A Journey Towards Enhanced Data Quality in Healthcare

Presented by:

Dr Zoran Bolevich
Director – Demand and Performance Evaluation
NSW Ministry of Health

20 November 2011

NSW GOVERNMENT Health

Overview

- Introducing NSW Health
- Importance of data quality in healthcare
- Common data quality issues and their causes
- NSW Health data quality framework
- Examples of strategies being pursued
- Learnings so far
- The road ahead

NSW GOVERNMENT Health

NSW GOVERNMENT Health

NSW GOVERNMENT Health

NSW Health

- Australia's largest state-based health system
- Serving the population of 7.3 million
- 2.5 million emergency department attendances per year
- 1.6 million hospital admissions per year
- 26 million non-admitted service occasions per year
- One of Australia's largest employers: more than 100,000 full-time equivalent employees
- Recurrent expenditure budget of $16.4 billion in 2011-12
- Capital expenditure budget of $1.1 billion in 2011-12
- 220 public hospitals, 500 community health centres, 220 ambulance stations....

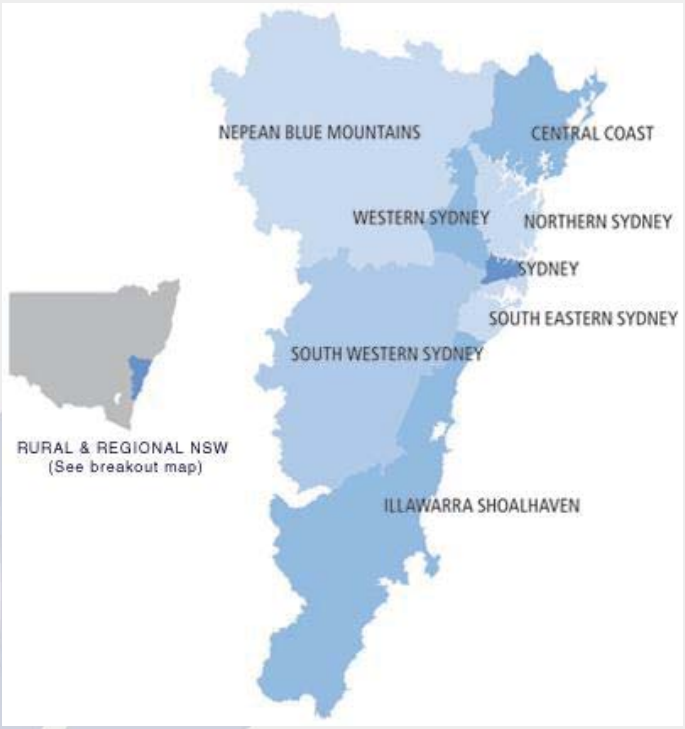
NSW GOVERNMENT | Health

Structure of NSW Health

- NSW Ministry of Health
- 15 geographically-based Local Health Districts
  - each responsible for a number of public hospitals
- Three specialist health networks
- Ambulance service
- Four specialised agencies (clinical quality, clinical innovation, workforce development, public reporting)

NSW GOVERNMENT | Health

Metropolitan NSW Local Health Districts



NSW GOVERNMENT Health

Rural and Regional Local Health Districts

NSW GOVERNMENT Health

Healthcare Data

- Clinical data
  - Patient level transactions
  - Clinical observations
- Corporate data
  - Financial data
  - Workforce data

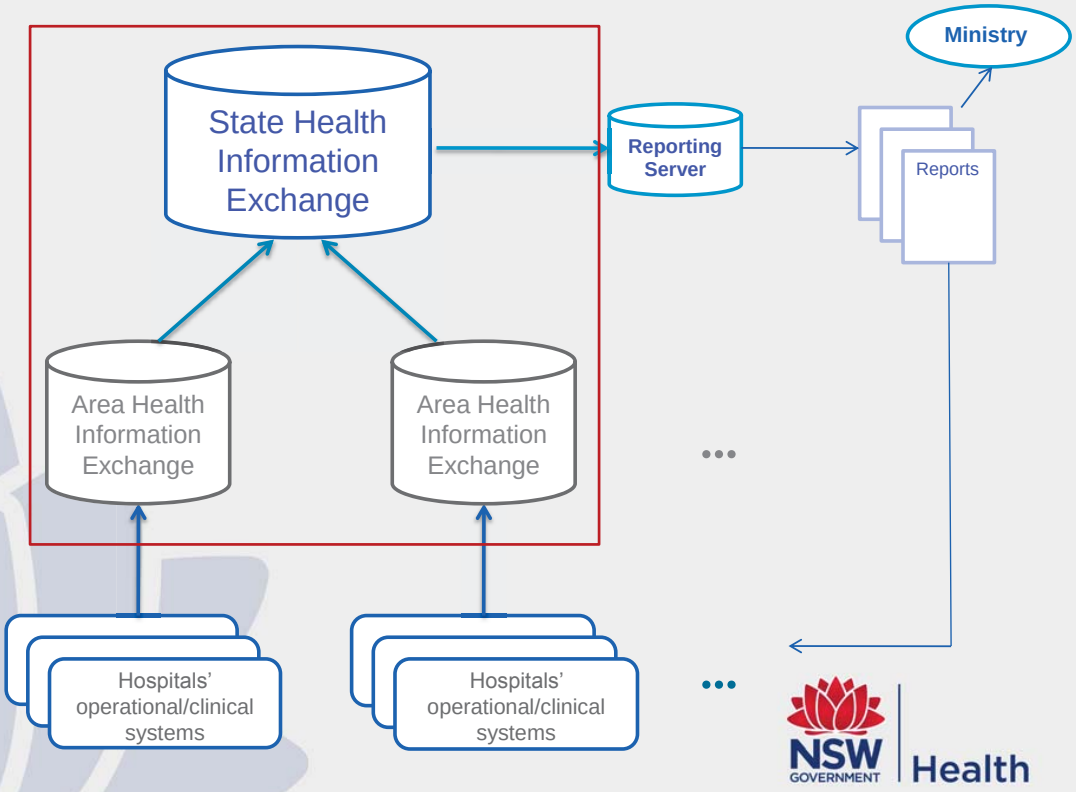
NSW GOVERNMENT Health

Uses of Clinical Data

- Primary use
  - Provision of clinical care to patients and families
- Secondary uses
  - Research
  - Public health surveillance
  - Service management
  - Service planning / policy development
  - Allocation of funds
  - Performance monitoring
  - Public accountability

NSW GOVERNMENT Health

NSW Health's Information Management Architecture



Importance of Data Quality

- Clinical decision making
- Managerial decision making
- Accuracy of long term projections and plans
- Activity based funding
- Accuracy of performance assessments
- Public reporting of health data

NSW GOVERNMENT Health

Performance Indicators

- Activity *(e.g. number of emergency department attendances, number of cost-weighted admissions)*
- Safety and quality *(e.g. hospital acquired infections, unplanned readmissions, in-hospital mortality)*
- Service access and patient flow *(e.g. time spent in EDs, length of stay in hospital, waiting times for elective surgery)*
- Population health *(e.g. immunisation rates, low birth weight babies, avoidable hospital admissions etc.)*

NSW GOVERNMENT | Health

Activity Based Funding

New South Wales - Activity Based Funding - Monitoring of Activity against Targets

	August 2011 (12.1% uncoded)				YTD August 2011 (7.9% uncoded)				Jul-11 to Jun-12	YTD Aug-11
	Actual	Target	Variance	%Variance	Actual	Target	Variance	%Variance	Target	Avg. Weight Actual
Acute Admitted Activity* (Weights)	113,234	107,078	6,155	5.7%	220,034	214,944	5,090	2.4%	1,236,197	1.26
Planned Surgery	25,229	24,018	1,211	5.0%	48,104	47,531	573	1.2%	273,642	1.55
Other surgery (incl. Unplanned)	25,965	24,453	1,513	6.2%	50,220	48,438	1,782	3.7%	281,901	3.16
Medical	48,921	46,147	2,774	6.0%	95,901	93,480	2,421	2.6%	534,833	0.95
Procedural	6,514	6,129	385	6.3%	12,840	12,516	324	2.6%	70,147	0.83
Obstetrics	6,604	6,332	272	4.3%	12,968	12,979	-10	-0.1%	75,672	1.15

	Actual	Target	Variance	%Variance	Actual	Target	Variance	%Variance	Target	Actual
Acute Admitted Activity* (Weights)	113,234	107,078	6,155	5.7%	220,034	214,944	5,090	2.4%	1,236,197	1.26
Murrumbidgee	2,255	2,225	29	1.3%	4,405	4,367	38	0.9%	25,536	1.08
Southern NSW	1,123	1,122	1	0.1%	2,204	2,251	-47	-2.1%	13,295	1.08
Far West	463	404	59	14.5%	862	791	71	9.0%	4,894	0.91
Western NSW	3,641	3,305	336	10.2%	6,875	6,597	278	4.2%	38,604	1.09
Hunter New England	14,151	12,532	1,619	12.9%	27,321	25,032	2,289	9.1%	147,152	1.29
Mid North Coast	3,525	3,395	130	3.8%	6,900	6,885	15	0.2%	39,303	1.17
Northern NSW	4,883	5,035	-152	-3.0%	9,598	10,313	-715	-6.9%	56,656	1.05
Central Coast	5,273	5,409	-136	-2.5%	10,429	10,818	-389	-3.6%	62,398	1.18
Northern Sydney	10,012	9,734	279	2.9%	18,997	19,189	-193	-1.0%	109,999	1.33
Sydney Children's Health Network	4,641	4,706	-65	-1.4%	9,133	9,179	-46	-0.5%	51,851	1.16

NSW GOVERNMENT | Health

Targets, Targets, Targets...

KPIs		Target	Not Performing X	Underperforming ↘	Performing ✓
Safety and Quality					
Tier 1	Staphylococcus aureus bloodstream infections (SA-BSI) (per 10,000 occupied bed days)	2	> 2.5	> 2 and ≤ 2.5	≤ 2
Tier 1	Unplanned hospital readmissions: all admissions within 28 days of separation (%):	< Previous year	≥ 2% points above previous year	< 2% points above and ≥ previous year	< Previous year
Tier 2	ICU Central Line Associated Bloodstream (CLAB) Infections (number)	0	≥ 1	N/A	0
Tier 2	Incorrect procedures: Operating Theatre- resulting in death or major loss of function (number)	0	≥ 1	N/A	0
Tier 2	Mental Health: Unplanned readmission within 28 days (%)	13	≤ 20%	> 13% and < 20%	≤ 13
Patient Flow					
Tier 1	Off Stretcher Time - < 30 minutes (%)	90	< 75%	≥ 75% and < 90%	≥ 90%
Tier 1	Emergency Department Presentations: Triage 3 – treated within benchmark times (%)	75	< 70%	≥ 70% and < 75%	Target of 75% met or better
Tier 1	ED patients admitted, referred or discharged within 4 hours of presentation (%)	70	< 65%	≥ 65% and < 70%	≥ 70%

NSW GOVERNMENT | Health

Media, Political and Public Interest

Superbugs at hospitals revealed

SUE DUNLEVY The Australian October 28, 2011

Category Stories

Number Crunching: Levels of Staph Infections in Hospitals made Public

Data reveals long emergency ward wait

Posted November 08, 2011 13:48:08

1233 ABC

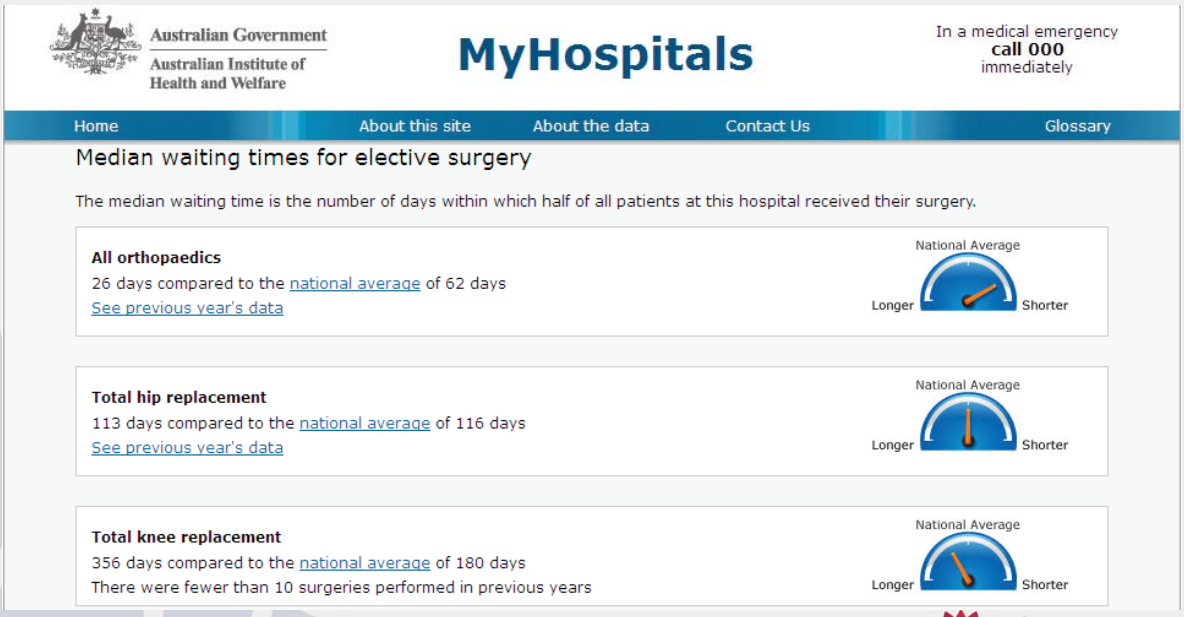
New NSW hospital bed figures questioned

Gov 2.0: health data becoming more accessible

Published on Wed, 02/11/2011, 01:15:45

NSW GOVERNMENT | Health

Public Reporting



NSW GOVERNMENT Health

Common Data Quality Issues

- Patient demographics (incl. Indigenous Status)
- Patient's "financial class"
- Emergency department arrival, triage and treatment times
- Admission sources
- Care type changes
- Clinical coding of discharge diagnoses

NSW GOVERNMENT Health

Error Rates

Collection	Number of records in 2009/10	Number of records with at least one critical error	Error rate
Emergency Departments	2,002,582	61,087	3.1%
Admitted Patients	1,465,977	4,780	0.3%
Waiting Lists	1,128,454	246	0.0%

- Current metrics are likely to seriously underestimate the problem!

NSW GOVERNMENT Health

Consequences

- Loss of revenue
- Lack of inter-hospital comparability
- Challenge to credibility of published performance data
- Reduced utility of data for planning and decision making

NSW GOVERNMENT Health

Common Causes of Data Quality Issues

- Complex processes
- Time critical nature of clinical processes
- Numerous data entry points and operators
- Workload pressures
- Lack of training
- Inadequacies of operational ICT systems
- Data extraction and transformation errors
- Data storage and use
- Definition/interpretation issues

NSW GOVERNMENT Health

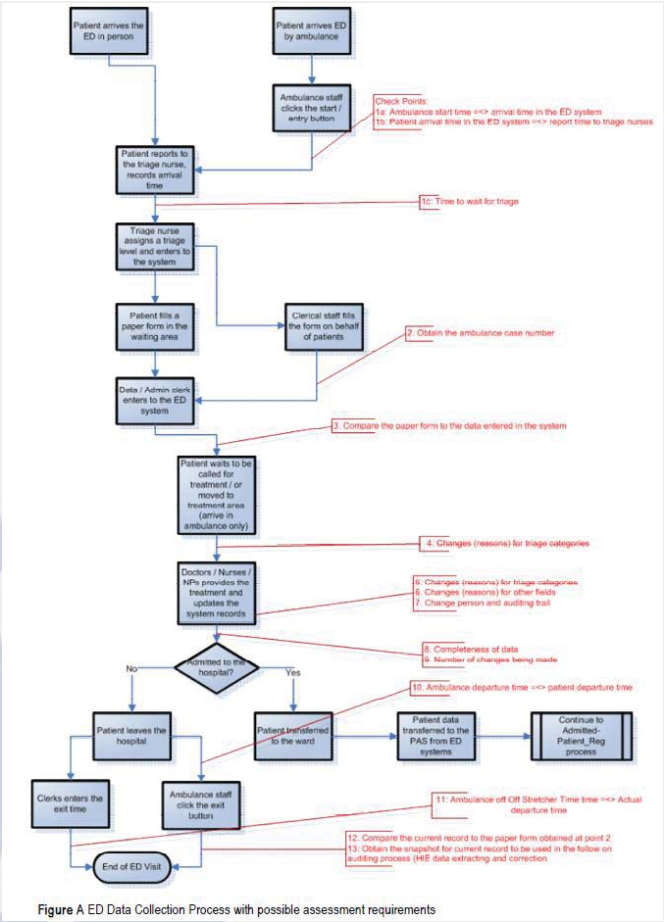


Figure A ED Data Collection Process with possible assessment requirements

NSW GOVERNMENT Health

Key Impacts on Data Quality Dimensions

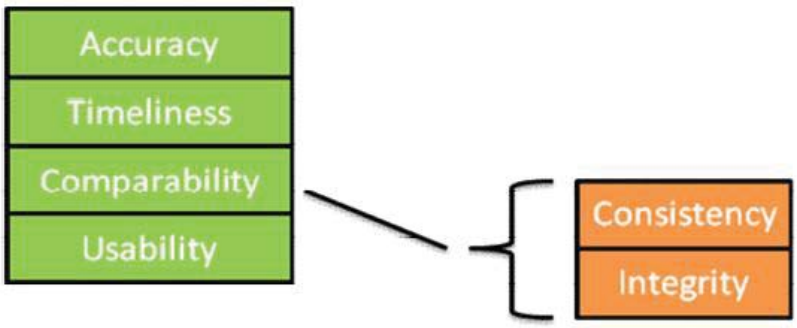


Figure 7 The Validity Dimension Decomposed

Source: Developed by the authors for this project

NSW GOVERNMENT Health

Data Quality Critical Success Factors

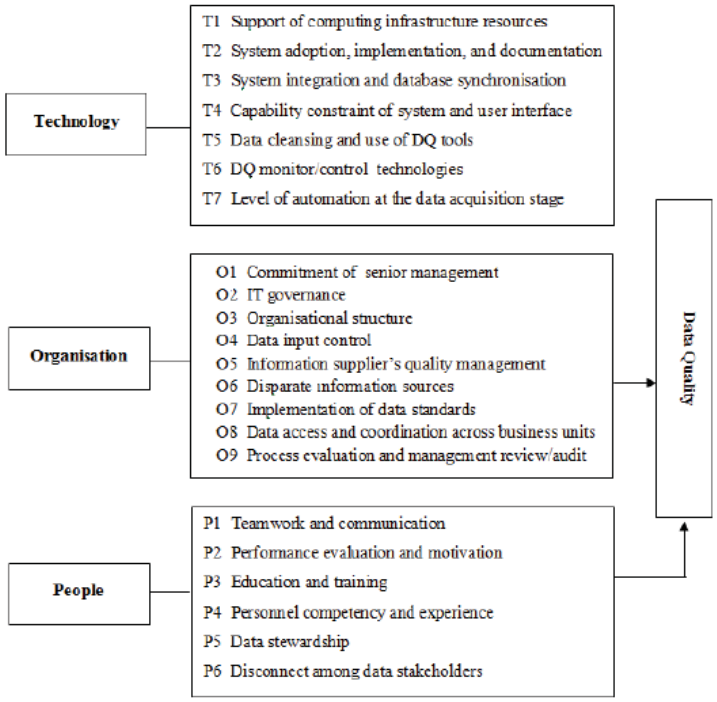
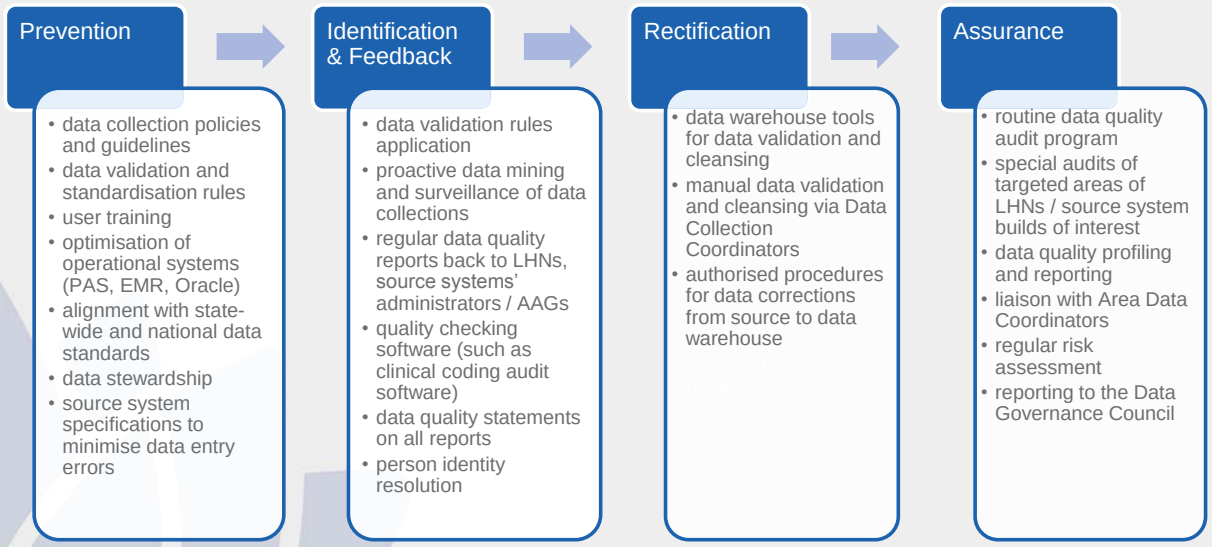


Figure 3 TOP Data Quality CSFs

Source: Lin, Koronios & Gao (2007)

NSW GOVERNMENT Health

NSW Health's Data Quality Framework



NSW GOVERNMENT | Health

Preventative Strategies

- New/updated data collection guidelines (e.g. bed counting, admission policy)
- Working with ED system vendor to enhance data entry controls
- Training of clinical coders (incl. audit training)
- Reviewing and enhancing ETL processes

NSW GOVERNMENT | Health

Identification and Feedback Strategies

- Data coordinators (subject matter expertise)
- Implementation of a data profiling tool
- Dedicated data quality analyst
- Data quality scores reported back to Local Heath Districts
- Software tool for checking quality of clinical coding – reported back to Local Health Districts

NSW GOVERNMENT | Health

Rectification Strategies

- Manual intervention by local and central data coordinators
- Data warehouse hygiene (data cleansing scripts run monthly)
- Data cleansing routines built into the new Enterprise Data Warehouse

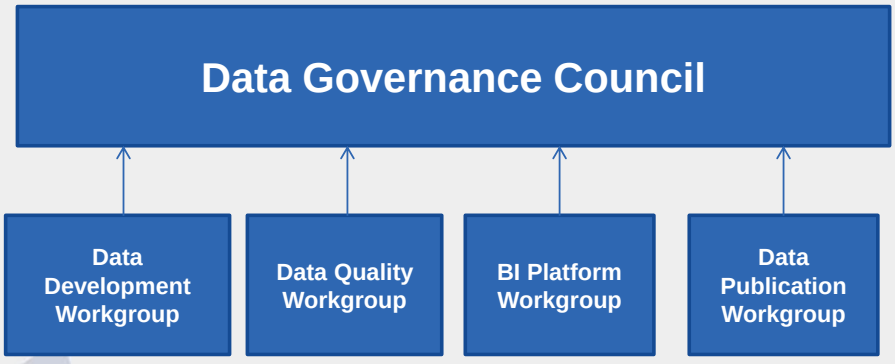
NSW GOVERNMENT | Health

Assurance Strategies

- Routine data quality audit program
  - External, third party provider
  - Three year cycle of audits
  - Continuous quality improvement approach
- Special (issue-based) audits and reviews
- Governance processes

NSW GOVERNMENT Health

Data Governance Model



- Data and KPI definitions
- Alignment with national definitions
- Development of new collections
- Rationalisation of existing collections
- Metadata and master data oversight
- Data asset register
- Data policy reviews

- Oversight of DQ audit program
- Maintenance of DQ framework
- Data coordinators' input
- Definition of data validation rules
- Oversight of rectification of IT defects causing data quality issues

- Oversight of BI support function
- Access and security policies
- Prioritisation of improvements and future developments
- BI 'design authority'
- BI metadata management

- Oversight of all forms of data publication (web, reports, tools, documents)
- Strategic approach to statistical documents
- Input into NSW State Statistical Plan
- Development and oversight of publication standards

NSW GOVERNMENT Health

Learnings So Far

- Importance of communication and executive level support
- Alignment of objectives
- Culture of openness
- Balance between audit and continuous quality improvement
- [illegible]
- People and processes first, followed by technology
- Importance of vendor management

NSW GOVERNMENT Health

The Road Ahead....

- Governance Council
- Audit program
- Data profiling
- Communication strategy
- New data warehouse
- Vendor relations

NSW GOVERNMENT Health

NSW GOVERNMENT Health