H·CUP

HEALTHCARE COST AND UTILIZATION PROJECT

Exploring ICD-10 Data
What Impact on Trends Analysis?

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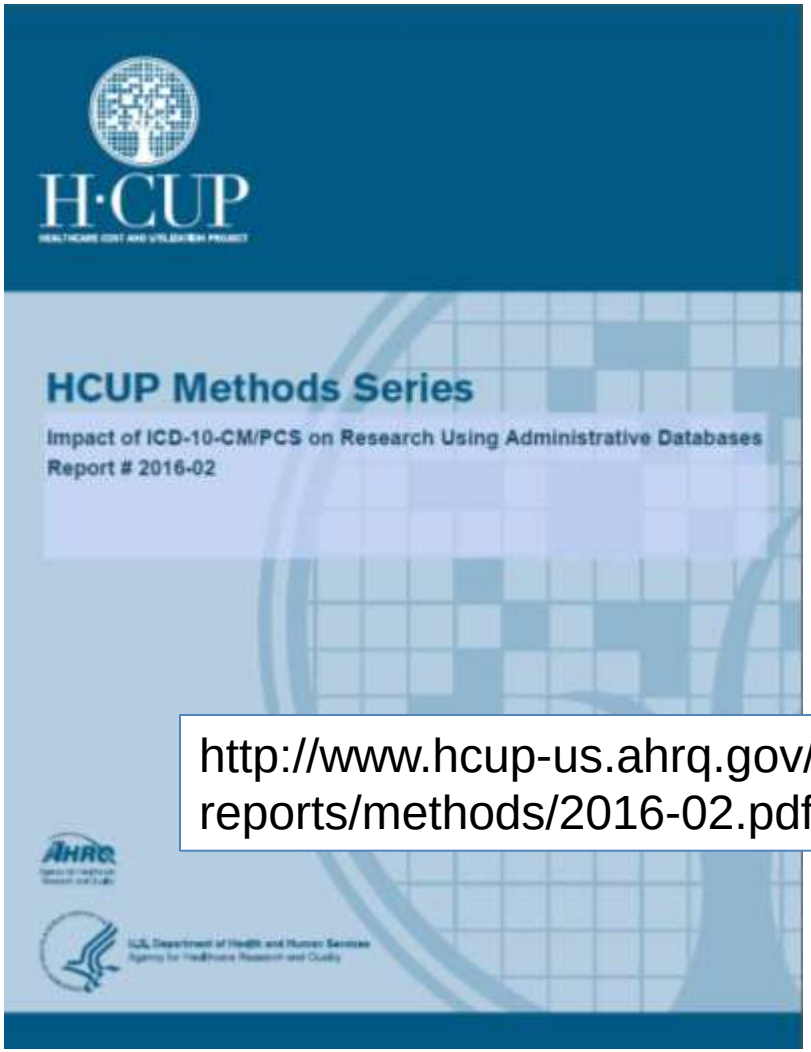
Purpose of these Analyses

- Examine the potential for doing trends analysis covering the ICD transition period
- Understand shifts in diagnosis and procedure codes
- Compare ICD-9 period to ICD-10 period: how discharges are assigned to
  - Service lines
  - Diagnosis chapters
  - Procedure chapters
  - CCS (groupings of ICD codes)
  - MS-DRGs

Results Reported from Three Projects

- ICD-10 Methods Report
  - Literature review and review of HCUP tools
- Dually Coded Data Analysis
  - Based on a small dataset from Washington state
- HCUP ICD-10 Data
  - Based on quarterly data from 12 states (submitting data for Oct-Dec 2015)

Project #1—ICD-10 Methods Report: Impact on Research Using Admin Data



http://www.hcup-us.ahrq.gov/reports/methods/2016-02.pdf

- Report summarizes some of the effects of transition to ICD-10
  - Compares ICD-9 and ICD-10
  - Changes in coding rules
  - Coding differences
  - Translation tools
  - GEMS
  - Trends
  - Resources for researchers

Project #1—ICD-10 Methods Report: Diagnosis Coding

- More combination codes (ICD-10 contains more information in a single code)
  - DM with complications + manifestations = one code in ICD-10 rather than multiple codes in ICD-9
- No consistency in the meaning of alpha characters
  - First character D = benign neoplasm and blood disorders
  - Alpha characters are in the middle of ranges
    - C43, C4A, C44, C45 (Neoplasms)
  - Final character is more consistent but not entirely
    - A = initial encounter (S46) or A=initial counter for closed fracture (S82)

Project #1—ICD-10 Methods Report: Procedure Coding

- Uses standard PCS terminology to reduce ambiguity
  - ► But does not use medical record terms, e.g., PTCA
- Each character has a different meaning; differs by section of ICD-10
  - ► 3rd character for breast biopsy = root operation (excision)
  - ► 3rd character for radiation Rx = modality (brachytherapy)
- Diagnosis information is not included in PCS
  - ❑ ICD-9: *86.22 excision of wound, infection, burn* translates to
  - ❑ ICD-10: *OHB excision skin and breast* or *OJB excision subcutaneous tissue* (no mention of condition)
  - ► Cannot use PCS to identify patient cohorts

Project #1—ICD-10 Methods Report: Summary of Boyd et al.

Relationship between ICD-9 and ICD-10 codes	Description	Percent of codes
Identity	One ICD-9 code matches to one ICD-10 code	28%
Class-to-subclass	One ICD-9 code gets mapped to multiple ICD-10 codes	22%
Subclass-to-class	Multiple ICD-9 code get mapped to a single ICD-10 code	12%
Convoluted	Complex mapping where multiple similar ICD-9 codes get mapped to multiple ICD-10 codes but in a complex way	36%
No mapping	What it sounds like	1%

Project #1—ICD-10 Methods Report: Use DX and PR Groupings for Trends Analysis?

- Clinical Classification Software maps ICD into groups
  - We hoped that using broad categories would ease mapping across ICD-9 and ICD-10
- However … Some CCS procedure categories are not populated with ICD-10 codes:
  - 57 Creation/removal fistula/cannula for dialysis
  - 68 Injection/ligation esophageal varices
  - 140 Repair of OB laceration
  - 143 Bunionectomy
  - 151 Excision semilunar cartilage of knee
  - 169 Debridement wound/burn/infection
  - 206 Microscopic exam (bacterial smear, culture)

Project #2—
Analysis of Dually Coded Data

- Had difficulty finding a dually coded dataset
- Most analyses rely on coding conversion based on GEMs
  - Rather than coders assigning ICD-9 and ICD-10 codes to the same records
- Wanted to see impact of ICD-10 coding in practice
- Dually coded dataset from Washington state
  - 2,665 inpatient discharge records that were dually coded using both ICD-9-CM and ICD-10-CM/PCS
  - 8 hospitals submitted data

Project #2— Analysis of Dually Coded Data: CCS Coding in the Same Records

Comparing ICD-9 and ICD-10 codes in the same records	Frequency	Overall %	% with coding agreement
Diagnoses			
DX code assigned in one system but not the other	94	9.3	
CCS assignment was the same	870	85.9	94.7
Different CCS coded	49	4.8	5.3
Procedures			
PR code assigned in one system but not the other	145	12.5	
CCS assignment was the same	903	77.6	88.7
Different CCS coded	115	9.9	11.3

Suggests potential issues with process used by coders

Excludes potential coding issues

Project #2— Analysis of Dually Coded Data: Causes of Different CCS Category Assignment

- Two major causes of differences between the CCS assignment in the ICD-9-CM and ICD-10-CM/PCS codes
  - A code was recorded in I-9 and not in I-10, or vice versa
  - Changes in coding based on differences in the coding systems

Project #2— Analysis of Dually Coded Data: Differences in Coding Systems

- In some cases there is increased specificity in codes
  - But in some cases less specificity
- More codes may be required
  - Especially for procedures: multiple codes per operation
- Some ICD-10 codes have more detail (replace multiple ICD-9 codes) so fewer codes on record
- Coding rules have changed
  - For example, may be more difficult to identify rehab cases
- Some conditions reclassified to different categories
  - Sarcoidosis was Chap. 1 infection, now Chap. 3 blood/ immunity

Project #3—Analysis of ICD-10 HCUP Data: Methods

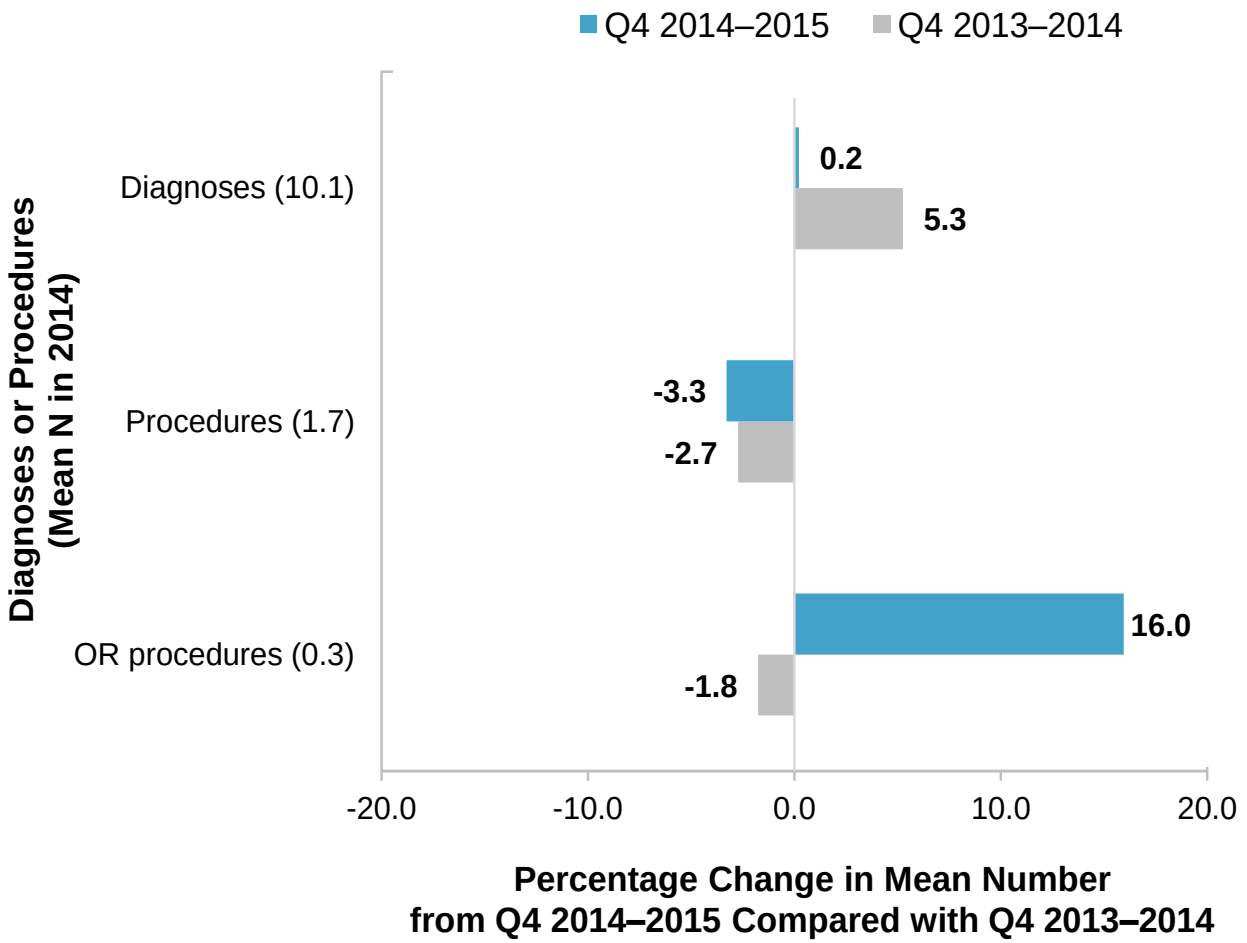
- Data from 12 States with ICD-10 data (Oct-Dec 2015)
- Outcomes:
  - Number of diagnoses, procedures, and OR procedures
  - Service lines (hierarchical, mutually exclusive):
    - Maternal/neonatal
    - Mental health/substance abuse disorders
    - Injury
    - Surgical
    - Medical
  - All-listed procedures grouped by PR chapter
  - 1st-listed and 2ndary diagnoses grouped by DX chapter
  - MS-DRGs

Project #3— Analysis of ICD-10 HCUP Data: Methods (cont'd)

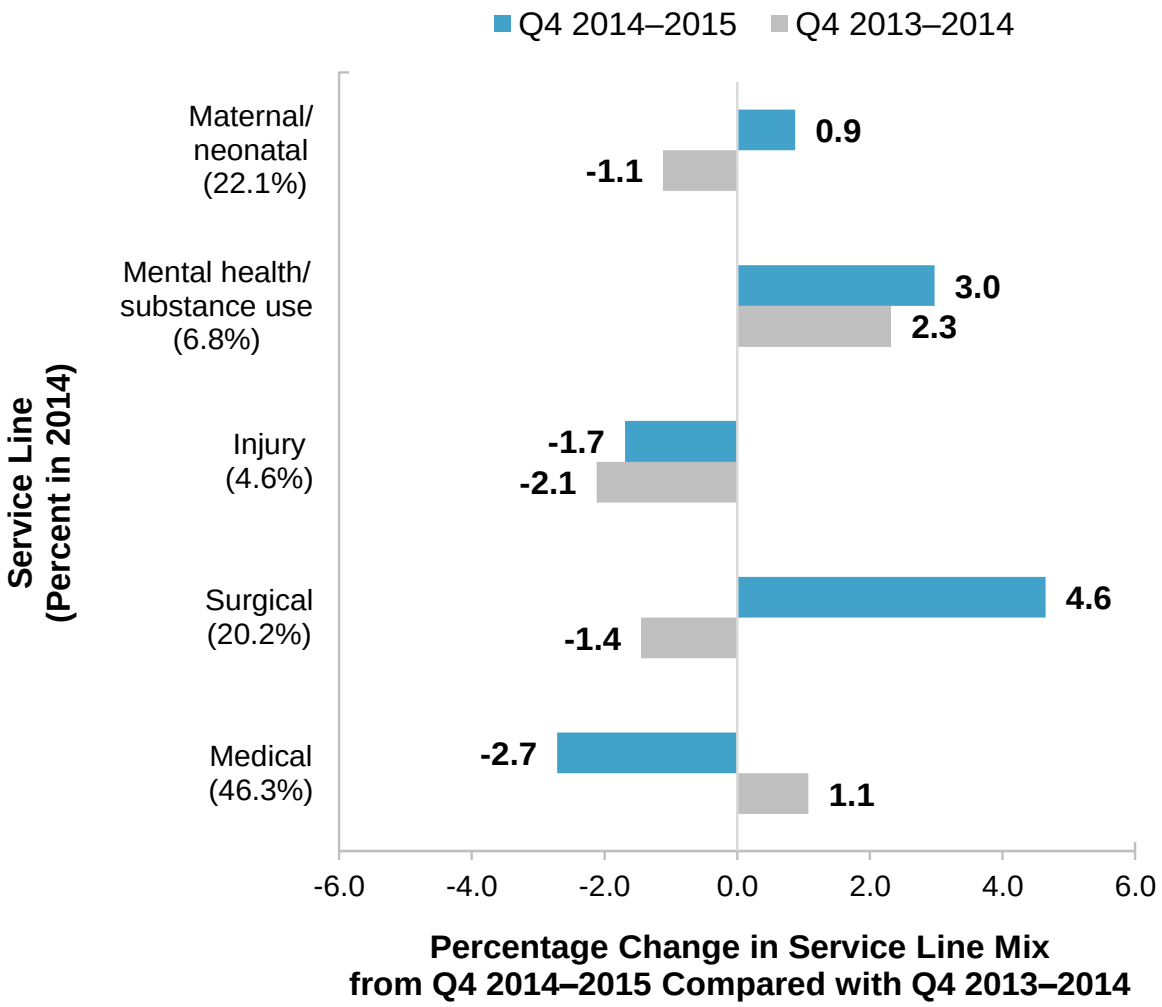
- Examined quarter 4 of 2013, 2014 and 2015
- Calculated change during two periods:
  - Percentage change from 2013–2014
  - Percentage change from 2014–2015
- For all States (combined—pooled together)
- Frequency distributions by hospital
- Preliminary findings based on only one quarter of ICD-10 in the field

Project #3— Analysis of ICD-10 HCUP Data: Number of Diagnoses & Procedures

- 2013-2014: 5% increase in number of DX per record
- 2014-2015: no change
- No real difference in number of PR per record between time periods (*expected increase*)
- 2014-2015: record level analysis—16% increase in number of records with at least one OR procedure coded

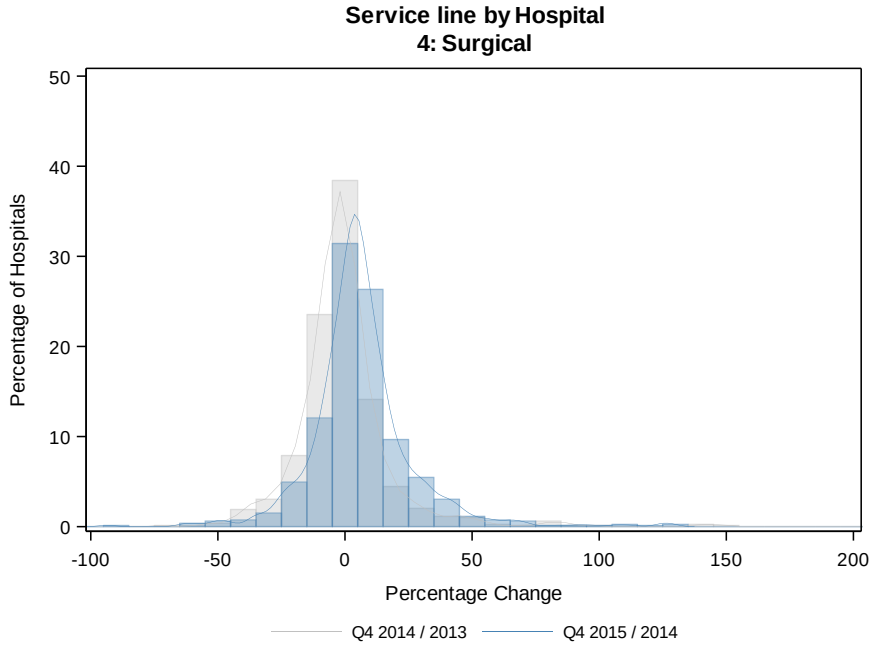


Project #3— Analysis of ICD-10 HCUP Data: Service Lines – Overall



- Small change in maternal/neonatal records
- Similar pattern for MHSU and injury
- Surgical records ↑ by 4.6% from 2014-2015
- Records showing only a medical problem ↓ by 2.7%

Project #3—Analysis of ICD-10 HCUP Data: Service Lines – by Hospital

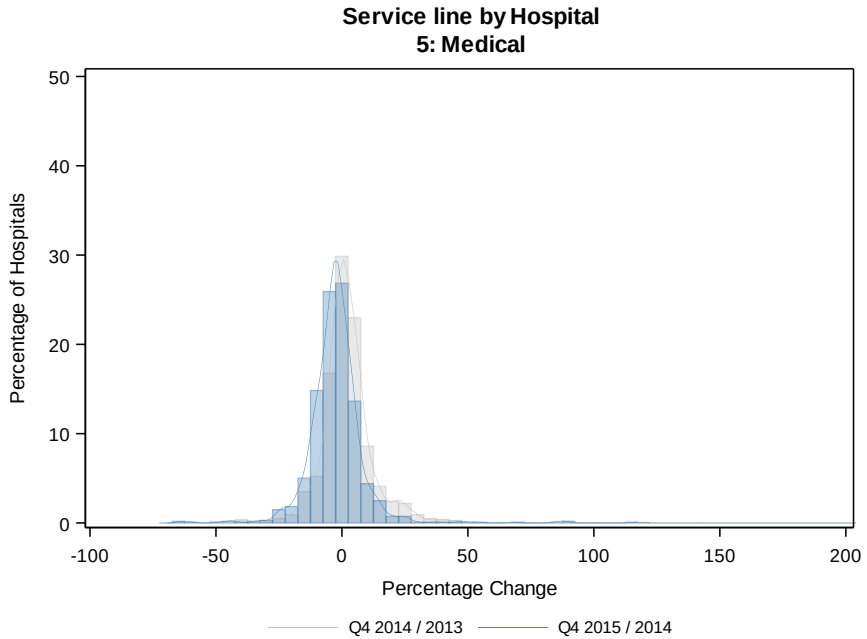


Surgery

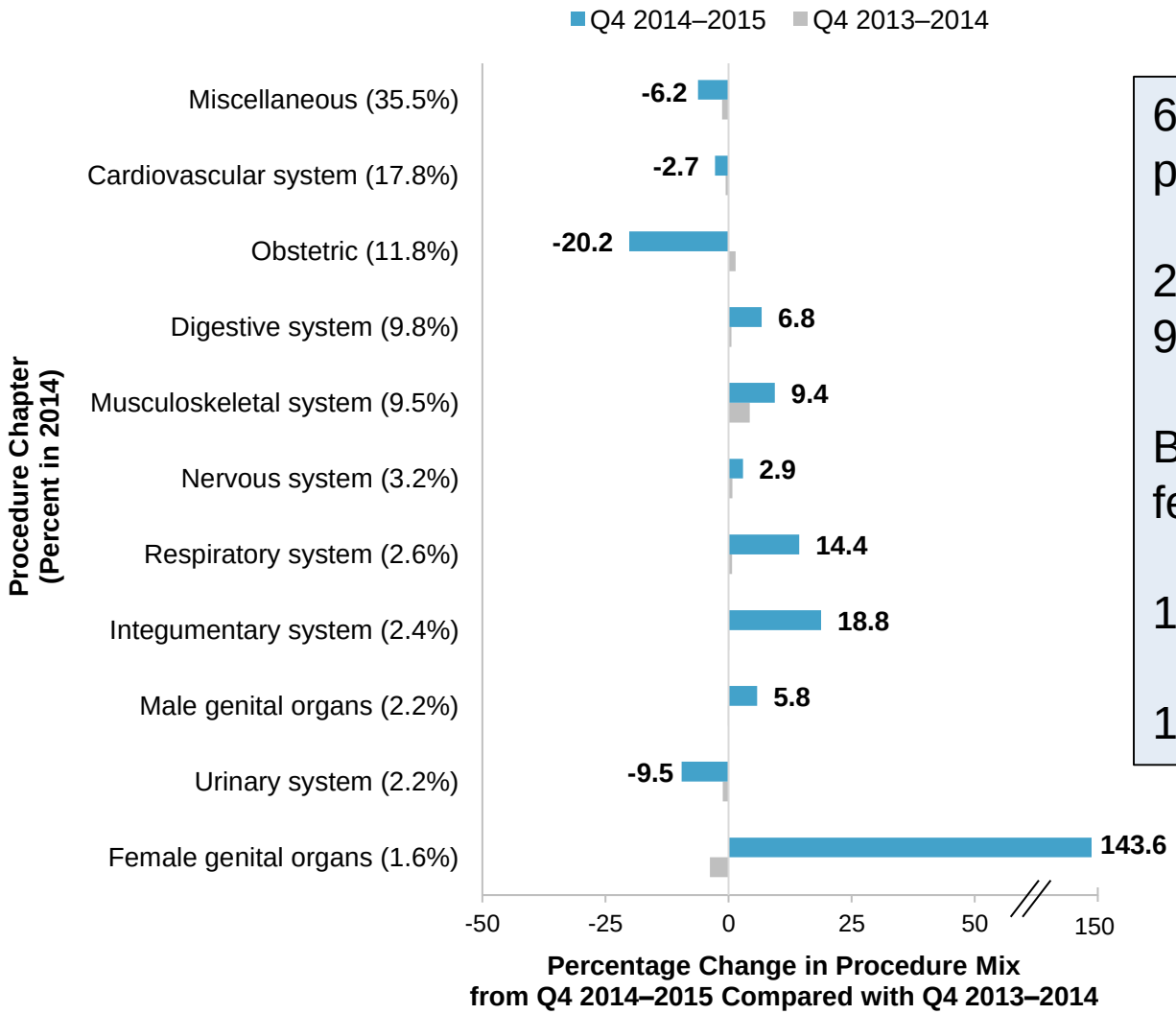
- Blue line to right = ↑ in number of surgical records from 2014-2015 compared to 2013-2014
- Blue line wider = less concordance between 2014-2015

Medical

- Less difference



Project #3—Analysis of ICD-10 HCUP Data: All-listed Procedures – Body System



6.2% ↓ in miscellaneous procedures

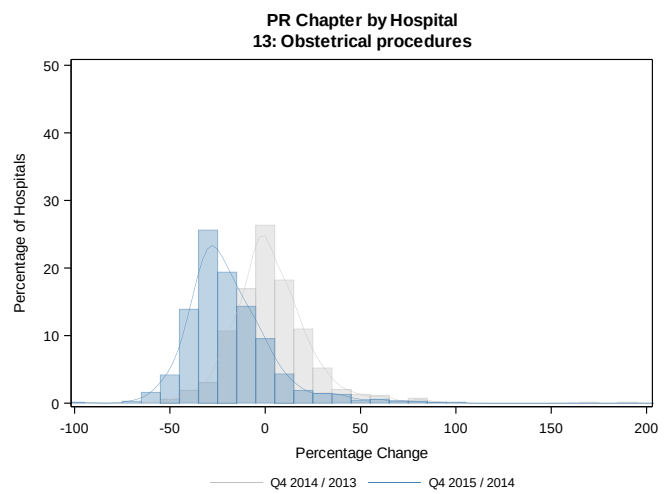
20.2% ↓ in OB procedures
9.5% ↓ in urinary

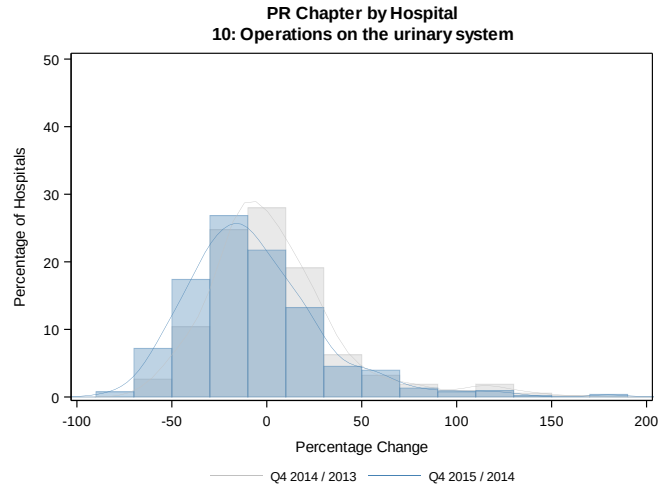
Balanced by large ↑ in female genital procedures

18.8% ↑ in skin

14.4% ↑ in respiratory

Project #3—Analysis of ICD-10 HCUP Data: All-listed Procedures – by Hospital

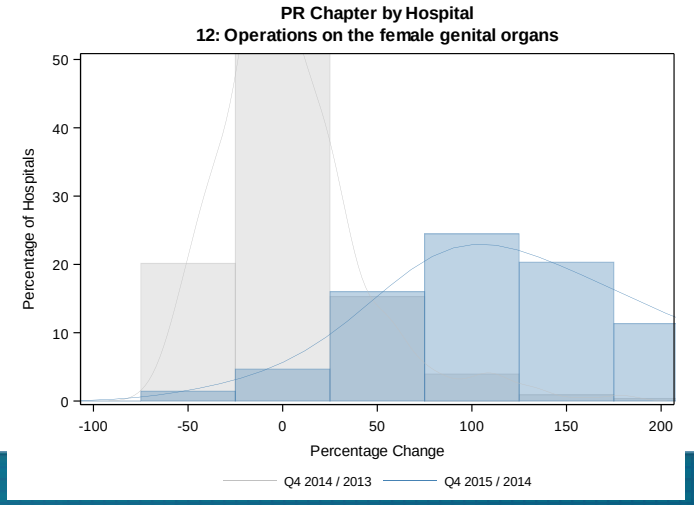




Downward shift in OB procedures

Not quite as large a shift in urinary procedures

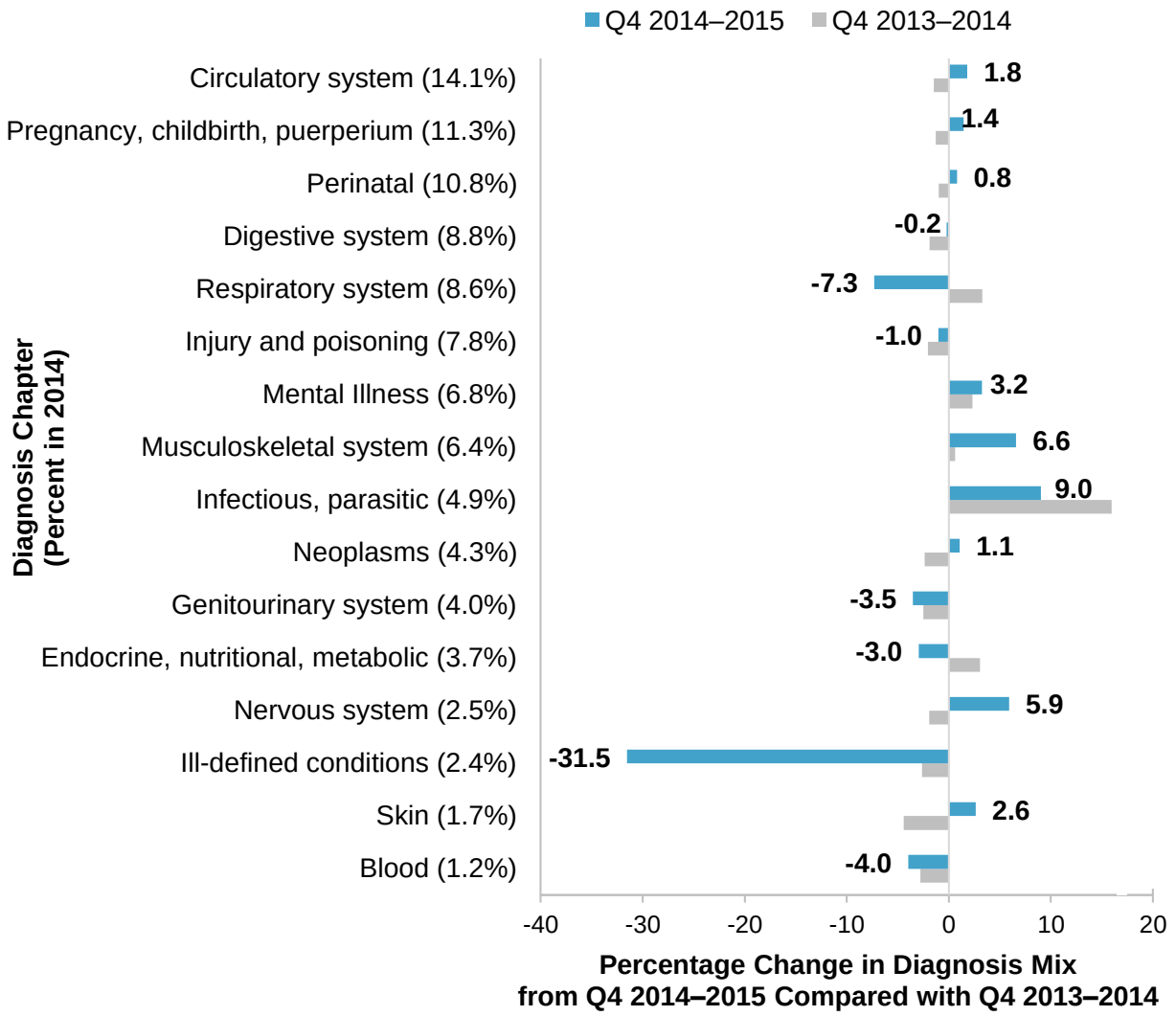
Large increase in female genital procedures with more variability across hospitals (*no diagnostic info in procedure codes*)



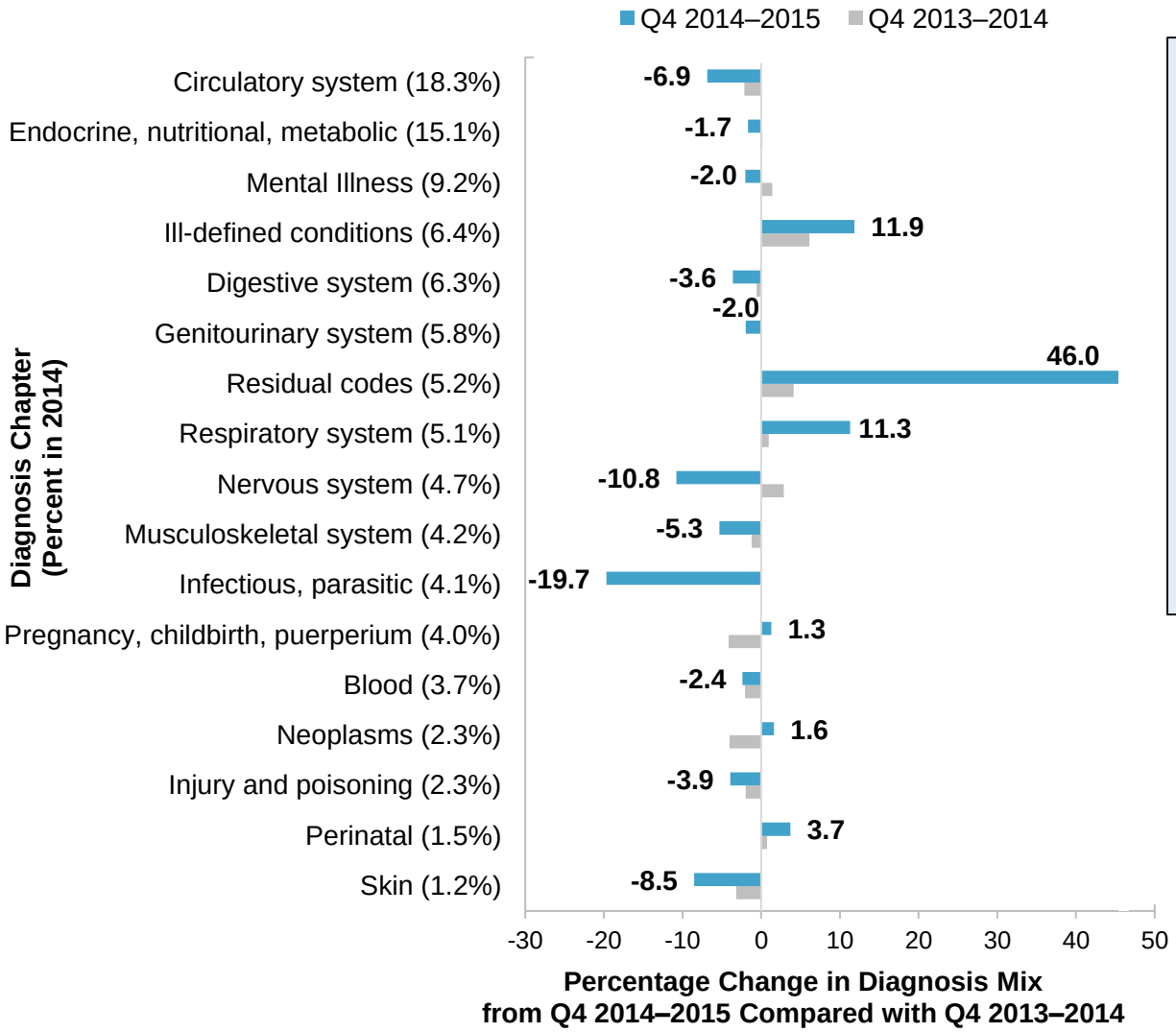
Project #3—Analysis of ICD-10 HCUP Data: Principal Diagnosis – by ICD Chapter

Decreases in:
- Respiratory system
- Ill-defined conditions

Increases in:
- Musculoskeletal
- Infectious (but less than 2013-2014)
- Nervous



Project #3—Analysis of ICD-10 HCUP Data: Secondary Diagnoses – by ICD Chapter



Decreases in:

- Infectious (19.7%)
- Nervous (10.8%)
- Skin (8.5%)
- Circulatory (6.9%)

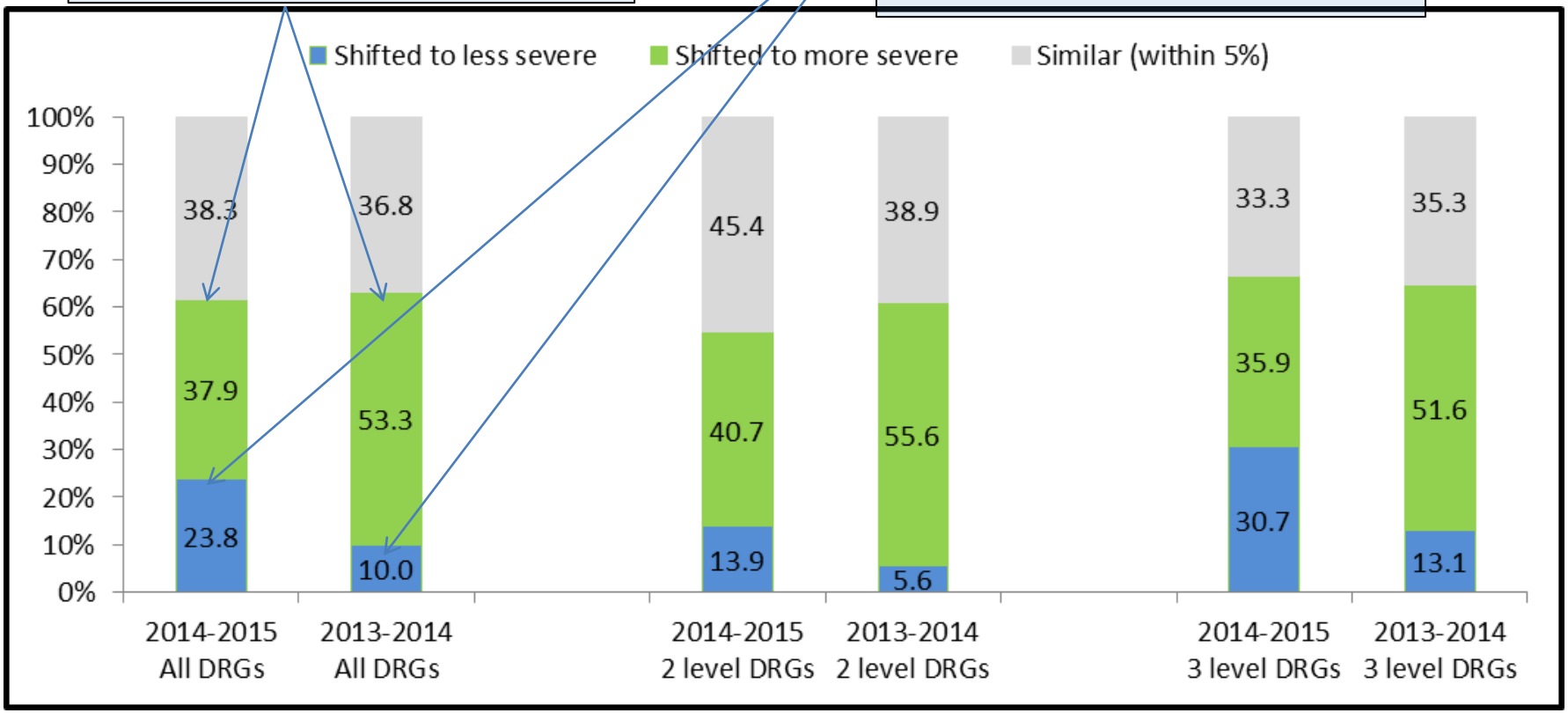
Increases in:

- Ill-defined conditions
- Residual
- Respiratory

Project #3—Analysis of ICD-10 HCUP Data: MS-DRGs

% of cases assigned to **more severe** DRGs
2013-2014: 53%
2014-2015: 38%

% of cases assigned to **less severe** DRGs
2013-2014: 10%
2014-2015: 24%

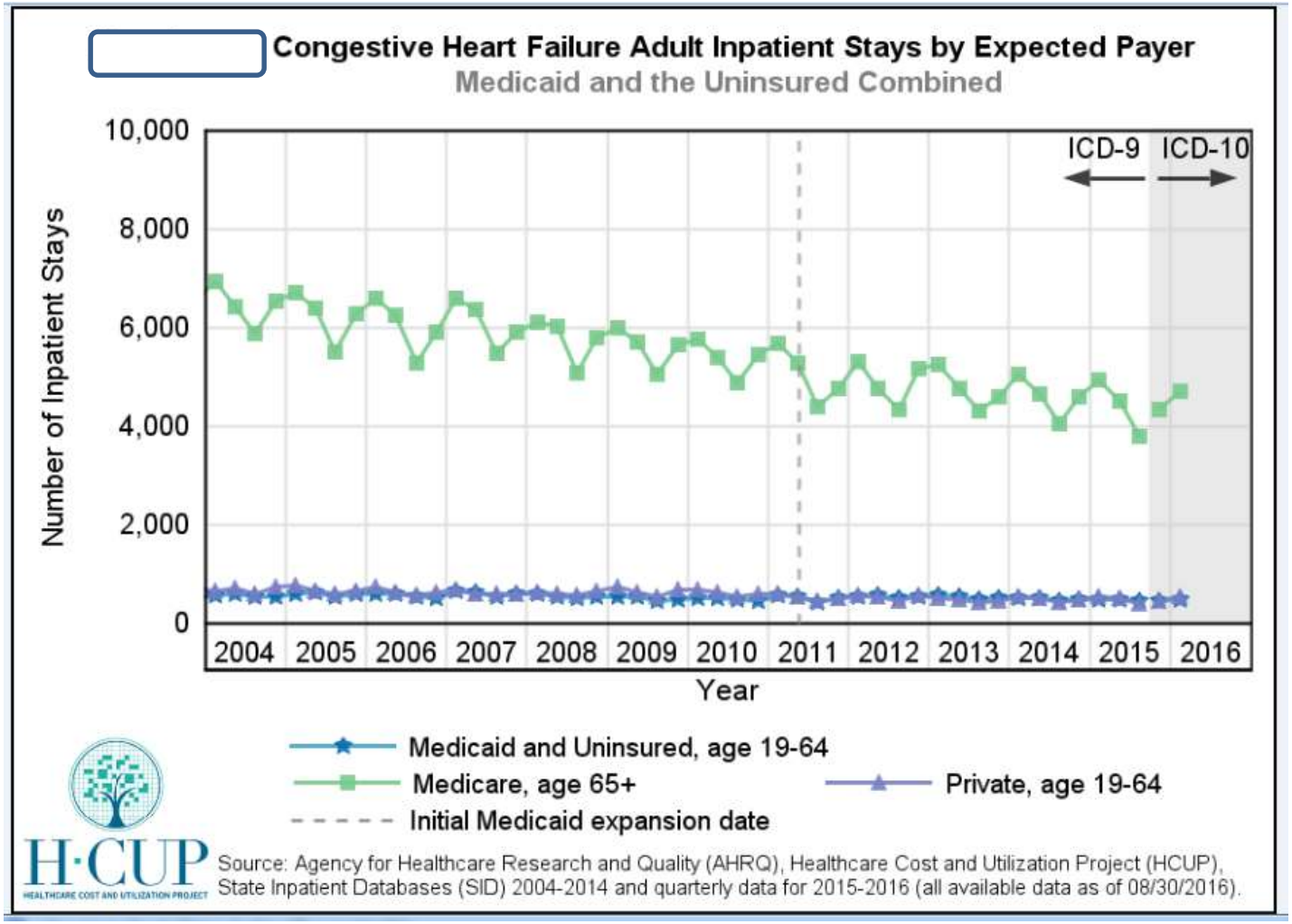


Project #3—Analysis of ICD-10 HCUP Data: Conclusions

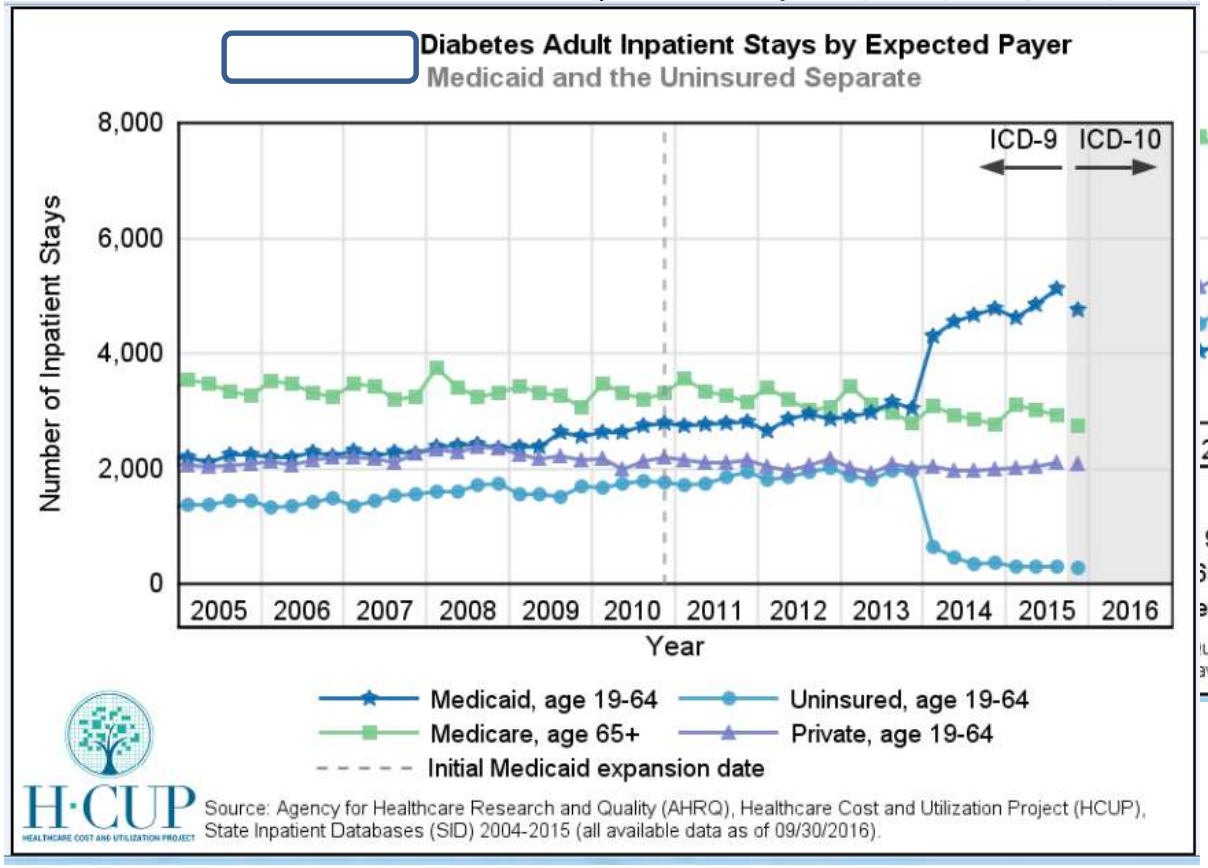
- Seeing some shifts in diagnoses and procedures with the transition from ICD-9 to ICD-10
- Even at broad service lines
- Pattern of DRG assignment seemed to change with ICD-10: increase in assignment of less severe DRGs
- Need to continue exploration
  - ► More quarters of data
  - ► More States
- Caution when interpreting trends

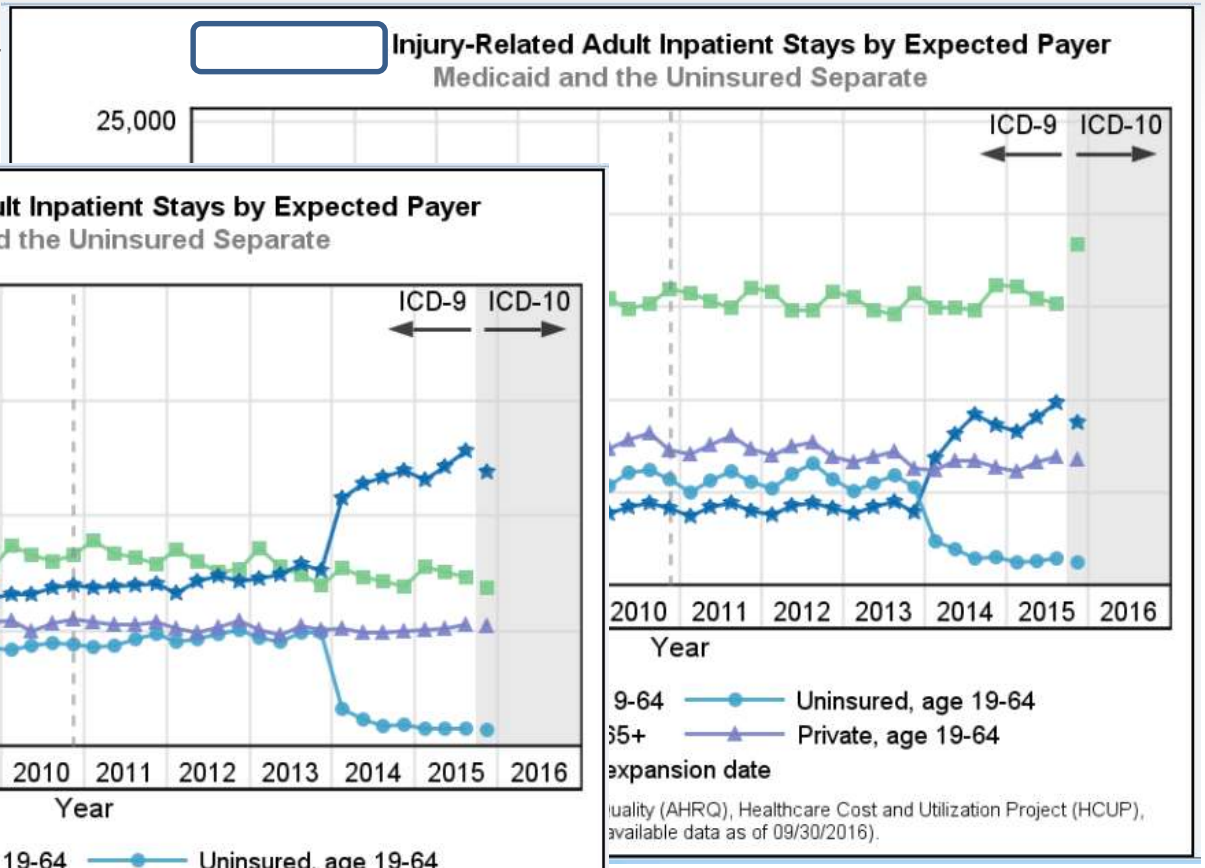
Conclusion:
One Way to Deal with Trends

For the foreseeable future, we will demarcate the transition to ICD-10 in our trends analyses

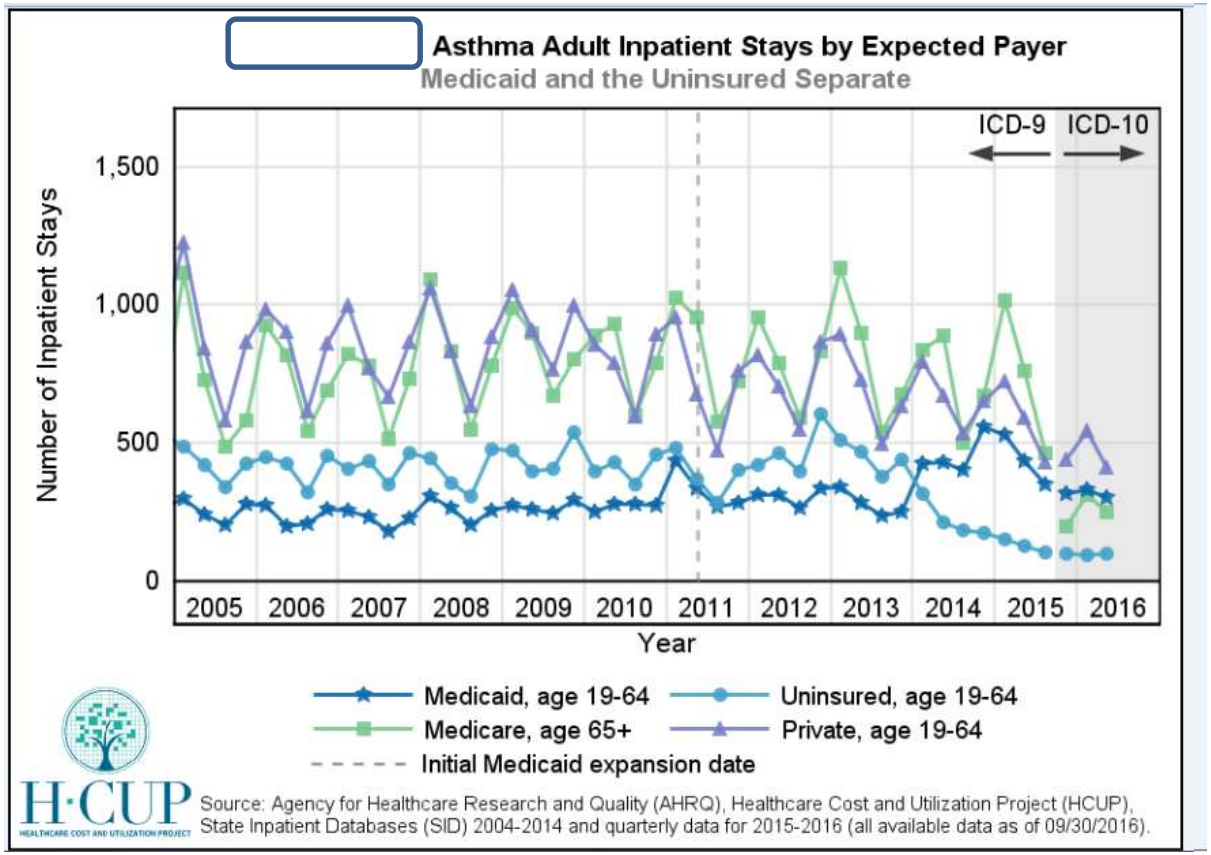


Examples of Trend Lines





More examples—
3 quarters of ICD-10 data



More work to do

- Continuing analyses on how to handle CY 2015 data in terms of creating our databases
  - 3 quarters of ICD-9 and 1 quarter of ICD-10
- Open questions still being considered
  - National estimates?
  - Trends?
  - How to structure our national databases for CY 2015
    - 3 quarter of ICD-9, 4th quarter ICD-10
- What help do you need?

Questions/Comments?

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