

Disease coding

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WITH increasing use of mechanical data processing there is a need for numerical coding of disease. An ideal code should be simple to use and should not rob the data of significance (Taylor 1967). Existing codes are either simple to use and of limited field or complex and definitive. This paper describes a new code which compromises between these opposites.

The most definitive code is the International Classification of Disease (ICD) but this is ponderous and difficult to use. The existing codes; the Cardiff Diagnostic Classification and the codes produced by the Royal College of General Practitioners are derived from the ICD. The Cardiff Classification (1969) is a specialized paediatric code which is as complex as the ICD. The first College code (Research Committee of Council 1959) was a hierarchical system based on the 18 primary headings of the ICD. This system was found difficult to use and it led to the present code in which the ordering of disease retains the original 18 ICD headings within which common diseases and symptom complexes are numbered from 1 to 510. This has produced a simple coding system but one which frequently robs data of significance. Since a great deal of time is spent collecting morbidity records it is a pity to then waste that time and effort by losing information in coding. Because of this a new system of disease coding was devised for a survey in 1966 and 1967 (Hull 1969). Experience during this survey led to the present code which has proved simple to use.

The 18 headings of the ICD are not arranged according to frequency. Where possible throughout the new code those diseases occurring most commonly appear high in the classification and the progressively rarer conditions follow.

The descriptive name of a disease embodies much information none of which should be lost in coding. Consider "Carcinoma of bronchus", this term gives the following information about a pathological process:

1. It is a respiratory disease (System)
2. It is a malignant neoplasm (Type of disease)
3. It involves the bronchus (Organ)
4. It is a respiratory neoplasm (System/type)
5. It is a malignant neoplasm of the bronchus (System/type/organ)

In searching a body of data one may be interested in extracting any of these categories of information; one may for example be examining respiratory disease in general (system) or neoplasms in general (type). In either case one may not need to have the rest of the information which makes up the whole diagnosis.

System-type-organ coding

In this code five figures are used allowing 10^5 possible disease codes instead of 10^8 in the Royal College code. The five figures are faceted; the first two refer to the bodily system involved in the disease, the second two to type of disease process and the terminal figure to the organ involved. Taking carcinoma of the bronchus as an example:

| <i>System code</i> | <i>Type code</i> | <i>Organ code</i> |
|--------------------|--------------------|-------------------|
| Respiratory | Malignant neoplasm | Bronchus |
| 01 | 13 | 4 |

or acute appendicitis:

gastro-intestinal
03

Acute infection
01

Appendix
6

This method has been criticized on the grounds that five figures are more confusing than three. The faceted nature of the code like that of subscriber trunk dialling telephone numbers makes the common codes easy to memorize. It is not suggested that morbidity recording should be made directly in code and the method will involve coding from written English usually by ancillary staff.

System. The term system embraces not only the usual respiratory, cardiovascular and alimentary systems but the skin, the psychic and dental "systems" and also such general conditions as pregnancy and labour.

A further departure from the major headings of the ICD lies in the removal of neoplasia and congenital disease from the first rubric of the code. Both these conditions logically find their place in the type rubric. This represents an improvement on the Royal College code. For example, in that code to find all respiratory disease it is necessary to search through the neoplastic and congenital groups in addition to the respiratory group *per se*.

When difficulty is found in allocating a disease within a system reference to the ICD may assist classification. For example disseminated lupus erythematosus is included under connective tissue in the ICD; the nearest available system code in this is soft tissue 14.

Type. This comprises the major pathological process such as infection, neoplasia, trauma. In addition there are a number of descriptive terms such as degenerative, allergic, metabolic and so on.

Organ. Classification of the organ depends on the system. In most systems the terminal figure refers to some specific organ but in others the rubric is used conventionally as for example within the systems of neurosis or communicable disease. Extraction of organ data depends on simultaneous extraction of system.

Summary

A new method of coding disease is described. The code comprises a five digit faceted figure. The first two digits refer to the system, the second two digits to the type of disease process and the terminal figure to the organ within the system implicated in disease. The method has been found simple to use and it allows recovery of the data in whole or in part.

Details of coding follow in Appendix I-IV.

REFERENCES

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APPENDIX I
SYSTEM CODES

| | | | | | |
|----------------------------|----|--------------------------|----|---------------------|----|
| Respiratory | 01 | Locomotor soft tissue .. | 14 | Lymphatic | 24 |
| Skin | 02 | Locomotor joint | 15 | Pregnancy | 25 |
| Gastro-intestinal .. | 03 | Locomotor bone | 16 | Labour | 26 |
| Neurosis | 04 | Dental | 17 | Breast | 27 |
| Psychosis and addiction .. | 05 | Eye | 18 | Poisoning | 28 |
| Female genital | 06 | Cardiovascular | 19 | Undiagnosed | 29 |
| Male genital | 07 | C.N.S. | 20 | Drug reaction | 30 |
| Urinary | 08 | Ear | 21 | Unclassified | 31 |
| Communicable disease | 09 | Endocrine | 22 | | 32 |
| | 10 | Blood and blood forming | 23 | | 00 |
| | 11 | tissue | | | |
| | 12 | | | | |
| | 13 | | | | |

APPENDIX II
TYPE CODES

| | | | | | |
|------------------------------|----|---------------------------|----|---------------------------|----|
| Acute infection | 01 | Allergic | 22 | Cystic | 42 |
| Chronic infection | 02 | Deficient | 23 | Ulcerative | 43 |
| Viral infection | 03 | Thrombotic | 24 | Psoriatic | 44 |
| Fungal or monilial infection | 04 | Haemorrhagic | 25 | Seborrhoeic | 45 |
| Trichomonal infection .. | 05 | Congestive | 26 | Ecematous | 46 |
| Syphilitic infection .. | 06 | Ischaemic | 27 | Occupational | 47 |
| "Wheezey" infection .. | 07 | Arteriosclerotic | 28 | Hyperplastic/hypertrophic | 48 |
| Vincent's infection .. | 08 | Essential hypertensive .. | 29 | Autoimmune | 49 |
| Tuberculous infection .. | 09 | Malignant hypertensive .. | 30 | Epileptiform | 50 |
| "Rheumatic" infection .. | 10 | Dilatational | 31 | Iatrogenic | 51 |
| Post-inflammatory Fibrosis | 11 | Parasitic | 32 | Wax | 52 |
| — | 12 | Febrile | 33 | Motion sickness | 53 |
| Malignant neoplasia .. | 13 | Foreign body | 34 | Demyelinating | 54 |
| Benign neoplasia | 14 | Calculus | 35 | Retentive | 55 |
| *Trauma, trivial | 15 | Obstructive | 36 | Toxaemic | 56 |
| *Trauma, moderate | 16 | Postural | 37 | Self inflicted | 57 |
| *Trauma, severe | 17 | Prolaptic | 38 | Accidental | 58 |
| Congenital | 18 | Herniating | 39 | Homicidal | 59 |
| Functional | 19 | Ectopic | 40 | Idiopathic | 60 |
| Degenerative | 20 | Effusive | 41 | Unclassified | 00 |
| Metabolic | 21 | | | | |

*Trivial trauma—unlikely to lead to permanent disability.
 *Moderate trauma—likely to lead to permanent disability.
 *Severe trauma—risk to life.

APPENDIX III
ORGAN

| | | | | |
|--------------------------------|-----|--|---|-----------------------------|
| <i>System 01 (Respiratory)</i> | 3 | Sebaceous glands | 4 | Hernia (inguinal) |
| 0 U R T | 4 | Sweat glands | | Hernia (femoral) |
| 1 Ear | | | 5 | Diaphragm |
| 2 Nose, nasal sinuses, eusta- | | <i>System 03, 04 (Gastro-intestinal)</i> | 6 | Mesenteric glands |
| chian tube | 030 | Tongue | 7 | General |
| 3 Throat, tonsil, pharynx, | 1 | Mouth | | <i>System 05 (Neurosis)</i> |
| larynx | 2 | Oesophagus | 0 | Behaviour problems in |
| 4 Trachea and main bronchi | 3 | Stomach | | children |
| 5 Bronchioles | 4 | Duodenum | 1 | Enuresis/encopresis |
| 6 Lung parenchyma | 5 | Small intestine | 2 | Premenstrual tension |
| 7 Pleura | 6 | Appendix | 3 | Marital problems |
| 8 Hilar glands | 7 | Large intestine | 4 | Anxiety |
| 9 | 8 | Rectum | 5 | Hysteria |
| | 9 | Anus | 6 | Non-psychotic depression |
| <i>System 02 (Skin)</i> | 040 | Liver | 7 | Obsessional states |
| 0 Hair and follicles | 1 | Gallbladder | 8 | Neurasthenia |
| 1 Skin | 2 | Pancreas | 9 | Anorexia nervosa |
| 2 Nails | 3 | Peritoneum | | |

- System 06 (Psychosis/addiction)*
- 0 Organic psychosis
 - 1 Schizophrenia
 - 2 Manic depressive psychosis
 - 3 Psychopathy
 - 4 Alcoholism
 - 5 'Soft drug' addiction
 - 6 'Hard drug' addiction
 - 7 Other psychosis
 - 8 Other conditions not included in 05 and 06
 - 9
- System 07 (Female genital)*
- 0 Ovary
 - 1 Tube
 - 2 Myometrium
 - 3 Endometrium
 - 4 Uterine cervix
 - 5 Vagina
 - 6 Vulva
 - 7 Bartholin and associated glands
 - 8 Parametrium
 - 9 Female infertility
- System 08 (Male genital)*
- 0 Testis
 - 1 Epididymis
 - 2 Tunica
 - 3 Vasa
 - 4 Seminal vesicles
 - 5 Prostate
 - 6 Penis
- System 09 (Urinary)*
- 0 Renal parenchyma
 - 1 Renal pelvis
 - 2 Ureter
 - 3 Bladder
 - 4 Urethra
 - 5 Meatus
- System 10, 11, 12 and 13 (Communicable disease)*
- Communicable diseases are coded on the terminal 'organ' figure, type remains unclassified.
- | | |
|---------------|-------|
| eg. Measles | 10003 |
| Herpes zoster | 11004 |
| Malaria | 12007 |
- Systems 14, 15, 16 (Locomotor system)*
- 0 Generalized
 - 1 Trunk
 - 2 Neck
 - 3 Head
 - 4 Upper arm (including shoulder)
 - 5 Lower arm (including elbow)
 - 6 Hand (including wrist)
 - 7 Upper leg (including hip)
 - 8 Lower leg (including knee)
 - 9 Foot (including ankle)
- System 17 (Dental)*
- 0 Embryonic tissues
 - 1 Tooth
 - 2 Gingiva
 - 3 Periodontal tissue
 - 4 Bone
 - 5
 - 6
 - 7
 - 8
 - 9
- System 18 (Eye)*
- 0 Glaucoma
 - 1 Lids
 - 2 Conjunctiva
 - 3 Cornea
 - 4 Iris and aqueous
 - 5 Lens and vitreous
 - 6 Lachrymal glands and ducts
 - 7 Retina
 - 8 Strabismus
 - 9 Refractive error
- System 19 (Cardiovascular)*
- 0 Heart valves and endocardium
 - 1 Pericardium
 - 2 Myocardium
 - 3 Coronary arteries
 - 4 Cardiac failure
 - 5 Aorta and major branches
 - 6 Peripheral arteries
 - 7 Vena cava and major tributaries
 - 8 Peripheral veins
 - 9 Haemorrhoida veins
- System 20 (Central nervous system)*
- 0 Generalized
 - 1 Brain
 - 2 Cranial nerves
 - 3 Peripheral motor nerves
 - 4 Peripheral sensory nerves
 - 5 Autonomic nervous system
 - 6 Meninges
- System 21 (Ear)*
- 0 External audiotry meatus
 - 1 Drum and middle ear
 - 2 Conducting mechanism
 - 3 Semicircular canals
 - 4 Cochlear
 - 5 Presbycusis
- N.B.* Acute otitis media is considered as a respiratory disease.
- System 22 (Endocrine)*
- 0 Obesity
 - 1 Thyroid
 - 2 Parathyroid
 - 3 Adrenal
 - 4 Pituitary
 - 5 Diabetes mellitus
 - 6 Gonad
 - 7
- System 23 (Blood and blood forming tissue)*
- 0 Bone marrow
 - 1 RBC microcytic anaemia
 - 2 RBC macrocytic anaemia
 - 3 RBC other
 - 4 WBC
 - 5 Platelet
 - 6 Haemolytic disease
 - 7 Clotting dysfunction
 - 8 Generalized
- System 24 (Lymphatic)*
- 0 Generalized
 - 1 Spleen
 - 2 Lymph nodes
 - 3 Lymph vessels
 - 4 Disturbance of immunoglobulins
 - 5
- System 25 (Pregnancy)*
- 0 General
 - 1 Uterus
 - 2 Foetus
 - 3 Placenta
 - 4 Membranes
 - 5 Urinary tract
 - 6 Abortion
- System 26 (Labour)*
- 0 Normal
 - 1 Unclassified
 - 2 Prolonged
 - 3 Uterus
 - 4 Foetus
 - 5 Placenta
 - 6 Membranes
 - 7 Periuneum
 - 8 Bony pelvis
 - 9 Puerperium
- System 27 (Breast)*
- 0 General—normal breast
 - 1 General—lact. breast
 - 2 Nipple
 - 3 Areola
 - 4 Ducts
 - 5 Gland tissue
 - 6 Supportive tissue
- Systems 28, 29, 30 (Poisoning)*
- 260 Unknown
 - 1 Carbon monoxide
 - 2 Aspirin
 - 3 Barbiturate
 - 4 Alcohol (not chronic alcoholism vs)
 - 5 Addictive drugs
 - 6 Other non-addictive drugs
 - 7 Heavy metals
 - 8 Agricultural poisons (organophosphorous, etc.)
 - 9 Industrial poisons
 - 270 Household poisons
 - 1 Corrosive poisons not listed above

| | | | |
|---|---|----------------------------------|---|
| 2 | Naturally occurring alkaloids (yew, atropa, belladonna, etc.) | 6 7 8 9 | 1 Drug interaction 2 Drug withdrawal |
| 3 | | | <i>System 32 (Undiagnosed)</i> |
| 4 | | <i>System 31 (Drug reaction)</i> | |
| 5 | | 0 Sensitivity | <i>System 00 (Unclassified)</i> |

APPENDIX IV

SOME EXAMPLES OF DISEASE CODES

| | | |
|-------------------------|---------|-------|
| Acute bronchitis | | 01014 |
| Chronic bronchitis | | 01024 |
| Ca. stomach | | 03133 |
| Nonpsychotic depression | | 05006 |
| Schizophrenia | | 06001 |
| Dysmenorrhoea | | 07192 |
| Frozen shoulder | | 14104 |
| Fractured femur | | 16177 |
| Foreign body in eye | | 18342 |
| Microcytic anaemia | | 23001 |

A full list of disease codes is available from the author on request.

Vitamin A for night-blindness in prolonged jaundice. Jean M. Wright, J. S. Wright. *British Medical Journal*, 1971, 3, 92.

A patient suffering from obstructive jaundice due to neoplasm developed night-blindness and was unable to read newsprint. After eight daily injections of vitamin A his dark adaption greatly improved and he was again able to read newsprint. The deterioration in his general condition was unaffected.

Health centres

“. . . the official guide for health centres reproduces, with implicit approval, the plans of 19 health centres, built by 16 different local authorities, without any criticism of them or any report on how they have worked out in practice. As it happens, no hindsight is needed to see faults in all of them, nor is there need to ask how they are working to be sure that nearly all are wasting many man-hours, including doctor-hours, every day. The exceptions are those which have been designed in disregard of some of the specific advice given in the guide”. J. R. James—Health centre design—A criticism. *British Medical Journal*, 1971, 2, 389.