

## **Combined GS1 Healthcare and GS1 Healthcare User Group – Australasia**

### **Submission to the Therapeutic Goods Commission: Consideration of Bar Coding of Medicines**

#### **1 Executive Summary**

GS1 is global, neutral, not-for-profit standards organisation dedicated to the design and implementation of global standards and solutions to improve efficiency and visibility in supply and demand chains. There are 108 GS1 member organisations world-wide, each dedicated to assisting industry implement the GS1 System of standards. The GS1 System is the most widely used system of identification (numbering) and data carrier (bar code) standards throughout the world. It is recognised by organisations such as the International Standards Organisation (ISO), the American National Standards Institute (ANSI) and the European Committee for Standardisation (CEN).

GS1 Healthcare<sup>1</sup> was created to drive the development and adoption of GS1 standards and solutions to meet the needs of the global Healthcare industry. Global solutions will allow the Healthcare industry to drive towards the effective utilisation and development of global standards with the primary focus on automatic identification to improve patient safety.

The GS1 Healthcare User Group – Australasia<sup>2</sup> is the Australian and New Zealand local user group of GS1 Healthcare.

Within the GS1 System, the GTIN (Global Trade Item Number) is used to identify the different product variants and package configurations of a medicine product. The stakeholders to this submission recommend that the GTIN be selected as the unique identifier for medicines products traded in Australia. This recommendation aligns with initiatives made by other jurisdictions in recent years.

The stakeholders also believe that support for all bar codes incorporated within the GS1 System should be included in any TGC recommendations. This then allows the selection of the type of GS1 bar code to be applied to a particular medicine to be a business decision of the organisation applying the bar code. In addition, this will future-proof any solution in the event that new bar code symbologies are incorporated within the GS1 System.

Australian based research indicates that over 90% of prescription pharmaceuticals in Australia carry a GTIN (numbering structure) and GS1 bar code symbology<sup>3</sup>. This ubiquity has happened in the absence of any regulatory requirement and has been 'industry-driven'. There is broad anecdotal evidence from within the Australian Healthcare industry that the use of a globally standardised and supply chain agnostic identifier is a more optimal solution than a proprietary solution is able to provide.

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<sup>1</sup> Refer: [www.gs1.org/healthcare/](http://www.gs1.org/healthcare/)

<sup>2</sup> Refer: <http://www.gs1au.org/industry/healthcare/australasia/>

<sup>3</sup> Refer to Section 6.1



29<sup>th</sup> April 2009

Our strong recommendation is for the TGC to reference the position and recommendations of industry, existing work of other Government organisations, e.g., NEHTA, and also the policies and recommendations from other Healthcare jurisdictions, many of whom are either moving towards or have implemented the GS1 System.

The stakeholders recognise that a collaborative approach is both necessary and desirable. As such, we emphasise our commitment to working collaboratively with the TGC to aid the development of a standardised medicines identification and bar coding policy that will benefit all Healthcare stakeholders throughout Australia.

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## 2 Background to this Submission

GS1 Australia was recently provided with a copy of the written communication between the Therapeutic Goods Committee (TGC) secretary Lyn Lewis and Ian Chalmers, CEO, Medicines Australia, as well as a copy of the communication from Ian Chalmers to Medicines Australia members asking for their input and assistance to the TGC's work.

At the request of pharmaceutical manufacturers and other industry participants, GS1 Australia has coordinated this submission on behalf of the organisations listed in Section 3.

In preparing this submission, the stakeholders have emphasised their wish to work collaboratively with the TGC to aid the development of a medicines identification and bar coding policy that will leverage work already being undertaken within the sector and ultimately benefit the complete Healthcare supply chain. We hope that the TGC will make use of the combined knowledge and expertise of the stakeholders in arriving at an optimal solution for Australia.

## 3 Stakeholders

The following organisations have all provided input to this submission.

- GS1 Healthcare
- GS1 Healthcare Public Policy Work Team
- Leadership team of the GS1 Healthcare User Group Australasia, comprising:
  - Clifford Hallam Healthcare (CH2) – Group Chair
  - Douglas Pharmaceuticals Ltd
  - GS1 Australia
  - GS1 New Zealand
  - Pfizer Australia
  - South Australia Health
  - Terumo Australia

## 4 Contact

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## 5 Background

### 5.1 Who is GS1?

GS1 is a global, neutral, not-for-profit organisation dedicated to the design and implementation of global standards and solutions to improve efficiency and visibility in supply and demand chains. GS1 and its subsidiaries and partnerships connect companies with standards-based solutions that are open, consensus-based and universally endorsed. From bar codes, electronic messaging, data synchronisation, radio frequency identification, to business process automation standards, GS1 is the trusted source to deliver innovative standards, services and solutions for business' most pressing supply chain challenges. GS1 is a fully integrated global organisation, with 108 Member Organisations serving over a million companies doing business across 145 countries.

### 5.2 What is GS1 Healthcare?

Globally, GS1 supports the Healthcare community through its GS1 Healthcare initiative. GS1 Healthcare is a voluntary, global user community bringing together all Healthcare stakeholders, including: pharmaceutical and medical devices manufacturers, wholesalers and distributors, group purchasing organisations, hospitals, pharmacies, logistics providers, governmental and regulatory bodies and associations.

GS1 Healthcare was created to drive the development of GS1 standards and solutions to meet the needs of the global Healthcare industry, and to allow the Healthcare industry to drive the effective utilisation and development of global standards with the primary focus on automatic identification to improve patient safety. The objectives of GS1 Healthcare are to:

- Work with key partners in the global Healthcare supply chain to develop and optimise the use of global standards to enhance accurate and fast movement of goods from manufacturer to distributor to Healthcare providers (such as hospitals or retail pharmacies).
- Facilitate awareness in the Healthcare sector of new technologies and methods of doing e-business.
- Provide advice and recommendations to GS1 on issues and opportunities in the Healthcare sector.
- Promote best practice implementation of the GS1 System in the Healthcare industry.
- Promote the implementation of GS1 voluntary, global business standards throughout the Healthcare sector.

There are currently over 300 participants in GS1 Healthcare, representing over 150 companies, including thirty of the forty largest global manufacturers. The group was formed in association with leading industry groups and associations and benefits from the active participation from all key supply chain roles (i.e., manufacturers, distributors, retailers, and hospitals/providers)<sup>4</sup>.

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<sup>4</sup> Refer: <http://www.gs1.org/sectors/healthcare/>

### **5.3 What is the GS1 Healthcare User Group – Australasia?**

The GS1 Healthcare User Group – Australasia is the Australian and New Zealand local user group of GS1 Healthcare, the GS1 global Healthcare user group. This local group comprises over 50 representatives from Healthcare organisations operating in the Australian and New Zealand markets, who wish to ensure they have the opportunity to input to the work being undertaken by GS1 Healthcare for the benefit of the global Healthcare community<sup>5</sup>.

### **5.4 What is the GS1 System?**

The GS1 System is the most widely used system of identification (numbering) and data carrier (bar code) standards throughout the world. Over 1.5 million users across 145 countries and more than 24 industry sectors have adopted the GS1 System. It is recognised by organisations such as the International Standards Organisation (ISO), the American National Standards Institute (ANSI) and the European Committee for Standardisation (CEN).

At its most fundamental level, the GS1 System is an integrated suite of global standards that provides for accurate identification and communication of information regarding products, assets, services and locations. Using GS1 Identification Numbers, companies around the world are able to globally and uniquely identify physical items like trade items, assets, logistic units, shipments, and physical locations, as well as logical items like corporations or a service relationship between provider and recipient. When this identification system is combined with GS1 data carriers, electronic business messages, data synchronisation via the National Product Catalogue (NPC) in Australia and the Global Data Synchronisation Network (GDSN) worldwide, the connection is made between these physical or logical items and information the supply chain needs about them.

#### **The GS1 System is:**

- **Open:** the GS1 standards development process is user-driven which permits full interoperability and compatibility and ensures end users are not locked into proprietary often inflexible solutions.
- **Global:** Healthcare is by nature a global sector, with supply chains that often cross national borders. On the other hand, Healthcare is also very much local. The GS1 standards development process ensures that local needs are incorporated into global standards.
- **Proven:** the GS1 System has been used for over 30 years in different industry sectors all over the world ensuring its robustness and reliability, including built-in security and privacy (e.g. identification numbers are non-significant - they identify an item but contain no information about it).

It is widely accepted that the use of GS1 standards improves patient safety and reduces costs in the global Healthcare supply chain. It enables traceability and promotes a safe and secure supply chain by providing greater visibility, accuracy and efficiency for the benefit of all parties involved. Preventing medical errors and combating counterfeiting are top-of-mind concerns facing the Healthcare sector, and GS1 standards are helping to solve these issues.

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<sup>5</sup> Refer: <http://www.gs1au.org/industry/healthcare/australasia/>

## **5.5 How does the GS1 System enable Identification and Bar Coding of Medicines?**

For the purpose of this submission, the identification of medicines i.e., unique and unambiguous numbering of different levels of packaging of a medicine product, and bar coding of these medicines are considered two independent concepts, the reasons for which are outlined below.

### **5.5.1 Identification of Medicines Products**

Within the GS1 System, the GTIN (Global Trade Item Number) is used to identify the different product variants and package configurations of a medicine product. A change to one aspect, characteristic, variant or formulation of a medicine may require the allocation of a new GTIN.

GS1 Healthcare has produced a guide to GTIN allocation for Healthcare items<sup>6</sup>. This guide clearly outlines both medicines and other Healthcare related products and provides a comprehensive reference to organisations responsible for GTIN allocation.

Integrity of the GTIN throughout the medicine product's lifetime is key to maintaining accurate identification of products by manufacturers, wholesalers, distributors, hospitals, regulatory bodies and other supply chain stakeholders, irrespective of their country or region.

**Our submission recommends that the GTIN, using the GS1 System, be selected as the unique medicines identifier for products traded in Australia.**

### **5.5.2 Bar Coding Medicines Products**

When considering the appropriate bar code to apply to a medicine product, the organisation applying the bar code (generally the brand owner or manufacturer) has a number of considerations, including:

- Available label space for application of the bar code.
- Type of substrate onto which the bar code is being applied.
- The need to include information additional to the GTIN (e.g., batch or expiry date) in the bar code.
- Manufacturer printing abilities (e.g., is a linear bar code more appropriate than a 2 dimensional – GS1 DataMatrix – bar code).
- Bar code reading capabilities of supply chain partners, e.g., wholesalers, hospitals, pharmacies.

The GS1 System currently includes five bar code formats, providing flexibility for trading partners in selecting the best bar code for their application. Each of the GS1 symbologies or formats have a common global standard method by which information (e.g., GTIN plus additional information, if applicable) can be encoded<sup>7</sup>. This ensures that GS1 standards function on the premise that the best way to determine the right bar code for a product is to have a user driven, global process (where bar code selections are based on considerations such as those highlighted above). The GS1 System provides guidelines for selection, structure and placement to assist this decision.

Bar code scanners sold today are pre-programmed to support all open standard GS1 bar code symbologies, thus enabling the manufacturer's right to assess their product and make an unconstrained decision about the applicable type of GS1 bar code.

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<sup>6</sup> Refer: <http://www.gs1.org/gtinrules/index.php/p=static/t=healthcare>.

<sup>7</sup> Refer Section 6.8

It is also important to note that one key principle of the GS1 System is that the bar coded data is simply a pointer to a record contained in a data base. This means the amount of information carried in the bar code should be the minimum needed to look-up and access that database, but also sufficient to enable capturing of item specific information (e.g., batch and expiry date) for traceability purposes.

Overall, it is the belief of the stakeholders of this submission that support for all bar codes incorporated within the GS1 System should be included in any TGC recommendations. This then allows the selection of the type of GS1 bar code to be applied to a particular medicine to be a business decision of the organisation applying the bar code.

## 6 Specific Information Requested

### 6.1 *Current levels of Bar Coding within the Australian Medicines Sector*

Within the last few years, three studies of the penetration / use of GS1 identification and GS1 bar coding of medicines in Australia have been undertaken. The results of these (below) illustrate a trend to the increased use of GS1 bar codes for pharmaceuticals in Australia.

- **Survey 1: 2001**
  - Location: Hunter Area Health Service Distribution Centre
  - Scope: All products in the Distribution Centre
  - Result: 85% of pharmaceutical box/each level units carried GS1 bar codes
- **Survey 2: 2003**
  - Location: Monash Medical Centre Hospital Pharmacy, Victoria.
  - Scope: All products in stock at the hospital pharmacy
  - Result: 89% of box/each level units carried GS1 bar codes, 26% of inners (shrink wrap) or shippers (cartons) carried GS1 bar codes
- **Survey 3: 2005**
  - Location: Clifford Hallam Pharmaceuticals (CHP, prior to merging with Hospital Supplies of Australia and becoming Clifford Hallam Healthcare).
  - Scope: This survey involved audit of a subset of products in the CHP warehouse.
  - Result: 93% of box/each level units carried GS1 bar codes.

Based on the above results, the stakeholders believe that information provided to the TGC from the Pharmacy Board of Victoria, indicating that up to 10% of prescription medicines (at box/each level) do not carry bar codes, would be reasonably accurate. However, this also identifies that over 90% of prescription pharmaceuticals do carry GTINs and GS1 bar codes - an excellent proportion considering there has been no Australian policy requiring identification and bar coding of these products, and a testament to the enormous voluntary uptake of a global solution within the Healthcare user community.

There is very little bar coding of medicine product at higher levels of packaging (ie, shrink wrap, case, shipper) and this is certainly an area where bar coding related policy would facilitate implementation, and benefit industry by enabling introduction of traceability systems within the sector. For more information, refer to Section 7.7.

## **6.2 Exemption / Waiver Process**

Our recommendation is to include provision for a formal Waiver or Exemption process in any planned regulation / policy as it may be difficult to mark every pharmaceutical product with a bar code.

- a. Products might be too small, have no label space or even have no label.
- b. Manufacturer / Brand Owner should be provided the opportunity to request exemptions or waivers for specific products based on facts submitted.
- c. At minimum, the following categories of drug products should be considered as complex and potentially subject to waiver.
  1. Kits that contain any drug product
  2. Combination Drug / Device
  3. Drug products that are custom-made for a specific patient (such as anti-allergy extracts manufactured for one patient)

However, it should be noted that any limitations preventing physical bar coding **do not prevent** allocation of a GTIN to that particular item at that level of packaging.

## **6.3 The extent of use of other bar coding systems, e.g. non-GS1, in the sector**

The 2003 study<sup>8</sup> conducted by GS1 Australia, indicated that the only application of alternate identification and bar coding of medicines products was 'internal / proprietary' bar coding found only 1% of the shipper / case level packaging assessed. There was no alternate bar coding used for each / box packaging – the products either carried GS1 bar codes or no bar code.

Strong anecdotal evidence from industry representatives supports the above finding and so it is the conclusion of the stakeholders to this submission that the only identification and bar coding standard used in the medicines sector today is GS1.

## **6.4 Product details currently encoded within the bar code**

Currently each / box unit pharmaceuticals in Australia carry a bar code containing the GS1 GTIN only.

Higher level packaging, e.g., shrink wrap, case, shipper, may carry bar codes that contain the GTIN plus attribute information such as batch / lot number, expiry date, serial number, etc. The provision of this additional information is currently at the discretion of the manufacturer / organisation applying the bar code, and often this information is used internally within the manufacturer's business for traceability functions.

Where additional information exists, this is starting to be used by pharmaceutical wholesalers wishing to enable traceability within their own businesses.

It is the recommendation of the stakeholders that the focus be placed on allocation of GTINs and physical bar coding at all levels of packaging (as appropriate) as a first step for any policy introduced. A longer term focus would then be provision of attribute information, e.g., batch and expiry date, that may be applied to the box / each or higher level packaging.

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<sup>8</sup> Refer to Section 6.1

## 6.5 Current purposes for bar coding

### 6.5.1 Australia

The existing uses in Australia of medicines identifiers and bar codes include:

- Ensuring accurate dispensing to hospital pharmacy outpatients via a 'scan dispensing' process, whereby the bar code on the box / each being dispensed is scanned and matched against the patient record. This ensures the right patient receives the right drugs, and facilitates this occurring at the right time. A number of retail pharmacies in Australia also undertake the above process.
- Stocktake for imprest in hospital wards, where the bar code on the medicine is scanned at the ward imprest location for identification and re-ordering.
- Confirmation of accurate picking for imprest replenishment in the hospital pharmacy stores, i.e., scanning the bar codes on the packs so that picking of the correct quantity of the correct product for a particular ward can be verified.
- Within wholesalers and distributors, scan receiving goods into organisations, either at each / box or case level for recording receipt, stock put away, etc. Also scan picking and packing is used within wholesalers and distributors to ensure accurate shipments are being collated.

### 6.5.2 International

Internationally, whilst all of the activities mentioned in Section 6.5.1 occur, there is a greater focus on scanning medicines bar codes at the patient bed side or in the operating theatre to ensure improved patient safety in hospitals.

A clear indication of the business case for such work has been developed in New Zealand, where an estimated 150 people die each year from medication error and approximately 4000 others are temporarily or permanently disabled.<sup>9</sup>

Likewise studies conducted both in the US and Netherlands clearly indicate the patient safety benefits. At Gelre Hospitals, Apeldoorn in the Netherlands, introduction of a bar code scanning process at patient bedside resulted in a 50% reduction in dispensing errors<sup>10</sup>. A dispensing error is identified as a 'difference between what was prescribed by the physician and what is actually administered to the patient'<sup>11</sup>.

In the US, at Brigham and Women's Hospital, implementation of bar code scanning in the pharmacy resulted in significant reductions in dispensing and administration errors. Prior to implementation, approximately 3% of the medicines issued to the patient were incorrect in the areas of type, strength or form. Post implementation of bar code scanning, there was an overall 85% reduction in the instance of these errors.<sup>12</sup>

Other countries such as France, Japan, Korea, amongst others have or are about to release policy relating to bar coding of medicines to ensure patient safety at the bedside.

This area seems to be a lower priority focus in Australia today, but is certainly an opportunity.

For information about overall identification and bar coding policy, much can be learned from the work of the National Health Service (NHS) in England. This organisation has embarked

<sup>9</sup> Anderson, B., Improving Medication Safety: Bedside Verification, Draft Project Outline, 20<sup>th</sup> August 2007, p5

<sup>10</sup> Ros, H., Bedside assortment picking – Decreasing the number of dispensing errors by implementing CPOE and bar code assisted dispensing, Presentation to GS1 Healthcare Conference, London, 29<sup>th</sup> October 2008

<sup>11</sup> Ibid

<sup>12</sup> Cooley, T.W., Implementing barcode technology strategies to improve patient care: impact and lessons learned, International Hospital Federation Reference Book, 2007/2008, p36

on an ambitious programme to use Automatic Data Capture Technologies (AIDC) throughout England's Healthcare sector which is foundational on GS1 standards and identifiers. The well publicised and referenced 'Coding for Success' document is seen by many Healthcare jurisdictions as a global industry template for standardised coding because of the benefits it promises to deliver to Healthcare outcomes<sup>13</sup>.

After undertaking extensive research into the use of potential coding systems for England, the NHS Purchasing and Supply Agency (NHS PASA) identified and recommended to all Healthcare sector stakeholders that the GS1 System (then known as EAN.UCC) was the preferred solution<sup>14</sup>.

## **6.6 Future potential purposes for bar coding**

In the future, Australian organisations will have the opportunity to focus the use of medicines identification and bar codes on more advanced applications, including:

- The use of bar code scanning at the patient bedside and in the operating theatre. This may mean that future initiatives could involve identification and bar coding of medicines to unit dose level, i.e., the individual pill or capsule blister.
- Bar code scanning in the patient home for self-medication management could become a focus. At the St James Hospital, Ireland, a bar coding application has been deployed for haemophiliacs managing a stock of clotting agents in their own homes. This application uses GS1 bar codes for traceability (i.e., Are products within an applicable batch and expiry range?), as well as ensuring patients are self-administering the correct product.<sup>15</sup> In the first 12 months since the project was live, cold chain delivery was able to be verified within the desired temperature range, product wastage reduced from €90,216 to zero and documentation errors were reduced from 12 to zero.
- Use of bar code scanning for traceability, to ensure the location of medicines can easily be identified in the case of recall, will be a key area of application. A manufacturer, distributor, wholesaler, pharmacy or hospital will be able to scan bar codes to capture traceability information at goods receipt and keep a record of the individual batches within its deliveries. When combined with the information sharing mechanisms that form part of the GS1 standards, this will allow verification and authentication of medicines throughout the Healthcare supply chain, ensuring both traceability, and that counterfeit product does not enter the market.

## **6.7 Types of Bar Codes / Data Carriers – Now and Future**

### **6.7.1 Current bar code symbologies**

Currently, we see that each / box level pharmaceuticals carry a GTIN in either of an EAN-8, EAN-13, UPC-A or UPC-E bar code symbology. These symbologies are traditionally applied in a 'point of sale' environment in Healthcare, but also industry sectors such as Hardware, Grocery, General Merchandise, Automotive Aftermarket, etc.

Shrink-wrap, shipper or case level packaging that is currently marked with a GS1 bar code generally carries a GTIN in an EAN-13 or ITF-14 symbology or alternatively a GTIN and attribute information (e.g., batch, expiry date) in a GS1-128 symbology.

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<sup>13</sup> Lovell, H. Department of Health (UK). Coding For Success – Simple Technology for safer patient care. 2007

<sup>14</sup> Refer Appendix

<sup>15</sup> White, B., Case study: Using an Electronic Patient Record and unique medication Bar Coding to deliver integrated comprehensive patient care for patients with Haemophilia, Presentation.

It should be noted that some medicines companies are now moving towards the use of GS1 DataMatrix, GS1 DataBar (or a combination of the traditional GS1 symbologies mentioned above, together with GS1 Composite symbology) for marking of each / box level medicines. This is generally driven by two factors:

1. The organisation's need to capture information such as the GTIN, batch and expiry date in a bar code form on a small package;
2. The presence of legislation specifically requesting GS1 DataMatrix symbology be used to mark all medicines sold to a particular market.

Regulation developed in isolation and not with a global harmonised approach is costly and difficult to implement. GS1 Healthcare has worked in the last few years to develop Application Standards detailing identification and bar coding principles for all Healthcare products. GS1 Healthcare has also worked to align the stakeholders to these global standards. We would encourage the TGC to reference the GS1 Healthcare Application Standards in any policy or regulation that may be developed.

### **6.7.2 Future bar code symbologies**

As with any technology, bar coding will continue to develop, with new bar code symbologies being released. There are a number of different bar codes included in the GS1 System for one good reason - each has specific strengths in solving challenging marking problems.

GS1, via the user-driven standards development process, ensures forward and backward data compatibility as part of the new bar code introduction process while providing flexibility to adopt new bar codes as they are developed, without need for constant regulatory changes every time a new bar code is developed.

The stakeholders to this submission have recommended in Section 5.5.2, that the full suite of bar codes as defined as part of the GS1 System be supported in any policy or recommendation made by the TGC. This ensures that the solution recommended is future proofed and that the bar code symbology chosen is appropriate for the product and its function within the Healthcare environment.

It should be noted, however, that the primary product identifier, the GTIN, remains constant, irrespective of the bar code used to encode it.

## **6.8 Considerations for implementation of more complex data carriers**

For the purpose of this submission, more complex data carriers will be defined as any data carrier that has the ability to encode information additional to the item GTIN. This means that the EAN-13, EAN-8, UPC-A, UPC-E and ITF-14 symbologies supported within the GS1 System will not be discussed. Rather, GS1-128, GS1 DataBar and GS1 DataMatrix will be considered.

GS1-128 and GS1 DataBar are both linear symbologies, whereas GS1 DataMatrix is a 2-dimensional symbology. All of these symbologies have a standard mechanism by which data is encoded, using GS1 Application Identifiers (AIs), which function as field triggers to indicate to databases the content of the scanned data following the AI.

When implementing these symbologies, the following needs to be considered:

- Scanner capability to read the symbologies

GS1-128 symbology has been in the market for over a decade and existing scanners have the capability to read the symbology.

GS1 DataBar has been released to the market in the last few years and will become an open standard for use by all supply chain partners in 2014. Until that date, GS1 DataBar can be implemented between trading partners by bilateral agreement. Scanners sold in the last 3 years are capable of reading GS1 DataBar and slightly older scanners can be upgraded to do so.

GS1 DataMatrix, like GS1 DataBar, has been released to the market in the last few years, and is currently being implemented for niche applications. GS1 DataMatrix is being implemented in the Healthcare sector by trading partner agreement, much of which is driven by the release of legislation in certain countries. As this is a two dimensional symbology, imaging or camera-based scanners are required to read these bar codes, so organisations looking to scan this symbology will most likely need to upgrade their scanners. Camera-based scanners will also read the other bar codes supported within the GS1 standards, so there is no requirement for a specific scanner for only one type of symbol. GS1 Healthcare has published recommendations to Healthcare organisations, indicating that if companies are going to upgrade their scanners, they should invest in camera-based scanners. For more information, refer to [www.gs1.org/hug/about/news/GS1\\_HUG\\_ps\\_Camera\\_Based\\_Scanners.pdf](http://www.gs1.org/hug/about/news/GS1_HUG_ps_Camera_Based_Scanners.pdf).

- Database capability to 'store or ignore' the additional data

Organisations reading any of the GS1 bar code symbologies discussed above have the capacity to 'store or ignore' the attribute or additional information contained within the symbol. This enables a manufacturer to encode in a single symbol all traceability information required by multiple trading partners. For example, if one trading partner requires GTIN and batch number information, and another GTIN and expiry date, this could all be implemented in a single concatenated bar code.

Organisations wishing to store the additional data will need to make a decision to build the field functionality into their business systems. Many already have the functionality required. However, having to build or update systems to hold additional data is not a pre-requisite of using any of the more complex symbologies - If an organisation does not have the capacity to store certain data, it can be ignored.

- Ability to print these symbologies

Like the appearance of text in a Word document, bar codes are produced based on fonts that specify the combination of bars and spaces (or in the case of GS1 DataMatrix, boxes) that represent a character in the symbol. Fonts for all of the GS1 System supported bar codes are readily available, both as stand alone software to incorporate into existing programs or as part of commercial 'bar code software packages' that can produce bar codes for the entire range of GS1 bar codes.

- 'Print and Apply' versus 'Pre-Print'

Production of GS1 bar codes containing information additional to the GTIN requires application of these bar codes to packaging on a 'print and apply' basis, rather than mass production 'pre-printing' of packaging. Organisations need to have the ability to apply these bar codes in a timely manner on the production line, or via other processes.

Where the more complex bar code contains only the GTIN, there is the option to 'pre-print' a quantity of packaging containing the appropriate GTIN and bar code, but the benefits of traceability and information capture, resulting from the presence of additional information in the bar code, are lost.

## **7 Other Considerations**

### **7.1 Support for Industry**

A significant part of GS1 Australia's charter is to provide support in various forms for Australian companies, including education & training, implementation assistance and industry user groups. In 2008, GS1 Australia provided, at no cost to attendees, a telephone/web based Healthcare specific training program around the GS1 System as well as approximately ten face to face industry education seminars. In addition, GS1 Australia provides multi-industry training, telephone and email based support to Australian industry. Therefore, any recommendation made by the TGC would be fully supported by GS1 Australia via our industry programs.

The network of GS1 member organisations (108 around the world) provide similar support to their local markets as GS1 Australia does. Multi-national companies, or organisations importing product from overseas would find that their head offices / suppliers would have the information they need to implement any recommendations or policy issued.

### **7.2 International regulatory practice / Harmonisation with other countries**

A number of countries around the world have regulations in place regarding use of the GS1 System for identification and bar coding of pharmaceuticals. GS1 Healthcare maintains a list of all of the current regulations and should the TGC be interested, can provide this document for your reference.

In addition, GS1 Healthcare actively works with regulators across the globe to educate and advise of industry endorsement of the GS1 System. GS1 Healthcare sees their role being to help educate regulators about what members of the sector see as best practice for identification and bar coding, to ensure that any policy developed is undertaken in a collaborative manner reflecting a global approach.

The stakeholders to this submission believe it is important that any policy or recommendation released in Australia be in line with that undertaken in other countries to ensure global interoperability, thus minimising the cost imposed on the supply chain and ensuring global medicines traceability.

### **7.3 NEHTA Supply Chain Initiative**

#### **7.3.1 The National Product Catalogue**

As recognised in the TGC documentation, the National Product Catalogue (NPC) is being implemented in Australia as the single repository of product, pricing and Healthcare data for all Health industry product categories for the purpose of data synchronisation. The National E-Health Transition Authority (NEHTA) and all State, Territory and Federal Health Departments, endorse the NPC as the 'single source' of item master data for public health institutions seeking to purchase medicines, medical devices and other necessary Healthcare items.

The NPC is part of the GS1 Global Data Synchronisation Network, a network of data pools developed to global standards to allow interoperability. GDSN ensures that organisations operating in different countries (and subscribing to different data pools) have the ability to synchronise item master data globally and so have accurate, complete and standardised data in their business systems.

The NPC is the most advanced implementation of a GDSN compliant data pool in Healthcare. As well as its use in Australia's public Healthcare sector it is also being implemented in the private Healthcare sector, with data recipients including Advantage Pharmacies, Cabrini Health, CH2 and National Pharmacies.

The primary item identifier used in the NPC is the GTIN. This provides the key for matching NPC data with data recipient and data provider systems and therefore accurate and complete data being recorded against each GTIN.

As part of the NPC initiative there is no requirement for physically bar coding products, however, any decisions relating to the type of identifier to be used for medicines (and as a result the standards for bar coding that identifier) should take into account the current identification recommendations within the sector.

### **7.3.2 eProcurement Strategy**

NEHTA has selected GS1 XML as the messaging format for its eProcurement strategy. GS1 XML is a GS1 open, global electronic messaging standard, which is being implemented in a number of industry sectors.

The NEHTA eProcurement strategy allows transmission of transactional messages such as the purchase order, purchase order response, purchase order change, despatch advice (advanced shipping notice) and invoice between the public health jurisdictions and their suppliers.

The decision to use GS1 XML as the messaging format for this strategy has ensured that the GTIN is the primary item identifier within the messages exchanged. This provides for easy linking between this information and the data provided via the NPC.

Already, WA Health has implemented the eProcurement strategy with a medicines supplier, Baxter, exchanging accurate and complete NPC data in procurement messages.

Use of the GTIN and an applicable GS1 bar code for physical marking of medicines completes a three way match between the item master data exchange, the transactional data exchange and the physical product, eliminating any confusion that would result from introduction of different identifiers.

## **7.4 Radio Frequency Identification**

GS1 develops standards for the use of Radio Frequency Identification (RFID) called EPC standards. EPC stands for Electronic Product Code.

The GS1 EPCglobal framework encompasses standards for identification, capture and exchange of information using RFID. The EPC standards for identification and marking items use GS1 Identifiers, such as the GTIN (but encoding of the product identifier in an RFID tag rather than a bar code and including a unique serial number). As with all GS1 standards, the EPC standards are global, user driven and open, enabling multi-trading partner adoption, without proprietary implementation barriers.

## **7.5 Industry Developed Guidelines and Standards**

Today, an extensive set of standards and guidelines exist for identification and bar coding of Healthcare items using the GS1 System. GS1 Healthcare has worked in a cross-functional, global team of over 90 members for the past 2 years to define a tiered approach to identification and bar coding of Healthcare items, with the amount of data carried in the bar code appropriate to the intended use of the product. This work is currently in the final phase

in the GS1 Global Standards Management Process (GSMP) and will ultimately be integrated into a new revision of the GS1 General Specification document.

The recommendation of the stakeholders to this submission, requesting all bar code formats within the GS1 System are supported in any proposal relating to medicines bar coding, falls in line with the work already completed by GS1 Healthcare.

## **7.6 Level of bar coding of complementary medicines**

It was noted that the TGC had been advised that ‘while there may already be a trend for prescription medicines to include bar codes, fewer complementary medicines did’.<sup>16</sup>

Referring to the TGA classes of complementary medicines<sup>17</sup>, those complementary medicines such as Vitamins & Minerals, Nutritional Supplements, Herbal Medicines and Aromatherapy Products that are likely to pass a point of sale in a retail environment would most likely carry a GTIN encoded in a GS1 bar code. Products sold through Australia’s major grocery and general merchandise retailers must be identified and bar coded in this way as a term of trading. These products are also sold into hospitals, wholesalers, retail pharmacies, etc.

Certainly traditional medicines, sold in smaller traditional shops, where bar coding is yet to be implemented may not carry identification and bar codes, but these comprise only one category of the six classifications specified.<sup>18</sup>

The stakeholders to this submission would encourage that recommendations relating to bar coding of medicines encompasses complementary medicines, where these products are sold via the same channels as prescription medicines, i.e., into an environment where unique identification and bar coding is important for patient safety, traceability and supply chain efficiency.

## **7.7 Identification of different levels of packaging**

Much of the discussion relating to bar coding of medicines seems to relate to the each / box level packaging issued to the patient via a dispensary. In the medicines sector, packaging levels exist for many reasons; as a result, all will have different purposes for being identified with a GTIN and marked with a bar code.

Consider the following typical hierarchy:

- Individual tablet (dose) in a blister pack – administered at the patient bedside
- Box of 24 tablets – issued at the dispensary of a retail or hospital pharmacy as well as used for handling and shipping at the wholesaler or manufacturer, and receiving at the hospital or retail pharmacy
- Shrink wrap of 12 boxes – used for handling and shipping at the wholesaler or manufacturer, and receiving at the hospital or retail pharmacy
- Carton of 12 shrink wraps - used for handling and shipping at the wholesaler or manufacturer

There is a case for each of these levels of packaging to be allocated a GTIN and marked with a GS1 bar code as each needs to be unique and unambiguously identified at some point in the patient care or supply chain.

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<sup>16</sup> Therapeutic Goods Committee 33<sup>rd</sup> Meeting (15-16 October 2008), Information for Stakeholders – Report on Meeting, p21

<sup>17</sup> The regulation of complementary medicines in Australia – An overview, Therapeutic Goods Administration, web site, <http://www.tga.gov.au/cm/cmreg-aust.htm>

<sup>18</sup> Ibid

It is the recommendation of the stakeholders to this submission that whilst initial discussions may focus on the each / box level of packaging, the TGC considers a future widening of the scope of its considerations to include the other levels of packaging in the medicines hierarchy.

## 8 Conclusion

The stakeholders to this submission are very pleased that the TGC is collecting information about the potential to make identification and bar coding of medicines in Australia a requirement, and are keen to support the TGC throughout the information gathering and decision making process. Whilst not discussed in detail in this submission, there is very conclusive evidence that bar code scanning processes reduce dispensing errors and improve patient safety. The GS1 standards are well suited to meet the specific needs of Healthcare for identification and bar coding, and are the predominant standards within the medicines sector.

The GS1 System allows organisations to implement consistent identification formats, but select the bar code symbology most appropriate to their products and business capabilities. Functionality currently in the market allows reading of all of the bar code symbologies encompassed within the GS1 System.

Throughout its decision making process, the stakeholders to this submission recommend the TGC reference the position and recommendations of industry, existing work of other Government organisations, e.g., NEHTA, and also the policies and recommendations from other countries across the world, many of whom are moving to implementation of the GS1 System.

The leadership of the GS1 Healthcare User Group – Australasia would be pleased to meet with representatives of the TGC to discuss further this submission, and any related questions. Please contact Tania Snioch, Industry Manager – Healthcare, at GS1 Australia (contact details at the beginning of this document) to arrange further discussions.



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## 9 Appendix

## **NHS PASA's**

# **Position Statement on Automatic Identification for products sold to and used by the English NHS<sup>19</sup>**

**E-Commerce Directorate  
NHS Purchasing and Supply Agency**

**5 October 2004**

**Version 0.6**

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<sup>19</sup> Please note: This document has been annotated in certain areas to reflect current GS1 technical terminology. This in no way changes the meaning of the document, but rather provides current names for the GS1 related terms used. The document without terminology updates can be accessed from:  
<http://www.pasa.nhs.uk/pasa/Doc.aspx?Path=%5BMN%5D%5BSP%5D/NHSprocurement/eEnablement/2%20eEnablement/5%20NPEP%20work%20streams/6%20Standards%20and%20eEnablement%20technologies%20work%20stream/PASA%20Barcoding%20position%20statement%20Oct2004.pdf>

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## 1. Recommendations for suppliers to the English NHS

- 1.1 NHS PASA support the voluntary use of bar codes for the unique identification of products sold to and used by the English NHS.
- 1.2 NHS PASA recommend that all products being supplied to the English NHS should be identified using a bar code, which should preferably be the EAN.UCC (now GS1).
- 1.3 The only exclusion to this recommendation is for products already coded using the HIBC format. Suppliers using the HIBC set of standards may continue to do so for the foreseeable future.
- 1.4 Suppliers using other bar code standards are strongly advised to migrate to EAN.UCC as soon as possible.
- 1.5 All suppliers planning to bar code their products are strongly advised to consider only the EAN.UCC set of standards.

## 2. Recommendations by product category

NHS PASA envisages that, through uniquely identifying products from cradle to grave, NHS stakeholders are able to track and trace, accurately identify and administer those products: improving supply chain efficiency and patient safety. The way to ensure unique product identification is for all products and “aggregated purchase units\*” to be coded and bar coded before entering the NHS supply chain with a globally unique code and symbol, controlled centrally by an organisation. EAN International (now GS1 Global Office) and HIBCC are such organisations.

### **2.1 Single use products, consumables and unit dose (disposable)**

EAN.UCC for application and capture on any single use product, consumable or unit dose in the NHS

### **2.2 Single Use products - multiple issue (disposable)**

EAN.UCC for application and capture on any single use unit – multiple issue in the NHS. e.g. Blister pack, tube of ointment.

### **2.3 Re-usable products, loaned products**

EAN.UCC for application and capture on any re-usable or loaned unit in the NHS. For assistive technology NHS PASA endorse the BHTA guidelines. These guidelines can be found at [www.gs1uk.org/](http://www.gs1uk.org/)

### **2.4 Bespoke, assembled, compounded products**

EAN.UCC for application and capture on any bespoke, assembled or compounded product in the NHS. For assistive technology NHS PASA endorse the BHTA guidelines. These can be found at [www.gs1uk.org/](http://www.gs1uk.org/)

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\* Aggregated purchase unit = consumer unit, multi pack, case, pallet

#### **2.5 *Products transferred or resold within the NHS***

Where products are transferred or resold in the NHS, they should be still identified by their original code and bar code and not be re-coded or re-bar coded. This code and bar code should be EAN.UCC.

#### **2.6 *Assets***

EAN.UCC standards include asset identification for tracking.

#### **2.7 *Medical devices recorded in patient records***

EAN.UCC for application and capture on any medical or surgical device that is to be held within the NHS Dictionary of Medicines and Devices, which will support the NHS Care Record System by the end of 2005.

#### **2.8 *Products imported into the English NHS***

EAN.UCC for application and capture on any product being imported and distributed into the NHS. In the case of re-labelling or repackaging, the product requires a new EAN.UCC code to be applied.

#### **2.9 *Products in transit***

EAN.UCC for all aggregated purchase units delivered to the NHS.

### **3. Recommendation for codification of products in databases**

In addition to the NHS PASA guidelines for product coding (supplier product number), Trusts involved with codification in the NHS as part of building their catalogue, should record the product's original EAN.UCC (now GTIN) (or HIBC) code for automatic identification and demand capture.

NHS PASA also recommend that product codes be recorded in the databases of all companies in the supply chain, so ownership of the product is known before passing it on to the NHS, to ensure full product traceability.

#### **4. AIDC and systems compatibility**

All IT system applications involving recording product information should be adapted if necessary, to allow recording of the EAN.UCC code.

At present, few of the e-procurement systems in the NHS are capable of using bar codes for automatic identification and demand capture (AIDC). NHS PASA has begun working together with leading e-procurement system providers to adopt and roll out the use of bar codes in the NHS.

By recommending the adoption of EAN.UCC data set, NHS PASA do not prescribe the data carrier to be used by suppliers. A full list of data carriers (bar codes, two dimensional codes and radio frequency identifiers) is available from eCentre (now GS1 UK, [www.gs1uk.org/contact/contact.asp](http://www.gs1uk.org/contact/contact.asp))

## 5. Why EAN.UCC?

In 2003, NHS PASA studied the different options for product codification using automatic identifiers:

### 5.1 Coding environment

The first step in the decision process was for NHS PASA to choose the coding environment that best suited the NHS community. The four options defined are based on the combination of identifiers (ISO or non-ISO) and control system (closed or open).

**Option 1: Proprietary (non-ISO) identifiers – Closed system**

**Option 2: Many global identifiers – open system**

**Option 3: One global identifier – Closed system**

**Option 4: One global identifier – Open system**

**Option 1: Proprietary (non-ISO) identifiers – Closed system**

i.e.: NSV (National Supplies Vocabulary)  
PIP (Pharmaceutical interface products code)

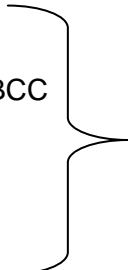
Where organisations create their own code structure, they destroy the possibility of uniquely identifying products throughout the supply chain. This option also requires the organisation that dictates the code to maintain the system and to police its use in the supply chain. Therefore it is applicable only in supply chains completely managed by the customer (or distributor). Additionally, proprietary identifiers are not interoperable with other identifiers and cannot be communicated with non-compatible systems.

**The message is: Suppliers Should Not Invent Their Own Code Structures**

**Option 2: Many global identifiers – open system**

i.e.: Interleaved 2of 5  
EAN.UCC  
Code 39 and HIBCC  
Code 128  
PDF417  
Maxicode  
DataMatrix  
QR Code

in the NHS



Where organisations allow multiple standards they complicate the message to suppliers about one code throughout the supply chain and force suppliers down the route of standards comparison and evaluation many times over. By allowing many standards to specialise in different supplier groups, there is also a possibility that standards may develop into proprietary: i.e.: the healthcare standard or the car manufacture standard, which are not inter-operable and carry different sets of data.

**The message is: Standardise Code Structures**

### **Option 3: One global identifier – Closed system**

I.e.: EAN in Marks & Spencer

NPC represented with Interleaved 2 of 5 in NHS Logistics and the NHS

This option applies to organisations that have complete control over their total supply chain from point of manufacture through receipt to point of use.

Where organisations decide to standardise on one global code structure but keep the copyright and royalties of the identifier to themselves, they repeat Option 1.

**The message is: Suppliers Should Control and Manage Their Own Codes**

### **Option 4: One global identifier – Open system**

I.e.: EAN.UCC in Tesco, Asda and elsewhere in the retail sector

EAN.UCC plans in Pharmaceuticals Industry

Where organisations decide to standardise on one open global code structure and ask that all their suppliers comply with the decision, life for suppliers and customers is straightforward: they can communicate their requirements (requisitions, orders, delivery notes, invoices) in a common language and they can expect their items to be identified in a standard format. The biggest advantage is that Option 4 is an “all systems go” situation for suppliers who can buy a standard solution package and open to their business doors to new opportunities.

**The message is: There should be one Global Coding Standard For All Suppliers Controlled and Managed by Suppliers themselves.**

**NHS PASA has decided that Options 1,2 and 3 are not conducive to the needs of the English NHS and therefore recommends the adoption of Option 4 for all suppliers.**

## **5.2 Comparison & evaluation of global coding standards**

NHS PASA needed an objective mechanism to compare and evaluate the different ISO standards for coding and data carrier technologies. This mechanism was provided by CIPS\* set of criteria for “Maximising Returns from Purchasing Data”<sup>\*</sup> through item classification and codification.

The standards below are for data carrier standards which may represent specific or variable data structures (product codes with specific characters and minimum - maximum number of characters). Among them, only EAN or UCC and HIBCC can be truly unique globally as the code structure and actual code numbers are controlled by central organisations. Without central control, there is no guarantee that codes are unique and immediately recognisable (Criterion 2).

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<sup>\*</sup> The Chartered Institute of Purchasing and Supply. Maximising Returns from Purchasing Data. November 2002.  
<http://www.cips.org/downloads/Professional%20Resources/Overview/codingclass.pdf>

The table below compares and evaluates the different ISO coding and data carrier standards against the CIPS standards:

Coding & Data Carrier Standards	EAN/UPC set	Code 39 (HIBC)	Interleaved 2 of 5	Code 128	PDF 417	Maxi code	Data Matrix	QR Code	
<b>9.1.1.1 Code symbology (Types of Data Carriers)</b>									
1	Application to multiple data carriers including linear bar code	Yes	Yes	No	No	No	No	No	No
<b>9.1.1.1.2 Code integrity</b>									
2	Globally unique codes	Yes	Yes	No	No	No	No	No	No
3	Standard data structure	Yes	Yes	No	No	No	No	No	No
4	ISO accredited	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	UK technical support & quality control	Yes	Limited	No	No	Yes	No	Yes	Limited
6	Code structure consistency and verification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	Independent standard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>9.1.1.1.3 Code relevance</b>									
8	Long-term future of standard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Generic: applicable to retail and healthcare market	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	Penetration in retail and healthcare market internationally	Yes	Yes	No	Yes	No	No	No	No
11	Common understanding of and access to codes by all stakeholders	Yes	Yes	No	Yes	No	No	No	No
<b>9.1.1.1.4 Code related costs &amp; compatibility</b>									
12	Costs and ease of adoption, maintenance and migration from other codes	Fixed	Fixed	Variable	Variable	Variable	Variable	Variable	Variable
13	Cost structure incl. joining fee, cost of new codes and cost of maintenance	Fixed	Fixed	Bespoke	Bespoke	Bespoke	Bespoke	Bespoke	Bespoke
14	Compatibility with other codes for cross-referencing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Final score									
		14/14	13/14	6/14	8/14	7/14	6/14	7/14	7/14

### 5.3 EAN.UCC because...

NHS PASA recommend the use of EAN.UCC in the English NHS because it is the one standard out of all other ISO standards that satisfies the criteria that NHS PASA decided was key to selection. Specifically, EAN.UCC is:

1. Available in linear symbology, which is the most widely used anywhere in the world.
2. A unique and secure numbering system.
3. ISO accredited.
4. Present in UK for resolving any type of customer query.
5. A consistent code structure, immediately recognisable.
6. Independent and a not-for-profit organisation, found for the benefit of companies of any size, anywhere in the world.
7. Here to stay, with 1m users, 5bn transactions per day in 129 countries with future proof: ebXML, RFID, RSS and plans: EPC, two-dimensional symbology.
8. Code structure is numeric and non-significant, and therefore can apply to any industry.
9. Already present in many different sectors in the manufacture, retail and healthcare.
10. Integrated with many types of data carrier: bar code, RSS (now GS1 DataBar), RFID depending on application.
11. Widely available throughout the supply chain for any type of company so that total cost of implementation and integration is minimised.
12. Available at a standard cost which includes active support for companies that wish to implement it or migrate from other codes.
13. Available at a standard cost and inherently supports code integrity (failsafe code structure).
14. Is immediately compatible with current systems and has a failsafe element: Optical Character Recognition part for use even without reading scanners.
15. Built on the simple element of product identification with the choice of associated attributes being attached to the basic code in an identifiable way.
16. The standard of choice of an overwhelming number of suppliers nationally contracted by NHS PASA as a research conducted by NHS PASA in 2003 shows:
  - Pharmaceuticals: 80 (23%) of the 278 NHS PASA suppliers of pharmaceutical products responded. The results were:
    - 64 suppliers (80%) use or plan to use bar codes in their operations. Of these 64 suppliers:
      - 92% use EAN or UPC
      - 3% use HIBCC
      - 5% use other codes.
    - 12 suppliers (15%) do not use nor plan to use bar codes in their operations
    - 4 suppliers (5%) were distributors and answered Not Applicable.

- Healthcare & Non-healthcare (excluding Pharmaceuticals): 468 (48%) of the 982 NHS PASA suppliers of non-pharmaceutical products responded. The results are:
  - 239 (51%) use or plan to use bar codes in their operations. Of these 235 suppliers:
    - 74% use EAN or UPC
    - 8% use HIBC
    - 8% use other codes
    - 10% don't know what they use.
  - 229 suppliers (49%) do not use nor plan to use bar codes in their operations.

## **6. Conclusion**

During 2003 NHS PASA went through a process of evaluation and comparison of all possible options and standards for the automatic identification and demand capture of products supplied to the English NHS. NHS PASA concluded that EAN.UCC should be the one global coding standard and that it should be adopted, controlled and maintained by all suppliers in the total NHS supply chain for all products supplied to the NHS independent of supply chain entry level.

The only exclusion to this recommendation is where products are already bar coded using the HIBC set of standards. Suppliers using HIBC may continue to do so for the foreseeable future.

## 7. Contacts

- **GS1 UK<sup>20</sup>** serves its 16000+ UK members by developing and supporting the **EAN•UCC** system for uniquely numbering and automatically identifying products, services, assets and trading locations. This global system forms the basis of interoperable solutions for asset tracking, traceability, collaborative planning, order management and logistics. It brings speed and certainty to the supply chain ensuring that the right goods and services reach the right place at the right time.

As well as helping its members implement current bar coding systems and business-to-business communications such as EDI (Electronic Data Interchange), **GS1 UK** strives to support members' future needs by playing a leading role in international initiatives for new standards and solutions, including the emerging ebXML (electronic business extensible mark-up language) standards for business communications, reduced space symbology bar codes and radio frequency identification tags.

Further information about GS1 UK can be found at [www.gs1uk.org/contact/contact.asp](http://www.gs1uk.org/contact/contact.asp)

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<sup>20</sup> *Note: This report has been updated to reference GS1 UK, as the original report referenced e.centre, which was a franchise that no longer exists.*

## **Glossary**

### **AIDC:**

Automatic Identification and Data Capture. It encompasses a range of data carrier technologies including linear bar codes, 2-dimensional, multi-row or matrix bar codes, magnetic stripe cards, smart cards, RFID and other Smart Labels.

### **AIM:**

Automatic Identification Manufacturers, Inc., the worldwide association representing the AIDC industry, is the source for technically accurate, unbiased, commercial-free, and up-to-date information on all AIDC technologies.

### **Bar code:**

An automatic identification technology which encodes information into an array of varying width parallel rectangle bars and spaces.

### **Code 128:**

A full alphanumeric bar code capable of encoding all 128 ASCII characters.

### **Code 39:**

(3 of 9 Code). A full alphanumeric bar code consisting of nine modules, three of which are wide.

### **Data Carriers:**

The range of media used to apply a code symbology on a product. Linear bar codes, 2-D bar codes, stacked bar codes, Serial Shipping Container Codes, RFID, Smart Labels and Magnetic Cards are examples of Data Carriers.

### **Data Matrix / Dot Matrix:**

A system of printing where individual dots are printed in matrix (5x7, 7x9, etc.) forming bars, alphanumeric characters, and simple graphics.

### **Data set:**

A set of data carriers.

### **EAN.UCC:**

European Article Numbering System is an open Global supply chain and transactional standard which is now known globally as GS1

### **EDI:**

Electronic Data Interchange.

### **HIBCC:**

Healthcare Industries Bar Code Council is a not-for-profit American organisation. In Europe codes are controlled and allocated by EHIBCC (European HIBCC).

### **HIBC:**

Health Industry Bar Code. A healthcare specific code standard developed by American healthcare companies.

### **Identifier:**

Symbology representing the data set.

**Interleaved Two of Five Code:**  
(I 2/5) A number-only bar code symbology consisting of five bars, two of which are wide. In this code both the bars and spaces carry information.

**ISO:**  
International Organization for Standardization.

**PDF417:**  
A 2D Stacked bar code symbology.

**QR Code:**  
A 2D Matrix bar code symbology.

**Radio Frequency Tag:**  
An electronic tag capable of receiving/storing and/or transmitting digital information by means of, and in response to, RF energy.

**Reduced Space Symbology (RSS):**  
Bar code symbology developed by GS1 for space constrained situations and is now known as GS1 DataBar.

**RF:**  
Radio Frequency. An electro-magnetic wave.

**RFID:**  
Radio Frequency Identification.

**Scanner:**  
An electronic device to read bar codes that electro-optically converts bars and spaces into electrical signals. For RF systems see "Interrogator".

**Standard:**  
A set of rules, specifications, instructions and directions to use a bar code or other automatic identification system to your profit. Usually issued by an organization, e.g. Logmars, HIBCC, EAN.UCC, etc.

**UCC:**  
Uniform Code Council; the organization which administers the UPC and other retail standards. UCC and EAN merged in 2002 to form EAN.UCC organization which is now known globally as GS1.

**UPC:**  
Universal Product Code - The standard bar code symbol for retail food packages in the United States. In Europe, EAN is the equivalent. Both the UPC and EAN are now known collectively as the GTIN.