Big Data and Healthcare Analytics

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Big Data and Healthcare Analytics – Why Now?

- More data

- Linked data

- New data

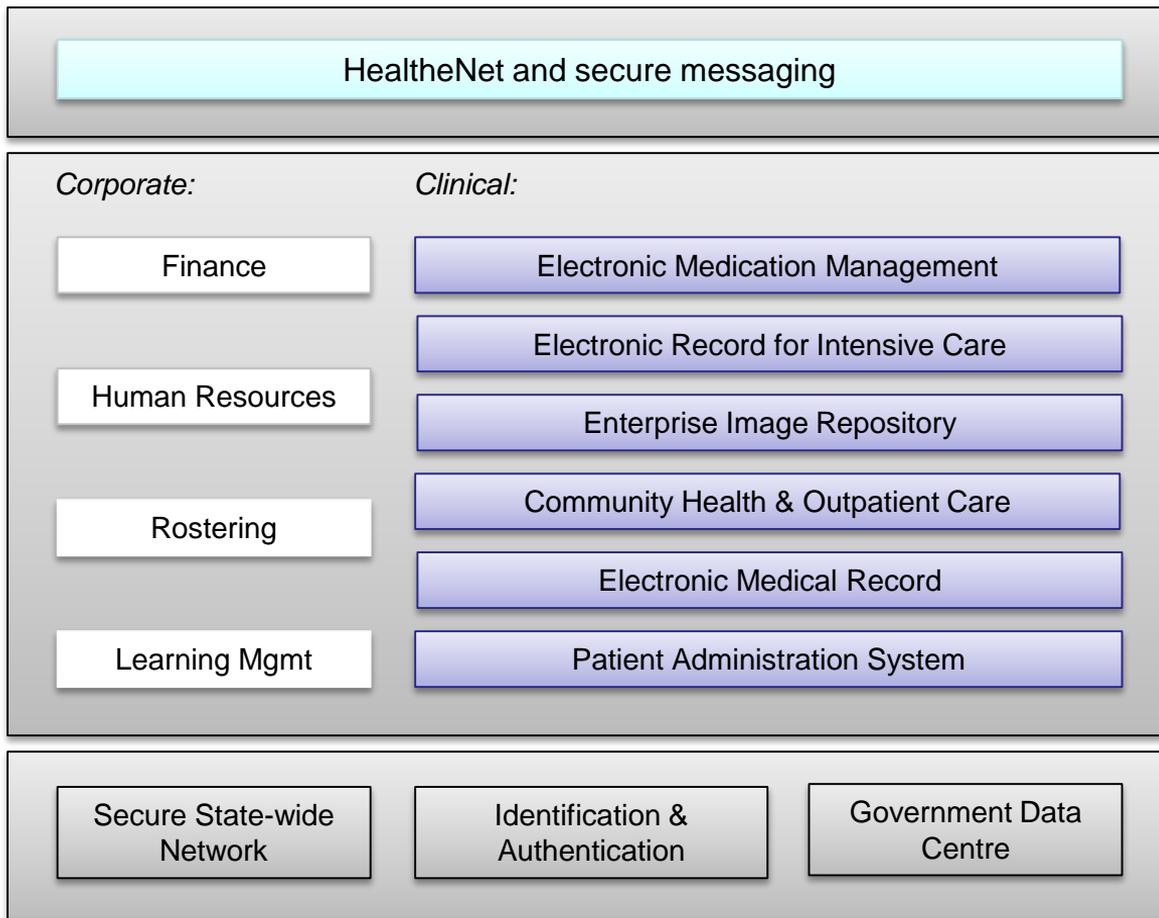- Growing need/motivation to use data

More Data – NSW Health

- More than 20 well established state-wide data collections (and growing)

- Electronic Medical Record systems in most hospitals

- New systems (clinical and corporate) and increasing functionality of existing ones

State Wide Integration and Data Sharing
(integrating care)

HealtheNet and secure messaging

State Wide Applications
(a standard approach)

Corporate:

Finance

Human Resources

Rostering

Learning Mgmt

Clinical:

Electronic Medication Management

Electronic Record for Intensive Care

Enterprise Image Repository

Community Health & Outpatient Care

Electronic Medical Record

Patient Administration System

State Wide Infrastructure
(a solid foundation)

Secure State-wide Network

Identification & Authentication

Government Data Centre

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Linked Data – NSW Health

- The Centre for Health Record Linkage (CHeReL)
  - Established in 2006
  - Dedicated population data linkage unit for NSW and the ACT
  - Contains over 107 million records from 20 frequently requested datasets
  - Has been used by over 1,370 investigators to-date and attracted more than $70 million to NSW
  - Around 45 new projects with 225 investigators are approved each year (currently: 180 active data linkage projects)
- Expanding range of data sets being linked

New Data – NSW Health

- Biometric data

- Bioinformatics data (e.g. genomic)

- Patient Reported Measures

- Integrated care (incl. aged care and social care; risk stratification; shared care plans)

- Social media

- Internet of 'healthcare things'

Patient Reported Measures

Enabling patients to provide direct, timely feedback about their health related outcomes and experiences to drive improvement and integration of health care across NSW.

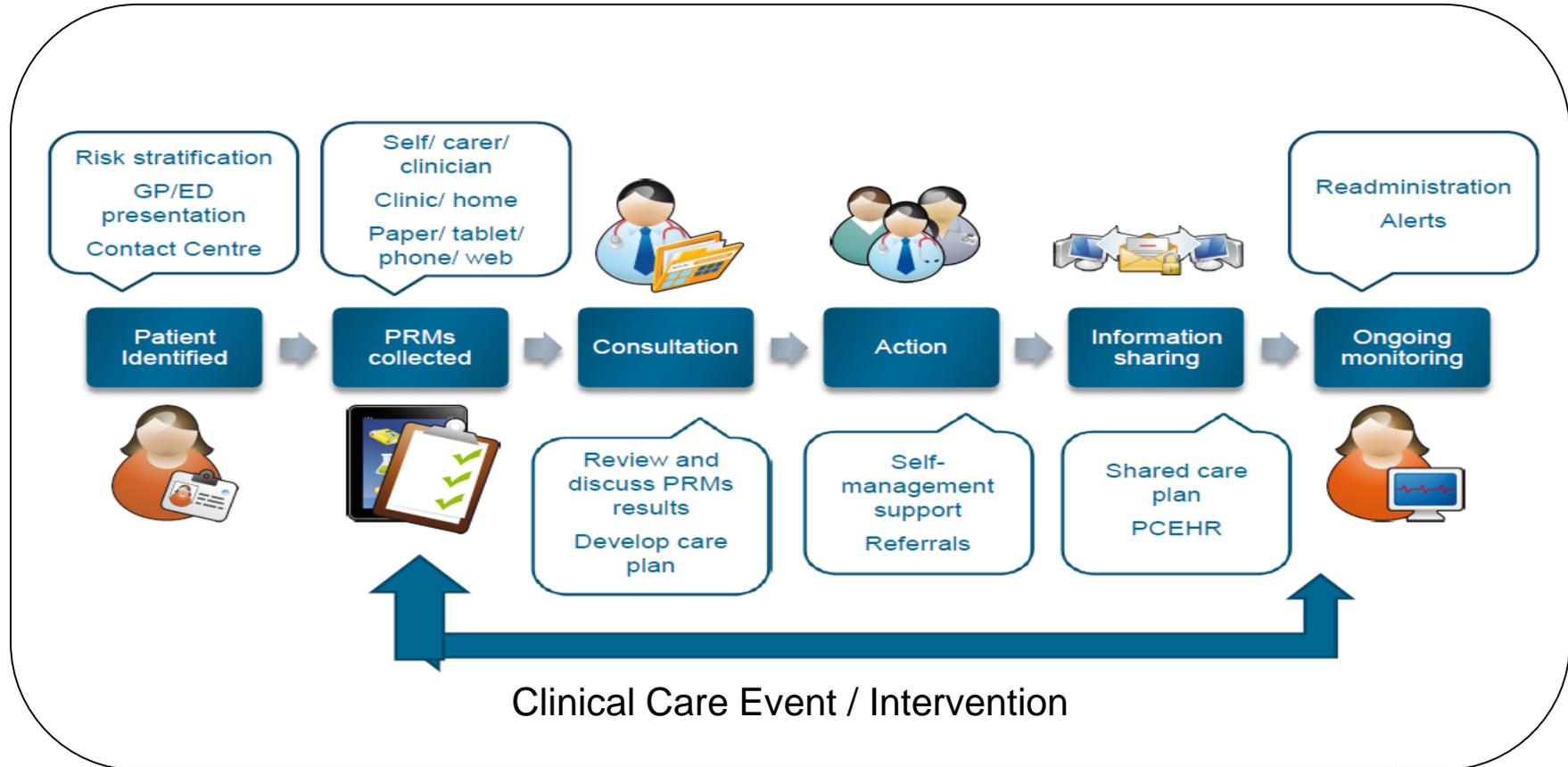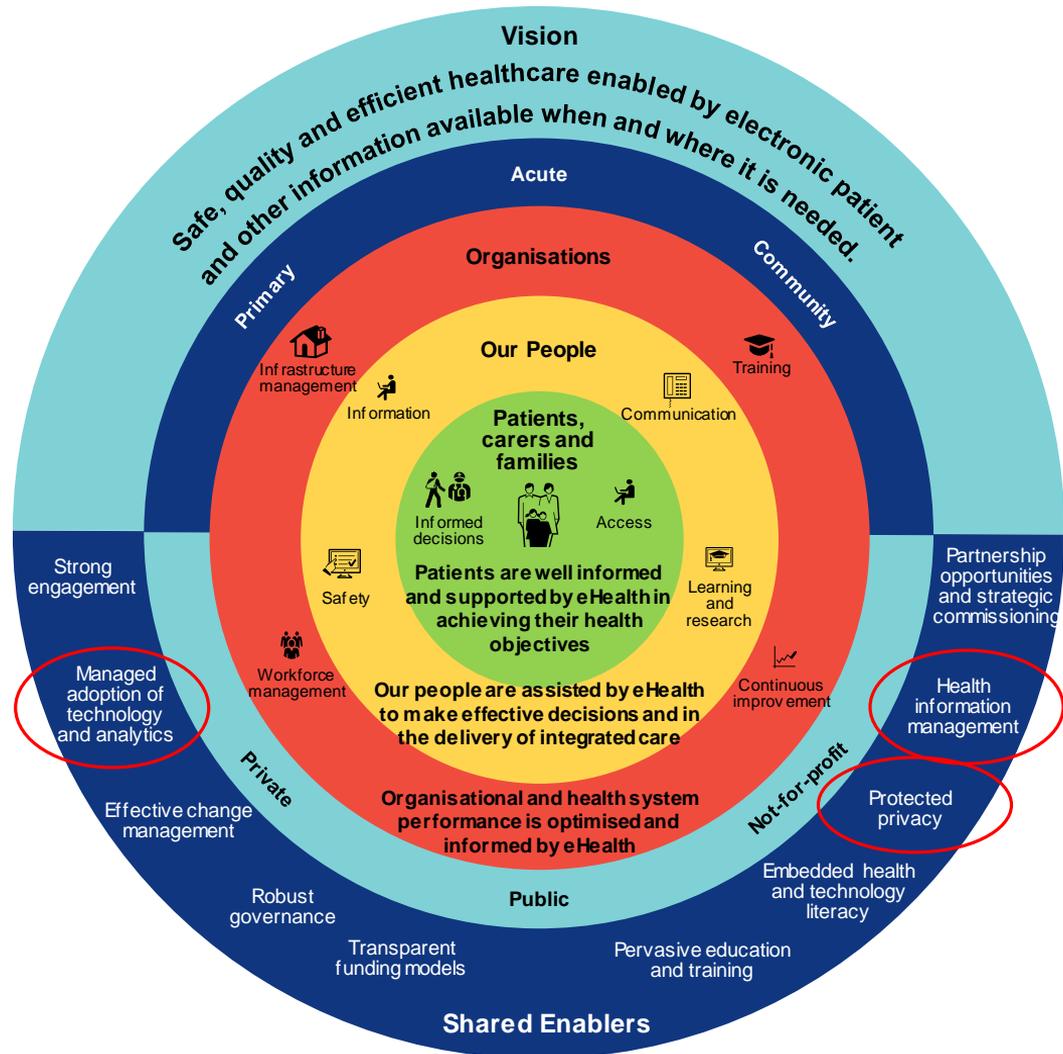| Individual	Improve quality of care by informing care planning and management
Service	Identify what is working well and areas for improvement
System	Evaluate system of integration and outcomes (the Integrated Care Strategy)

Example: Proposed PRMs Scenario in Clinical Practice

Clinical Care Event / Intervention

Source: Agency for Clinical Innovation

Vision

Safe, quality and efficient healthcare enabled by electronic patient and other information available when and where it is needed.

Acute

Organisations

Primary

Community

Our People

Infrastructure management

Information

Communication

Training

Patients, carers and families

Informed decisions

Access

Safety

Learning and research

Workforce management

Continuous improvement

Patients are well informed and supported by eHealth in achieving their health objectives

Our people are assisted by eHealth to make effective decisions and in the delivery of integrated care

Strong engagement

Partnership opportunities and strategic commissioning

Managed adoption of technology and analytics

Health information management

Organisational and health system performance is optimised and informed by eHealth

Private

Effective change management

Protected privacy

Not-for-profit

Robust governance

Embedded health and technology literacy

Public

Transparent funding models

Pervasive education and training

Shared Enablers

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Growing Need/Motivation to Use Data

- Activity Based Funding

- Process optimisation (incl. predictive capabilities)

- Safety and quality agenda

- Unwarranted clinical variation

- Integrated care

- Local innovations in clinical (and other) analytics

- Health/Medical research agenda

- Consumer demand

Responses to Data Opportunities – NSW Health

- New tools (e.g. Activity Based Management Portal; Patient Flow Portal)

- New data management platforms (e.g. data warehouses; secure research environment)

- New partnerships (health providers + central agencies + universities/researchers + vendors)

- Workforce development

  - E.g. 45 highly specialised biostatisticians trained in partnership with the Biostatistical Collaboration of Australia; further 16 in training this year
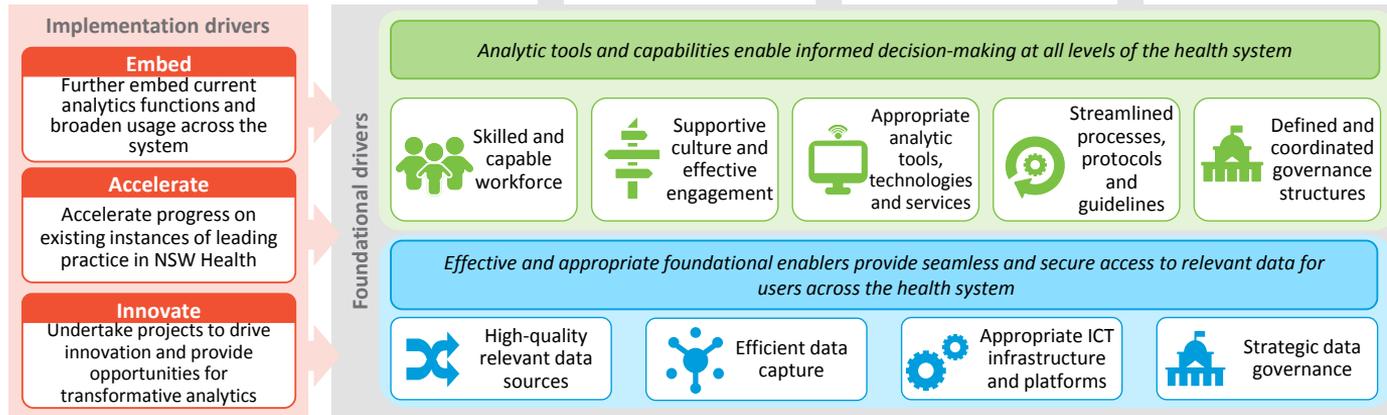
Draft NSW Health Analytics Framework

NSW Health Analytics Framework
Transformed health through data and insights
Analytics will enable NSW Health to provide world-class and truly integrated healthcare,
by delivering data and insights that support evidence-based decision making, planning and performance

The NSW Health Analytics Framework will have strong links to whole-of-government initiatives to drive a coordinated approach to analytics.

Benefits

Consumers	Clinicians	Heath and other services	Health system	Population
Empowered consumers are enabled to make the right health care choices and have access to better value care	Highly informed clinicians are able to continually improve clinical practice through timely access to data and information	Informed providers maximise workforce resourcing and financial efficiency to provide better value and higher quality care	The NSW Health system operates at an optimal level through greater transparency on the quantity and quality of services	The NSW population has improved health and well-being through better risk factor prediction and management of population-level health programs or interventions

Implementation drivers

Embed
Further embed current analytics functions and broaden usage across the system

Accelerate
Accelerate progress on existing instances of leading practice in NSW Health

Innovate
Undertake projects to drive innovation and provide opportunities for transformative analytics

Foundational drivers

Analytic tools and capabilities enable informed decision-making at all levels of the health system

- Skilled and capable workforce
- Supportive culture and effective engagement
- Appropriate analytic tools, technologies and services
- Streamlined processes, protocols and guidelines
- Defined and coordinated governance structures

Effective and appropriate foundational enablers provide seamless and secure access to relevant data for users across the health system

- High-quality relevant data sources
- Efficient data capture
- Appropriate ICT infrastructure and platforms
- Strategic data governance

Definition: health analytics is the use of data, technology and quantitative and qualitative methods aimed at gaining insight for making informed decisions to improve health outcomes and health system performance.

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