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Leyla Rahjou-Esfandiary
Center for Drug Evaluation and Research
Food and Drug Administration
Bldg. 51, Rm. 2262
10903 New Hampshire Ave.
Silver Spring, MD 20993
leyla.rahjouesfandiary@fda.hhs.gov

Stephen Ripley
Center for Biologics Evaluation and Research
Food and Drug Administration
Bldg. 71, Rm.7301
10903 New Hampshire Ave.
Silver Spring, MD 20993
stephen.ripley@fda.hhs.gov

Re: Revising the National Drug Code Format and Drug Label Barcode Requirements, Proposed Rule, 87 Fed. Reg. 44038 (July 25, 2022), Docket No. FDA-2021-N-1351

Dear Ms. Rahjou-Esfandiary and Mr. Ripley:

The Healthcare Distribution Alliance (HDA) thanks the Food and Drug Administration (FDA) for this opportunity to submit comments regarding the agency's proposed rule, *Revising the National Drug Code Format and Drug Label Barcode Requirements,* 87 Fed. Reg. 44038, (July 25, 2022) ("proposed rule"). We recognize that FDA has had to undertake this proposed 2-digit expansion of the National Drug Code (NDC) because the inventory of 10-digit numbers will be exhausted in the coming years.

Changing the NDC from the existing 10-digit format to a 12-digit format will be an enormous undertaking. We believe the effort is akin to the collaborative work of U.S. business and governments to prepare for and implement the IT changes necessary at the turn of the 20th century, better known as the "Y2K". We greatly appreciate and support the agency's proactive efforts to "get ahead of" what will be a seismic change to the pharmaceutical supply chain and healthcare in the U.S.

About HDA

HDA represents primary pharmaceutical distributors – the vital link between the nation's pharmaceutical manufacturers and more than 180,000 pharmacies, hospitals, long-term care facilities, clinics, and others nationwide. This essential function is provided with little public recognition or visibility, and at great savings to the healthcare system. HDA members serve as the central link in a sophisticated national supply chain. HDA members take this mission very seriously, and we support manufacturers, healthcare providers, and the government in ongoing efforts to ensure the U.S. medicine supply chain remains secure, efficient, and highly regulated.

HDA has been closely following FDA's work regarding the development of this proposed rule, first as an observer at the November 2018 public meeting and thereafter submitting comments.[1] We recognize the necessity of expanding the NDC from 10 to 12 digits and support the proposed rule's justifications and solution. Our comments below focus predominately on providing additional information for the agency to consider as it proceeds to implement this change.

1. Support for GS1

GS1 is the leading global standards organization in the healthcare industry, and GS1 US is the local member organization of GS1 responsible for supporting implementation of GS1 Standards in the United States. GS1 standards are widely used in U.S. healthcare.

GS1 standards are used for industry implementation of the Drug Supply Chain Security Act (DSCSA). The GS1 DataMatrix is a 2-dimensional (2-d) bar code that has been used by the U.S. pharmaceutical industry to comply with the requirements of the DSCSA that all covered drug packages bear a product identifier within a machine-readable, 2-d data matrix bar code that includes that drug package's unique standardized numerical identifier[2], lot number and expiration.[3] The GS1 DataMatrix can carry the data necessary for DSCSA compliance and in a smaller space than a traditional, linear bar code. The supply chain has chosen to use the GS1 DataMatrix to satisfy the DSCSA's product identifier, serialization, and traceability requirements.

GS1 US has long anticipated the expansion of the NDC to 12 digits. HDA members participate in GS1 activities including serving on the GS1 Healthcare US New NDC Format Workgroup. That Workgroup participated in the 2018 public meeting and submitted comments[4] on the proposed NDC change.

We support GS1's efforts and the comments GS1 has submitted to this docket and the proposed rule.

In its recent comments on the proposed rule, GS1 explains the relationship between the GS1 Global Trade Item Number® (GTIN®) and the NDC. GS1 standards define the format and structure of the GTIN across all applications where a product needs to be identified, including in IT systems and business transactions. GS1 has supported pharmaceutical manufacturers by creating a standard for the integration of NDCs into GTINs so that products are consistently and accurately identified both for business/supply chain needs and for regulatory purposes. Because the GTIN cannot accommodate a 12-digit NDC, GS1 has created a new Application Identifier (AI) for the NDC (the AI (715)). This new AI, with a 12-digit NDC, can be carried by the GS1 DataMatrix for DSCSA compliance and will, under GS1 standards, be added as a new data field to the 2-d data matrix bar code on each DSCSA-covered package. The GTIN, however, will also remain in the GS1 DataMatrix because it is essential to unique

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[1] HDA's Comment on Future Format of the National Drug Code; Public Hearing (Jan. 4, 2019), is available here: https://www.regulations.gov/comment/FDA-2018-N-2610-0019

[2] The "standardized numerical identifier" includes the NDC and "means a set of numbers or characters used to uniquely identify each package or homogenous case that is composed of the National Drug Code that corresponds to the specific product (including the particular package configuration) combined with a unique alphanumeric serial number of up to 20 characters." § 581(20).

[3] *See* § 581(14) (definition of product identifier); § 582(a)(9) (product identifiers); § 582(b)(2) (manufacturers must affix product identifiers to packages); § 582(e)(2)(repackagers must affix product identifiers to packages).

[4] GS1's comments on Future Format of the National Drug Code are available here: https://www.regulations.gov/comment/FDA-2018-N-2610-0004.

identification of a product in its unique packaging configuration, such as a specific serialized package or homogenous case of that product.

2. An "All Hands" Event

It is no exaggeration to characterize the NDC number as a linchpin in the pharmaceutical supply chain and in healthcare delivery in the United States. The financial infrastructure and physical movement of pharmaceuticals in the U.S. depend upon the NDC, including manufacturing, ordering, purchase and sale, delivery, prescribing, dispensing, administration, billing, reimbursement, rebates, reporting, surveillance, enforcement, and medication management. The NDC also supports federal and state regulation of pharmaceuticals.

Apart from FDA's own NDC-related regulatory and IT functions (which are themselves considerable), we have identified the following entities and functions that we believe will also be impacted by the 2-digit expansion of the NDC:

- Centers for Medicare and Medicaid Services, and all pharmaceutical reimbursement, rebates, and coverage including the 340B drug discount program
- State Medicaid programs
- State regulators, including Departments of Health and Boards of Pharmacy
- Customs and Border Protection
- Department of Veterans Affairs (VA), including all VA hospitals and healthcare services
- Department of Defense (DOD) and all of its healthcare services and pharmacies
- Drug Enforcement Administration (DEA) and State diversion control[5]
- Private health insurers and other payors
- Drug formularies and Prescription Drug Benefit Managers
- All drug manufacturers and repackagers
- All pharmaceutical wholesale distributors
- All healthcare prescribers
- All dispensers and providers of healthcare, including physician offices, pharmacies, hospitals, clinics, and care facilities
- Entities that support pharmaceutical stakeholders, including the above, through indexing, data management, and IT services, including service providers, the National Council for Prescription Drug Programs (NCPDP), and compendial services such as DRUGDEX, Micromedex, Redbook, and U.S. Pharmacopeia

There are surely many, many others.

We emphasize that successful implementation of the change to a 12-digit NDC is not merely a matter of education and outreach, and cannot be accomplished by "flipping a switch." All of U.S. healthcare and pharmaceutical supply currently uses, inputs, scans, and/or retains records of the NDC in its 10-digit format. Each of the above entities (and there are tens and even hundreds of thousands

[5] The NDC number is critical to numerous DEA systems for oversight, regulation, and diversion control, including, but not limited to: Automation of Reports and Consolidated Ordering System (ARCOS); Controlled Substance Ordering System (CSOS); Theft/Loss Reporting (TLR); Year-End Reporting; and Suspicious Orders Reporting System (SORS). Many States have additional controlled substance reporting requirements, all using the NDC number. In addition, there are various other DEA reporting and regulatory requirements that may use the NDC number, including, potentially, DEA registration, quota setting, chemical or controlled substance import/export declarations, and bulk chemical manufacturing reports.

of them) likely have a 10-digit NDC number (or the 11-digit variant widely used for reimbursement purposes) embedded in standard forms, processes, and, critically, IT systems. Scanners are programmed to only read 10 digits; systems can only accept 10 digits; fields only accommodate 10 digits; databases only store 10 digits and only 10 digits can be searched. Vast change will need to be completed so that information, systems, and processes can continue to function without failure or error.

The 2-digit change poses significant challenges for business and compliance requirements which mandate interoperability. Supply chain systems (such as the enhanced system for electronic data exchange required by the DSCSA) and healthcare systems (such as those used in reimbursement, electronic health records, and Health Insurance Portability and Accountability Act (HIPAA)-related requirements) must be interoperable. As these systems all assume a 10-digit NDC, the data and information exchange they support will not be interoperable until all are changed to accommodate a 12-digit NDC. Put another way, it is not enough that a single entity or trading partner updates all of its systems to support a 12-digit NDC – in order to be interoperable and communicate electronically with anyone else, that entity must have coordinated with ***every other*** entity and/or trading partner, each of which must have ***also*** updated its own systems.

Given the magnitude of the task and the number of government and private entities impacted, we urge a federal government-wide approach to coordinate and inform all stakeholders. We believe that the change is akin to the IT concerns associated with the Y2K change that were smoothly managed through industry and government-wide collaboration. We urge a similar, nationwide public-private collaborative effort headed by FDA and/or knowledgeable, senior leadership within HHS. A series of well-publicized FDA listening sessions could help identify all the impacts in and on the pharmaceutical supply chain and healthcare systems.

We also believe that FDA should develop and widely publicize timelines and checklists to guide NDC users in when they should begin changeovers and how to do so. We also suggest that FDA provide, on an ongoing basis, its estimate of how long it believes it can continue to issue 5-digit labeler codes and when it will have to begin issuing 6-digit codes. If FDA is "burning" through its inventory of available numbers faster than anticipated, the many NDC users will need to be alerted that they will need to similarly accelerate their own changeovers.

We recognize that this complex and costly change is inevitable. Concerted, coordinated, sustained effort will be needed to help ensure that affected businesses, regulators, government agencies, and providers are "on board" to continue to deliver needed healthcare products and patient care in a timely and efficient manner with minimal disruption.

3. The Importance of EDI

Standards setting organizations establish the rules that enable pharmaceutical trading partners, providers, payors, regulators, and other entities to, among other things, share critical information in order to support healthcare delivery and meet patient needs. Of these standards, none is as important to healthcare and the pharmaceutical supply chain as Electronic Data Interchange (EDI)[6]. EDI is the building block used throughout the pharmaceutical supply chain and healthcare delivery to enable efficient, interoperable exchange of data and information. Common EDI

[6] Electronic Data Interchange (EDI) is commonly defined as the transfer of structured data (by agreed message standards) from one computer system to another without human intervention. Once the EDI information is sent, back-end systems convert the data through a translator into a single format for use by the receiver.

"documents"[7] include, but are not limited to, electronic health records (including compliance with HIPAA-related requirements), benefits and claims, product shipments, purchasing, and many other interactions, transactions, and events. The entire financial side of the healthcare system also operates on EDI standards. The use of common EDI standards enables interoperability and seamless exchange of data and information in healthcare delivery and the supply chain.

In turn, all these EDI standards assume a 10-digit NDC, or its 11-digit variant. EDI standards are set by the Accredited Standards Committee X12 (also known as ASC X12) (chartered by the American National Standards Institute (ANSI)). The 12-digit NDC will not be supported or recognized in the many EDI documents that currently use it. Consequently, for EDI documents to be correctly formatted, sent, and received, ASC X12 will have to publish new standards to accommodate the 12-digits and the thousands of organizations in healthcare and the pharmaceutical supply chain that use EDI will then have to update their systems, processes and documents to accommodate and follow the new EDI standards.

Further, once the EDI standards are updated, GS1 US, HDA, and other entities will then have to convene relevant stakeholders to revise the applicable industry guidelines that implement these standards. HDA has sponsored development of guidelines that support numerous EDI documents, including but not limited to: the 856 Advance Ship Notice, 850 Purchase Order, and 852 Product Activity. These and many others will have to be updated to accommodate the 12-digit NDC.

4. The Benefits of a Standardized, 6-4-2 Format

We strongly support the conversion of all existing NDCs to the proposed, uniform 6-4-2 numerical format.[8] We also support FDA's rejection of alphabetic characters as a means of expanding the number of labeler codes in order to still maintain the 10-digit format. As FDA noted, (87 Fed. Reg. at 44043), adding alphabetic characters poses significant challenges and undermines the important goal of uniformity. As difficult as the transition to a 12-digit NDC is, we believe attempting to add alphabetic characters would be ***even more*** difficult.

FDA is correct that use of letters creates difficulties from an IT perspective. Many IT systems currently in use cannot accommodate alphabetic characters and we agree that their use "would not likely relieve many stakeholders of the requirement to update their systems to be capable of handling the new NDC format, as many current systems are unlikely to be able to handle alphabetic characters in NDCs." 87 Fed. Reg. at 44043.

Number-only NDCs are superior for other reasons. We believe that the addition of alphabet characters could increase the likelihood of medication errors and risks to patient safety with, for example, confusion over zeros and the letter O and the number 1 versus the letter l (small case) or I (capitalized). Numbers in bar codes also can be compressed to conserve space on drug packages and labels – this compression cannot be accomplished if a bar code includes letters.

The 6-4-2 standard presentation of the NDC will, once stakeholders are educated and acclimated to the change, provide enormous efficiencies and benefits. It will no longer be necessary to

[7] EDI "documents" are in an electronic, not paper, format, and are also referred to as "transaction sets."
[8] We trust that FDA has evaluated the repository of NDC numbers that would be available with the expansion to 12-digits and deemed the number sufficient to satisfy all anticipated needs. Given the difficulties of this change, pharmaceutical and healthcare stakeholders certainly prefer to implement such a change only once.

parse ambiguous NDCs by cross-referencing indexes and conversion tables. With all NDCs converted to and presented in the 6-4-2 format, there would be no uncertainty, as there can be now, as to the length of the labeler, product and package segment codes. Having only one standardized and uniform format will, we believe, reduce errors and inefficiencies.

With the conversion to a standard 6-4-2 format for all drugs, HDA assumes trading partners will continue to have the flexibility to eliminate the dashes in machine-readable, electronic presentations of the NDC. Electronic messaging does not include dashes, including the critically important standards for EDI which, as discussed, are used throughout healthcare and the supply chain. Using dashes in EDI documents results in errors and interferes with interoperable communication and data exchange. With the standardized presentation, it would also no longer be necessary to electronically store NDC data elements with the dashes.

5. Wholesale Distributor Changes to Internal Systems and Processes

After the 2018 public meeting, HDA's members evaluated their internal databases and systems to assess how they employ the NDC within their businesses. Having now revisited that work, HDA members report that databases and systems using the 10-digit NDC include, but are not limited to:

- Product ordering, including wholesale distributor purchases from manufacturers and dispenser purchases from wholesale distributors,
- Receiving and shipping,
- Inventory tracking,
- Warehouse management,
- Payment and invoicing,
- Rebates and chargebacks,
- Tax and other financial recordkeeping,
- Regulatory reporting and compliance (DEA, FDA, and other federal and state regulatory bodies),
- DSCSA compliance (discussed more below), and,
- EDI as part of many of the processes listed above.

We are still considering how the change from a 10 to 12-digit NDC will impact DSCSA compliance and implementation. As FDA has recommended, wholesale distributors intend to use EPCIS, a GS1 standard, to meet the DSCSA's 2023 requirements for electronic, interoperable data exchange.[9] EPCIS, in turn, currently assumes a 10-digit NDC. The EPCIS standard, and all of a wholesale distributor's related systems, technologies, and instruments (such as scanners) used for DSCSA compliance will have to be modified to accommodate a 12-digit NDC.

Other complications associated with the change in NDC configuration include what NDC will be used and when for DSCSA compliance. For example, the DSCSA requires that the NDC must be provided with the Transaction Information that must be provided when each DSCSA-covered product

[9] "FDA recommends that trading partners use the Electronic Product Code Information Services (EPCIS) standard to provide and maintain the data associated with transaction information and transaction statements. EPCIS is a global GS1 standard that allows trading partners to capture and share information about products as they are transacted through the supply chain." Draft Guidance for Industry, *DSCSA Standards for the Interoperable Exchange of Information for Tracing of Certain Human, Finished, Prescription Drugs* at lines 140-143 (July 2022) (footnotes omitted).

changes ownership and in illegitimate product notifications. For a time, the same product will be in the supply chain with both a 10-digit and 12-digit NDC so there will need to be clarity around when DSCSA requirements will have to be satisfied with the new configuration. There may be similar confusion with regard to actions such as recalls. These transition issues are not limited to DSCSA compliance and are discussed further in section 7 below.

Implementing these changes to internal systems, processes, and databases to accommodate a 12-digit NDC will take a great deal of time. Further, it will require an enormous commitment of resources – financial and personnel – to implement the necessary changes to all relevant systems. Based upon reports from members, HDA believes that the costs to the prescription drug wholesale distributor sector, alone, will account for more than $100 million in one-time costs. Once the changeover is made, there will be additional annual updating and maintenance costs.[10]

Regardless, it is not the intent of HDA or its members to stop or slow implementation of a 12-digit NDC. We recognize its inevitability and appreciate the agency's efforts to provide much-needed warning and lead-time. We provide the above information so that the agency is aware of the burdens for the wholesale distributor sector; other government and business entities and sectors will likely face similar challenges.

6. Support for Eliminating the Linear Bar Code When Duplicative

We support the agency's consideration of eliminating the linear bar code requirement (21 C.F.R. § 201.25) for product packages that already bear the 2-d data matrix bar code required by § 582 of the Food, Drug and Cosmetic Act, as amended by the DSCSA. If a product must have a bar code, a 2-d data matrix bar code is, we believe, a superior means of identifying products and renders the linear bar code, at best, as superfluous.

We recognize that there is resistance to and concern with so significant a change from the familiar linear bar code. Based upon GS1's comments, however, we believe that the continued use of certain forms of the linear bar code will, itself, pose challenges. We understand that the GS1 UPC-A is the format most commonly used to implement the FDA linear bar code requirement today. However, the GS1 UPC-A can only accommodate a 10-digit NDC. Consequently, any entity that wishes to continue to use a linear bar code will have to change to a format other than the UPC-A regardless.

Another benefit of only requiring one bar code is associated with space constraints on drug labeling. It can be problematic to fit both bar codes on a single product package and if they are too close together, they may be difficult to scan and read.

The only potential barrier we see to eliminating the linear bar code when the 2-d data matrix bar code is present is that healthcare practitioners, hospitals, dispensers, and other persons and entities would have to replace the scanners currently being used that can only read linear bar codes. They would have to purchase scanners that can read both linear bar codes and 2-d data matrix bar codes (as both bar codes would be in use for some time). We believe, however, that this cost is a relatively minor one, particularly as most handheld linear bar code scanners currently in use would

[10] We believe the agency has significantly underestimated the costs to the pharmaceutical supply chain, healthcare entities, private and public insurance entities, federal and state purchasers, and federal and state regulatory bodies to implement the 2-digit change. Simply given the sheer number of businesses, additional affected payors, regulatory bodies, and other stakeholders, as well as the systems within each that must change, we believe the costs will far exceed the agency's high estimate, even on an annual basis, of $19.4 million.

likely need to be replaced due to obsolescence and/or "wear and tear" during the time it will take to issue and implement the final NDC rule.

The long period of the rule's implementation gives ample time for those that need to scan bar codes to budget for and replace their current linear bar code readers with scanners that can read both linear and 2-d data matrix bar codes. We believe that scanners that can scan both types of bar codes are readily available now and can be purchased today for under $1,000 – a cost that will surely decline over the next decade. Scanners can then be programmed to parse out the NDC embedded in the 2-d data matrix bar code.

7. Transitioning systems from 10 to 12-digit NDCs

Maintaining interoperability between trading partners and healthcare entities during the transition from 10 to 12-digit NDCs will be a very significant effort. For a period of what will likely be several years, products bearing 10-digit and those bearing 12-digit codes will both be in the market at the same time.[11] Operations, systems, and technologies will need to be able to ensure that both presentations of a drug product's code can be received, read, scanned, processed, and stored.

We are particularly concerned with how to phase or stage the transition. At its most basic, the sender of data cannot "get ahead" of the receiver of that data – the systems of the data receiver have to be able to capture, read, process and store a 12-digit NDC before the sender begins sending an electronic document with that 12-digit number. As an example, a seller of a drug will not be able send a DSCSA transaction to a customer with a 12-digit NDC in the Transaction Information if the customer has not yet configured its system to accept the 12-digit number. Similarly, if a dispenser or provider sends a request for reimbursement for a drug with a 12-digit NDC to a payor, and the payor has not yet changed its systems to receive and process a 12-digit NDC, that reimbursement request will fail.

Consequently, how to build and stage adoption and implementation of a 12-digit NDC across interoperable systems will be very complex. We understand that, in its comments to this rule, GS1 has included a detailed discussion of staging the transition. That discussion may be a good starting point for what will be a challenging period. We recommend that FDA convene technical experts from government agencies and across the supply chain and healthcare, as well as standards setting experts from GS1 and ASC X-12. FDA and these experts will need to work together with real urgency to avoid what could otherwise be a catastrophic supply and reimbursement disruption in the already overburdened U.S. patient care system.

8. Effective dates

We thank FDA for the proposed effective date of 5 years from publication for the new rule to become effective, with a 3-year implementation period thereafter. We believe, at this time, the full 8 years is the minimum time needed. We recognize, as FDA cautions, that if the inventory of available NDC numbers dwindles faster than expected, this timeline could be accelerated. We ask that the

[11] It will take several years before products bearing 10-digit NDCs either expire or are consumed. A significant percentage of prescription drug products have 2-year expiration dating and, as such, products will remain in the supply chain for ***at least*** this long. By comparison, manufacturers had to begin affixing product identifiers to DSCSA-covered products beginning November 27, 2017 (though FDA granted an additional period of enforcement discretion). Five years later, there are still some covered and compliant products, with very long expiration dating and very slow patient consumption, that remain in the supply chain without product identifiers.

agency continue to communicate to industry and stakeholders should this occur as all timelines will then have to accelerate accordingly.

We believe that manufacturers will have important insight into the time needed to make the conversion given the considerable labeling, packaging, and other regulatory changes involved. We also believe the timeline FDA is proposing to be adequate for the necessary changes to standards such as EPCIS for the provision and receipt of DSCSA-required transaction data.

It will be important for FDA to explain its expectations for the 5 year and 3 year effective and implementation dates and "ramp up." To that end, we believe that the proposed rule is somewhat ambiguous about when entities would have to begin the changeover. For example, the preamble to the proposed rule states that firms should start labeling drugs that were assigned a 10-digit NDC with the new 12-digit NDC "no later than when a firm runs out of its existing labeling inventory for the drug and orders or begins printing new labeling." 87 Fed. Reg. at 44044. We are concerned that such statements may encourage firms to delay the necessary changeover by ordering and continuing to use old labeling, equipment, and systems displaying or using 10-digit NDCs.

To avoid delay and ambiguity, we believe it of particular importance for FDA to clearly communicate the date after which all products must be packaged with a 12-digit NDC and that the agency will not permit a trading partner or other entity to wait until 8 years after publication of the final rule to begin its transition. The agency will also need to explain the legal status of products with 10-digit numbers that entered the supply chain before the effective date. We urge clarification that such products will be grandfathered and can continue to move in commerce. Guidance for trading partners in the timing of the transition might also be useful.

The systems between trading partners, healthcare entities, and other stakeholders for pharmaceutical supply and patient care are (or will be) interoperable and all are 10-digit dependent. Each of these entities will need to update its own internal systems to the new NDC format and then test its interoperable data and information exchanges with other entities and trading partners. Failures and errors are inevitable and it will take time and effort to resolve them. We urge FDA to state its expectations explicitly to ensure a transition without loss of interoperability in the transactions and information exchanges that are critical to patient care and safety.

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We thank FDA for its proactive work on this very significant change. We look forward to working with the agency and other stakeholders to achieve a smooth transition. If you have questions, please contact me Ducca at 703-885-0240 or aducca@hda.org.

Sincerely,

Anita T. Ducca
Senior Vice President, Regulatory Affairs