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The Role of International Standards for National Statistical Offices

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Introduction

The purpose of this paper is to stimulate discussion on the roles and practices that surround international statistical standards.

The key focus of this paper is to discuss the role of international standards in, and for, the international official statistics community. In particular the main issues to be discussed include:

- What are international statistical standards?
- What benefits do international statistical standards provide?
- What problems do they address and what status should they have?
- What issues and challenges do their creation, maintenance and implementation create?
- Conclusions and Recommendations

What are international statistical standards?

The aim of international statistical standards and classifications is to provide a common framework for collecting and organising information about a particular statistical system, concept or variable. Their use, either directly or through national adaptations, facilitates the exchange and comparability of statistics and other information between countries. These statistical standards and classifications have generally been developed through extensive international consultations.

Generally an international statistical standard, classification or framework is one developed by an international agency such as the United Nations Statistical Division (UNSD), International Organisation for Standardisation (ISO), International Labour Organisation (ILO) or World Health Organisation (WHO).

So how are international statistical standards, classifications or frameworks defined?

International Standards

The International Organisation for Standardisation (ISO) endorsed the following definition of an international standard:

"*International standards are usually documents established by consensus and approved by a recognised body that provides for common and repeated use, rules, guidelines for activities or their results, aimed at the achievement of the optimum degree of order in a given context*."[1]

The Guidelines for the Template for a Generic National Quality Assurance Framework (NQAF) state that:

'*Standards refer to a comprehensive set of statistical concepts and definitions used to achieve uniform treatment of statistical issues within a survey or across surveys, and across time and space. Standards assist in maximising the effectiveness of statistical outputs and*

[1] ISO/IEC Guide 2, 1996: Section 3.2

the efficiency of the production process in terms of inter-temporal, national and international comparability and coherence (i.e. the capacity for integration) of the statistics.'[2]

The Guidelines further state that there are two broad types of standards – '*those that are applied to the structure and content of data, and those that are applied to the structure and content of metadata*.' These two broad types of standards could be supplemented by also recognising '*standards for the statistical production process'* as classified in Domain 4 of the UN Classification of International Statistical Activities (UNICSA).

It is important to recognise that there is no agreed definition for what constitutes an international statistical standard. Perhaps this is due to there being no clear statement of what constitutes an international statistical standard, and what elements and content it should have. Additionally many definitions exist, particularly in the metadata environment, which provide generic definitions for application within a statistical system. This sometimes causes conflict when there are specific statistical terms used, for example classification compared to statistical classification. Are they the same or different, or can they be applied consistently across different contexts?

International Statistical Standard

In the absence of a single agreed definition for an international statistical standard, some examples of definitions around statistical standards are:

- "*A statistical standard provides a comprehensive set of guidelines for surveys and administrative sources collecting information on a particular topic*"[3];
- "*An agreed rule or guideline on how one or more parts of the statistical business process should be carried out, conforming with requirements for professionalism*."[4]

Perhaps an outcome of researching the various definitions could lead to a definition that states:

"An international statistical standard is a comprehensive document of statistical guidelines and recommendations for managing statistical frameworks, processes, and surveys, and administrative sources to support the production of information on a topic or variable."

International statistical standards allow the production and collection of statistics on a consistent basis to enable integration of data over time and across different data sources. They contain concepts, definitions, classifications and rules, which can be used in isolation or collectively, to support processing and output of data. Effectively the international statistical standard provides the supporting metadata and operational guidelines that enable the use of international statistical classifications and frameworks.

It is possible that the lack of usage of the term 'international statistical standard' has been caused by the use of the term 'guidelines' to represent the operational information which supports the usage of the classification, rather than the application of the rules and

[2] http://unstats.un.org/unsd/dnss/docs-nqaf/GUIDELINES%208%20Feb%202012.pdf p14
[3] OECD Glossary of Statistical Terms: http://stats.oecd.org/glossary/detail.asp?ID=4920
[4] SDMX Metadata Common Vocabulary: http://sdmx.org/wp-content/uploads/2009/01/04_sdmx_cog_annex_4_mcv_2009.pdf

definitions for a particular statistical variable or concept. Consequently a clearer decision on terminology may eliminate the existing confusion i.e. utilise 'international statistical standard' rather than 'guidelines' in all documentation.

International Statistical Classifications

The United Nations Statistical Commission endorsed the following definition of an international statistical classification for use by national statistical agencies:

"A statistical classification is a classification having a set of discrete categories, which may be assigned to a specific variable registered in a statistical survey or in an administrative file, and used in the production and presentation of statistics."

However the Generic Statistical Information Model (GSIM), which leverages off the Neuchâtel Terminology Model, describes a statistical classification as '*a tool that is used to handle and structure objects systematically into categories in the production of statistics*.' Whereas Neuchâtel defines the term 'classification' as '*a classification version is a list of mutually exclusive categories representing the version-specific values of the classification variable*.' Potentially the two models are not quite describing the same concept or object but it creates confusion when an international generic model seeks to adopt an existing term and then redefine it – rather than achieving standardisation of terms, this continues the process of proliferation of like standards, and reaffirms the need to have a central custodian for such standards, who can monitor and ensure that there is a justified need for deviation, and ensure that there is no proliferation.

The approach to creating and using the above definitions reflects the primary issue for national statistical agencies of which standard to use, and this is further exasperated by the varying metadata standards and their definitional material. From a statistical perspective the logical standard is that endorsed by the UN Statistical Commission.

International statistical classifications often have supporting metadata and guidelines for use but this is very much subject to the custodian of the classification having developed them. Also there is no consistency in what information is provided with each classification i.e. no international template or agreement on what constitutes the essential supporting information to enable national statistical offices to adopt international standards. This additional information needs to reflect the content of an international statistical standard, and without it raises the issue that again confusion is created by where the relevant metadata and operational information appropriately resides.

International Statistical Frameworks

As with the situation for international statistical standards there is no agreed definition of what constitutes an international statistical framework. Frameworks are developed to meet different information needs and the challenge is to integrate different worlds of statistics, namely economic statistics and social statistics.[5]

[5] Statistical Framework for the Measurement of Movement of Persons: http://unstats.un.org/unsd/tradeserv/TSGdocuments/frame_Jan2005.pdf

Traditional examples of statistical frameworks are the System of National Accounts (SNA), System of Environmental and Economic Accounts (SEEA), Balance of Payments Manual (BPM), and the International Labour Standards.

One definition may be that *"Statistical frameworks are the tools that ensure the consistency of data collected over time and from different sources, as well as the methodologies that translate data collected at the national level into a form that is roughly comparable across countries."*[6]

Alternatively it could be proposed that:

"A statistical framework defines the scope of a statistical system, lays out the structural elements of it and organises those elements in a coherent way leading to a planned approach for long-term statistical development."

International statistical frameworks i.e. SNA, BPM etc. provide an agreed set of international recommendations on how to compile measures on economic, environmental and labour activity. These contain concepts, definitions, classifications and rules, which can be used in isolation or collectively, but which often require extensive resource to develop, and implement in, national statistical offices.

The SNA is both a conceptual framework and an accounting framework which ensures consistency in definitions and classifications used in fields of statistics and for consistency in data from different sources. SEEA is a conceptual framework based upon agreed concepts, definitions, classifications, and accounting rules for understanding the interactions between the economy and the environment based upon the application of the System of National Accounts. BPM provides concepts, definitions, classifications and conventions on the transactions and positions between an economy and the rest of the world. All three are examples of statistical frameworks that facilitate international comparability and which may also be considered as conceptual frameworks.

Ideally these statistical frameworks will be applicable to a range of economies, societies and labour markets, from smallest and least developed to advanced and complex. However their complexity and size often hampers full use within a statistical environment particularly in developing countries. Additionally the time required to implement these frameworks is also a consideration especially when there is often no coordinated international implementation strategy or program.

An issue here is whether a statistical framework and a conceptual framework are synonyms for each other or are they something different.

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[6] Statistical Frameworks and Co-ordination Mechanisms for Collecting and Reporting of Education Statistics by International Organizations: http://unstats.un.org/unsd/statcom/doc09/BG-Education.pdf

What benefits do International Statistical Standards provide?

It is a fundamental need for any statistical system to have standard concepts, definitions and classifications. International standards are developed and adopted by international agencies to ensure that there is a standardised and consistent approach to classifying and reporting statistical data. The aim is to provide a basis for statistics that are reasonably comparable between countries, and to enable the development of national standards and classifications for the same variable or concept utilising identical or similar characteristics. The use of common statistical standards underpins the UN Fundamental Principles of Official Statistics[7] by informing government and society with statistics that are practical, relevant and impartial. These principles also advocate the use of scientific principles on the methods and procedures for the collection, processing, storage and presentation of statistical data to provide trust in the statistics for users, and that information is presented through the use of scientific standards on the sources, methods and procedures of the statistics.

In particular, principle 9 of the UN Fundamental Principles of Official Statistics states: "The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels." This is particularly relevant in a world where globalisation increases the need for connectedness and integration of production processes, communication and technologies, including the statistical world, to produce consistencies and efficiencies in all walks of life.

However whilst this is a critical principle to adhere to in official statistics, the effectiveness of the principle is somewhat undermined by (a) the principle not being binding on agencies when it comes to adopting international standards, (b) the proliferation of 'like' standards and the move away from a single standard for a topic or variable, (c) ensuring that national needs are adequately reflected without compromising the overarching requirement for international standards, and (d) the need for a central repository of international statistical standards (this being rectified by the development of the Global Inventory of International Statistical Standards).

It should be noted that in 2010 the Bureau of the Conference of European Statisticians created a High Level Group for Strategic Developments in Business Architecture in Statistics (HLG-BAS), and at its June 2012 meeting decided on some proposed mechanisms of governance of global standards. One of these mechanisms was to be the creation of a central contact point for information on official statistics standards which would involve:

(a) regular maintenance of an inventory of all standards that can be seen as belonging to the official statistics domain;
(b) mapping the relations between standards, and their mutual dependence;
(c) creation and maintenance of a life cycle program for all standards; and
(d) facilitation of use and application of standards.

A new terms of reference for the HLG-BAS was prepared for consideration at the November 2012 meeting of the CES Bureau and this included the renaming of the HLG-BAS to the

[7] http://unstats.un.org/unsd/methods/statorg/FP-English.htm

High Level Group for the Modernisation of Statistics (HLG-MOS). Two of the main outputs for the HLG-MOS by the end of 2015 are:

(a) to develop necessary standards to support the modernisation of official statistics, such as the Generic Statistical Information Model (GSIM); and
(b) to actively promote relevant standards, methods and tools.

International standards are developed to support policy making, and to provide a framework for collecting, organising and analysing data from both statistical and administrative collections, and for international comparability. They ensure that statistics are relevant to current and prospective users in government and the wider community, and provide a mechanism for making official statistics more easily accessible. International statistical standards can enhance the integration of administrative and statistical information to deliver fit-for-purpose and robust statistical data reducing time and burden for national statistical offices.

These standards are developed by international experts thus enabling statistical agencies to benefit from the opinion of experts without having to call on their services directly.

International standards ensure information is linked together in common ways to enable robust analysis to inform policy and decision-making, inform debate and create knowledge. In an age of increasing statistical information availability, they reduce the proliferation of data that is incomplete and/or inconsistent with each other, whilst providing a robust framework for production of statistical data. Use of international standards enables groupings or clusters of statistics to be produced which reflect both the real world, and which are fit for purpose.

Common standards create flexibility to integrate and re-use data more effectively ensuring information is collected once and shared across the international community. Invariably the inability to get wider acceptance and use of international standards is due to regional or national differences being seen as more important than the international good, and the lack of certainty as to where to find the appropriate standards. For example whilst there is a single International Standard Industrial Classification, it's international application is affected by regional variations such as NAICS and/or ANZSIC, resulting in comparability issues and the need to utilise resource in mapping or concording from regional to international.

Underlying the discussion is the key concern that national statistical offices are uncertain about the need for, and application of, international statistical standards thus undermining their importance and value to the international official statistical system.

What problems do they address and what status should they have?

The approach of modifying international standards, while using robust frameworks to adapt to local requirements, has an associated cost of time and resources. These can be substantial and maybe beyond the means of some countries. The benefits however are that if national statistical offices make strong contributions to the international standard development process then they are easier to adopt at the national level as national needs are already being met. The disadvantage of not adopting international standards is undertaking expensive and lengthy national reviews and implementations such as that which

occurred in Australia and New Zealand with the introduction of the Australian and New Zealand Standard Industrial Classification (ANZSIC06).

It is the general intention that international standards are developed to meet the wide needs of both developed and developing countries, and to provide a framework for national statistical offices to use either as is, or adapt to national needs.

The international statistical frameworks such as SNA, BPM or SEEA should be regarded as models for statistical standards and be examples of best practice for the development and maintenance of statistical standards. Whilst there are basic principles documented for standard statistical classifications[8], and whilst the UN Expert Group on International Statistical Classifications is currently developing a best practice guidelines document for statistical classifications[9], best practice is implied by the international frameworks. For example, key requirements for international standards are:

(a) an identified custodian to maintain and update the international standard;
(b) a communication strategy for global consultation between countries and international agencies (both statistical and non-statistical);
(c) the development of consistent methodological documents, guidelines and supporting metadata;
(d) the development of operational guidelines to support data collection, processing and reporting;
(e) an implementation strategy that enables key agencies such as UN Statistics Division to provide global technical assistance to developing countries or countries wanting to update standards, with support of major regional statistical agencies;
(f) the ability to accurately audit usage, compliance and implementation of international standards via common monitoring tools to identify for example the minimum required data sets;
(g) an established global knowledge base or inventory.

Adoption of international standards should ideally be a binding agreement between international statistical agencies to provide consistent and standard international data comparability. The challenge, however, is around how international agencies and national statistical offices encourage support and adoption of international standards. The international frameworks need to be based on best practice, informed by global consultation and usage, and therefore national statistical offices need to be able to adopt or use as appropriate to meet their needs within available resources.

What issues and challenges do their creation, maintenance and implementation create?

The key question here is why there is a persistent and pervasive underutilisation of international statistical standards? Is this due to there not being enough statistical standards to meet the needs, not knowing where to find them, national statistical offices not wanting to resource work on international reviews, or is it a case of too many standards to choose

[8] http://unstats.un.org/unsd/class/family/bestprac.pdf
[9] http://unstats.un.org/unsd/class/intercop/expertgroup/2011/ac234-2.asp (Document 6)

from? Compounding the issue may be the complexity of the statistical frameworks or a lack of relevance to smaller or developing countries which limits global uptake.

Another significant issue arising from the development and application process for international statistical standards is the ability of some national statistical offices to adopt or utilise international statistical standards, classifications and frameworks. As stated above these standards are developed to be used as is, or as adaptations relevant to national requirements. The benefit of trying to utilise an international standard that doesn't necessarily meet the domestic need tends to lead to resources being unnecessarily spent by national statistical offices on developing their own versions. This impacts on the collection, production and output phases as the cost is not just limited to the time spent modifying or changing the international standard.

However there is no process for agreeing on where and how they will be used or implemented, it is somewhat inferred or implied through the development process. The international review process does not seem to include an implementation plan or strategy as part of the initiation process. To include one may assist international buy-in and also answer the essential question of 'Is the review needed'. There generally seems to be a lack of implementation strategies to support international standards with the only factor to facilitate their adoption being a date for international reporting on the new standard basis. The challenge is in identifying what is the cost and outcome of national statistical offices not adopting an international statistical standard.

Lack of support for international agencies such as UNSD or ILO to implement international standards in developing countries appears to be a factor which may require not only the support of regional commissions i.e. ESCAP or ECLAC but also the major national statistical agencies in the region.

Ideally international statistical standards, classifications, and frameworks should be designed to enable adoption by any country at any level and in particular, the highest level of a classification should enable all developed and developing countries to have a minimum categorisation for input and/or output purposes.

Questions that may wish to be considered include:

- whether there is a concern that there is no formal, agreed implementation strategy or audit process to help understand why or why not an international standard is being used?
- whether there is a concern that the international statistical community is uncertain as to when to adopt or use international statistical standards?
- whether there should be a mandatory or discretionary requirement addressed through the international standard development and implementation process?
- whether there is a cost of not having a compliance process, and whether there is benefit in such a process?

Reasons for the lack of adoption of international statistical standards may include:

- difficulty in understanding the need for an international standard and ensuring that that need is met

  Often new standards are created without (a) due consideration of the exact need for, or issues that might require a new standard, (b) investigating whether an existing standard can be enhanced or modified to meet the new need, or (c) considering the implications for proliferating like standards and the subsequent change in usage of existing standards. With large complex frameworks such as SNA or SEEA, it seems desirable to have component parts finalised, and agreement on where and when components should be used as part of the approval or sign-off.

- lack of encouragement or support by international agencies and national statistical offices in the adoption of international standards

  The difficulty lies with balancing compliance versus a binding obligation to adopt but consideration needs to be given to the benefits of adoption being a prime driver when determining which approach to take. Some national statistical offices may choose to utilise the concepts that underpin the international standard to build their own structures or frameworks, others may attempt to adopt the whole and then modify to national requirements. To achieve the ideal of making an international statistical standard mandatory in its application would require considerable effort to ensure that it meets the needs of all in the first place. However if left as optional then there seems little point in countries making any effort to adopt or implement because of the lack of national content. The potential proliferation of regional variations then makes harmonisation back to an agreed international standard difficult. A resolution may be to ensure that there is a minimum adoption at the highest or broadest level of an international standard to facilitate international reporting but that adoption at lower levels is an optional exercise for national statistical agencies.

- difficulty in obtaining international consensus and input into international statistical standard development and maintenance

  This is a particular challenge with developing countries who may have limited resourcing to engage with international reviews, and/or have limited use for a comprehensive international standard. Use of technology such as virtual meetings or discussion forums is a useful methodology to overcome some of the challenges of contributing to reviews, however for developing countries, having a reliable and appropriate internet or telecommunications capability is not always a reality. Also having clarity around the need and scope for the development or review of an international standard would ensure that the consultation wasn't an overly complicated or lengthy process.

- a lack of a central agreed repository for official international statistical standards

  This may cause confusion for NSOs not knowing what is the primary international standard (when there are variations around) or primary custodian, for example whether to visit the UN Statistics Division website or the UNECE. This could be

resolved through the Global Inventory of Statistical Standards work being undertaken but may still require some decision or influence about where this should be accessible from.

- where the custodian of the international statistical standard resides

  This affects the ability of countries to attend critical development meetings, as international standards are often under the custodianship of international agencies based in different countries. For example, for New Zealand and its Pacific neighbours the cost of travel to Europe or the United States to attend meetings and fully contribute to international developments is a challenge. This is also a challenge shared by many developing countries.

- overcoming dominant country or regional influences to ensure that international standards are robust

  For example, national statistical offices in Europe may be required by European Union regulation to follow a Eurostat standard which may result in the use of a variation of an international statistical standard, or follow a directive/standard from UNECE which again may result in the use of a variation from a UNSD standard. There is also the significant challenge that international meetings do not have a representative cross section of the international community in attendance, and/or the right level of expertise to progress issues.

- the length of time taken to implement major frameworks such as SNA or SEEA and their associated standards.

  Implementation of these major frameworks is hampered by their complexity and competing policy needs and priorities for countries. Additionally understanding the relationships between standards such as SEEA Water and SEEA Energy, within the central SEEA framework and even the SNA highlights the need to achieve coherence between national accounts, water statistics and energy accounts. This is further exasperated by the perception that implementation of an international statistical framework is done in its entirety rather than through a modular approach, supported by guidance documents, training packages and understanding country specific practices.

- prioritisation of international reviews against the work programme for a national statistical office

  This appears to have led to an international approach to undertake major reviews on a 10-15 year cycle. However this may detract from the ability of an international standard to be relevant and reflective of real world requirements.

- ensuring international agencies such as UNSD get national statistical office collaboration and support for regional development and implementation of international standards

This could be facilitated through the establishment of strategic partnerships between the international and regional agencies, UN regional commissions and countries, as well as a strategic vision for describing the purpose of the program of work, the goals to be achieved and the desired actions to address gaps and needs requirements.

- identifying what is the 'official' international standard to be used when there may be a proliferation of like standards i.e. how to deal with proliferation versus standardisation

  For example, there are a number of international metadata standards like SDMX, DDI, ISO 11179 and the Neuchâtel Terminology. To achieve a standards-based modernisation of official statistics the reuse of existing terms and definitions seems desirable where possible – as exampled by the Generic Statistical Information Model (GSIM). However which standard should be used in which instance, and what should happen when something like the GSIM seeks to amend or modify an existing standard, such as the Neuchâtel Terminology, and introduce new terms and concepts.

A positive issue or challenge to come from international reviews is the establishment of international collaboration between agencies and national statistical offices, which provides a level of capability and education that does not always exist with national reviews. National statistical offices are fundamentally all performing the same functions, and leveraging from each other or sharing of systems, standards and processes saves resources and promotes efficiency.

The development of international statistical standards can provide a starting point for collaboration between national statistical offices, for example bringing a regional perspective to the discussions rather than a country specific perspective.

An issue both at international and national level is often that an international statistical standard or classification must meet all the needs of all users and be a comprehensive entity before it can be used. Consequently there is some belief that if a national statistical office cannot adopt the standard in its entirety then the international standard cannot be used.

For example the Balance of Payments and International Investment Position Manual (BPM6) states: *"The Manual provides a framework that is applicable for a range of economies, from the smallest and least developed economies to the more advanced and complex economies. As a result, it is recognised that some items may not be relevant in all cases. It is the responsibility of national compilers to apply international guidelines in a way appropriate to their own circumstances."*[10]

This approach may be challenging for developing countries and it could be beneficial if international standards were structured in tiers i.e. with basic, moderate and full elements available for adoption. The choice of tier, which would be optional, would depend on the need and resources available in each country.

[10] Balance of Payments and International Investment Position Manual (BPM6) section 1.4, P1

This approach is similar to the guidelines of the System of National Accounts (SNA) which states: "*the accounts of the SNA are built around a small number of conceptual elements, in particular sectors, transactions and classifications of the items subject to transactions and other flows, especially assets and liabilities. For each of these elements, a hierarchical classification exists. Accounts can be compiled at greater or lesser degrees of detail by using higher or lower levels of these hierarchies*."[11]

The reality is that an international standard is a framework that can be adopted as is, or modified to national circumstances and this isn't always understood. Alternatively it may be appropriate to just use the conceptual base of an international standard and build a framework or classification structure appropriate for national usage, rather than take the conceptual and structural basis as one entity and then modify.

Conclusions and Recommendations

The ability for national statistical offices to fully utilise international statistical standards is essential to the exchange and comparability of official statistics between countries, and they underpin the international official statistical system.

The analysis and commentary provided in this paper has shown, however, that significant issues exist when it comes to understanding what is meant by an international statistical standard, their benefit, and the problems, issues and challenges they create for the statistical world, particularly when there is an increased need for connected and integration of statistical processes within the context of globalisation.

Despite these issues, the need for international standards and their role for the national statistical community cannot be undervalued. Comparability and consistency in the development, maintenance and dissemination of official statistics requires a clear understanding of what the purpose and benefit of international statistical standards is.

This paper has identified a number of challenges that need to be addressed or overcome to enable successfully adoption of international standards. It is recommended that the following actions be considered:

(a) that there is continuing dialogue to ascertain an agreed definition of 'international statistical standard' and to identify a rationalising of conflicting terms;
(b) that distinction and clarity be sought regarding when and why international statistical standards, classifications and frameworks should be used;
(c) that approaches for supporting UN Fundamental Principle 9 be undertaken;
(d) that there is discussion on new ways of designing international statistical standards to facilitate wider use and uptake;
(e) that there is support for greater involvement in international fora and expert groups by national statistical offices to enable more robust and relevant international standards to be developed and implemented;

[11] System of National Accounts 2008 p545

(f) that creation and maintenance of a program for the implementation of international statistical standards, and clarifying their relationships to each other be undertaken.

Points for Discussion

To facilitate further engagement and dialogue on strategies to achieve a coordinated international approach to the development and application of international statistical standards, the meeting is invited to:

(a) review and comment on the need to address the roles and practices that surround international statistical standards;
(b) consider the implications of how international agencies and national statistical offices encourage support and adoption of international standards, and the compliance issues that results;
(c) review and endorse the recommendations noted in this paper.