



The Evolving eHealth Landscape

Thoughts on the Direction of
eEnabled Medicine



eHealth is at the Intersection Between Two Rapidly Changing Fields

Information Technology and Healthcare are very dynamic fields.

What might the implications be for the future of clinical practice?



IT Driven Transformation in Other Industries

- Disruptive new entrants to the market
- Major changes in industry dynamics (i.e. workflow)
- Consolidation to a smaller number of large players
- Tight vertical integration (either through consolidation or supply chain relationships)
- Consumer self service on a large scale
- Globalization of markets



Healthcare is Resistant to Transformation

- Heavy government regulation resulting in suppression of
 - market competition
 - M&A
 - Cross border service delivery
- Strong union influence
- Commercial relationship between patient and provider is heavily intermediated
- Very limited consumer knowledge about care quality



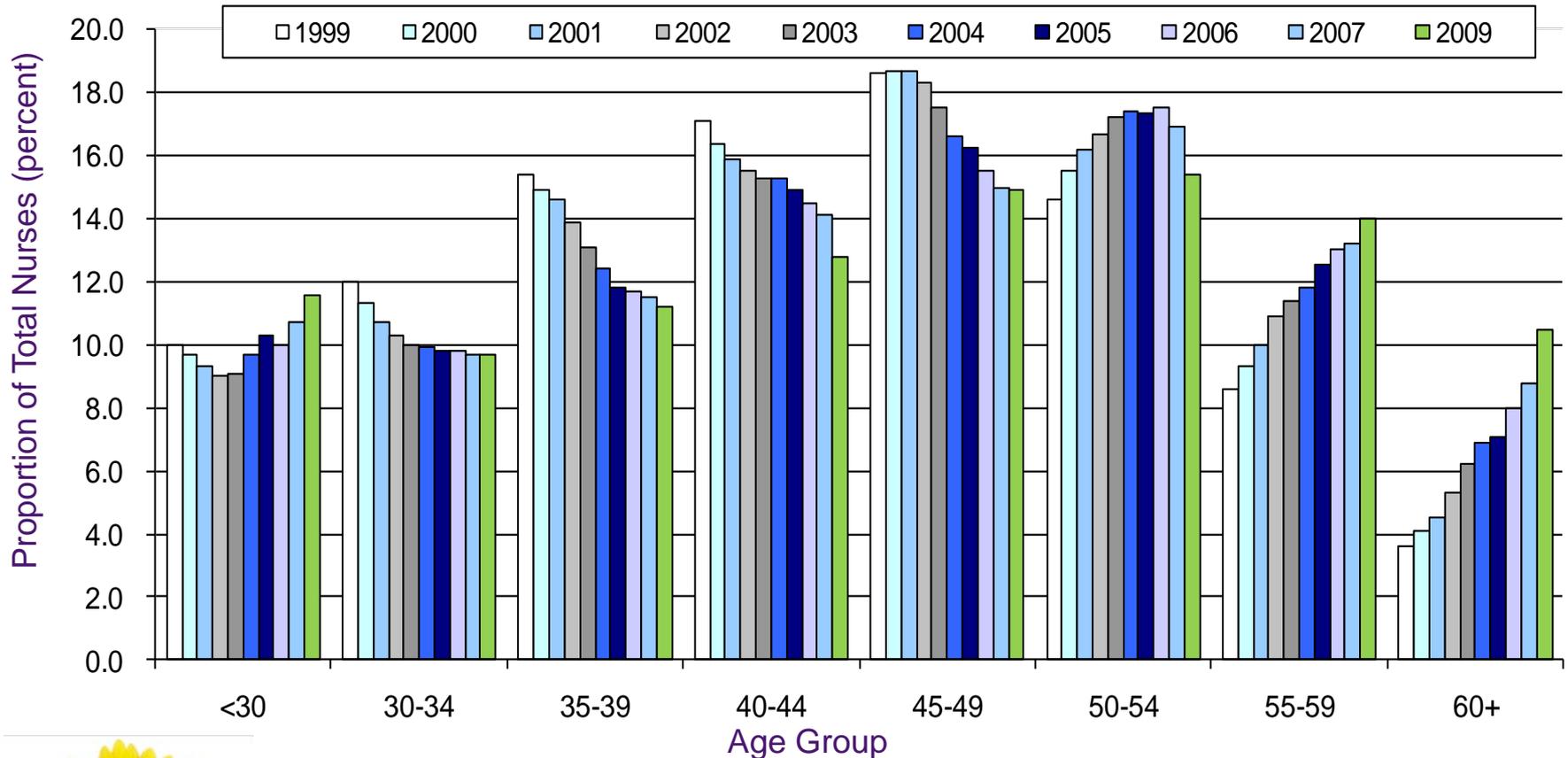
Forces Impacting on Healthcare

- Population demographics – age and chronic disease
- Supply of clinical professionals
- New technology – genomics, drugs, devices, IT
- Growing consumer expectations
- Massive quality problems – and growing consumer awareness
- Fiscal stress

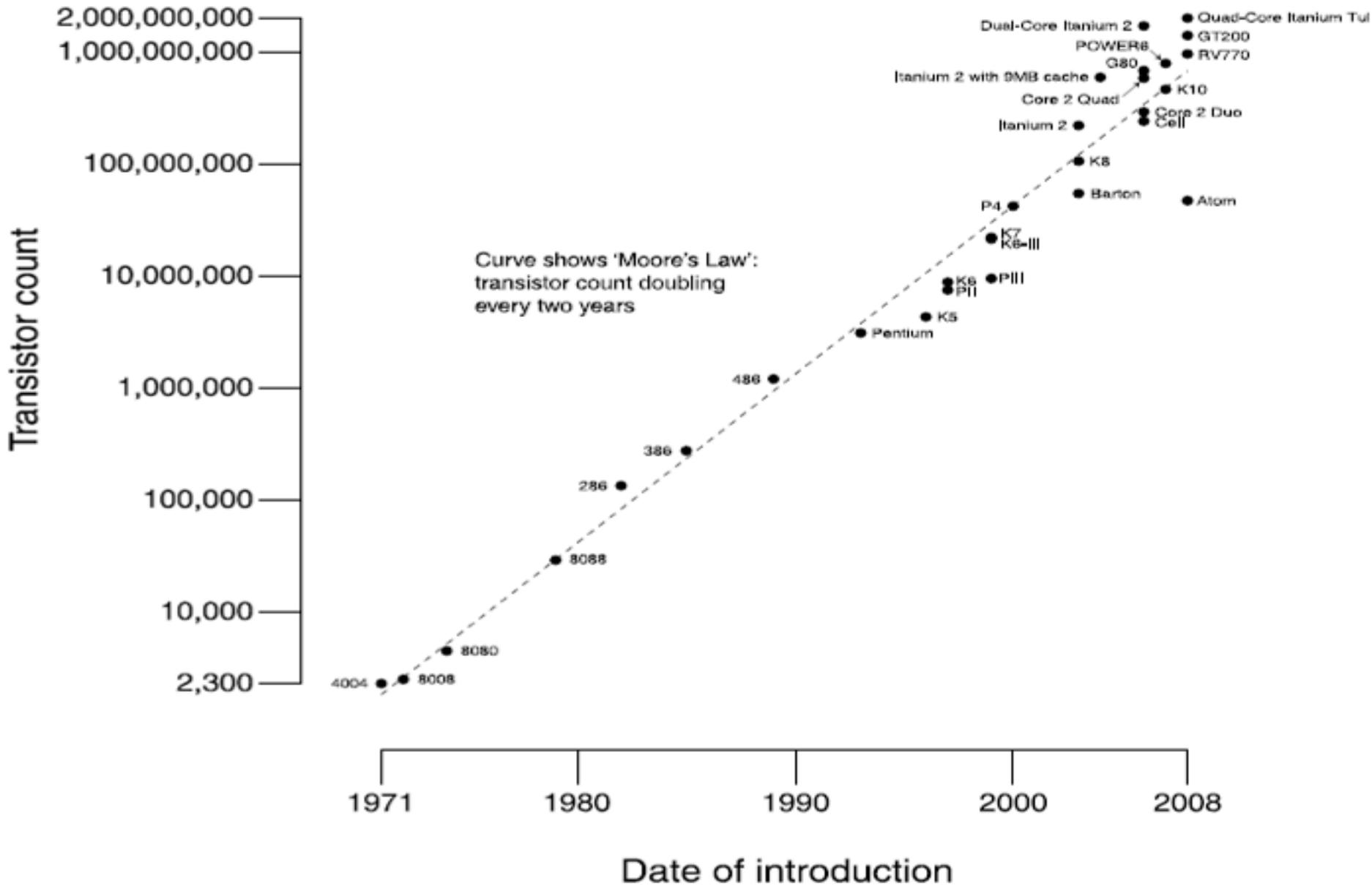


Clinician demographics challenge the system

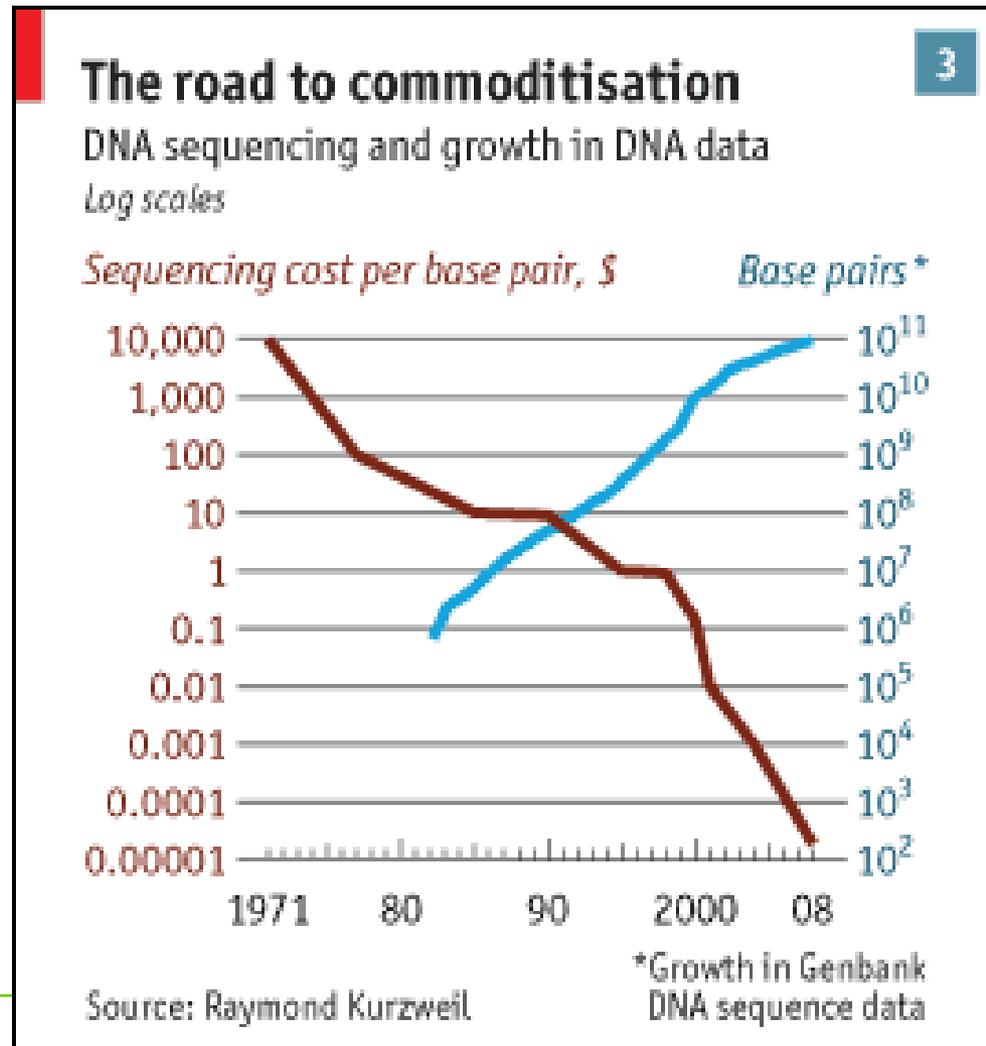
Proportion of Nurses by Age Group 1999 to 2009



CPU Transistor Counts 1971-2008 & Moore's Law



Moore's Law analog in genomics



Information for life

Source: "Getting Personal", The Economist, April 16, 2009

Quality problems are penetrating public awareness

THE GLOBE AND MAIL



Radiologists sought beefed-up standards a year ago

February 15, 2011

The British Columbia Radiological Society had been advocating beefed-up quality assurance for medical scans before **problems related to the tests emerged in three separate health authorities** this month.

A quality assurance initiative, launched more than a year ago, is part of a broader continuing education program and was driven in part by high-profile instances of **botched medical tests in Saskatchewan and Newfoundland**, BCRS president Emil Lee said on Tuesday.



Quality problems are penetrating public awareness



Doctors create council to beef up medical testing standards

November 16, 2010

After several high-profile scandals that **damaged public confidence in the accuracy of medical tests** in Canada, leading medical organizations have unveiled the first steps in a plan to fix the system and prevent more patients from being wrongly diagnosed.

The Royal College of Physicians and Surgeons of Canada and the Canadian Association of Pathologists announced Tuesday the creation of a national body designed to produce uniform standards for hospital laboratories across the country. The aim is to reduce errors and increase accountability.



Quality problems are penetrating public awareness



Universal health care matters, but so does quality

July 14, 2010

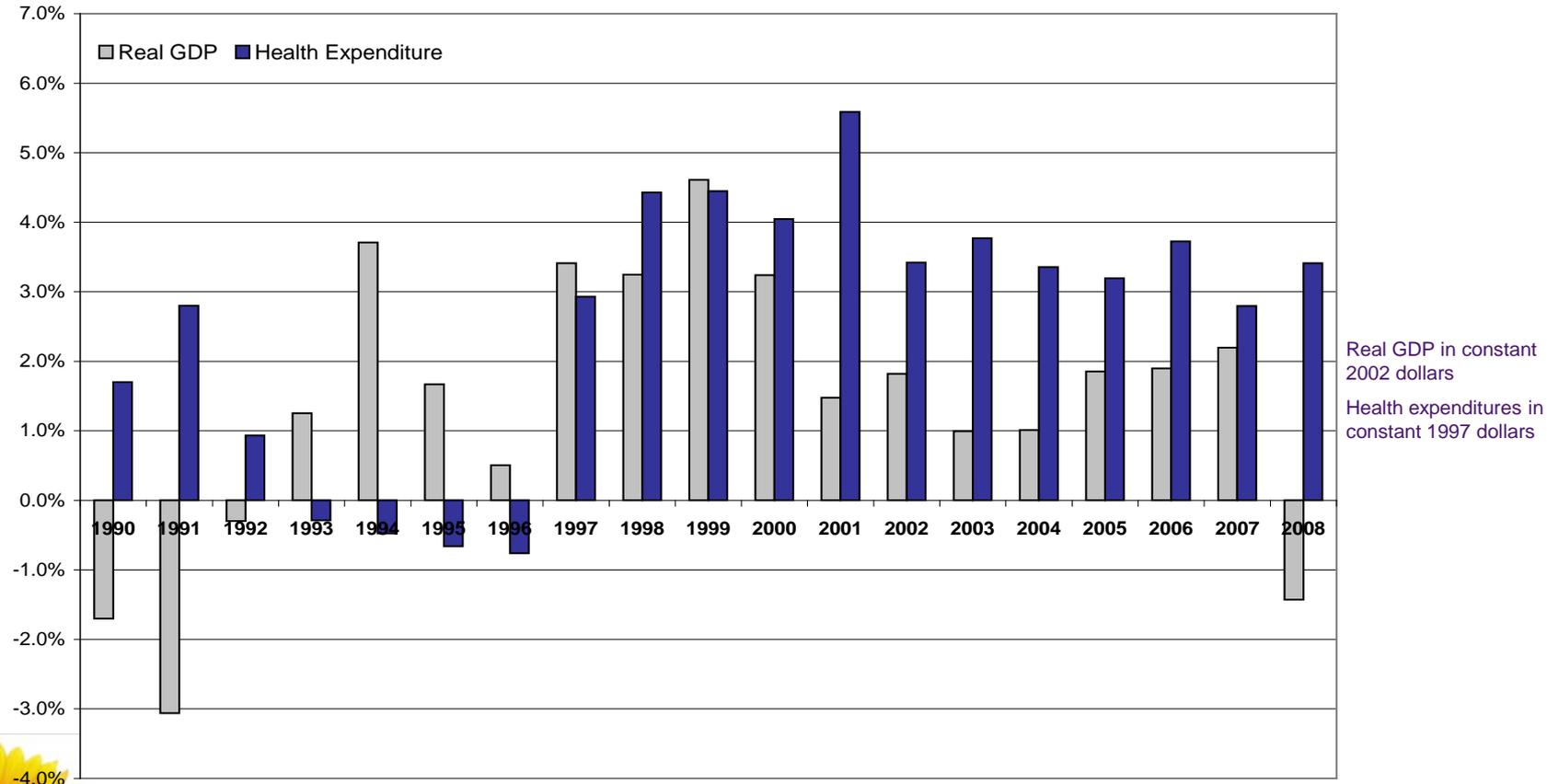
Care in Canada is ineffective because of our obsession with reactive sickness care. We do not invest enough on prevention, and **the care of those with chronic illnesses** (which consumes two in every three health dollars) **is horribly unco-ordinated** and, again, the lack of electronic health records is a major problem.

Care is not near as safe as it should be: **Rates of medical and medication errors are troublingly high**, and there remains a reluctance to discuss the problem openly and address it systematically.



Health spending has grown faster than the economy

Annual Canadian Growth Rate in Health Expenditures & Real GDP 1990 to 2008



Sources: 1. CIHI. News Release "Provincial and territorial governments expected to spend \$96 billion on health in 2006–2007." November 2006.

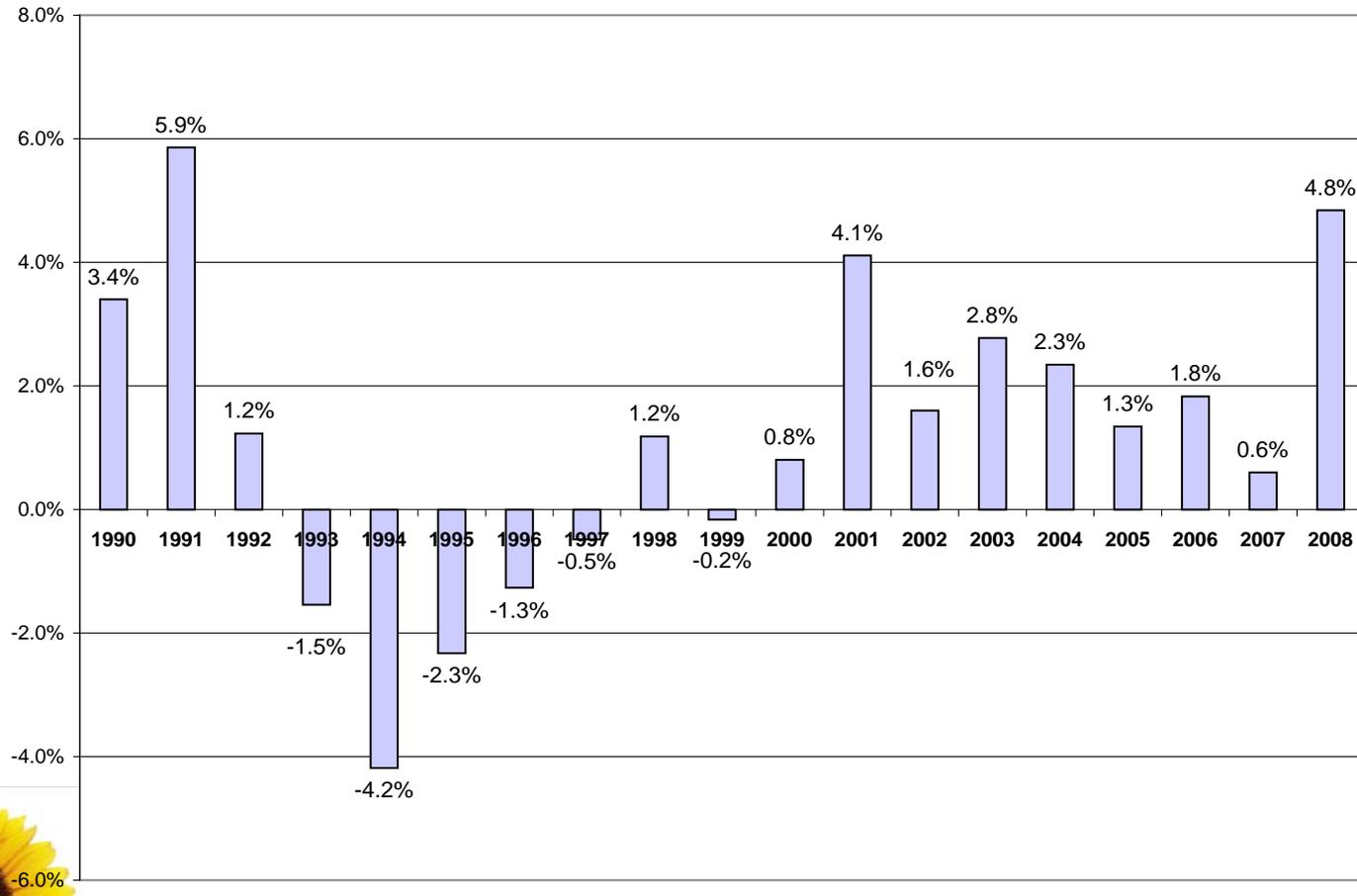
2. Information for Life. Ontario Budgets. <http://www.fin.gov.on.ca/english/budget>. Accessed 2009.

3. Statistics Canada. CANSIM. Table 380-0002 and Table 051-0005.



Growth that outstrips the economy is unsustainable

Growth in Health Expenditures Exceeding Real GDP Growth 1990 to 2008



Sources: 1. CIHI. News Release "Provincial and territorial governments expected to spend \$96 billion on health in 2006–2007." November 2006.

2. Information for Life. Ontario Budgets. <http://www.fin.gov.on.ca/english/budget>. Accessed 2009.

3. Statistics Canada. CANSIM. Table 380-0002 and Table 051-0005.

Implications for the healthcare system

- Severe fiscal challenges lead to quality and access problems
- Quality and value for money become paramount
- Severe client-side capital constraints inhibit restructuring
- International providers become competitive on cost and quality
- Poor management of chronic disease overwhelms acute care hospitals
- Growing consumer expectations are not met



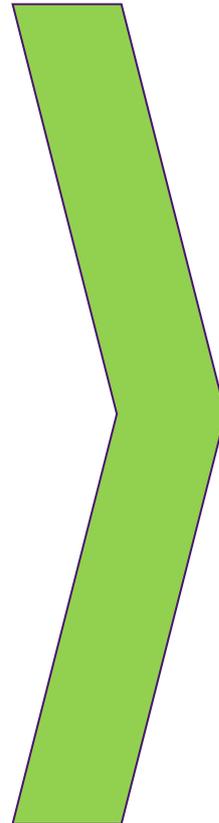
Reaction brings major changes

- Consumers seek other solutions – some are willing to pay for quality and convenience
- Profound change in the roles of different clinical professionals and of consumers
- Large parts of care management become self-service
- Interaction between consumers and the health system becomes more frequent, 7x24 and virtual
- Market increasingly resistant to paying for IT – rather pay for clinical benefits (risk transfer)
- Work process standardization becomes central (protocols, reminders, deficiency reporting, load forecasting)
- Focus on frequent flyers and demand management



Health System Dynamics Will Change

- Episodic care
- Few Visits/Encounters
- Face to face
- Fragmentation of care
- Wait lists
- Unexpected emergencies

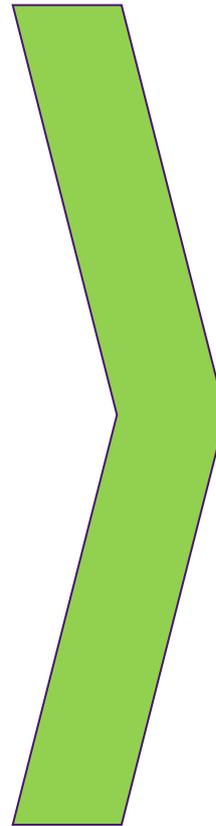


- Continuous monitoring
- Frequent communications
- Virtual contact
- Persistent case managers
- Dynamic load management
- Early warnings about future events (proactive)



This will require a change in information management

- Registries
- Lab
- PACS
- Drug
- HIAL
- Clinical History
- Data about patients



- Care process
- Relationships (especially between provider and consumer)
- Standard clinical protocols and enrolment
- Protocol exception handling
- Reminders about actions



Context becomes more important

- Standard protocols provide context
- When a new piece of data becomes available, what is its significance?
- Time becomes a very important variable
- Missing data is as important as available data
- True quality management becomes possible
- Complete data is required



The pace of change is about to increase

- Older initiatives are slowing down
- Money for old approaches is drying up
- These events are harbingers of a major strategic shift
- We are about to enter a time of accelerating change in eHealth
- This will require us to rethink the way we work





The Evolving eHealth Landscape

Thoughts on the Direction of
eEnabled Medicine

