3 International Classification of Impairments, Disabilities and Handicaps (ICIDH)

3.1 Introduction

The 1980 ICIDH was published by the WHO as a manual of classification relating to the consequences of disease. It is undergoing a process of review—an international effort coordinated by the WHO. A publicly available draft Beta ICIDH-2 has recently been released (internet site http://www.who.ch/icidh), with the final revised version scheduled for release in 1999.

This chapter briefly describes the 1980 ICIDH, and indicates some criticisms. It then describes the process of revision of the 1980 ICIDH, including in Australia, and outlines the newly released draft 'Beta-1' ICIDH-2. The chapter focuses on the new third dimension of the ICIDH-2 , Participation (formerly Handicap), and the various approaches suggested for its measurement.

3.2 1980 ICIDH and directions for change

The 1980 ICIDH provides a conceptual framework for disability which is described in three dimensions—Impairment, Disability and Handicap:

> **Impairment**: In the context of health experience an impairment is any loss or abnormality of psychological, physiological or anatomical structure or function.
>
> **Disability:** In the context of health experience a disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.
>
> **Handicap**: In the context of health experience a handicap is a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfilment of a role that is normal (depending on age, sex, and social and cultural factors) for that individual. (WHO 1980)

Impairment is considered to occur at the level of organ or system function. Assessment of impairment requires judgement of mental and physical functioning of the body and its component parts according to accepted standards. The classification of impairment is hierarchical, allowing considerable specificity for those needing to record such detail.

Disability is concerned with functional performance or activity, and limitations therein, affecting the whole person. The disability codes attempt to encompass those activities considered important in daily life. Like impairment, the classification of disability is hierarchical but allows for an additional parameter to record the severity of disability.

Handicap focuses on the person as a social being and reflects the interaction with and adaptation to the person's surroundings. The handicap codes attempt to classify those consequences which place that individual at a disadvantage in relation to their peers. The classification system for handicap is not hierarchical, but comprises a group of 'survival roles', with each survival role having an associated scaling factor to indicate impact on the individual's life.

The ability of the ICIDH not only to classify an individual's circumstance but to provide a theoretical framework to interrelate impairment, disability and handicap has made it a powerful tool for a range of applications including:

> clinical diagnosis and rehabilitation assessment, record keeping in health and rehabilitation settings, the development of medical and rehabilitation monitoring systems, program evaluation and development, the promotion of linguistic agreement, debate and conceptual development in the interdisciplinary field of disablement studies, development of research programs, the formulation of disability policy and the planning measures for equalisation of opportunity, data collection in survey research and database development. (Badley 1993)

There is, nevertheless, a considerable critical literature relating to the ICIDH (for instance, WCC and Dutch Classification and Terminology Committee for Health 1994) and an associated recognition of the need to revise the classifications. A fairly wide recognition in Australia of the concepts of impairment, disability and handicap, and an interest in the ICIDH revision were indicated at a 1994 AIHW workshop on the measurement of disability, when people from a wide range of disciplines discussed the need for more relatable terms, definitions and measuring instruments (AIHW 1994b).

The workshop also discussed the possible further development of the ICIDH and participants made a number of observations which are characteristic of the criticisms made of the current ICIDH:

- There are overlaps in the way impairment, disability and handicap are operationalised in the classification. These boundary problems and other structural problems (a suggested lack of cohesiveness or coherence) mean that the 1980 ICIDH is not yet considered by some to be a true classification system.
- Handicap in particular needs further development, in terms of its definition, classification and rating. It is a social construct by definition, so there is difficulty in establishing an international standard enabling comparison among different societies and cultures. The concept of 'handicap' has encountered great difficulty in translation to various languages.
- The environmental influence on handicap needs specific recognition, for instance in the identification of barriers, of appropriate interventions and of the outcomes of interventions.
- There is a need for a fourth dimension in (or perhaps adjunct to) the ICIDH, relating to the environment and to the barriers (including discrimination) contributing to the individual's experience of disability and handicap.
- Despite the understanding of the social context which defines handicap—and the recognition that environment not only affects handicap but can also affect disability—the ICIDH concepts are defined specifically 'in the context of health experience'. A number of participants pointed out the importance not only of recognising that the ICIDH is set out 'in the context of health experience' but also of retaining the notion of impairment as underlying or accompanying disability and handicap. Otherwise, according to one workshop participant, disability is

purely socially constructed and 'becomes a matter of choice'; then there is no accompanying basis for constructing the desired indicators of severity and need.

- If the ICIDH is to be an international standard it needs to provide replicable measurements. If it is too specific to context and culture it becomes too difficult to make comparisons across contexts.

It was generally thought by workshop participants that the ICIDH needs greater promotion in Australia, in order to foster the search for a national and international standard.

3.3 Revision of the 1980 ICIDH

In 1993, the WHO agreed to begin a revision process of the 1980 ICIDH, across all three dimensions—Impairment, Disability and Handicap. The aim of this work is to provide a more coherent and widely applicable set of classifications, which will be conceptually valid and useful.

Revision process

The revision process is coordinated by the WHO. In the early stages, various collaborating centres throughout the world concentrated on a specific content or classification area. The French and Dutch Centres worked on Impairment, the Dutch Centre worked on Disability, and the North American Centre (US and Canada) worked on Handicap and the newly proposed annexe of Environmental/Contextual Factors. In addition, specialist task forces worked on the applicability of the classification in the areas of: mental health, children, social policy and the aged.

In 1994 the AIHW was asked to extend its terms of reference as a WHO Collaborating Centre for the International Classification of Diseases (ICD), to participate in the revision of the ICIDH. The AIHW considered that it could best contribute to the third dimension of the classification (Handicap), and agreed to focus on this dimension, the development of which was being led by the North American Collaborating Centre.

An 'Alpha' draft of the revised ICIDH was collated in May 1996, incorporating the work of all collaborating centres. At this point, it was agreed that collaborating centres would concentrate on the draft as a whole. From then until February 1997 the collaborating centres and task forces provided comment on the Alpha draft. Basic questions confronting major issues were also discussed.

At the April 1997 international meeting of collaborating centres, a preliminary Beta draft was distributed to participants. This draft integrated suggestions made in the previous year. After discussion at the meeting, the current Beta-1 draft (ICIDH-2) was prepared and released into the public arena for field trials. The timeline for further development is outlined in table 3.1.

Table 3.1: Timeline for development of the new ICIDH

Date	Milestone
December 1997	End of stage 1 of Beta testing
May 1998	Release of revised Beta draft for second stage testing
December 1998	Completion of second stage Beta testing
1999	Release of new ICIDH-2

The first stage of field trials is underway. Trials are being undertaken in several countries, including Australia. The Australian Collaborating Centre plans to undertake stage 1 Beta testing of the ICIDH-2 in the following areas:

- *People with intellectual disabilities.* This is a joint project involving the Institute and the new Centre for Developmental Disability Studies in Sydney. The testing will examine both the concepts and classifications of the ICIDH-2;
- *Disability among Aboriginal and Torres Strait Islander communities.* This project will examine relevance of the concepts of disability to Indigenous people, using the ICIDH-2 as a possible framework. The addition of the Contextual Factors annexe to the ICIDH-2 may be particularly significant to understanding disability in these communities, given the importance of environmental and cultural factors among them;
- *National discussions of the ICIDH.* These will be undertaken in tandem with national discussions of this paper; and
- *Other opportunities to obtain comment on ICIDH-2.* for example, the Institute was invited to present the Beta version to an expert group convened to discuss rehabilitation coding.

3.4 Incorporating Australia's perspective

For the ICIDH to become a useful and accepted tool in the Australian context, it is necessary to ensure that Australian views shape this revision as far as possible. The AIHW as the Australian Collaborating Centre has worked to achieve this through:

- holding meetings with the Disability Data Reference and Advisory Group. The Group agreed at its first meeting, to serve as the Australian Reference Group (to the Australian Collaborating Centre) for the revision of the ICIDH. It provides the Collaborating Centre with an invaluable source of understanding and knowledge of the Australian disability field;
- developing suggestions to WHO about the conceptualisation and qualification of the third dimension (Participation in the ICIDH-2). A discussion of Australia's input into the revision process is found in section 3.6;
- coordinating testing in Australia, and collating comments for transmission to WHO;
- coordinating and promoting testing of the ICIDH-2 in the Australian context; and
- holding discussions of this paper and the ICIDH-2 to enable wide input.

3.5 Beta-1 draft of the ICIDH-2

The introduction to the new draft ICIDH-2 states that the aim of the classification is to provide a unified and standard language to serve as a frame of reference for the 'consequences of health conditions'. The classification covers any disturbances in terms of functional changes associated with health conditions at body, person and society levels. The ICIDH does not classify diseases, disorders or injuries, which is the aim of the ICD (International Classification of Diseases).

The new draft ICIDH-2 proposes three dimensions, Impairment, Activity, and Participation, and a supplementary annexe, Contextual Factors. The title of the classification has been changed from *ICIDH: International Classification of Impairments, Disabilities and Handicaps*, to *ICIDH-2: International Classification of Impairments, Activities, and Participation*.

In the draft ICIDH-2, the second dimension (previously Disabilities), has been renamed Activities. The third dimension (previously Handicap) has been expanded and renamed as Participation. The ICIDH-2 states:

> Thus the term 'disability' has been replaced by a neutral term 'activity' and negative circumstances in this dimension are described as 'activity limitation'. Similarly, 'handicap' has been replaced by 'participation', and negative circumstances in this dimension are described as 'participation restriction'. The term 'disablements' has been included as an umbrella term to cover all the negative dimensions of the ICIDH-2 (ie: impairments, activity limitations and participation restrictions), either together or separately.

A brief description of each of the dimensions of the draft ICIDH-2 are included in boxes 3.1, 3.2, and 3.3. Appendix 3 contains a list of the one- and two-digit codes, with some examples, of each dimension.

Box 3.1: Impairment dimension of ICIDH-2

Definition

In the context of health condition, Impairment is a loss or abnormality of body structure or of a physiological or psychological function.

Operationalisation of Impairment

The classification of Impairment relates primarily to loss or abnormalities at the level of the body, body part or organ. It does not include problems at the level of tissues or cells, or at the subcellular or molecular level. Impairments are not the same as the underlying pathology, but are the manifestations of that pathology. Impairments may be temporary or permanent, progressive or regressive, intermittent or continuous, and may contribute to disablement and/or other health conditions and influence the extent of the person's participation.

Qualifiers of Impairment

Impairment is coded in two complementary sections: Impairments in function and Impairments in structure. Where appropriate, individual chapters in the first section contain additional codes to qualify the impairment of function.

The second section, Impairments of structure, is qualified using two additional digits:

Structural impairment code

0 more than one type of structural impairment
1 absence—total
2 absence—partial
3 additional part
4 aberrant dimensions
5 discontinuity
6 deviating position
7 qualitative changes in structure, including accumulation of fluid
8 pain
9 not stated

Region code

0 more than one region of structural impairment
1 right
2 left
3 both sides
4 front
5 back
6 proximal
7 distal
8 not applicable
9 not stated

Source: ***Beta-1 draft ICIDH-2, WHO***.

Box 3.2: Activity dimension of ICIDH-2

Definition

In the context of health condition, Activity is the nature and extent of functioning at the level of the person. Activities may be limited in nature, duration and quality.

Operationalisation of Activity limitations

Difficulties with activities can arise when there is a qualitative or quantitative alteration in the way in which these activities are carried out. Limitations in activities were formerly referred to as disabilities. Limitations in the ability to carry out an activity may be temporary or permanent, reversible or irreversible, and progressive or regressive. Limitations in activities, therefore, relate to the individual's difficulties in performing, or the impossibility to perform an activity or set of activities.

Qualifiers of Activity limitations

For most people the ability to carry out an activity is not an 'all or nothing' phenomenon. Activities may be carried out with varying degrees of ease or difficulty, or as components of different types of behaviour. Activities may also be carried out using technical or other aids, or with the help of another person. This classification is therefore designed to be used in conjunction with two qualifiers that indicate the manner of accomplishment of the activity.

The first qualifier rates degree of difficulty of accomplishment of the activity and is rated as follows:

0 no difficulty
1 slight difficulty
2 moderate difficulty
3 severe difficulty
4 unable to carry out the activity
9 level of difficulty unknown

The second qualifier is optional and describes any personal or non-personal assistance used in accomplishment of the task. Assistance is rated as follows:

0 no assistance needed
1 non-personal assistance (including the use of assistive devices, technical aids, adaptations, prosthesis, wheelchair, cane and other material help)
2 personal assistance (where the task is carried out with the 'help' of another person, where 'help' includes supervision as well as cuing and/or physical help)
3 both non-personal and personal assistance
9 level of assistance unknown

Source: *Beta-1 draft ICIDH-2, WHO.*

Box 3.3: Participation dimension of ICIDH-2

Definition

In the context of health condition, Participation is the nature and extent of a person's involvement in life situations in relation to impairments, activities, health conditions and contextual factors.

Operationalisation of Participation

Participation may be restricted in nature, duration and quality (a restriction in participation was formerly called a handicap). Participation is characterised as the outcome or result of a complex relationship between, on the one hand, a person's health condition, and in particular the impairments or limitations of activities he or she has, and on the other, features of the context that represent the circumstances in which the person lives and conducts his or her life.

Unlike the notion of handicap in the original 1980 version of the ICIDH, the notion of participation is neutral, if not positive. Undoubtedly, the primary and most appropriate use of the ICIDH-2 is to identify situations of limitation or restriction of function, activity or participation—that is, negative situations. The classification of Participation is available to identify areas of life in which a person with impairments or limitations of activities is restricted in some way.

The classification of Participation explicitly incorporates the principle of 'equalization of opportunities' from the United Nations Standard Rules on the Equalization of Opportunities for Persons with Disabilities. This establishes an international norm that requires that the levels of participation for persons with disablement be classified in the light of the expected levels of participation for persons without disablement.

Qualifiers of Participation

There are two qualifiers for the classification of Participation. The first records on a seven-point scale the extent of participation. The second, used when the recorded level of participation is less than full, records which area of the context is responsible for the recorded level of participation. It can also be used to record contextual facilitators of participation.

Extent of Participation

0 Full participation under all usual circumstances. Without reliance on any contextual facilitators.
1 At risk full participation. The person fully participates, but is at risk for reduced participation if contextual facilitators are lost, removed or made inoperative.
2 Participation with restrictions. The person has full participation in some situations but has minor or major restrictions in participation in other situations.
3 No participation
7 Not expected
8 Not determined
9 Not applicable

Contextual facilitator / barrier

0 Product, tools and consumables
1 Personal support and assistance
2 Social and political institutions, associations and organizations
3 Education and training systems
4 Economic institutions
5 Other public infrastructure
6 Sociocultural structures, norms and rules
7 Human-made physical environment
8 Natural environment
9 Other or unknown

Source: *Beta-1 draft ICIDH-2, WHO.*

Participation—the new third dimension

A significant change since the 1980 version has occurred in the third dimension, where Handicap has been renamed and re-conceptualised as Participation. Whereas the 1980 definition of handicap focused on the disadvantage experienced by an individual when trying to fulfil a life role, the new draft version states much more explicitly that participation is a consequence of the interaction between a person and their environment.

This shift at the third level reflects the growing emphasis on the rights and needs of people with a disability. It is grounded in the philosophy that people with a disability are entitled to the same opportunities and choices as the rest of the community, and generally desire participation in all areas of human and social life. It recognises that individuals experience a participation outcome as a consequence not only of their impairment but also of their interaction with the world around them.

The introduction of the ICIDH-2 makes the following point regarding Participation:

> Handicap, as formerly used, focused on seven dimensions which were defined as the most important dimensions of disadvantageous experience. It gave a summary measure of one's disadvantage in relation to peers in accordance with the norms of society. The structure of the P code has also evolved further to a nominal classification instead of summarising only the most important domains. The new third dimension identifies the domains of social interactions between the person and society / environment.

Table 3.2 provides a comparison of the 1980 Handicap dimension's six survival roles, and the seven domains of participation in the ICIDH-2.

Table 3.2 Third dimensions of the 1980 ICIDH and 1997 ICIDH-2

1980 Handicap—six survival roles	1997 ICIDH-2 Participation—seven domains of Participation
Orientation handicap	Participation in personal maintenance
Physical independence handicap	Participation in mobility
Mobility handicap	Participation in exchange of information
Occupation handicap	Participation in social relationships
Social integration handicap	Participation in the areas of education work, leisure and spirituality
Economic self-sufficiency handicap	Participation in economic life
Other handicap	Participation in civic and community life

The 1980 survival roles are coded with a single digit, so are very broad groupings. Participation contains seven domains of interactions which are further divided to the three-digit coding level, so are more detailed.

Contextual factors annexe

Contextual factors are defined as 'the features, aspects and attributes of, or objects, structures, human-made organizations, service provision, and agencies in, the

physical, social and attitudinal environment in which people live and conduct their lives'.

The objective of the annexe is to present a list of potential objects, structures and organisations, or features, aspects or attributes of these things, which might help a person with impairments or activity limitations to increase their level of participation in some domain, or alternatively which might be responsible for decreasing the level of participation.

There are no qualifiers for this annexe, because it is developed with the classification of participation in mind, and is explicitly incorporated as the second qualifier of participation.

The Contextual factors listing is coded using three digits. The single-digit groupings are:

- products, tools and consumables;
- personal support and assistance;
- social, economic and political institutions;
- sociocultural structures, norms and rules;
- human-made physical environment; and
- natural environment.

Appendix 3 provides the two-digit detail for these codes.

3.6 Development of qualifiers for the participation dimension: a key area of Australian input

New qualifiers for participation

The movement from the six 'survival roles' of the 1980 ICIDH to the seven domains of Participation in the draft ICIDH-2 meant that the six individual severity scales of Handicap needed rethinking. Critical to the development of the new qualifiers was the notion that some relatability be retained between the old scales and those proposed in the draft ICIDH-2.

A range of qualifiers for participation have been suggested during the revision process, chiefly by the North American and Australian Collaborating Centres. The final drafting team for the draft ICIDH-2 also suggested a qualifier: 'extent of participation'.

Proposals of the Australian centre

At the May 1996 meeting of ICIDH centres, the Australian Collaborating Centre commented that the qualifier then proposed for the third dimension—satisfaction with participation—was useful for monitoring the extent of participation in society, but still inadequate. Missing were some of the underlying, useful ideas in the 'handicap' dimension of the 1980 ICIDH.

It was also noted that it is important to be clear about the policy purpose for measuring this third dimension. The purposes of measuring impairment and disability include

monitoring the outcomes of health conditions and health interventions, and indicating the need for and success of medical and rehabilitation interventions. The purposes of measuring participation are more oriented towards social policies and services.

It was argued that the new notion of participation needed an indication of where the help or intervention is needed, and the amount of help or response needed. This concept was present in a rudimentary form in the 1993 ABS disability survey, and was crucial in being able to quantify unmet demand for certain types of services and assistance (see chapter 4).

Australia also suggested a need for a second qualifier—an improved and environmentally conscious version of the previous 'handicap' notion which not only indicates the *type* of assistance needed (falling broadly into person-focused assistance or environmental / systemic modification), but also the *level* or amount.

Australia was asked at the May 1996 ICIDH meeting to draft its ideas on a set of 'enabling response' qualifiers for the third level. Two drafts were sent during 1996, developed in discussion with Australian experts. A third draft was sent in December 1996, attached to the Australian Centre's comments on the Alpha draft ICIDH as a whole. The proposals are outlined in appendix 4.

'Options testing'

The published draft ICIDH-2 contains two qualifiers for participation—'extent of participation' and 'contextual enabler / facilitator' (Box 3.3). These qualifiers represent the new work of the Beta drafting team and a modified version of the 'environment focused enabling response' of the Australian Centre.

At the April 1997 meeting, the Australian Centre made a brief critical analysis of all the qualifiers suggested so far for the participation dimension. It argued that there were five key ideas, which were all worthy of inclusion in the testing of the draft ICIDH-2. A paper outlining these ideas was submitted by the Australian Centre to WHO, shortly followed by an 'options testing' document for testing these qualifiers against those proposed in the draft ICIDH-2. An abridged version of the Australian Centre's submission follows.

Australian submission on qualifiers of participation (May 1997)

There is some overlap among many of the qualifiers suggested to WHO during 1996 and 1997. However, if we attempt to extract the key ideas reflected in these qualifiers, five emerge:

- satisfaction of the person
- (contextual) facilitator or barrier
- personal support needed
- difficulty experienced by the person
- extent of participation.

There are good reasons for the inclusion of all these key ideas in the Beta test. Some have had more operationalisation and application than others, but all these ideas are recognisable in the field.

Ideas included in the description of the participation dimension also point to the need for a range of qualifiers. The text contains repeated use of the phrases: the 'quality and

extent of', 'manner and extent of', 'nature and degree of', 'quality, extent and character of' and so forth. These words provide an indication of important aspects of participation.

When the variously proposed qualifiers and the key phrases of the Beta version are compared, the following relationships emerge:

- quality: implicit in the 'satisfaction' qualifier;
- extent and degree: found in the 'extent' qualifier (which would understandably be difficult to develop, but the frequent use of this terminology in the document indicates a need for such an instrument);
- nature and manner: implicit in the 'personal support' and 'contextual facilitator / barrier' qualifiers.

This only leaves the 'difficulty' qualifier not directly relating to these key phrases in the Beta text. However, 'difficulty' can be a significant factor in 'satisfaction'—depending on whether you are measuring satisfaction with the *process* of participation, or satisfaction with the *outcome* of participation. Difficulty is very much about process. The inclusion of two satisfaction qualifiers, one focused on process and the other on outcome, would then be valuable.

Five qualifiers were then proposed by the Australian centre for Beta testing.

1. Satisfaction with *manner* of participation

Key Beta words: quality

Advantages

- One of the main goals of the disability field appears to be to empower the person to set their own goals and make their own decisions.
- It is clear who is making the judgement.
- 'Difficulty' is implied—this needs to be clarified in the text, and possibly in the codes.

Use the North American Collaborating Centre's (NACC) draft of June 1996:

1. Very satisfied
2. Satisfied
3. More or less satisfied
4. Dissatisfied
5. Extremely dissatisfied
6. Indifferent

2. Satisfaction with outcome of participation

Key Beta words: quality / quantity, extent of participation

Advantages

- One of the main goals of the disability field appears to be to empower the person to set their own goals and make their own decisions.
- It is clear who is making the judgement.

Use the NACC draft of June 1996 (1–6 as for 'manner' above), changing the focus to outcome, for example, by asking 'Are you satisfied with your participation outcome?'

3. (Contextual) facilitator or barrier

Key Beta words: nature and manner

Advantages

- This provides important recognition that the environment / context may need to change.
- This concept is capable of highlighting areas requiring attention.

Use existing Beta ICIDH-2 draft (see box 3.3).

4. Personal support or assistance

Key Beta words: nature and manner

Advantages

- 'Support needed' is a well recognised concept in disability support services, and a key factor included in the ninth revision of the American Association on Mental Retardation (AAMR) definitions (see Luckasson et al. 1992).
- This concept has been operationalised in Australian population surveys and used to estimate unmet demand for disability support services.

Use Australian Collaborating Centre's draft (December 1996) minus the difficulty element:

0 No response needed in usual environment

1 Equipment and / or financial assistance

2 Occasional assistance to participate to desired level

3 Needs regular personal assistance (most days)

4 Needs significant daily support

5. Extent of Participation

Key Beta words: extent and degree

This may be the most complex qualifier. Whoever judges the extent of participation could take into account a number of things including the person's goals, the person's activity limitations, cultural expectations, UN rules, and other aspects of the environment.

All these factors are relevant, not only in determining the actual level of participation, but also for anyone judging what this 'level of participation' actually means. Depending on which of these factors are taken into account, this qualifier could overlap to some extent with 'satisfaction with outcome' above.

Use existing Beta ICIDH-2 draft (see box 3.3)

3.7 Where to from here?

It is difficult to predict what influence the new ICIDH will have in Australia, because it will depend on a number of factors:

- results of the two stages of Beta testing and the contents of the final classification;
- relevance of the new ICIDH to the Australian context—which it is hoped will be maximised by Australia's participating in and commenting on the draft;

- relatability of the new ICIDH to the previous version and existing classifications and collections in place in Australia; and
- commitment of key players to the promotion and integration of the new ICIDH.

It is fair to say that there has been fairly broad acceptance in Australia of the utility of three 'dimensions of disablement' to support the provision of information relevant to the very wide range of purposes of interest and value in the disability field. The ICIDH conceptualisation thus potentially provides a useful starting point for a framework in which to locate the Australian definitions now in use. Chapter 4 of this paper explores this idea further by mapping current definitions and terminology to the new draft ICIDH-2.