

Data Quality and Case Mix Measurement: A North American Perspective

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Where Knowledge Informs Change



Data Quality and Case Mix Measurement

■ United States:

- ◆ DRG used for prospective payment of acute hospitalizations (publicly insured)
 - Severity levels
 - MS-DRG removes preventable conditions acquired in hospital
- ◆ 745 DRG (increased from 538) in 2008
- ◆ \$401 Billion US (2006)

■ Canada:

- ◆ Hospitalizations are publicly insured
 - DRG a small component of hospital funding (grant-based and population based)
 - \$38 Billion US (2004)





Data Quality and Case Mix Measurement

- What does 'Data Quality' mean in case mix?
 - ◆ Clinical information:
 - Accuracy and Specificity
 - Comprehensiveness
 - Sequencing
 - Clinical Coding Guideline adherence
 - Timeliness

- Why does 'Data Quality' matter?
 - ◆ Accurately define service contracts between government and hospitals
 - ◆ Rationalize / Centralize services
 - ◆ Population-based research
 - ◆ Resource allocation between hospital departments
 - ◆ DRG and reimbursement



Data Quality and Case Mix Measurement

- How is clinical coding organized?
- United States:
 - ◆ Professionally trained coders, 2-year training program plus on-the-job training
- Canada:
 - ◆ Professionally trained coders, 2- or 4-year training program plus on-the-job training
- Traditional set-up
 - ◆ Coders in separate department which receives completed charts after discharge
 - ◆ ‘Concurrent coding’, coders are embedded within clinical departments
 - ◆ Hospitals free to choose how they organize coding
 - Certified coders required



Data Quality and Case Mix Measurement

- Imprecision in hospital case mix measures as a result of data quality
 - ◆ Random variation
 - ◆ Non-random variation

- International results:
 - ◆ Implementation of case mix for hospital funding will induce changes in coding practices
 - ◆ Evidence of undercoding and overcoding

- Finding unexplainable coding variation/data quality typically involves two strategies:
 - ◆ Statistical analysis of discharge data
 - ◆ Reabstraction of patient charts
 - ◆ Statistical analysis provides insight, but does not provide ‘smoking gun’ of re-abstraction



Data Quality and Case Mix Measurement

- Statistical analysis of discharge data

- Silverman and Skinner (2000)
 - ◆ Time series analysis

- Serden et al., (2003)
 - ◆ Number of secondary diagnoses

- Preyra (2004) reported substantial changes in case mix not attributable to random variation
 - ◆ Number and type of secondary diagnoses

- Sutherland and Steinum
 - ◆ Longitudinal analyses of hospitalizations



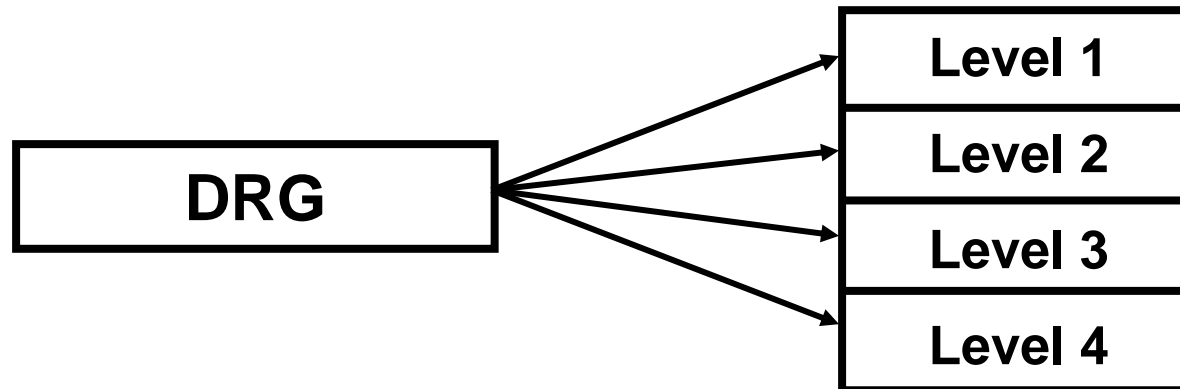
Data Quality and Case Mix Measurement

- Reabstraction - DRG mis-assignment rates are well reported:
 - The Office of the Inspector General (1999)
 - ◆ 20% of septicemia cases
 - Berthelsen (2000)
 - ◆ 16.5% of cases in DRG 143, Chest Pain
 - ◆ 9% of cases in DRG 125, Circulatory Disorders
 - ◆ 12.7% of cases in DRG 140, Angina Pectoris
- Richards, Brown and Homan (2001) reported 13.4% error rate in most responsible diagnosis
- Canadian Institute for Health Information (2002) estimated 12.8% of cases inaccurately coded most responsible diagnosis
- Preyra, Sutherland and Wardle (2003) approximately 13% of DRG mis-assigned



Data Quality and Case Mix Measurement

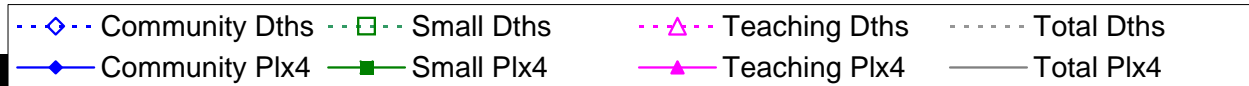
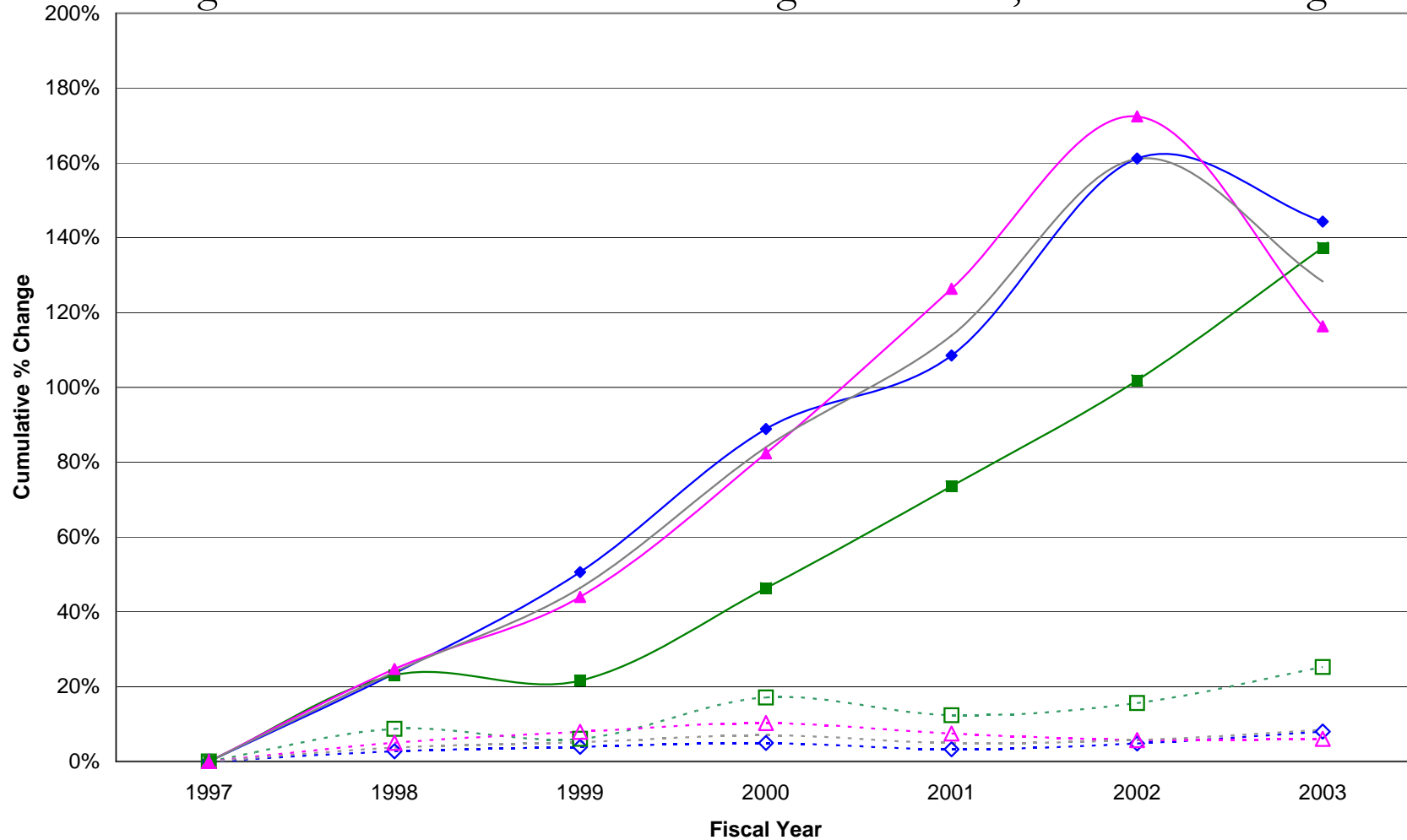
- Canadian experience
 - ◆ 12 million residents, >160 acute inpatient hospitals
- CMG case mix system (variant of DRG)
 - ◆ Secondary conditions that affect hospitalization
 - ◆ Level 4: Additional secondary conditions that are deemed 'life threatening'





Data Quality and Case Mix Measurement

Percent change in deaths and 'Life-Threatening Conditions', medical and surgical cases





Data Quality and Case Mix Measurement

Audited Charts that Changed DRG After Reabstraction

Hospital	DRG		
	Pneumonia and Pleurisy	Nutritional and Misc Metabolic Disorder	Septicemia
A	22%	55%	41%
B	17%	27%	10%
C	13%	15%	25%
D	29%	22%	35%
E	15%	50%	31%
F	17%	15%	46%
G	24%	32%	36%
H	24%	35%	21%
I	19%	31%	18%
J	13%	39%	24%
All	19%	33%	29%



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- Re-abstraction key observations:
 - ◆ Systematic coding of “insignificant” co-morbid diagnoses and symptoms in some hospitals
 - ◆ Coding guidelines not well adopted and/or are too subject to interpretation in selected instances
 - ◆ Incidental findings on lab reports, x-rays, pathology reports or examinations were found to be considered comorbid.
 - There must be clinical documentation supporting the condition and its relevance



Data Quality and Case Mix Measurement

- Hospital perspective:
 - Changes in coding guidelines
 - Shortage of experienced and qualified coders
 - Feeling that current cost weight does not reflect patient cost or acuity



Data Quality and Case Mix Measurement

- United States example:
 - ◆ Outlier payments
 - Each day of stay beyond the trim point is paid as a percentage of reported daily costs
 - Trim points are set such that payments are 1.5% of total
 - ◆ From 1.5% to >3% of DRG payments
 - Very substantial increase in outlier payments (\$9 Billion US)
 - ◆ Strata:
 - hospital location (urban or rural);
 - hospital education status (teaching or nonteaching)
 - disproportionate share status (disproportionate share or nondisproportionate share); and
 - ownership (proprietary, nonproprietary, or governmental).
 - ◆ Frame: 362 hospitals



Data Quality and Case Mix Measurement

- United States example:
 - Hospitals were increasing patient charges on days past the LOS trim point
 - Reimbursement levels for days past trim point were much greater than cost
- Impact: Changing methodology for estimating cost from charges:
 - ◆ Most recent data only
 - ◆ Revising cost to charge ratios (inflated charges for outliers)
 - ◆ Private hospitals experienced 68.6% decrease in outlier payments (largest decrease)
- Recovery of over \$200 million US from hospitals



Data Quality and Case Mix Measurement

- Impact of inaccurate coding on cost weights
 - ◆ Assess the impact of inaccurate coding on cost weights
 - ◆ Assess the impact of biased weights on hospitals in the Ontario hospital system
 - ◆ Using re-abstraction study results, effect on cost weights:

	Conservative
Plx	% Over Weight
1	3.86
2	-6.12
3	-0.82
4	-13.46
9	2.86

- ◆ High level weights are under-weighted
 - Due to presence of mis-assigned, lower cost patients



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	Hospital	2002 /2003 Acute Weighted Cases	Conservative % from Actual
Small	Alliston (596)	2,829	3.60
	Dryden (647)	1,791	5.15
	Sturgeon Falls (881)	1,296	2.83
	Red Lake (896)	494	0.07
	Sioux Lookout (964)	1,824	1.49
Community	Bracebridge (614)	3,495	-0.37
	Collingwood (640)	4,817	0.69
	North York (632)	33,363	-2.64
	Guelph (665)	14,428	-0.99
	Lindsay (707)	8,057	-1.99
	Stratford (813)	8,138	0.63
	Scarborough (960)	48,049	-3.69
Teaching	Hamilton (674)	30,111	-2.67
	St. Michael's (852)	49,829	-4.95
	London (936)	66,315	-6.58
	UHN (947)	69,326	-8.40
	Sunnybrook (953)	53,962	-3.10
	Ottawa (958)	81,716	-5.75



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■ Results

- ◆ Complex and highly acute patients are negatively impacted
 - Low acuity patients and normal newborns favorably impacted
- ◆ Differential hospital impact
 - Negatively affects tertiary hospitals
 - Positively affects small, community hospitals
- ◆ Highly specific grouping methodologies are most vulnerable to poor clinical data quality
 - APR-DRG, CMG/Plx



Data Quality and Case Mix Measurement

- Key Canadian initiatives:
 - ◆ All health record coders attend Coding Workshop and complete online training.
 - ◆ Teach the importance of high quality and timely clinical documentation in student training curriculum.
 - ◆ Capture of diagnoses based on documentation from all members of patient's clinical team

 - ◆ Government to lead development of a data quality strategy, including continued re-abstraction studies.
 - ◆ Government to investigate including provisions for data quality in Hospital Service Agreements



Data Quality and Case Mix Measurement

- United States initiatives:
 - The False Claims Act has proven to be one of the most effective tools in fighting Medicare and Medicaid fraud
 - ◆ Must repay three times the amount of damages suffered by the government
 - Fraud:
 - ◆ Billing for services not furnished;
 - ◆ Misrepresenting the diagnosis to justify payment;
 - ◆ Unbundling or “exploding” charges
 - Abuse:
 - ◆ Providing medically unnecessary services or services that do not meet professionally recognized standards
- Since the False Claims Act was amended, the government has recovered more than \$3.5 billion
 - ◆ Results are publicly reported



Data Quality and Case Mix Measurement

- Medicare Integrity Program:
 - ◆ Coordination of Benefits Contractor
 - Coordinating Medicare benefits with private insurers
 - Determining costs and reimbursement amounts
 - ◆ Statistical Analysis Contractor
 - Comprehensive ongoing analysis of trends, utilization data, and other information which will assist in the detection of abusive and/or fraudulent behavior
 - ◆ Program Safeguard Contractor
 - Focused medical review / Cost report audits
 - Identify inappropriate billing for services
 - Identify overutilization, abusive billing, and inappropriate care



Data Quality and Case Mix Measurement

- Summary
 - ◆ Other users of the data need high quality / accurate data !!
 - ◆ Clear links between financial incentives, DRG, and coding practices
 - ◆ Data quality is very important to the integrity of the case mix system used for hospital payment
 - Poor data quality most affects teaching hospitals
 - ◆ Multiple perspectives on how to address
 - Education
 - Monitoring
 - Enforcement
 - Reporting
- Each country is developing it's own strategy for improving, or maintaining, data quality for case mix measurement in DRG hospital financing systems



Data Quality and Case Mix Measurement

- Questions