



Canada Health
Infoway

Inforoute
Santé
du Canada



Accelerating the Development and Implementation of Electronic Health Records (EHR) in Canada

Waterloo Smarter Health Seminar Series
University of Waterloo
November 23, 2005

Richard Alvarez, President and CEO
Canada Health Infoway

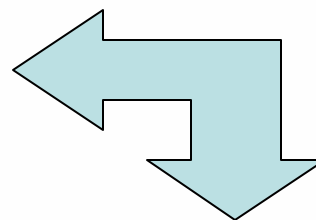
Creating Healthy Connections

Agenda

- The case for the Electronic Health Record
- Measuring Benefits
- Canada Health Infoway
 - Role
 - Progress
- Infoway Challenges and Priorities

Last Year, In Canada

- › **35 million Diagnostic Images**
- › **440 million Laboratory Tests**
- › **2.8 million Inpatient hospitalizations**
- › **382 million Prescriptions filled**
- › **3.4 million Vioxx Prescriptions in 2003 for patients that had to be contacted in 2004**
- › **322 million office-based physicians visits - 94% resulting in handwritten paper records**
- › **60,000 physicians faced 1.8 million new medical papers in 20,000 journals and 300,000 clinical trials**



About 2,000 health care transactions per minute, many quite complex, and all requiring documentation and information flow

**Information is the Lifeblood of our
Healthcare System!**

In spite of spectacular advances in medicine, the foundation of healthcare delivery is still primarily **paper-based**



Electronic Health Records

The International Scene

Most industrialized countries have recognized the need to implement electronic health record solutions quickly to improve the quality and safety of patient care and system efficiency

United States

United Kingdom

Australia

France

...and in Canada

Calls for Accelerated EHRs

The First Ministers continue to recognize the necessity of EHRs. In their “10-Year Plan to Strengthen Health Care”, they

Agreed **“to accelerate** the development and implementation of the electronic health record, including e-prescribing.”

Recommended a *National Pharmaceuticals Strategy* that would “broaden the practice of e-prescribing through **accelerated deployment** of the *Electronic Health Record*”

Health Council of Canada’s first report, which recommended an “immediate broadening of the use of IT”, saying

“electronic patient records will pay huge health dividends in improved patient safety and lives saved”. “Canada can and should achieve this goal for all Canadians in five years – not fifteen “.



And Why Not? The Stakes are High

The Reality Behind the Headlines

Adverse Events and Lack of Patient Data

For Every. In Canada
1000 hospital admissions	_____	75 people will suffer an Adverse Event
1000 patients with an ambulatory encounter	_____	20 people will suffer a serious Adverse Drug Event
1000 patients discharged from hospital	_____	90 people will suffer a serious Adverse Drug Event with the drugs received on discharge
1000 Laboratory tests performed	_____	up to 150 will be unnecessary

....continued

The Reality Behind the Headlines

Adverse Events and Lack of Patient Data

For Every. In Canada
1000 Emergency Department visits	————	320 patients had an information gap identified, resulting in an average increased stay of 1.2 hours
Study of 168 traditional medical records	————	81% lacked the information required for patient care decisions
1000 women at risk of cervical cancer	————	300-400 are not screened
1000 Canadians recommended for influenza protection	————	370-430 are not vaccinated

The Canadian Institute for Health Information (CIHI) estimates up to 24,000 deaths each year result from preventable adverse events in hospitals in large part due to incomplete information

Electronic Health Records

Healthcare in Canada – the Priorities

- Improving access
- Wait time reduction
- Health human resources
- Home care
- Primary care reform
- National pharmaceuticals strategy
- Public health
- Health innovation
- Aboriginal health
- Accountability

Ten Year Plan to Strengthen Health Care (2004)

“..... First Ministers agree to accelerate the development and implementation of the electronic health record, including e-prescribing. To this end, First Ministers commit to work with Canada Health Infoway to realize the vision of the electronic health record through an ambitious plan and associated investment.....”

This is the complex and rapidly changing environment into which *Infoway* has been challenged to introduce the electronic health record

Electronic Health Records

Electronic Health Records in Canada

Electronic health records give authorized providers rapid access to their patients' complete, up-to-date health information

An Electronic Health Record (EHR) is a secure and private lifetime record of an individual's key health history and care. It creates significant value, providing a longitudinal view of clinical information. The record is available electronically to authorized health care providers and the individual anywhere and anytime in the support of care

A network of interoperable electronic health record solutions is being implemented in Canada – one that links clinics, hospitals, pharmacies and other points of care

Will help improve Canadians' access to health services, enhance the quality of care and patient safety, and assist the healthcare system to become more efficient and effective.

EHR 

GME0000 Smith, Ethan (M/5 years) 25 Provincial Rd., Edmonton, AB T6M 4T4

Help

Logout

▼ Patient Record

- ▶ Summary
- Lab Results
- Diagnostic Images
- Details
- Notes/Comments

Patient Details



GME0000 Smith, Ethan

Sex: Male
DOB: 01/01/2000
Next of Kin: John Smith

Phone: 365 565 6969
Address: 25 Provincial Rd. Edmonton, AB T6M 4T4

Alerts

- Allergies - Peanuts
- Allergies - Strawberries

GP Details

Name: Jones, Evan
Phone: 333 445 5555

Address: 112 Territorial Ave. Edmonton, AB T6N 5R3

Medications

Date	Medication	Description
02/03	Hydrocortisone Cream 1%	Discontinued
04/03	Protogic Cream .03%	Apply to Affected Areas
03/03	Amoxicillin 250 mg	Discontinued
03/04	Amoxicillin 250 mg	Discontinued
04/04	Coclor 375 mg	Discontinued
10/04	Flovent 50 mcg	Two puffs twice/day
12/04	Sarvent 50 mcg	One puff twice/day

Medical History

Category Service Author

Advanced

Signature	Date	Status
Croup	11/01	Resolved
Eczema	02/03	Ongoing
Oral Media	04/03	Resolved
Oral Media	03/04	Resolved
Asthma	10/04	Ongoing
Chest X-rays	11/01	
CBC	03/03	

Encounter History

Date	Facility	Specialty	Clinician	Reason	Type
02/03	Children's Hosp.	Infectious Diseases	Brown	Croup	Inpatient x 2 days
04/03	Children's Hosp.	Dermatology	Matthews	Eczema	Outpatient
04/03	Children's Hosp.	ENT	Smith	Oral Media	Outpatient
03/04	Children's Hosp.	Emergency	Reynolds	Asthma	Emergency
04/04	Children's Hosp.	Respirology	Litman	Asthma	Outpatient
10/04	Children's Hosp.	Respirology	Litman	Asthma	Outpatient
12/04	Children's Hosp.	Respirology	Litman	Asthma	Inpatient x 2 days

Immunizations

Type	Date	Date	Date	Date	Status
Hep B	01/00				Complete
DTPPHb	03/00	05/00	07/00	07/01	Complete
DTPP					
HMR	01/01				
Varicella	01/01				
Pneumococcal	03/00	05/00	07/00	01/01	

Identifying information for patient and GP

Patient's allergies to food and medications

Patient's medication history, including appropriate dosage recommendations

Patient's lab results and diagnostic images

Patient's interactions with the health care system

Patient's medical history/ problem list

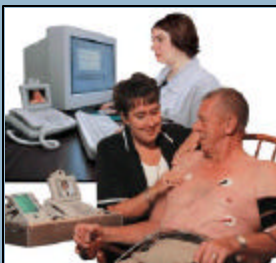
Patient's immunization history and reminders for scheduled vaccinations

Electronic Health Records – Access

The Benefits of Electronic Health Records and *Infoway's* Priorities

***Infoway* Electronic Health Record**

Demographics
Diagnostic Images
Laboratory Results
Drug Profile
Clinical Reports
Immunizations
Telehealth



- Increased interpretations by remote specialists
- Improved wait-times for diagnostic imaging services
- Improved availability of community based health services
- Reduced patient travel time and cost to access services
- Increased patient participation in home care
- Increased patient access and use of their health record

Access

- Availability of Services
- Ability to Access Services
- Patient Participation

Electronic Health Records - Quality

The Benefits of Electronic Health Records and *Infoway's* Priorities

Infoway **Electronic Health Record**

Demographics
Diagnostic Images
Laboratory Results
Drug Profile
Clinical Reports
Immunizations
Telehealth



- Decreased medical errors
- Improved interpretation of diagnostic and laboratory results
- Decreased adverse drug events
- Decreased prescription errors
- Improved prescribing practice
- Increased speed and accuracy in detecting infectious disease outbreaks

Quality

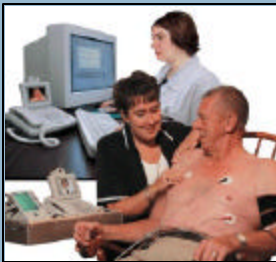
- Safety
- Effectiveness
- Appropriateness

Electronic Health Records - Productivity

The Benefits of Electronic Health Records and *Infoway's* Priorities

Infoway Electronic Health Record

Demographics
Diagnostic Images
Laboratory Results
Drug Profile
Clinical Reports
Immunizations
Telehealth



- Increased access to integrated patient information
- Reduced duplicate tests and prescriptions
- Reduced physician prescription call-backs
- Reduced patient and provider travel costs
- Improved vaccine management
- Improved information management resulting in reduced costs

Productivity

- Efficiency
- Care Coordination

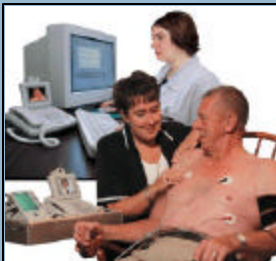


Electronic Health Records

The Financial Payoff

Infoway Electronic Health Record

Demographics
Diagnostic Images
Laboratory Results
Drug Profile
Clinical Reports
Immunizations
Telehealth



Benefits = \$30 million/ year¹

- Medical Transportation Savings = \$30 m/yr

Access

Benefits = \$3.4 billion/ year²

- Inpatient ADE = \$1.6 b/yr
- Ambulatory ADE = \$1.4 b/yr
- Post Discharge ADE = \$0.4 b/yr

Quality

Benefits = \$1.6 billion/ year^{2,3}

- Diagnostic Imaging Efficiencies = \$1.1 b/yr
- Laboratory Test Efficiencies = \$0.5 b/yr

Productivity

Sources

1. Health Canada – Telehealth Evaluation
2. Booz Allen Hamilton – EHR ROI Model
3. Courtyard Group – DI ROI Model

Infoway's Investment Strategy

Infoway's Role

Mission

- To foster and accelerate the development and adoption of electronic health information systems with compatible standards and communications technologies on a pan-Canadian basis, with tangible benefits to Canadians. To build on existing initiatives and pursue collaborative relationships in pursuit of its mission.

Shared Governance Facilitates Collaboration

Canada Health Infoway is an independent not-for-profit organization, whose Members are Canada's 14 federal, provincial and territorial deputy ministers of health.

Goal

- Infoway's plan is to have an interoperable electronic health record in place across 50 percent of Canada (by population) by the end of 2009.

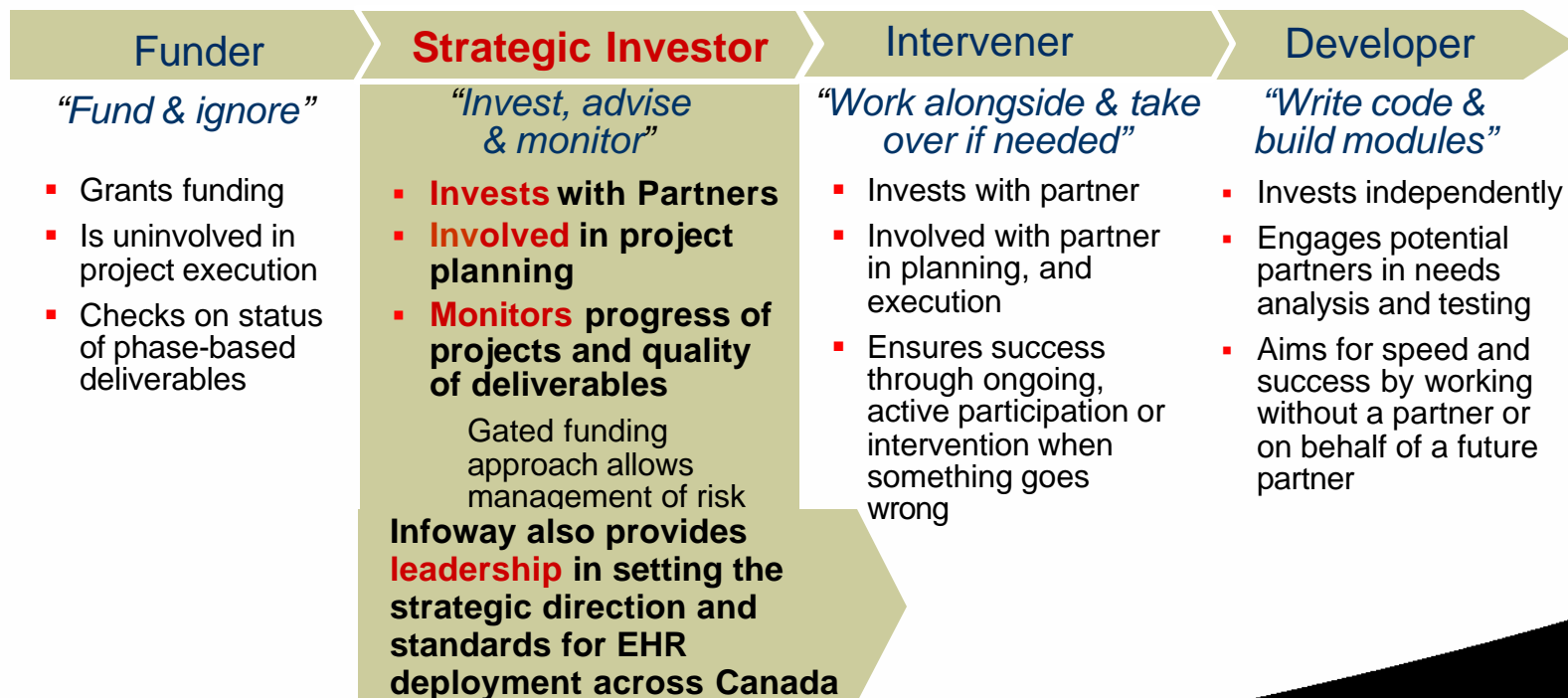


Infoway's Investment Strategy

Infoway's Role

Core Business

- We strategically invest with public sector partners to develop, replicate and re-use compatible electronic health systems, thereby leveraging public funds, knowledge and results across Canada, to build a safer, more efficient healthcare system.

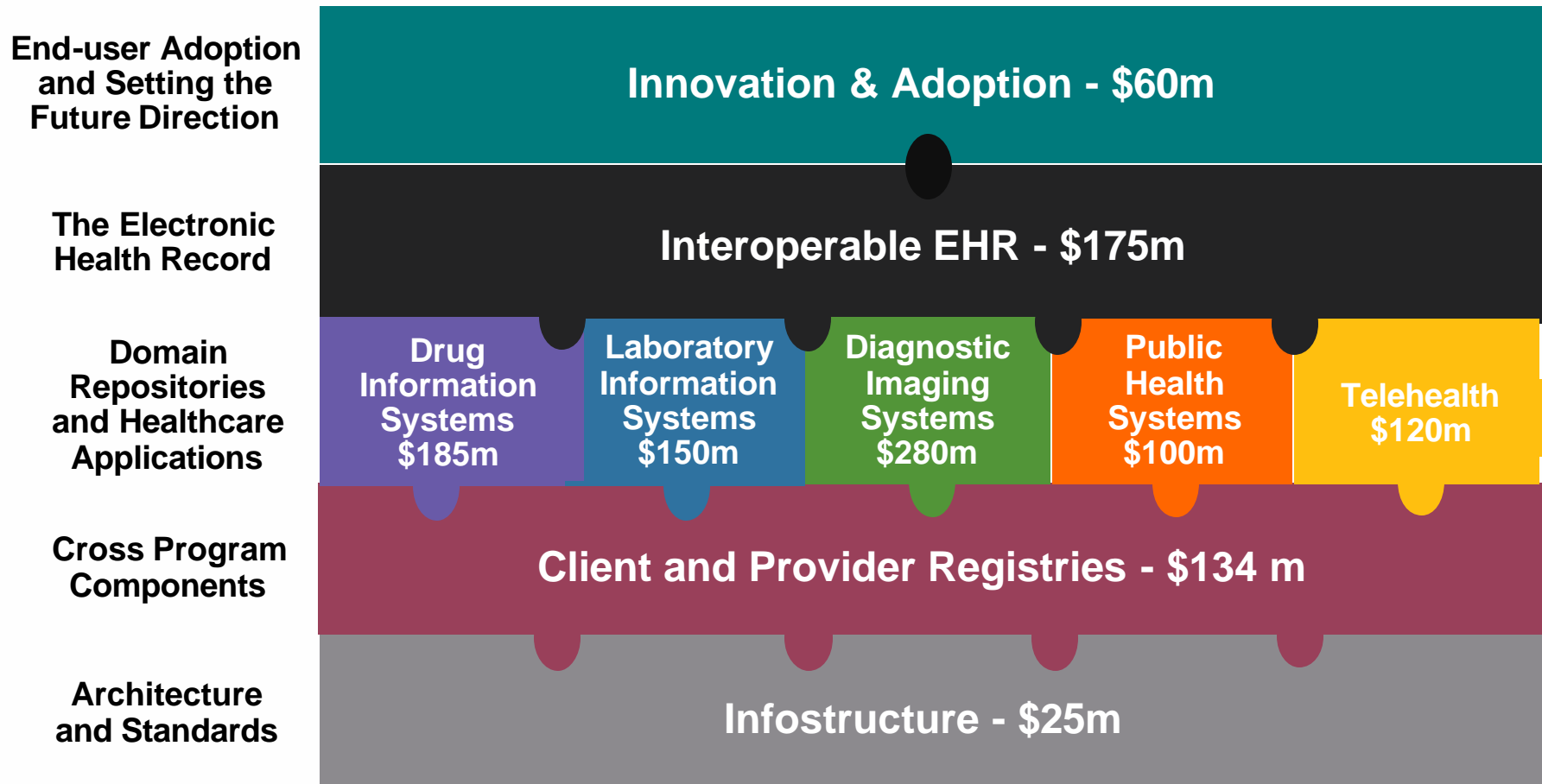


Infoway's Investment Strategy

Infoway's Business Model

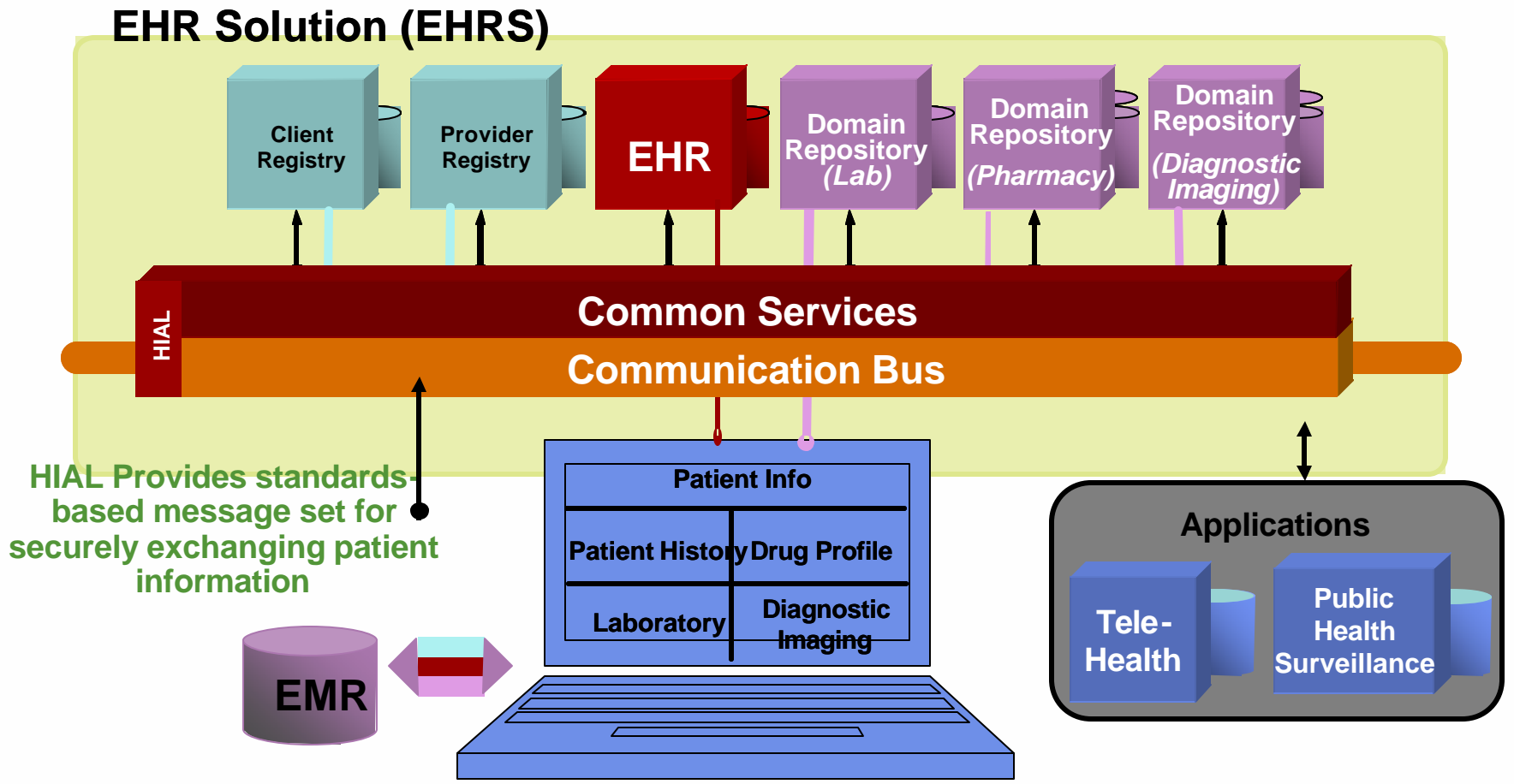
- *Infoway's* business model is built on seven complementary strategies which is allowing Canada's provinces and territories to accelerate the implementation of interoperable electronic health records while minimizing costs and risk.
- ? **Targeted Investment Programs** - focused on nine investment programs
 - ? **Collaboration with Health Ministries and Other Partners** - joint planning with health ministries and other parties to ensure alignment
 - ? **Co-Invest with Public Sector Partners** - share the investment in projects with our public sector partners
 - ? **Leveraged Investment** - invest in solutions that can be replicated across the country
 - ? **Form Strategic Alliances with the Private Sector** - form strategic alliances with the private sector to implement standards-based commercial solutions that reduce cost and risk
 - ? **Focus on End-User Acceptance** - early and ongoing focus on end-users to gain acceptance and adoption
 - ? **Measure Benefits and Adjust** - continually measure the benefits achieved against those planned and make the necessary adjustments

Nine Strategic Investment Programs

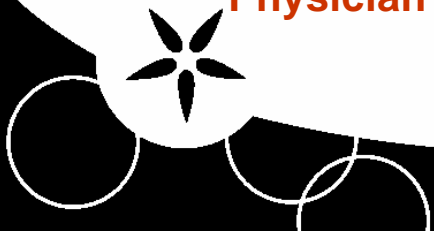


A 3-year joint technology and investment plan is developed with each jurisdiction to provide a long-term roadmap as to how these EHR components will

EHR Blueprint Architecture Promotes Interoperability

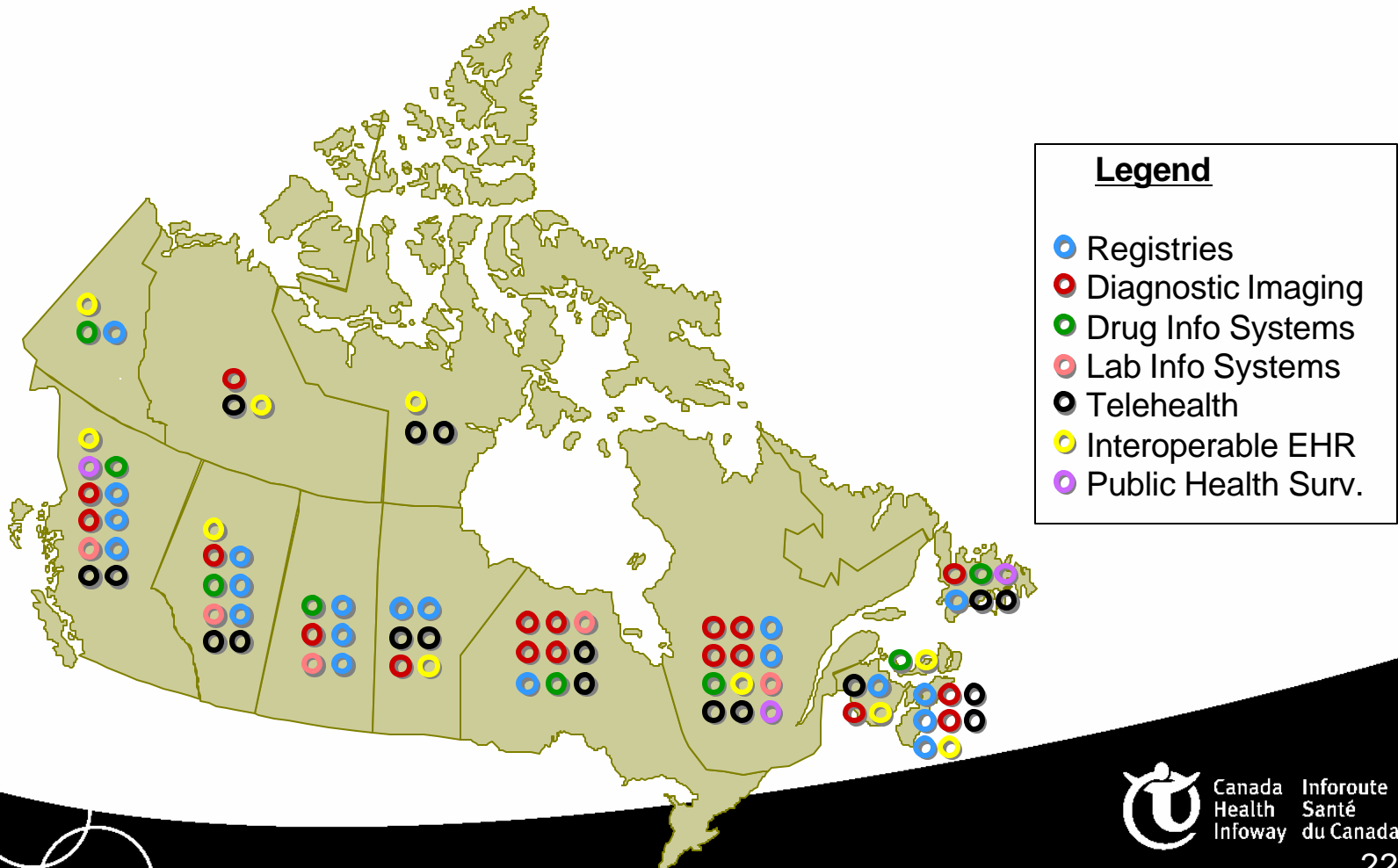


The EHR integrates standalone, disparate Clinical information systems and Physician Electronic Medical Records (EMR) into a powerful, complete personalized medical information system



Infoway's Projects Providing Value Coast to Coast

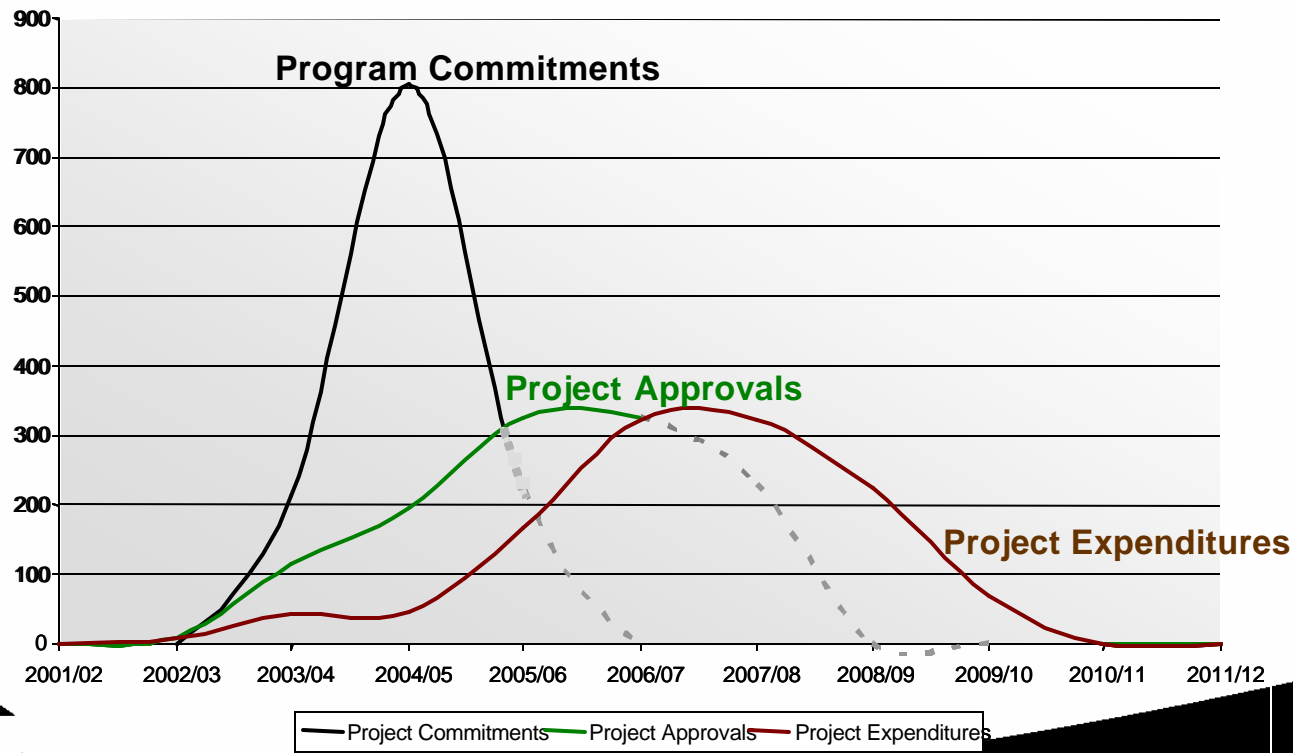
141 active and completed projects valued at **\$427** million in all 9 investment programs. The **82** projects jointly developed with provinces and territories are shown. In addition, **59** national projects are also underway.



Canada Health Infoway

Infoway's Investment Progress

- *Infoway* has an investment target range of \$275 - \$375 million in project approvals for 2005-06. On a cumulative basis this will result in \$646 million or 54% of the \$1.2 billion that *Infoway* has committed to its nine investment programs.



Example Diagnostic Imaging Systems

- The DI program contains 17 active and 5 completed projects in 10 jurisdictions
- Implemented “Shared Service” model to realize economies of scale even for smaller hospitals
- 20% radiology productivity gains
- Cost avoidance -\$350 million annually, by eliminating duplicate and unnecessary procedures and film
- \$1 Billion in total annual savings estimated



“With the system up and running, I have become a better diagnostic radiologist. I don’t think there’s any doubt

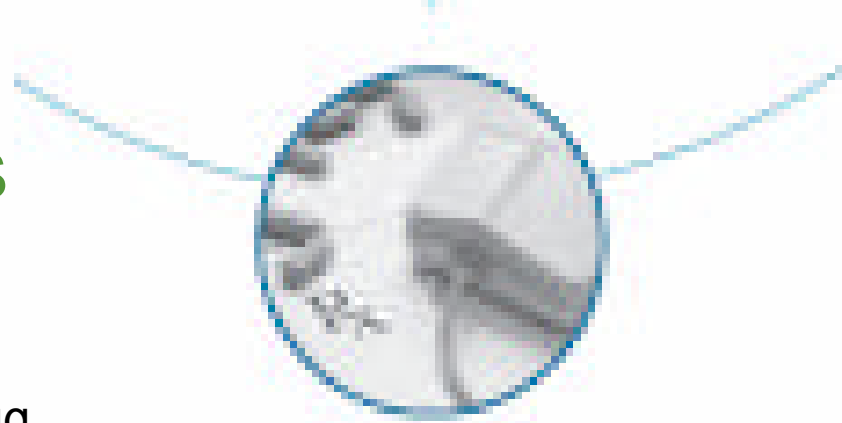
Dr. K Wong, Radiologist,
Fraser Valley

Better results at less cost.

Infoway Toolkits capture all phases of the projects (lessons learned, RFP templates, software components, adoption strategies) to reduce the cost and risks for other jurisdictions

Example Drug Information Systems

- 7 active projects in 7 jurisdictions
- AB: Province-wide DIS with e-prescribing, drug profile, adverse-reaction alerts
- ON: To view Ontario's Drug Program information, initially Emergency room access
- SK: Province-wide DIS for 95% of meds prescribed – begins 2005
- Developing clinical drug messaging standards. Drug claims message standards already developed



.... When VIOXX was pulled from the market, it took our practice just one hour to produce a report on patients who had been prescribed the medication, allowing us to contact every one of them the same day.”

Dr. Sue MacLean, Founding Partner, Markham Family Physicians

Expect \$3.6 billion annual savings, Canada wide, avoiding adverse drug reactions and drug compliance issues

Program Investments - Ontario

ONTARIO			
	04	05	06
CR	●	●	●
PR			
DI	▲	● ▲	▲ ■
DIS	●	▲	▲
LIS		●	▲
IEHR			●
TH	●	▲	● ▲
PHS			●

Client Registries – Phase 1B, Phase 2 (March 2006)

Provider Registries - no project planned

Diagnostic Imaging Systems

- TVPP Phase 2
- SWO Phase 2 (Q3, 2005)
- TEN Phase 2 (Q4, 2005)
- PNO Phase 2 (Q4, 2005)

Drug Information Systems

- ODPV Phase 2
- ADAP

Laboratory Information Systems – Phase 2

iEHR – Phase 0 (Q3, 2005)

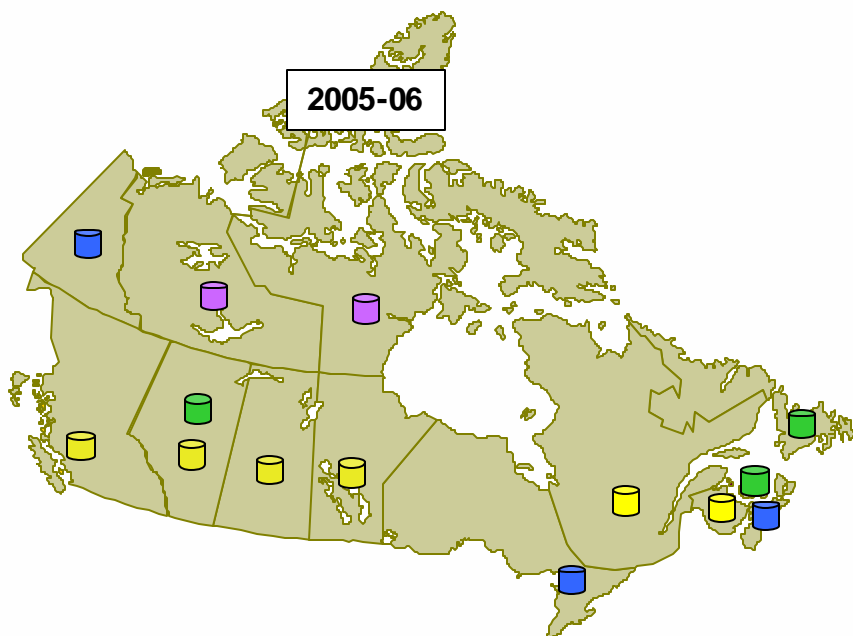
Telehealth – Phase 0/1 (Q3, 2005)

Public Health Surveillance – Phase 1 (Q3, 2005)

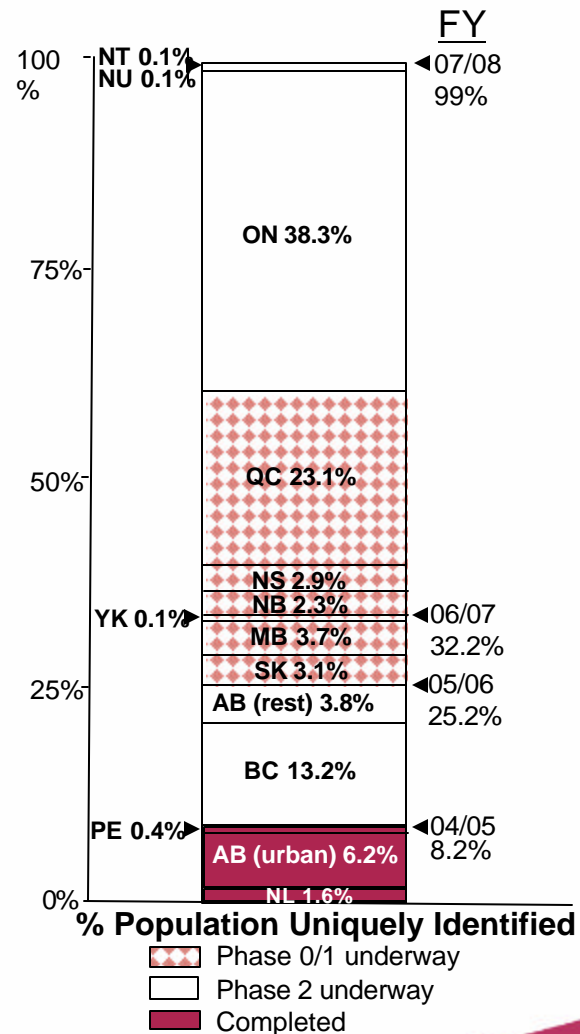
Registries Investment Program

2005-06 Client Registries Actions

- Project Planning in ON, NS, YK
- Project Implementation in BC, AB, SK, MB, QC, NB
- Complete in AB (urban), NL, PE
- Pan-Canadian HL7 v3 messaging standards for client registries



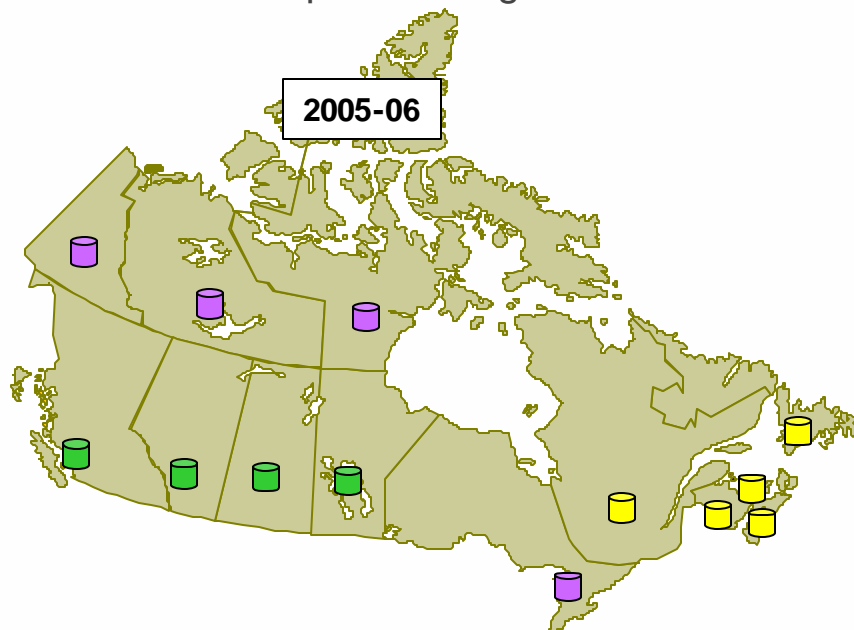
■ Target
 ■ Planning
 ■ Implementation
 ■ Completed



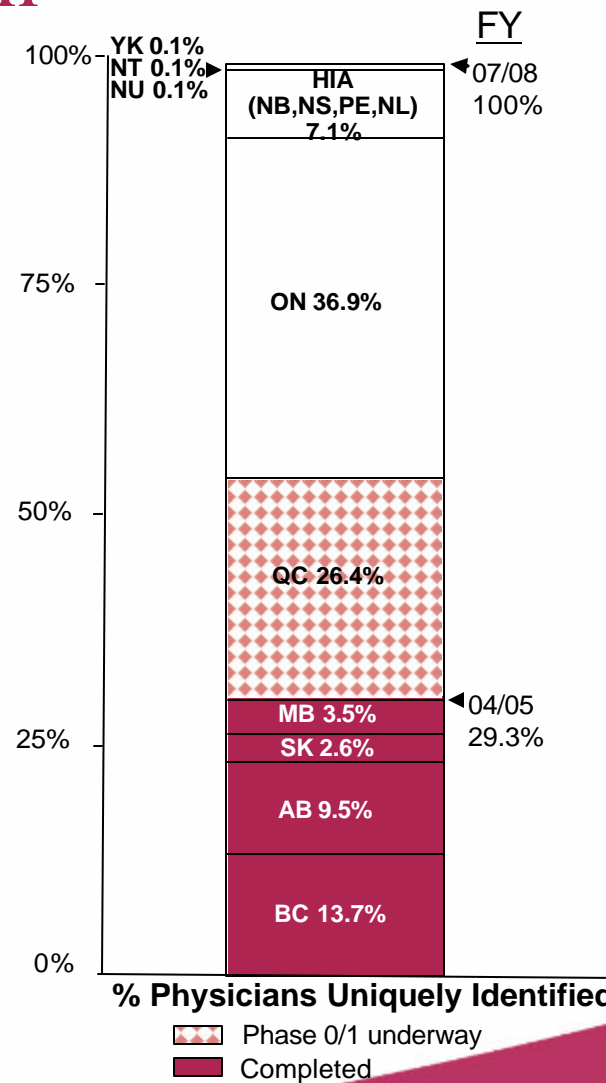
Registries Investment Program

2005-06 Provider Registries Actions

- Project Implementation in QC, NS, NB, PE, NL (HIA)
- Projects Complete in BC, AB, SK, MB
- Pan-Canadian HL7 v3 messaging standards for provider registries



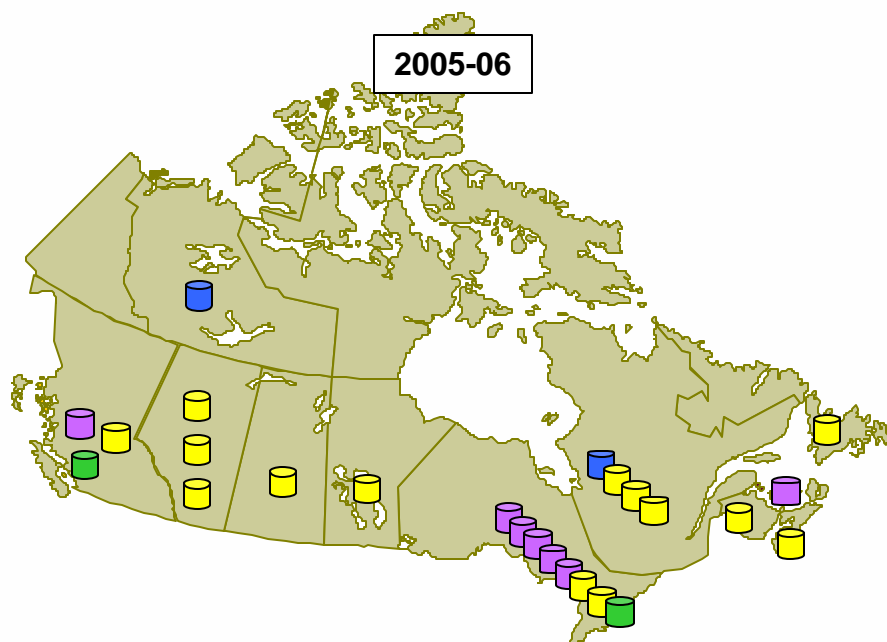
■ Target
 ■ Planning
 ■ Implementation
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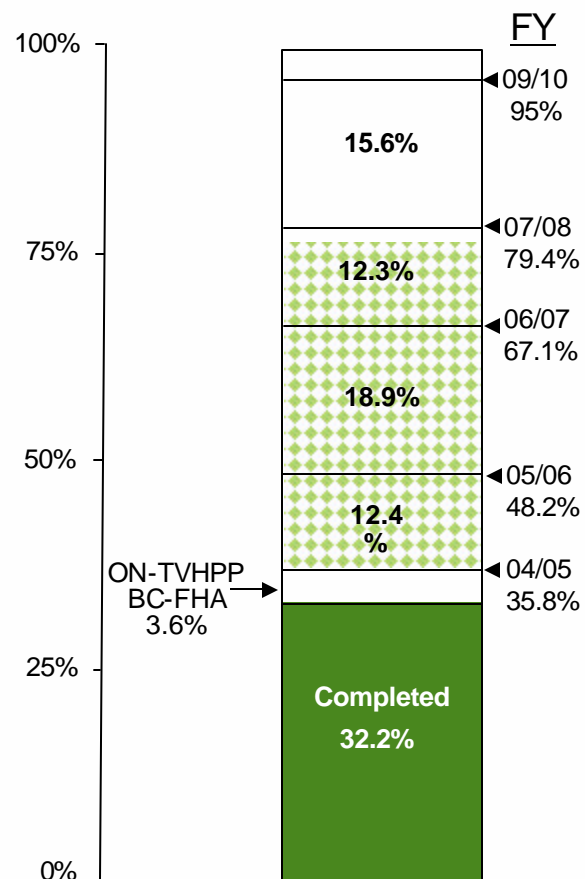
Diagnostic Imaging Investment Program

2005-06 Diagnostic Imaging Systems Program Actions

- Project Planning in QC, NT
- Project Implementation in BC, AB, SK, MB, ON, QC, NS, NB, NL
- Project Completed in BC (FHA), ON (TVHPP)



■ Target
 ■ Planning
 ■ Implementation
 ■ Completed

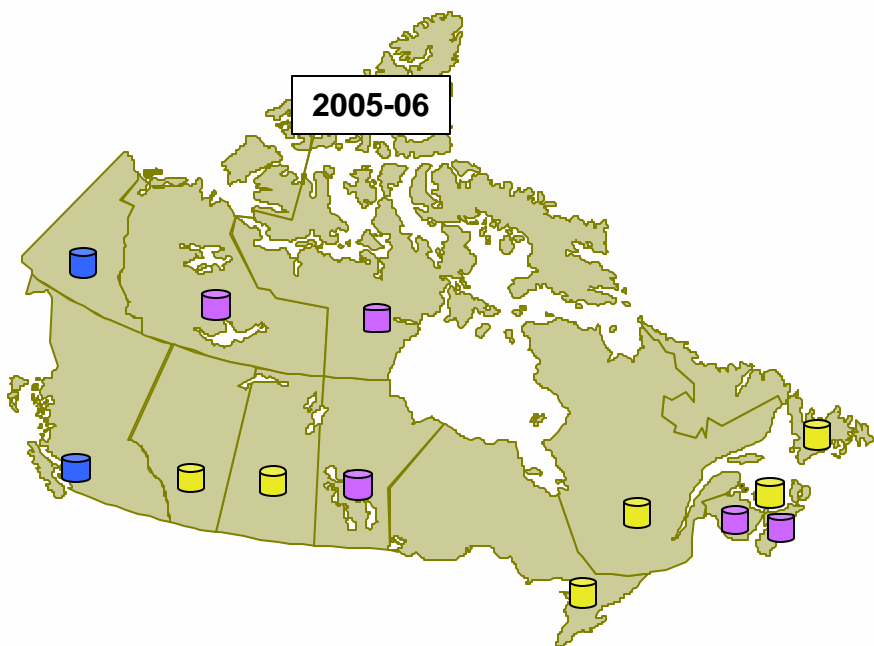


■ Completed
 Phase 2 underway
 Phase 0/1 underway

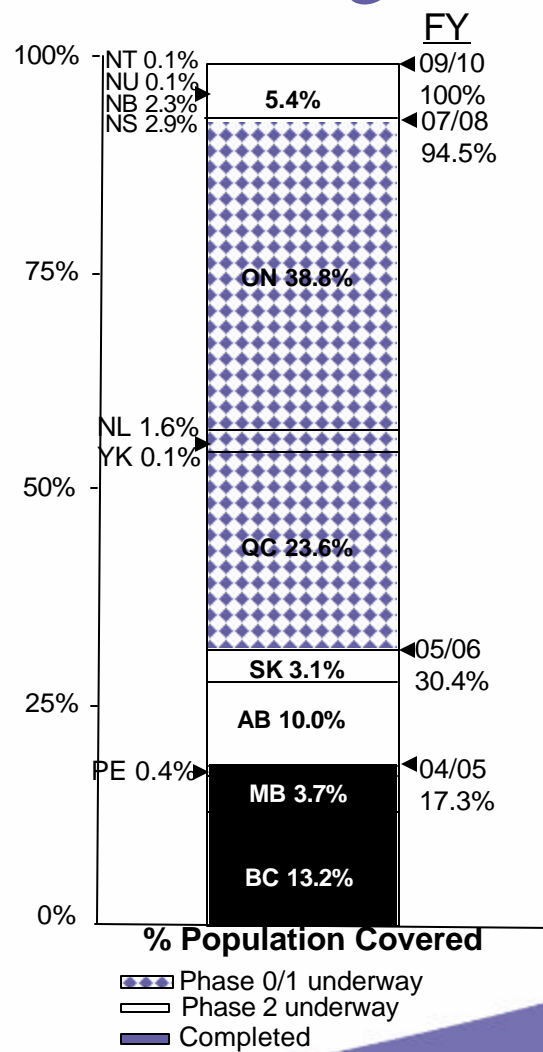
Drug Information Systems Investment Program

2005-06 Drug Information Systems Program Actions

- Project Planning in BC, YK
- Project Implementation in AB, SK, ON, QC, PE, NL
- Pan-Canadian HL7 v3 clinical drug messaging standards completed



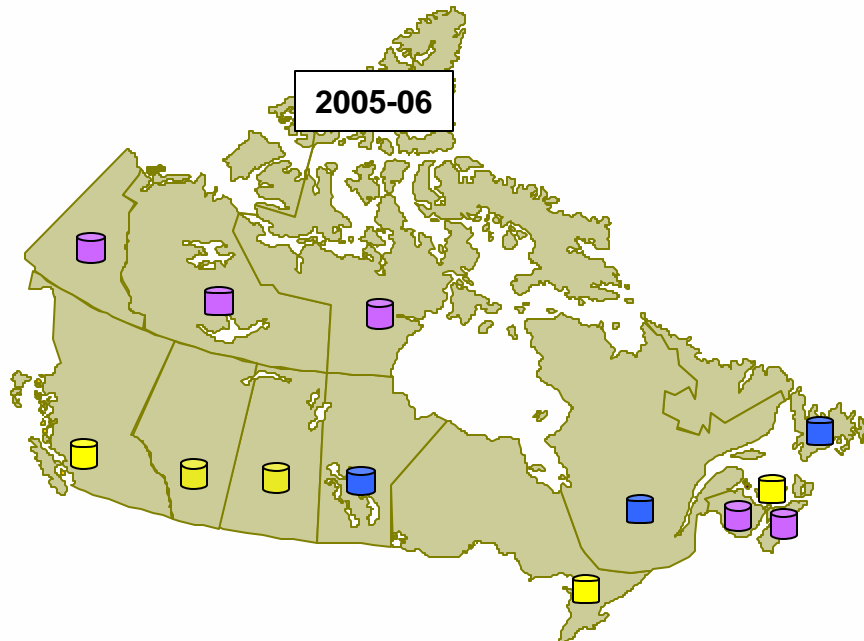
■ Target
 ■ Planning
 ■ Implementation
 ■ Completed



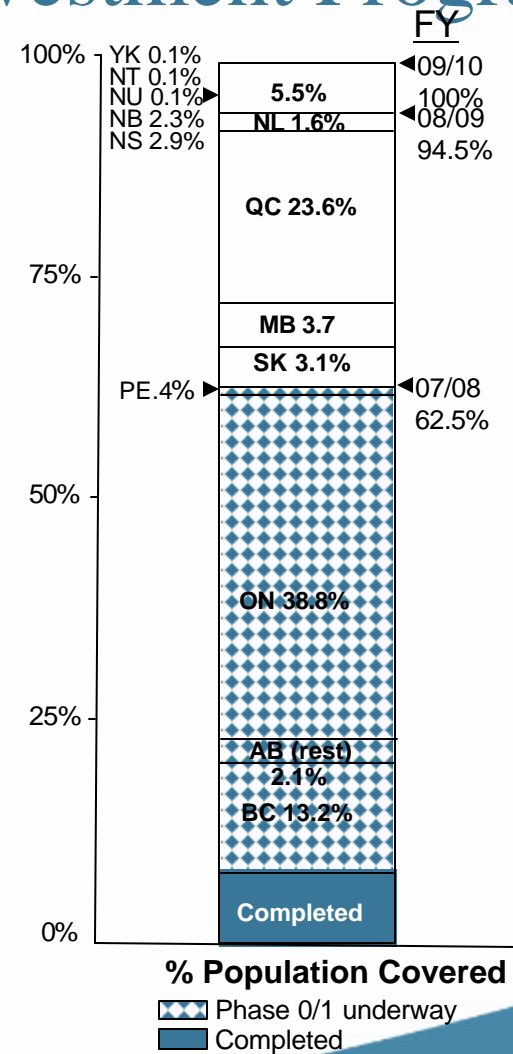
Laboratory Information Systems Investment Program

2005-06 Laboratory Information Systems Program Actions

- Project Planning in MB, QC, NL
- Project Implementation in BC, AB, SK, ON, PE
- Pan-Canadian HL7 v3 laboratory messaging standards project initiated



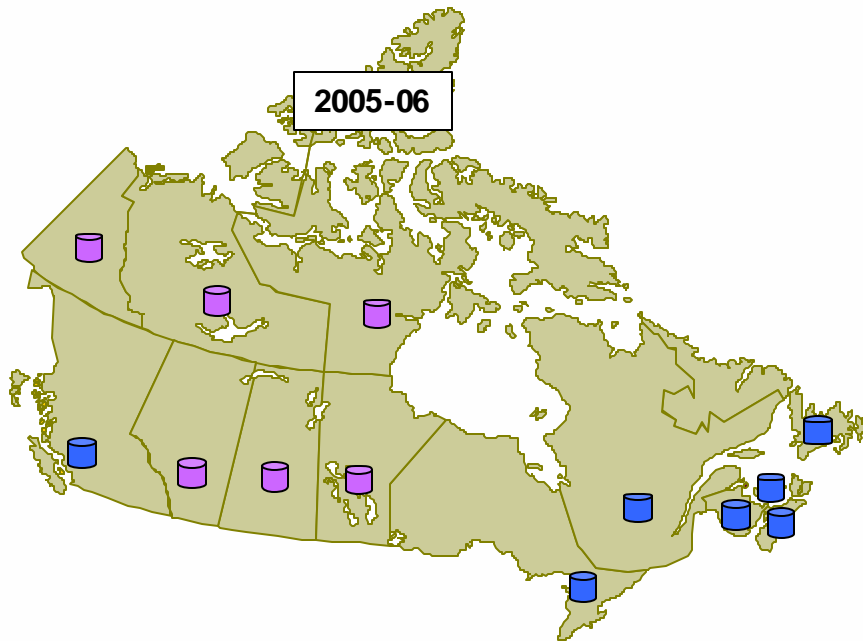
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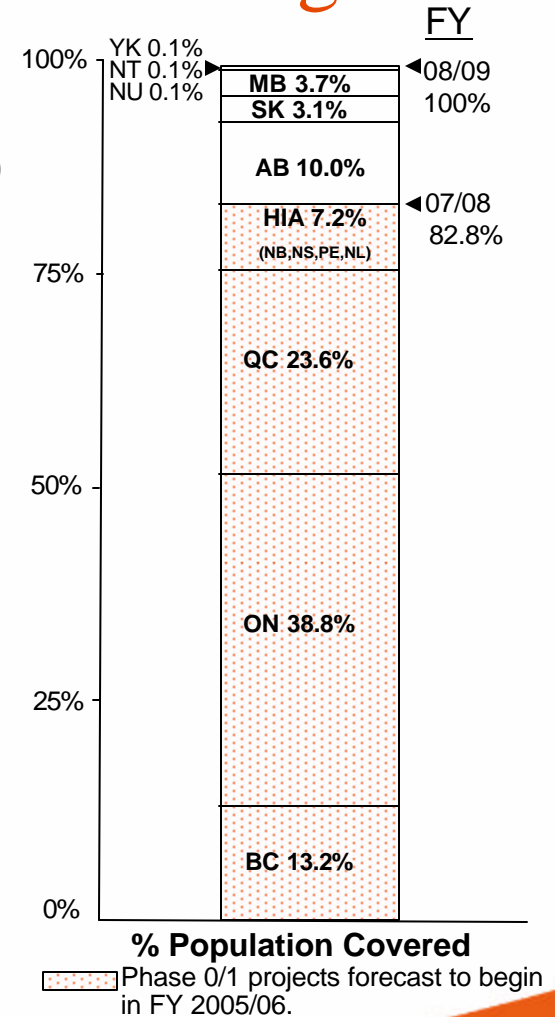
Public Health Surveillance Investment Program

2005-06 Public Health Surveillance Program Actions

- Pan-Canadian solution design and development
- Project Planning in BC, ON, QC, NS, NB, PE, NL (HIA)
- Pan-Canadian PHS Standards project initiated



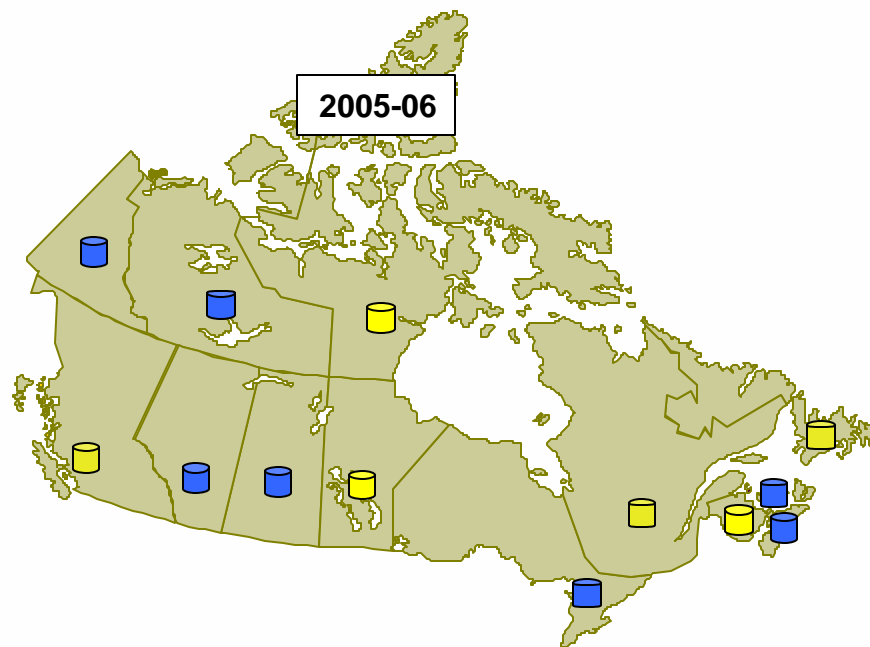
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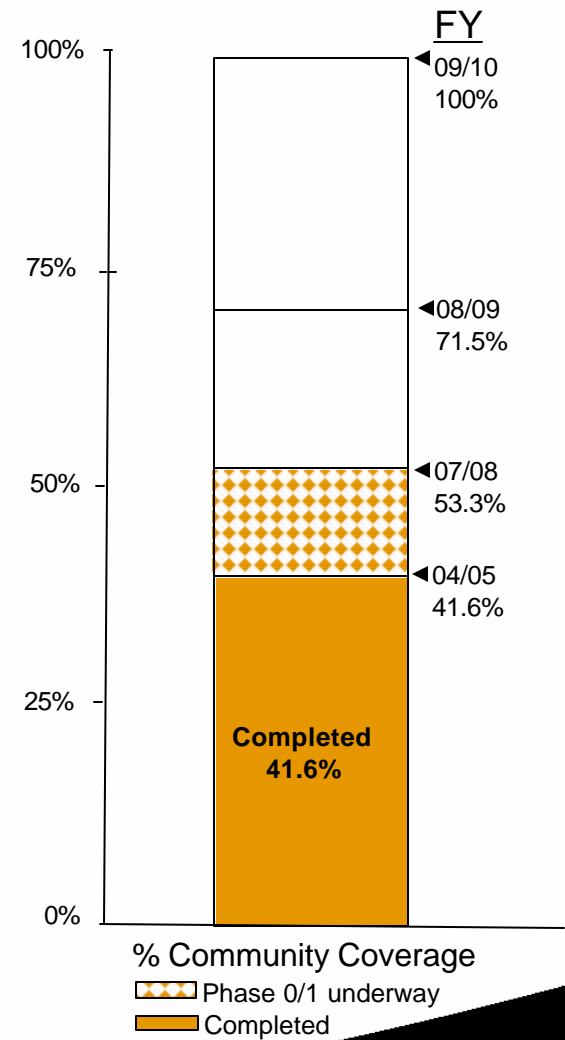
Telehealth Investment Program

2005-06 Telehealth Program Actions

- Planning in all jurisdictions
- Projects underway in BC, MB, QC, NB, NL, NU



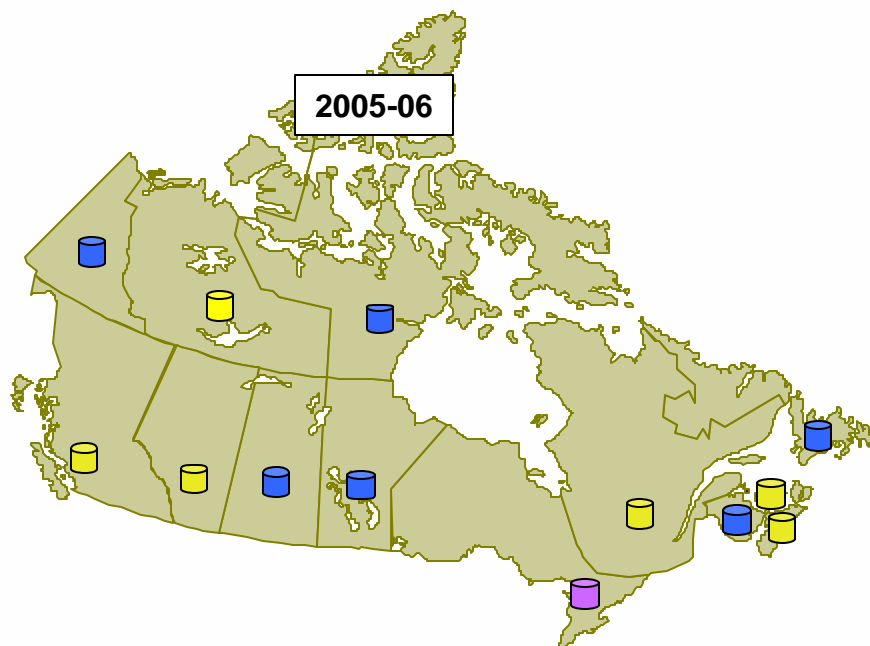
■ Target
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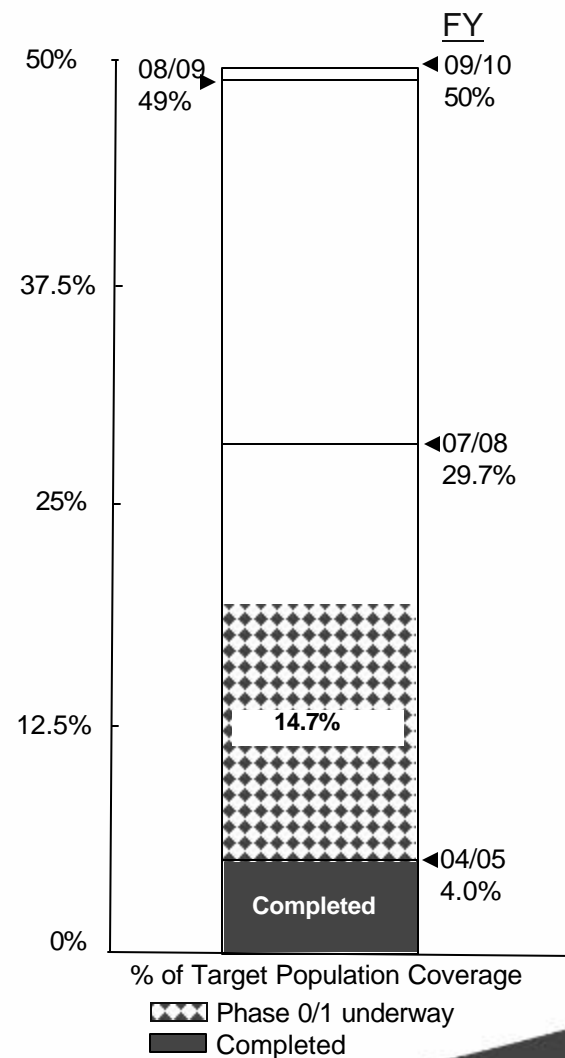
iEHR Investment Program

2005-06 iEHR Program Actions

- Project Planning in SK, MB, ON, NB, NL, YK, NU
- Project Implementation in BC, AB, QC, NS, PE, NT
- Pan-Canadian iEHR standards project initiated



■ Target
 ■ Planning
 ■ Implementation
 ■ Completed



Phase 0/1 underway
 Completed



Positive Signs of Progress

The Signs

- All investment programs are approved by the board
- Reviews of programs will be conducted to optimize the investment

Annual 3 year jurisdiction planning will ensure alignment

- Continues in 2005-06

More collaboration / common action among jurisdictions

- Coordinated RFPs (e.g. AB, MB on EMPI)
- Joint Procurement in Diagnostic Imaging
- Shared Services Models within and among jurisdictions (e.g. HIA Health Surveillance)

The jurisdiction EHR spend is starting to increase

- We are seeing increasing EHR spend in most jurisdictions
- Changing the investment ratio has been received positively

Challenges

Adoption / Acceptance by healthcare professionals

- Physician automation remains a major challenge [CMA/Infoway Survey]
- Working with the Deputy Ministers to move this agenda forward

Infoway capitalization insufficient to achieve objectives

- The 10 year cost of acquisition for a pan-Canadian EHR, covering all Canadians and all domains, is estimated to be \$10 billion
- The 10 year total cost of ownership for a pan-Canadian EHR, covering all Canadians and all domains, which includes both acquisition and recurring costs is estimated to be \$22.7 billion.
- Based on Infoway's current mandate of a limited EHR implementation Booz Allen estimates Infoway's projected costs to be \$4.1 billion.

Challenges

Ability of some jurisdictions to support several programs

- In the last 2-5 years there has been a significant increase in EHR activity in Canada and around the world
- Jurisdictions are finding it harder to recruit and retain the required skills sets
- The issues around quality and quantity of resources are especially apparent in smaller and remote regions
- A number of health informatics programs, at all levels, are now being offered at colleges and universities across the country (e.g. Conestoga College in Kitchener and U of Waterloo Bootcamp)

Benefits evaluation

- Bottom-up research necessary

Challenges

Interoperable standards

- Use of Pan-Canadian messaging and vocabulary standards are key to interoperability
- Standards are being developed to support EHR initiatives but the standards development process is slow
- Infoway is actively engaged national and international

Managing Multi-Million Dollar Projects

Criteria for Success

- **Commitment** – Strong support to complete the job together
- **eHealth Strategy** – clear, concise, pragmatic and well understood
- **ehealth Governance** – collaborative leadership to get the job done quickly and effectively
- **Project Leadership** – the key players are in place with the know-how to get the job done
- **Human Resources** – the right mix of qualified public and private sector resources are in place
- **Technology** – a well designed set of interoperable commercial solutions - custom develop only as a last resort
- **Deployment** – a sensible staged approach to deploying the EHR
- **Change Management** - well designed approach that stimulates adoption by clinicians, especially physicians
- **Privacy** – the rules around consent and access to information are clear



Infoway Focus

End-User Focus

- End-user adoption strategy approved by Infoway Board of Directors
- Clinical Advisors appointed to support the implementation of the strategy and related initiatives within the clinician community
 - Dr. Lynn Nagle
 - Dr. Bob Burns
 - Dr. Mark Dermer

EHR Funding

- Infoway continues to advocate for the implementation of electronic health records solutions at all levels of government



Infoway Focus

Measure and Communicate Benefits

- **Benefits Framework** - the over-arching benefits framework plus the indicators and measurement approach for investments are “under construction”.
- **Sampling approach** – not all projects will be measured; a sampling of projects will be used.
- **Focus on key indicators** – there will be 3-4 key indicators per investment program that are measured
- **Develop credible evidence** – use the appropriate measurement technique, including primary research, to develop evidence that is credible and can withstand peer review – has to be the basis for benefits that are truly realizable.
- **Confirm top-down analysis** – use the “bottom-up evidence” to confirm or modify the original top-down analysis.

Electronic Health Records for Better Health Care

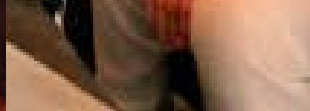
Better Prescribing Practices

Reduced Wait Times

Improved access to care in rural and remote communities

Complete and accurate clinical information to diagnose and treat

***Less administrative burden,
More time for patients***



Electronic Health Records for Better Health

Less adverse drug events



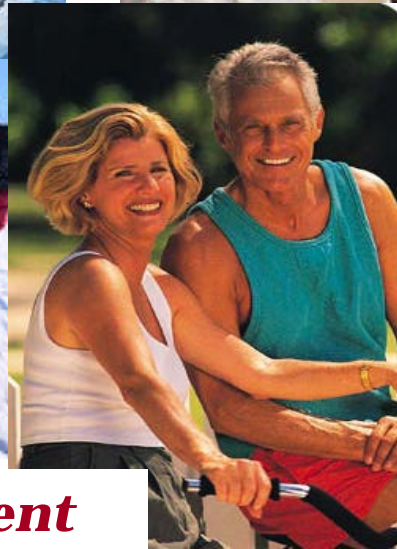
Better therapeutic outcomes



Healthier lifestyles



Increased patient participation in care



Well managed chronic illness

Thank-you!