Placement of CT Pairs on the List

OTA examined the relative roles of category placement, net benefit values, and the judgments of the HSC in determining the final order of CT pairs on the prioritized list.

Category Placement--Figures 3-la and b show the relationship between the ranked position (1 through 709) and CT pair category placement for the unadjusted and final adjusted list, respectively. Figure 3-la shows a step-like pattern because on the unadjusted list, all category 1 CT pairs are ranked highest, then category 2 CT pairs and so on. Figure 3-lb shows jagged steps because the HSC moved some CT pairs up and down the list, beyond the proximity of other CT pairs of the same category. Despite the extent of movement, the final ranking follows category placement—most category 1 through 9 CT pairs are highly ranked and most category 14 through 17 CT pairs are low-ranked (table 3-3). Statistical tests confirm this; CT pair category assignment is highly correlated with final list placement (correlation coefficient 0.85).[29]

Net Benefit-Net benefit influenced ranking in two ways: it was considered when CT pairs were assigned to categories, and it was used to initially rank CT pairs within categories. How net benefit and other health outcome measures are related to category assignment is discussed later. This section describes the importance of net benefit in determining rank and rank within category on the adjusted list.

Figures 3-lc and 3-id show the relationship between rank and net benefit for the unadjusted and final adjusted lists, respectively. In the unadjusted case (figure 3-lc), the series of disconnected slopes show the ranking of CT pairs by category, and within category from the highest to lowest net benefit scores. The peak of each slope is the highest net

26 The HSC assigned each CT pair to 1 of 14 Cost categories.

27 Each CT pair was assigned an age category representing the age cohort usually affected by the condition and associated treatment. See table 3-7 for ages included in categories.

28 CT pairs affecting the elderly (over age 70) accounted for 1 percent of CT pairs moved down 100 or more lines.

29 Correlation of 0.85 is significant at p = 0.001 (1-tailed).

Box 3-I-Condition-Treatment (CT) Pairs Whose Coverage Status Changed as a Result of Ranking Adjustment

Adjusted rank	Unadjusted rank	Condition	Treatment
CT pairs ***covered by adjusted ranking that would not have been covered by unadjusted ranking[1]***			
352	***646***	Pilonidal cyst with abscess	Medical and surgical treatment
358	656	Acute conjunctivitis	Medical therapy
387	607	Lyme disease	Medical therapy
390	605	Atopic dermatitis	Medical therapy
391	592	Contact dermatitis and other eczema	Medical therapy
392	596	Acne	Medical and surgical treatment
396	670	Infective otitis externa	Medical therapy
397	598	Chronic otitis media	Medical therapy
401	604	Gout	Medical therapy
402	615	Crystal arthropathies	Medical therapy
423	638	Osteoporosis	Medical therapy
425	593	Disorders of refraction and accommodation	Medical therapy
434	662	Body infestations (e.g., lice, scabies)	Medical therapy
469	600	Endometriosis without hysterectomy	Medical and surgical treatment
483	611	Osteoarthritis and allied disorders	Medical therapy
486	613	Menopausal management	Medical therapy other than hormone replacement
534	606	Allergic rhinitis and conjunctivitis	Medical therapy
537	608	Pelvic pain syndrome	Medical and surgical treatment
571	588	Brachial plexus lesions	Medical therapy
572	590	Chronic sinusitis	Medical therapy
574	597	Dysmenorrhea	Medical therapy
578	599	Raynaud syndrome	Medical therapy
580	601	Urticaria, chronic	Medical therapy
581	602	Keratoderma, acquired; acquired acanthosis nigricans, striae atrophicae, other and unspecified hypertrophic and atrophic conditions of skin	Medical therapy
586	589	Spondylosis and other chronic disorders of back	Medical and surgical treatment
587	591	Esophagitis	Medical therapy

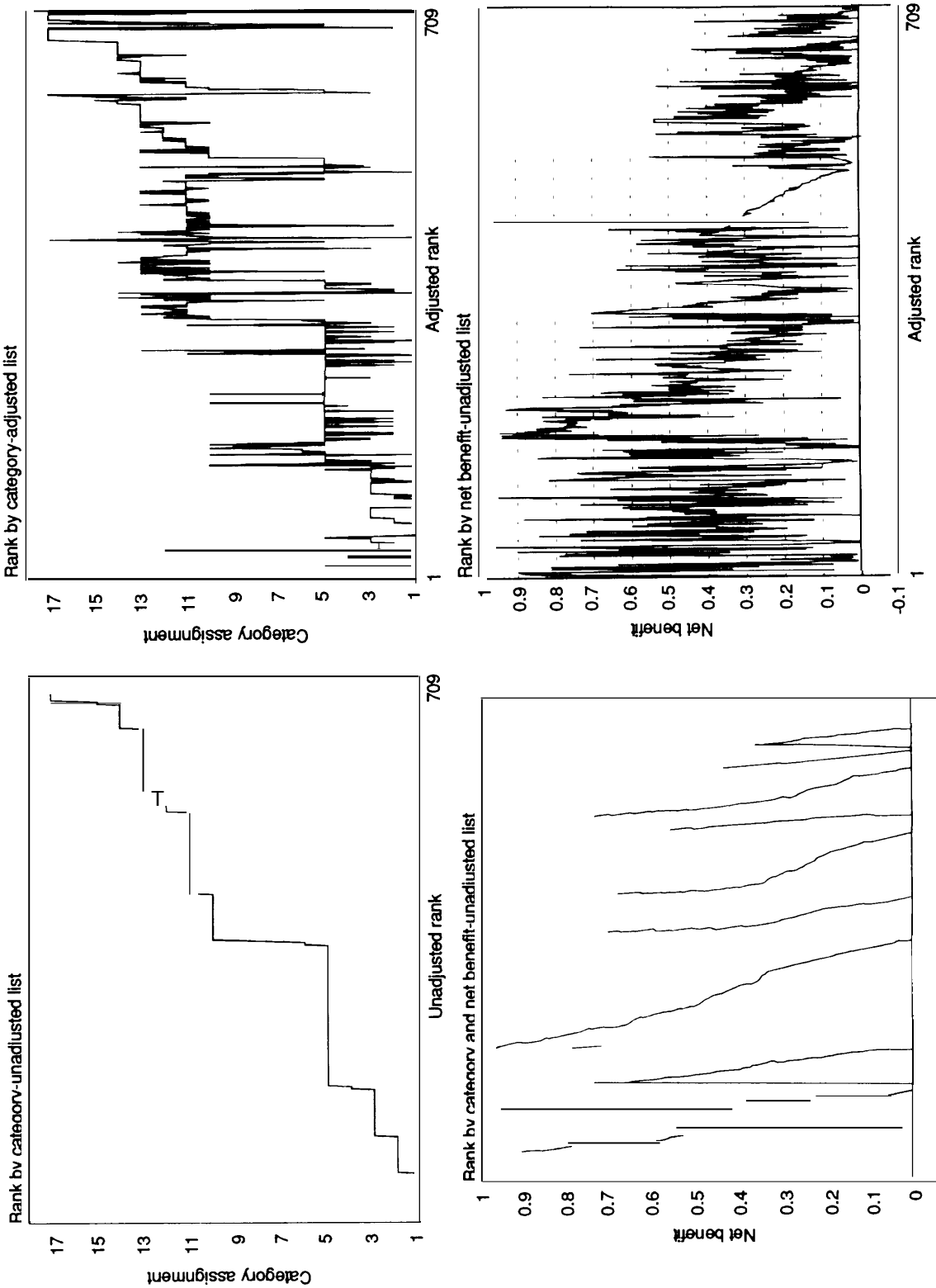
Box 3-l-Condition-Treatment (CT) Pairs Whose Coverage Status Changed as a Result of Ranking Adjustment-Continued

Adjusted rank	Unadjusted rank	Condition	Treatment
CT pairs not covered by adjusted ranking that would have been covered by unadjusted ranking			
588	577	Intervertebral disc disorders	Thoracic-lumbar laminectomy, medical therapy
599	463	Hydrocele	Medical therapy, excision
600	514	Absence of breast after mastectomy as treatment for neoplasm	Breast reconstruction
601	506	Spastic dysphonia	Medical therapy
606	166	Hepatorenal syndrome	Medical therapy
607	267	Other deficiencies of circulating enzymes (alpha 1-antitrypsin deficiency)	Lung transplant
608	350	Lethal midline granuloma	Medical therapy
609	351	Amyotrophic lateral sclerosis (ALS)	Medical therapy
610	235	Cancer of liver and intrahepatic bile ducts	Liver transplant
611	409	Hematoma of auricle or pinna and hematoma of external ear	Drainage
612	416	Enophthalmos	Revision
613	421	Acute lymphadenitis	Incision and drainage
614	462	Congenital anomalies of female genital organs	Surgical treatment
615	467	Generalized convulsive or partial epilepsy without mention of impairment of consciousness	Focal surgery
616	434	Varicose veins of lower extremities	Stripping/sclerotherapy
617	525	Disease of capillaries	Excision
618	486	Anomalies of relationship of jaw to cranial base, major anomalies of jaw size, other specified and unspecified dentofacial anomalies	Osteoplasty, maxilla/mandible
619	510	Congenital anomalies of the ear without impairment of hearing	Otoplasty, repair& amputation
621	489	Temporomandibular joint (TMJ) disorders	TMJ surgery
625	455	Cervical rib	Surgical treatment
645	581	Benign intracranial hypertension	Medical therapy
652	582	Food allergy	Medical therapy
654	530	Sublingual, scrotal, and pelvic varices	Venous injection, vascular surgery
687	97	Intraventricular and subarachnoid hemorrhage of fetus or neonate	Medical therapy
689	518	Sensorineural hearing loss	Cochlear implant
690	263	Alcoholic cirrhosis of liver	Liver transplant
691	329	Non-Hodgkin's lymphomas	Bone marrow transplant (5-6 loci match)
692	515	Obesity	Gastroplasty
694	403	Benign polyps of vocal cords	Medical therapy
706	522	Prolapsed urethral mucosa	Surgical treatment

[1] Only 26 of 30 CT pairs are listed. The 4 unlisted CT pairs cannot be identified from those that have no net benefit assigned to them (i.e., their unadjusted rank cannot be determined).

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

Figure 3-1—Relationship of Category Assignment and Net Benefit With Condition-Treatment (CT) Pair Rank for the Adjusted and Unadjusted Lists



SOURCE: Office of Technology Assessment, 992; based on 199· data from the Oregon Health Services Commission.

Table 3-3-Condition-Treatment (CT) Pairs by Category and Location on the List

Category	Number of CT pairs	Location on list						
		1-99	100-199	200-299	300-399	400-499	500-599	600-709
		Percent of CT pairs within ranges						
"Essential"								
1-9	*366*	*26.8*	*26.0*	*26.2*	*11.5*	*1.6*	*5.7*	*2.2*
1	64	79.7	10.9	4.7	1.6	1.6	1.6	0.0
2	48	45.8	25.0	12.5	12.5	2.1	0.0	2.1
3	61	32.8	50.8	3.3	6.6	1.6	3.3	1.6
4	4	50,0	25.0	25.0	0.0	0.0	0.0	0.0
5	182	1.6	20.9	46.2	16.5	1.6	9.9	3.3
6	4	0.0	75.0	0.0	25.0	0.0	0.0	0.0
7	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
8	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
9	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
"Very important"								
10-13	*275*	0.4	1.8	1.5	20.0	33.5	26.9	16.0
10	60	0.0	8.3	3.3	25.0	31.7	25.0	6.7
11	106	0.0	0.0	0.9	16.0	56.6	13.2	13.2
12	28	3.6	0.0	0.0	32.1	14.3	50,0	0.0
13	81	0.0	0.0	1.2	17.3	11.1	38.3	32.1
"Valuable to certain individuals"								
14-17	*68*	*0.0*	*0.0*	*0.0*	*4.4*	*2.9*	*7.4*	*85.3*
14	31	0.0	0.0	0.0	9.7	3.2	12.9	74.2
15	4	0.0	0.0	0.0	0.0	0.0	25.0	75.0
16	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
17	32	0.0	0.0	0.0	0.0	3.1	0.0	96.9
Total	709	14.0	14.1	14.1	14.1	14.1	14.1	15.5

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission. Total Percentages may not add to exactly 100.0 due to rounding error.

benefit score for that category. Peaks are highest (i.e., they approach 1.0) in categories 1 through 9 and are at their lowest in categories 14 through 17 (i.e., none exceed 0.5). The trend of declining net benefit with increasing category is expected because net benefit was considered when CT pairs were assigned to categories. There is a wide range of net benefit scores within each category, especially categories 1 through 9. While CT pairs in categories 1 through 9 include most (84 percent) CT pairs with high net benefit scores (i.e., 0.5 or higher), as many as one-quarter (26 percent) of category 1 through 9 CT pairs have benefit scores lower than 0.2 (table 3-4).

The HSC adjustment moved almost all CT pairs from their original position. Many CT pairs moved out of their category's range on the list or were reordered within their category's range. Figure 3-id shows the effect of this reordering-there are now wide fluctuations in net benefit by rank and the slopes seen in figure 3-lc have largely disappeared. Statistical tests confirm that following adjustment net benefit loses importance in determining CT pair rank. Although the adjusted and unadjusted rankings are highly correlated (correlation coefficient = 0.87),[30] the strength of this relationship is largely explained by CT pair category assignment. Category assignment alone is highly correlated to final list placement (correlation coefficient = 0.85).[31]

Net benefit determined CT pair order within categories on the unadjusted list. If CT pairs are analyzed by category, does this relationship still hold for the adjusted list? Figures 3-2A through 3-21 show net benefit among CT pairs within categories (ordered by rank within category). The wide fluctuations in net benefit persist in all but two categories—some CT pairs in categories 10 and 11 show net

[30] Correlation of 0.87 is significant at p = 0.001 (1-tailed).

[31] Correlation of 0.85 is significant at p = 0.001 (1-tailed).

Table 3-4-Net Benefit Scores by Category

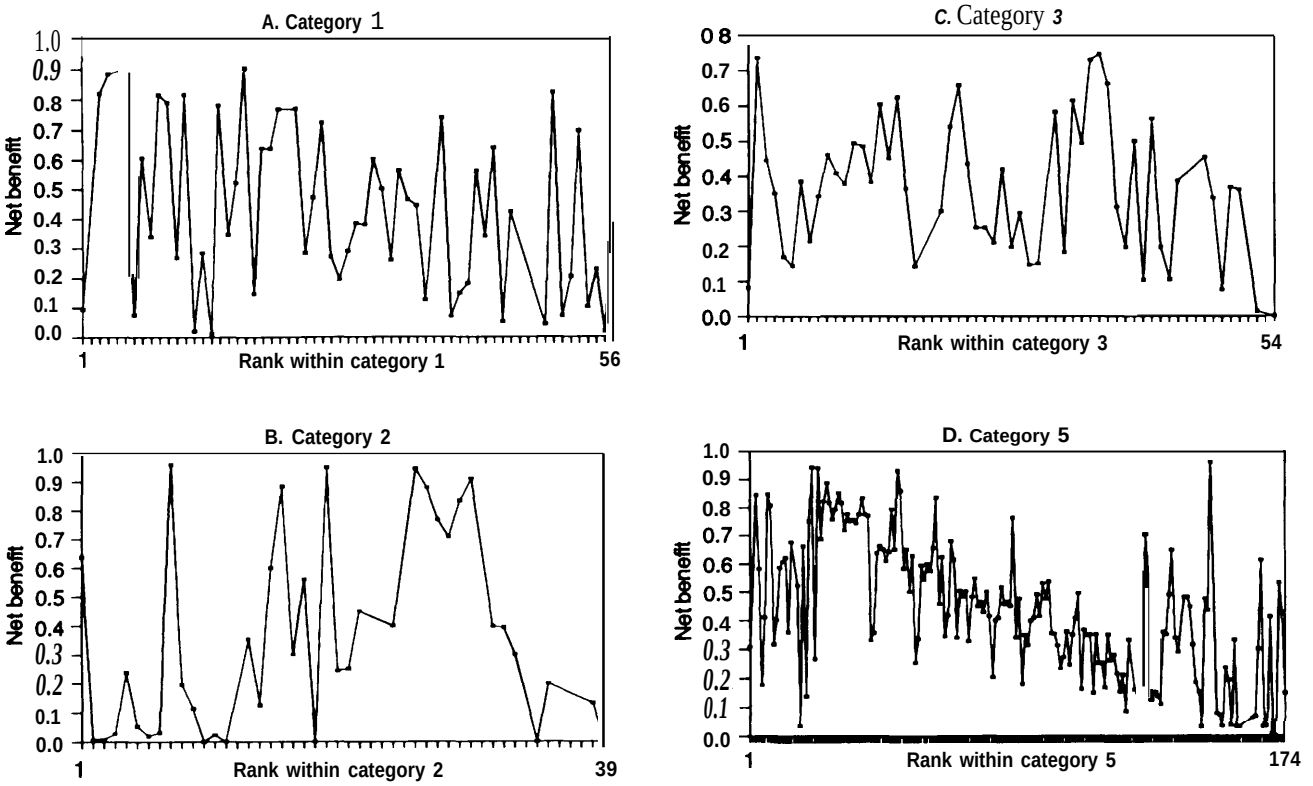
CT pair category[a]	Net benefit 0	<.1	.1-.19	.2-.29	.3-.39	.4-.49	.5-.59	.6-.69	.7-.79
					Percent (count)				
1-9	1.2 (4)	12.4 (41)	12.1 (40)	9.7 (32)	15.8 (52)	14.5 (48)	7.9 (26)	9.4 (31)	8.2 (27)
10-13	1.1 (3)	12.5 (33)	25.0 (66)	28.4 (75)	16.3 (43)	8.7 (23)	4.5 (12)	2.7 (7)	.8 (2)
14-17	18.2 (12)	36.4 (24)	19.7 (13)	16.7 (11)	7.6 (5)	1.5 (1)	0.0 (0)	0.0 (0)	0.0 (0)

NOTE: Number of missing observations = 49.

[a] The Health Services Commission considered categories 1-9 to be "essential," categories 10-13 "very important," and categories 14-17 "valuable to percentages may not add to exactly 100.0 due to rounding error.

SOURCE: Office of Technology Assessment, 1992; based on data from the Oregon Health Services Commission.

Figure 3-2—The Relationship Between Net Benefit and Rank Within Categories for the Adjusted List



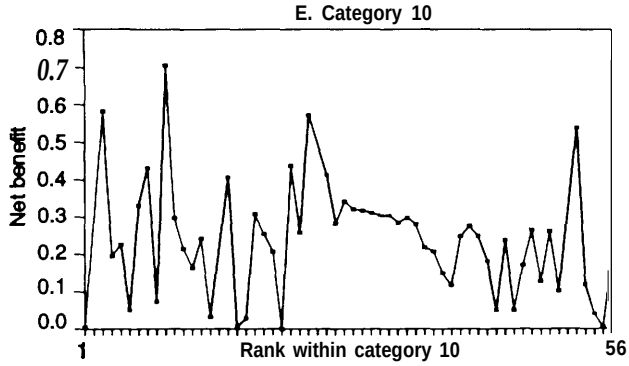
benefit gradually declining with increasing rank (see figures 3-2e and 3-2f). Figure 3-3 summarizes the relationship between within-category net benefit and rank showing median net benefit for categories and quartiles within categories. The expected decline in median net benefit as rank increases is seen in several categories (i.e., categories 5, 11, 12, 13, and 17).[32] Statistical tests show that following adjustment, CT pair rank within category is poorly or moderately correlated to rank based on net benefit (table 3-5).

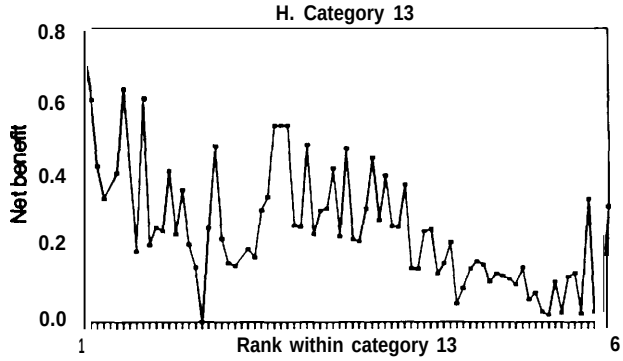
While net benefit is not, in itself, highly correlated with list placement,[33] of note is that none of the CT pairs below line 600 has a high net benefit term (i.e., 0,6 or above) and 88 percent (84/96) of CT pairs with high net benefit terms are above line 300 (see table 3-6). While a high net benefit term seems to be associated with high placement on the list, a low net benefit term (i.e., less than 0.2) is not associated with low placement. In fact, more than one-third (35 percent) of CT pairs with such low net benefit scores are above line 400.[34]

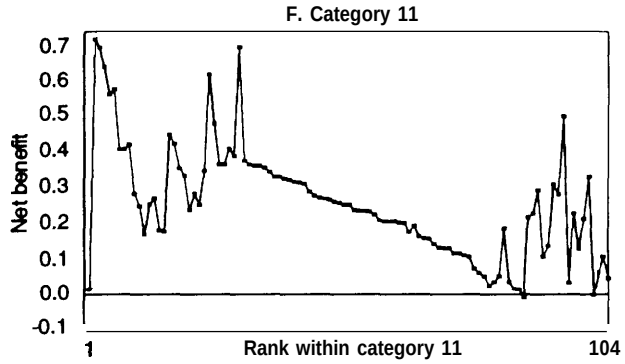
32 Another expected trend is that the median net benefit for categories in the essential range (i.e., categories 1 through 9) are generally higher@ those in the "important" range (i.e., categories 10 through 13), which are in turn higher than the median net benefit for CT pairs in the "important to individuals' range (i.e., categories 14 through 17). Category 2, maternity services is an exception—its median net benefit is lower than that of categories 10 through 13.

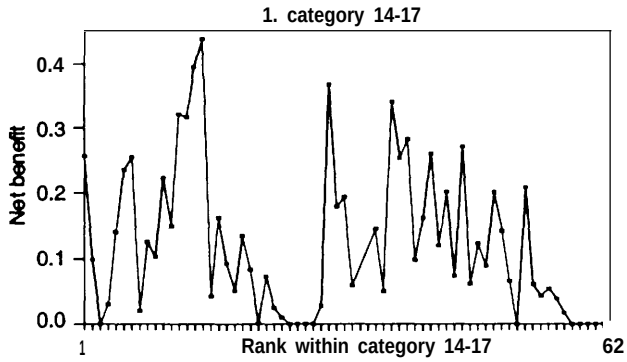
33 A ranking of CT pairs based on the net benefit term alone is only moderately correlated to the adjusted (correlation coefficient = 0.47, significant at P = 0.001 (l-tailed)) and unadjusted list (correlation coefficient = 0.41, significant at p = 0.001 (l-tailed)).

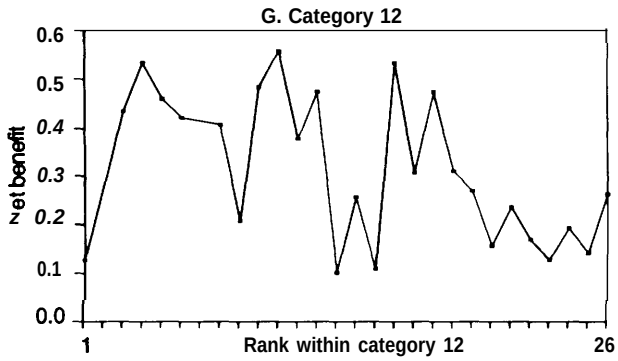
34 The relatively low net-benefit terms associated with some of the highly ranked CT pairs may be explained because avoidance of death does not always contribute to large changes in net benefit (35,244).











SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

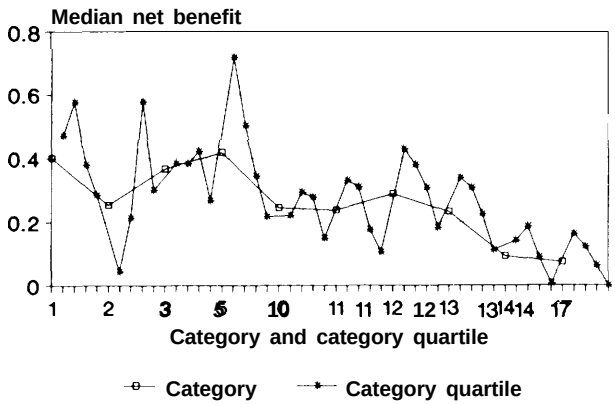
Table 3-5-Correlation Between Order of Condition-Treatment (CT) Pairs Within Categories if Determined by Rank or by Net Benefit[a]

Category	Number of CT pairs in category	Correlation between CT pair order within category by rank and net benefit	Percent of variation explained by net benefit
1	56	.3105[b]	9.6
2	39	–.2774	7.7
3	54	.1558	2.4
5	174	.6130[b]	37.6
10	56	.1836	3.4
11	104	.6699[b]	44.9
12	26	.4230	17.9
13	78	.6176[b]	38.1
14	31	.5099[b]	26.0
17	31	.7745[b]	60.0

a Analysis is limited to those categories with more than 10 CT pairs. Correlation is between order of CT pairs within category as ranked by the Oregon Health Services Commission and order expected if ranked by net benefit.
b Correlation is significant at p -.01 (l-tolled).

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission,

Figure 3-3-Median Net Benefit by Category and Quartile Within Category



SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

Characteristics of the List

The distribution of CT pairs on the list can be described by three CT pair-associated characteristics: age,[35] sex,[36] and treatment-associated costs.[37]

CT Pair Rank by Age-CT pairs related to children generally rank fairly high on the list. Nearly two-thirds (66 percent) of infant-related CT pairs, one-half (50 percent) of child-related CT pairs, and one-third (34 percent) of adolescent CT pairs are located within the top 300 lines (table 3-7). CT pairs associated with infants, senior adults (age 56 to 70), and the elderly (age 70 and older) are least likely to be toward the bottom of the list (i.e., below 587). The 27 CT pairs affecting infants, children, and adolescents falling below line 587 are shown in box 3-J.[38]

Ranking of CT Pairs Affecting Women-CT pairs affecting women also tend to rank relatively high on the prioritized list. Nearly all CT pairs can affect women (89 percent; 634 of 709), but 59 (8 percent) can be classified as "primarily or only" affecting women.[39] Of these, 41 percent (24 of 59 CT pairs) fall within the top 300 lines of the list and 17 percent (10 of 59 CT pairs) fall below line 587 (box 3-K).

CT Pair Rank by Cost—Nearly one-half (46 percent; 25 of 55 CT pairs) of high-cost CT pairs (i.e., $40,000 and above) are found within the top 300 lines of the list and as many as one-third of low cost CT pairs (i.e., less than $1,000) fall below line 587 (table 3-8).

35 Clinician panels in Oregon provided information on the age group usually affected by the CT pair. Some of the pediatric age cohort assignments made by the Oregon clinicians were incorrect according to an OTA clinical reviewer (235). For example, rheumatic fever (CT pair 145) was inappropriately omitted as a pediatric CT pair and cataract (CT pair 337) was inappropriately included as a primarily pediatric CT pair.

36 OTA clinical contractors identified CT pairs unique or common to women (14).

37 The HSC used information from clinicians and the Office of Medical Assistance Programs (OMAP) to estimate CT pair-associated cost groupings.

38 More than one-quarter (28 percent; 9/32) of CT pairs affecting adolescents and more than 1 in 10 (15 percent; 11/76) CT pairs affecting children fall below line 587 on the list (table 3-7).

39 CT pairs "primarily or only" affecting women are those for which women make up at least 75 percent of all patients (14).

Table 3-6—Net Benefit by Rank

	Net benefit											
CT pair rank	<0	< 1	1-.19	2-.29	3-.39	4-.49	.5-.59	.6-.69	.7-.79	.8-.89	.9-1.0	Row total
1-99												
Count	2	15	12	8	14	11	5	8	9	7	2	93
Row percent	2.2	16.1	12.9	8.6	15.1	11.8	5.4	8.6	9.7	7.5	2.2	14.1
Column percent	10.5	15.3	10.1	6.8	14.0	15.3	13.2	21.1	31.0	35.0	22.2	
100-199												
Count	0	8	11	10	9	6	8	8	15	10	4	85
Row percent	0.0	9.4	12.9	11.8	10.6	7.1	9.4	9.4	17.6	11.8	4.7	12.9
Column percent	0.0	8.2	9.2	8.5	9.0	8.3	21.1	21.1	51.7	50.0	44.4	
200-299												
Count	0	1	5	11	24	21	13	13	3	3	2	96
Row percent	0.0	1.0	5.2	11.5	25.0	21.9	13.5	13.5	3.1	3.1	2.1	14.5
Column percent	0.0	1.0	4.2	9.3	24.0	29.2	34.2	34.2	10.3	5.0	22.2	
300-399												
Count	2	11	16	18	13	17	3	7	2	0	0	89
Row percent	2.2	12.4	18.0	20.2	14.6	19.1	3.4	7.9	2.2	0.0	0.0	13.5
Column percent	10.5	11.2	13.4	15.3	13.0	23.6	7.9	18.4	6.9	0.0	0.0	
400-499												
Column	2	1	25	30	26	7	3	1	0	0	1	96
Row percent	2.1	1.0	26.0	31.2	27.1	7.5	3.1	1.0	0.0	0.0	1.0	14.5
Column percent	10.5	1.0	21.0	25.4	26.0	9.7	7.9	2.6	0.0	0.0	11.1	
500-599												
Column	0	23	18	28	11	6	5	1	0	0	0	92
Row percent	0.0	25.0	19.6	30.4	12.0	6.5	5.4	1.1	0.0	0.0	0.0	13.9
Column percent	0.0	23.5	15.1	23.7	11.0	8.3	13.2	2.6	0.0	0.0	0.0	
600-709												
Column	13	39	32	13	7	4	1	0	0	0	0	109
Row percent	11.9	35.8	29.4	11.9	6.4	3.7	0.9	0.0	0.0	0.0	0.0	16.5
Column percent	68.4	39.8	26.9	11.0	7.0	5.6	2.6	0.0	0.0	0.0	0.0	
Column total	19	98	119	118	100	72	38	38	29	20	9	660
	2.9	14.8	18.0	17.9	15.2	10.9	5.8	5.8	4.4	3.0	1.4	100.0

NOTE: Number of missing observations = 49. Total percentages may not add to exactly 100.0 due to rounding error.

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

Table 3-7--Condition-Treatment (CT) Pair Age Cohort[a] by Rank

CT pair rank	Age group													
	Infancy		Children		Adolescent		Young adult		Middle-age		Senior adult		Elderly	
	Percent (count)													
1-300	*65.9*	*(56)*	50.0	(38)	34.4	(11)	36.2	(77)	38.1	(69)	38.1	(32)	25.0	(2)
301-587	25.9	(22)	35.5	(27)	37.5	(12)	42.3	(90)	41.4	(75)	50.0	(42)	62.5	(5)
588-709	8.2	(7)	14.5	(11)	28.1	(9)	21.6	(46)	20.4	(37)	11.9	(Io)	12.5	(1)
Total	100.0	(85)	100.0	(76)	100.0	(32)	100.0	(213)	100.0	(181)	100.0	(84)	100.0	(8)

NOTE: n = 679; number of missing observations_ 30. Total percentages may not add to exactly 100.0 due to rounding error.
a Infancy = Less than age one; children = 1-10 years old; adolescent = 11-18 years old; young adult = 19-35 years old; middle-aged = 36-55 years old; senior adult = 56-70 years old; elderly = over 70 years old.

SOURCE: Office of Technology Assessment, based on data from the Oregon Health Services Commission, 1991.

Table 3-8-Condition-Treatment (CT) Pair Cost Interval[a] by Rank

CT pair rank	cost											
	up to $1,000		$1,000 to 4,999		$5,000 to 17,999		$18,000 to 39,999		$40,000 to 99,999		$100,000 and over	
	Percent (count)											
1-300	*22.7*	*(25)*	29.0	*(47)*	*46.0*	*(104)*	*67.3*	*(76)*	60.0	(18)	28.0	m
301-587	43.6	(48)	52.5	(85)	40.3	(91)	19.5	(22)	30.0	(9)	52.0	(13)
588-709	33.6	(37)	18.5	(30)	13.7	(31)	13.3	(15)	10.0	(3)	20.0	(5)
	100.0	(110)	100.0	(162)	100.0	(226)	100.0	(113)	100.0	(30)	100.0	(25)

NOTE: n = 666; number of missing observations = 43. Total percentages may not add to exactly 100.0 due to rounding error.
a The Oregon Health Services Commission estimated the cost interval for each CT pair.

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

Box 3—J-The 27 Condition-Treatment (CT) Pairs Affecting Children That Fall Below Line 587[1]

Rank	Condition	Treatment
594	Sprains, strains and non-allopathic spinal lesions: thoracic, lumbar and sacrum acute	Medical therapy
614	Congenital anomalies of female genital organs	Surgical treatment
618	Anomalies of relationship of jaw to cranial base, major anomalies of jaw size, other specified and unspecified dentofacial anomalies	Osteoplasty, maxilla/mandible
619	Congenital anomalies of the ear without impairment of hearing	Otoplasty, repair and amputation
624	Cavus deformity of foot	Medical therapy, orthotic
625	Cervical rib	Surgical treatment
634	Obesity	Nutritional and lifestyle counseling
639	Herpes simplex without complications	Medical therapy
640	Testicular and polyglandular dysfunction	Medical therapy
649	Diaper or napkin rash	Medical therapy
652	Food allergy	Medical therapy
660	Internal infections and other bacterial food poisoning	Medical therapy
662	Viral, self-limiting encephalitis, myelitis and encephalomyelitis	Medical therapy
663	Acute tonsillitis	Medical therapy
667	Aseptic meningitis	Medical therapy
668	Infectious mononucleosis	Medical therapy
669	Other nonfatal viral infections	Medical therapy
670	Acute pharyngitis and laryngitis and other diseases of vocal cords	Medical therapy
675	Vitiligo, congenital pigmentary anomalies of skin	Medical therapy
680	Agenesis of lung	Medical therapy
685	Ichthyosis	Medical therapy
687	Intraventricular and subarachnoid hemorrhage of fetus or neonate	Medical therapy
692	obesity	Gastroplasty
693	Congenital cystic lung-severe	Lung resection
705	Constitutional aplastic anemia	Medical therapy
708	Extremely low birth weight (under 500 gm) and under 23 week gestation	Life support
709	Anencephalous and similar anomalies and reduction deformities of the brain	Life support

1 This listing is based on data supplied by the HSC. The HSC may have misidentified some CT pairs as principally affecting children (e.g., obesity) (see reference 235).

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

Box 3-K-The 10 Condition-Treatment (CT) Pairs "Primarily or Only" Affecting Women That Fall Below Line 587[1]

Rank	Category	Condition	Treatment
598	15	Anovulation (infertility)	Medical therapy
600	11	Absence of breast after mastectomy as treatment for neoplasm	Breast reconstruction
603	15	Tubal disease	Microsurgery
614	11	Congenital anomalies of female genital organs	Surgical treatment
645	13	Benign intracranial hypertension	Medical therapy
666	14	Vulval varices	Vascular surgery
672	17	Old laceration of cervix and vagina	Medical therapy
681	17	Gallstones without cholecystitis	Medical therapy, cholecystectomy
683	17	Sicca syndrome	Medical therapy
696	15	Tubal dysfunction and other cases of infertility	In-vitro fertilization, GIFT[2]

1 CT pairs that "primarily or only" affect women are those for which women make up at least 75 percent of all patients (see ref. 14).
2 Gamete intrafallopian transfer.

SOURCE: Office of Technology Assessment, 1992; based on 1991 data from the Oregon Health Services Commission.

CRITIQUE OF THE PRIORITIZATION PROCESS

This section presents the results of OTA analyses designed to answer the following questions:

- How complete is the prioritized list? Are all important health care services included?
- How appropriately are conditions and treatments aggregated into CT pairs?
- Should category assignment be an important determinant of CT pair order on the prioritized list?
- How accurate is CT-specific outcomes information provided by panels of clinicians?
- Are the public's health state preferences appropriately integrated into the prioritization process?
- Were community values appropriately assessed and incorporated into the 'prioritization process?

Completeness of the Prioritized List

Virtually all conditions are accounted for in the prioritization process, according to a study conducted to assess the list's completeness. OTA identified a systematic sample of ICD-9-CM codes[40] and checked inclusion of these codes on the prioritized list or on the "Missing ICD-9 Code Report" provided by the HSC (192). The missing code report includes 948 ICD-9-CM codes intentionally omitted from the prioritized list, representing roughly 10 percent of all ICD-9-CM codes. In all but one case, the sampled codes, or the more detailed subcodes, were found on either the prioritized list or the missing code list.

OTA reviewed selected conditions listed on the "Missing ICD-9 Code Report"[41] and found that most omitted codes either represent conditions or treatments initially excluded from prioritization (e.g., mental health conditions) or are nonspecific codes that the HSC intentionally omitted from the list (e.g., ICD-9-CM code 459, other disorders of circulatory system). By omitting the nonspecific codes, the HSC hoped to encourage clinicians to use specific codes. Currently, all codes ending in "99" require manual review prior to payment (170).

Some conditions represented on the missing code list, however, probably represent errors. The codes for secondary hypertension (ICD-9-CM code 405) and hypertensive renal disease (ICD-9-CM code 403), for example, should probably have been included within CT pairs 147 (hypertension and hypertensive disease) and 148 (hypertensive heart and renal disease), respectively. Similarly, impetigo (ICD-9-CM code 684)[42] and carbuncle and furuncle (ICD-9-CM code 680) should probably have been included in CT pair 217, infectious skin conditions.

Some missing codes may represent more serious omissions. The following are examples of conditions that will probably have to be reviewed by the HSC and formally added to the list through its technical review process: benign neoplasms of the eye (ICD-9-CM code 224); disorders of fluid, electrolyte, and acid-base balance (ICD-9-CM code 276);[43] visual disturbances (ICD-9-CM code 368); and chronic laryngitis (ICD-9-CM code 476).

Appropriateness of Aggregation of Conditions and Treatments Into CT Pairs

Ideally, patients falling within any given CT pair should have similar clinical experiences with treatment. According to OTA's review of CT pair content, however,[44] CT pairs are so broadly defined that in many instances patient outcomes can vary substantially within a CT pair. Heterogeneity within CT pairs can often be traced to outcome differences expected by patient characteristics such as age and comorbidity. Some patient subpopulations within high-ranking CT pairs have as poor an expected outcome as patients falling into below-the-line CT

40 A systematic sample of 39 ICD-9-CM three-digit codes (representing 4 percent of a total of 910 three-digit codes) was selected from *The International Classification of Diseases, 9th Revision, Clinical Modification. Every 25th code was* selected following a random start. Excluded from this sample were 'E" codes used to classify injuries and diseases caused by external events (e.g., railway and motor vehicle accidents) and "V" codes used to classify procedures that do not fall into either the numerical or "E" code categories.

41 OTA analyzed all 131 three-digit ICD-9-CM codes listed in the ''Missing ICD-9 Code Report' (192).

42 Impetigo herpetiformis is listed on line 591.

43 The HSC is considering adding anew CT pair for disorders of fluid, electrolyte, and acid-base balance to the revised list that is expected to be issued in h&y 1992 (35).

44 The clinical review was undertaken on OTA's behalf by four physicians (two internists and two pediatricians) who reviewed the entire prioritized list (14,80,235). For this and other analyses, the clinical contractors were instructed to use readily available published information (e.g., review articles, medical textbooks) and consultations with experts.

pairs. Conversely, some patient subpopulations within low-ranking CT pairs probably have as good a prognosis as those falling within above-the-line CT pairs. This issue is explored further in a later section of this chapter, which provides the results of a clinical evaluation of the list.

Specific types of clinical problems with CT pair content include:[45]

- Heterogeneous conditions within CT pairs--CT pairs often include several ICD-9-CM codes that describe conditions with very different consequences. CT pair 95, for example, includes myocarditis, pericarditis, and endocarditis, which differ in their clinical implications and their responses to treatment. CT pair 663, medical therapy for acute tonsillitis, includes both viral pharyngitis (a simple sore throat) and gangrene of the tonsils. Even within an ICD-9-CM code there can be markedly different clinical states. Patients with benign prostatic hypertrophy (a single ICD-9-CM code), for example, range from having no urinary symptoms to experiencing very severe symptoms, such as urinary retention.
- Inappropriate grouping of CT pairs-Some CT pairs include clinical conditions that are themselves diverse, with widely different implications. Line 264, for example, includes diseases of white blood cells, some of which are trivial or benign while others are life-threatening. Line 640 includes testicular hyperfunction, which may require no treatment, and Schmidt's syndrome, which is fatal without treatment of the adrenal insufficiency, and for which the treatment is inexpensive and completely effective (31 1).
- Lack of information on comorbidity--Some CT pairs are commonly associated with other illnesses, making their ranking problematic. Disseminated intravascular coagulation (CT pair 102), for example, is often a secondary result of a primary condition such as cancer or infection. It is difficult to evaluate this secondary condition without knowledge of the underlying primary condition. Age is a predictor of treatment outcomes for many conditions, yet only two conditions are split into separate CT pairs by age to distinguish childhood from adult forms of disease (i.e., hearing loss and acute lymphocytic leukemia). The HSC was concerned that making distinctions by age might be interpreted as discriminatory (244).
- Inappropriate separation of CT pairs-Some CT pairs are so similar that separating them seems unnecessary. CT pairs 11, 100, and 119, for example, represent surgical repair for injuries to major blood vessels (i.e., upper extremity, thoracic cavity, lower extremity) that have similar outcomes and could have been grouped together. Other CT pairs are inappropriately separated on the list if clinical outcome itself is the only criterion. Liver transplantation for nonalcoholic liver failure is widely separated from transplantation for alcoholic cirrhosis of the liver (line 366 and 690), despite similar success rates (299). A more reasonable distinction could have been made based on liver failure associated with hepatitis B virus or cancer (14).
- Inappropriate prognostic staging—For some CT pairs, attempts to distinguish among different grades or stages of the same disease are inadequate or inappropriate (e.g., cancers, human immunodeficiency virus (HIV) disease, burns). Cancer is categorized as treatable or nontreatable, the latter being defined as "treatment results in less than a 10 percent chance of survival in 5 years.
- ICD-9-CM/CPT-4 code mismatch—There are substantive inconsistencies between the ICD-9-CM or CPT-4 codes listed and the verbal diagnosis or treatment descriptions listed for some CT pairs. So-described "treatable dementia' (line 230), for example, includes some codes for dementias that some clinicians would not consider effectively treatable (i.e., ICD-9-CM 290.40, multi-infarct dementia and ICD-9-CM 291.2, alcoholic dementia) (14).
- Apparent coding errors-There are numerous examples of duplicate or misplaced ICD-9-CM or CPT-4 codes. If uncorrected, some coding problems could contribute to misinterpretation of the scope of conditions or treatments included in the CT pair.[46]

45 The HSC is in the process of correcting some technical errors and plans to issue a revised list in May 1992 (244).

46 OTA clinical reviewers and an obstetrician-gynecologist consultant were unable to comprehend one CT pair (line 672, medical therapy for old laceration of cervix or vagina).

To better understand how often these types of problems occurred, OTA's contractors analyzed a systematic sample of 35 CT pairs.[47] Nearly one-third (10 of 35) of sampled CT pairs encompass such a wide variety of conditions that available information from the literature on condition-specific outcomes could not be interpreted to provide reliable CT pair outcome estimates. Comorbidity or other factors were noted to substantially affect the outcomes of over one-third (14 of 35) of sampled CT pairs. One-half (18 of 35) of sampled CT pairs had at least one of these problems (i.e., heterogeneous CT pair or CT pair substantially affected by comorbidity or other factors).

The Use of Categories in Prioritization

ACT pair's health service category assignment is an important determinant of CT pair placement on the prioritized list. OTA critiqued the use of health service categories as a prioritization tool and then assessed the category assignment of a sample of CT pairs.

The 17 health service categories used to rank CT pairs were a useful organizational tool for the HSC, but their use has some inherent drawbacks because of the inability of the categories to distinguish conditions on grounds that are clinically meaningful. The distinction between acute and chronic conditions in 8 of the 17 categories, for example, is clinically irrelevant to its "importance.' If two conditions, one acute and episodic (e.g., vaginal infections), the other chronic (chronic cystitis), both have similar outcomes with treatment, there is little clinical reason one should be ranked above the other. Other distinctions between categories may also be poor indicators of clinical ' 'importance. ' Categories 11 (i.e., chronic nonfatal, one-time treatment improves quality of life) and 13 (chronic nonfatal, repetitive treatment improves quality of life), for example, differ only because one treatment needs to be repeated and the other doesn't. The HSC prioritized category 11 CT pairs because they represent services that are likely to be less costly (i.e., only performed once) and more convenient for patients (244).

To assess whether the classification system was ambiguous, OTA had clinician reviewers examine the categorization of a systematic sample of 35 CT pairs. Two CT pairs were viewed as being assigned to the wrong category (lines 112 and 412). Another six CT pairs' assignments were viewed as possibly correct, but given the nature of the condition, the CT pair could easily have been assigned to another category. Otherwise the clinicians agreed with CT pair assignment to categories. OTA concludes that some CT pairs' placement (as many as one in five) into categories are at least debatable. Given that category placement had important implications for final ranking, some CT pairs could probably be justifiably moved on the list.

Accuracy of Outcomes Information Supplied by Clinicians

Net benefit was not as important a determinant of CT pair placement on the list as other aspects of the prioritization process. Nonetheless, the outcome information provided to the HSC by clinicians was a vital conceptual part of the process. This section explores whether that information was accurate and could have been used reliably.

OTA's clinician contractors evaluated morbidity and mortality data for a systematic sample of 35 CT pairs. These data are integral to the calculation of CT pair net benefit values. OTA reviewers found that the net benefit value assigned to most CT pairs (22 of 35 CT pairs) was difficult to justify based on available published information. When the direction of the discrepancy could be determined, there were as many overestimates of net benefit as underestimates.

Reviewers also assessed the appropriateness of the set of health states available to characterize morbidity. For more than one-half of sample CT pairs (19 of the 35), the assigned health states were viewed as inadequate descriptors of morbidity (e.g., the symptoms of stroke and glaucoma, CT pairs 252 and 332 respectively, are not well defined by the list of health states). Pediatrician reviewers felt that the health states failed to account for the unique developmental and physiologic concerns of children (e.g., problems of weight gain, failure to thrive). Reviewers also noted several instances where health states were erroneously assigned to a condition (e.g., "cough, wheeze, or trouble breathing" assigned to anal fissure, line 432).

47 OTA selected a 5 percent systematic sample of 709 CT pairs for this and other analyses. Every 20th CT pair on the list was selected from a randomly selected starting point.

While outcomes assessment by this method may vary among individuals according to experience and opinion, the OTA reviewers' assessments demonstrate that at best it is a highly subjective process. Several specific aspects of the outcomes gathering process that may have contributed to inconsistencies in outcomes assessment are discussed below.

Provider panels varied in size and methods. There were no requirements regarding the composition or size of the clinician panels, which ranged from 3 to 14 members (244). Since the literature suggests that group judgments vary according to group size and composition, each panel's outcome assessments might have been different if a group of a different makeup had been assembled (48,69).

Clinician panels were given a uniform charge with explicit instructions on how to provide outcomes information, but the actual methods adopted by various panels to complete their charge varied. Clinicians generally provided information based on their training, experience, and clinical judgment, but sometimes they made a special review of the professional literature, especially when considering new methods of treatment, such as transplants.[48] The type of data available to assess outcomes varied. Rarely, Oregon-specific data were available to help assess outcomes. For example, treatment outcomes of coronary artery bypass grafting (CABG)[49] and percutaneous transluminal coronary angioplasty (PTCA)[50] for coronary artery disease (CAD) were obtained by examining a historical database containing information from approximately 20,000 patients who had been treated with CABG or PTCA at one hospital in Portland, Oregon.

There was little attempt to identify clinician bias in reporting treatment outcomes. The HSC assigned groups of CT pairs to provider panels according to their specialty. Neonatologists, for example, were assigned CT pairs related to the critical care of newborns, and cardiologists were assigned cardiovascular-related CT pairs. Each CT pair was assigned to only one panel. CT pairs that could fall under the domain of both internists and specialists (e.g., ischemic heart disease, diabetic care) were usually assigned to the more specialized provider group.

Specialist data could have been systematically reviewed by other clinician groups (e.g., pediatric review of neonatology data) to identify whether specialists tend to overestimate the effectiveness of their treatments. A systematic primary care provider review might have been helpful, as these providers may be most familiar with the outcomes of many interventions at the 5-year endpoint specified by the HSC. The HSC's five primary care clinicians reviewed outcomes information and all participating panelists had an opportunity to review the HSC finalized list.

Important physician groups did not participate in the process. A list of clinician groups that provided outcomes information is shown in table 3-9. Two primary care provider groups, general pediatricians[51] and family practitioners, decided not to provide information on CT pair-specific treatment outcomes. Both the pediatricians and family practitioners informed the HSC that outcomes data for primary care treatments were generally unavailable, but they encouraged the HSC to get more readily available nonprimary care outcomes data from specialty or subspecialty groups.

Clinicians providing outcomes information were not representative of Oregon physicians. Clinician panel participants were generally representatives of the State's professional societies. The general internists that participated, for example, were senior officials of the Oregon Society of General Internal Medicine. The clinical opinions of these officials might differ from those of nonparticipating physicians. Nonetheless, the HSC made a concerted effort to ensure participation from as many volunteer clinicians as possible.

Factors affecting outcomes (e.g., age, comorbidity) were not handled consistently among panels. As anticipated, the clinician groups often had difficulty providing outcomes information for "average" patients and split CT pairs by such factors as age and

48 Clinicians relied on the professional literature for only 4 to 5 percent of their outcome judgments (244).

49 CABG is an operative procedure in which a vein from the leg is removed and surgically implanted in a coronary artery to "bypass" an obstruction.

50 PTCA is a nonoperative intervention in which a balloon on the end of a catheter is threaded into an obstruction of a coronary artery and inflated rapidly to "crack' the obstruction.

51 Pediatricians provided information on the timing and frequency of well-child care visits. one pediatrician provided outcomes information on otitis media treatment (35).

Table 3-9-Provider and Specialty Groups Submitting Health Outcomes Data to the Health Services Commission (HSC)[a]

Acupuncture	Obstetrics and gynecology
Adult infectious disease	Oncology
Allergy	Ophthalmology
Burn care	Oral surgery
Cardiovascular surgery	Orthopedics
Cardiology	Osteopathy
Chiropractic	Otorhinolaryngology
Cornea transplant	Pain management
Dentistry	Pediatrics[b]
Dermatology	Pediatric cardiology
Diabetes	Pediatric infectious disease
Endocrinology	Pediatric rehabilitation
Gastroenterology	Pediatric surgery
General surgery	Physician's assistants
Genetics	Plastic surgery
Hyperbaric oxygen	Podiatry
Metabolic specialists	Poison control
Internal medicine	Psychiatry
Morbid obesity	Radiology oncology
Naturopathy	Rehabilitation & physical medicine
Neonatology	Rheumatology
Nephrology	Thoracic surgery
Neurology	Transplant surgery
Neurosurgery	Trauma
Nurse practitioners	Urology

a This list includes clinician groups that completed structured worksheets prepared by the HSC to collect treatment-related outcomes information. Other clinician groups provided information to the HSC at public meetings and in correspondence.
b General pediatricians from the Oregon Pediatric Society provided information to the HSC on the periodicity of well-child visits. One pediatrician provided outcomes data for the acute otitis media CT pair.

SOURCE: D. Coffman, researcher, Oregon Health Services Commission, Salem, OR, personal communication, Dec. 17, 1991.

comorbidity.[52 53] The internal medicine provider panel, for example, provided outcomes information for:

- Patients who had only the condition in question,
- Patients with other complicating conditions, and
- The average elderly patient (1 12).

Cardiology specialists also stratified their outcomes. They provided their outcome estimates for CABG and PTCA interventions for CAD based on the New York Heart Association classification of the patient at the time of diagnosis.[54] Other panels, on the other hand, provided more general outcomes information.

Where panels provided detailed information, the detail was often lost in the final CT pair list. The HSC extensively reviewed outcomes information provided by the panels and grouped many treatments and conditions into general categories. The physicians on the HSC used their judgment to revise outcomes estimates when information from several CT pairs were grouped. Revised data sheets were sent to provider panels with an accompanying memo asking them review the outcomes information and the appropriateness of service category placements. Outcomes information supplied by some of the specialty groups were subjected to review by a clinician who had not participated in the initial process.

The outcomes assessment method may have underestimated the value of treatments for acute conditions. Clinician panels provided outcomes information for treatment effects at 5 years. Many acute conditions may be resolved eventually without treatment (e.g., sprains and strains), but treatment effectively relieves immediate symptoms. With the estimate of the effects of treatment and lack of treatment set at 5 years, some treatments effective in the short term are not identified as effective. In the example of sprains and strains, comparing the 5-year outcomes of no treatment with treatment would indicate no benefit, assuming the sprain or strain would resolve itself eventually. The benefit of immediately alleviating symptoms such as pain is not captured.

Use of Health Outcomes Information To Place CT Pairs Into Categories

Much of the health outcomes information obtained from clinician panels was inconsistent with the published literature or contradicted OTA contractor's clinical judgment, and yet the information was used to assign most CT pairs to categories. This may, in part, explain why OTA clinicians found CT pair category assignment to be debatable in 20

52 Comorbid conditions are coexisting health problems that tend to worsen the patient's overall clinical condition.

53 The HSC anticipated that clinician panels would have problems and instructions to panels stated that, "[I]t is understood that some outcome data may be subjective in nature. A disease may be bimodal with significantly different outcomes occurring dependent on age of onset or vary according to the extent of the disease at the time of presentation (stage). If this is the case, please use two or more lines to define the condition . . . .Please think of the average patient that presents with this condition, not the extremes.'

54 The New York Heart Association classification system stratifies patients with CAD into four separate categories depending on their type and severity of symptoms.

percent of the sample of CT pairs they reviewed. Even if one assumes that the health outcomes information was an accurate reflection of clinical practice in Oregon, there are some apparent inconsistencies in CT pair category assignment. Nearly one-quarter (23 percent) of CT pairs in category 12, for example, have high with-treatment benefit scores[55] (i.e., 0.9 or above), despite being defined as conditions for which treatment is ''without return to previous health." The health outcomes estimates appear to be consistent with category 17 placement where all 31 CT pairs have low net-benefit values (less than 0.4) indicating "minimal or no improvement in quality of life.

Incorporation of Oregonians' Health State Preferences Into the Measurement of Treatment Outcomes

An innovative aspect of the HSC prioritization method is the incorporation of public perceptions of health states into the assessment of treatment outcomes. Public preferences for health states were obtained from a telephone survey and average preference weights were then incorporated into the estimate of a CT pair's net benefit. Neither net benefit nor the incorporated survey weights were important determinants of CT pair list placement, but the effort to measure public health state preferences was an important conceptual aspect of the prioritization process.

The preference weights derived from the telephone survey have a number of problems that render them inadequate representations of true public preferences as applied in Oregon's prioritization process (OTA analyses of the survey are described in more detail in app. C):

. More than one-third of respondents (381 of 1001) gave inconsistent responses, indicating that they had difficulty with the telephone interview. More than one-quarter (27 percent) of respondents, for example, provided illogical responses to the nested questions pertaining to functional limitations. One example of such a response is giving a less-favorable score to a health state defined by one fictional limitation (e.g., used a wheelchair) than to a health state including that and an additional limitation (e.g., used a wheelchair *and* needed help going to the bathroom or eating). Respondents with inconsistent responses were significantly more likely to be insured through the Medicaid program, have incomes at or below the Federal poverty level, and be members of a racial/ethnic minority group.

The HSC decided to use all values from the survey, despite the logical inconsistencies of some responses. According to OTA analyses, however, adjusting the data for inconsistencies does alter the weights and had net benefit been used to rank CT pairs within category, the order of some CT pairs would have changed had adjusted weights been used.[56] But even if the survey-derived weights were adjusted, evidence of respondent confusion might invalidate their use.

Respondent confusion may account for the presence of some counter-intuitive weights. Having stomach aches, vomiting, or diarrhea (-0.370), for example, was viewed as comparable to having a bad burn over large areas of the body (-0.372).

- For many states, individual scores varied widely from the average, suggesting either that there is general disagreement regarding the implications of the specified health states or that health states were too broadly defined (table 3-10).[57] Many of the health states include a wide range of conditions (e.g., coma and fainting are included in the same health state), and it is possible that different weights would have been obtained if health states had been more precisely defined.
- Weights differ significantly by respondent sociodemographic characteristics such as age and sex and according to whether the respondent had experienced the health state. Among the trends noted are that: respondents who had experienced the health state in question viewed

55 Net benefit is the difference between the assessed benefit with and without treatment.

56 An estimated 49 CT pairs (7 percent of 709 CT pairs) would move 10 or more lines if adjusted weights were used instead of unadjusted weights. These shifts would not have changed coverage status with coverage set at line 587.

57 The variation of individual Oregon scores as reported in table 3-10 is of the same magnitude as istypically feud in preference measure s. Available evidence suggests that while individuals within groups express differences in preference, preference weights are relatively constant from group to group (260).

Table 3-10-Functional Limitation and Health State/Symptom Weights, Standard Deviations, and 95 Percent Confidence Intervals

Survey item	Oregon weight	Standard deviation	Confidence interval[a]
Functional limitation			
Mobility			
MI. Have to stay at hospital or nursing home.	-0.049	.137	(-0.057, -0.041)
M2. Cannot drive a car or use public transportation	-0.046	.112	(-0.054, -0.038)
Physical activity			
PI. Have to be in bed or in a wheelchair controlled by someone else	*-0.560*	*.257*	(-0.575, -0.543)
P2. Have to use a walker or wheelchair under your own control	-0.373	*.246*	(-0.389, -0.357)
Social activity			
S1. Need help to eat or go to the bathroom.	-0.106	.146	(-0.1 16, -0.096)
S2. Are limited in the recreational activities you may participate in.	-0.062	.099	(-0.068, -0.056)
Health states/symptoms			
HI. Have losses of consciousness from seizures, blackouts, or coma.	-0.114	.175	(-0.126, -0.102)
H2. Have a bad burn over large areas of your body ... ,	-0.372	.265	(-0.388, -0.356)
H3. Have drainage from your sexual organs and discomfort or pain	-0.325	.240	(-0.341, -0.309)
H4. Have trouble learning, remembering, or thinking dearly	-0.367	.235	(-0.381, -0.353)
H5. Have difficulty in walking because of a paralyzed or broken leg, but you have no other limitations on activity.	-0.253	.210	*(--0.267, -0.239)*
H6. Have a painful or weak rendition of the back or joints	-0.253	.210	*(-0.267, -0.239)*
H7. Have pain while you are urinating or having a bowel movement. ... , .	-0.299	.236	*(-4.315, -0.283)*
H8. Have stomach aches, vomiting, or diarrhea	-0.370	.239	*(-0.386, -0.354)*
H9. Experience a lot of tiredness or weakness.	-0.275	.201	*(-0.287, -0.263)*
H1O. Cough, wheeze, or have trouble breathing	-0.318	.224	*(-0.332, -0.304)*
H11. Are often depressed or upset	-0.326	.234	*(-0.340, -0.312)*
H12. Have headaches or dizziness	-0.305	.221	*(-0.319, -0.291)*
H13. Have an itchy rash over large areas of your body	-0,297	.227	*(-0.311,* -0.283)
H14. Have trouble talking, such as a lisp, stuttering, or hoarseness	-0.188	.202	(-0.200, -0.176)
H15. Have pain or discomfort in your eyes or vision problems that corrective lenses can't fix.	-0.248	.212	(-0.262, -0.234)
H16. Are overweight or have acne on your face .,	-0.215	.227	(-0.229, -0.201)
H17. Have pain in your ear or trouble hearing	-0.217	.204	(-0.229, -0.205)
H18. Are on prescribed medicine or a prescribed diet for health reasons , .	-0.123[b]	.183	(-0.135, -0.1 11)
H19. Wear glasses or contact lenses	-0.055	.166	(-0.065, -0.045)
H20. Have trouble falling asleep or staying asleep	-0.248	.218	(-0.262, -0.234)
H21 . Have trouble with sexual interest or performance.	-0.276	.246	(-0.292, -0.260)
H22. Can't stop worrying.	-0.215	.216	(-0.229, -.201)
H23. Have trouble with the use of drugs or alcohol	-0.455	.290	(4.473. -0.437

a The 95 percent confidence interval shows the range of values that should include the true weight 95 percent of the time. The confidence interval is calculated by taking the weight +/- two times the standard error.
b The Health Services Commission decided not to use this weight (see text).

SOURCE: Office of Technology Assessment, 1992, based on analyses of 1990 telephone survey data supplied by the Oregon Health Services Commission.

12 health states more favorably than those who had not experienced them (e.g., having difficulty in walking); increased age was associated with less favorable scores for 11 of the health states (e.g., have trouble talking); males viewed 3 health states as being significantly worse than did females (e.g., trouble with sexual interest or performance) [58] (table 3-11).

If net benefit had been used to order CT pairs within categories and the weights of those who had experienced the health state were used instead of weights for the entire sample, the relative position of 45 CT pairs (6 percent of 709 CT pairs) would have changed by 10 or more lines. Following these shifts, six CT pairs would have changed coverage status with coverage set at line 587 (three would have moved up to be covered, three would have moved down to lose coverage). Selective use of women's weights for health conditions such as dysmenorrhea (CT pair 574) also would affect the ranking of some CT pairs.[59]

58 Women viewed three health states as being significantly worse than did *men (e.g.,* having a bad bin).

59 For example, men viewed experiencing drainage from sexual organs and sexual dysfunction less favorably than did women. US@ women's weights for these symptoms, which are associated with dysmenorrhea, would have the effect of moving that CT pair down the list by 10 lines (see app. C, box C-5, for net benefit calculations for this CT pair).

Table 3-1 l—Differences in Oregon's Preference Weights by Medicaid Status, Poverty, Race/Ethnicity, Age, Sex, Experience With Problem, and Metro/Nonmetro Residence[a]

Survey items	Medicaid status[b]	Poverty[c]	Race/ethnicity[d]	Age[e]	Sex[f]	Experience with problem[g]	Residence metro/nonmetro[h]
Functional limitations							
Mobility							
MI. Have to stay at hospital or nursing home	—	—	—	J	—	—	—
M2. Cannot drive a car or use public transportation	—	—	—	—	—	—	—
Physical activity							
PI. Have to be in bed or in a wheelchair controlled by someone else	—	—		—	—	—	—
P2. Have to use a walker or wheelchair under your own control	—	—		—	✓	J	—
Social activity							
S1. Need help to eat or go to the bathroom	—	—	J	J	✓	—	—
S2. Are limited in the recreational activities you may participate in.	—	—	J	—	—	—	J
Health states/symptoms							
H1. Experience loss of consciousness due to seizures, blackouts, or coma.	—	—	—	—	✓	—	—
H2. Have a bad burn over large areas of your body.	—	—	—	✓	✓	—	—
H3. Have drainage from your sexual organs and discomfort or pain	—	—	J	✓	✓		J
H4. Have trouble learning, remembering, or thinking dearly	—	—	—	—	—	J	—
H5. Have difficulty in walking because of a paralyzed or broken leg, but you have no other limitations on activity	—	—	—	—	—	J	—
H6. Have a painful or weak condition of the back or joints	—		—	—	—	—	—
H7. Have pain while you are urinating or having a bowel movement	—	—	—	✓	—		—
H8. Have stomach aches, vomiting, or diarrhea.	—	—	—	✓	—	✓	—
H9. Experience a lot of tiredness or weakness	—	—	—	✓	—	✓	—
H10. Cough, wheeze, or have trouble breathing	—	—	—	✓	—	✓	J
H11. Often depressed or upset	—	—	—	—	—		—
H12. Have headaches or dizziness	—	—	—	J	—	J	—

Table 3-n-Differences in Oregon's Preference Weights by Medicaid Status, Poverty, Race/Ethnicity, Age, Sex, Experience With Problem, and Metro/Nonmetro Residence[a]--Continued

Survey items	Medicaid status[b]	Poverty[c]	Race/ethnicity[d]	Age[e]	Sex[f]	Experience with problem[g]	Residence metro/nonmetro[h]
H13. Have an itchy rash over large areas of your body	—		—	J	—	—	—
H14. Have trouble talking, such as a lisp, stuttering or hoarseness	—	—	—	J	—	—	—
H15. Pain or discomfort in your eyes or vision problems that corrective lenses can't fix	—	—	—	—	—	—	—
H16. Overweight or have acne on your face	—	—	—	√	—	√	—
H17. Have pain in your ear or trouble hearing	—	—	√		—	—	—
H18. Are on prescribed medicine or a prescribed diet for health reasons	—	—	—	—	—	J	—
H19. Wear glasses or contact lenses	—	—	—	—	—	J	—
H20. Have trouble falling asleep or staying asleep	—	—	J	—	—	√	—
H21. Have trouble with sexual interest or performance	—	—	—	J	√	√	—
H22. You can't stop worrying	—	—	—	—	—	—	—
H23. Have trouble with the use of drugs or alcohol	—	—	—	J	—	—	—

[a] Multivariate analyses (analysis of variance) were used t. assess whether item-specific weights varied significantly (indicated by checks) by respondent characteristics.

b Those reporting anyone in the household holding a Medicaid card were coded as being a Medicaid participant (n=83).

c Those living at or below the Federal poverty level (FPL) were coded as poverty level (n=90).

d Blacks, American Indians, Orientals, Hispanics, and those reporting mixed heritage were coded as being minority group members (n=65). Minority group members perceived needing help for self-care (S1) (p=.01) more favorably than nonminority group members and perceived recreation limits (S2) (.02), sexual organ discomfort (H3) (p=.02), ear pain (H17) (p=.04), and sleep problems (H20) (p=.03) less favorably than nonminority group members.

e Age was treated as a continuous variable. As age increased, there were more favorable weights for hospital stays (M1) (p=.01), needing help for self-care (S1) (p=.008), and sexual dysfunction (H21) (.02). As age increased, there were less favorable weights for burns (H2) (.006), sexual organ discomfort (H3) (p=.03), urination/defecation pain (H7) (~-03), stomach aches (H8) (P-.000), tiredness (H9) (p=.05), cough (H1O) (p=.000), headaches/dizziness (H12) (p-.000), rash (H13) (p=.002), trouble talking (H14) (p=.02), overweight/acne (H16) (p-.003), and trouble with drugs/alcohol (H23) (p=.01).

f Women (n=598) viewed three states as being significantly worse than did men (n=403): needing help for self-care (S1) (@.02), loss of consciousness (HI) (p=.002), and burns (H2) (p-.004). Men viewed three states as being significantly worse than did women: using a walker or wheelchair under own control (P2) (p=.02), sexual organ discomfort (H3) (p=.02), and sexual dysfunction (H21) (p- .005).

g Weights are significantly more favorable for respondents with experience with the condition than for those without such experience for 12 conditions: using a walker or wheelchair under own control (P2) (n=78) (p-.000), trouble learning/remembering (H4) (n=1 21) (p-.005), difficulty walking (H5) (n=139) (p=.012), stomach aches (H8) (n=381) (p=.03), tiredness/weakness (H9) (n-230) (p=.05), cough (H1 O) (n-290) (p=.000), headaches/dizziness (HI 2) (n=385) (p=.005), overweight/acne (H16) (n=436) (p-.007), prescription medications/diet (H18) (n=436) (p=.000), glasses (H19) (n=683) (.002), sleep problems (H20) (n=339) (p=.02), and sexual dysfunction (H21) (n-84) (p=.01).

h Weights of residents of metropolitan areas (SMAs) (n=676) were significantly more favorable than Weights of nonmetro residents (n=324) for recreational activity limitations (S2) (p=.02), sexual organ discomfort (H3) (p=.04), and cough (H1O) (p-.009).

SOURCE: Office of Technology Assessment, 1992, based on analyses of survey data supplied by the Oregon Health services Commission, 1990.

That Oregon's preference weights varied by sociodemographic and health experience should not be surprising. Kaplan and his colleagues report negative correlations between individuals' preference scores and age, number of chronic medical conditions, number of reported symptoms or problems, number of physician contacts, and dysfunctional status (109). Such differences, however, raise questions regarding the appropriate use of the weights (e.g., whether women's weights should be used to assess conditions affecting only women).[60]

In addition to problems related to the validity of the weights themselves, there are two potential problems with how the weights were applied:

- The list of 29 defined health states were used by both the clinicians providing outcomes information and the survey respondents valuing those health states. However, the descriptions of the health states that the clinicians used were more lengthy and often substantially different from those used for the survey. For example, when providing outcomes information, clinicians could use the descriptor ''pain, stiffness, weakness, numbness, or other discomfort in chest, stomach (including hernia or rupture), side, neck, back, hips, or any joints or hands, feet, arms, or legs. " For the telephone survey this symptom was abbreviated to "have a painful or weak condition of the back or joints." The weights from the survey might have been less favorable if the more extensive description of symptoms had been used.
- Different clinical endpoints were defined for the survey and for clinicians supplying outcome information. Clinicians were told to estimate outcomes that would be expected to occur in 5 *years, while survey* respondents providing health state preferences were told to assume that the health state was *permanent.* Although some symptoms or functional limitations present at 5 years are probably permanent, some of the weights might have been more favorable if respondents had assumed that the health condition described was not necessarily permanent. Furthermore, some immediate consequences of treatment (e.g., alleviation of pain following surgery) that may be important to patients are not accounted for using the clinicians' 5-year endpoint.

Incorporation of Community Values

Incorporating community values into the prioritization process was an important goal of the Oregon Basic Health Services Act, and the HSC attempted to become informed of public values through both public hearings and community meetings. Despite a concerted effort to solicit the views of the population most likely to be affected by the demonstration (i.e., Medicaid recipients, those without medical insurance), the majority of community meeting attendees (69 percent) were health care providers (91). Although these individuals may have tried to express the needs of their patients, they also had their own interests to express. On the other hand, given the nature of the values discussed at the meetings (see box 3-G), it is unlikely that different values would have been expressed had the socio-demographic composition of the group been different (e.g., the high prioritization of services for mothers and children and the low prioritization of infertility services) (83,105).

Regardless of the representativeness of the meetings, the HSC category rankings do seem to reflect the values expressed at them. Potentially life-saving treatments, maternal and child health services, preventive services, dental services, and treatments that improve quality of life were highly ranked categories, while treatments for conditions for which minimal or no improvement in quality of life is expected were generally ranked low.

Factors the HSC May Consider When Issuing Another Prioritized List in 1993

Some of the criticisms raised in this section have been acknowledged by the HSC, which is making technical amendments to the list. The list issued May 1, 1991 is not unchangeable. The legislation stipulates that the list be under continual review and a new list issued every 2 years. Some factors that may be considered or considered more fully in the future include (193):

60 Differences between the Oregon weights and those measured by Kaplan (preferences of San Diego County, California residents were assessed in the mid- 1970s) are discussed in app. C.

- Comorbidity,
- Severity of illness,
- Public preference for immediate versus future health benefits,
- Ranking preventive services according to their relative effectiveness,
- Societal impact of the prevention of contagious disease,
- Societal impact of fertility/birth control measures,
- Personal responsibility for condition,
- Condition incidence and prevalence,
- Discounting of future costs and benefits,
- Costs of health maintenance when a Life is saved,
- Costs of non-treatment or of alternative treatments (e.g., dialysis instead of liver transplant), and
- Social costs (e.g., unemployment due to disability).

The Implications of Integrating Additional Services Into the Prioritized List

Mental health and chemical dependency (MHCD) services would be incorporated into the 1993 version of the list, and some services for the aged, blind, and disabled are expected to be integrated. The HSC's MHCD subcommittee prioritized 51 MHCD services using a similar approach to the HSC and issued an integrated list of 760 health and MHCD services.[61] The subcommittee recommended that at a minimum the frost 39 of the 51 MHCD services be covered (244). Actuarial estimates are not yet available for the integrated list, but including expensive MHCD services may require substantial additional expenditures to maintain coverage of the current list of 587 health services (96). The process of identifying and prioritizing services for the aged, blind, and disabled is just beginning, so it is unclear how their inclusion might affect the prioritized list.

EVALUATING THE PRIORITIZED LIST

Clinical Critique of the Prioritized List

A clinical review of the list was undertaken on OTA's behalf by four physicians (two internists and two pediatricians) who reviewed the entire prioritized list (14,80,235). For this and other analyses, the clinical contractors were instructed to use readily available published information (e.g., review articles, medical textbooks) and consultations with experts. An informal review of the entire list identified the following problems associated with its use:

- Ranked too low—There are numerous examples of CT pairs that are more effective or clinically important than other nearby CT pairs. Examples of CT pairs where clinicians may find it hard to accept noncoverage for treatment include medical therapy and thymectomy for myasthenia gravis (line 593),[62] and medical therapy for chronic bronchitis (line 643), sarcoidosis (line 644), and sprains and strains (lines 653 and 655).
- Ranked too high—There are numerous CT pairs that are less effective or clinically important than other nearby CT pairs. Examples include line 495, excision of ganglion of tendon or joint, which is usually a trivial condition, and line 606, medical therapy for hepatorenal syndrome, for which treatment is generally regarded as ineffective.
- Related treatment rankings-Some alternative treatments for the same condition are inappropriately ranked given the usual sequence of current practice. In some cases, surgical therapy is ranked above line 587 and medical therapy ranked below line 587. Surgical treatment for peripheral enthesopathies (CT pair 493), for example, is covered, while medical therapy is not (CT pair 642).[63] Clinicians generally try medical therapy, and proceed to surgery only if medical therapy fails. Such rankings create counterproductive incen-

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61 The HSC plans to finalize an integrated list summer 1992 (244).

62 The HSC is considering moving myasthenia gravis from line 593 to between lines 159 and 160 as part of the technical amendment process. This change is expected to be reflected in the May 1992 revised list (190).

63 The HSC, as part of the technical amendment process, is considering redefining CT pair 493 and moving it down the list to between lines 531 and 532. The redefined CT pair would include surgical treatment for all peripheral enthesopathies. Medical therapy for peripheral enthesopathies would remain uncovered at line 642 (190),

tives for providers, encouraging expensive and invasive therapy.

. Heterogeneous patients within CT pairs-Patients within many CT pairs are heterogeneous with respect to expected outcomes and therefore some subgroups of patients within CT pairs below the line could be expected to benefit from treatment. Physicians may have difficulty denying potentially beneficial treatment to some of these patients. CT pair 640, for example, includes testicular hyperfunction, which may require no treatment, and Schmidt's syndrome, which is fatal without treatment of the adrenal insufficiency and for which the treatment is inexpensive and completely effective (311).

. Distinctions between some CT pairs are very subjective--Distinctions between some CT pairs, such as cancer and HIV-related CT pairs, require very subjective and arbitrary judgments of clinicians. There are 27 site-specific cancer CT pairs above the coverage line specified as "treatable.' Line 688 specifies treatments for cancer of various sites with distant metastasis where treatment will not result in a 10 percent 5-year chance of survival. A similar distinction is made for HIV disease. Medical therapy for HIV disease is covered at line 158, but it is not covered if the patient is in the end stages of HIV disease (CT pair 702). End-stage HIV disease is defined as the last 6 months of life. Comfort care would be available for terminal ' 'untreatable" conditions. It may be difficult for clinicians to classify a condition as untreatable or terminal. In fact, a determination of a poor prognosis for patients is often made only after a patient fails to respond to treatment.

. Inseparability of treatment from diagnostic evaluation—For some CT pairs, the treatment is largely inseparable from a reasonable diagnostic evaluation. In the case of surgery for peritoneal adhesions (line 508), for example, the diagnosis is made at the time of laparotomy, the surgical procedure employed to treat the condition.

. Many opportunities to up- or down-code-Decisions to categorize patients by CT pair is in many cases subjective so that up- or down-coding could easily occur. Sometimes a CT pair is split according to severity of illness. Lung resection for congenital cystic lung disease, for example, occurs twice on the list, once for the mild or moderate form (CT pair 212) and once for the severe form (CT pair 693). The distinction between mild or moderate and severe is subjective, and clinicians could make such distinctions according to their inclination to treat. In other cases, the treatment might not be covered for the patient's immediate condition, but if the physician coded the patient according to his or her underlying or secondary condition, the treatment could be covered. Cholecystectomy is an uncovered treatment, but it is sometimes indicated for patients with sickle-cell anemia. The surgery might be covered if coded as a treatment for sickle-cell anemia (CT pair 160). Treatment of terminal cancer is not covered, but when such patients experience a complication such as anemia or intestinal blockage, that treatment could be covered under higher ranking CT pairs.

. Empty CT pairs--Some treatments ranked near the bottom of the list represent ineffective care that in practice is rarely provided, giving their lack of coverage little meaning. Oregon neonatologists are not now, for example, providing aggressive medical treatment to anencephalic babies (CT' pair 709), or to extremely low-birth-weight babies that are considered nonviable (babies weighing less than 500 grams and born at less than 23 weeks gestation) (CT pair 708) (57).

. Confusion regarding where certain conditions and their treatments are on the list—Until the list is corrected and provider instructions for using it completed, coding errors and inconsistencies would lead to confusion as physicians try to locate specific conditions or treatments on the list. Many CT pairs have duplicate or missing ICD-9-CM or CPT--4 codes. ICD-9-CM code 722.7 (intervertebral disc disorder with myelopathy), for example, appears within two CT pairs, one above and the other below the line (CT pair 58&medical and surgical treatment for spondylosis and other chronic disorders of back, and CT pair 588--thoracic-lumbar laminectomy or medical therapy for intervertebral disc disorders). It is unclear what the intent for coverage is for this condition, Another source of confusion is inconsistency between the CT pair descriptions and the ICD-9-CM or CPT-4 codes listed within the CT pair. Treatable dementia (line 230), for example, includes conditions that

some clinicians would not consider effectively treated (e.g., multi-infarct dementia).

It is not surprising that OTA clinical reviewers found numerous examples of CT pairs that, in their opinion, were ranked either too high or too low, given that the ranking was dependent on the judgments of HSC commissioners. Clinicians may have difficulty using the list as it now stands, either because of its ambiguities or because it forces clinicians to accept judgments that may not coincide with their own or do not seem applicable to individual patients. The clinical consequences to beneficiaries of applying the prioritized list are discussed in the following chapters.

SUMMARY AND CONCLUSIONS

The Prioritization Process

The HSC prioritized CT pairs using a two-staged ranking process, followed by **a** reordering of selected CT pairs on the list according to its judgment. In the **first stage** of the ranking process, CT pairs were assigned to 1 of 17 health service categories. The categories were then ranked using a group consensus method intended to reflect community health care values expressed at public meetings. In the second stage, CT pairs were ranked within categories by a "net benefit" term, which indicates the likely improvement in health-related quality of life associated with treatment for the specified condition. Its calculation integrates information from two principal sources: health care providers' assessments of treatment outcomes, and Oregonians' health state preferences elicited through a telephone survey.

Following the two-staged ranking, the HSC used its best judgment to reorder some CT pairs. Selected CT pairs were moved up and down the list either within or beyond the range of their original category placement.

Determinants of CT Pair List Placement

OTA concludes that CT pair order on the prioritized list was determined largely by judgment-based HSC rankings of service categories and "hand" adjustments of the list. The hand adjustments of the **list** were extensive; the HSC moved nearly one-quarter (24 percent) of CT pairs at least 100 lines up or down the list. CT pair health service category assignment remains an important determinant of CT pair placement on the prioritized **list,** but HSC adjustment of the list reduced the importance of "net benefit,' which had been used to order CT pairs within categories. Given that rankings depended on HSC judgments, it is unlikely that the exact rankings of the final list would be reproduced if a similar process were undertaken by others. That the list may not be replicable does not itself necessarily condemn its use in Oregon, but it does imply that the list cannot be adopted by other States and retain whatever meaning it has.

Given that Oregon's prioritized list is widely discussed as an example of "rationing," it is important to note that certain factors often discussed as part of 'rationing" are relatively unimportant to the list. For example, CT pair-related cost and cost-effectiveness were not important determinants of CT pair order on the list. Nearly one-half of the highest-cost CT pairs are found within the top 300 lines of the list, and as many as one-third of low-cost CT pairs fall below line 587. The relative order of some CT pairs may appear counterintuitive to some if the list is viewed from a cost-effectiveness perspective. Simple and inexpensive-to-treat sprains and strains, for example, fall below the coverage line while expensive transplants generally fall above the line.

Also, the relative effectiveness of diagnostic tests were not considered as part of prioritization-all diagnostic tests are included in a hypothetical CT pair O. Other mechanisms that area part of Oregon's plan (e.g., utilization review, managed care) are to control any inappropriate use of diagnostic services.

Finally, while the list does seem to concentrate some conditions for which treatment is regarded as ineffective at the bottom of the list, the list itself does not effectively eliminate what many would consider "futile' care. For example, although the list does prioritize comfort care over the treatment of terminal cancer, a patient with complications of terminal cancer (e.g., anemia, surgical treatment of an intestinal blockage) could be treated under the plan.

Critique of HSC Prioritization Process

Community Meetings and Public Hearings--The community meetings and public hearings held as part of the prioritization process provided an important opportunity for the public to raise issues and participate in the process. Some of the public values expressed at these meetings seem to be reflected in the list. However, the views expressed at

the community meetings may not be representative of a cross section of Oregon residents. Despite a concerted effort on the part of meeting organizers to reach out to populations likely to be affected by the demonstration, the majority of participants were health care providers.

A potential liability of using a focus group or ''town meeting' approach to setting priorities is that irrespective of whether balanced representation is achieved, various stakeholders are likely to skew the outcomes. Treatments affecting subpopulations might suffer if majority consensus or well-funded special interest groups drive resource allocation decisions. If the demonstration proceeds, awareness of the importance of the prioritized list would be raised and providers and various interest groups would probably lobby the HSC for special consideration. Representatives of the HSC expect this to occur (244) and point out that such efforts routinely occur on a national basis (e.g., lobbying Congress for Medicare coverage for certain services).

The HSC would require technical and analytic expertise to judge the validity of interest group claims to avoid being swayed by biased or faulty data. Such expertise would be needed both for the biannual preparation of a new list and for the technical amendment process that would occur in the interim. The HSC now has a very small technical staff, and Ballot Measure 5-related cuts may reduce the available staff by as much as 25 percent, limiting the HSC's ability to provide necessary analytic support (191).

Treatment Outcomes Information-Net benefit was not as important a determinant of CT pair placement on the list as other aspects of the prioritization process. Nonetheless, the outcome information provided to the HSC by Oregon clinicians and the public preferences elicited by telephone were vital conceptual parts of the process.

The HSC relied on panels of clinicians to provide outcomes information based primarily on their own clinical judgment rather than extensive reviews of the medical literature. OTA clinician reviewers disagreed with most of the outcomes information for a sample of CT pairs they examined, suggesting that outcomes assessment by this method is a highly subjective process that may vary substantially among individuals according to experience and opinion.

It was difficult for Oregon clinicians to provide outcomes information in accordance with their own experience because individual CT pairs often aggregated a wide range of conditions and treatments, and because there was no way to systematically capture the effects of factors such as age and comorbidity on outcome. Several specific aspects of the outcomes gathering process may have also contributed to errors and inconsistencies in outcomes assessment (e.g., the fact that clinician panels providing outcomes information differed in composition, size, and methods).

One of the most innovative aspects of Oregon's prioritization process is the integration of quality-of-life measures into treatment outcome assessments. A uniform set of health states were used to describe all treatment outcomes, making it possible to compare such diverse treatments as medical therapy for diaper rash and bone marrow transplantation for leukemia. Clinician-supplied outcomes information was specified in terms of the presence or absence of these health states, which were in turn weighted according to public preferences or the relative desirability of experiencing the health states (as determined by a statewide phone survey). Using the weights allows the prioritization of a treatment that avoids a particularly dreaded symptom over another treatment that avoids a less onerous one.

OTA analyses of the telephone survey responses and the resultant weights, however, suggest that it is premature to apply these measures to resource allocation decisions. More research on eliciting weights (e.g., in-person vs. phone interviews), defining health states to be measured, and methods to calculate weights are needed before they can be applied with scientific validity.

Clinical Critique of the Prioritized List

From a clinical perspective, a weakness in the prioritization methodology is the reliance on broadly defined service categories (e.g., chronic fatal, acute non-fatal). These categories were an important determinant of CT pair order on the list, but they are clinically problematic because many of the distinctions among categories are not useful measures of treatment ''importance' (e.g., acute vs. chronic, repetitive vs. one-time treatment). On the other hand, the service-defined categories (e.g., reproductive health, dental services) were a useful organizational tool which enabled the HSC to incorporate

public values elicited at community meetings and hearings. For example, the HSC was able to rank high women's and children's services and rank low treatments for infertility.

A major problem with the list is that many diverse conditions are aggregated into CT pairs and many CT pairs include conditions of varying severity and responsiveness to treatment. The HSC used its judgment to rank CT pairs for the average patient within the CT pair. From the perspective of the patients and physicians using the list, however, the list may seem unreasonable when applied to individuals because of the level of aggregation of conditions and treatments within CT pairs. There are numerous examples of patient subpopulations within below-the-line CT pairs that might benefit substantially from treatment, and there are other examples of patient subpopulations within above-the-line CT pairs for which treatment might be ineffective. Clinicians and patients may have difficulty accepting the validity of the list when the patient's treatment falls below the line, but the treatment is expected to improve the condition because of the patient's unique clinical circumstances. Lastly, there are numerous technical errors in the list that if not corrected could contribute to misinterpretation of the scope of conditions or treatments included in CT pairs on the list.

In summary, a *quantified* prioritization process incorporating net-benefit values was not possible, in part because accurate health outcome information is not yet available for most treatments. Even if such data were available, however, it would be difficult to apply in the Oregon context because of the variety of conditions and treatments included in many CT pairs and the inability for CT pair-based outcomes estimates to account for such factors such as age and comorbidity. If CT pairs were disaggregated to better specify conditions on such factors as comorbidity and better define patient populations by factors such as age, the list could number in the tens of thousands and the subjective processes used by the HSC would become unmanageable. One group that has attempted to use a clinician consensus process to generate outcomes for certain procedures, for example, has enumerated as many as 2,000 indications for hysterectomy alone (33). If conditions were disaggregated, a more systematic or quantified approach than that used by the HSC would have to be used. Even if a quantified approach were developed to rank even a much less extensive list, however, the list might not serve as a useful guide to health benefits-it would be nearly impossible to actuarially price such a list and it would be impractical for clinicians to use it. Furthermore, difficult ethical questions would arise as rankings by treatment effectiveness would certainly be influenced by such factors as age and presence of disability.

Applying cost-effectiveness analysis to a list made up of CT pairs is also problematic. CT pairs are defined so broadly that clinical approaches of widely varying costs and effectiveness are buried within a single CT pair (e.g., treatment is often defined as medical or surgical therapy, which could include anything from an office visit to invasive surgery). Quantifying costs and benefits and adjusting for quality of life over a lifetime for all health services are daunting tasks which are theoretically possible but unlikely to be achieved in the near future. Information will be available incrementally to help guide specific health resource allocation decisions and to improve physician-patient counseling and decisionmaking.

The Oregon prioritization process has provided some valuable lessons. Public awareness of limited health care resources has been raised and a concerted effort was made to identify the medical and social value of treatments as assessed by community physicians and patients. Refinements and variations of the process could be used to: define the extremes of coverage (i.e., highly prioritized care and 'futile' or socially unimportant care), guide utilization management programs, and focus the efforts of the health service research community.