HOPE Data Submission Specifications Overview
Version 1.00.0

Table of Contents

1. Introduction

Version 1.00 of the HOPE Item Set will be implemented on October 1, 2025. Data submission specifications were developed to support the submission of the HOPE. This document, as well as a set of supporting files and documents, detail specifications for the HOPE, effective October 1, 2025. Submission of HOPE data records is required for all patients admitted to hospice care on or after October 1, 2025. All users of the specifications are strongly urged to read this document carefully.

2. Version History

The table below summarizes the published versions of the data submission specifications, along with their effective dates.

Table 1: Data Submission Specifications Version History

Data Specs Version	Effective Start Date	Effective End Date
1.00	10/01/2025	none

3. Version Implementation

Each published version of the data specifications is assigned a version number that is formatted as *n.nn.r*. The *n.nn* portion represents the version number, while *.r* represents the revision number. For example, *1.00.0* is the initial release of Version 1.00. The first revision is 1.00.1, the second would be 1.00.2, etc.   The major version number is incremented whenever there is a substantive change to the data specifications that requires software changes. Minor version numbers are incremented when minor changes or corrections are made to a major version.

When a new major version of the data specs is published, a starting effective date is assigned to it. The version that is in effect when the new specs are published is assigned an ending effective date equal to the day before the new version takes effect. The data specs effective dates, in conjunction with the **target date** determine which version of the data specs applies to the record.

The target date is a key date which is defined as follows:

- On an admission record (where A0250=[1]), the target date is equal to the admission date (A0220).

- On a HUV record (where A0250=[2,3]), the target date is equal to the date assessment was completed (Z0350).

- On a discharge record (where A0250=[9]), the target date is equal to the discharge date (A0270).

When a submitted record is validated by iQIES, its target date is evaluated and is used to load the appropriate set of edits for the specifications in effect on the target date. If the submitted record does not conform to those edits, the appropriate warning and/or fatal error messages are issued. Once a new version of the data specs takes effect, data submission software typically handles records from the previous version (or versions) and the new version. Thus software must identify the target date for each record, determine which version of the specs applies, and use those specifications to validate the record prior to submission. Failure to do this may result in warnings, fatal errors, or unexpected results.

For example, suppose a new item is defined and activated in a new version of the data specs. If that new item is included in a record with a target date that precedes the effective date for the new version of the specs, then that new item is ignored. It is ignored because the new item is unknown to the data specs that are in effect and iQIES ignores unknown items. If the new item is omitted from a record with a target

date that is on or after the effective date of the new specs, then a fatal error occurs and the record is rejected. This occurs because iQIES applies the new version of the specs and determines that the new item was not included in the submitted record when it was required.

Note that the appropriate data specs version is determined without regard to the submission date. Thus, if a record has a target date that would qualify it for version 1.00 of the specs, version 1.00 would apply even if the submission date followed the implementation of a subsequent version of the specs. Note also that if a record is modified, then the version of the data specs is determined using the target date of the modified record, just as if it were a new record.

When submitting a record (new record, modification, or inactivation), the SPEC_VRSN_CD item in the control section must be included. The SPEC_VRSN_CD is an informational item that indicates the version of the data specs used to create the record. The allowable values of SPEC_VRSN_CD correspond to the published major version numbers, and the submitted value should match one of these values. If it does not, a warning is issued. Note that if the value submitted does not match the version that is in effect based upon the target date of the record, no warning is issued. Furthermore, the value submitted does not affect or control in any way the version of the data specs that is applied to the submitted record. As explained above, this is controlled solely by the target date of the submitted record.

On rare occasions, a change to the data specs may take effect based upon submission date rather than target date. When this occurs, it is noted in the data specs.

4.   Overview of Data Specification Structure

- **Item labels.** A numbering scheme is used to label HOPE data submission items. This scheme is designed to be logical and to allow flexibility if new items are added in the future. The beginning letter(s) of each item label reflect the section of assessment to which the item belongs (e.g., "A" for items in Section A and "J" for items in Section J). Following this, four digits are used to indicate the item's number within the section (e.g., A0100 and J0910). Gaps were intentionally left between item numbers so that additional items can be inserted at a later time, if necessary.

  Some items contain one, two, or three levels of sub-items that divide the item into multiple questions or that provide response options. First level sub-items are designated with a letter (e.g., A0100A and A0100B). Second level sub-items are designated with a number following the letter (e.g., J0910C1 through J0910C9). Third level sub-items are designated with another letter following the number[1].

  All item labels on the item set form and in the data specifications utilize upper case letters exclusively.

- **Submission file format.** iQIES processes submission records in Extensible Markup Language (XML). Each XML submission record file must contain data for one and only one assessment. The XML tags that are used to identify the data for each item correspond to the item labels described above. Thus, if the value of item A0800 (gender) is "2" (female), the tagged XML representation of that item is:

  <A0800>**2**</A0800>

  The XML file structure is described in more detail in a later section of this document.

- **Fixed file format.** As noted above, providers use XML files to submit data to CMS by means of iQIES. In addition, the data specs also define a fixed-format file layout utilized by CMS for other purposes. For example, CMS uses the fixed file format for data extracts, such as those sent to researchers.

- **Item Groups.** The data specifications address the following "item groups": "control", "assessment", "calculated", or "filler". Control items are the items that are required but are not part of the clinical item set (e.g. the software vendor information). Assessment items are simply those that are contained in the published item sets. Assessment and control items are submitted to iQIES. Calculated items are those items that are calculated by iQIES (e.g.,

---

[1] The HOPE item set does not currently contain any third-level sub-items.

patient age and assessment ID). Calculated items are never submitted. Finally, filler items are reserved for future use on the fixed-format record.

- **Item subset codes.** Item subset codes reflect the fact that the entire set of HOPE data items represents a superset of all of the possible items that can be included on *any* type of assessment record. *Subsets* of these items are included on various types of assessment records (e.g., HOPE admission and discharge records). Item Subset Codes (ISCs) are defined based on the "reason for record" item (item A0250). Item subset codes and the reasons for the record are a key part of the data specifications and are explained further in a later section of this document.

- **Active and inactive items.** The concept of active and inactive items was implemented for the HOPE item set. The ISC controls the set of items that are active for a particular type of record. Only active items must be included in the XML submission file. XML elements for any inactive items should be excluded from the submission file. Calculated items are always excluded from the submission file.

- **IDs assigned to edits.** Each edit (formatting and consistency) is assigned a unique ID. If an edit applies to more than one item, the Detailed Data Specifications Report lists the edit ID along with the text of the edit so that it is clear that the same edit applies to a set of items. In addition, each edit is systematically listed with every item that is included in the edit. Another specification report contains an unduplicated list of edits along with a list of the items to which each edit applies. This report assists developers in creating and validating their software. Finally, the edit IDs that are used in the data specifications are included on the iQIES validation (feedback) reports to assist those who reconcile errors and warnings.

- **LOINC codes.** In order to promote the use of electronic health records and standardized nomenclature systems, CMS plans to support the optional submission of LOINC codes that are associated with HOPE data items and with each of the responses to those items. At this time, LOINC codes are not supported by iQIES. When they are available, the relevant LOINC codes will be included in future data specifications.

5. Data Specifications Files

Two sets of files are included in the data specifications. The first set consists of reports and documentation that describe the data specifications. The second set are extracts of the data dictionary tables used to generate the data specifications. This latter set of files is useful to software developers. Note that in the file names below, ***Vn.nn.r*** stands for the version and revision number associated with the data specifications. In addition, the file names for draft versions of the documents contain the word "draft" after the version number.

5.1. Reports and Documentation

- **HOPE data specs overview (Vn.nn.r).pdf** This document.

- **Detailed data specs report (Vn.nn.r).pdf** A report detailing the data specifications for every item in the HOPE item set.

- **Unduplicated edits report by ID (Vn.nn.r).pdf** A report providing an unduplicated list of all edits (formatting rules, consistency checks, etc.) that apply to the item set. It is sorted by the edit ID number.

- **Item change report (Vn.nn.r).pdf** A report listing changes that were made to items or item responses since the previous release of the data specs. This report will not be produced for the initial release of the data specs, but will be included in subsequent releases.

- **Edit change report (Vn.nn.r).pdf** A report listing changes made to edits since the previous release of the data specs. This report will not be produced for the initial release of the data specs, but will be included in subsequent releases.

- **Data specs HTML files (Vn.nn.r).zip** A zip file containing a set of HTML files that display the same information as is in the detailed data specs document. To use these files, unzip them to an empty folder and use a browser to open the file called INDEX.HTML. A two-panel window

opens. Use the left-hand panel to navigate a list of the HOPE items or edits. Select an item or edit to view detailed information about the selected entity in the right-hand panel. Hyperlinks allow easy navigation from one item or edit to another. This provides a convenient alternative to the PDF version of the data specs.

5.2. Data Dictionary Files

- **Itm_mstr (Vn.nn.r).csv** A comma-separated value file containing data from the itm_mstr table in the data dictionary. This is the master item table that contains one record for each HOPE item. This table may be useful for programmers who wish to build their own HOPE data dictionary.

- **Itm_val (Vn.nn.r).csv** A comma-separated value file containing data from the itm_val table in the data dictionary. This table contains one record for every response option for each HOPE item. This table can be used in a data dictionary when linked with the item master table described above. It can be used to generate reports or screens containing the text of each item's response options.

- **Isc_mstr (Vn.nn.r).csv** A comma-separated value file containing data from the isc_mstr table in the data dictionary. This table lists the ISC codes and is useful for generating reports that describe the item subset codes.

- **Isc_val (Vn.nn.r).csv** A comma-separated value file containing data from the isc_val table in the data dictionary. This table shows the correspondence between the reason-for-record item and ISC codes. This table can serve as a useful lookup table for converting the reasons for record into item subset codes.

- **rltn_mstr (Vn.nn.r).csv** A comma-separated value file containing data from the rltn_mstr table in the data dictionary. This table contains one record for every relational edit in HOPE. It can be used to generate reports or screens containing the master list of HOPE edits.

- **rltn_itms (Vn.nn.r).csv** A comma-separated value file containing data from the rltn_itms table in the data dictionary. This table can be used in a data dictionary when linked with the relation master table described above, in order to generate reports of edits and their associated items.

- **rltn_itm_txt (Vn.nn.r).csv** A comma-separated value file containing data from the rltn_itm_txt table in the data dictionary. This table contains the results of joining the item master and relation master tables via the rltn_itms table. Therefore, this table contains all instances of each edit with an associated item.

The fields within each of these tables are described in Appendix A of this document.

6. Detailed Data Specifications Report

The Detailed Data Specifications Report contains at least one page for every item in the HOPE item set. Each item begins on a new page. The report is divided into six major sections:

1. Basic information

2. Item subsets for which the item is active or inactive

3. Allowable responses or values for the item

4. Fatal and warning edits associated with the item

5. Supplemental information about the item (this section appears only for certain items)

6. Version notes describing changes to the item and the edits that apply to it.

These sections are described below.

6.1. Basic Item Information

For each HOPE item, the Detailed Data Specifications Report presents basic information about the item under the following headings:

- **Item ID.** The item identifier (e.g., A0800)

- **Item Label.** A brief description of the item (e.g., "Gender")

- **Item Group.** There are four groups of items:

    o **Control items.** Control items are supplemental items that are included in the submission file and are used to control processing or for other purposes (e.g., the name of the software used to produce the submission file).

    o **Assessment items (abbreviated "Asmt" on the report).** Assessment items are items that are part of the complete HOPE Item Set. This includes the items defined by CMS for inclusion in submitted records.

    o **Calculated items (abbreviated "Calc" on the report).** These items are calculated by iQIES, stored in CMS's national database, and included in fixed-format files that are produced by CMS. ***These items are not submitted and are not to be included on the XML submission files.***

    o **Filler items.** Filler is reserved for future use on fixed-format files containing HOPE data. ***These items are not submitted and are not to be included on the XML submission files.*** The structure and use of the fixed-format file layout is described in a later section of this document.

- **LOINC code.** At this time, LOINC codes are not assigned.

- **Item type.** Items are classified into the following types (note that some of the item types discussed below may not be used in the data specs):

    o **Text.** Items that contain text (e.g., A0500C, patient last name).

    o **Code.** Coded items are those with a limited number of response options (e.g., J0900A, was patient screened for pain, has two valid response options).

    o **Checklist.** Checklist items are a subset of coded items for which each component item in the checklist has response options of 0 (Not checked (No)), or 1 (Checked (Yes)).

    o **Number.** Numeric items can contain a range of numeric values.

    o **Date.** Example of a date item is A0900, Birth Date.

- **Max length.** This property shows the maximum number of characters or bytes that the submitted item may contain.

- **Fixed-format start-end bytes.** This column displays the start and end bytes that are used to store the item on fixed-format files. The structure of the fixed-format file layout is described in a later section of this document.

6.2. Item Subsets

The Item Subsets section contains two lines: active and inactive. These two lines list the ISC codes that apply to the item. For example, the following ISCs are listed for item J2050A:

Active: HA, HUV

Inactive: HD, XX

This means that J2050A is active on HA (admission) and HUV records and must always be included in XML files for HA and HUV assessments. It is inactive for HD (discharge) and XX (inactivation request) records so it is not included in XML files for HD and XX records (XX records are explained later in this document).

6.3. Item Values

The table in the Item Values section of the page lists the allowable values that may be submitted for the item. For example, two values are listed for item A0800: [1,2]. The text associated with each item value is taken directly from the HOPE Item Set, where available. Some values and their associated text are not

listed on the item set itself (such as "-" and "^") and are discussed in more detail in a later section of this document.

6.4. Item Edits

The table in the Item Edits section of the page lists the fatal and warning edits that are associated with the item. This table contains the following four columns:

- **Edit ID.** Each edit is assigned an edit ID. These IDs begin with the number -3000 and increase sequentially in absolute value. The assignment of an edit ID to an edit is arbitrary. These edit IDs are included on the validation reports that are produced iQIES. This makes it possible to directly relate an error or warning on a validation report with a specific edit in the data specifications. Edit IDs between -1 and -999 are system-level warnings and errors. System errors encountered while reading or processing the submission file (.zip file) or any of the submission record(s) (.xml files) included in the submission file result in fatal errors. These system errors are listed in the Error Message section of the HOPE Item Set Technical User's Guide, but are not included in the data specifications reports.

  Please note that ***in the Detailed Data Specifications Report, an edit is listed under each item to which it applies.*** Thus, a given skip pattern edit, for example, is listed for the item that triggers the skip pattern as well as for all items that may be skipped according to the value of the trigger item.

  A second report described below (the Unduplicated Edits Report), lists each edit only once and references all of the items to which each edit applies. This system of uniquely identifying edits is intended to assist developers in insuring that all required edits are incorporated in their software.

- **Edit Type.** As noted above, there are various types of edits, which are described below (note that some of the edit types discussed below may not be used in the data specs).

  - **Format.** Format edits specify special rules for formatting item values.

  - **Consistency.** Consistency edits define logical constraints among multiple items.

  - **Skip pattern.** Skip patterns always involve two or more items. The first item in the group is designated the trigger (or gateway) item. The value of the trigger item determines whether the remaining items are answered by the assessor or are skipped. If an item is skipped, it is blank (has no value). Items that are blank because they are skipped must be denoted with the "caret" character (^) in the submission file. If an item is not skipped, it has a value other than the "caret" character. Edit -3040, for example, defines the skip pattern associated with item J0910A (the trigger item) and items J0910B through J0910C9 (the dependent items). If J0910A=[0] (zero), then all of the dependent items must be skipped (must equal [^]). If J0910A=[1], then the dependent items cannot be skipped (must not equal [^]). All skip patterns follow a similar pattern. Skip pattern edits are listed for every item involved, including both the trigger item and all dependent items.

  - **None of the above.** These edits specify rules for "none of the above" checklist items. As noted above, checklist items consist of a group of component items all of which have values of 0 (Not checked (No)), and/or 1 (Checked (Yes)). Furthermore, the checklist group usually includes a "none of the above" item. Three edits are always associated with checklist items. For example, items J0910C1 through J0910C9 contain edits -3041 which is a none-of-the-above edit. This edit consists of the following three parts. Sub-edit (a) says that if the "none of the above" item (J0910C9) is equal to zero (is not checked), then at least one of the active component items must have a value of one (checked). Sub-edit (b) says that if the "none of the above" item is equal to one (checked), then all of the active component items must have a value of zero (not checked). Finally, sub-edit (c) says that if any of the "none of the above" items has a value of dash (not assessed or information not available), then all of the "none of the above" items must equal dash. All "none of the above" edits follow this pattern. The same none-of-the-above edits are listed on the report for every item in the checklist group.

- **Severity.** The severity column describes the impact of violating the edit. There are two possible values:

  - **Fatal.** Violation of a fatal edit results in rejection of the HOPE record. Format, none-of-the-above, and skip pattern edits are always fatal. Most consistency edits are fatal, but some are warnings.

  - **Warning.** Violation of a warning edit results in a warning message on the user validation (feedback) report. However, a warning does not prevent the submitted HIS data from being accepted and stored in iQIES.

- **Edit Text.** This column contains the text of the edit.

6.5. Supplemental Information

When appropriate for a HOPE item, another section of the report presents a Supplemental Information table. This table only appears if there is additional information related to the item. It may include one or more informative messages that provide background information or additional instructions that are related to the item. These messages are not issued by iQIES. At this time, there are only a few items with supplemental information. This table contains the following columns:

- **Info ID.** This is a unique ID assigned to the message. Info IDs begin with the number -9001 and increase sequentially in absolute value. The assignment of each Info ID to an informational message was arbitrary.

- **Type.** The type of message is always "Information" for information messages.

- **Text.** This column contains the text of the message.

6.6. Version Changes

The final section of the report lists any changes that were made to the item or the edit since the previous version of the data specs was released. This section appears only for items that were changed. This section did not appear in the initial release of the data specifications, but is included in subsequent releases.

7. Unduplicated Edits Report

The Detailed Data Specifications Report lists all of the edits that are associated with each item in the HOPE item set. Because most edits apply to multiple items, there is a great deal of duplication on this report. For this reason, a second report is provided listing each edit only once. The Unduplicated Edits Report lists each edit and indicates the items to which it applies.

For each edit listed, the edit ID, type, and text of the edit are displayed. After this, the items to which the edit applies are listed.

The Unduplicated Edits Report serves as a resource for developers who wish to ensure that their software incorporates all required edits and that each of those edits is applied to the proper set of items.

8. Conventions Used in the Data Specification Reports

Certain conventions were adopted in the data specification reports in order to make them clear and unambiguous. These conventions are described below:

- On the Detailed Data Specifications Report, the "Item Values" table lists all allowable values for each item. If a submission file contains any values other than those listed in this table, a fatal error occurs and the file is rejected. For example, for item A0800 (gender) the values 1 and 2, are listed in the "Item Values" table. If any other value is submitted for A0800, a fatal error occurs. Note that edits may constrain the list of allowable values based upon specific logical conditions (e.g., if Item A has certain values, then only a subset of Item B's values may be allowed); however, it is never allowable to submit a value that is not listed in the "Item Values" table.

- If the item is a numeric item, then the "Item Values" table may not list every individual value since enumerating all possible values is not practical. Instead, the first two rows of the "Item Values" table list the minimum and maximum allowable values. Restrictions on the values between the minimum and maximum values are listed in the edits for the item. Any additional rows list special values that may be submitted. For example, the "Item Values" table for CRCTN_NUM (correction number) has two rows. The first row lists a value of "00" which is labeled "minimum" and the second row lists a value of "99" which is labeled "maximum". CRCTN_NUM has an edit (-3013) with a format restriction that requires that the numbers be positive integers. Decimal points are not allowed. A sign is not allowed.

- Two special values are reserved for use on certain items:

    - Dashes (-) are used to indicate that an item was not assessed or the information was not available. For example, item F2000B is used to record the date that the patient/responsible party was first asked about preference regarding the use of CPR. If this date is unavailable in the medical record, a dash may be entered in this item. Dashes are allowed on some, but not all, items. When a dash is allowed for an item, it is listed in the "Item Values" table. A dash must not be submitted for items where the "Item Value" table does not list it as an allowable value; submitting a dash for such an item results in a fatal error. When a dash is allowed for an item, a single dash should be submitted for the item regardless of the item's normal length.

    - Carets (^) are used in the submission file to indicate that an item was left blank due to a skip pattern or, for certain text items, the item was left blank. If an item is active for a given type of assessment but was skipped because it is in a skip pattern, then the XML tags for the item must be included in the XML file and a single caret must be submitted as the value between the element's tags. Note that carets are allowed for only some items, as indicated by the "Item Values" table.

- Where edits refer to values of an item, those values are always enclosed in brackets. For example, an edit might say, "If F2000A=[1,2], then if F2000B is active it must not equal [^]." This statement means, "If F2000A is active and is equal to '1' or '2', then the value of F20000B must not be equal to blank '^'." The values contained within brackets should be understood to be character literals even though quotation marks were omitted. Furthermore, when more than one value is listed, they are implicitly connected by a logical "OR". The following summarizes the conventions that are used when specifying values:

    - [1,2,3] means "1" or "2" or "3".

    - [00-15] means "00" through "15" (inclusive).

    - [^] means the caret character, which indicates a blank.

    - "Not equal [^]" refers to any legal value for an item other than the caret character, which indicates a blank.

    - [-] refers to a dash, which indicates that an active item was not assessed or no information was available.

- The relational edits that are included in the data specifications apply only to items that are active for a particular item subset. Items that are not active on a particular item subset should not be submitted and are not edited if they are submitted.

For example, consider an edit that says, "If Item A = [1], then Items B, C, and D must equal [2]". If Item A were equal to [1], then any of the items B, C, and D that were active must equal [2]. However, if any of these three items (e.g., Item B) was inactive, it would not be submitted, would not have a value, and would not be edited. The edit would therefore not apply to the inactive item but would continue to apply to the remaining active items, if any. Similarly, if Item A was not active, the entire edit would not apply.

There are exceptions to this general rule. One exception is that "none-of-the-above" edits apply only if all items involved are active. None-of-the-above edits do not apply if any of the component items was inactive.

All other exceptions to the general rule are handled explicitly in individual edits.

9. XML File Structure

As noted above HOPE data is submitted using XML files. XML files must employ ASCII character encoding. Figure 1, below, shows how HOPE XML submission files are structured.

Figure 1: Example HOPE XML File

```
<?xml version="1.0" standalone="yes"?>
<ASSESSMENT>
        <ITM_SET_SYS_CD>HOPE</ITM_SET_SYS_CD>
        <ITM_SBST_CD>HA</ITM_SBST_CD>
        <ITM_SET_VRSN_CD>1.00</ITM_SET_VRSN_CD>
        <SPEC_VRSN_CD>1.00</SPEC_VRSN_CD>
        <CRCTN_NUM>0</CRCTN_NUM>
        <STATE_CD>IA</STATE_CD>
        <FAC_ID>123122</FAC_ID>
        <SFTWR_VNDR_ID>999213459</SFTWR_VNDR_ID>
        <SFTWR_VNDR_NAME>SOME VENDOR</SFTWR_VNDR_NAME >
        <SFTWR_VNDR_EMAIL_ADR>SUPPORT@VENDOR.COM</SFTWR_VNDR_EMAIL_ADR>
        <SFTWR_PROD_NAME>HOPE ENTRY SYSTEM</SFTWR_PROD_NAME>
        <SFTWR_PROD_VRSN_CD>V2.44</SFTWR_PROD_VRSN_CD>
        <A0050>1</A0050>
        <A0100A>1234567890</A0100A>
        <A0100B>123456</A0100B>
        <A0215>01</A0205>
                .
                .
                .
        <A0800>1</A0800>
        <A0900>19350621</A0900>
                .
                .
        <F2000A>0</F2000A>
        <F2000B>^</F2000B>
        <F2100A>1</F2100A>
        <F2100B>-</F2100B>
                .
                .
                .
        <Z0500B>20251001</Z0500B>
</ASSESSMENT>
```

The XML file depicted in Figure 1 shows only a subset of the elements (items) that might be submitted. The dots are meant to depict additional elements that would be included in the submission file.

The example above begins with the standard XML header line which is followed by the <ASSESSMENT> element that contains the data for a single assessment. Only one assessment may be included in an XML file. Each assessment must be in an uncompressed XML file with an extension of .xml. If a provider wishes to submit data for multiple assessments during an upload session, separate files must be created for each assessment. One or more of these separate files must be zipped together into a single standard compression ZIP file (not zipx) which can then be submitted. This submitted file must be a zipped file with the extension of .zip. Assessment files submitted as a .zipx receive a fatal error and the file is rejected by iQIES.

All submission files must be 5 MB or less in size. Any submission file exceeding this size limitation is rejected by iQIES. If a ZIP file contains multiple XML files, iQIES sorts the data within the ZIP file before processing. This allows proper processing of HOPE records when multiple records are submitted for the same patient, as long as those multiple records are included in the same ZIP file. If multiple records for the same patient and target date are submitted at the same time, these records should be included in the same ZIP file. If they are spread across two or more ZIP files, unexpected timing errors may occur.

The following rules must be followed when naming XML and ZIP submission files:

1. File names for ZIP files cannot exceed 260 characters, including the file extension. A file extension of ".zip" is required.

2. File names for XML files cannot exceed 260 characters, including the file extension. A file extension of ".xml" is required.

The <ASSESSMENT> beginning tag and the </ASSESSMENT> ending tag are used to enclose the elements for individual items that belong to the assessment. These tags are required. The file must include elements for every item that is active for the type of assessment that is being submitted. Any other elements that are included in the submission file are ignored by iQIES and any data contained in those elements is not stored in CMS's database.

The tag for each item corresponds to the item IDs that are listed in the Detailed Data Specifications Report. For example, the beginning tag for item A0100A is <A0100A> and the ending tag is </A0100A>. The submitted value for each item is included within that item's tags. For example, in Figure 1 the value of A0800 is "1". The <ASSESSMENT> beginning tag, the </ASSESSMENT> ending tag, and all intervening tags must be upper case. These tags are required.

For numeric items, leading and trailing zeroes may be omitted. No decimal point or sign (positive or negative) is allowed in the submitted value. For example, the item CRCTN_NUM is an integer item which can range from 00 to 99. The following submitted values are acceptable:

> < CRCTN_NUM >**0**</ CRCTN_NUM >
> < CRCTN_NUM >**00**</ CRCTN_NUM >
> < CRCTN_NUM >**1**</ CRCTN_NUM >
> < CRCTN_NUM >**01**</ CRCTN_NUM >
> < CRCTN_NUM >**14**</ CRCTN_NUM >

Dates must be submitted in YYYYMMDD format (see item Z0500B in Figure 1 for an example). The exception is a birth date for which the day or the month and day may be unknown. If the full birth date is known, it must be submitted as YYYYMMDD, like any other date. For example, if the birth date is April 17, 1935, it is submitted as:

> < Z0500B>**19350417**</Z0500B>

If the year and month were known, but not the day, it is submitted as:

> < Z0500B>**193504**<Z0500B>

If only the year were known, it is submitted as:

> < Z0500B>**1935**</Z0500B>

Note that for all items, leading and trailing blanks should be trimmed. In addition, alphabetic text in any item (such as patient name) may be submitted in upper, lower, or mixed case. iQIES trims leading and trailing blanks on all submitted values and converts alphabetic text except for the software vendor's e-mail address (SFTWR_VNDR_EMAIL_ADR) to upper case without issuing any warnings. These converted values are displayed on submission feedback reports and other database reports. Thus, users should be aware that even if a text item (such as patient name) is submitted as a lower case string or with leading or trailing blanks, it appears trimmed and in upper case on the validation report.

If the value of an item in the XML file exceeds the maximum length of the item, the item is not parsed and a fatal error is issued. Some HOPE items (such as A0500C, patient last name) can contain special characters, such as apostrophes. A properly formatted XML file may encode these characters using "entity references". For example, the name "O'NEAL" can be encoded using the "'" entity reference which substitutes for the apostrophe. If this entity reference is used, the name would be encoded as "O'NEAL".

The iQIES use of entity references follows existing XML standards. According to these standards, entity references are required for the less-than and ampersand symbols, but are optional for three other special characters (the greater-than, apostrophe, and quotation-mark symbols). Thus, the last name "O'NEAL" may be submitted either as "O'NEAL" or as "O'NEAL". Note that if an entity reference is used, it must be lower case; using upper case or mixed case characters may result in XML parsing errors or unexpected results.

It is possible that such an item, in its raw, XML form before it is parsed, could violate HOPE edits. For example, a string such as "O'NEAL" could be longer than the maximum allowed length for an item or might contain characters (such as the ampersand) that are not allowed for the item. Such items **are**

accepted, however, because the edits are applied ***after*** the XML file is parsed. The parsing converts the XML coding of the special characters to the desired character. In the case of A0500C, "O'NEAL" is parsed to "O'NEAL" before any edits are applied.

Each element may contain one of two attributes: (a) LOINC_ITEM (the LOINC code associated with the item) or (b) LOINC_RESP (the LOINC code associated with the item's response value). These attributes are optional; both, either, or neither of these attributes may be included with each element. No editing of these attributes occurs at this time. If these attributes are included, they must be syntactically correct (according to XML rules). In no other respect does their presence affect the processing of the XML file. LOINC codes that are included in the submission files are not checked to insure that they correspond to the LOINC codes that are assigned to the items or values. These LOINC attributes are allowed solely to allow software developers to include them in the submission file if they are needed for other purposes. The LOINC attribute tags ("LOINC_ITEM" and "LOINC_RESP") should be upper case for consistency.

Figure 1 also illustrates the use of the special characters described above: dashes and carets. Item F2000B contains a caret, indicating that it was blank due to a skip pattern. Item F2100B contains a dash, indicating that the information was not available.

9.1. Determining the ISC for a HOPE Record

Item subset codes (ISCs) correspond to the various types of HOPE data records. The ISC for a record is determined using two "type of record" items:

- A0050 Type of record

- A0250 Reason for record

There are two ways to map the type-of-record items to the ISCs. They can be mapped using logical statements or by enumerating the values of the type-of-record items and the corresponding ISCs. Table 2, below, shows the logical mapping, while Table 3 enumerates the possible value combinations.

Table 2: Item Subset Codes – Logical Mapping

ISC	Description	HOPE Type of Record	Demographic and Administrative Items	Clinical Items
HA	Admission	A0050=[1,2] and A0250=[1]	X	X
HUV	Update Visit	A0050=[1,2] and A0250=[2,3]	X	X
HD	Discharge	A0050=[1,2] and A0250=[9]	X	X
XX	Inactivation	A0050=[3] and A0250=[1,9]	X	

The first two rows of Table 2 represent the HOPE item set ISCs ("HA" and "HD"), while the last row represents the inactivation ISC ("XX"). The third column of the table shows the logical relationship between the type-of-record items and the three ISC values. Table 3 presents the same information in a different way, by enumerating the ten combinations of the values of A0050 and A0250 and showing the corresponding ISC.

Table 3: Item Subset Codes – Item Value Mapping

ISC	Description	A0050 Value	A0250 Value	Demographic and Administrative Items	Clinical Items
HA	Admission	1 – new record	1 – admission	X	X
HD	Discharge	1 – new record	9 – discharge	X	X

ISC	Description	A0050 Value	A0250 Value	Demographic and Administrative Items	Clinical Items
HA	Admission	2 – modification	1 – admission	X	X
HD	Discharge	2 - modification	9 – discharge	X	X
HUV	Update Visit	1 – new record	2 - HUV 1	X	X
HUV	Update Visit	1 – new record	3 – HUV 2	X	X
HUV	Update Visit	2 - modification	2 – HUV 1	X	X
HUV	Update Visit	2 - modification	3 - HUV 2	X	X
XX	Inactivation	3 – inactivation	1 – admission	X	
XX	Inactivation	3 - inactivation	9 – discharge	X	

The information in Table 3 is contained in a lookup table that is supplied with the data specifications. In the exports, this table is called isc_val. The contents of this table are supplied with the data specs in a comma separated value file called isc_val.csv.

9.1.1. Determining the HOPE Items Associated with an ISC

Once the ISC is ascertained, the items that are active and inactive for the HOPE record can be determined. In the exports, the itm_mstr table contains the necessary information. This table contains one row for each item in the HOPE item set. Each row contains four fields called ISC_HA (admission), ISC_HUV (update visit), ISC_HD (discharge), and ISC_XX (inactivation) that indicate whether that item is active on each of the four ISCs. For each HOPE item (i.e., each row in the table), these columns can have one of two values:

    x = the item is active on the ISC
    blank = the item is inactive on the ISC

Items that are active on an ISC must be included in the XML submission file. Items that are inactive should be omitted from the XML file; if they are included they are ignored by iQIES. Thus, if a particular record is an "HA" (admission) record, then every item that contains an "x" in the ISC_HA column of the itm_mstr table must be included in the record's XML file.

10. Fixed-Format File Layout

10.1. Uses for the Fixed-Format Layout

As noted above, hospice providers use XML files to submit HOPE data to CMS. However, the data specs also define a fixed-format file layout which is used in other circumstances. For example, CMS uses the fixed file format for data extracts, such as those that are used to periodically extract data from the national database. The format is also used to produce data extracts for other users (such as researchers or individual providers who need to rebuild their assessment database). This fixed format is useful for anyone who wishes to transfer large batches of assessment data, and software vendors may find it useful to support this format for importing HOPE data. The data specifications provide information about starting and ending bytes for each item in the fixed-format record. This information is also contained in the itm_mstr.csv file that is supplied with the data specs. Each item's starting byte, ending byte, and length are contained in the following fields: fixed_rec_strt_byte, fixed_rec_end_byte, and fixed_rec_lngth. The table must be sorted by the itm_srt_id field to order items as they appear in the fixed-format record.

Note that the CSV files contains items that are not included in XML submission files. The itm_grp_cd field identifies the item group: "control", "asmt" (assessment), "filler", and "calc" (calculated). Only control and assessment items are to be included in XML submission files. When a record is accepted by iQIES,

certain calculated values are stored in CMS's national database. These calculated values are contained in the "calc" items at the end of the fixed-format string. The filler items provide space for future Federal assessment items.

10.2. Rules for Creating the Fixed-Format String

The rules below describe how the fixed-format string must be formatted.

3. The string must be 9342 bytes in length.

4. The last three bytes of the string must contain the following characters:

    a. Byte 9340 must contain the percent sign ("%") to indicate the end of data.
    b. Byte 9341 must contain a carriage return (CR) character (ASCII 013).
    c. Byte 9342 must contain a line feed (LF) character (ASCII 010).

5. Except for the three items listed above, all items that are defined as calculated items (that belong to the item group called "Calc") may be left blank. These items are contained in bytes 8715 through 8876. These calculated items are populated in export files that are created by CMS for various purposes.

6. Any items belonging to the item group called "Filler" should be left blank. Data for each item must be contained within the start and end bytes defined in the data specifications.

7. Items that are inactive on a particular record should be filled with blanks. Any data contained in the fields for inactive items is ignored.

8. Items that are active on an assessment record but are blank due to a skip pattern must contain a single caret ("^"). If the length of the item is greater than 1 byte, then the single caret must be left justified and the remaining bytes in the field must be filled with blanks. For example, if item F2000A=[0], then F2000B is skipped. If F2000B is *active* for a given assessment, then F2000B, an 8-byte item located in bytes 551-558 of the fixed-format record, would contain "^   ", (a caret followed by a 7 spaces). On the other hand, if both of these items were *inactive* on a given record, then both would be blank (not caret) filled.

9. Some HOPE items may be coded with a single dash ("-") if the item was not available. If the length of the item is greater than 1 byte, then the single dash must be left justified and the remaining bytes in the field must be filled with blanks. For example, if item F2000B, which is 8 bytes in length, was coded with a dash, then "–   " (a dash followed by 7 blanks) would be inserted in bytes 551-558 in the fixed-format record.

10. The rules below define formatting rules that are specific to each of the different data types.

    a. **Checklist items**. Each of these items is one byte in length. The value that is contained in the record (i.e., [0,1,-,^]) must be inserted in the correct byte of the fixed-format record. No special formatting is required.

    b. **Code items**. The value inserted in the fixed-format record for a coded item must match exactly one of the values allowed in the data specifications for that item. For example, item A0215 is a two-byte coded item that allows the following values: [01,02,03,04,05,06,07,08,09,99]. The value inserted in bytes 436-437 of the fixed-format record must match exactly one of the ten values listed. For example, it is not acceptable to insert " 1" (blank followed by a "1") or "1 " ("1" followed by a blank) for a value of "01". For a few items, the allowed values that are listed are shorter than the length of the item. For example, the data specs version code, SPEC_VRSN_CD, lists an allowed value of "1.00" even though the item is 10 bytes in length. In these cases, left-justify and blank fill the value (i.e., put "1.00" followed by six blanks in bytes 34-43 of the fixed-format record).

    c. **Date items**. All date items are eight bytes in length and are coded as YYYYMMDD. These date values must be inserted in the fixed-format string exactly as coded. For example, if a date item contains "20251108" (11/08/2025), then "20251108" must be inserted in the appropriate bytes in the fixed-format string. Item A0900 (birth date) is one exception to this rule. A0900 can have a missing day (in which case it is coded

YYYYMM), or a missing month and day (in which case it is coded YYYY). In these cases, left-justify the coded value and fill the remainder of the field with blanks. For example, if the date of birth was coded as "1940" (i.e., the month and day were unknown), then bytes 534-541 of the fixed-format record must contain "`1940    `" ("1940" followed by 4 blanks). Note that for any fixed-format file created by CMS, the birth date does not contain a partial date because the month and/or day are imputed where necessary.

d. **Number items**. The value inserted in the fixed-format string for a numeric item must match exactly one of the values (or the range of values) allowed in the data specifications for that item. This means that numeric values must be right-justified and zero-filled. For example, item CRCTN_NUM can have the following values: [00-99]. If the value for a HOPE record is "01", then "01" must be inserted in bytes 34-35 of the fixed-format record; "`1 `" (one followed by a blank) and "` 1`" (a blank followed by one) are not allowed.

Note that these rules for numeric (not coded) items differ from the rules that apply to XML submission files. For example, if the value of an item on a record is "01", a value of either "01" or "1" may be submitted in an XML file. However, for the fixed-format record, a value of "01" must be used.

e. **Text items.** Text items (such as A0500C, patient last name) can have a large set of possible values and the data specifications therefore cannot delineate all allowed values. Furthermore, the values for these items can be shorter than the maximum allowed length. Text values must therefore be left-justified and blank filled in the fixed-format record. For example, if a patient's last name is "Smith", then "`SMITH            `" ("SMITH" followed by 13 spaces) must be inserted in bytes 477-494 of the fixed-format record. For consistency, all text items (except SFTWR_VNDR_EMAIL_ADR, software vendor email address) should be converted to upper case before inserting them in the fixed-format record, although this is not required. It is acceptable to use lower case characters for SFTWR_VNDR_EMAIL_ADR, since email addresses are typically lower case.

11. Additional Documentation

In order to understand the submission process completely, software developers may need information that is not contained within the data specs themselves or in this document. This additional information is available in the HOPE Item Set clinical manual that is published by CMS. The HOPE Item Set manual contains information about topics such as completing the items, submission timing, record sequencing rules, and record modification and inactivation procedures.

Appendix A: Data Dictionary Tables

As noted above, the data dictionary files used to produce the data specifications are distributed to assist software developers. The data dictionary tables are distributed as a set of comma-separated value (CSV) files. The most useful tables contained in the database are described below.

Table A1: Database Table Descriptions

Table Name	Description
isc_mstr	Master table containing one record for every item subset code (ISC).
isc_val	Detail table that lists the values of the reason for record items that are associated with each item subset code (ISC). This table is linked to the isc_mstr table using the isc_mstr_key field.
itm_mstr	Master table containing one record for every item that is contained in the HOPE Item Set.
itm_val	Detail table that contains one record for every value (response option) that is allowed for each item. This table is linked to the itm_mstr table using the itm_mstr_key field.
rltn_mstr	Contains one record for every edit or information message.
rltn_itms	Contains one record for every edit or information message ID associated with each item.
rltn_itm_txt	Contains one record for every edit or information message that is associated with every item. This table was used to generate the detailed data specifications report, the unduplicated edits report, and the supplemental information report.

The following table describes the fields that are contained in each of the database tables described above.

Table A2: Database Field Descriptions

Table	Field	Data Type	Field Size	Description
isc_mstr	isc_mstr_key	Number	4	primary key for table
isc_mstr	isc_id	Text	3	ISC ID code
isc_mstr	isc_txt	Text	55	ISC text
isc_val	isc_id_key	Number	4	primary key for table
isc_val	isc_id	Text	10	ISC ID code

Table	Field	Data Type	Field Size	Description
isc_val	isc_mstr_key	Number	4	foreign key
isc_val	A0050_val	Text	2	type of record value
lsc_val	A0050_txt	Text	30	type of record text
isc_val	A0250_val	Text	1	reason for record value
lsc_val	A0250_txt	Text	30	reason for record text
itm_mstr	itm_mstr_key	Number	4	primary key for table
itm_mstr	sys_cd	Text	10	"HOPE"
itm_mstr	itm_srt_id	Number	10	item sort sequence (e.g., 12600)
itm_mstr	itm_id	Text	30	item ID (e.g., "A0800")
itm_mstr	itm_db_id	Text	30	item database ID (e.g., " GNDR_CD)
itm_mstr	itm_shrt_label	Text	50	item short label (e.g., "Gender")
itm_mstr	itm_sect_srt_id	Text	2	item section sort ID (e.g., "01", "02")
itm_mstr	itm_sect_label	Text	10	item section label (e.g., "A")
itm_mstr	itm_grp_cd	Text	10	Item group code (e.g., "Asmt","Control", "Filler")
itm_mstr	itm_type_cd	Text	10	Item type code (e.g., "Text", "Date"),
itm_mstr	fixed_rec_srt_id	Number	10	sort sequence for fixed-format items (e.g., 12600)
itm_mstr	fixed_rec_strt_byte	Number	10	starting byte for fixed-format record (e.g., export record)
itm_mstr	fixed_rec_end_byte	Number	10	ending byte for fixed-format record (e.g., export record)
itm_mstr	fixed_strt_end_bytes	Text	10	string showing start and end bytes
itm_mstr	fixed_rec_lngth	Number	10	field length for fixed-format record (e.g., export record)
itm_mstr	itm_vrsn_notes	Memo		notes describing edit changes since previous specs version
itm_mstr	isc_active	Text	80	ISC list: item is active
itm_mstr	isc_inactive	Text	80	ISC list: item not active
ltm_mstr	isc_ha	Text	1	Item status on HA (admission) ISC: "x"=active, null=inactive
tm_mstr	isc_hd	Text	1	Item status on HD (discharge) ISC: "x"=active, null=inactive
ltm_mstr	lsc_huv	Text	1	Item status on HUV ISC: "x"=active, null=inactive

Table	Field	Data Type	Field Size	Description
tm_mstr	isc_xx	Text	1	Item status on XX (inactivation) ISC: "x"=active, null=inactive
itm_val	itm_val_key	Number	4	primary key for table
itm_val	itm_mstr_key	Number	4	foreign key to the rltn_mstr table
itm_val	val_srt_id	Number	10	value sort order within item
itm_val	itm_id	Text	30	item ID (e.g., "A0800")
itm_val	val_id	Text	20	item value (e.g., "1")
itm_val	val_txt	Text	255	text associated with value (e.g., "Male")
itm_val	val_loinc_id	Text	20	LOINC value code
rltn_mstr	rltn_key	Number	10	primary key for table
rltn_mstr	rltn_id	Number	10	relation message ID
rltn_mstr	rltn_srt_id	Text	10	relation sort ID (e.g., "01", "02")
rltn_mstr	rltn_type_cd	Text	10	relation type code (e.g., "SKIP", "FORMAT")
rltn_mstr	rltn_svrty	Text	10	relation message severity (e.g., "Fatal", "Warning")
rltn_mstr	rltn_type_txt	Text	10	relation type text (e.g., "Consistency", "Format")
rltn_mstr	rltn_svrty	Text	10	relation message severity (e.g., "Fatal", "Warning")
rltn_mstr	rltn_txt	Memo		relation message text
rltn_mstr	rltn_vrsn_notes	Memo		notes describing edit changes since previous specs version
rltn_itms	rltn_itm_key	Number	10	primary key for table
rltn_itms	rltn_key	Number	10	foreign key to the rltn_mstr table
rltn_itms	rltn_itm	Text	20	item label of item associated with relation
rltn_itm_txt	rltn_itm_txt_key	Number	10	primary key for table
rltn_itm_txt	itm_mstr_key	Number	4	foreign key
rltn_itm_txt	itm_id	Text	30	item ID code (e.g., "A0800")
rltn_itm_txt	itm_srt_id	Number	4	item sort sequence (e.g., 12600)

Table	Field	Data Type	Field Size	Description
rtln_itm_txt	rltn_key	Number	10	foreign key to rltn_mstr table
rtln_itm_txt	rltn_src_cd	Text	5	source code: "M"=manual, "G"=generated
rtln_itm_txt	rltn_id	Number	10	relation message ID
rtln_itm_txt	rltn_srt_id	Text	10	relation sort ID (e.g., "01", "02")
rtln_itm_txt	rltn_type_cd	Text	10	relation type code (e.g., "CONSIST", "FORMAT")
rtln_itm_txt	rltn_type_txt	Text	10	relation type text (e.g., "Consistency", "Format")
rtln_itm_txt	rltn_svrty	Text	10	relation message severity (e.g., "Fatal", "Warning")
rtln_itm_txt	rltn_txt	Memo		relation message text
rtln_itm_txt	rltn_vrsn_notes	Memo		notes describing edit changes since previous specs version
rtln_itm_txt	itm_vrsn_notes	Memo		notes describing item changes since previous specs version