

Breast Cancer Screening in Canada, Successes and Challenges

**International Meeting on Breast Cancer Screening
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Rio de Janeiro, Brazil**

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Organized Breast Screening: Mammography

- The evidence from randomized trials inviting women aged **50-69** to screening with mammography shows that mortality from breast cancer is reduced by 25% (IARC, 2002).
- 35% for those who accept an invitation to screening
- effectiveness of national screening programs varies due to differences in: coverage, mammography quality, treatment and other factors
- organized screening programs are more effective in reducing the rate of death from breast cancer than sporadic screening of selected groups of women

Clinical Breast Examination (CBE)

(IARC, 2002)

- Effectiveness of CBE in reducing mortality from breast cancer is unknown
- Trials with CBE + Mammography cannot answer the question
- CBE may be important in countries where
 - There is insufficient mammography
 - Where disease is usually at an advanced stage at time of diagnosis
- CBE research is needed:
 - Randomized trial of CBE vs no screening
 - Randomized trial of CBE vs. mammography (where there is some mammography but not full coverage)



CANADA



- 13 provinces and territories – each is responsible for the provision of health care services
- Population Estimate July, 2008:
33,311,400
- Largest population: Ontario (12,929,000)
- Smallest population: Nunavut (31,400)

12 of 13 jurisdictions have breast screening programs, with starting dates between 1988 and 2003.

A Comparison of Two Countries

Country	Brazil	Canada
Total Geographic Size	8,511,960 sq.km (#5 in world) (3,285,618 sq.mi)	9,984,670 sq.km (#2 in world) (3,854,082 sq.mi)
Population (2008)	196,342,592 (#5 in world)	33,311,400 (#37 in world)
Estimated Breast Cancer Incidence	50.71 per 100,000 in 2006-07 (crude rate)	>100 per 100,000 in 2006 (age standardized rate)
Adjusted Mortality estimates	12.0 per 100,000 in 2005	23 per 100,000 in 2007



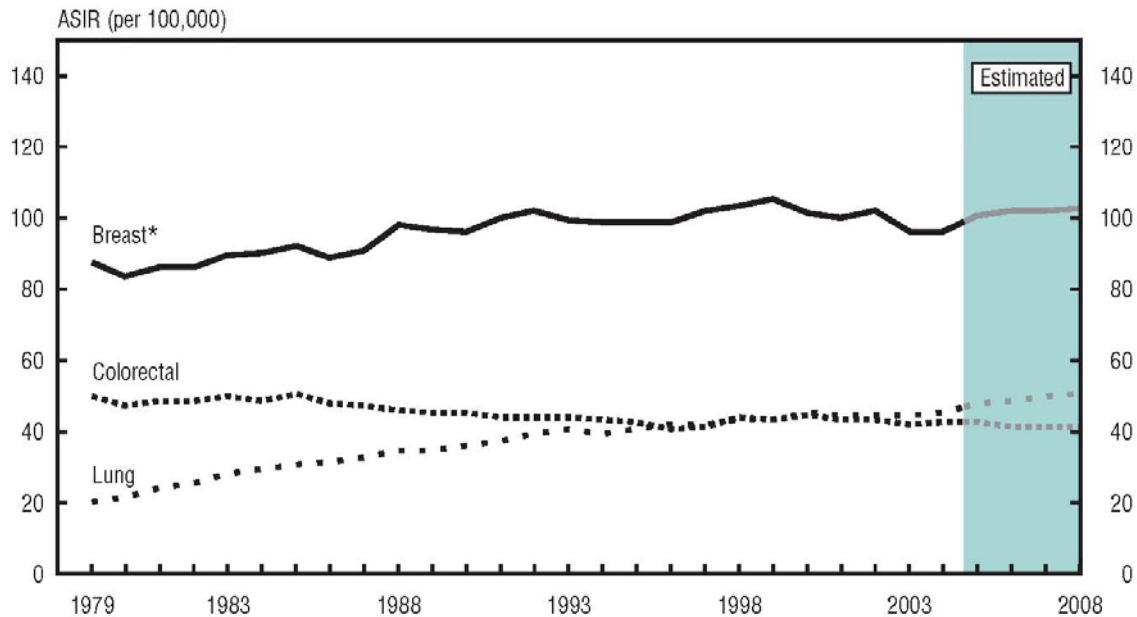
Figure 6.1

Age-Standardized Incidence Rates (ASIR) for Selected Cancers, Females, Canada, 1979-2008

Since 2000, a declining trend has been observed

Reduction of prevalent cancer pool;

Risk factor changes



* Projected estimates for breast cancer beyond 2004 reflect the long-term increasing trend in breast cancer incidence and are not sensitive to recent decline.

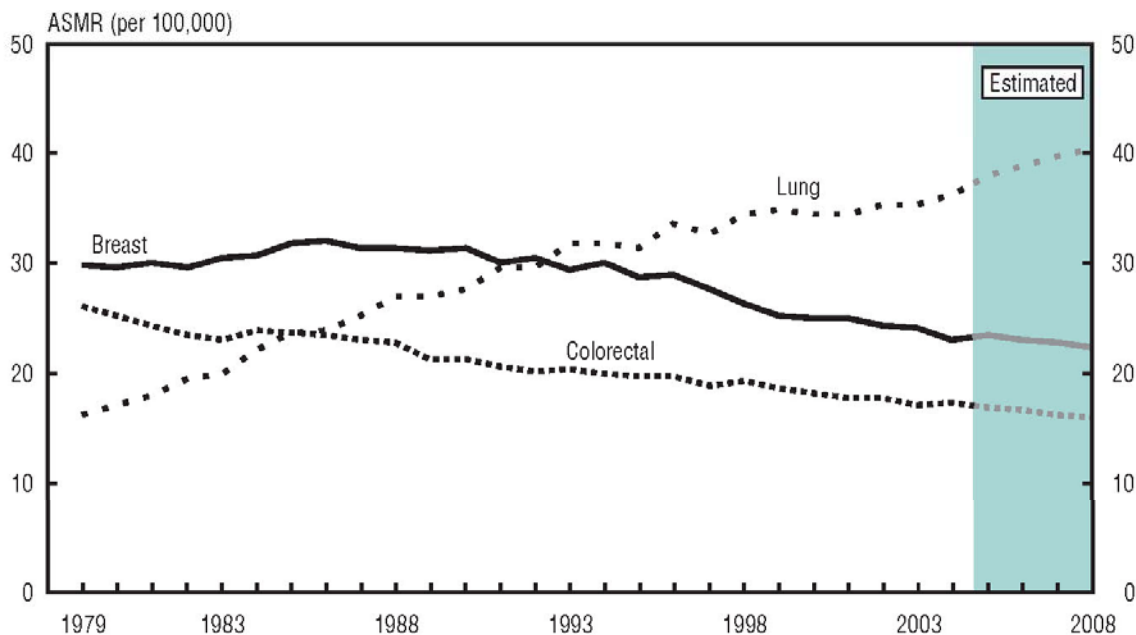
Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 8.1 for data points. Actual incidence data are available to 2005 except for Quebec, Manitoba and Alberta where 2005 incidence is estimated. Please refer to *Appendix II: Methods* for further details. Please note that each graph has a different scale for the vertical axis because of the wide range.

Source: Chronic Disease Surveillance Division, CCDPC, Public Health Agency of Canada

Figure 6.2

Age-Standardized Mortality Rates (ASMR) for Selected Cancers, Females, Canada, 1979-2008

25%
decline
since
1986



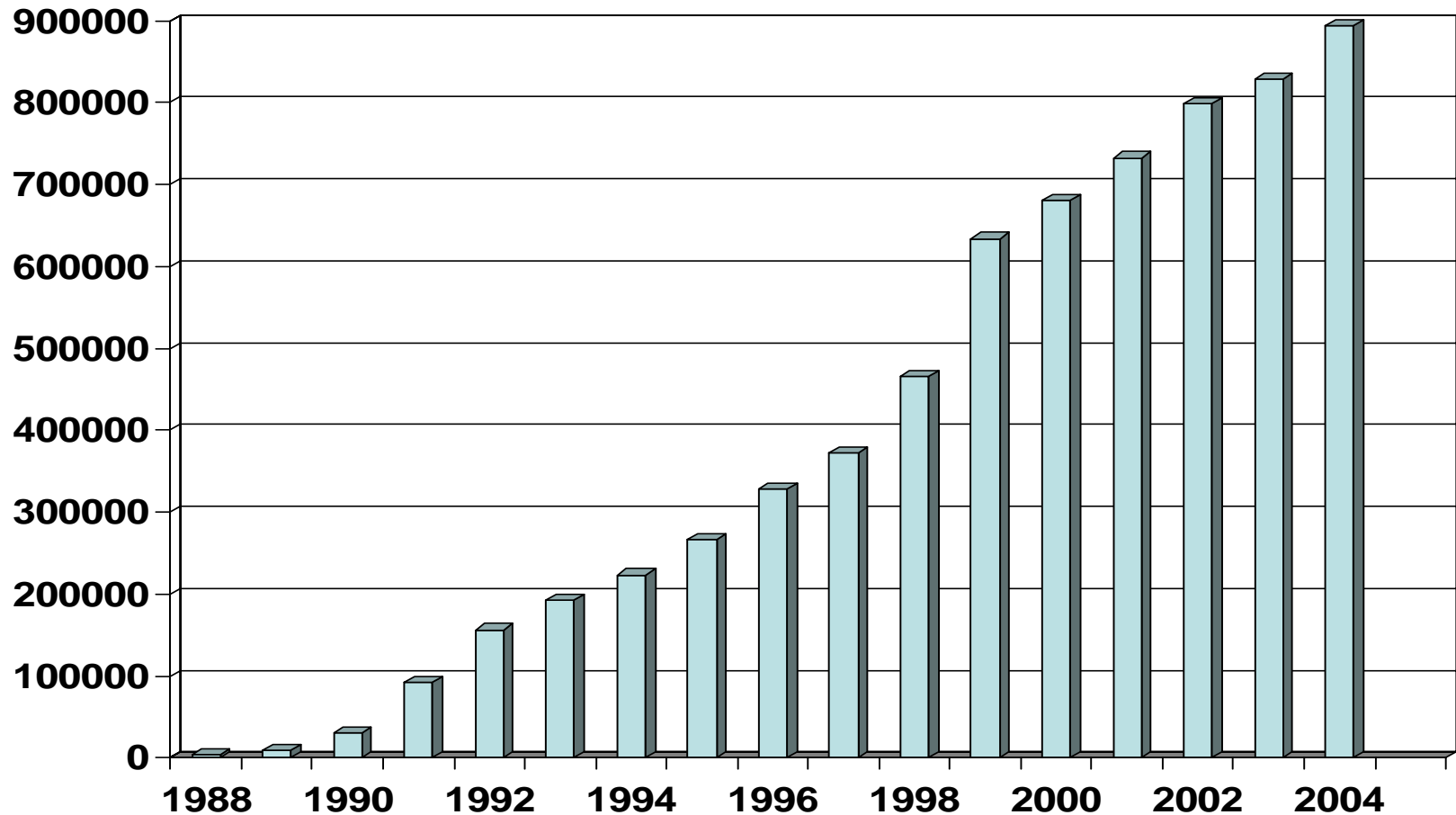
Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 8.2 for data points. Please note that each graph has a different scale for the vertical axis because of the wide range.

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Components of Breast Screening Programs in Canada

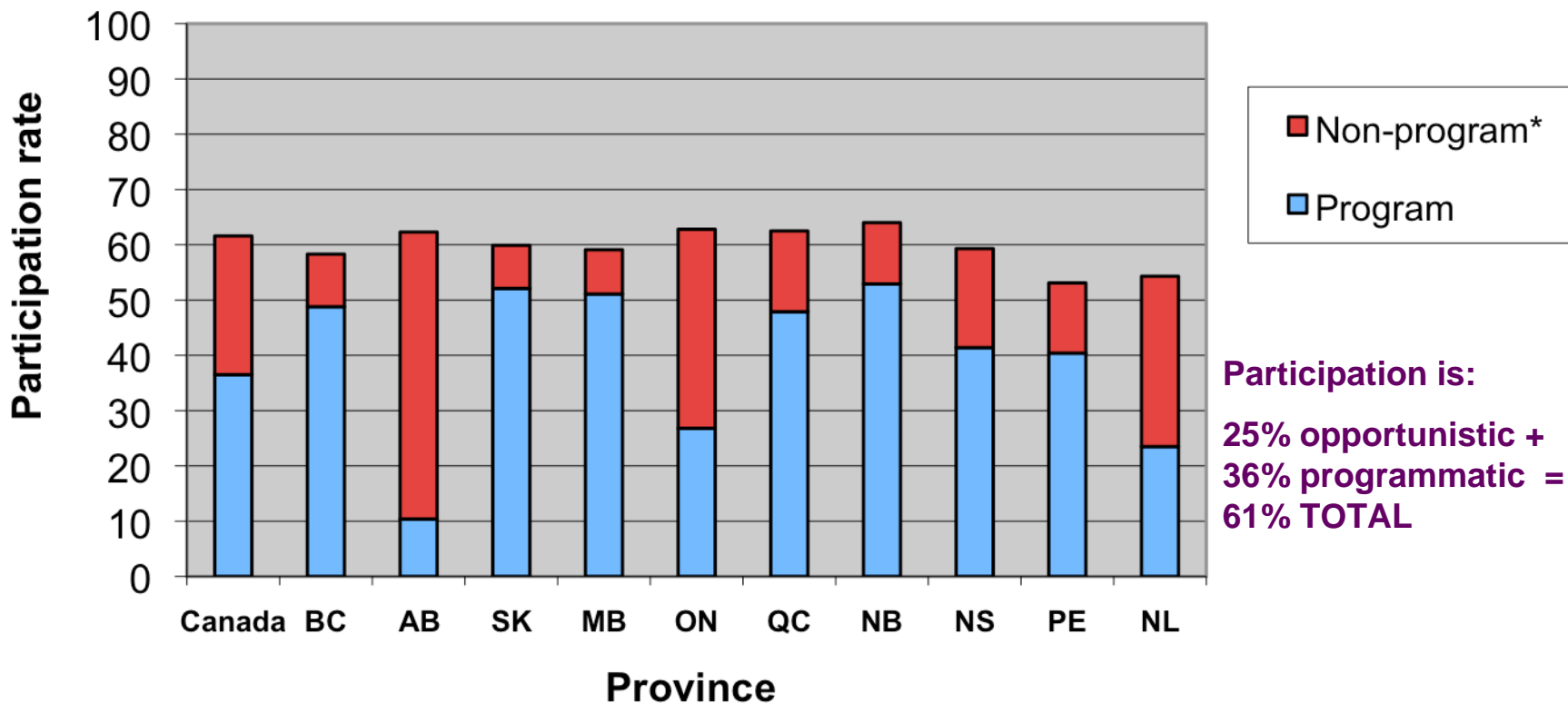
<p>Recruitment strategies</p> <ul style="list-style-type: none"> •Education/awareness •first time invitations at 50 •Reminders for next time •Doctor referrals or Self referral to program 	<ul style="list-style-type: none"> •To get women of the target age 50-69 come for screening – •Some programs accept women in their 40's, but don't promote or invite them to join the program
<p>Quality screening test: Mammography</p> <ul style="list-style-type: none"> –Mammography accreditation program –Quality indicators •3/10 province provide Clinical Breast Exam in addition to mammography 	<p>To improve accuracy of screening in cancer detection</p>
<p>Facilitation and linkages to the diagnostic follow-up (for Abnormal screen results)</p>	<p>To get the right follow-up for women with an abnormal screen within reasonable wait times</p>
<p>Quality diagnostic tests</p>	<p>To improve accuracy of diagnosis of cancer</p>
<p>Program evaluation and quality monitoring</p>	<p>To provide continuous evaluation of program effectiveness</p>

Annual Programmatic Screening Volume, 1988 to 2004 in Canada, all ages

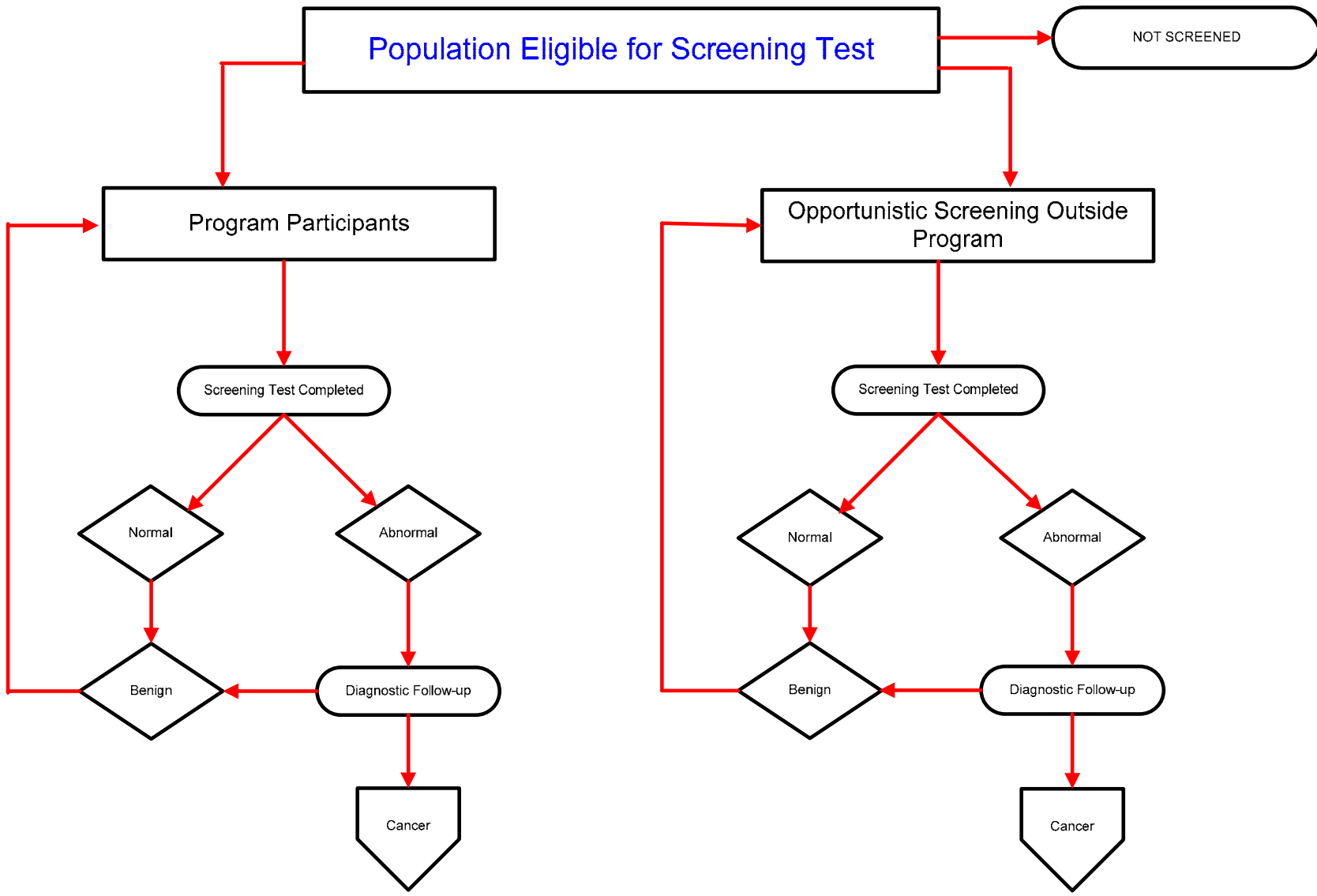


Programmatic vs Opportunistic Screening Participation, by Province 2003/2004, women aged 50-69

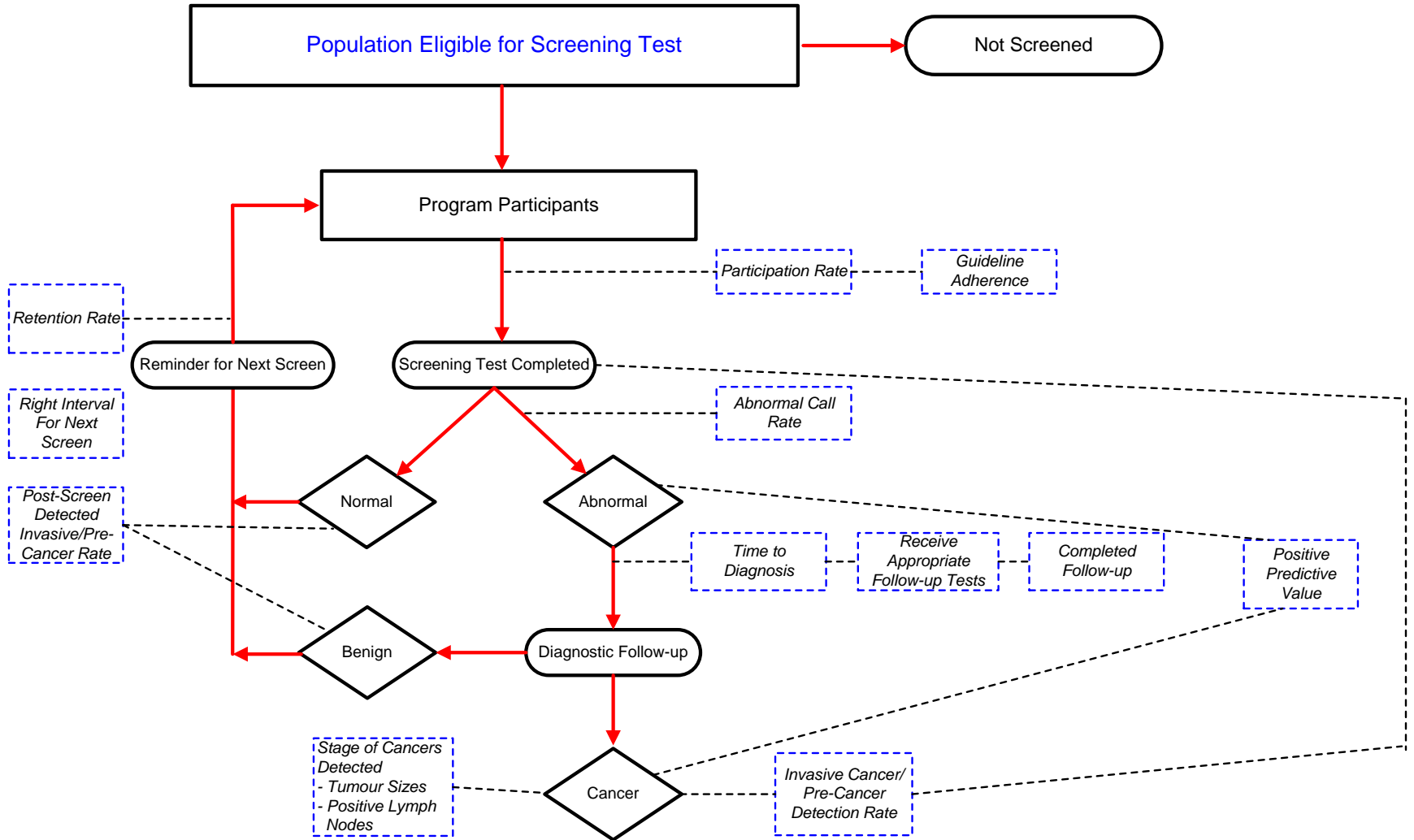
(Data Sources: CCHS 2005, Canadian Breast Cancer Screening Database 2003/2004)

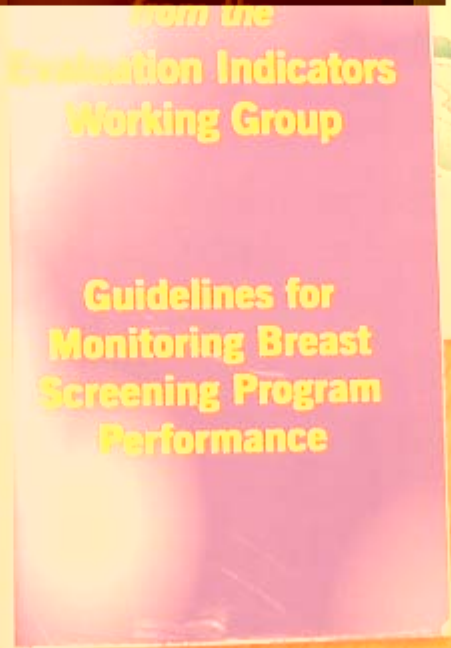
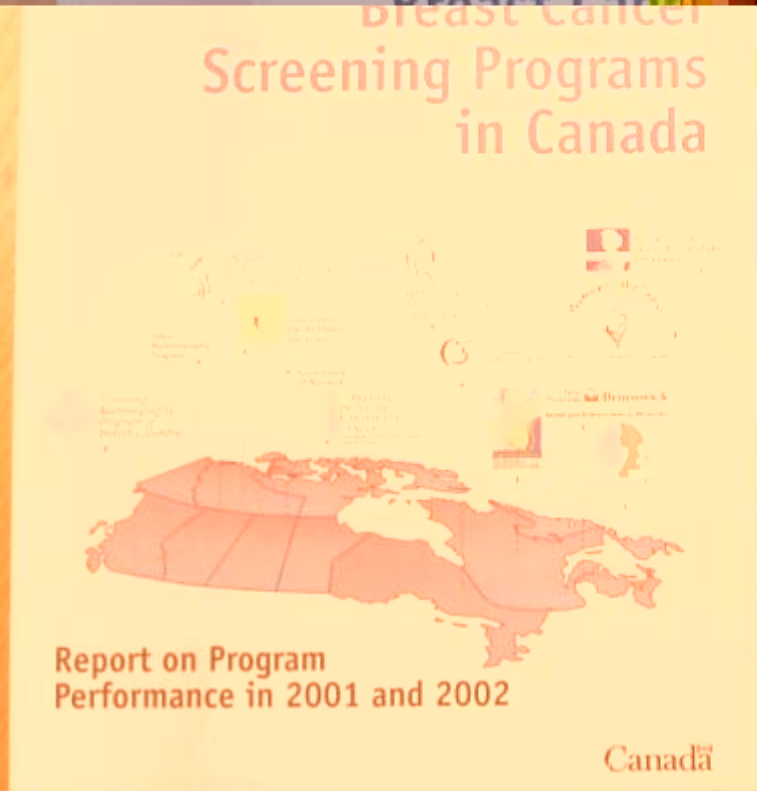
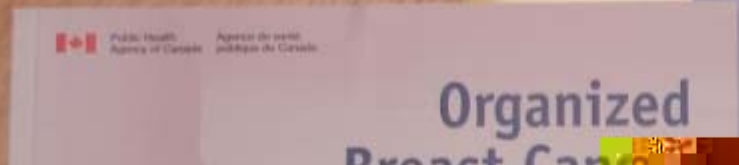


Source: Organized Breast Screening Programs in Canada, 2003/04



Organized Cancer Screening Program Pathway





2006 8 29

Results of Key Selected Program Indicators, Canada 2004

Indicator	Definition	Target	Results 2004
Participation Rate	Percentage of women who have a screening mammogram (calculated biennially) as a proportion of the eligible population	≥ 70% of eligible population	36.5 (this is program participation only and does not include opportunistic mammography)
Retention Rate	The estimated percentage of women who are re-screened within 30 months of their previous screen	≥ 75% initial re-screen within 30 months; ≥ 90% subsequent re-screens within 30 months	64.9 76.8
Abnormal Call	Rate Percentage of women screened who are referred for further testing because of abnormalities found with a program screen	> 10% (initial screen); > 5% (subsequent screens)	12.1 6.5
Invasive Cancer Detection Rate	Number of invasive cancers detected per 1,000 screens	> 5 per 1,000 (initial screen) > 3 per 1,000 (subsequent screens)	4.7 3.7



Results of Key Selected Program Indicators, Canada 2004

Indicator	Definition	Target	Results 2004
Invasive Cancer Tumour Size	Percentage of invasive cancers with tumour size of .10 mm and .15 mm in greatest diameter as determined by the best available evidence: 1) pathological, 2) radiological, and 3) clinical	> 25% ≤ 10mm; > 50% ≤ 15mm	36.4 64.8
Node Negative Rate in Cases of Invasive Cancer	Proportion of invasive cancers in which the cancer has not invaded the lymph nodes	> 70% (initial and subsequent screens)	74.8
Diagnostic Interval No Tissue Biopsy	Time from abnormal screen to resolution	≥ 90% within 5 weeks	74.3
Diagnostic Interval with Tissue Biopsy	Time from abnormal screen to resolution	≥ 90% within 7 weeks	46.3



The Ontario Breast Screening Program (OBSP)

- Started in 1990; eligible women **50+**
- Screening through 141 radiology affiliated sites which must meet accreditation standards and 8 regional centres which also monitor regional performance of screening.
- Projected number of women to be screened in 2008/09 fiscal year: **455,850**
- All participants receive mammography; about 50% also have a clinical breast exam performed by a trained nurse examiner
- Physician or Self referral of women; Reminder letters when next screen is due up to 74.
- Central Information system for booking appointments and collecting screening and diagnostic data

Screening Modalities in the Ontario Breast Screening Program – evolution with the evidence

1990	<ol style="list-style-type: none">1. Mammogram every 2 years2. Clinical Breast Exam3. Breast Self Exam Instruction
1998	<ol style="list-style-type: none">1. Mammogram every 1 or 2 years2. Clinical Breast Exam (optional for new screening sites joining program)3. Breast Self Exam Instruction
2002	<ol style="list-style-type: none">1. Mammogram every 1 or 2 years2. Clinical Breast Exam (Not provided by new screening sites joining the program)3. Breast Self Exam (instruction only if requested by patient)
2009 (today)	<ol style="list-style-type: none">1. Mammogram every 1 or 2 years2. Clinical Breast Exam provided to < 50% of patients in the Program (site-specific) and decreasing3. Breast health awareness has replaced the Breast Self Exam instruction

Screening Modalities

Quality Outcomes in the Ontario Breast Screening Program

Clinical Breast Examination: Maximizing Cancer Detection, Minimizing False Positive

Policies & Procedures for the following:

- Standards of Practice
 - CBE Method
 - Documentation
 - Referral Criteria – visual and palpable findings
- Certification and Maintenance of Competence
- Quality Assurance Program
 - Minimum Chart Audits
 - Yearly Nurse Examiner Outcomes

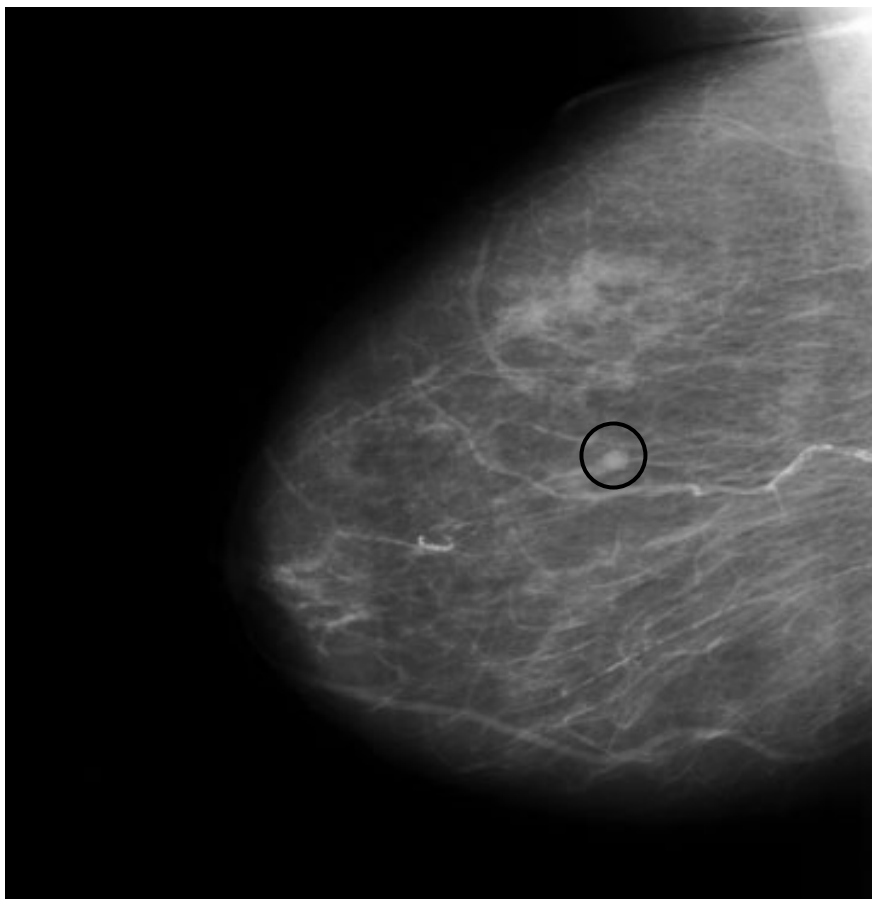
(referral rates, positive predictive values, cancer detection rates)



Nurse Examiner's Report Provided to Each Nurse Annually

No. of Screens	2,706
No. of Referrals	57
Referral Rate	2.1%
No. of Cancers	2
Detection Rate	0.7 cancers per 1,000 screens
Positive Predictive Value	3.5%
No. of Invasive Cancers	2
Invasive Cancers of Known Size	2
% Having Small Size (<=1.0 cm)	0.0%
Invasive Cancers for Which Nodes Were Examined	2
% Node Negative	100.0%

Mammogram Accreditation by the Canadian Association of Radiologists (CAR-MAP)



CAR-MAP sets standards for:

- equipment
- image quality
- radiology staff skills and qualifications
- Accreditation is good for 3 years
- 100% of the 141 OBSP-affiliated sites are accredited – it is a requirement for being affiliated with the program
- For non-program sites that provide mammography services, it is optional in Ontario.
- Some provinces in Canada have made CAR accreditation mandatory for all mammography services



Maintaining Mammography Quality

- CAR – Accreditation Requirement
- Annual Radiologist Performance Feedback
 - Abnormal Call Rate
 - Cancer Detection Rates
 - Positivity Predictive Value
- Interval Cancer Reviews to determine if it is
 - True interval
 - Missed at screen
 - Missed at diagnostic assessment
- Program Performance Reporting

Key Radiologist Outcomes reported in each of in Ontario, by region

- Chart 1: Radiologist abnormal call rates
- Chart 2: Radiologist in-situ cancer detection rates
- Chart 3: Radiologist invasive cancer detection rates
- Chart 4: Radiologist positive predictive value
- Chart 5: Radiologist small size invasive cancers
- Chart 6: Radiologist node negative invasive cancers
- Chart 7: Invasive Interval Cancer Rate
- Chart 8: Radiologist sensitivity/specificity rates

Comparison of Outcomes For Total Screens (Initials + Rescreens) for 2004-2006, OBSP

	CBE (n=588,811 screens)	Mammography (n=847,206 screens)
Abnormal Call Rate	2.6%	7.0%
Invasive Cancer Detection Rate	1.4 (per 1000)	4.0 (per 1000)
Positive Predictive Value	5.9%	7.1%

Diagnostic Procedures for Abnormal Screens by Modality of Referral, 2006 – All Ages (OBSP)

	CBE only	MM only
No. Assessed	3942	20,838
% MD Visit	47.6	0.6
% Surgical Consultation	23.5	7.7
% Diagnostic Mammogram	4.1	84.0
% Ultrasound	70.1	66.7
% Fine-Needle Aspiration	3.7	1.6
% Core Biopsy	3.3	13.8
% Open Biopsy	3.1	3.5
% Other Procedures	2.0	0.3



Cancer Detection By Modality in Four Canadian Breast Screening Programs

	INITIAL	RESCREENS
CBE Only	40 (5%)	42 (6%)
CBE & Mammography	323 (40%)	212 (33%)
Mammography Only	437	392
Total	800	646

Source: Bancej, C. 2003, Journal of Medical Screening

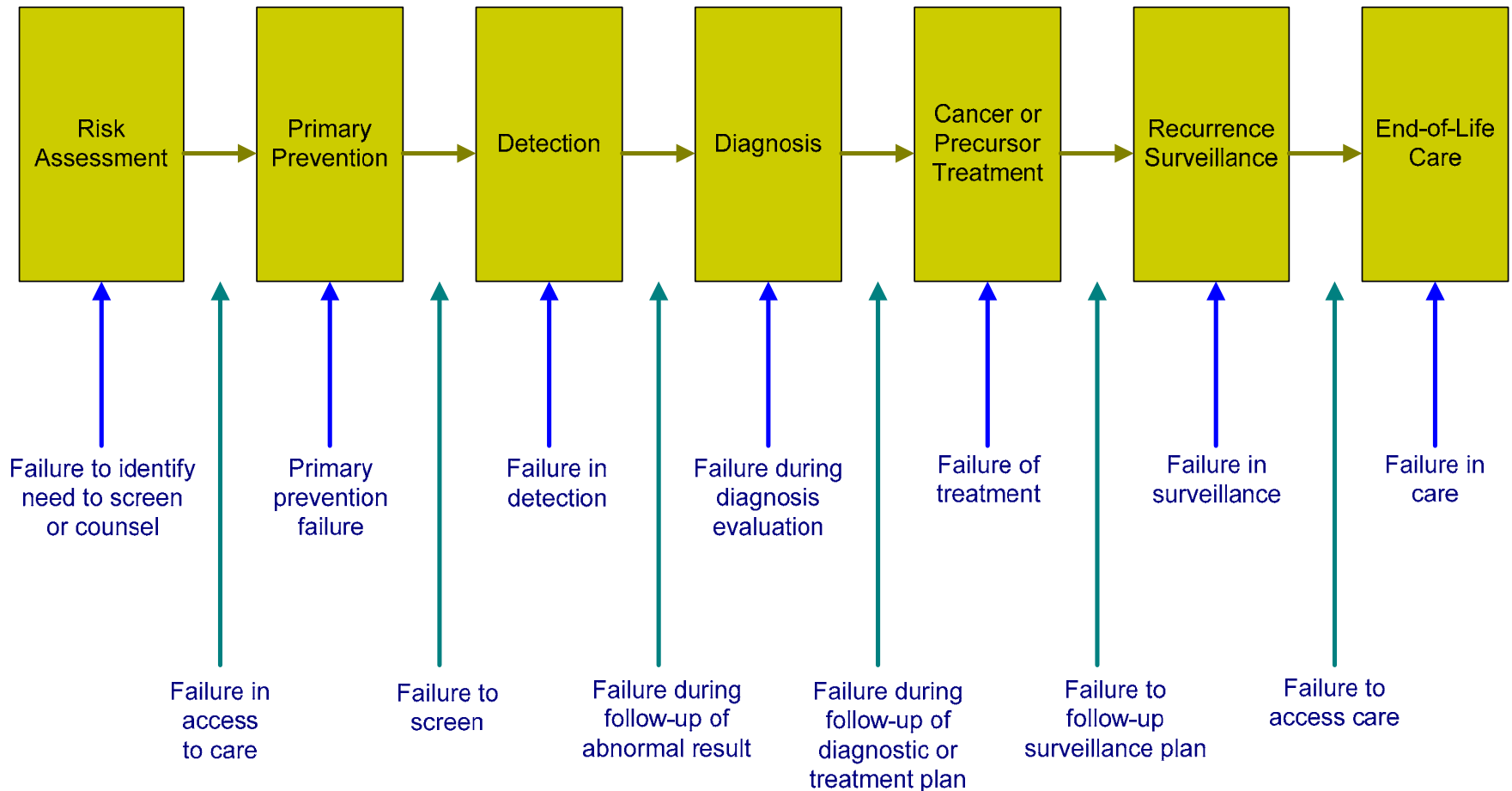
1996-1998 screens

Cancer Detection By Modality in the Ontario Breast Screening Program, 2006

	ALL SCREENS
CBE Only	52 (5%)
CBE & Mammography*	240 (21%)
Mammography Only	839 (74%)
Total	1131

*Abnormal CBE not counted if it was not on the same side as the breast cancer

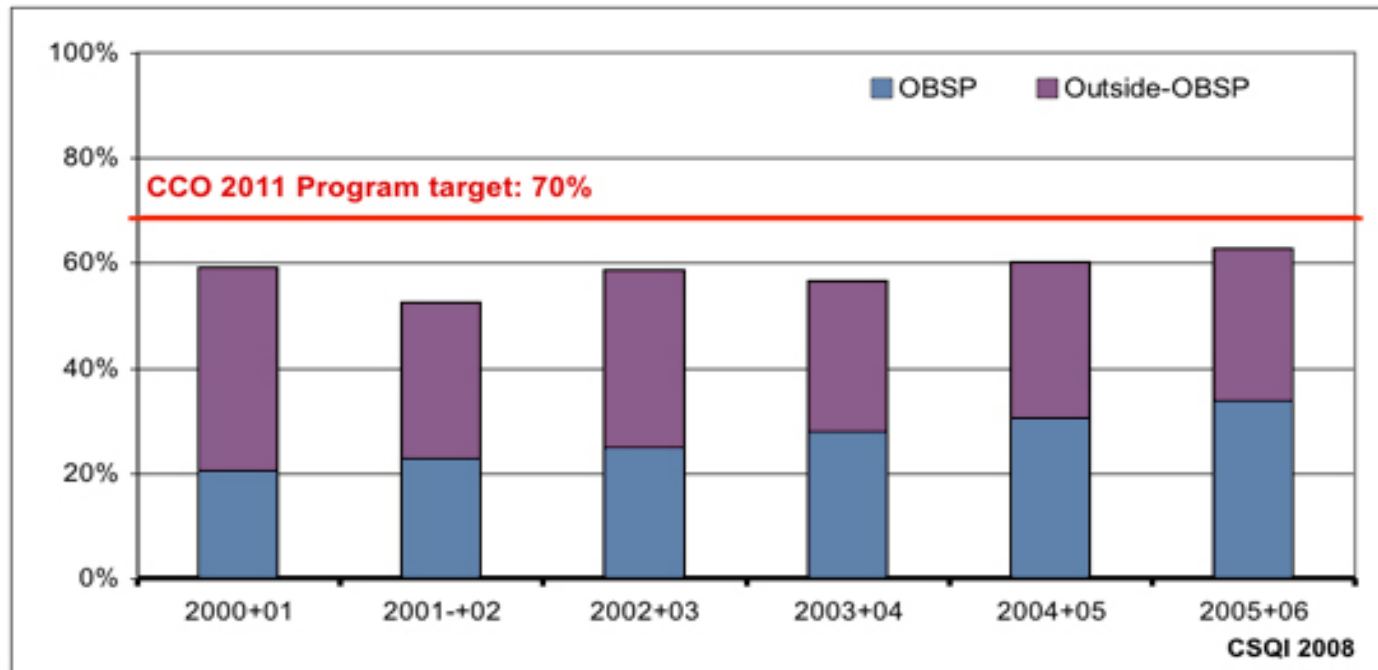
TYPES OF CARE – "A Framework for Improving Quality of Cancer Care"



Potential Failures During the Processes of Care

Breast Cancer Screening - Mammography

Percent of screen-eligible women (ages 50-69) receiving a mammogram in the past 2 years
by type of screening (OBSP vs. outside OBSP), Ontario, 2000-2006



Source: Ontario Health Insurance Plan database; Cancer Care Ontario, Ontario Breast Screening Program; Registered Persons Database (RPDB) of the Ontario Ministry of Health and Long-Term Care

Analysis conducted by scientists in the Cancer Program at the Institute for Clinical Evaluative Sciences (ICES) in Toronto

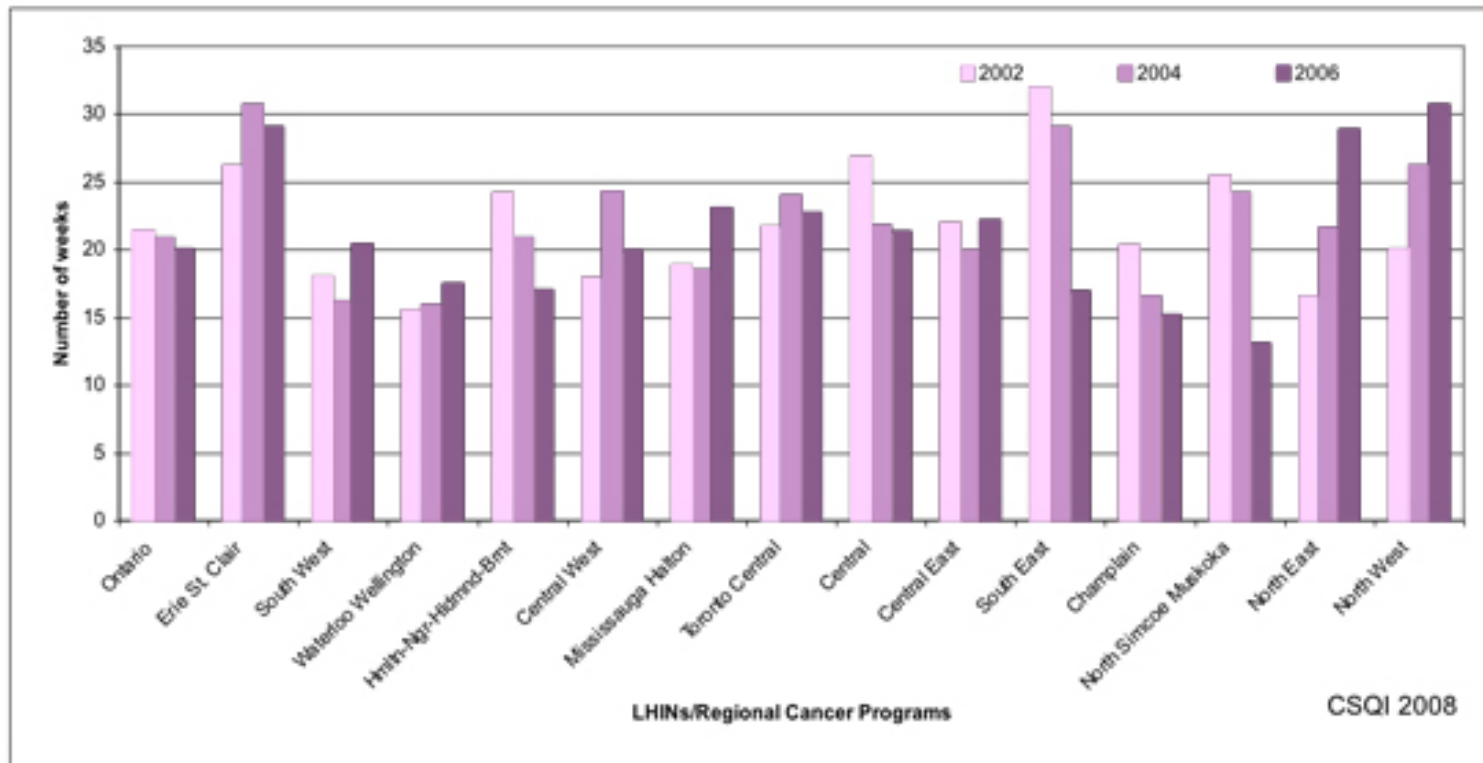
Notes:

1. Women screened are counted only once (i.e. excludes re-screens);



Breast Cancer Test Waits

Median waits (in weeks) from abnormal screen to first surgical excision for breast cancer patients 2002, 2004, 2006



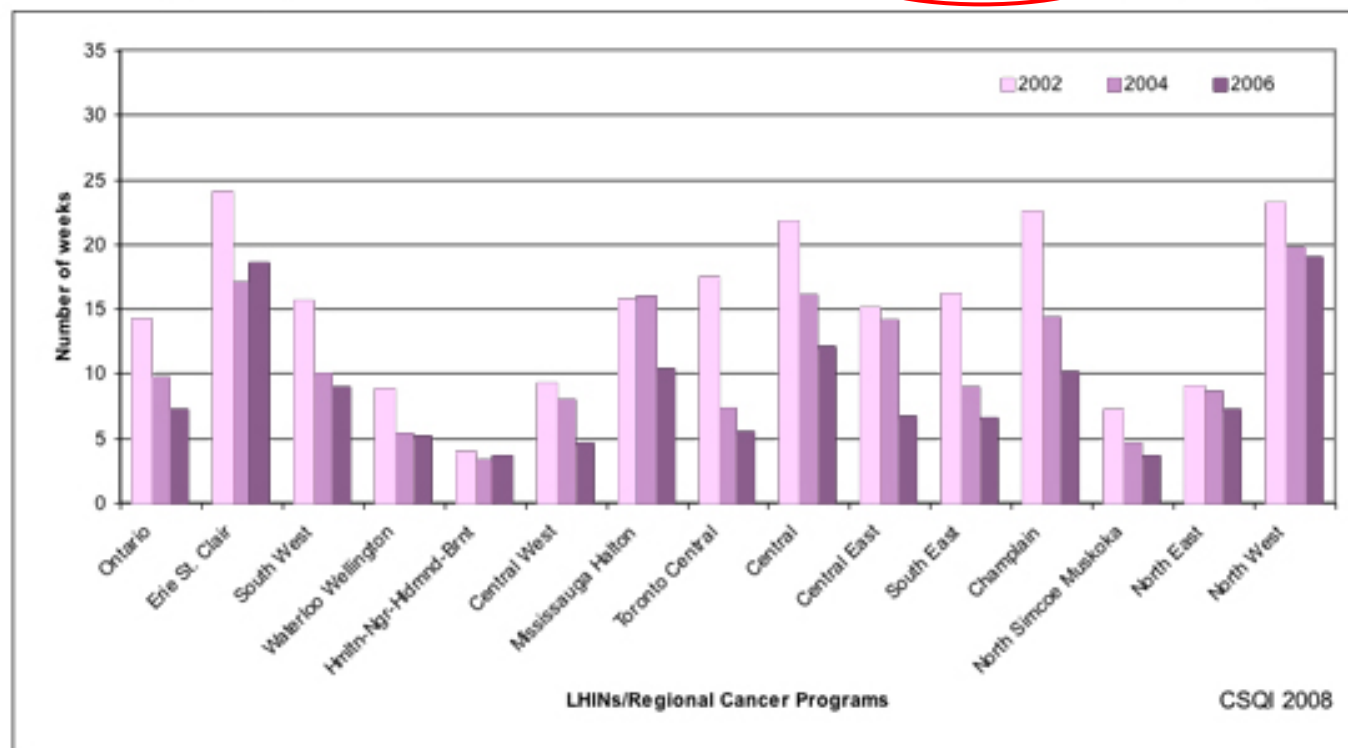
Sources: Cancer Care Ontario, Ontario Breast Screening Program; Ontario Health Insurance Plan database; Canadian Institute for Health Information (CIHI) Discharge Abstract Database; Registered Persons Database

Analysis conducted by scientists in the Cancer Program at the Institute for Clinical Evaluative Sciences (ICES) in Toronto

Note: 1. To measure wait times for this analysis, women were followed for a maximum of 1 year.

Breast Cancer Test Waits

Median waits (in weeks) from abnormal screen to resolution for women without breast cancer 2002, 2004, 2006



Sources: Cancer Care Ontario, Ontario Breast Screening Program; Ontario Health Insurance Plan database; Canadian Institute for Health Information (CIHI) Discharge Abstract Database; Registered Persons Database

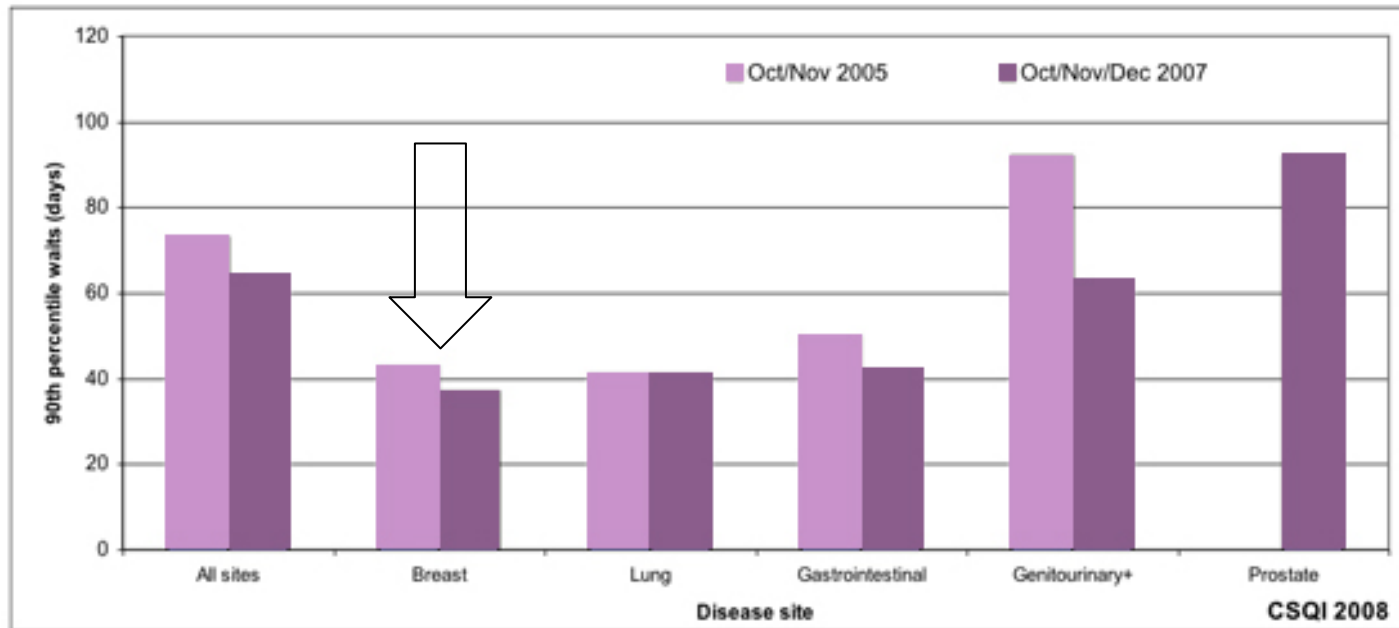
Analysis conducted by scientists in the Cancer Program at the Institute for Clinical Evaluative Sciences (ICES) in Toronto

Notes:

1. "Resolution" of mammogram includes last procedure, including further imaging;
2. To measure wait times for this analysis, women were followed for a maximum of 1 year.

Cancer Surgery Waits

Cancer surgery 90th percentile waits* (days), decision-to-treat to operation, 2005, 2007**, by disease site



Source: Interim Wait Time Collection Database & Wait Times Information System, Cancer Care Ontario

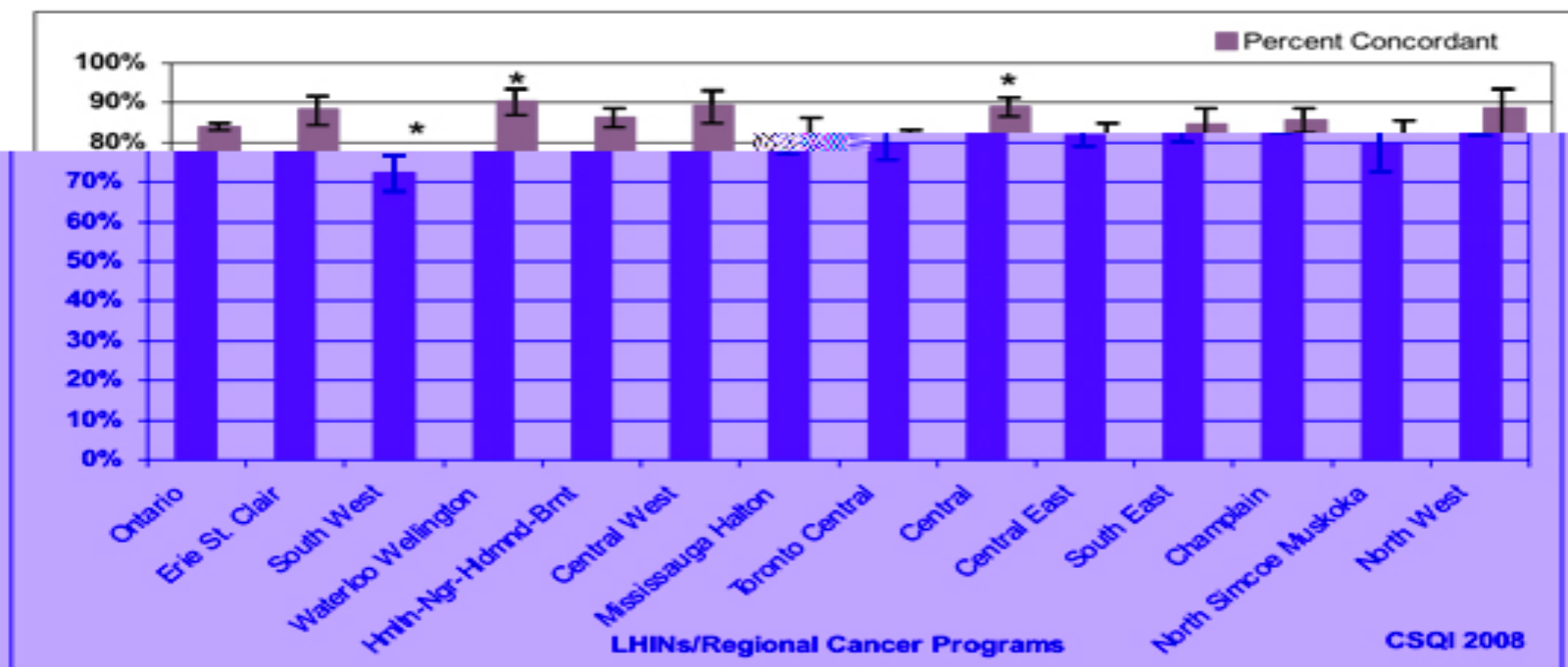
Notes:

- * The 90th percentile is the time at which 90% of all patients have received surgery and 10% have not.
- ** Data included for Oct/Nov 2005 and Oct/Nov/Dec 2007
- * Includes prostate for 2005; Excludes prostate for 2007



Use of Guidelines for Treatment of Breast Cancer

Standardized Percent of Stage I & II Breast Cancer Patients Treated with Guideline Recommended Radiation Following Breast Conserving Surgery by LHIN of Patient Residence (patients having surgery from April 2005 to March 2007)



Sources: Cancer Care Ontario, Activity Level Reporting and Ontario Cancer Registry

Notes:

1. Results are standardized for patient age and stage (I vs. II) and driving distance between patient residence and nearest treatment centre.
2. Confidence interval bars indicate the range (plus or minus) within which the results could vary statistically. Only LHIN-specific results whose interval does not overlap with that of the Ontario average (two horizontal lines) would be considered significantly different from that average (also identified with an asterisk).
3. North East LHIN results are excluded because of data quality issues.
4. * Denotes significantly different from provincial average

Current Challenges in Breast Screening

- The challenge of promoting evidence-based screening interventions, in an environment of constantly evolving evidence and new technologies
 - Determining the role of new screening technologies in population screening programs
 - Digital Mammography vs. Conventional
 - The role of MRI for screening in high risk women
 - Dealing with unproven technologies
 - Population screening for women in their 40's – balance of benefits and harms?
- Supporting informed decision making about cancer screening
 - Presenting the information on the potential benefits and limitations effectively to assist women to decide about screening
- Dual Systems: programmatic and opportunistic
- Capacity issues in the health care system

Capacity Issues in Breast Screening Program

- The population in the screening age group is increasing each year with the aging of the “baby boomer” generation, meaning that more women must be screened to even maintain the same participation rates for the age-eligible population
- Program budget caps limit annual growth in volumes in some provinces
- Increasing waiting times to get a screening appointment date / or appointment cancellations when short-staffed.
- Capacity in the health care system may be contributing as well - inadequate radiologists and medical radiation technologists to meet needs
- Impact in the future with retirement of the “boomers and the potential for enhanced educational requirements for technologists (university degree) may be even greater shortages.



Summary

- Screening programs must adopt a culture of continually striving to **increase the benefits** and **minimize the harms** of screening.
- A lot has been accomplished, given the existence of 13 separate jurisdictions, each with their own set of issues and priorities on the delivery of health care, through a strong national collaboration.
- The key benefits have not yet been maximized, given the challenges faced to improve participation rates in women 50-69, and we must continue to address quality improvement and new evidence



Muchas gracias !


Obrigada !



Ontario Breast Screening Program in Northern Ontario

HOW IT WORKS!

Mammography and clinical breast exams are the most reliable screening methods. Regular breast self-examinations can help women learn what is normal for their breasts.

- 
- Average size lump found by getting regular **mammograms.**
 - Average size lump found by first **mammogram.**
 - Average size lump found by **clinical breast examination** by a healthcare professional.
 - Average size lump found by women performing regular **breast self-examinations.**

The Thing-a-ma-boob

for breast screening awareness

Canadian Cancer Society