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**Title:**            **Report on findings of the ICD-10 Coder Needs Assessment Surveys**

**Authors:**       **Sue Walker**, Associate Director, National Centre for Classification in Health, Queensland University of Technology, Brisbane, Australia  
                 **Kirsten McKenzie**, Research Fellow, National Centre for Classification in Health, Queensland University of Technology, Brisbane, Australia

**Purpose:**        for information and discussion

**Recommendations:**

- **that the information provided by the needs assessment surveys be used to inform future work of the WHO-FIC Network**
- **that consideration be given to publication of selected results of the Needs Assessment survey in the WHO Bulletin or an international epidemiological journal**

**Abstract:**

In early 2004, the WHO-FIC Education Committee distributed a survey to WHO member states to request information about the international coder workforce. Designed to collect data about morbidity coders and mortality coders separately, the survey included questions about the implementation and use of ICD-10, perceived barriers to implementation, characteristics of people who perform the coding function, coders' roles and responsibilities, educational backgrounds of coders and how coding training is obtained, proficiency levels, views about the development of an international credentialing process for coders and additional support required to promote coding in each country.

Approximately 100 survey responses were returned for morbidity coders and a similar number for mortality coders. This represents approximately a 50% overall response rate from the 192 WHO member states. The highest percentage of respondents came from countries represented by the Pan American Health Organization (AMRO) (88.6%) and the lowest rate from the South East Asia Region (27.3%). The response rate from the Western Pacific was 63%, African region was 30.3%, Eastern Mediterranean region at 33.3% and European region at 51.9%. The surveys were distributed and returned in English, French, Spanish and certain other official WHO languages.

This paper outlines the results of the surveys, providing the first known comprehensive view of the coder workforce internationally.

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# Introduction

The WHO Collaborating Centres for the Classification of Diseases recognized in 1999 the importance of conducting needs assessments about the capacity, skills and responsibilities of ICD coders in member states. Needs assessment questionnaires for ICD-10 mortality and morbidity medical coders were developed, translated and circulated to WHO regional offices and collaborating centres by the WHO Implementation Committee Subgroup on Training and Credentialing in 2002; preliminary results were reported at the 2002 annual meeting of collaborating centres. The response rate was quite low, and it was clear that several respondents had misinterpreted some of the questions. During the April 2003 Subgroup meeting in Washington, D.C., it was agreed that the questionnaires should be revised to clarify questions and facilitate data analysis and then re-fielded to all countries, regardless of whether they had implemented ICD-10. The revised questionnaires were reviewed during the annual meeting of the WHO Family of International Classifications (WHO-FIC) Network in Cologne, Germany in October 2003, and it was decided that several questions should be added about the status of ICD-10 implementation to assist in the “stocktaking” of the new WHO-FIC Implementation Committee.

The WHO-FIC Education Committee, successor to the earlier Subgroup, circulated the revised questionnaires to regional offices and collaborating centres in February 2004. As with the earlier questionnaires, the Pan American Health Organization had translated the questionnaires into French, Portuguese and Spanish. The Australian Collaborating Centre entered the responses into a data base and provided a preliminary report on a subset of the responses at the May 2004 Education Committee meeting in Prague. Participants at this meeting agreed that the preliminary results were extremely interesting and should guide future work of the WHO-FIC Education and Implementation Committees. This paper outlines the full results of the surveys received from nearly 100 countries, providing the first known comprehensive view of the coder workforce internationally.

# 1. Mortality

## 1.1 Respondents' profile

This analysis relates to the responses received from 99 countries. Countries included in this report are:

Albania	Galicia (Spain)
Algeria	Georgia
American Samoa	Germany
Anguilla	Ghana
Antigua and Barbuda	Grenada
Argentina	Guatemala
Aruba	Honduras
Australia	Hungary
Austria	Iceland
Bahamas	Iraq
Bangladesh	Italy
Barbados	Jamaica
Belize	Japan
Bolivia	Jordan
Bosnia & Herzegovina	Latvia
Brazil	Lebanon
Brunei Darussalam	Lithuania
Bulgaria	Malaysia
Burkina Faso	Maldives
Canada	Mali
Catalonia(Spain)	Mexico
Chile	Mongolia
Cook Islands	Montserrat
Costa Rica	Mozambique
Croatia	Myanmar
Cuba	Namibia
Cyprus	New Zealand
Czech Republic	Nicaragua
Denmark	Niue
Dominica	Norway
Ecuador	Panama
Egypt	Paraguay
El Salvador	People's Republic of China
England and Wales	Peru
Ethiopia	Philippines
Federated State of Micronesia	Republic du Congo
Fiji	Republic of Macedonia
Finland	Republic of Mauritius
Finland	Samoa
France	Senegal
Gabon	Seychelles

Singapore  
Slovak Republic  
Spain  
St Kitts & Nevis (aka St Christopher and Nevis)  
St Vincent and the Grenadines  
Sudan  
Sultanate of Oman  
Suriname  
Sweden  
Switzerland  
Syrian Arab Republic  
Tanzania  
Thailand  
Tokelau  
Trinidad and Tobago  
Tuvalu  
United States

## 1.2 Mortality data profile

Of the 99 respondents, 93.9% reported that mortality data is coded in their country. The six countries that responded but do not code mortality data at all are:

Lebanon  
Mali  
Niue  
Samoa  
Senegal  
Tokelau

Of those countries that code mortality, 77 (82.8%) code the underlying cause of death for all deaths that occur and are reported. Sixteen (17.2%) code only a portion of deaths – the limitations of those deaths that do get coded are:

- those that occur in a hospital (any hospital, or only a public or mission hospital)
- those where information is gathered by the Ministry of Health from special surveys
- where there has been an agreement for medical certification of the death
- where doctors are available to certify the death or coders are available to code it.

Of the 93 countries that code mortality data,

- 86.0% use ICD-10
- 9.7% use ICD-9 (Albania, Bulgaria, Guatemala, Iraq, Italy, Macedonia, Singapore, Tanzania)
- 2.6% use other ICD revisions (ICD-10-AM – Fiji, New Zealand; ICD-6 – Ethiopia, 1965 (ICD-7?) short list - Republic of the Congo)
- 2.8% use other classifications (Eurostat Short List - Cyprus, local codes – Brunei Darussalam).

### 1.3 ICD-10 Implementation Plans

There were 19 countries which either do not currently code mortality data or which use a classification other than ICD-10. Of these, 13 countries (68.4%) reported that they have plans to implement ICD-10.

- Mauritius indicated that data for 2003 is still being coded using ICD-9 and ICD-10 in parallel; however, ICD-10 will be used exclusively for 2004 data
- Tokelau hopes to restart coding mortality data following a mid-year redevelopment of their Health Information System
- Niue hopes to start coding following redevelopment of their hospital after a tropical cyclone
- Italy will implement in 2004-5
- Bulgaria, Ethiopia and Iraq hope to implement in 2005
- Cyprus hopes to implement ICD-10 'in the next 2-3 years'
- Albania reported plans to implement around 2008-2010
- Singapore reported that no timeline has yet been set
- other countries stated that they would use ICD-10 'once it is available to us' (Tanzania) or 'once new hospital is completed and resources are available' (Niue) or 'when funds are available' (Samoa).

### 1.4 Barriers to Implementation of ICD-10

Countries that do not code mortality data at all, do not use ICD-10 currently or which do not have plans for implementation of ICD-10 were asked to provide reasons for not implementing ICD-10. Note that respondents could provide as many responses as were applicable for their country.

- 1 respondent reported a lack of high level political commitment
- 7 reported that there is a lack of financial resources to support training
- 5 stated that it is too expensive to buy coding books
- 4 indicated that changing computer systems was too expensive or too difficult
- 4 countries do not have computer systems which can handle ICD-10 codes
- 6 feel that they do not have sufficient ICD-10 trainers
- 3 countries stated that there are not enough coders
- 3 countries do not feel that their coders are sufficiently experienced
- a lack of translations of ICD-10 in local languages was not seen as a barrier by any respondent country
- other reasons provided included the necessity to determine whether mortality coding would be the responsibility of the Ministry of Health, the Statistical Service or the Ministry of the Interior; a lack of knowledge and information about ICD-10 and a lack of awareness of the usefulness of ICD-10.

## 1.5 How mortality coding is performed

The following results relate only to those respondents that reported that coding of mortality data is performed in their countries.

The locations where mortality coding is done are as follows. Note that respondents could indicate more than one location if appropriate.

- 43.0% (40 countries) code at the Ministry of Health
- 38.7% (36 countries) code at the national statistical office
- 4.3% (4 countries) code mortality data at one central hospital
- 7.5% (7 countries) code mortality at some hospitals
- 16.1% (15 countries) code mortality at all hospitals
- 6.5% (6 countries) code mortality at the Registrar's office
- 32.3% (30 countries) reported other locations, including institute of legal medicine, regional health directorates, local centres for disease control at regional level, health secretariats at municipality level, at Health Statistics and Medical Terminology agency, institutions of public health, state health departments and other statistical organisations.

Seventy countries (75.3% of those countries that code mortality) use coding books to code manually; 7 (7.5%) use an automated system exclusively, 20 (21.5%) reported that they used a combination of automated and manual coding methods and two reported other methods of coding (Denmark stated that automated coding will be introduced as soon as electronic death certificates are available, and Canada reported manual coding of underlying cause for still births and manual coding of multiple causes for general deaths). Those countries that reported the use of automated systems use MMDS either alone or in combination with MIKADO or STYX .

## 1.6 Who codes mortality data?

Respondents were asked to indicate the job titles of people who complete the coding of mortality data. Responses were as follows, noting that multiple responses were permitted:

- 19.4% reported clinical coders
- 33.3% reported administration officers
- 33.3% reported health information or medical record managers
- 40.9% reported statistical assistants
- 24.7% reported medical officers
- 18.3% reported other professional groups are responsible for coding mortality data. These included "normal people" (sic) with extensive coding experience (>10 years); a team consisting of the national epidemiologist and registered nurses; local civil registrar; nurses; epidemiologists; senior health planners; nosologists.

Fifty four respondents (58.1%) reported that coders are employed under a clerical employment category and 39 (41.9%) stated that coders are not employed under a clerical category. Other reported categories were medical doctors, nurses, advisers,

consultant coders, executive officers, medical records and health informatics officers and technical specialists. One country reported that there is not a category for people who complete the coding. Thirty (32.3%) respondents stated that there are different gradings for coders, based on knowledge and experience. These respondents indicated that different grades are based on:

- length of service and/or experience in the job
- length of time that the coder has worked as a coder
- one respondent reported that underlying cause and multiple cause coders are paid differently and have different training opportunities and qualification requirements
- increased responsibilities, not necessarily on coding experience
- initial training or professional backgrounds
- different grades for older coders who may not have formal qualifications and younger coders who are recruited with more educational experience.

Sixteen per cent of countries indicated that there are plans to change the grades for coders, through provision of further education, changes from clerks to medical record technicians, introduction of higher grades for ‘experienced’ coders, and through application for Job Reclassification. One country is waiting for the recommendation of the WHO-FIC Education Committee!

Respondents were asked to nominate the experience level of coders using the definitions supplied with the survey documentation. Note that there may be more than one response per respondent country.

	Entry level	Intermediate level	Advanced level	Nosologist	<b>Total responses</b>
Clinical coder	3 (17%)	5 (28%)	8 (44%)	2 (11%)	<b>18 (11%)</b>
Admin officer	10 (31%)	7 (22%)	12 (38%)	3 (9%)	<b>32 (20%)</b>
MRM/HIM	7 (23%)	12 (40%)	10 (33%)	1 (3%)	<b>30 (19%)</b>
Statistical asst	16 (41%)	9 (23%)	10 (26%)	4 (10%)	<b>39 (25%)</b>
Medical officer	4 (15%)	5 (19%)	7 (27%)	10 (38%)	<b>26 (17%)</b>
Other	4 (33%)	3 (25%)	3 (25%)	2 (17%)	<b>12 (8 %)</b>
<b>Totals</b>	<b>44 (28%)</b>	<b>41 (26%)</b>	<b>50 (32%)</b>	<b>22 (14%)</b>	<b>157 (100%)</b>

The percentage time that mortality coders spend assigning mortality codes was also requested.

	<20%	21-50%	51-80%	81-100%	<b>Total responses</b>
Clinical coder	4 (22%)	3 (17%)	6 (33%)	5 (28%)	<b>18 (12%)</b>
Admin officer	9 (31%)	3 (10%)	9 (31%)	8 (28%)	<b>29 (19%)</b>



MRM/HIM	11(37%)	5 (17%)	11 (37%)	3 (10%)	<b>30 (20%)</b>
Statistical asst	9 (24%)	13 (35%)	10 (27%)	5 (16%)	<b>37 (25%)</b>
Medical officer	9 (38%)	7 (29%)	5 (21%)	3 (13%)	<b>24 (16%)</b>
Other	1 (8%)	6 (50%)	2 (17%)	3 (25%)	<b>12 (8%)</b>
<b>Totals</b>	<b>43 (29%)</b>	<b>37 (25%)</b>	<b>43 (29%)</b>	<b>27 (18%)</b>	<b>150 (100%)</b>

For coders who do not spend 100% of their time coding, respondents were asked to specify what other responsibilities they have.

- 61.3% of coders also have data entry duties
- 48.4% conduct data analyses
- 48.4% are responsible for quality assurance of coded data
- 39.8% write reports
- 18.3% also code birth certificates
- 43% reported other responsibilities, including batching returns and proof-reading tables, administrative/clerical/statistical duties, clinical duties, meetings, information services, coding of marriages and divorces, coding of morbidity data and general medical record duties, data processing and tabulations for special reports/research projects, administration of certificates (eg processing of birth or death certificates for relatives or insurance companies), presentations to clinical services, seeking additional information in other records and databases, requesting further information from certifiers, development of strategic and corporate plans, special studies relating to mortality data, staff supervision, surveillance and monitoring of suspected disease outbreaks.

## 1.7 Coder education

Respondents were asked to consider entry level mortality coders and were asked about whether formal education is required by coders before they begin to code, Forty-four percent of respondents indicated that formal education is required; 56% of coders are taught solely 'on the job'. Formal education is provided by:

- universities (8.6%)
- community colleges (7.5%)
- distance education (4.3%)
- short courses by trainers from other countries (17.2%)
- other means (28%) – including local short courses provided by national trainers or institutions (public health departments, medical record technicians, statisticians, ministries of health), '8 years of schooling', by WHO-FIC Centres

For coders who are required to have formal coder education before they commence coding, respondents were asked to indicate what subjects are necessary:

- medical terminology (47.3%)

- anatomy and physiology (38.7%)
- basic coding (41.9%)
- computer basics (data entry, word processing, spreadsheets) (29%)
- principles of statistical classifications (29%)
- use of automated software (12.9%)
- four respondent countries teach other subjects prior to commencement of coding. These include biostatistics, medical registration, pathology, basic statistics and analysis.

For coders who are taught ‘on the job’, respondents indicated what subjects are taught after hiring but before coding commences.

- medical terminology (43%)
- anatomy and physiology (25.8%)
- basic coding (66.7%)
- computer basics (data entry, word processing, spreadsheets) (46.2%)
- principles of statistical classifications (38.7%)
- use of automated software (21.5%)
- other – statistics (1 respondent), varies from state to state (1 respondent), pathology (1 respondent), morphology (1 respondent).

Fifty nine percent of respondents have specific training materials for mortality coder education. These materials include:

- volumes 1,2,3 of ICD-10
- death certificates
- nationally-developed exercises and case studies
- a training manual and local coding instructions
- basic materials for morbidity as well as mortality
- materials from a previous CDC course in the USA about multiple cause coding
- materials from Mortality Forum and other international materials and resources
- medical dictionaries
- TENDON
- INTERCOD
- materials from Australian and Mexican WHO-FIC Centres, Swedish coding instructions, National Statistics Institute.

Respondents were asked their opinion on the adequacy of coder training in terms of coders’ ability to assign codes according to the coding rules. Nearly 38% believed that coder training was inadequate, for the following reasons

- training is of too short a duration (many responses)
- it has been more than 20 years since formal training was provided
- there is no suitable trainer (local coders are used and training is based on their experience)
- coders only use an electronic short list of 65 codes and do not receive proper training
- finances are too low for follow up or periodic training
- coders only receive basic coding instruction – medical terminology, anatomy and physiology are required as well to improve coding quality

- current coders are more-or-less self-trained
- training varies from state to state – requires standardisation
- there is a need for morbidity as well as mortality training given that mortality coding has added complexity
- the concept of sequencing is fundamental to mortality coding, this needs to be taught. The training may enable them to assign codes but not to apply the rules of choosing the underlying cause of death. This takes more experience and on the job training, which requires more support.

Respondents supplied information about whether sufficient numbers of mortality coders are available in their countries. Sixty countries (64.5%) felt that there are insufficient coders, with additional numbers required ranging from ‘one more’ to ‘1500+’ to one in each municipality/health institution/regional health department to ‘more for backup in case of leave or illness’.

## 1.8 Mortality coding support

Assistance with the training of mortality coders is felt necessary by 71 countries – 76.3% of all respondents to the survey. The sort of assistance required was grouped into the following categories:

- technical and logistic support from Collaborating Centres
- financial support
- provision of expertise (expert coders and expert trainers – international trainers)
- training manuals and software
- access to ICD-10 volumes 1,2,3
- associated subjects such as medical terminology and anatomy and physiology
- information and training in use of automated systems
- coding certification from a recognised university or other institution
- WHO standard training materials
- access to ICD-10 updates from WHO
- ‘everything’.

The survey contained questions regarding the length of time mortality coders require to become proficient at their jobs and then what is required for them to progress to become expert coders. The time required was reported as:

Time required	Number of responses	Percentage of responses
0-6 months	20	21.5%
7-12 months	33	35.5%
13-24 months	24	25.8%
more than 2 years	15	16.1%
No response	1	1.1%

To become experts, respondents reported the following methods. Note that respondents could indicate as many methods as were thought relevant.

How to develop expertise	Number of responses	Percentage of responses
Further on-the-job training	59	34.9%
Further formal education	19	11.2%

Mentoring with expert coder	66	39.1%
Other methods	25	14.8%

Other methods specified included:

- annual training
- ‘controlled coding project’ (sharing of death certificates between countries and discussion of results and discrepancies)
- mentoring or consultation with medical staff
- participation in the ICD Forum
- periodic quality assessment/review with feedback to coder
- supportive supervision
- coding seminars and workshops
- system of credentialing with continuing education a requirement to continue credential.

Respondents were requested to indicate if they felt that there is a serious problem with turnover of mortality coders in their countries. Thirty-three countries (35.5%) felt that this was an issue for them, with the following reasons given to support their assertion:

- lack of availability of doctors or coders
- no formal credential exists for this work
- there is no ‘salary stimulus’
- the ‘politics of information resources’ doesn’t exist
- it’s a hard job with low salaries
- lack of job satisfaction, no incentives such as training or change of experience
- low salary, high workload, lack of support from management
- rotation of personnel to other administrative functions where there are better salaries and conditions
- there is only one experienced coder who trains the rest, who are inexperienced – if she leaves?!
- lack of career structure
- training new coders takes about one year
- with the experience they get as coders, they are applying for jobs in foreign countries
- many of our coders are currently expatriates.

## 1.9 Credentialing of coders

Thirteen (14%) respondents indicated that some form of national credentialing, certification or formal examination for coders exists in their country. These respondents were from Algeria, Argentina, Brazil, Cuba, Egypt, Mexico, Mongolia, Myanmar, Oman, the Philippines, Spain, Suriname and Tanzania. However, it is inferred that this question was poorly understood and the responses may not truly reflect a national credentialing process in those countries that indicate that one exists. The types of national credential were specified as follows; more than one response was possible:

Type	Number of responses	Percentage of responses
National exam at central location	1	7.7%
National exam at many locations	1	7.7%
Supervisor recommendation	2	15.4%
Exam after training course	6	46.2%
Other (many training courses, seminars, workshops)	1	7.7%

The survey asked whether an international credential for mortality coders would be useful. Seventy six respondents (81.6% of countries) thought that this would be useful, with those that did not feel that an international credential would be useful (five respondents) providing the following reasons for their response. Note that twelve respondents did not answer this question.

- favour credentialing of coding tools
- our country is so small with a small team that provide supervision for coders. This is sufficient without formal certification. It would be useful to compare our coding results against other countries.
- useful but who would do the course and what to do with the ‘old ones’.
- we would prefer to use the funding for training.
- we do not have the money to send our few coders for international education even if it would be useful.

### 1.10 Other comments about mortality coding

The free text comments provided by respondents were grouped into the following issues:

1. lack of coders available to code mortality data
2. lack of training, supervision and support for mortality coders
3. need for improvements in basic certification of deaths, including education for certifiers in correct completion of death certificates.

## 2. Morbidity

### 2.1 Respondents' profile

This analysis relates to the responses received from 96 countries. Countries included in this report are:

Albania	Georgia
Algeria	Germany
Anguilla	Grenada
Argentina	Guatemala
Australia	Honduras
Austria	Iceland
Bahamas	Iran
Bangladesh	Iraq
Barbados	Italy
Belize	Jamaica
Bhutan	Japan
Bosnia & Herzegovina	Jordan
Brazil	Laticia
Brunei Darussalam	Lebanon
Bulgaria	Lithuania
Burkina Faso	Madagascar
Burundi	Malaysia
Canada	Maldives
Chad	Mali
Chile	Marshall Islands
Costa Rica	Mauritius
Croatia	Mexico
Cuba	Mocambique
Cyprus	Mongolia
Czech Republic	Montserrat
Democratic Republic of Congo	Myanmar
Denmark	Namibia
Dominica	Nepal
Ecuador	New Zealand
Egypt	Nicaragua
El Salvador	Norway
England and Wales	Paraguay
Estonia	People's Republic of China
Ethiopia	Peru
Federated States of Micronesia	Philippines
Fiji	Poland
Finland	Republic of Macedonia
Finland	Saint Lucia
Gabon	Seychelles
Galicia- Espana	Singapore
Galicia- Spain	Slovak Republic

St Kitts and Nevis (aka St Christopher and Nevis)  
 St Vincent and the Grenadines  
 Sudan  
 Sultanate of Oman  
 Suriname  
 Sweden  
 Switzerland

Syrian Arab Republic  
 Tanzania  
 Thailand  
 Timor-Leste  
 Trinidad and Tobago  
 Tuvalu  
 United States

## 2.2 Morbidity data profile

Of the 96 respondents, 90 (93.8%) reported that morbidity data is coded in their country. Burundi, Chad, the Republic of Congo, Georgia, Madagascar and Timor Leste do not currently code morbidity data at all.

Of those countries that do code morbidity data:

- 59 (65.6%) code all hospital discharges from all hospitals;
- 19 (21.9%) code all discharges from some hospitals;
- 3 (3.3%) countries code a percentage of discharges from some hospitals;
- 4 (4.44%) countries code all discharges from one hospital;
- 3 (3.3%) reported other forms of morbidity coding coverage. These mainly related to special surveys conducted in certain hospitals at certain times.

Considering diagnosis coding,

- 74 countries code morbidity using ICD-10 (82.2%)
- 8 use ICD-9 (8.9%)
- 14 use another version of the ICD (15.6%) – these included ICD-10-AM, ICD-10-CA, ICD-9-CM, ICD-6, ICD-O
- two countries reported using another classification.

Considering procedure/operation coding,

- 19 countries code with ICPM (21.1%)
- 2 countries use OPCS (2.2%)
- 20 countries use ICD-9-CM (22.2%)
- 3 countries reported using ACHI (3.3%)
- 26 countries reported the use of other classifications – these included a combination of classifications in different hospitals/institutions, the Nordic Classification of Surgical Procedures, the Canadian Classification of Interventions, local ‘Classification of Manipulations’ used by health funds for payment purposes, a classification used by the Brazilian Health System for payment purposes, a 1971 Classification of Operations and Medical Procedures, OMS 1978, OPS-301 (German), short lists based on the most common procedures.
- 20 countries either do not code procedures or did not respond to this question.

Respondents were asked what sort of information is coded and were given the opportunity to provide as many responses as were applicable to their country.

- 33 countries (36.7%) code main diagnosis only
- 59 countries (65.6%) code both main diagnosis and other secondary diagnoses
- 11 (12.2%) code main procedure only
- 48 (53.3%) code both main procedure and other procedures or operations
- 48 (53.3%) code external causes
- six countries reported that other information is also coded (special data on cardiology and psychiatric patients, hours on mechanical ventilation and administration of CPAP, X-ray and laboratory findings, death certificates).

## **2.3 ICD-10 Implementation Plans**

There were 16 countries that either do not code morbidity data or which use a classification other than ICD-10. Five countries: Galicia in Spain, Georgia, Madagascar, Singapore and Timor Leste, do not have current implementation plans. Albania plans to implement in 2008-2010; Bulgaria, Republic of Congo, Ethiopia and Mali in 2005; Chad in 'two years'; Iraq in second half of 2004; Jordan will implement in Ministry of Health hospitals between 2003-2008; Tanzania will start using ICD-10 'as soon as it is available' to that country, Burundi will implement 'as soon as possible' and the USA indicates that they will implement ICD-10-CM in 2007 depending on the government's regulatory process.

## **2.4 Barriers to Implementation of ICD-10**

Countries that do not code morbidity data at all, do not use ICD-10 currently and which do not have plans for implementation of ICD-10 were asked to provide reasons for not implementing ICD-10. Note that respondents could provide as many responses as were applicable for their country.

- 5 (31.3%) respondents reported a lack of high level political commitment
- 11 (68.8%) reported that there is a lack of financial resources to support training
- 5 (31.3%) stated that it is too expensive to buy coding books
- 5 (31.3%) indicated that changing computer systems was too expensive or too difficult
- 7 (43.8%) countries do not have computer systems which can handle ICD-10 codes
- 10 (62.5%) feel that they do not have sufficient ICD-10 trainers
- 11 (68.8%) countries stated that there are not enough coders
- 6 (37.5%) countries do not feel that their coders are sufficiently experienced
- 4 (25%) respondents reported that there are no translations of ICD-10 in their local language
- 6 (37.5%) countries reported that they have difficulty because there is no procedure classification to accompany ICD-10



- 3 (18.8%) respondents indicated that they are waiting for the release of ICD-10-CM
- the single other reason provided was the long term use of ICD-9 (ten years).

## 2.5 How morbidity coding is performed

The following results relate only to those respondents that reported that coding of morbidity data is performed in their countries.

The locations where morbidity coding is done are as follows. Note that respondents could indicate more than one location if appropriate.

- 51 countries (56.7%) code in all hospitals
- 10 countries (11.1%) code in one central hospital
- 21 (23.3%) only code in some hospitals
- 21 (23.3%) code at the Ministry of Health
- 9 (10%) code morbidity at the national statistical office
- 13 (14.4%) countries reported that coding is done in other locations. These included a combination of locations depending on whether the hospital is a public or private institution, a state insurance company, the psychiatric centre, at regional health centres, by some private medical officers, at primary health care centres, Epidemiology Service, physicians' offices, Home Health Services, long term care facilities or only for special surveys.

Fifty-four countries (60% of those countries that code morbidity) use coding books to code manually; 5 (5.6%) use an automated system exclusively, 34 (37.8%) reported that they used a combination of automated and manual coding methods and 6 reported other methods of coding, including the use of paper-based and electronic short lists

## 2.6 Who codes morbidity data?

Respondents were asked to indicate the job titles of people who complete the coding of morbidity data. Responses were as follows, noting that multiple responses were permitted:

- 26 (28.9%) reported that clinical coders are responsible for coding morbidity;
- 31 (34.4%) reported administration officers
- 48 (53.3%) reported health information or medical record managers
- 33 (36.7%) reported statistical assistants
- 36 (40%) reported medical officers
- 22 (24.4%) stated that nurses code morbidity data
- 4 (4.4%) indicated that morbidity coding is performed by nosologists.
- 6 (6.7%) reported other professional groups are responsible for coding morbidity data. These included statisticians, assistant medical record officers, technical personnel, dentists and in one country 'in smallest hospitals, any person may code'.

Forty one respondents (45.6%) reported that coders are employed under a clerical employment category. Of those that are not clerical coders, other reported categories were the head of the department of medical information, health service providers, medical coding specialists, statistical technicians, medical officers/physicians, nurses.

Twenty (22.2%) respondents stated that there are different gradings for coders, based on knowledge and experience. These respondents indicated that the gradings are mainly based on length of service and/or experience in the job, supervisory level positions, possession of the National Clinical Coding Qualification (UK), university qualifications in Health Information Management (Australia) or a credential awarded by AHIMA or AAPC (USA).

Twenty countries (22.2%) indicated that there are plans to change the grades for coders, through the UK Agenda for Change initiative, through review of the clinical coder workforce, through provision of more training, by changing from clerical assistant to statistical assistant, through regular review process that occurs every 3-5 years, through a formal job evaluation exercise and through coder registration processes.

Respondents were asked to nominate the experience level of coders using the definitions supplied with the survey documentation.

	Entry level	Intermediate level	Advanced level	Nosologist	<b>Total responses / % of total</b>
Clinical coder	4 (18.1%)	6 (27.3%)	10 (45.5%)	2 (9.1%)	<b>22 (12.2%)</b>
Admin officer	16 (53.3%)	9 (30%)	4 (13.3%)	1 (3.3%)	<b>30 (16.7%)</b>
MRM/HIM	6 (13.6%)	17 (38.6%)	21 (47.7%)	0	<b>44 (24.4%)</b>
Statistical asst	14 (43.8%)	13 (40.6%)	4 (12.5%)	1 (3.1%)	<b>32 (17.8%)</b>
Medical Officer	1 (3.6%)	14 (50%)	12 (42.9%)	1 (3.6%)	<b>28 (15.5%)</b>
Nurse	7 (35%)	9 (45%)	4 (20%)	0	<b>20 (11.1%)</b>
Nosologist	0	0	0	4 (100%)	<b>4 (2.2%)</b>
<b>Total responses/ % of total</b>	<b>48 (26.7%)</b>	<b>69 (38.3%)</b>	<b>55 (30.6%)</b>	<b>8 (4.4%)</b>	<b>180 (100%)</b>

The percentage time that morbidity coders spend assigning morbidity codes was also requested.

	<20%	21-50%	51-80%	81-100%	<b>Total responses/ % of responses</b>
Clinical coder	4 (19.0%)	5 (23.8%)	5 (23.8%)	7 (33.3%)	<b>21 (12.3%)</b>
Admin officer	5 (22.7%)	11 (50%)	4 (18.2%)	2 (9.1%)	<b>22 (12.9%)</b>
MRM/HIM	8 (17.4%)	18 (39.1%)	16 (34.8%)	4 (8.7%)	<b>46 (27.1%)</b>
Statistical asst	7 (24.1%)	6 (20.7%)	10 (34.5%)	6 (20.7%)	<b>29 (17.1%)</b>
Medical officer	15 (57.7%)	6 (23.1%)	1 (3.8%)	4 (15.4%)	<b>26 (15.3%)</b>
Nurse	10 (58.8%)	5 (29.4%)	2 (11.8%)	0	<b>17 (10%)</b>
Nosologist	1 (33.3%)	0	2 (66.7%)	0	<b>3 (1.8%)</b>
Other (medical secretary, technician)	1 (16.7%)	0	5 (83.3%)	0	<b>6 (3.5%)</b>
<b>Totals</b>	<b>51 (30%)</b>	<b>51 (30%)</b>	<b>45 (26.5%)</b>	<b>23 (13.5%)</b>	<b>170 (100%)</b>

For coders who do not spend 100% of their time coding, respondents were asked to specify what other responsibilities they have. Multiple responses were allowed for this question.

- 64.4% (58 respondents) reported that coders are also responsible for data entry
- 52.2% (47 respondents) undertake some data analysis
- 52.2% (47 respondents) conduct quality assurance studies
- 47.8% (43 respondents) write reports
- 56.7% (51 respondents) have general medical record duties
- 20% (18 respondents) are also responsible for medico-legal duties
- 14.4% (13 respondents) are also ward clerks
- 26.7% (24 respondents) reported that they have other duties to perform in addition to their coding role. These additional functions were reported as clinical work, provision of education and training, liaison with IT personnel, software testing, nursing, managerial duties, reception and admission office duties, revenue collection and statistical reporting, health promotion and a variety of other duties depending on the jurisdiction.

## 2.7 Coder education

Respondents were asked to consider entry level morbidity coders and were asked about whether formal education is required by coders before they begin to code, Fifty-two of respondents (57.8%) indicated that formal education is required; 38 countries (42.2%) are taught 'on the job'. Formal education is provided by:

- universities (18.9%)
- community colleges (12.2%)
- distance education (8.9%)
- short courses by trainers from other countries (26.7%)

- short course taught by local trainers (37.8%)
- other means (10%) – including Health Record Technician School, through e-learning and through learning to code as part of another program such as biostatistics.

For coders who are required to have formal coder education before they commence coding, respondents were asked to indicate what subjects are necessary:

- medical terminology (61.1%)
- anatomy and physiology (50%)
- basic coding (56.7%)
- computer basics (data entry, word processing, spreadsheets) (36.7%)
- principles of statistical classifications (40%)
- use of automated software (18.9%)
- general medical record duties (34.4%)
- cancer notification (16.7%)
- other – one respondent indicated that a formal medical education is required before coding commences, others specified that they are required to learn to code mortality.

For coders who are taught ‘on the job’, respondents indicated what subjects are taught after hiring but before coding commences. It should be noted that some respondents reported that coders are taught both ‘on the job’ and through a formal educational program and thus are represented in both sets of data.

- medical terminology (40%)
- anatomy and physiology (22.2%)
- basic coding (64.4%)
- computer basics (data entry, word processing, spreadsheets) (35.6%)
- principles of statistical classifications (43.3%)
- use of automated software (26.7%)
- cancer notification (10%)
- general medical record duties (33.3%)
- other (8.9%) – one country reported that there is no training at all.

Forty eight (53%) respondents have specific training materials for morbidity coder education. These materials included:

- country-specific morbidity training manuals and booklets
- teacher and student materials and text books written by local coders, coding authorities and professional HIM associations
- ICD-10 coding books – Volume II in particular - and associated case studies and manuals
- short lists of common diseases from Ministries of Health
- update workshops and web-based materials, conferences, practical activities for coders
- TENDON, INTERCOD.

Respondents were asked their opinion on the adequacy of coder training in terms of coders’ ability to assign codes according to the coding rules. Forty percent of

respondents (36 respondent countries) believed that coder training was inadequate. The following outlines some of the reasons for this assertion:

- training is of too short a duration (many responses)
- coding should be a professional job
- qualified coders are often given other jobs to do, especially once they receive training and upskilling
- medical records are inadequate as source documents
- trained coders required supervision and mentoring after they complete a short course
- no access to international courses or coding forums, so teaching from local knowledge only.

Respondents supplied information about whether sufficient numbers of morbidity coders are available in their countries. Sixty four countries (71.1%) felt that there are insufficient coders, with additional numbers required ranging from ‘one more’ to thousands.

## 2.8 Morbidity coding support

Assistance with the training of morbidity coders is felt necessary by 59 countries – 65.6% of all respondents. The sort of assistance required was grouped into the following categories:

- increase capacity of current schools to take more students
- scholarships
- provision of international expertise and trainers
- financial and material support
- standardised reference materials
- refresher courses
- training of trainers
- assistance with medical terminology, anatomy and physiology, principles of classification
- how to abstract the information from medical records for coding
- automated coding systems
- more guidelines for supporting code choices
- explanations regarding importance of morbidity coding for decision-makers.

The survey contained questions regarding the length of time morbidity coders require to become proficient at their jobs and then what is required for them to progress to become expert coders. The time required was reported as:

Time required	Number of responses	Percentage of responses
0-6 months	19	22.9%
7-12 months	32	38.6%
13-24 months	19	22.9%
More than 2 years	13	15.7%

No response	6	n/a
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To become experts, respondents reported the following methods. Note that respondents could indicate as many methods as were thought relevant.

How to develop expertise	Number of responses	Percentage of responses
Periodic assessment or auditing, with feedback	61	29.6%
Further on-the-job training	51	24.8%
Further formal education	30	14.6%
Mentoring with expert coder	52	25.2%
Other methods	12	5.8%

Other methods specified included:

- attachment programs
- coders participating in investigations and discussions, international coding consultation
- decentralised coding comparisons
- update courses
- systematic supervision
- refresher courses and workshops
- visits to observe and advise
- ‘there is no way the Ministry of Health can assess the proficiency of coders’.

Respondents were requested to indicate if they felt that there is a serious problem with turnover of morbidity coders in their countries. Thirty eight countries (42.2%) felt that this was an issue for them, for the following reasons:

- after training, even if they are prepared to code, they might get moved to other sectors where they do not code
- no ‘salary stimulus’, poor salaries
- poor motivation
- changes in posting or responsibility – new coders are often left to themselves
- inconsistencies in code interpretation
- lack of stable jobs
- less of a problem now but still low salaries and increasing responsibilities
- coders are able to move from one hospital to another or are ‘poached’ to work in other departments such as clinical audit
- no career path or opportunity for initiatives to create specialisation
- we use medical officers and they rotate and resign
- At central level: contracted staff. At local level: poorly defined job description
- medical record officers with advanced level skills are currently expatriates
- Coding is a very hard job with low salaries, Frequent training is necessary
- Low salary, high work load. Lack of support from the management.

## 2.9 Credentialing of coders

Fourteen respondents indicated that some form of national credentialing, certification or formal examination for coders exists in their country. These respondents were from Argentina, Canada, Cuba, Egypt, England and Wales, Galicia-Spain, Japan, Mongolia, Myanmar, Oman, Philippines, Suriname, Tanzania and the United States. As with the mortality responses to this question, it is inferred that the issue of national credentialing is poorly understood and these results may over represent the true number of countries with such programs. The types of national credential were specified as follows; more than one response was possible:

Type	Number of responses	Percentage of responses
National exam at central location	1	6.3%
National exam at many locations	3	18.8%
Exam after training course	11	68.8%
Other	1	6.3%

Ten per cent of respondents who reported an examination or credentialing process indicated that this was developed by a government agency, 3.3% by the national health information management association and 4.4% reported the exam was developed by another organisation. Other organisations that developed examinations included representatives from the Ministry of Public Health, the National Health Service Information Authority in collaboration with the Institute for Health Records Information and Management in the UK, Japan Hospital Association and a local trainer. Credentialing exams are administered by the local health information management association in four countries, by government agencies in nine countries and other organisations in five countries. Written examinations are used in the majority of countries that offer examinations, using the following question styles:

- 12.2% contain multiple choice questions (11)
- 14.4% include case studies (13)
- 4.4% require essay-writing (4)
- 3 countries reported other exam format. One respondent indicated that ‘quick fire questions’ are required, with short one-line answers being provided by coders sitting the examination.

In five countries, the credentialing examination is held once per year. A examination is conducted twice per year in two countries. In the other countries it is a ‘one-off’ and held as often as necessary or is held only at the end of a training course. Four respondents reported that there is a requirement for continuing education or professional development to maintain the credential.

The survey asked whether an international credential for morbidity coders would be useful. Fifty two per cent percent of respondents (47 countries) thought that this would be useful, with those that did not feel that an international credential would be useful (13 respondents) providing the following reasons for their response. Note that 30 respondents did not answer this question.

- graduates of an internationally credentialed course would receive a different pay than staff not accredited. Some staff might not be able to get an international credential due to financial reasons.
- because coding is not a profession in our country, it would not be useful but it needs a change of thinking by decision-makers
- An international credential for morbidity coders would eventually be useful but special attention needs to be given in the development of the content, given the unique needs of various countries and the coding instructions that have been developed by some countries
- National credentialing is voluntary at this time. Until it becomes mandatory there is no advantage for influencing hiring or immigration policies
- there is not the same level of education in different countries
- Too many uses of classifications (statistical, administrative, DRG-oriented). Too many differences between the national forms (procedure catalogues etc.) to match them to one credential.

## **2.10 Other comments about morbidity coding**

Finally, respondents were asked if they had any additional comments about morbidity coding. Many and varied responses were submitted and have been grouped into the following broad categories:

1. moves to try to improve the coverage and quality of morbidity coding, through better management of the process through Ministries of Health and standardisation of information systems used to collect the data
2. need for more training and support, development of formal educational courses
3. need for greater recognition for the work of coders and understanding of the importance of the role
4. need for improvements in the source documentation
5. need for better career structure and salaries for coders
6. need for better channels of communication between WHO, health departments and coders to ensure that all are aware of coding issues, revisions and updates
7. need for WHO to direct support to assist with implementation of coding and development of international coding standards.