

Utility of Hospital Discharge Data for Registry Enhancement

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Overview

- Florida AHCA
 - Medicaid Administration
 - License and regulate health facilities
 - Provide data about quality of care
 - Maintain discharge databases
- Current
 - Link with subset of discharge data
 - Case finding (cancer diagnosis / ICD)
- Pilot
 - Enhanced link with full discharge database
 - “all cause”



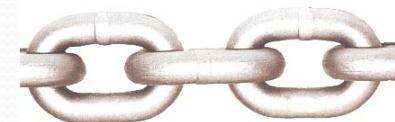
Linkage Goals

Registry Ops

- Data improvement
 - Patient Level
 - Date of last contact
 - Demographics
 - SNN, dob, race, ethnicity
 - Tumor Level
 - 1st course treatment

Research

- Enhanced, external research file
 - Patient Level
 - Co-morbidities
 - Enhanced treatment
 - Biopsy/diagnostics
 - Additional risk factors
 - # of hospitalizations
 - Average length of hospital stay (LOS)



Datasets

AHCA

- Inpatient
 - Psych
- Emergency
- Ambulatory
 - Hospital outpt, ambi surg, cardiac catherization, and lithotripsy
 - Radiation facilities no longer reported (1997-2003)
- Denominator = ??

FCDS

- “Alive”
- Florida Resident
- Dx Date 81-08 plus ‘9999’
- SSN Known
- Denominator = 977,236



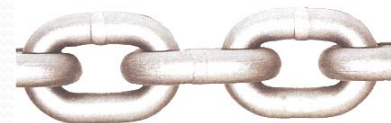
AHCA Linkage

- 2008 AHCA
- Deterministic match against SSN only
 - Did not use dob, sex, race, ethnicity or county
 - Duplicate SSN in both files
 - Unknown which case AHCA choose
- N unknown
- Simplistic
 - Incorrect matches
 - Inability to match against those with missing or incorrect SSN (i.e. transpositions)
 - No names in AHCA



Incorrect Matches

- Compared sex, race, and DOB
- 24,799 incorrect encounter links
 - 2.4% total
 - 2.0% ASC
 - 2.3% IN
 - 3.3% ER
- 9,462 incorrect patient links
 - 2.3% total
- No additional links



Improved Linkage

Potential Mismatched Pre

- DOB
 - 3.4% different from AHCA
- Sex
 - 1.1% different from AHCA
 - AHCA no unknowns
 - <0.1% due to additional sex codes

Potential Mismatched Post

- DOB
 - 1.1% different from AHCA
 - 3 yrs/days
- Sex
 - 0.7% different from AHCA
 - <0.01% additional codes



Linked Files

Linked files

- 1,023,914 encounters
- ASC
 - 480,995 encounters
- Inpatient
 - 337,320 encounters
- ER
 - 205,599 encounters

Linked patients

- 398,754 patients
 - 41% of FCDS
 - 44% < 65
 - Single Files
 - 34% ASC only, 18% IN, 11% ER
 - Multiple Files
 - 14% ASC & IN
 - 7% ASC & ER
 - 8% IN & ER
 - 8% ASC, IN & ER



Data Improvement Potential

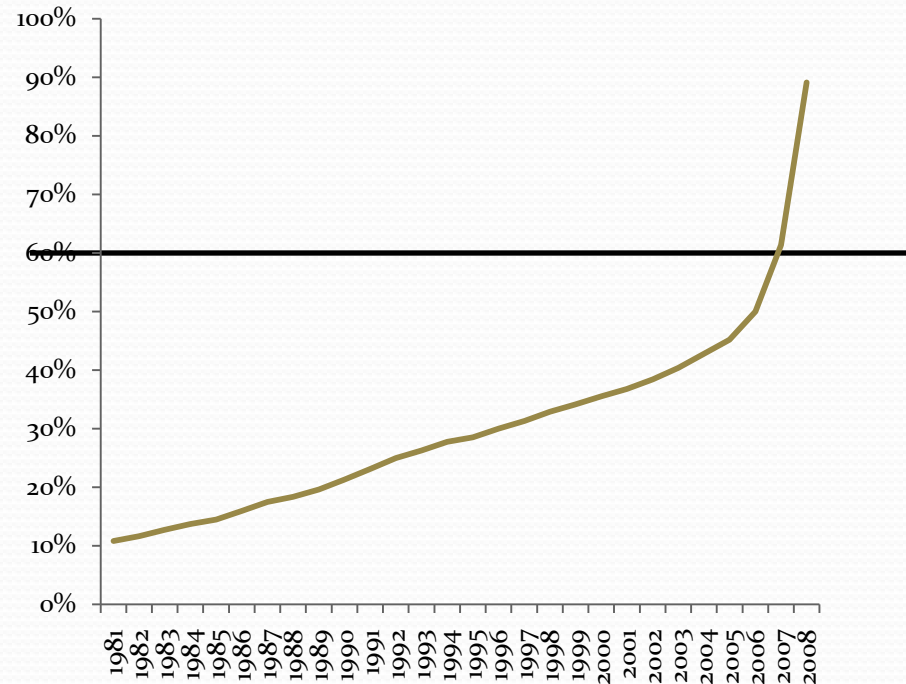
- DOB
 - None missing
 - 100% known in AHCA
- Sex
 - 162 missing
 - 100% known in AHCA
- Race
 - 3,413 missing
 - 100% known in AHCA
- Ethnicity
 - 9,176 missing
 - 100% known in AHCA
- SSN
 - NA
- Current County
 - 9.2% differ from AHCA
- DX year 9999
 - 8,118 missing
 - 46% of “9999” matched AHCA



Date of Last Contact

- AHCA
 - Combined files, last encounter date
 - Non-specific; Quarter, year
- FCDS last seen
 - 30% Updated
 - 10% 2008 ('same')
 - 0.6% 2009

Percent Matched by Year of DX (Latest)



Matched vs Unmatched

- Stage – Matched higher % late
 - 2007: 32% versus 24%; unknown stage same
 - 2008: 37% versus 27%, unknown stage same
- Age – Matched similar average age
 - 2007: 65 versus 64
 - 2008: 65 versus 65
- Source – Matched higher % Inpt
 - 2007: 93% versus 87%
 - 2008: 96% versus 81%
 - Note: **10% inpt not linked**
- Class – Matched higher % 0,1
 - 2007: 67% versus 64%
 - 2008: 73% versus 52%



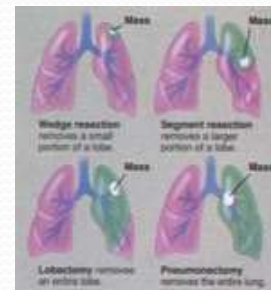
Matched vs Unmatched: Site

- Overall match 41%
 - 2007 61%
 - 2008 89%
- Lung and Pancreas
 - 4-5% points higher
- Melanoma and Prostate
 - 10-21 points lower
- Breast, Cervix, and “other”
 - equivocal
- Lung
 - 2007: 66% matched; 2008: 93%
- Pancreas
 - 2007: 66% matched; 2008: 94%
- Melanoma
 - 2007: 43% matched; 2008: 68%
- Prostate
 - 2007: 51% matched; 2008: 75%
- Breast
 - 2007: 61% matched; 2008: 91%
- Cervix
 - 2007: 62% matched; 2008: 91%
- Other
 - 2007: 64% matched; 2008: 91%



Treatment

- Principle Procedure Codes
- 31 total variables in-patient
 - ICD procedure codes
 - Used decimals 2006 forward
 - No cancer related list
 - Chemo/Radiation from SEER-Medicare, 2003
- 10 total variables Ambi & ER
 - CPT codes
 - In-house cancer related list
 - Cancer directed?



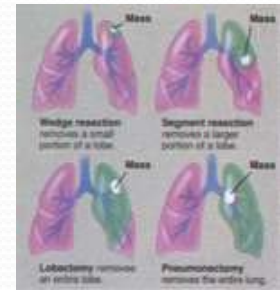
Treatment

Inpatient

- 6,746 Chemo patients
 - 4% of linked
 - 6% 2007 & 2008
 - 63% single report, 16% second
 - Max 20 reports
- 3,779 Radiation patients
 - 2% of linked
 - 4% 2007 & 2008
 - 89% single report, 9% second
 - Max 6 reports

Ambi & ER

- Chemo: 220 patients (<1% of linked, 2007 & 2008)
 - 56% single report
- Radiation:
 - 3,634 non-CD (1% of linked, 1% 2007; 4% 2008)
 - 42% single report
 - 1,295 CD (<1% of linked, 1% 2007 & 2008)
 - 74% single report
- Surgery:
 - 60,217 non-CD (18% of linked; 19% 2007; 19% 2008)
 - 67% single report
 - 103,102 CD (1% of linked, 33% 2007, 46% 2008)
 - 73% single report



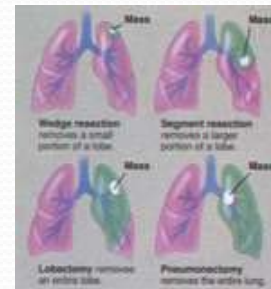
Missed 1st Course?

Inpatient

- Any Treatment
 - 1,163 No tx in abhist
 - <1% of linked patients
 - 281 2007; 585 2008
- Chemo
 - 1,827 No tx in abhist
 - <1% of linked patients
 - 437 2007; 682 2008
- Radiation
 - 1,596 No tx in abhist
 - <1% of linked patients
 - 462 2007; 571 2008

Ambi & ER

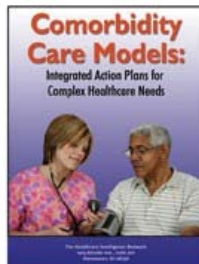
- Any Treatment
 - 17,322 No tx in abhist
 - 5% of linked patients
 - 2,562 2007; 6,362 2008
- Chemo
 - 60 No tx in abhist
 - 13 2007; 28 2008
- Radiation
 - 2,998 No tx in abhist
 - 391 2007; 2,011 2008
- Surgery
 - 45,104 No tx in abhist
 - 14% linked patients
 - 6,648 2007; 13,771 2008



Co-morbidities

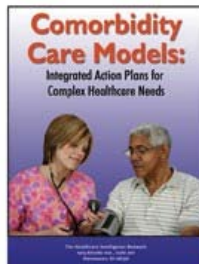
- Issues

- Dates of linkage
- Timing Rules
 - Pre versus peri/post diagnosis
 - Rule out co-morbidities caused by tx or cancer
 - Prior co-morbidities
 - E-codes? POA?
 - Issues with years, completeness, reliability
 - LOS for MI
- Inpatient versus clinic, ER & ambi (over estimation)
- Which measure?
 - Multiple indices
 - 0/1 versus indices (summary measure weighted appropriate for cancer)



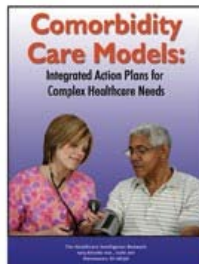
Co-morbidities

- Used ICD principle diagnosis codes
 - 31 total inpt; 10 ambi & ER
 - Did not use admitting diagnosis
 - In-patient only; Overinflate
- Coded for Charlson only
- 54 missing diagnosis of any type



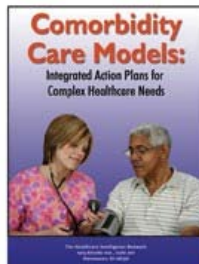
Co-morbidities: Charlson

- 1 + co-morbid conditions
 - 25% of FCDS (“alive”, FL 81-08, 9999)
 - 61% total linked patients
 - 87% of Inpt; 15% of total Inpt only
 - 57% of Ambi; 12% of total Ambi only
 - 64% of ER; 3% of total ER only
 - Note: Potential for overinflation
 - 68% of 2007; 91% 2008
 - 63% > 65; 58% < 65



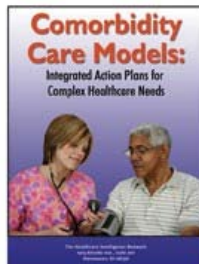
Co-morbidities: Charlson

- 35% CANCER
 - 14% of “alive”, 50% of 2007; 84% 2008
 - **Note: 10% of 2008 were unlinked**
 - **Remainder are likely deceased and not yet reported**
- 12% METS
 - 5% of “alive”, 18% of 2007; 25% 2008
- 7% MI, 10% CHF, 6% PVD, 5% CVD, 2% DEM, 19% COPD, 2% Rheum, 2% PUD, 3% MildLD, 18% DIAB_NC, 2% DIAB_C, 1% PARA, 8% RENAL, 1% MSLD, 3% HIV
- Comparable to prior work



Enhanced Research Variables

- Ave Hospital Days/yr: 10 days
 - Range 0 – 806
 - 12 days 2007 & 2008
- Ave Hospitalizations/yr: 2
 - Range 1 - 49
 - Same 2007 & 2008
- Ave stay per Hospitalization/yr: 6 days
 - Range 1 - 492
 - Same 2007 & 2008
- Total Healthcare Encounters/yr: 3
 - Range 1 - 112
 - Same 2007 & 2008



Future Enhancements

- Research
 - Cancer screening & diagnostics
 - Length of time between screening and treatment
 - Routine vs diagnostic screening
 - Requires timing rules
 - Requires more years of AHCA data (retroactive)
 - Potential TX complications
- Registry Ops
 - Diagnosis date
 - Year “9999”



Issues to Overcome

- Improved linkage
 - Probabilistic linkage
 - Additional years of AHCA data
- National code crosswalks
 - ICD-9, CPT
 - Convert to tx codes
- Correct tx with correct cancer
 - Patient level vs tumor level

