University HealthSystem Consortium

# Data Quality in Healthcare Comparative Databases

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THE POWER OF COLLABORATION



## University HealthSystem Consortium

- A member owned and governed consortium of academic medical centers
  - This relationship is what makes us unique
  - Approximately 90% of all major not for profit academic medical centers are UHC members
  - Affiliate hospitals are welcome and increasing in numbers (we currently have over 150 associate member hospitals)
  - Nearly 140 members and affiliates subscribe to the CDB
- UHC began in 1984, and has had only 2 CEOs
- UHC provides comparative databases, associated services, a Group Purchasing Organization, and networking opportunities

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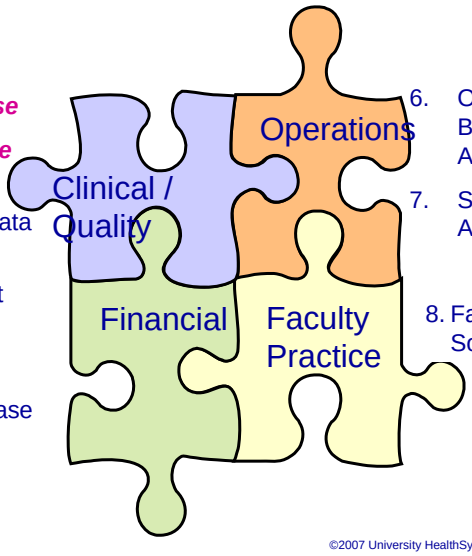
# 8 Comparative Databases

1. ***Clinical Data Base***
2. ***Clinical Resource Manager***
3. Core Measures Data Base
4. Patient Safety Net
5. Financial Data Base




6. Operational Data Base (Thomson Action OI)
7. Supply Chain Analytic Database
8. Faculty Practice Solutions Center

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***"Healthcare's single most important issue is its inability to improve"***

***Don Berwick***

***Reasons for this are many, but a major hurdle is that very little quality data is perfect***

***HOWEVER, Imperfect data can be very useful in providing direction for improvement efforts … only if you understand the imperfections***

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## R2 x I3 = Change

- Relationships
- Resources
- Information
- Incentives
- Innovation

*Using data to tell as story / motivate improvement*

1. Is the data accurate?
2. Do you have appropriate comparisons / targets?
3. Is the data adjusted properly?
4. Do you have the necessary data?
5. Is the data analyzed correctly?
6. Is the data presented correctly (both in print and word)?

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## Source/Scope of CDB Data

***Scope***

- Inpatient Discharges
- Outpatient (Currently in R&D) will include ED, observation, chemo/rad therapies, and selected ambulatory procedures
- Three years of rolling data available online

***Source***

- CPDF – data feed for both CDB and CRM (line item detail)
- Monthly submission

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# Data Quality

1. Does the data smell or look *fishy*?
    1. UHC has developed an automated process that examines member data and spits out data quality reports
        1. These reports will look at all variables and ask whether they are within a target range
        2. If a variable is not within the target and does not effect overall statistics, the data still passes
        3. If a variable is not within the target and effects overall statistics, the data is returned to the member to be fixed
2. Is the data an accurate reflection of clinical practice?

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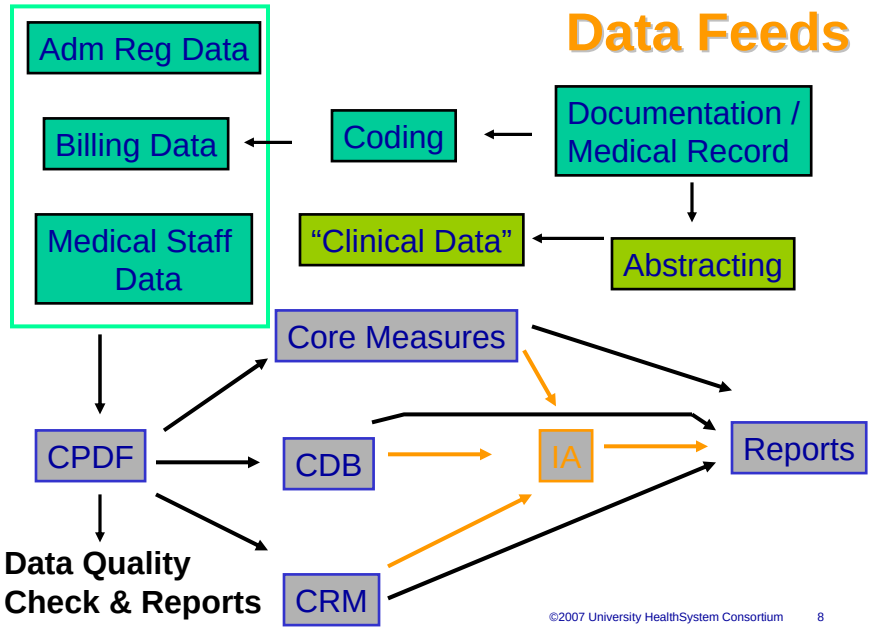
# Data Feeds

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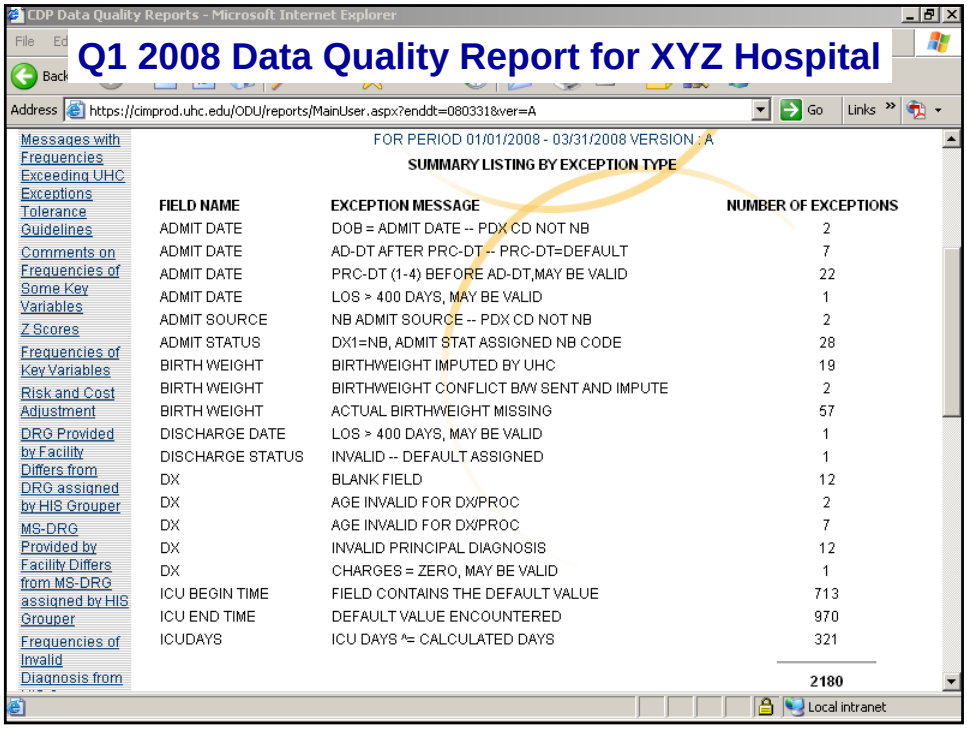


## Is the data an accurate reflection of clinical practice?

## Administrative vs. Clinical Data

- Debate on the usefulness of administrative data
- Clinical data requires analysis of the chart and can be very expensive
- Administrative data also comes from analysis of the chart
- The chart is a result of the clinician's (mainly physicians) documentation

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# Similarities & Differences

**Administrative Data**

- From medical record of discharged patient
- Began as a financial process
- Completed by educated coders
- Uses a standardized methodology
- Does not include values or test results

**Clinical Data**

- From a medical record & other IT systems
- Individualized by the nature of the project
- Usually completed by clinicians
- Individualized by the nature of the project
- Could include values or test results

*The medical record is the place where clinicians take the results of tests and document the patient's condition*

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# Literature Review

- 'Administrative data outperformed single-day chart review for comorbidity measure'.
  - Luthi et al. *International Journal for Quality in Health Care*. Vol 19. No. 4 Aug 2007. pges 225-231.
- 'Enhancement of claims data to improve risk adjustment of hospital mortality'
  - Pine et al. *JAMA*. Vol. 297. No.1 Jan 3, 2007. pges 71-6.
- 'Developing data production maps: meeting patient discharge data submission requirements'
  - Davidson, Lee and Wang. Int. J. Healthcare Technology and Management. Vol. 6 No. 2, 2004. pges 223-240.
- 'Comparison of administrative data and medical records to measure the quality of medical care provided to vulnerable older patients'
  - MacLean et. al. Medical Care. Vol 44. No. 2, Feb 2006. pges 141-8.

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## What Variables Can be Investigated

- ✓ Risk Adjusted Outcomes – Observed and Expected LOS, Mortality and Cost
- ✓ Other variables include: Complications, Readmissions, AHRQ PSIs, Charge, CMI

Performance based on:

- ✓ Hospitals
- ✓ Product Lines
- ✓ DRGs & MS-DRGs
- ✓ Diagnoses / Procedures
- ✓ Physicians
- ✓ Discharge Date/Month/Year
- ✓ Patient Demographics

Resource Utilization*:

- ✓ Blood Products
- ✓ Drugs
- ✓ Imaging Tests
- ✓ ICU
- ✓ Med/Surg Supplies
- ✓ Pharmacy

** CRM*

Items that may be different between administrative and clinical data

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## Uses of CDB / CRM Data

1. Ongoing consistent reports for meetings
   - Scorecards
   - Examining a DRG per meeting
   - Standard agenda items on Medical Staff Meetings, Leadership Meetings, Board Meetings
2. Improvement Initiatives
   - Drill down from scorecards
   - Answering a question
   - Improvement Priorities
3. Research
4. Improve accuracy of documentation & coding

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## 2008 Data Quality Related Projects

- MS DRGs (complete)
  - Developed for resource use and are derived from a grouper
- Present on Admission
  - Must be consistently documented
- Bringing in 'clinical data' (e.g. lab results)
  - Infection Control Tool
- Shortening time frame for submission & return of data
- Download re-architecture
- Adding nursing units and physician names
- Post hospital mortality
  - Currently use phone follow up &/or master death file

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## 3 Forms of Expression

- Management Reports

- Quality & Accountability Study

- CDB Online Data Tools

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# Quality & Accountability Study

- Three years
- Beginning to get traction as the most statistically based ranking on quality
- Measures include: mortality (aggregate and by product line), core measure (did each patient receive all measures), AHRQ patient safety indicators with the highest signal ratios, & equity (core measures by race, gender & SES)

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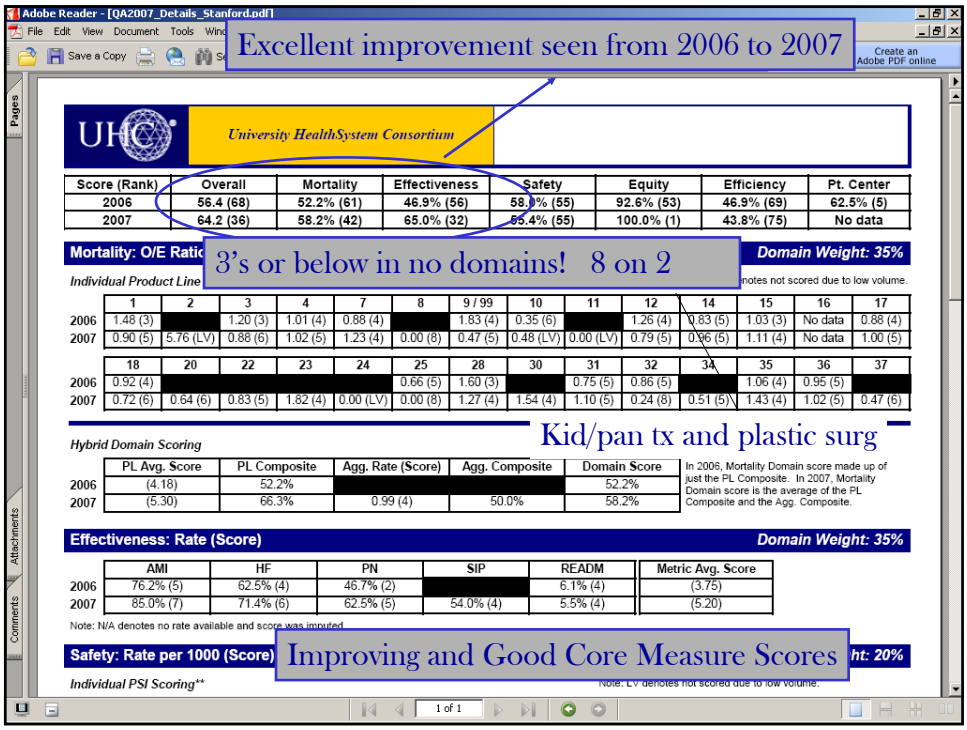
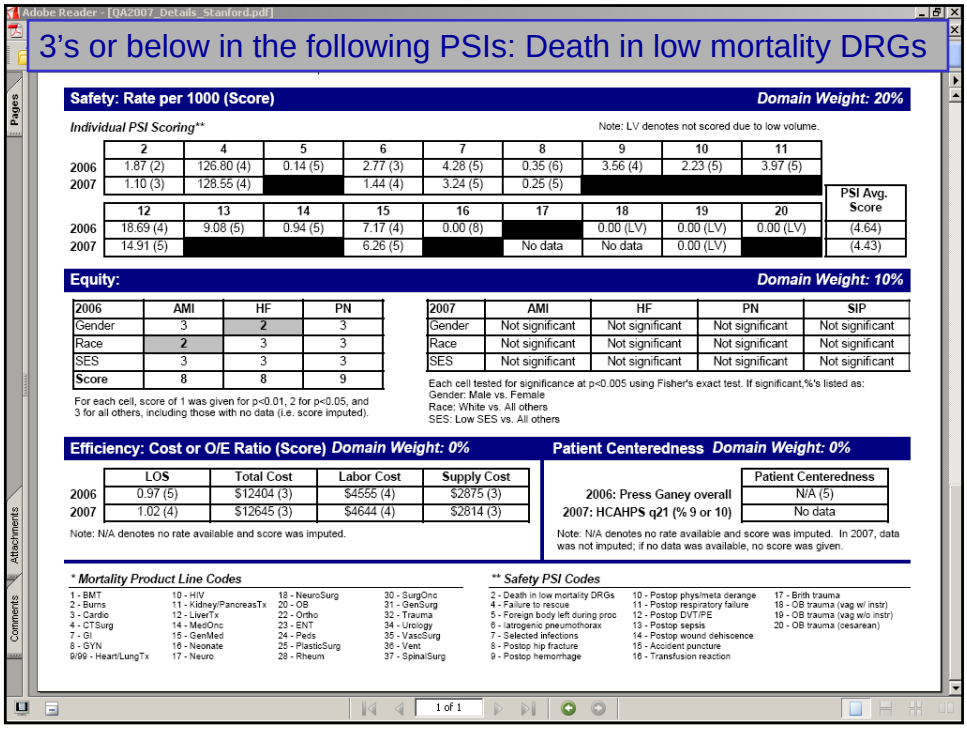





# Management Reports

Key Indicator Report (KIR)

Clinical Outcomes Report (COR)

Hospital Quality Measures Report (HQMR)

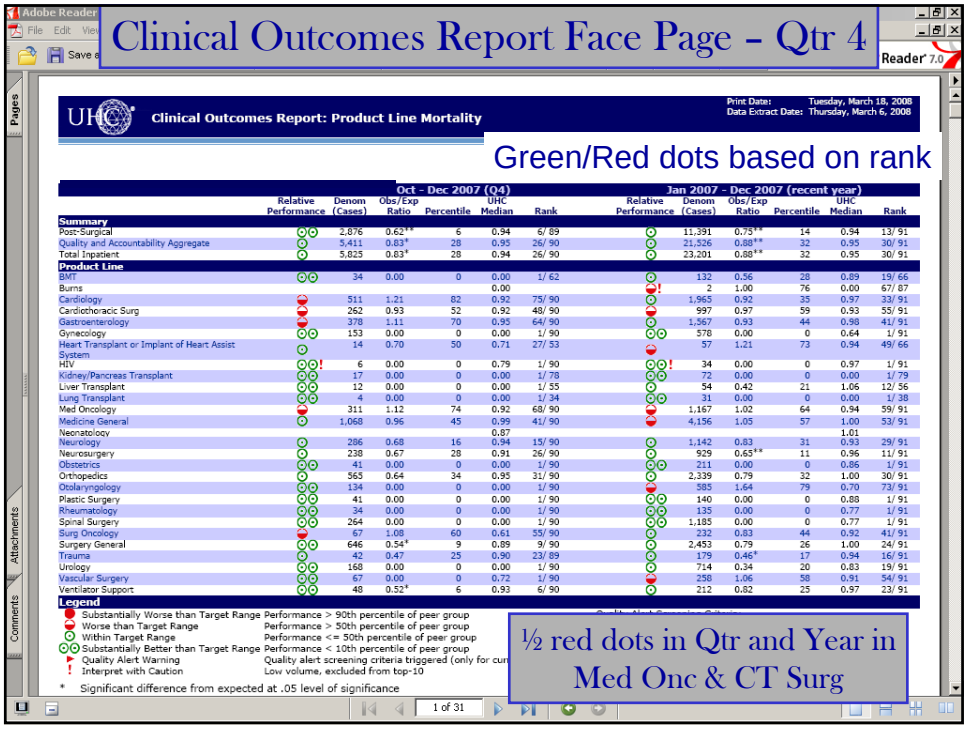
Quality & Safety Management Report (QSMR)

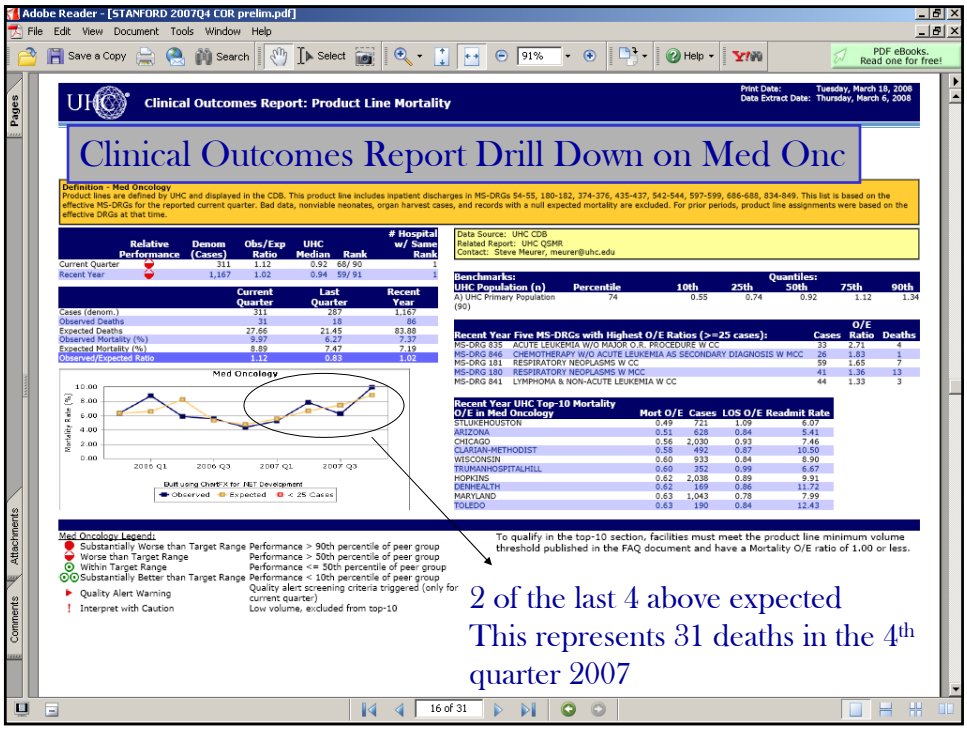
Efficiency Management Report (EMR)

Supply Chain Report (SCR)

- Semi-static reports you receive quarterly
- KIR can be thought of as a balanced scorecard
- Widely dispersed among the membership
- The more databases you are in, the more data you will receive


Clinical Outcomes Report Face Page – Qtr 4
Clinical Outcomes Report: Product Line Mortality
Print Date: Tuesday, March 18, 2008
Data Extract Date: Thursday, March 6, 2008
Green/Red dots based on rank
Oct - Dec 2007 (Q4)
Jan 2007 - Dec 2007 (recent year)
Summary
Post-Surgical
Quality and Accountability Aggregate
Total Inpatient
Product Line
BMT
Burns
Cardiology
Cardiothoracic Surg
Gastroenterology
Gynecology
Heart Transplant or Implant of Heart Assist System
HIV
Kidney/Pancreas Transplant
Liver Transplant
Lung Transplant
Med Oncology
Medicine General
Neonatology
Neurology
Neurosurgery
Obstetrics
Orthopedics
Otolaryngology
Plastic Surgery
Rheumatology
Spinal Surgery
Surg Oncology
Surgery General
Trauma
Urology
Vascular Surgery
Ventilator Support
Legend
Substantially Worse than Target Range
Worse than Target Range
Within Target Range
Substantially Better than Target Range
Quality Alert Warning
Interpret with Caution
Performance > 90th percentile of peer group
Performance > 50th percentile of peer group
Performance <= 50th percentile of peer group
Performance < 10th percentile of peer group
Low volume, excluded from top-10
Significant difference from expected at .05 level of significance
½ red dots in Qtr and Year in Med Onc & CT Surg
1 of 31


Clinical Outcomes Report: Product Line Mortality
Print Date: Tuesday, March 18, 2008
Data Extract Date: Thursday, March 6, 2008
Clinical Outcomes Report Drill Down on Med Onc
Definition - Med Oncology
Med Oncology
Built using ChiMEX for .NET Development
Observed
Expected
< 25 Cases
Med Oncology Legend:
Substantially Worse than Target Range
Worse than Target Range
Within Target Range
Substantially Better than Target Range
Quality Alert Warning
Interpret with Caution
To qualify in the top-10 section, facilities must meet the product line minimum volume threshold published in the FAQ document and have a Mortality O/E ratio of 1.00 or less.
2 of the last 4 above expected
This represents 31 deaths in the 4th quarter 2007
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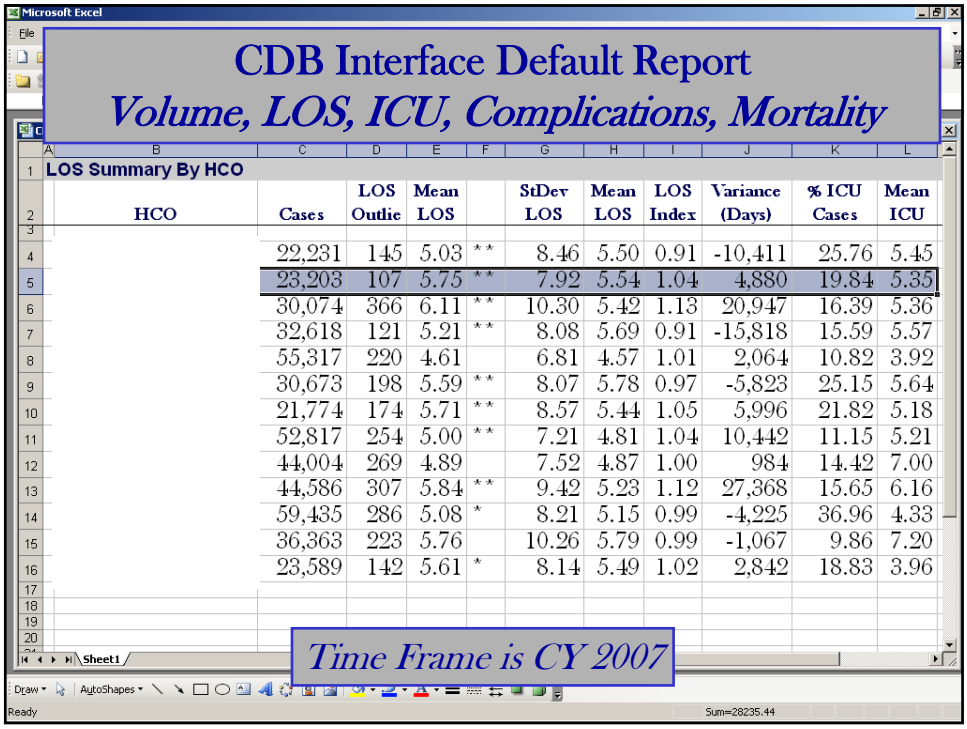
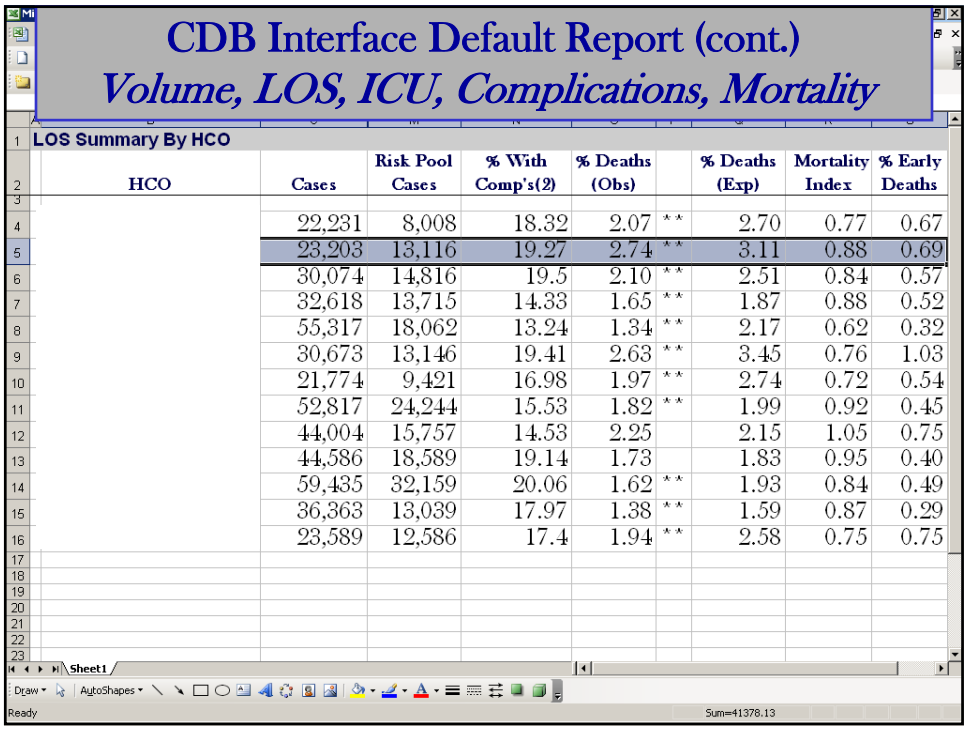


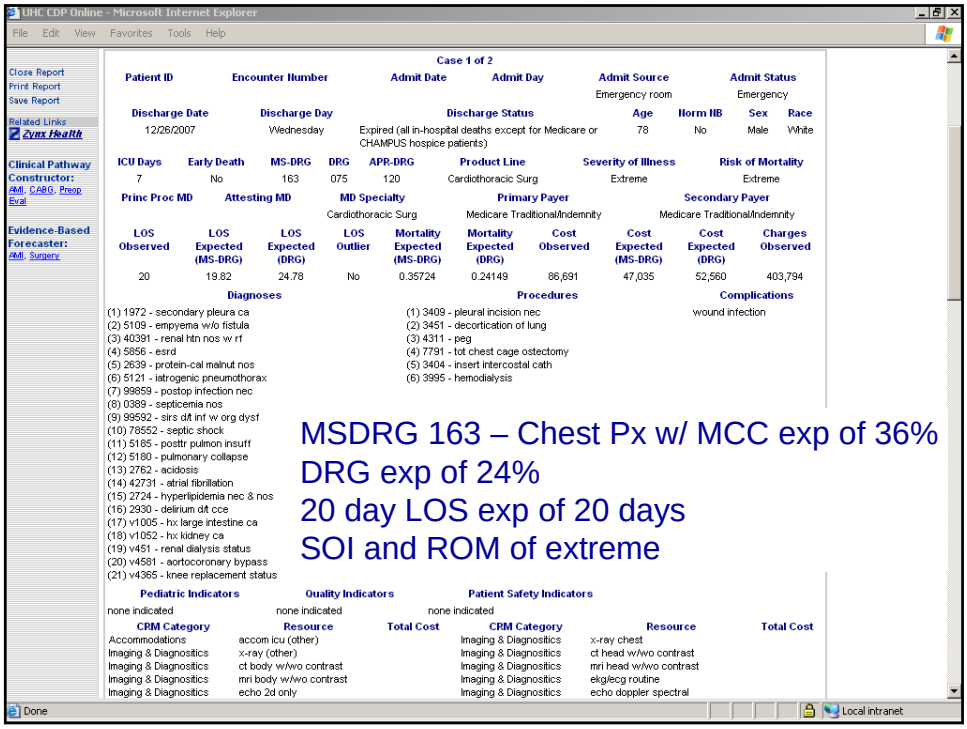

LOS Summary By HCO

| HCO | Cases | LOS Outlie | Mean LOS | | StDev LOS | Mean LOS | LOS Index | Variance (Days) | % ICU Cases | Mean ICU |
|---|---|---|---|---|---|---|---|---|---|---|
| | 22,231 | 145 | 5.03 | ** | 8.46 | 5.50 | 0.91 | -10,411 | 25.76 | 5.45 |
| | 23,203 | 107 | 5.75 | ** | 7.92 | 5.54 | 1.04 | 4,880 | 19.84 | 5.35 |
| | 30,074 | 366 | 6.11 | ** | 10.30 | 5.42 | 1.13 | 20,947 | 16.39 | 5.36 |
| | 32,618 | 121 | 5.21 | ** | 8.08 | 5.69 | 0.91 | -15,818 | 15.59 | 5.57 |
| | 55,317 | 220 | 4.61 | | 6.81 | 4.57 | 1.01 | 2,064 | 10.82 | 3.92 |
| | 30,673 | 198 | 5.59 | ** | 8.07 | 5.78 | 0.97 | -5,823 | 25.15 | 5.64 |
| | 21,774 | 174 | 5.71 | ** | 8.57 | 5.44 | 1.05 | 5,996 | 21.82 | 5.18 |
| | 52,817 | 254 | 5.00 | ** | 7.21 | 4.81 | 1.04 | 10,442 | 11.15 | 5.21 |
| | 44,004 | 269 | 4.89 | | 7.52 | 4.87 | 1.00 | 984 | 14.42 | 7.00 |
| | 44,586 | 307 | 5.84 | ** | 9.42 | 5.23 | 1.12 | 27,368 | 15.65 | 6.16 |
| | 59,435 | 286 | 5.08 | * | 8.21 | 5.15 | 0.99 | -4,225 | 36.96 | 4.33 |
| | 36,363 | 223 | 5.76 | | 10.26 | 5.79 | 0.99 | -1,067 | 9.86 | 7.20 |
| | 23,589 | 142 | 5.61 | * | 8.14 | 5.49 | 1.02 | 2,842 | 18.83 | 3.96 |

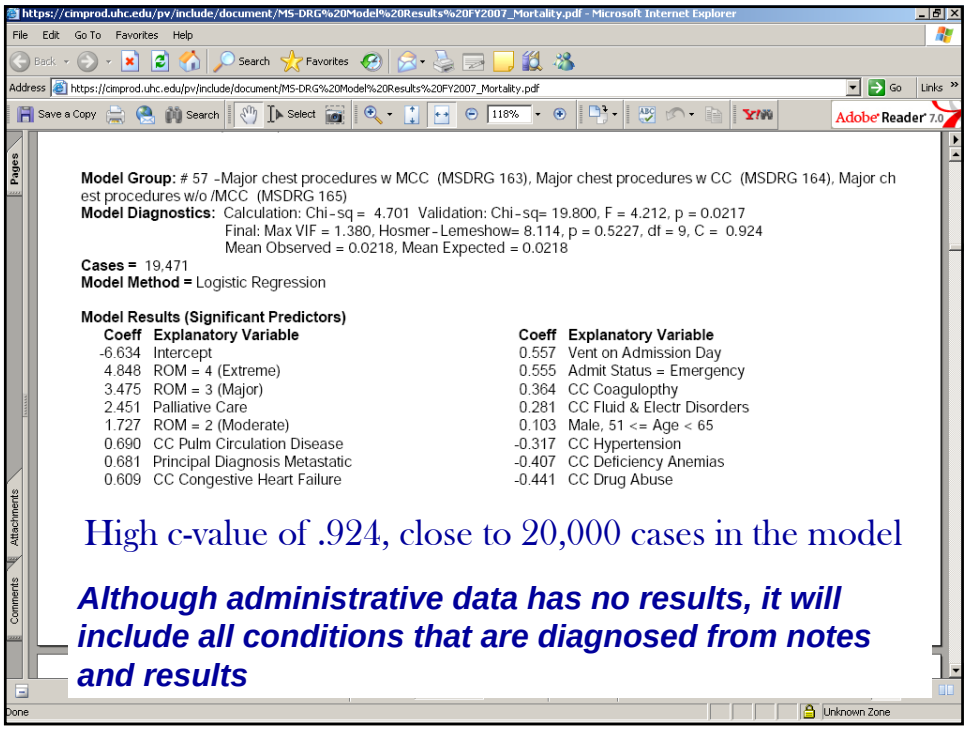



LOS Summary By HCO

| HCO | Cases | Risk Pool Cases | % With Comp's(2) | % Deaths (Obs) | | % Deaths (Exp) | Mortality Index | % Early Deaths |
|---|---|---|---|---|---|---|---|---|
| | 22,231 | 8,008 | 18.32 | 2.07 | ** | 2.70 | 0.77 | 0.67 |
| | 23,203 | 13,116 | 19.27 | 2.74 | ** | 3.11 | 0.88 | 0.69 |
| | 30,074 | 14,816 | 19.5 | 2.10 | ** | 2.51 | 0.84 | 0.57 |
| | 32,618 | 13,715 | 14.33 | 1.65 | ** | 1.87 | 0.88 | 0.52 |
| | 55,317 | 18,062 | 13.24 | 1.34 | ** | 2.17 | 0.62 | 0.32 |
| | 30,673 | 13,146 | 19.41 | 2.63 | ** | 3.45 | 0.76 | 1.03 |
| | 21,774 | 9,421 | 16.98 | 1.97 | ** | 2.74 | 0.72 | 0.54 |
| | 52,817 | 24,244 | 15.53 | 1.82 | ** | 1.99 | 0.92 | 0.45 |
| | 44,004 | 15,757 | 14.53 | 2.25 | | 2.15 | 1.05 | 0.75 |
| | 44,586 | 18,589 | 19.14 | 1.73 | | 1.83 | 0.95 | 0.40 |
| | 59,435 | 32,159 | 20.06 | 1.62 | ** | 1.93 | 0.84 | 0.49 |
| | 36,363 | 13,039 | 17.97 | 1.38 | ** | 1.59 | 0.87 | 0.29 |
| | 23,589 | 12,586 | 17.4 | 1.94 | ** | 2.58 | 0.75 | 0.75 |

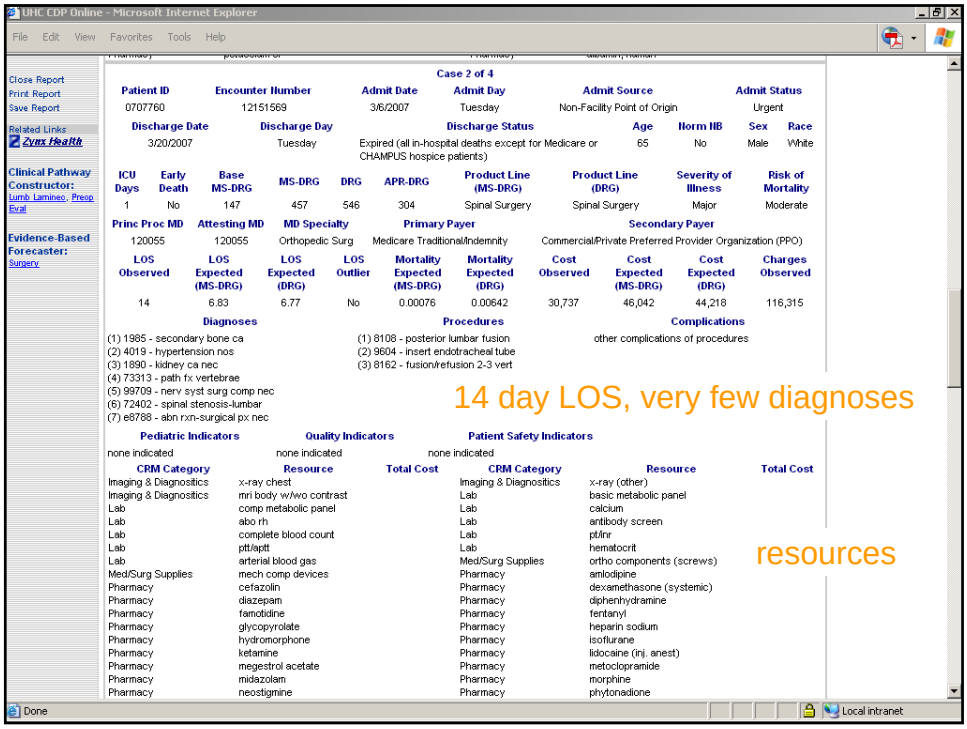



MSDRG 163 – Chest Px w/ MCC exp of 36%
DRG exp of 24%
20 day LOS exp of 20 days
SOI and ROM of extreme




High c-value of .924, close to 20,000 cases in the model

***Although administrative data has no results, it will include all conditions that are diagnosed from notes and results***




# Data Quality Study

- Goal is to evaluate whether the data in the CDB is an accurate reflection of clinical practice
- Used the 5 Chicago area academic medical centers
- Studied the data quality reports as well as global reports from the CDB
- 5 variables for each organization were chosen and contact with the member determined if the variance was real, an artifact of coding or documentation or something other

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# Study Summary

- UHC found the data discrepancies were mostly an effect of documentation and coding practices. In particular, they resulted from:
  - institutional emphasis on particular product lines,
  - documentation/coding of secondary diagnoses based on impact on reimbursement,
  - patient population, and
  - institutional patient safety/quality programs.

 

| 4. MS-DRG | a | b | c | d | e | Total |
|---|---|---|---|---|---|---|
| 781 Other antepartum diagnoses w medical complications | 90.04% | 85.40% | 92.04% | 90.52% | ***79.38%*** | 86.48% |
| 782 Other antepartum diagnoses w/o medical complications | 9.96% | 14.60% | 7.96% | 9.48% | ***20.62%*** | 13.52% |

2. Fluid and Electro Disorders

| Comorbidity | a<br>N = 22,374 | b<br>N = 26,969 | c<br>***N = 15,008*** | d<br>N = 22,056 | e<br>N = 32,380 | Total<br>N = 118,787 |
|---|---|---|---|---|---|---|
| Fluid and electr disorders (n) | 4,070 | 4,718 | ***2,038*** | 4,985 | 6,094 | 21,905 |
| Percent of All Cases | 18.2% | 17.5% | ***13.6%*** | 22.6% | 18.8% | 18.4% |

 

2. Characteristics of Tobacco Use

| ICD-9 Code | a | b | c | d | e |
|---|---|---|---|---|---|
| | N = | N = | N = | N = | N = |
| All Cases | 22,374 | 26,969 | 15,008 | 22,056 | 32,380 |
| v1582 - hx tobacco use (n) | 3611 | 2612 | 152 | 4998 | **82** |
| *v1582 - hx tobacco use (%)* | *16.14%* | *18.53%* | *0.55%* | *11.84 %* | ***0.47%*** |
| 3051 - tobacco use disorder (n) | 2478 | 2367 | 1037 | 3405 | **230** |
| *3051 - tobacco use disorder (%)* | *11.08%* | *12.63%* | *1.53%* | *10.73 %* | ***3.20%*** |

Clinical Data would not pick this up as it is an effect of documentation

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## The average number of diagnoses coded per case

**Diagnoses Profile**

| HCO | Cases | Mean # | Max # |
|---|---|---|---|
| 140088 | 22,374 | 10.072 | 59 |
| 140119 | 26,969 | 9.253 | 55 |
| ***140150*** | ***15,008*** | ***6.380*** | ***25*** |
| 140276 | 22,056 | 9.929 | 77 |
| 140281 | 32,380 | 8.230 | 30 |

This hospital does not seem to be giving Itself 'credit' for the severity of their patients

This will also negatively effect reimbursement

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# Summary

- For use in performance improvement, administrative data (if proper checks are in place) can be an effective portrayal of clinical practice
- In addition, the CDB can assist a hospital in improving the accuracy of administrative data quality and accuracy

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