# Discover the Power of DDI Metadata

Wednesday April 8, 2015

Workshop

North American DDI User Conference < naddi>

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#### Schedule

- Introductions
- Brief background of DDI
- Exercise 1
- Getting started
- Examples
- Integration into a data lifecycle workflow
- Exercise 2
- Wrap-up

## Brief Background of DDI

- What is DDI?
  - Data Documentation Initiative
  - http://www.ddi-alliance.org/
- An international specification
  - Not yet a formal ISO standard
  - Goal
- Formats documentation for a social science data file
  - More useful than a word or text file
- Supports the entire research data lifecycle

## Relationship to Other Standards: Archival

#### Dublin Core

- Basic bibliographic citation information
- Basic holdings and format information

#### METS

- Upper level descriptive information for managing digital objects
- Provides specified structures for domain specific metadata

#### OAIS

- Reference model for the archival lifecycle
- PREMIS
  - Supports and documents the digital preservation process

## Relationship to Other Standards: Non-Archival

- ISO 19115 Geography
  - Metadata structure for describing geographic feature files such as shape, boundary, or map image files and their associated attributes
- ISO/IEC 11179
  - International standard for representing metadata in a Metadata Registry
  - Consists of a hierarchy of "concepts" with associated properties for each concept
- ISO 17369 SDMX
  - Exchange of statistical information (time series/indicators)
  - Supports metadata capture as well as implementation of registries

- Creates a standard format
  - Used to mark up codebooks
  - Meaningful and consistent
  - Metadata is both human and machine readable
- Gives codebook level details such as
  - dataset contents, variable labels, summary Statistics and frequencies
  - Also question text for each variable

#### Caveat

• DDI is powerful provided that the information is entered into the appropriate fields when marking up the document.

- Remember
  - DDI facilitates the creation of metadata
- Expressed in XML
  - XML Schema
    - A way of tagging text for meaning, not appearance
  - Older version of DDI used DTD (Document type definition)
  - Defines
    - Which tags are available
    - The order the tags will appear in a document
    - Whether the tags are required or optional
    - Whether the tags are repeatable or not

#### Example of DDI Compliant Codebook

```
<?xml version='1.0' encoding='UTF-8'?>
<codeBook version="1.2.2" ID="ctums_82M0020XCB_E_2004_ann_person-file">
<docDscr>
  <citation>
   <titlStmt>
    <titl>
     Canadian Tobacco Use Monitoring Survey, 2004: Annual, Person File
    </titl>
    <subTitl>
     Annual, Person File
    </subTitl>
    <altTitl>
     CTUMS 2004: Annual, Person File
    </altTitl>
      <IDNo>
     ctums_82M0020XCB_E_2004_ann_person-file
    </IDNo>
```

- Benefits of DDI
  - Interoperability
  - Rich content
  - A single document with multiple purposes
  - Increased search capability
    - precision in searching
  - More visibility for the data because it is web-based
    - Research is no longer on just one computer

- Challenges
  - Complexity
  - Level of researcher buy-in
  - Need for tools
  - Changes in workflow
  - Access to metadata

- History
  - Started in 1995
  - The director of ICPSR, Richard Rockwell, constituted a Committee on metadata
  - Developed a draft list of codebook elements
  - An international committee
  - Quebec City

- Norwegian Social Science Data Services
- Harvard University
- American University
- Statistics Canada
- Health Canada
- Bureau of the Census
- University of Michigan
- Bureau of Labor Statistics
- ICPSR

- Yale University
- ESRC Data Archive (UK)
- University of California, Berkeley
- University of Southern Denmark
- The Roper Center
- Zentralarchiv für Empirische Sozialforschung (GESIS)

- Bjorn Henrichsen
- Micah Altman
- Atle Alvheim
- Grant Blank
- Ernie Boyko
- Bill Bradley
- Cavan Capps
- Bill Connett
- Cathryn Dippo
- Pat Doyle
- Dan Gillman
- Peter Granda

- Ann Green
- Peter Joftis
- Ken Miller
- Tom Piazza
- Karsten Boye Rasmussen
- Richard Rockwell
- Jostein Ryssevik
- Merrill Shanks
- Peter Solenberger
- Rolf Uher
- Mary Vardigan

- 1996: Prepared first DTD (document type definition)
  - Set up markups/specifications
- 1997: Received funding from the NSF
  - Specifications translated to XML
- 1999: Beta testing
  - Reports submitted
- 2000: DDI Version 1 published

- 2001: First DDI Training
  - 2001: Received funding from Health Canada
- 2002: DDI Alliance charter drafted
- 2003
  - DDI 2 published
  - DDI Alliance established
    - First Steering Committee meeting
  - Final meeting of original Committee

- 2007: Public review of DDI 3
- 2008: DDI 3 published as XML Schemas
- 2009: DDI Lifecycle 3.1 published
- 2012: DDI C 2.5 published as XML Schemas
- 2013: DDI Sprints
  - First DDI Executive Board meeting
- 2014: DDI C 2.5 modified
  - DDI 3.2 published

- DDI Alliance
  - Self-sustaining
  - Membership organization
  - Members have a voice in the development of DDI
  - Membership documents are all online
    - Charter, bylaws, member forms, ...
  - Publications are all one line
    - Newsletters, annual reports, ...
  - http://www.ddialliance.org/alliance

- DDI now branched into 2 separate development lines or metadata standards
  - DDI Codebook
    - aka DDI C
    - Formerly DDI 2
    - This was the original one
    - Built to emulate a physical codebook

- DDI Lifecycle
  - aka DDI L
  - formerly DDI 3
  - Supports the research data lifecycle
  - The one new users are learning

#### DDI 1 and 2

- Document Description
- Study Description
- Data Files Description
- Variable Description
- Other Study RelatedMaterials

#### DDI 3

- Study Concept
- Data Collection
- Data Processing
- Data Distribution
- Data Archiving
- Data Discovery
- Data Analysis
- Repurposing

- How to determine which version of DDI to use if you are new to the game?
  - DDI C
    - Relatively straight forward
    - If you want to catalog a dataset
    - If you are describing a single study
  - DDI L
    - If you are focusing on a lifecycle model
    - Broken down into different functions
      - Are you documenting questionnaires?
      - Are you documenting data?
      - Are you doing both?

- Challenge
  - How to go from DDI C to DDI L?
  - Even though DDI L is fast becoming the more preferred one, if you are already using DDI C, it would be too much work to convert to DDI L
  - Insufficient resources to do this conversion for most institutions (people, \$)
- Solution
  - Crosswalks, other resources

- Coming soon!
  - DDI 4
    - Has an integrative vision
      - DDI C (DDI 2) and DDI L (DDI 3)
    - Will be aimed at machine-actionable processing at the beginning

- Who is Using DDI?
  - CESSDA Data Portal (European quantitative social science datasets)
  - Australian Social Science Data Archive
  - DAMES Project (UK)
  - DataFirst at University of Cape Town
  - Data Liberation Initiative (Statistics Canada)
  - General Social Survey (US)
  - ICPSR (Interuniversity Consortium for Political & Social Research)
  - Israel Social Science Data Center
  - Philippines National Statistics Office
  - Statistics New Zealand
  - Vision of Britain (historical view between 1801 and 2001)
  - World Bank (International Household Survey Network)

## Global DDI

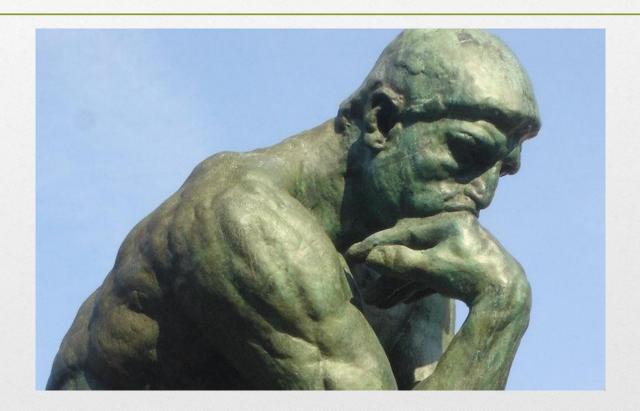
• In 2013



- What Projects are using DDI?
  - California Digital Library's "Counting California" Project
  - Centre for Comparative European Survey Data
  - Canadian Research Data Centres
  - DAMES Project (Universities of Stirling and Glasgow)
  - ICPSR Data Catalog
  - ODESI (Ontario Data Portal)
  - Sri Lanka Department of Census and Surveys
  - World Bank (International Household Survey Network)

- DDI website
  - http://www.ddialliance.org/what
  - Excellent resource
    - FAQ
    - Tools
    - Markup Examples
    - Metadata Resources
  - <ddi> Directions: A newsletter of the Data
     Documentation Initiative

#### Time to think!



#### Exercise 1

• As a researcher, what metadata do you *absolutely* need?

• How do you want it to streamline your research?

• What metadata would you like to have, if it is available, but it is *not integral* to your research?

## Getting Started with DDI

- Daunting at first
  - Process is broken down into steps
- Lots of help available
  - DDI Alliance
  - Colleagues
  - Other researchers
- DDI List-serv
- DDI Best Practices
  - Work in progress
    - Feedback always welcome

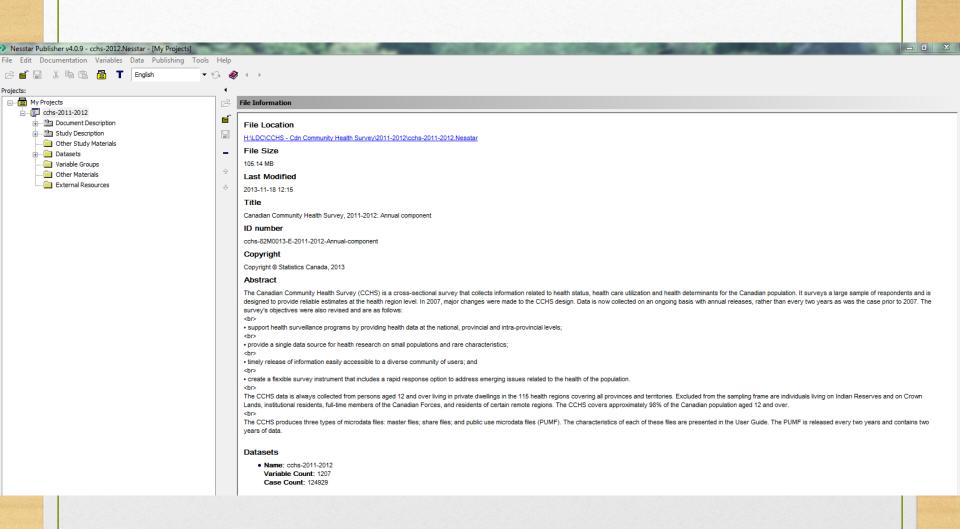
- Tools to help you get started
  - http://www.ddialliance.org/resources/tools
    - Drop down menu
    - Browse a list
    - Choose the one that will suit your purposes
    - License choices
      - Commercial
      - Freeware
      - GNU Lesser General Public License (LGPL)
    - For different versions of DDI

- One tool: Nesstar Publisher
  - Norwegian Social Science Data Services
  - Data management program
  - Freeware
  - Data and metadata conversion and editing tools
    - Enhance datasets
      - Combine catalogue and contextual information
  - Merge DDI documents with markup for different sections of the DDI for the same study
    - Merge variable descriptions from SPSS/SAS with DDI

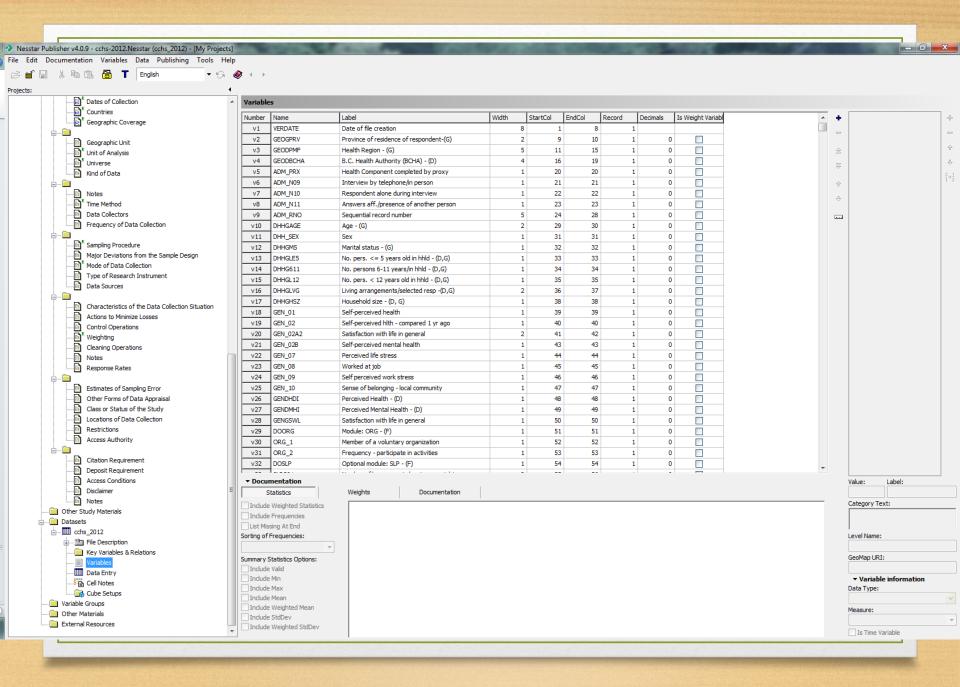
- Nesstar Webview
  - Metadata
  - Any associated documentation
  - Variable groups
  - Conduct basic analysis
    - Subsetting
    - Crosstabs
  - Bonus

- Nesstar Webview
  - Downloading
    - Documentation
      - PDF format
      - Export files with study descriptions and question text
    - Data exported in format of choice
      - SPSS, SAS, Stata, ASCII, ...

- Nesstar drawbacks
  - For advanced statistical analysis -
    - it is best to download the data and use a statistical analysis package
  - Must have access to a server to publish the dataset
  - Not intuitive when starting to markup datasets
  - Not intuitive for first-time user in Webview
  - Downloading into SAS not user friendly
- Not a drawback, just a consideration
  - Uses DDI Codebook standard



Nesstar Publisher v4.0.9 - cchs-2012.Nesstar (cchs 2012) - [My Projects] File Edit Documentation Variables Data Publishing Tools Help Projects: Dates of Collection Data Entry Countries 1 - VERDATE 2 - GEOGPR√3 - GEODPM14 - GEODBCH/5 - ADM\_PN/6 - ADM\_N09 7 - ADM\_N19 8 - ADM\_N19 - Geographic Coverage 1 20130606 BRITISH COL NORTH SHOLVANCOUVER NO NOT APPLIC NO 1 20 TO 24 YE MALE SINGLE/NEVE NONE CHILD 2 PAR 3 PERSONS GOOD 2 20130606 ONTARIO DIST. ALGON NOT APPLIC, NO NOT APPLIC, YES NOT APPLICA 2 80 YEARS OF FEMALE WIDOW/SEP NONE NONE UNATTACHE 1 PERSON VERY GOOD Geographic Unit IN PERSON YES 1 OR MORE 1 OR MORE PAR SPOUSE 4 PERSONS VERY GOOD 20130606 BRITISH COLOKANAGAN INTERIOR NO NOT APPLICA 3 30 TO 34 YE MALE COMMON-LA NONE 3 The Unit of Analysis 4 20130606 OUEREC RÉG. 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NOT APPLIC, NO IN PERSON YES NOT APPLICA 30 25 TO 29 YE FEMALE SINGLE/NEVE NONE NONE NONE UNATTACHE 1 PERSON VERY GOOD 31 20130606 BRITISH COLERASER SOLERASER NOT APPLIC YES NOT APPLIE 31 30 TO 34 YE MALE STINGLE INFVE NONE NONE NONE LINATTACHE 1 PERSON EXCELLENT Citation Requirement 32 20130606 BRITISH COL NORTH SHOLVANCOUVER NO NOT APPLIC, YES NOT APPLICA 32 12 TO 14 YE, FEMALE SINGLE/NEVE NONE NONE NONE CHILD 2 PAR 4 PERSONS EXCELLENT Deposit Requirement 33 20130606 ONTARIO WINDSOR-E NOT APPLIC NO IN PERSON NO NO 33 65 TO 69 YE MALE MARRIED NONE NONE NONE SPOUSE / PA 2 PERSONS | EXCELLENT Access Conditions 34 20130606 NEW BRUNS ZONE 3 NOT APPLIC, NO NOT APPLIC YES NOT APPLIC 34 65 TO 69 YE FEMALE WIDOW/SEP NONE NONE NONE UNATTACHE 1 PERSON VERY GOOD Disclaimer YUKON/NWT YUKON/NOR NOT APPLIC, NO 35 20130606 ON TELEPHO NO NO 35 25 TO 29 YE MALE COMMON-LA NONE 1 OR MORE | 1 OR MORE | PAR SPOUSE 3 PERSONS | VERY GOOD Notes 36 20130606 CENTRAL ZC NOT APPLIC, NO NOT APPLIC, YES NOT APPLICA 36 15 TO 17 YE MALE SINGLE/NEVE NONE NONE CHILD 2 PAR 3 PERSONS VERY GOOD Other Study Materials 37 SINGLE/NEVE NONE 20130606 NOVA SCOTI CAPE BRETC NOT APPLIC, NO IN PERSON YES NOT APPLIC 37 65 TO 69 YE FEMALE NONE NONE LINATTACHE 1 PERSON VERY GOOD - Datasets 38 20130606 ONTARIO HALTON REG NOT APPLIC, NO ON TELEPHO YES NOT APPLICA 38 12 TO 14 YE MALE STNGLE/NEVE NONE NONE NONE CHILD 2 PAR 3 PERSONS VERY GOOD i cchs\_2012 39 20130606 ALBERTA NORTH ZONI NOT APPLIC, NO NOT APPLIC, YES NOT ADDITE 39 40 TO 44 YE, FEMALE MADDIED NONE 1 OR MORE | 1 OR MORE | PAR SPOUSE 4 PERSONS | EXCELLENT - 🛅 File Description 40 20130606 ONTARIO NIAGARA RE NOT APPLIC, NO IN PERSON YES NOT APPLIC 40 50 TO 54 YE MALE MARRIED 1 OR MORE NONE PAR SPOUSE 3 PERSONS GOOD Key Variables & Relations WATERLOO NOT APPLIC NO 41 ONTARIO IN PERSON YES NOT APPLICA 41 25 TO 29 YE FEMALE MARRIED NONE NONE NONE SPOUSE / PA 2 PERSONS EXCELLENT Variables 20130606 NOT APPLIC, YES NOT APPLICA 42 15 TO 17 YE, FEMALE 5 OR + PERS EXCELLENT Data Entr 42 20130606 MANTTORA NORTHEN BY NOT APPLICANO SINGLE/NEVE LOR MORE NONE 1 OR MORE OTHER Cell Notes NOT APPLIC 43 65 TO 69 YE, FEMALE SPOUSE / PA 2 PERSONS GOOD 43 20130606 ALBERTA CALGARY ZO NOT APPLIC, NO NOT APPLIC, YES MARRIED NONE NONE NONE Cube Setups 44 20130606 AI BERTA CALGARY ZC NOT APPLIC, NO IN PERSON YES NOT APPLICA 44 12 TO 14 YE MALE STNGLE/NEVE NONE 1 OR MORE | 1 OR MORE | CHILD 2 PAR 4 PERSONS | VERY GOOD Variable Groups 45 1 OR MORE | 1 OR MORE | PAR SPOUSE 4 PERSONS | VERY GOOD 20130606 ALBERTA CALGARY ZC NOT APPLIC, NO NOT APPLIC, YES NOT APPLIC 45 40 TO 44 YE, FEMALE MARRIED NONE Other Materials 46 20130606 ONTARIO CITY OF TOF NOT APPLIC, NO IN PERSON YES NOT APPLICA 46 25 TO 29 YE FEMALE STNGLE/NEVE NONE OTHER 4 PERSONS GOOD External Resources DEEL DECTOR NOT APPLIED NO TNI DEDISONI VES NOT ADDITE 47 25 TO 20 VE MALE 1 OR MORE NONE 1 OD MODE DAD SDOLISE 4 DEDSONS EVOELLENT 47



- Another tool: Colectica for Excel
  - Based in the US
  - Freeware
  - Documents variables and datasets directly from within Excel
  - Can be used to produce detailed (item-level) metadata for studies already completed
  - Creates metadata and documentation for surveys
  - Saves metadata directly in the Excel file
    - When the file is shared, so is the metadata

- Colectica for Excel
  - Allows direct importing and documenting of Stata data files (.dta) and SPSS data files (.sav)
    - Will automatically import variable names, labels and code lists from the data file
    - This metadata will be added to the documentation that is already stored
- Uses DDI Lifecycle (DDI version 3.x)
  - Able to manage the entire life cycle of a study as well as manage legacy materials
  - Records audit trail through versioning

- Colectica Reader
  - Free tool
    - To view the metadata
    - No specialized software is needed
  - Generates documentation for variables and code lists
    - PDF, Word, HTML

- Other options available from Colectica
  - Colectica Portal
    - Allows you to browse, search and view the contents of the Repository on the web
    - Free
  - Colectica Repository
    - To store the metadata on a server
    - Not free

- Colectica 5 released November 2015
  - Support for DDI 3.2
  - New designer user interface
  - New survey instrument creator
  - Improved SPSS and Stata v13 support
  - New pricing options
  - http://www.colectica.com/news/Colectica-5-released

#### Next ...

- We have
  - learned the history of DDI
  - seen who is using it
  - learned how it can streamline our research
  - seen some tools that will help us use it
- Next, we will look at examples of DDI in 2 tools
  - These are to show you how important it is to have tools that will interpret it for you so you don't have to know XML

## Examples of using DDI

- Check out how Nesstar Webview works
  - Using the ODESI data repository
  - http://www.library.carleton.ca/help/odesi-how-to-use-odesi
    - Navigating the ODESI repository
    - Searching for variables
    - Finding, subsetting and downloading
    - Creating across tabulation
    - Downloading a subset
    - Downloading a full dataset

## Examples of using DDI (cont'd)

- Check out how Colectica works
  - A number of videos to watch
  - all are 2 minutes or less
    - http://www.youtube.com/user/Colectica
  - How to Open an Existing Study
  - User Interface Overview
  - Export DDI 3
  - Generate Documentation
  - •

#### Back in 15!



#### Review

- We have learned
  - the history of DDI
  - who is using it
  - how it can streamline our research
- We have seen
  - 2 tools and examples
    - Nesstar and Colectica for Excel
- Remember
  - There are 2 different lines of DDI development
    - DDI C and DDI L

#### Data Lifecycle Workflow

- Integrating Metadata and Research Data
   Management into a data lifecycle workflow
  - What metadata
  - When or where to integrate it
  - What does research data management have to do with this

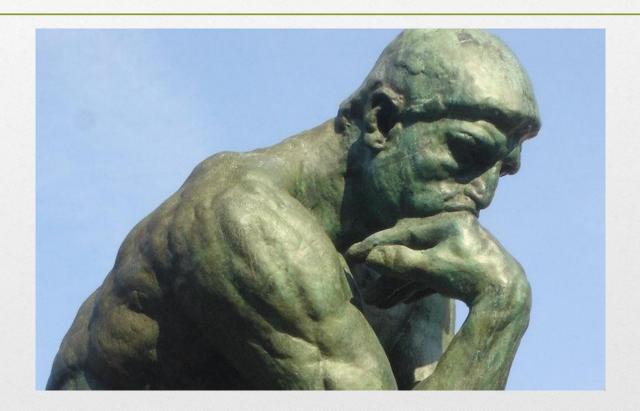
#### Data Lifecycle Workflow (cont'd)

- DDI Metadata accompanies and enables
  - Data conceptualization
  - Collection
  - Processing
  - Distribution
  - Discovery
  - Analysis
  - Repurposing
  - Archiving

#### Data Lifecycle Workflow (cont'd)

- Remember
  - More efficient and easier to capture information about all stages of the research workflow **at the time** of its occurrence rather than after the fact

#### Time to think!



#### Exercise 2

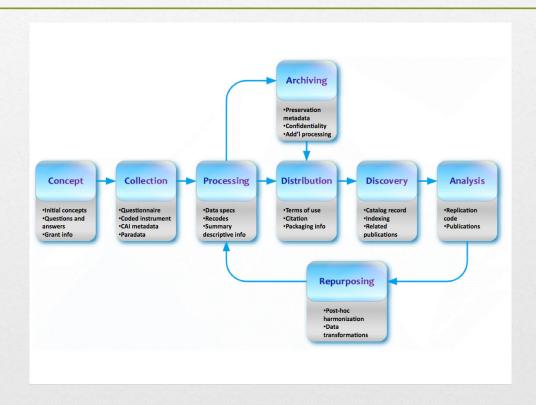
• When or where would you like to see metadata integrated into a data lifecycle workflow?

• What does research data management have to do with this?

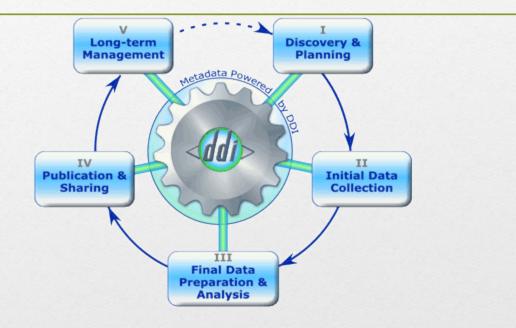
#### Best Practices

- Do they matter?
  - When
    - During data collection, coding, ingest, ...
    - At all times
  - To whom do they matter
    - You
    - Your research team
    - Future researchers

## DDI Research Lifecycle



# DDI Lifecycle 3.2



http://www.ddi-alliance.org/



## Workshop Materials

- To access materials from this workshop
  - They will be on the NADDI Conference website
  - They are also here:

http://www.library.carleton.ca/content/na-ddi-north-american-ddi-user-conference

#### References

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