NSW Health is able to deliver best health outcomes and most advanced medical research outputs when it operates together as a 'whole of system'.

That is when all parts of the system and all organisations within it are able to work together, learn together and continuously improve what they do.

Our contribution to this is through:
- Managing high quality state-wide data collections
- Producing state-wide comparative performance reports
- Adding value through statistical analysis of performance data
Inpatient Data

- Well developed, mature data collection (Admitted Patient Data Collection)
- Based on event-level data collected from hospitals’ patient administration systems through automatic data extracts
- Stored in LHD and statewide data warehouses (Health Information Exchange, Enterprise Data Warehouse, SAPHARI)
- Widely used for planning, funding, performance reporting, research, public health surveillance etc.

Useful public access resources:
Inpatient Data (cont.)

- Usually analysed separately for:
  - Acute inpatients (excluding MH)
  - Subacute inpatients
  - Mental Health patients

- Four focus areas for HSIPR (Acute Inpatients):
  - Length of stay in hospitals
  - Unplanned readmissions to hospital
  - In-hospital mortality
  - High users of health services
Length of Stay

- ‘Classic’ performance indicator for inpatient services
- Widely used across the system
- Most common reporting methods:
  - Unadjusted ALOS by peer group, facility, specialty, DRG...
  - Adjusted for ‘uncontrollable’ factors to enable more meaningful comparison across hospitals
Length of Stay – Ten Year Trend

Acute Episodes (*number of episodes*) and Overnight ALOS (*days*)
NSW Public Hospitals (source: HIE)

Overnight Episodes
Day Only Episodes
Overnight ALOS

45.7%
48.0%
Length of Stay Reporting – Example 1


Features:

- Unadjusted average length of stay
- Compared to peer group average
- Focus on ‘top 10 DRGs’ admitted through EDs
- Updated quarterly

Contact: [Julie.Lieknins@doh.health.nsw.gov.au](mailto:Julie.Lieknins@doh.health.nsw.gov.au)
Relative Stay Index – what is it?

- Used in National reporting to compare length-of-stay performance
- Methodology refined over more than 10 years
- Adjusts length-of-stay results to remove the impact of patient characteristics which are largely ‘uncontrollable’
- Adapted here for use in clinical environments
Adjusting for Uncontrollable Factors

Hospital peer groups; DRG; Age groups; Admission urgency

Unadjusted Average Length of Stay – LHD

LHD 1:

ALoS vs NSW = +5%

LHD 2:

ALoS vs NSW = +5%

Adjusted Average Length of Stay

LHD 1:

RSI = 0.5%

LHD 2:

RSI = 5.5%

LHD 1 serves older patients
LHD Level Results

Average Length of Stay Variance
By LHD, 12 Months to March 2014

<table>
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<tr>
<th>LHD</th>
<th>Variation (BD=Total Saved/Excess Bed Days)</th>
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<td>Sydney</td>
<td>+ 7.62% (BD= 27,802)</td>
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<td>Murrumbidge</td>
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Report Structure – Drill Down

LHD Result + 4%

Facilities

SRGs

DRGs
Relative Stay Index report

Features:
- Adjusted average length of stay
- Compared to state average
- Enables drill-down to facilities, SRGs and DRGs
- Updated quarterly (rolling 12-month periods)
- Distributed to LHDs via CE
- Contact: Ben.Smith@doh.health.nsw.gov.au
Unplanned Readmissions (within 28 days)

- In 2013-14, there were 78,000 readmissions within 28 days of the initial discharge from hospital.
Unplanned Readmissions (within 28 days)

- Complex indicator, often misunderstood
- Only a portion of unplanned readmissions (<20%) could be considered to be result of inadequate/substandard care received during initial hospital stay
- Complex factors at play – chronic illness, follow-up care in the community, socio-economic factors etc.
- Rate increases with: age, comorbidities, rurality/remoteness, Aboriginality, socio-economic status
- Joint review under way with the CEC and a group of LHD Directors of Clinical Governance
- Contact: Kathy.Smith@doh.health.nsw.gov.au
In-hospital Mortality (work in progress)

- Based on emerging national standards (Australian Commission for Safety and Quality in Healthcare)
- Used as flags for further exploration rather than definitive ‘performance indicators’
- Three types of routine indicators:
  - Hospital Standardised Mortality Ratio (HSMR)
  - Deaths in Low Mortality Diagnostic Related Groups (DLMDRG)
  - Condition Specific Mortality Indicators
    - Acute Myocardial Infarction (AMI)
    - Stroke
    - Fractured neck of femur
    - Pneumonia

Contact: Baohui.Yang@doh.health.nsw.gov.au
HSMR - hospitals in NSW

Hospitals with predicted deaths less than 0.2 are suppressed from the graph.

Data source: HIE JUL2012 to JUN2013
Data source: HIE JUL2012 to JUN2013

Note
Number of Lower Level 1 flags: 4
Lower Level 1 flags reached at: 04AUG2012, 10SEP2012, 13AUG2012, 20APR2013

Number of Lower Level 2 flags: 2
Lower Level 2 flags reached at: 06AUG2012, 11SEP2012
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High Users of Health Services (1)

Methods

- Obtain a ‘linked data set’ which enables combined analysis of admitted patient and ED services
- Assign an NWAU value to each record and add up NWAUs for each individual patient
- Order the patients from highest total NWAU in a year to lowest total NWAU in a year
- Determine top 1% and to 5% cut off points
- Multiply NWAU values with the State price to provide an approximation of cost associated with the services provided to each patient
- Using detailed information contained in each patient record, break the 1% and 5% cohorts into subgroups to analyse demographic, geographic and clinical features of each group

Notes:
- ‘Nursing home type’ patients and ‘ED only’ admissions were excluded
- Chemotherapy and renal dialysis patient were included
- Justice Health was excluded
High Users of Health Services (2)

Preliminary Results (using 2011-12 data)

- The top 1% of acute hospital users account for 10% of the total Health Budget and equate to 16,596 patients
  - 45% are 65 years and over
  - 94% were admitted to hospital more than once
  - 8% have died in hospital
  - 58% are female
  - Top 10 SRGs (69%) – Tracheostomy, Acute Psychiatry, Orthopaedics, Vascular Surgery, Qualified Neonate, Haematology, Non Subspecialty Surgery, Respiratory Medicine, Non Subspecialty Medicine, Cardiothoracic Surgery

- The top 5% of acute hospital users account for 22% of the total Health Budget and equate to 82,982 patients
  - 54% are 65 years and over
  - 91% were admitted to hospital more than once
  - 6% have died in hospital
  - 53% are female
  - Top 10 SRGs (64%) - Orthopaedics, Acute Psychiatry, Respiratory Medicine, Non Subspecialty Medicine, Neurosurgery, Colorectal Surgery, Cardiothoracic Surgery, Vascular Surgery, Tracheostomy, Non Subspecialty Surgery
Inpatient data is routinely collected, rich and widely used, locally and state-wide.

New ‘data visualisation tools’ are making the data more readily available to clinicians.

Statewide comparative reporting and statistical analysis can generate new insights and point to areas for local investigation and action as well as statewide policy/program development.

MoH performance reporting tends to focus on activity, efficiency (e.g. length of stay), quality (e.g. unplanned readmissions, mortality) and service use (e.g. high users).

Feedback and ideas are welcome:

Zoran.Bolevich@doh.health.nsw.gov.au