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Exploring the Upcoming Integrated cSDRG!

Srinivas G. Kovvuri, ADC Therapeutics USA;
Christine McNichol, Fortrea;
Randi McFarland, Ephicacy Consulting Group;
Kiran Kundarapu, Eli Lilly and Company;
Satheesh Avvaru, Alexion, AstraZeneca Rare Disease;
Misty Odle, Eli Lilly and Company;
Bidhya Sagar Basnet, Roche-Genentech

ABSTRACT

The Integrated Summary of Safety (ISS) and Integrated Summary of Efficacy (ISE) are essential for the approval of New Drug Applications (NDAs) and Biologics License Applications (BLAs). Sponsors must submit data supporting these integrated analyses and a Reviewer's Guide. There are multiple strategies to create integrated analysis datasets. One strategy is first to develop integrated Study Data Tabulation Model (CDISC SDTM) datasets to use as the source to build integrated analysis datasets. To facilitate the documentation of integrated SDTM, the PHUSE Optimizing the Use of Data Standards Working Group has developed a template for the integrated clinical Study Data Reviewer's Guide (icSDRG). An example document has been created to clarify the use of this template to meet regulatory agencies' (RA) recommendations and ensure consistent data submissions across the industry. This paper illustrates the example of the icSDRG, discusses differences from a study-level cSDRG, and offers practical guidance on preparing integrated SDTM documentation for submission.

DISCLAIMER

All views expressed in this paper are those of the authors and are not necessarily those of PHUSE, CDISC, or the authors' companies: ADC Therapeutics, Fortrea, Ephicacy, Eli Lilly, Alexion AstraZeneca Rare Disease, and Roche-Genentech. The step-by-step approach to standardization and the consistent process for building an integrated data reviewer's guide presented in this paper should not be interpreted as a standard and/or information required by regulatory authorities.

INTRODUCTION

With the enormous costs of research and development, companies developing pharmaceutical or biologic products must reduce the time from submission to regulatory approval. With successful studies completed, sponsors turn their attention to regulatory submission of the data and analyses. Several data standards developed by CDISC (Clinical Data Interchange Standards Consortium) have been adopted by regulatory agencies, including the FDA. PHUSE, in conjunction with the FDA, has developed data reviewers' guides to accompany and explain the Study Data Tabulation Model (SDTM) and Analysis Data Model (ADaM) for regulatory submissions. Study data may then be pooled to support integrated analyses, such as for ISS (Integrated Summary of Safety) or ISE (Integrated Summary of Efficacy). While many companies directly pool the study-level ADaM data, other companies choose to integrate the SDTM data first. Without a standard reviewer's guide documenting pooled SDTM data, sponsors may devise their own non-standard document. To facilitate quicker reviews, the PHUSE Optimizing the Use of Data Standards (ODS) Working Group developed a new standard template for pooled SDTM data - the Integrated Clinical Study Data Reviewers Guide (icSDRG). In addition, an icSDRG example and completion guidelines will be provided to promote implementation, help sponsors create standardized SDTM documentation and improve the review process for regulators. Through the example of icSDRG, this paper examines the icSDRG template, which provides detailed information on the pooled datasets, including source data, considerations for integration and traceability, data standards, and SDTM domain-specific details.

ACRONYMS

Acronym	Translation
ADaM	Analysis Data Model
ADaM IG	Analysis Data Model Implementation Guide
ADRG	Analysis Data Reviewer's Guide
ANDA	Abbreviated New Drug Application
BLA	Biologics License Application
CDISC	Clinical Data Interchange Standards Consortium
cSDRG	Clinical Study Data Reviewer's guide
FDA	US Food and Drug Administration
iADRG	Integrated Analysis Data Reviewer's Guide
icSDRG	Integrated Clinical Study Data Reviewer's Guide
iSAP	Integrated Statistical Analysis Plan
ISE	Integrated Summary of Efficacy
ISI	Integrated Summary of Immunogenicity
ISS	Integrated Summary of Safety
NA	Not Applicable
NDA	New Drug Application
ODS	Optimizing the Use of Data Standards
PK/PD	Pharmacokinetics/Pharmacodynamics Data
PMDA	Pharmaceutical and Medical Devices Agency (Japanese Regulatory Agency)
SDTM	Study Data Tabulation Model
SDTM IG	Study Data Tabulation Model Implementation Guide
eCOA	Electronic Clinical Outcome Assessment

OVERVIEW

Standardization is often implemented to improve efficiency. With pharmaceutical and biotechnology companies adopting the standardized CDISC data format now required by the FDA for individual clinical trials data submissions, clinical trial sponsors are also providing integrated tabulation and/or analysis data to support their regulatory submissions. Sponsors have different ways of presenting the integrated data and the associated documentation. While some sponsors prefer to integrate only analysis (ADaM) data, others prefer to integrate the tabulation (SDTM) data first. With an integrated analysis data reviewer's guide now available, there is an opportunity to standardize the integrated SDTM data reviewer's guide for a consistent approach across the industry.

As pharmaceutical and biotechnology companies plan for regulatory submissions, they may need to provide pooled analysis data, for both safety, and efficacy and/or immunogenicity. First, after compiling the appropriate studies that support their submission they need to standardize and integrate this data. This data may be coming from multiple sources in multiple formats, which may require the recoding and/or harmonizing to incorporate data exchange and terminology standards. These companies may choose to complete this standardization before creating analysis data, thus creating pooled SDTM data. With no current guidance on standardizing and pooling SDTM data, different companies have different approaches to combine the data and provide information and clarification about this data to regulatory agencies. The industry needs to have standardized documentation on integrated SDTM to support regulatory submissions to multiple agencies.

The PHUSE ODS Working Group has developed an Integrated Clinical Study Data Reviewer's Guide (icSDRG) template incorporating information from the cSDRG and recently published Integrated Analysis Data Reviewers Guide (iADRG). This document was developed to explain the data integration, including detailed information on the pooled datasets, such as source data, considerations for integration and traceability, data standards, and SDTM domain specific details. Additionally, an example and Completion Guidelines are being developed to help the sponsors provide all pertinent information. The icSDRG provides regulatory reviewers with additional context for integrated SDTM datasets that may be received as part of a regulatory submission.

INTERGRATION APPROACH

The data integration approach outlined below was considered in building the Integrated Clinical Study Data Reviewer's Guide and shown in Figure 1.0.

SDTM -> integrated SDTM: Legacy tabulation, legacy SDTM* and SDTM are converted to integrated SDTM. Although not all sponsors use this approach, creating integrated SDTM for use in creating integrated ADaM data is a valid approach.

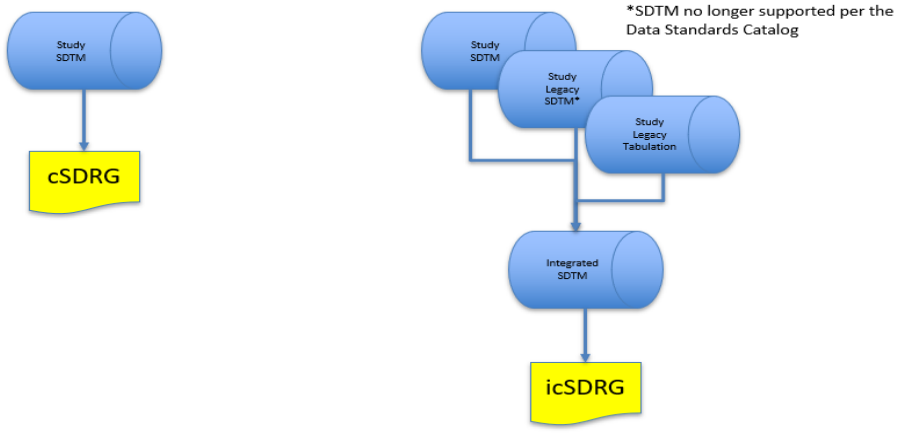

Figure 1.0 SDTM and legacy Datasets Used for Data Integration

COMPARISON OF CSDRG AND ICSDRG

There are similarities between the icSDRG and cSDRG as they both describe the SDTM datasets. However, the icSDRG contains additional sections, questions and modified content needed to fully describe the integrated nature of the data.

New and modified content is included in the following sections of the icSDRG:

- Section 1.4 – Source Data Used for Integrated Study Dataset Creation
- Section 1.5 – Traceability Flow Diagram
- Section 2.1 – Protocol Numbers and Titles
- Section 3 - Considerations Related to Creation of Integrated Datasets
- Section 3.1 – Overview
- Section 3.2 – Treatment Variables
- Section 3.3 – Considerations that Require Special Integration Rules
- Section 3.4 – Inclusion of Visits and Records
- Section 4.1 – Integrated SDTM Domains
- Section 6 – Submission of Programs

While this paper focuses on the details and examples of these differences, the upcoming PHUSE icSDRG template, completion guideline, and example document can be referenced for the full content, structure, and example of the icSDRG.

SOURCE DATA USED FOR INTEGRATED STUDY DATASET CREATION (SECTION 1.4)

This is a new section introduced in the icSDRG considering the integrated data is pooled from different individual studies. It provides a summary of the source data for each study included in the integrated SDTM datasets. In this section, a table (Table 1.0) was added for ease of reading, providing the source data information and traceability for each study. Users would list the study identifier and/or protocol number, data standard used for that study (i.e., SDTM, Legacy Tabulation), cutoff date or database lock (DBL) date and study status (Continuing/Ongoing).

Study Identifier and protocol number are included in separate columns as these numbers could be different for some sponsors.

Table 1.0 Source Data Information

Study Identifier (STUDYID)	Protocol Number	Source Data Standard	Cutoff-Date or DBL-Date / Study Status
		SDTM IG <version> Legacy Tabulation	

The following table provides an example for the Table 1.0.

Study Identifier (STUDYID)	Protocol Number	Source Data Standard	Cutoff-Date or DBL-Date /Study Status
QRS01	QRS- 1001	SDTM 1.4/ IG 3.2	2018-08-10/Completed

Study Identifier (STUDYID)	Protocol Number	Source Data Standard	Cutoff-Date or DBL-Date /Study Status
QRS02	QRS -1002	SDTM 1.7/IG 3.3	2023-08-23/Ongoing
QRS03	QRS -1003	SDTM 1.3/IG 3.1.3	2019-05-09/Completed
QRS04	QRS -1004	Non-standard Data	2016-02-01/Completed

This section also includes an “Additional Content of Interest” sub-section where the sponsor would be able to document any intermediate or reference datasets used, information related to data cutoff rules for an ongoing study or one that has an ongoing follow-up component, information related to up versioning the SDTM version, and if the sponsor is including the combined annotated CRF (acrf.pdf) in the integrated data submission. If including patient-reported outcome screenshots from eCOA (Electronic Clinical Outcome Assessment), which are not part of the aCRF document, it can also be documented here in “Additional Content of Interest”.

In cases where legacy data is converted to SDTM, or any source study was converted from a legacy format during integration, sponsors may include a reference to the Legacy Data Conversion Plan & Report Appendix.

TRACEABILITY FLOW DIAGRAM (SECTION 1.5)

This is a new section that was added to provide a traceability flow diagram and to describe the flow from the various sources of data to the integrated datasets. Additional details as needed regarding the traceability can be included. A sample illustration of a traceability diagram is shown in Figure 2.0 where the individual study datasets are coming from data with various standards. The diagram shows the up-versioning and normalization of the data to SDTM v2.0/ IG v3.4 during integration.

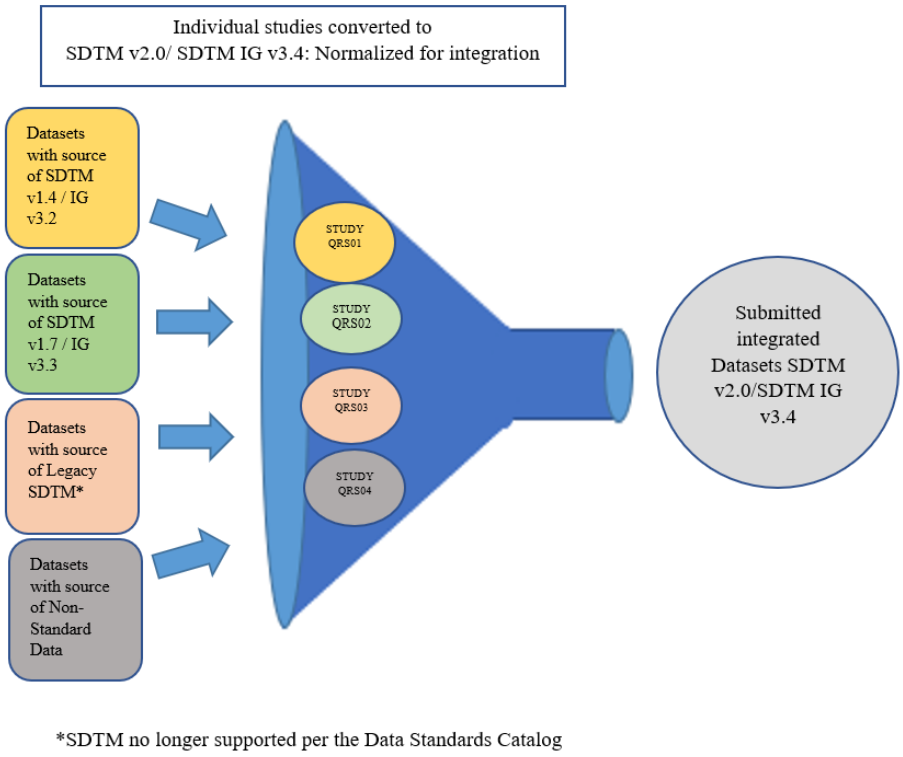

Figure 2.0. Traceability Flow Diagram

DESCRIPTION OF PROTOCOLS USED IN THE INTEGRATED DATASETS (SECTION 2)

This section has been updated to present information in a tabular format (Table 2.0), summarizing the protocol number, indication, protocol title, and phase for each study included in the integration. The previously included descriptions of protocol design and trial design datasets, as seen in the cSDRG template, have been removed.

Table 2.0 Protocol Information

Protocol Number	Indication(s)/ Protocol Title	Phase

A new sub-section titled “Additional Content of Interest” has been introduced to capture supplementary details. This may contain information on indications from protocols not included in the integration, study populations, primary endpoints, dosing regimens/formulations, and treatments from one or more protocols that were excluded from the integration.

The **Protocol Number** column lists the unique protocol number for each individual study. In the **Indication(s)/Protocol Title** column, provide all indications associated with the protocol along with the study title. If the protocol title already reflects the indication(s), sponsors are not required to list them separately. Additionally, if the protocol title is lengthy, sponsors may choose to provide a shortened version for clarity. In the **Phase** column, list the phase of the study.

The Table below shows an illustration of the Description of the protocols used in the integrated datasets.

Protocol Number	Indication(s)/Protocol Title	Phase
QRS- 1001	Phase 2, Multicenter, Randomized, Double-Blind, Parallel, Placebo-Controlled Study of DRUG A in Subjects with Moderate to Severe Ulcerative Colitis	II
QRS- 1002	Phase 3, Multicenter, Randomized, Double-Blind, Parallel, Placebo-Controlled Induction Study of DRUG A in Conventional-Failed and Biologic-Failed Patients with Moderately to Severely Active Ulcerative Colitis	III
QRS- 1003	A phase 3, multicenter, randomized, double-blind, placebo-controlled trial of oral DRUG A as induction and maintenance therapy for moderate to severe ulcerative colitis	III
QRS- 1004	Phase 3, Multicenter, Open-Label Extension Trial of DRUG A as Therapy for Moderate to Severe Ulcerative Colitis	III

CONSIDERATIONS RELATED TO CREATION OF INTEGRATED DATASETS (SECTION 3)

This part of the icSDRG is intended to document considerations specific to the SDTM integration, which include information about the harmonization of SDTM variables, value-level metadata, and datasets to have the same meaning across all studies. Documenting these considerations aids in understanding how each protocol design relates to the standardization of data mapping, SDTM data integration and aligns with the analysis strategy. This section is intended to describe considerations related to multiple integrated SDTM datasets. Otherwise, sponsors should use section 4.2.x of the icSDRG template.

OVERVIEW (SECTION 3.1)

The “Overview” section provides a high-level summary of the pooling strategy, study data included for submission, and the rationale. This section has question prompts to indicate whether the Trial Design datasets, split datasets, screen failure subjects, and adjudication data are present in the integrated data. Information about Trial Design datasets and screen failures can be documented in text or table format. The examples below illustrate the text and tabular formats used for documentation.

Are Trial Design datasets included in the submission? YES

Only SDTM.TS included. The integrated TS domain was created as a concatenation of the study level TS domains. Consistency updates for common values were made across study records for TSVAL, TSVALNF, TSVALCD, TSVCDREF, TSVCDVER.

Other Trial Design datasets were not created for the integrated datasets.

Do the integrated SDTM datasets include screen failures? YES

If yes, which integrated datasets include screen failure data?

Dataset	Dataset Label
AE	Adverse Events
CM	Concomitant Medications
DM	Demographics

TREATMENT VARIABLES (SECTION 3.2)

This new “Treatment Variables” section of the icSDRG is intended to provide details about the values of the treatment variables and any harmonization that has occurred in the process of integrating. This section has the following question prompts.

- Do the integrated SDTM include subjects with unplanned treatment?
- Are the treatment variables harmonized?

If subjects with unplanned treatment were included in the integrated SDTM, a description of this would be included in this section. The following is an example of a response that might be used to explain an unplanned treatment.

Yes. One participant received unplanned treatment in Study QRS01. The participant received Drug A but in week 4 they were given the wrong kit, so they took Drug B.

Any harmonization of the treatment variables would also be included in this section. This might include grouping treatment values or a change in how a drug is referred to in older to newer studies.

The example below shows an illustration of how harmonization of treatment arm values might be described.

STUDYID	TREATMENT ARM	HARMONIZED ARM
QRS01	Drug A1 + pre-med	Drug A
QRS01	Drug B	Drug B
QRS02	Drug A	Drug A
QRS03	Drug A2	Drug A

CONSIDERATIONS THAT REQUIRE SPECIAL INTEGRATION RULES (SECTION 3.3)

This new section describes any special integration rules or conditions that were applied that have an impact across domains. Similar to the cSDRG, there is a place for domain-specific details in Section 4.2 of the icSDRG. This section is intended to cover all aspects encountered during the process of integrating study-level data into the integrated SDTM. If special rules were applied to the study level SDTM, they would be described in the study level cSDRG.

This section has the following question prompt.

- Were any additional updates (e.g., codelists, value-level metadata, dictionaries) performed when integrating?

This could include details about up-versioning to a new MedDRA dictionary, WHODrugDictionary, CTCAE criteria, up-versioning terminology, and harmonizing other values such as test codes or units. Sponsors can opt to document in paragraph/s, a general bulleted list or a table format.

The example below shows an illustration of a bulleted list providing a high-level description of updates made during the process of integrating the SDTM datasets.

- Text values have been converted to uppercase for consistency as needed across datasets.
- Standard units have been harmonized across studies.
- Terminology was harmonized as documented in Section 1.3.
- Studies QRS01 and QRS03 were up versioned to the latest MedDRA version as found in Section 1.3.

The table below shows an example of harmonized values that might be used to describe value level changes.

Study Identifier (STUDYID)	Dataset	Variable	Conditional Variable	Conditional Value	Original Value	Harmonized Value
QRS01, QRS03	LB	LBCAT	LBTESTCD	HDL	LIPIDS	CHEMISTRY
QRS01, QRS03	LB	LBCAT			BLOOD_CHEMISTRY	CHEMISTRY
QRS02	SUPPAE	QVAL	QNAM	AERELCM	yes	Y
QRS02	LB	LBTEST	LBTESTCD	LBALL	Labs Data	Laboratory Test Results Data

The Additional Content of Interest part of this section can be used to describe any other information about integration such as:

- Describe whether any participants were excluded from integrated SDTM datasets and the rationale for the exclusion.
- If any participants were enrolled in multiple studies (for instance, an extension study), explain how this was handled for integrated SDTM. If this occurs, note if the same USUBJID was used across all records for a given participant.
- Differences between individual study datasets and integrated datasets for example:
    - Any standardization required across studies such as CAT/TESTCD,
    - Values that differed between studies in study level SDTM but were intentionally not harmonized, for example:
        - VISIT/VISITNUM
        - EPOCH
        - ARM/ARMCD – the details in section 3.2 can be referenced

INCLUSION OF SUBJECT VISITS AND RECORDS (SECTION 3.4)

This new section explains the record and visit selection from the individual study SDTM into the integrated SDTM. This section has the following question prompts.

- Were unscheduled visits incorporated in any integrated datasets?
- Are all records included from each study for the integrated datasets?

Usually, all records and unscheduled visits from individual study SDTM are included in the integrated SDTM. If so, only a “Yes” response is required. If only a subset of the visits or records are included or a particular visit or record is excluded, that should be described here with detail to provide clarity on the selection process.

INTEGRATED DATASETS DESCRIPTIONS (SECTION 4)

This section is intended to summarize the integrated datasets included in a submission and also to describe considerations related to a specific domain. Similar to the study level cSDRG, the icSDRG contains the following sections:

INTEGRATED SDTM DOMAINS (SECTION 4.1)

In order to summarize the integrated SDTM datasets, this section contains an inventory table which includes category, custom domain information, split datasets, supplemental qualifier, RELREC relationship and whether all studies in the integrated database contributed to that domain. The table columns were modified from the individual cSDRG to accommodate integration needs. The table below shows an illustration of the comparison between the study level cSDRG and icSDRG.

Individual cSDRG inventory table:

Dataset – Dataset Label	Efficacy	Safety	Other	Custom	SUPP-	Related Using RELREC

Integrated cSDRG inventory table:

New

New

Dataset – Dataset Label	Efficacy (E)/ Safety (S)/ Immunogenicity (I)	Other	Custom	Split Datasets	SUPP-	Related Using RELREC	All Studies Contribute (X=Yes)
AE – Adverse Events	S				X	DS, CM	X
APMH – Associated Persons Medical History		X					
QS - Questionnaire	E			X			X
XL – Laboratory Test Results XL	S		X				X

The column Efficacy, Safety and Immunogenicity is included to align with the iADRG template. When sponsors submit both ISS and ISE, sponsors may use only one integrated SDTM database as source. This column allows sponsors to categorize the datasets used for ISS and ISE. Also, two new columns were added to recognize split datasets and to identify whether all studies in the integrated SDTM database contributed to each domain.

A new sub-section titled “Additional Content of Interest” has been introduced to capture supplementary details such as if all studies did not contribute to a particular domain, sponsor may provide the rationale.

Domain Specific Details (Section 4.1.x)

The use of this section is similar to the individual cSDRG template. In addition to the standard use to explain supplemental domains, this section should also be used to further describe domain specific programming that was done to harmonize studies within an integrated database such as:

- Description of any variable level harmonization that was required.
- Sponsor-defined uses of category and sub-category.
- Sponsor extensions to CDISC Controlled Terminology.
- Mapping of legacy sponsor terminology to CDISC Controlled Terminology.
- Representation of disposition information in the Disposition (DS) domain especially for submissions where the study is ongoing.
- If the number of participants included in the integrated SDTM database are not the same as in the combined source studies, then describe the reason for the difference.

DATA CONFORMANCE SUMMARY (SECTION 5)

For integrated SDTM datasets, there are no conformance or validation rules specified for integrated datasets. The current industry practice is to use the same SDTM conformance checks and validation rules that are applied to individual study datasets.

Conformance Input questions from the cSDRG template were replaced with a table format to provide the same information shown in Table 3.0 below. This change aligns to the iADRG template.

Question	Description
Software name and version used for the integrated dataset validation	<In addition to software name and version used, if applicable include engine version>
Version of the validation rules (i.e. CDISC, FDA, PMDA) for the integrated datasets	
Software name and version for the Define-XML validation	<In addition to software name and version used, if applicable include engine version>
Version of the validation rules (i.e. CDISC, FDA, PMDA) for the Define-XML	

Table 3.0 – table format of the conformance input information

The example below shows an illustration of the icSDRG issues summary table where the Rule ID has been added per recommendation from PMDA for iADRG.

Dataset	Rule ID	Diagnostic Message	Severity	Count	Explanation

SUBMISSION OF PROGRAMS (SECTION 6)

It is not common for regulatory agencies to require sponsors to submit integrated SDTM programs. If requested by a specific review division or agency, this section covers how to submit integrated SDTM dataset creation programs and supportive macro programs in tabular format. This section is consistent to the iADRG and ADRG templates. However, given it is not typical for an integrated SDTM database to support analysis outputs (e.g. Tables & Figures), the icSDRG template does not include the “Integrated Analysis Output Programs” sub-section. If a sponsor’s integrated SDTM database is the source to integrated analysis outputs, then it would be recommended to add this sub-section to the template.

Since there are no guidelines from regulatory agencies specific to integrated studies, sponsors are using individual study program submission guidelines. If the review division requests the sponsor to include integrated SDTM dataset creation programs, it is recommended to discuss with the specific regulatory division review team on their specific needs and confirm the placement of these files in the eCTD backbone since there is not a standard folder to submit these types of program files like there is for analysis program files.

CONCLUSION

This paper outlines the key considerations involved in developing the icSDRG template and differences with individual study cSDRG. It incorporates best practices for consistently documenting integration details, as well as addressing nuances and non-conformances within the pooled study data. The adoption of this integrated study data reviewer's guide by industry sponsors aims to promote standardized documentation and enhance the clarity of integrated study data for regulatory reviewers.

REFERENCES

1. U.S. Department of Health and Human Services Food and Drug Administration, Center for Drug Evaluation and Research (CDER) and Center for Biologics Evaluation and Research (CBER). "Study Data Technical Conformance Guide". FDA website. March 2022. Available at: https://www.fda.gov/industry/fda-data-standards-advisory-board/study-data-standards-resources
2. US. Department of Health and Human Services Food and Drug Administration Center for Drug Evaluation and Research (CDER) Center for Biologics Evaluation and Research (CBER) Oncology Center of Excellence (OCE). "Providing Regulatory Submissions in Electronic Format — Standardized Study Data Guidance for Industry, Electronic Submissions Revision 2". FDA website. June 2021 Available at: https://www.fda.gov/industry/study-data-standards-resources/study-data-submission-cder-and-cber
3. PHUSE Optimizing the Use of Data Standards Working Group deliverables available at: https://advance.hub.phuse.global/wiki/spaces/WEL/pages/26804512/Deliverables

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Name	Company/Organization	Participation
Core Team		
Kiran Kumar Kundarapu	Eli Lilly	PHUSE Clinical Integrated Study Data & Analysis Data Reviewer's Guides working group (Project Co-Lead)
Satheesh Avvaru	Alexion, AstraZeneca Rare Disease	PHUSE Clinical Integrated Study Data & Analysis Data Reviewer's Guides working group (Project Co-Lead)
Randi McFarland	Ephicacy Consulting Group	PHUSE Clinical Integrated Study Data & Analysis Data Reviewer's Guides working group (Project Co-Lead)
Srinivas G. Kovvuri	ADC Therapeutics USA	PHUSE icSDRG Example sub-group Co-Lead
Christine Rossin	Pfizer	PHUSE icSDRG Example sub-group Co-Lead
Priyanka Pollarine	Biogen	PHUSE icSDRG Example sub-group
Krishna Varkur	PPD (Thermo Fischer Scientific)	PHUSE icSDRG Example sub-group
Misty Michelle Odle	Eli Lilly	PHUSE icSDRG Example & Completion Guidelines sub-group Co-Lead

Name	Company/Organization	Participation
Christine McNichol	Fortrea	PHUSE icSDRG Completion Guidelines sub-group Co-Lead
Kapila Patel	IQVIA	PHUSE icSDRG Completion Guidelines sub-group
Bidhya Sagar Basnet	Genentech	PHUSE icSDRG Completion Guidelines sub-group
Chintan Pandya	Merck	PHUSE icSDRG Completion Guidelines sub-group
Janet Low	Merck	PHUSE Optimizing the Use of Data Standards working group Lead
Sandy VanPelt Nguyen	Pfizer	PHUSE Optimizing the Use of Data Standards working group Lead
Chris Price	Roche	PHUSE Working Groups Director

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CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the authors at:

Name: Srinivas G. Kovvuri Company: ADC Therapeutics USA Email: srinivas.kovvuri@adctherapeutics.com Location: New Providence, NJ	Name: Christine McNichol Company: Fortrea Email: christine.mcnichol@fortrea.com Location: Orlando, FL
Name: Randi McFarland Company: Ephicacy Consultant Group, Inc. Email: randi.mcfarland@ephicacy.com Location: Iselin, NJ	Name: Kiran Kumar Kundarapu Company: Eli Lilly and Company Email: kiran.kundarapu@lilly.com Location: Indianapolis, IN
Name: Satheesh Avvaru Company: Alexion, AstraZeneca Rare Disease Email: satheesh.avvaru@alexion.com Location: New Haven, CT	Name: Misty Michelle Odle Company: Eli Lilly and Company Email: odle_misty_m@lilly.com Location: Indianapolis, IN
Name: Bidhya Sagar Basnet Company: Genentech Email: basnet.bidhya@gene.com Location: South San Francisco, CA	