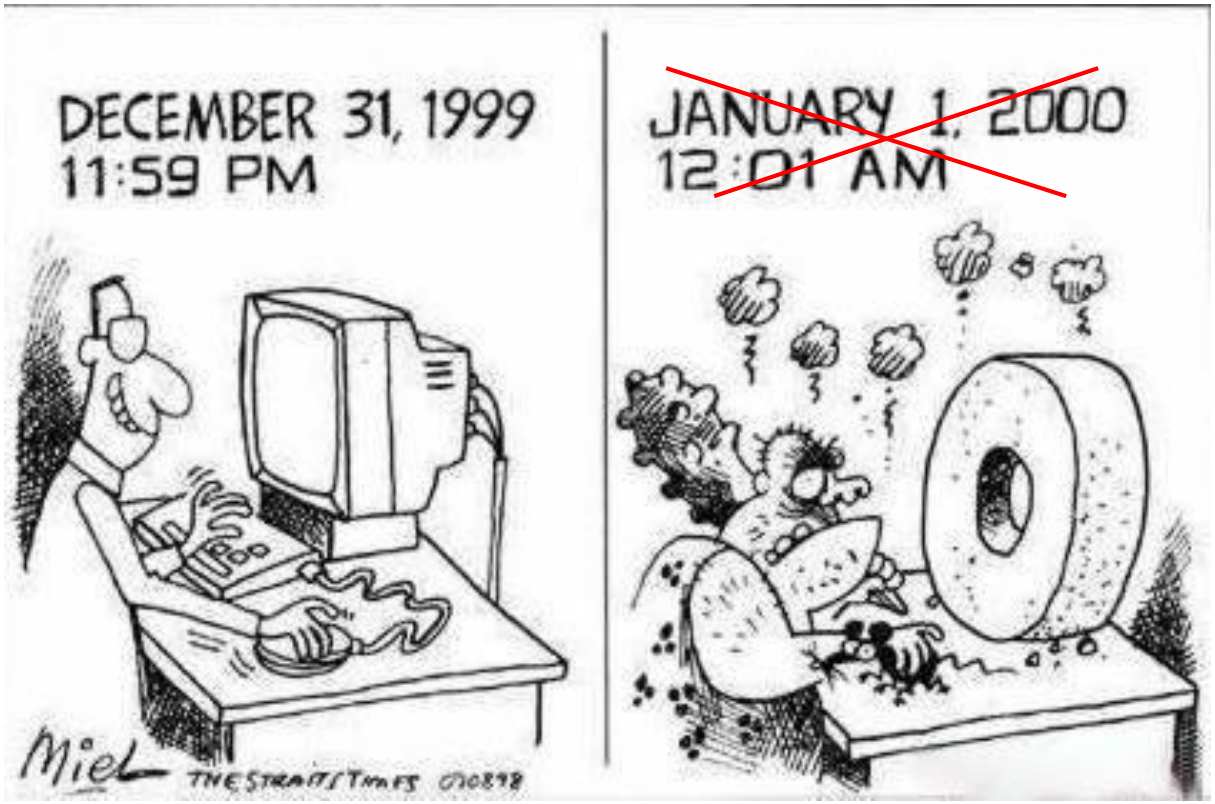
ICD-10 Transition in the NIH Collaboratory

Rachel Richesson, PhD, FACMI

Phenotypes, Data Standards, and Data Quality Core

May 9, 2016

October 1, 2015



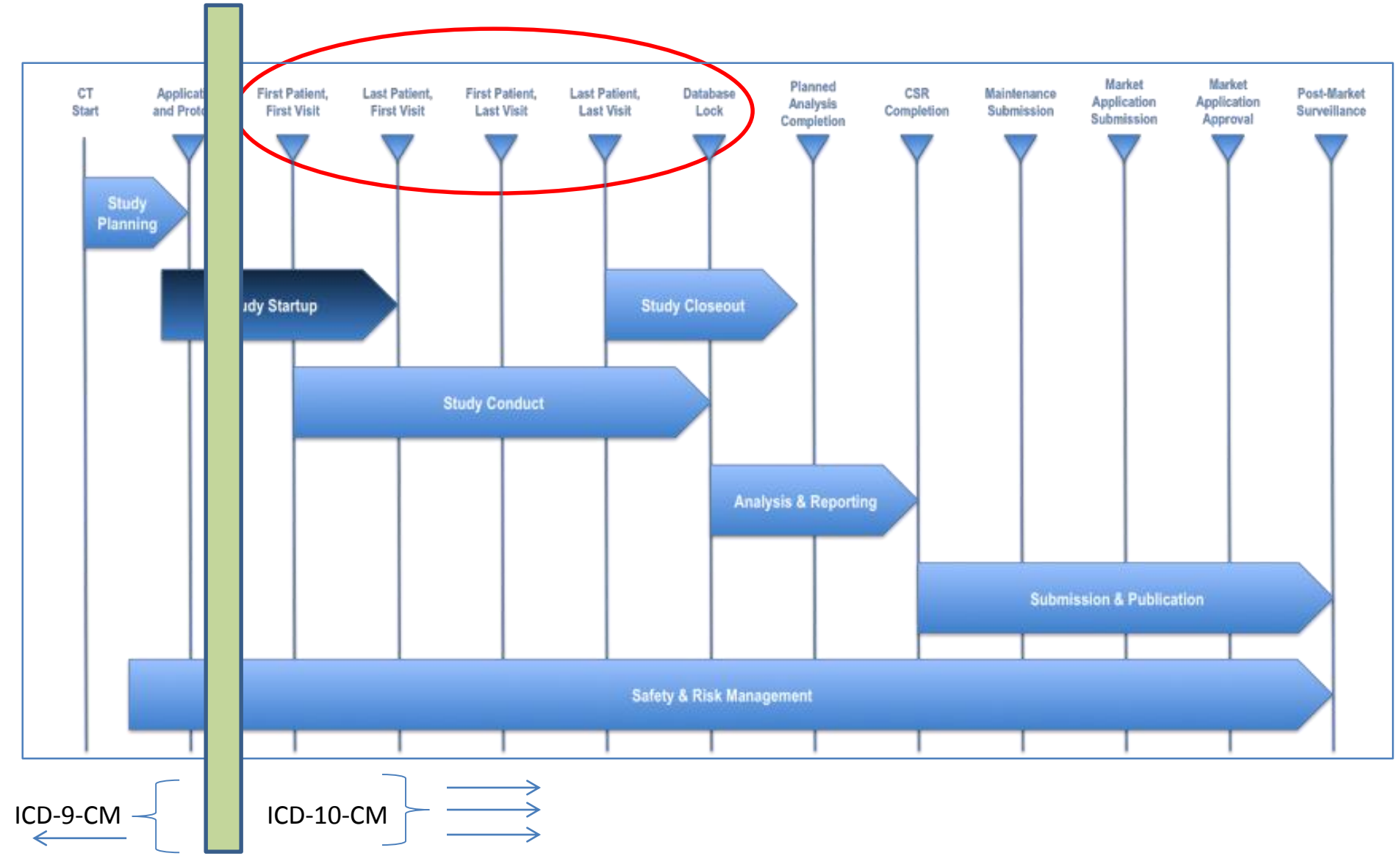
Source: http://blog.ivman.com/y2k-bug-in-retrospect/

Use of ICD Codes by Trial

	Screening/ Cohort ID / Recruitment	Randomiza-tion; Inter-vention (e.g., cues)	Adverse Event Reporting	Independent Variables or co-variates	Dependent Variables (Outcomes)
TiME				x	
SPOT	x				x
STOP CRC	x				
PROVEN					
LIRE			x	x	x
ICD-Pieces	x	x		x	x
PPACT	x		x		x
ABATE				x	
TSOS	x				

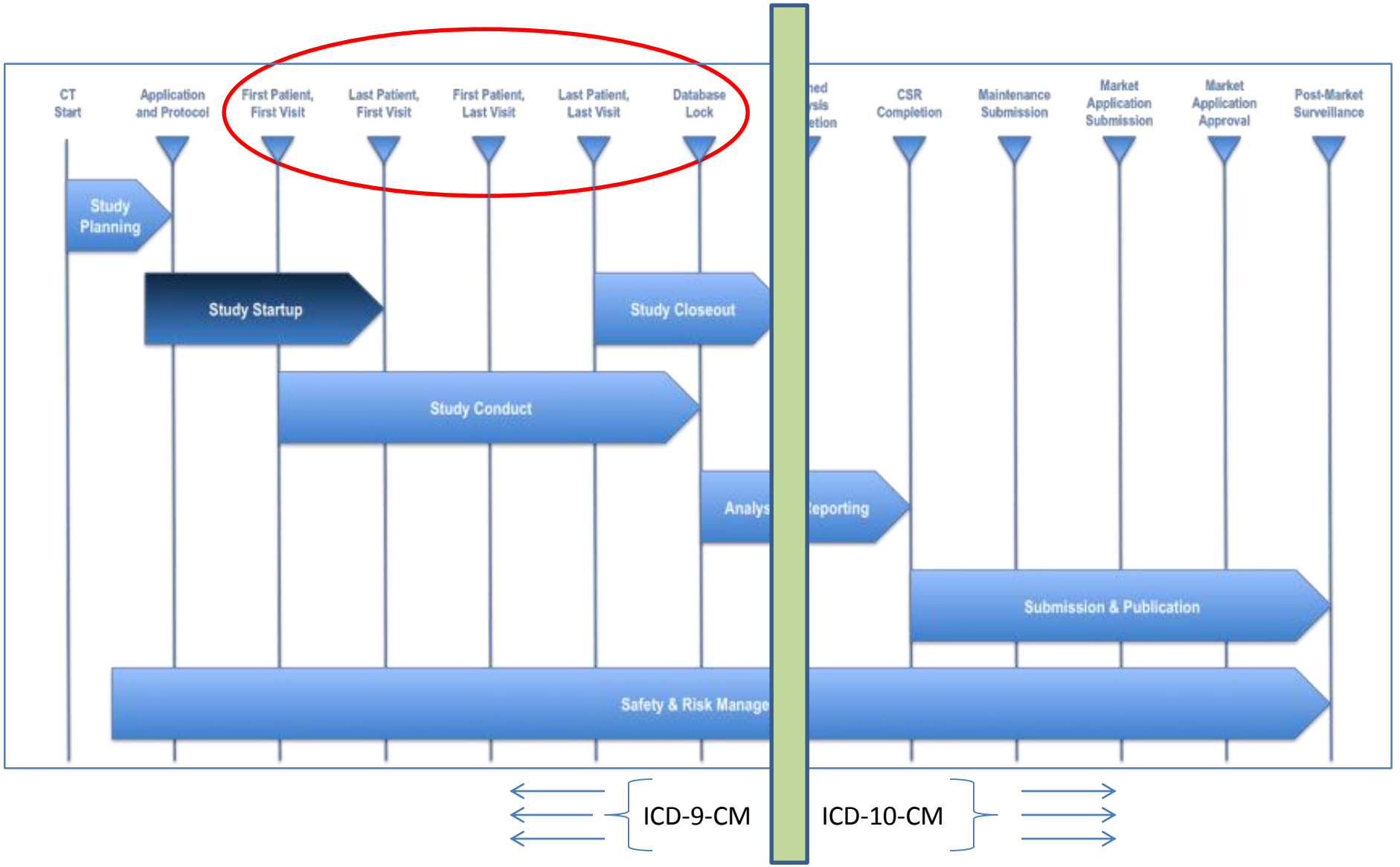
Low impact of ICD-10 transition:
PROVEN, TSOS

planning | *data collection* | *analysis & dissemination*



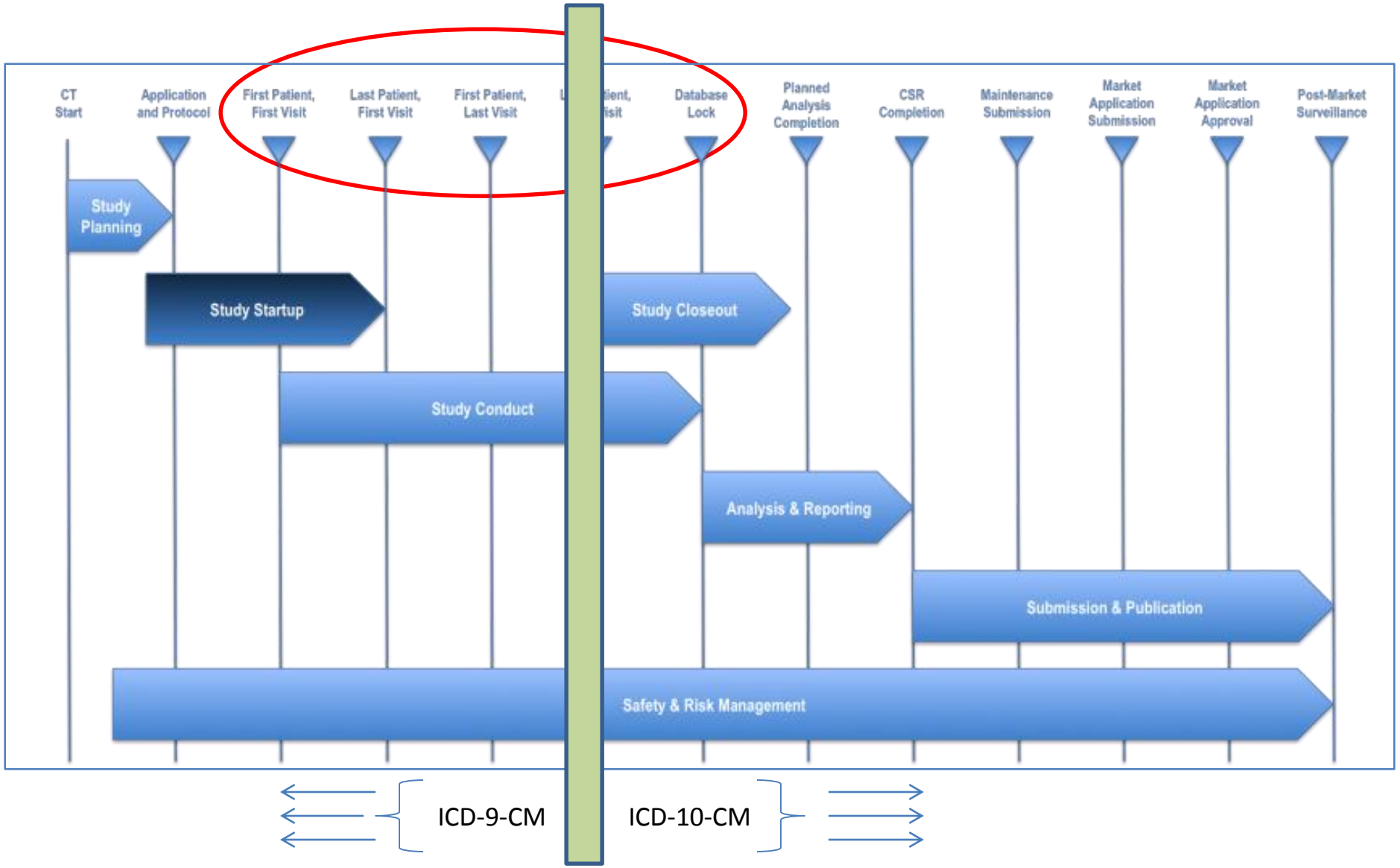
Potentially modest impact of ICD-10 transition:
ABATE

planning *data collection* *analysis & dissemination*



Potentially large impact of ICD-10 transition:
6 out of 9 demonstration projects

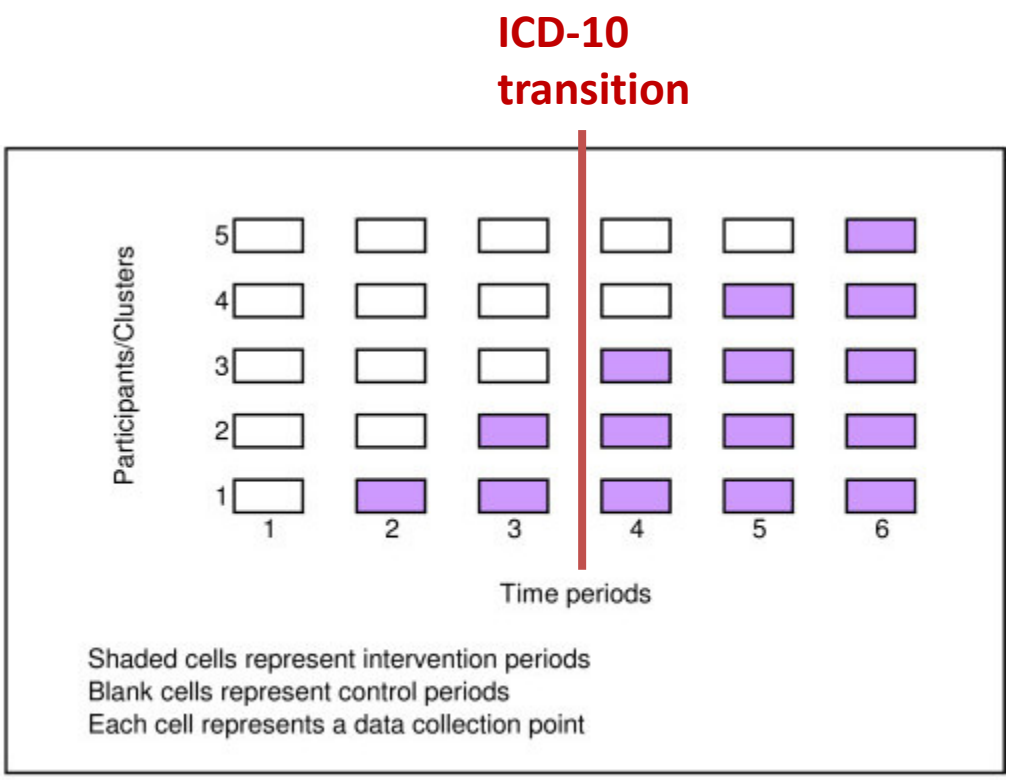
planning *data collection* *analysis & dissemination*



Project	First patient enrolled
LIRE	10/1/2013
TiME	12/1/2013
PPACT	4/1/2014
ABATE	6/1/2014
StopCRC	6/1/2014
SPOT	3/2/2015
TSOS	1/11/16
PROVEN	2/20/2016
ICD-Pieces	--

Impact Depends Upon Study Design

- Patient-level randomization → lesser impact
- Stepped-wedge → potentially large impact



- Sampling
- Intervention
- Outcome

Example: PROVEN Trial

- Study implementation after ICD-10 implementation
- Selection of sample relies on "checkbox" in the MDS if patient has Alzheimers or dementia, or CHF and/or COPD
- Relative to these gross classes of diagnoses there is little difference in coding from ICD-9 and ICD-10
- Eligibility more about level of functional impairment than the exact diagnoses of patients
- **Conclusion:** no impact

Example: STOP CRC

- Uses ICD to identify/exclude pts with prior or new colorectal cancer, renal failure, inflammatory bowel disease
- Compared to EPIC® "groupers" that cluster codes in a picklist on EHR interface.
  - Most (not all) needed codes were in the groupers. (STOP found more)
- Performed a code validation by running inclusion/exclusion program pre and post ICD-10 implementation for any noticeable differences in our numbers when using ICD9 vs. ICD10. (Found no major changes.)

- **Conclusion:** The impact was minimal due to groupers linking diagnoses to ICD-10 code.

Example: PPACT

- ICD important to one study outcome (chronic pain)
- Explicitly looking for points of discontinuity in the data during:
  - EHR pick list transition
  - official switch over to ICD-10-CM

- Not yet seeing a difference in diagnoses rates since Oct 1.
- Early reports are simple counts but the overall counts are stable.
- Seeing variability BETWEEN sites (who have different approaches to mappings) that warrants further investigation.
  - Some project defined ICD coding mappings that look to be off for certain sub-sets of codes.

- **Conclusion:** The impact appears negligible, but statistical and clinical validation still needed and ongoing.

Example: LIRE

- ICD important for utilization data (outcome)
  - Used in algorithms determining spine-relatedness of visits and procedures
  - Co-morbidity covariates in analyses

- All utilization data captured via the EHR
- Have data both pre- and post- transition

- **Conclusion:** Certain impact on the trial. Details pending.

  - Discussing ICD-10 transition approach & experience with each site
  - Analyses and quality assessment planned for future

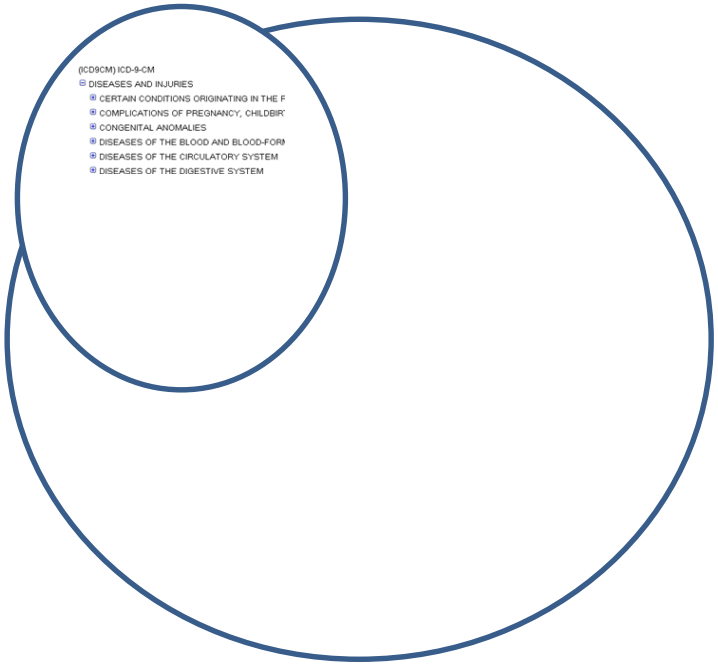
Example: SPOT

- ICD-10 codes used to define outcome (suicide attempt)
- It is critical that the groups of codes use to classify "suicide attempt") before and after October 1, 2015 represent the "same" populations and events
- Extensive local validation by comparing #'s of patients with likely attempts before and after

- **Conclusion**: No major impact but validation was necessary. Found increased specificity of coding with ICD-10 but no variation/change in providers coding (injuries suggestive of) suicide attempt.

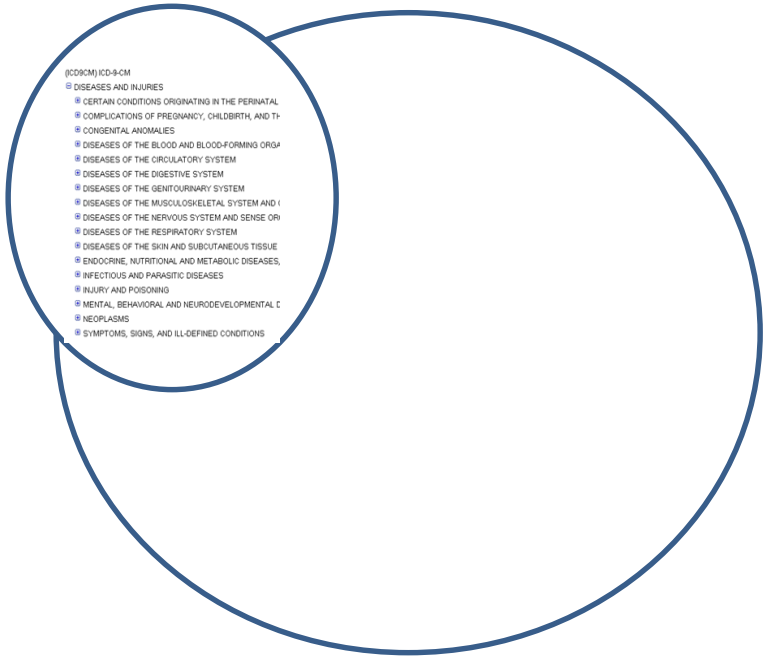
It is Really About Equivalence

Phenotype definition (ICD-9-CM)



"true" population with condition

Phenotype definition (ICD-10-CM)



"true" population with condition

CMS Approach

- **Examine "DRG shift"**
  - **When the MS-DRG from a record coded in ICD-9 is different from the MS-DRG from the same record coded in ICD-10**
- 10 million FY 2013 MedPAR records
- 1.07%with a DRG shift
  - 0.41% had DRG shift to higher paying DRG
  - 0.66%had DRG shift to lower paying DRG
- Statistically zero

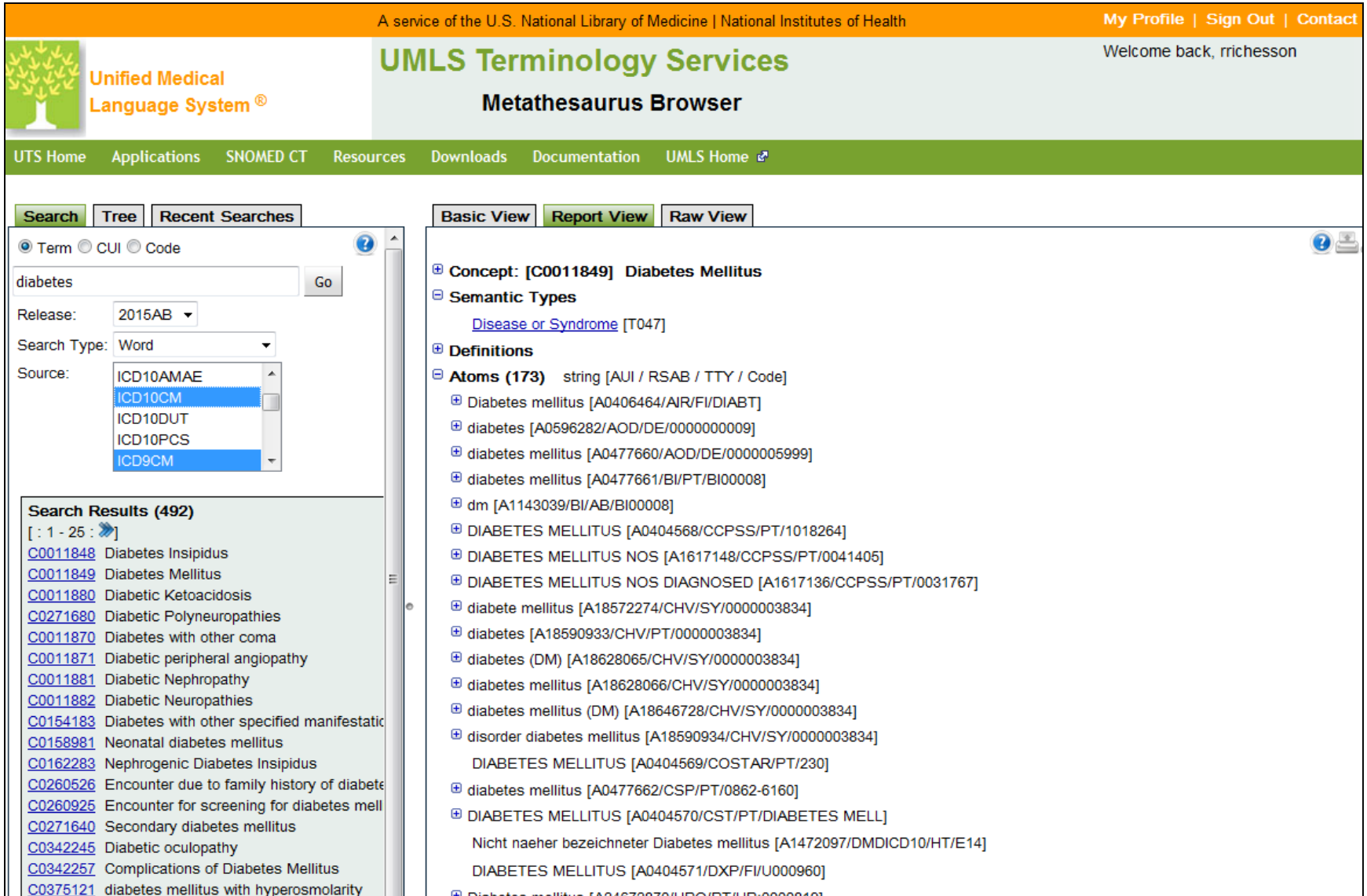
Estimating the Impact of the Transition to ICD-10 on Medicare Inpatient Hospital Payments

ICD-10 Coordination and Maintenance Committee

March 18, 2015

https://www.cms.gov/Medicare/Coding/ICD9ProviderDiagnosticCodes/Downloads/2015-03-18-Impact-ICD10-Transition.pdf

Triangulation of Code Sets to Define Conditions



Value Set Authority Center
U.S. National Library of Medicine

Welcome | Search Value Sets | Download

Apply Filters | Clear Filters

Narrow search results by selecting from pull-down menus below:

CMS eMeasure (NQF Number)
Select

Quality Data Model Category
Select

Steward
Select

Meaningful Use Measures
Select

Code System
Select

Search the NLM Value Set Repository

Query: Enter value set id, codes, words... Searc

Search Results | Value Set Details

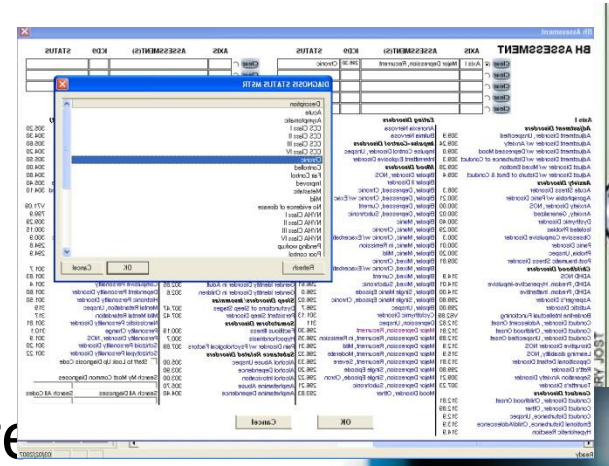
Matched Value Sets

Download | View | Toggle | Clear | Page 1 of 1 | 20

Name	Type	Code System	Steward	
diabetes				
Diabetes	Grouping	ICD10CM ICD9CM SNOMEDCT	NCQA	2.16.8
Diabetes	Extensional	ICD10CM	NCQA	2.16.8
Diabetes	Extensional	ICD9CM	NCQA	2.16.8
Diabetes	Extensional	SNOMEDCT	NCQA	2.16.8
Diabetes Medical Supplies (insulin syringes only)	Extensional	RXNORM	VU eMERGE	2.16.8
Diabetes Visit	Grouping	CPT SNOMEDCT	NCQA	2.16.8
Gestational Diabetes	Extensional	SNOMEDCT	NCQA	2.16.8
Gestational Diabetes	Grouping	ICD10CM SNOMEDCT	NCQA	2.16.8
Gestational Diabetes	Extensional	ICD10CM	NCQA	2.16.8
T1DM Medications. (Type 1 Diabetes Mellitus)	Extensional	RXNORM	VU eMERGE	2.16.8
T2DM Medications (Type 2 Diabetes Mellitus)	Extensional	RXNORM	VU eMERGE	2.16.8

Provider Coding Behavior

- Influenced by:
  - Interface
  - Business rules
  - Organizational culture



- Important questions:
  - Can we measure it?
  - Does it vary across sites?
  - Does it matter?

Recommendations (from previous Grand Rounds)

- Consider the phenotype definition as a “unit” or value set, and compare semantic equivalence of the set
- Consider different mapping approaches for automatic translation
- Be prepared to report methods for mapping
- Be prepared to validate locally
- Implement data quality assessment recommendations

NIH Collaboratory *Rethinking Clinical Trials™*
Health Care Systems Research Collaboratory

Assessing Data Quality for Healthcare Systems Data Used in Clinical Research (Version 1.0)

An NIH Health Care Systems Research Collaboratory Phenotypes, Data Standards, and Data Quality Core White Paper

Meredith N. Zozus, PhD[1]; W. Ed Hammond, PhD[1]; Beverly B. Green, MD, MPH[2]; Michael G. Kahn, MD, PhD[3]; Rachel L. Richesson, PhD, MPH[4]; Shelley A. Rusincovitch[5]; Gregory E. Simon, MD, MPH[2]; Michelle M. Smerek[5]

[1]Duke Translational Medicine Institute, Duke University School of Medicine, Durham, North Carolina; [2]Group Health Research Institute, Seattle, Washington; [3]University of Colorado, Denver, Denver, Colorado; [4]Duke University School of Nursing, Durham, North Carolina; [5]Duke Clinical Research Institute, Duke University School of Medicine, Durham, North Carolina

This work was supported by a cooperative agreement (U54 AT007748) from the NIH Common Fund for the NIH Health Care Systems Research Collaboratory. The views presented here are solely the responsibility of the authors and do not necessarily represent the official views of the National Institutes of Health.

Address for correspondence:
Meredith N. Zozus, PhD
Associate Director for Clinical Research Informatics
Duke Translational Medicine Institute
DUMC Box 3850
Durham, NC 27710
Tel: (919) 668-8339
meredith.nahm@dm.duke.edu

- Completeness
- Accuracy
- Consistency

Conclusion

- Some Collaboratory Trials will be severely impacted by ICD-10 transition, but most are not
- Impact varies by:
  - Study design
  - Reliance on ICD dx codes for sampling or outcome
  - Whether data collection includes the ICD-10 implementation date (October 1, 2015)
  - Existence of EHR-based “grouper” terms before study start
- Trials with potentially moderate – high impact need to formally assess this (Data Quality recs are helpful)

Members of the Phenotype Core of the NIH Collaboratory:

Alan Bauck, Kaiser Permanente

Denise Cifelli, U. Penn.

John Dickerson, Kaiser Permanente Northwest

Pedro Gozalo, , Brown Univ. School of Public Health & Providence VA Health Services Research Service

Bev Green, Group Health

Chris Helker, U. Penn

Beverly Kahn, Suffolk Univ., Boston

Michael Kahn, Children's Hospital of Colorado

Reesa Laws, Kaiser Permanente

Melissa Leventhal, University of Colorado Denver

John Lynch, Connecticut Institute for Primary Care Innovation

Rosemary Madigan, U. Penn

Vincent Mor, Brown Univ. School of Public Health & Providence VA Health Services Research Service

George "Holt" Oliver, Parkland Health and Hospital System (UT Southwestern)

Jon Puro, OCHIN

Alee Rowley, Kaiser Permanente Center For Health Research

Jerry Sheehan, National Library of Medicine

Greg Simon, Group Health

Kari Stephens, U. of Washington

Erik Van Eaton, U. of Washington

Other thanks: **Michelle Smerek, W. Ed Hammond, Tammy Reece, Jacqueline Bagwell**, Duke Univ.; **Kin Wah Fung,** National Library of Medicine