




**Big Data, Big Challenges:
Building Health and Business
Analytics Capabilities**

INTEGRATED HEALTHCARE PROVIDER PERSPECTIVE

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Our Vision, Purpose and Values

Vision: *Better health. Best in health care.*

Purpose: To improve the health of the population and the quality of life of the people we serve.

Values: **Respect, caring and trust** characterize our relationships.



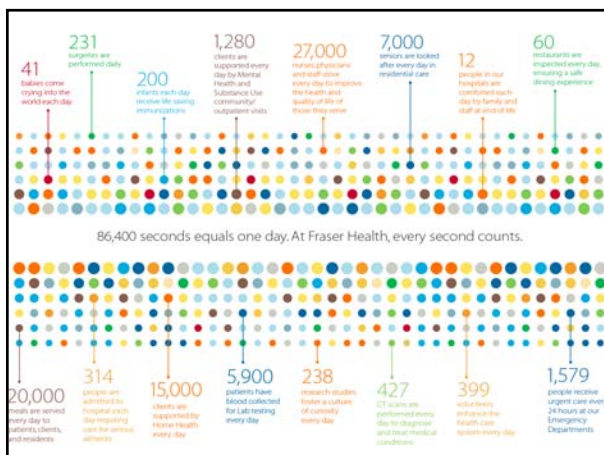

86,400
seconds equals one day.

At Fraser Health,
every second counts.





BC's largest and fastest growing health authority



Sea of Health Data

1. Web and social media data: Clickstream and interaction data from social media such as Facebook, Twitter, LinkedIn, and blogs. It can also include health plan websites, smartphone apps, etc.
2. Machine-to-machine data: Readings from sensors, meters, and other devices.
3. Big transaction data: Health care claims and other billing records increasingly available in semi-structured and unstructured formats.
4. Biometric data: Fingerprints, genetics, handwriting, retinal scans, and similar types of data. This would also include X-rays and other medical images, blood pressure, pulse and pulse-oximetry readings, and other similar types of data.
5. Human-generated data: Unstructured and semi-structured data such as electronic medical records (EMRs), physicians' notes, email, and paper documents.⁹

9. Kalkman, A. a. (2013, January). What it will take to achieve the as-yet-unfulfilled promises of health information technology. Health Affairs, 32(1), 63-68

FHA Point of Service Systems collect Vast amounts of data

FH Clinical System Context - Meditech

- Meditech's largest single standardized database
- Master Person Index - 3 million persons
- Users - 24,250
- 55,000 Inpt. orders entered/month
- 56,840 diagnostic orders / month
- 180,857 new prescriptions / month
- 516,171 laboratory orders / month
- ITS reports - 900+ allied health reports / day
- EMR -
 - 18 transactions / second
 - 19,000 access / day

FH Clinical System Context - PARIS

- PARIS is the Community source of truth for registration and client history
- 290,000 referrals were migrated to populate PARIS with client history
- 15.8% migrated clients had multiple files across multiple systems
- 160,000 unique clients
- 2580 active PARIS users
- 4 major systems retired
 - CPIM (MH&SU)
 - CCIM (IHH)
 - AIMS (SUJ)
- Meditech Magic

Session Goals

- The Null Hypothesis**
- Building our Capabilities – Organizational, Informatics & Analytics**
- Challenge Vignettes**
- Our Learnings**

Null Hypothesis

The exponential proliferation of “data” and “data” mining and analytics technologies will rapidly outpace the capabilities of health care delivery systems, providers and stakeholders to effectively make sustainable differences in population health, health care quality and cost.

Session Goals



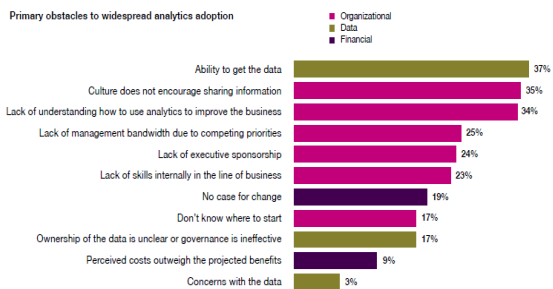
The Null Hypothesis

Building our Capabilities – Organizational, Informatics & Analytics

Challenge Vignettes

Our Learnings

Organizational factors are primary obstacles to analytics adoption



Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute of Business Value study. Copyright © Massachusetts Institute of Technology 2010. [Compare with Healthcare no. 116](#)

FHA Service Delivery Design Principles

Create seamless, person centered care and service delivery
Bringing parts into the whole - the process of linking together

INTEGRATION



STANDARDIZATION

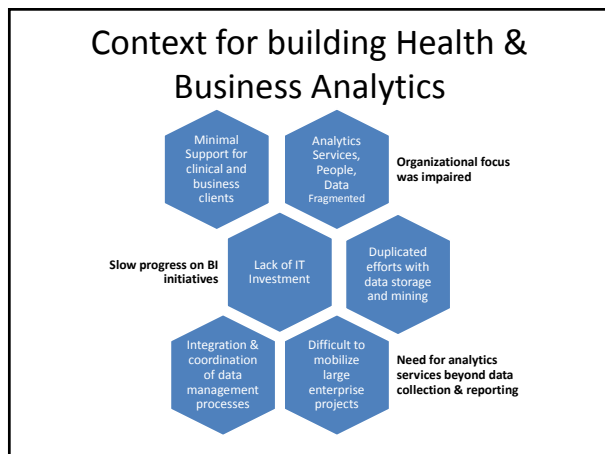
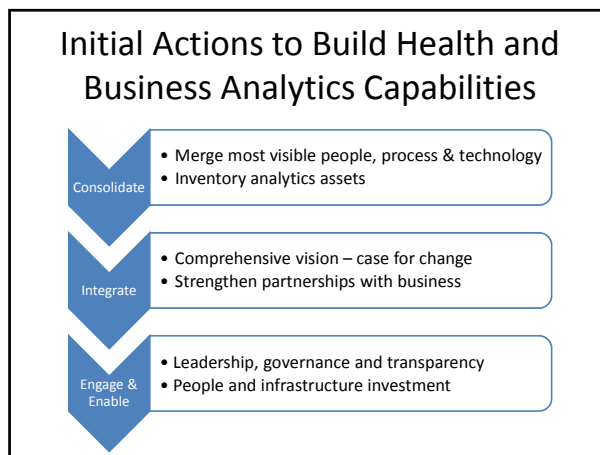
Reducing unnecessary variation
Improving Safety/Quality
Creating standard operating procedures, practices, pathways, guidelines and care maps

CONSOLIDATION

Increase alignment & efficiency
Sites/services/programs differentiated
Networks formed for communities & populations

FHA Information Management Capabilities

Enterprise Business Capabilities	Description
Healthcare Anywhere	Access to healthcare information services wherever and whenever it is needed.
Information without Boundaries	Seamless flow of information across organizational boundaries within the province of British Columbia.
Person Centric Information	Single view of a person across the continuum of care.
Technology Enabled Performance Management	Transparent, accountable and informed decision making at the person, population, program and organizational levels.
Informed Decision Making at the Point of Service	Convergence of information, methodology and technology supporting evidence-informed decisions at the point of service.
Data as a Strategic Asset	Data is treated as a strategic asset that has value to Fraser Health.
Success Through Partnerships	Fostering and enhancing progressive partnerships with vendors, service providers, business customers and the broader community.
Workforce Enablement	Empowering a transformed and collaborative workforce through the provision of innovative information management services and technologies.



Health and Business Analytics Unit

“Supporting change and transformation services to improve quality and organizational performance through enabling evidence based/informed decision making”

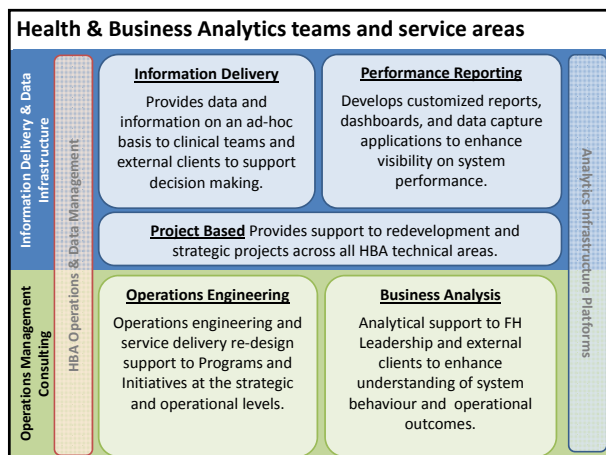
• Relevant • Accessible • Responsive • Transparent • Efficient

Integration of 3 distinct organizational areas:

- Operations Engineering & Management Consulting (Business Analysis and Process Improvement Services)
- Decision Support Services (Information Delivery and Performance Reporting)
- IM/IT Data Warehousing/Business Intelligence

Working in close partnership with:

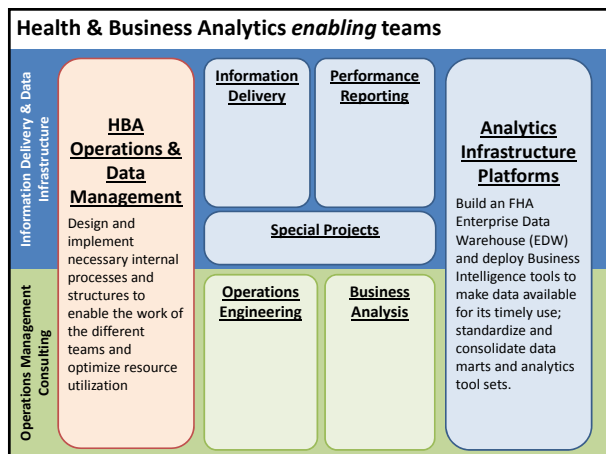
- Strategic Transformation Service (Change & Project Management Services, Strategy Consulting, Innovation)
- Knowledge Management & Business Systems
- Health Informatics
- Quality Improvement
- Clinical Research & Evaluation



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Challenge: Decreasing congestion levels and improving other high visibility indicators within 90-150 days

Context:

- Chronically high level of congestion (110% occupancy) at FH sites hit attention from the media and Minister of Health



Decreasing congestion levels and improving acute care patient access & flow to meet performance metrics within 90-150 days



Project Vignette: Taking Charge of Congestion

Challenge	Solution	Benefits
<ul style="list-style-type: none"> Media attention on high levels of congestion and other issues related with quality, access and patient safety increases pressures to boost a joint commitment between MOH and FH to achieve a significant improvement. Aggressive targets set to be met within 90/150 days in 8 metrics. Patients treated in non-clinically appropriate locations was an issue in 3 largest hospitals. Reduction in waits for hip fracture surgery for all sites. LOS an aggregated measure FH wide. 	<ul style="list-style-type: none"> FH Executive mobilized of all senior program leadership through a enterprise initiative task team led by a newly integrated function (VP-CCO), partnering with IT&S team. The support provided from the IT&S encompassed services from the whole range of analytics: from strategy definition, project management and change management consulting, to the actual definition and production of metrics at the different levels to guarantee the achievement of targets. 	<ul style="list-style-type: none"> The targets were mostly met within the established timelines. The alignment of all key stakeholders with key analytics supports proved to be a powerful combination. The team continues seeking further improvements in those metrics (new targets were set).

Building accountability through Quality Performance Management



Project Vignette: Quality Performance Management

Challenge	Solution	Benefits
<ul style="list-style-type: none"> Fraser Health decided to embrace an ambitious initiative to increase visibility on the most important quality performance indicators. Implement a balanced-scorecard type solution with a set of outcome-based indicators to monitor performance related to the top priorities of each Clinical Program. Establish an accountability framework for reporting to the FH Board and, ultimately, the public 	<ul style="list-style-type: none"> The VP of Medicine, Quality & Patient Safety, and the VP IT&S partnered with all Clinical VPs and their leads to develop a scorecard solution in which all 17 Clinical Programs established their most important KPI's under 5 dimensions (Access, Acceptability, Safety, Effectiveness and Efficiency). The solution involved both a strong business interaction to define their major indicators, and all analytics teams to design and implement, with the support of an external vendor, an automated BI application with 4 levels of drill down and writeback capabilities. 	<ul style="list-style-type: none"> Under a single platform, all programs have established and can now follow-up their most important Quality indicators, with their targets and reference performance. More than the application, the main benefit is the alignment of all indicators into a single area, where not only the visibility of current and past performance level is displayed, but more importantly the actions that the persons in charge of these areas are undertaking to improve performance, particularly in the areas where targets are not met.

Challenge: create a common language and tools for strategic management of quality and safety

Context:

- Multiple (disperse) sources of information regarding our performance, yet accountability is limited.



Why? A combination of factors: low visibility on the actions and commitments to improve performance added to the always competing priorities shift follow-up to new incoming priorities.

Session Goals



The Null Hypothesis

Building our Capabilities – Organizational, Informatics & Analytics

Challenge Vignettes

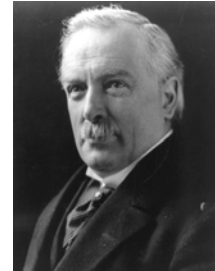
Our Learnings

Things we learned about our capabilities to leverage Health & Business Analytics

- **Analytics** – critical skill set for all/training needed at all levels, in all businesses
- **Data Governance** – policies, frameworks, real stewardship at program and enterprise level
- **Transparency Drives Action** – visibility greatly assists to close the loop on change
- **Usability of Analytics Tools** – toward self serve, real time dashboards, JIT, point of care

Closing Thought: David Lloyd George

“Never leap a chasm in two jumps”



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Questions about advancing big data beyond performance management

- ? Are we paying enough attention to data governance policy, data management processes in the structured data world? and the “unstructured internet of everything”
- ? How will industry clinical system/health information exchange vendors respond with clinical decision support solutions that leverage “big data”
- ? How will providers adopt and use “big data” clinical decision support solutions which appear to be another layer of clinical workflow on top of core clinical systems

*Comments
Questions?*