Breast Cancer in Young Women
Arrow Project
June 6th 2013

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Overview - Breast Cancer in Young Women

- 10% of breast cancers are diagnosed in women under 40
- Breast cancer is the leading cause of death amongst women under 45 in the Western world and is a major cause of morbidity
- Only 30% of breast cancers in women under 40 are caused by known genetic mutations
- unlike in older women we don't know what causes breast cancer in most young women

Breast cancer in young women – is a challenge!

- It is rare.
- Paucity of modifiable risk factors.
- Lack of screening.
- Fertility issues are unique to this group

Breast Cancer in Young Women

- Breast cancer in young women strikes them at the peak of:
- Their careers
- Their reproductive years
- Their motherhood and most active years of family life

Age-Specific Probabilities of Developing Breast Cancer

By age 30 … 1:1985
By age 40 … 1:229
By age 50 … 1:68
By age 60 … 1:37
By age 70 … 1:26
By age 80 … 1:24
By lifetime… 1:8

(ACS Research, SEER 2005)

Ten leading causes of death in women aged 15-44 by country income group, 2004

High-income countries			
Rank	Cause	Deaths (000s)	%
1	Road traffic accidents	14	10.2
2	Self-inflicted injuries	13	9.8
3	Breast cancer	11	7.9
4	Poisonings	5	3.8
5	Stroke	5	3.6
6	Ischaemic heart disease	4	3.2
7	Violence	4	2.9
8	HIV/AIDS	3	2.6
9	Trachea, bronchus and lung cancers	3	2.5
10	Cirrhosis of the liver	3	2.4

Women & Health, WHO Report, 2009

Ten leading causes of death in women aged 20-59 by country income group, 2004

High-income countries			
Rank	Cause	Deaths (000s)	%
1	Breast cancer	49	11.5
2	Trachea, bronchus, lung cancers	28	6.7
3	Ischaemic heart disease	28	6.7
4	Suicide	22	5.1
5	Stroke	20	4.8
6	Colon and rectum cancers	16	3.8
7	Road traffic accidents	16	3.8
8	Cirrhosis of the liver	13	3.1
9	Ovarian cancer	12	2.8
10	Cervical cancer	10	2.4

Women & Health, WHO Report, 2009

The NEW ENGLAND JOURNAL of MEDICINE

The Decrease in Breast-Cancer Incidence in 2003 in the United States

Peter M. Ravdin, Ph.D., M.D., Kathleen A. Cronin, Ph.D., Nadia Howlader, M.S., Christine D. Berg, M.D., Rowan T. Chlebowski, M.D., Ph.D., Eric J. Feuer, Ph.D., Brenda K. Edwards, Ph.D., and Donald A. Berry, Ph.D.

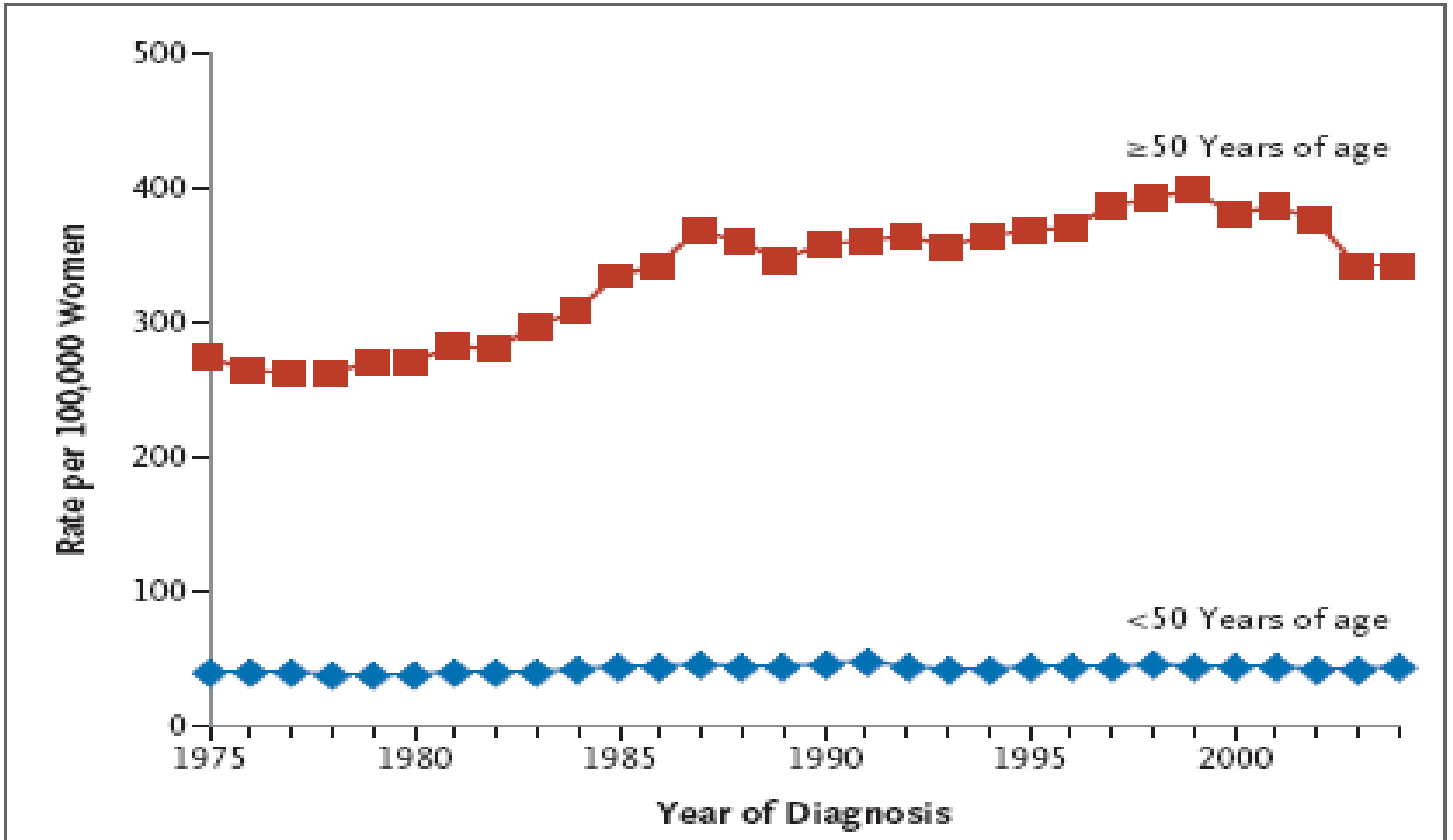


Figure 1. Annual Incidence of Female Breast Cancer (1975–2004).

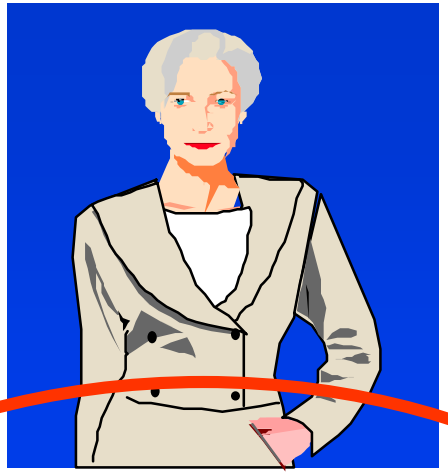
Data are from nine of the NCI's SEER registries. SEER sites include San Francisco, Connecticut, Detroit (metropolitan area), Hawaii, Iowa, New Mexico, Seattle–Puget Sound, Utah, and Atlanta (metropolitan area).

WHAT CAUSES BREAST CANCER IN YOUNG WOMEN?

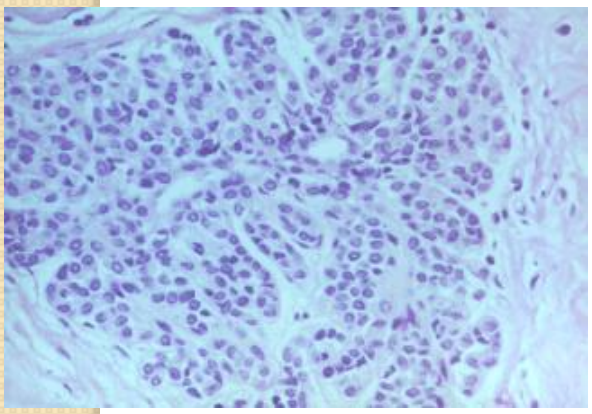
Major Breast Cancer Risk Factors

GENDER

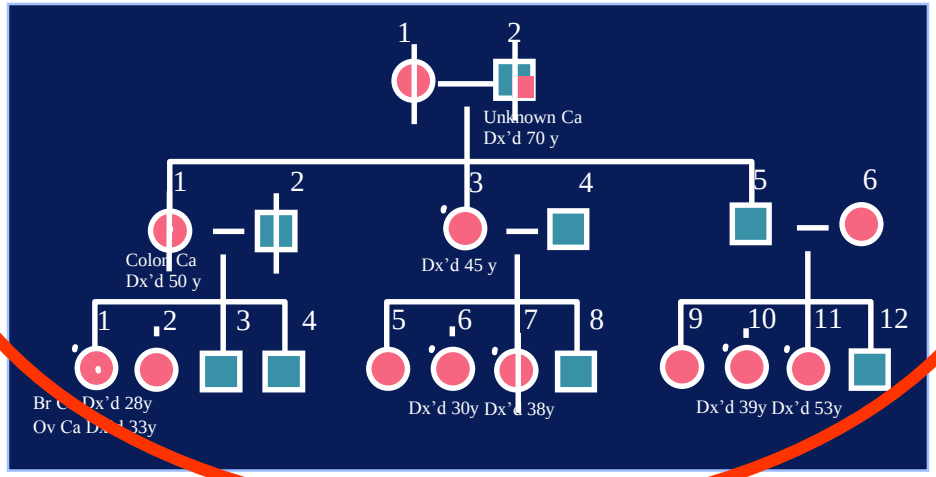
AGE



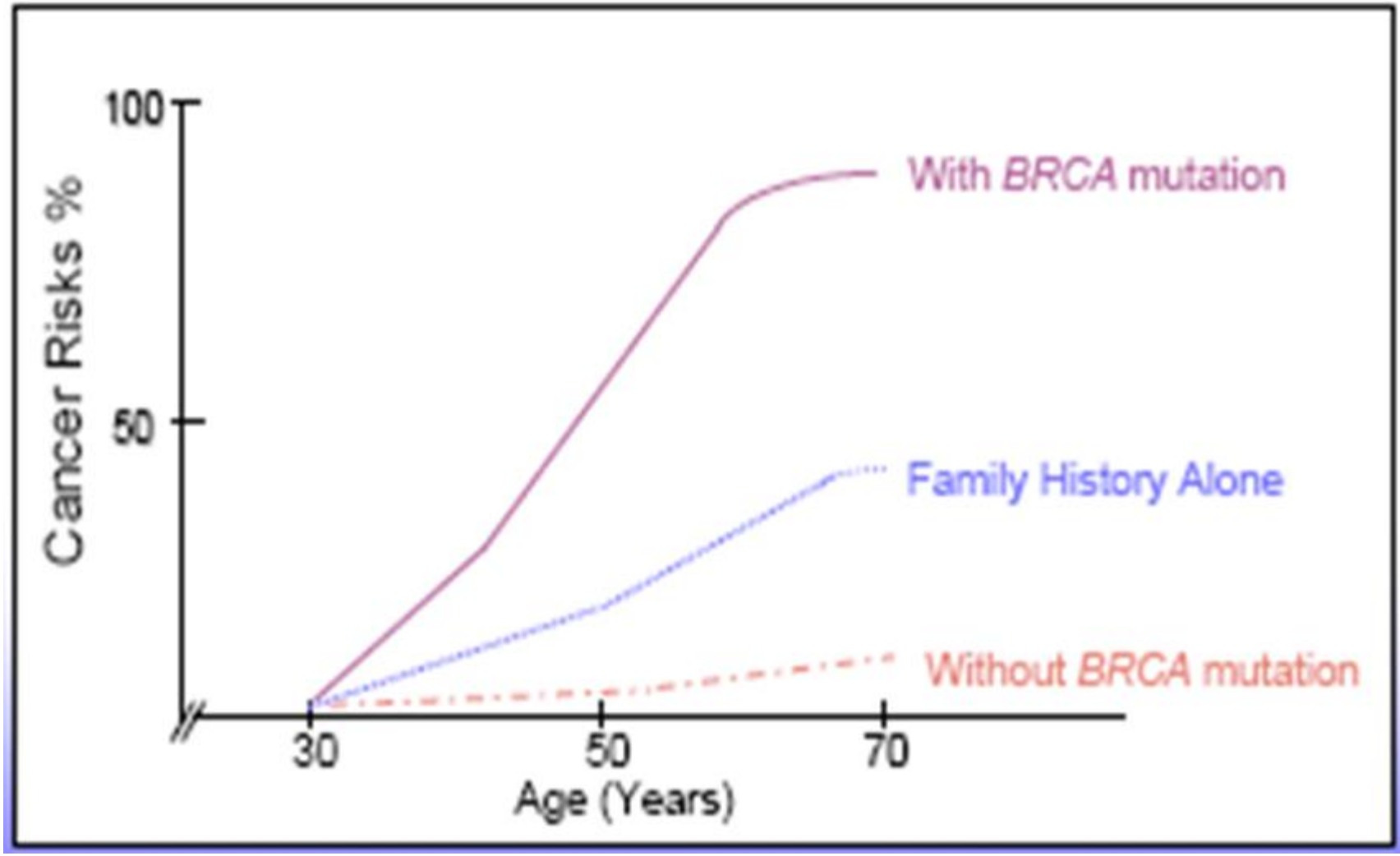
ATYPICAL HYPERPLASIA / LCIS



FAMILY HISTORY



Family history is not enough



Proven Risk factors for Early Onset Breast Cancer

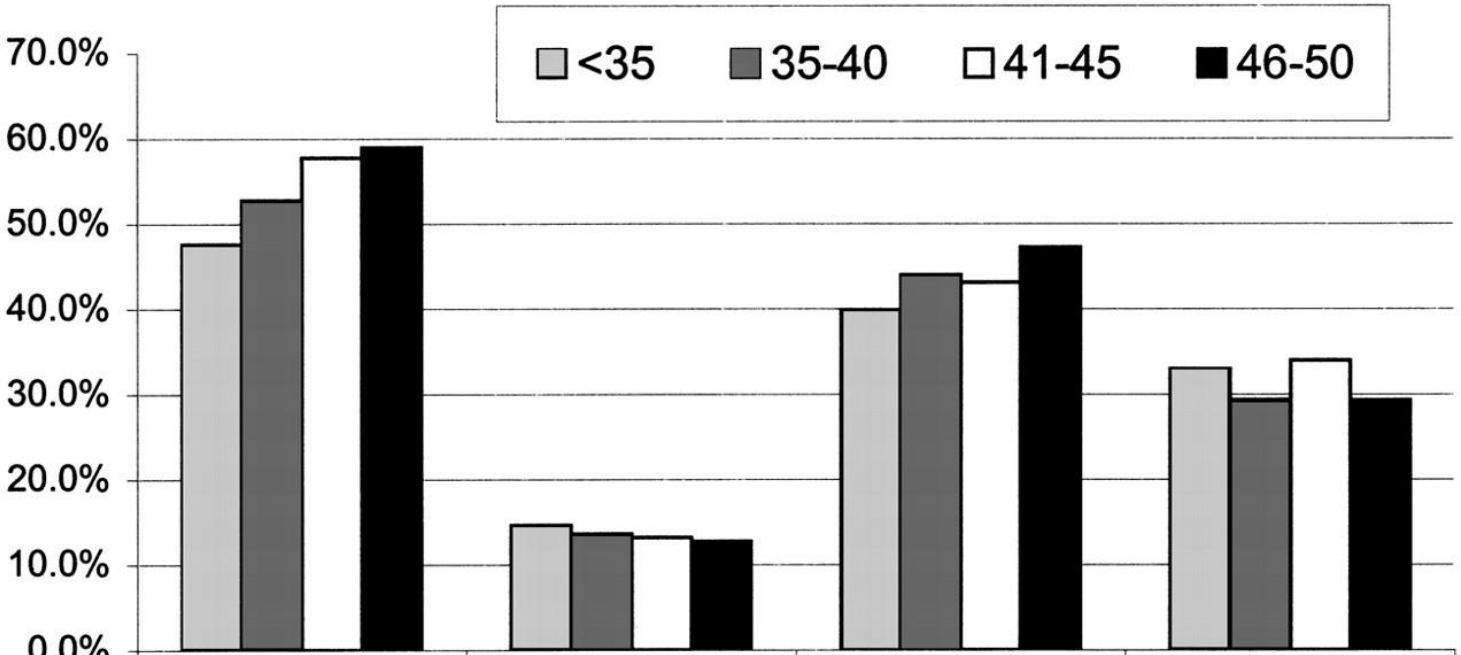
- Birth weight, growth rate in childhood, attained height – effects are small.
- High BMI is *protective* against breast cancer in premenopausal.
- Oral contraceptives – actual risk increase is small.
- Breastfeeding is *protective*- more modest effect in premenopausal.
- Increasing parity – the effect is *less protective* in young women.
- Exposure to ionizing radiation (depends on the age of exposure and the radiation dose.) – relative risk is higher for early onset BC <35.
- Genetic factors.

WHAT'S DIFFERENT ABOUT BREAST CANCER IN YOUNG WOMEN?

TNM STAGING

- Primary tumor (T)
- Regional lymph nodes (N) – clinical/pathologic
- Distant metastasis (M)

Pathological stage according to TNM (pTNM), tumor size and degree of axillary node involvement as a percentage of the respective age cohorts.

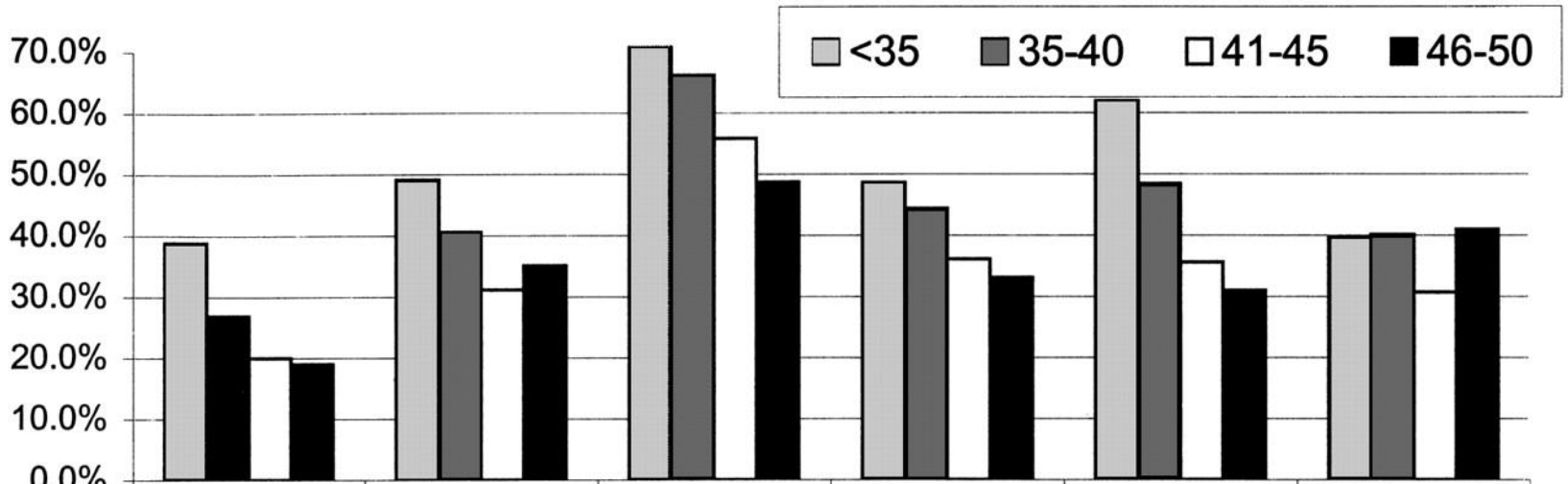


	pT1	>=1cm	pN0(+Sent Neg.)	1-3 nodes
<35	47.6%	14.6%	39.9%	33.0%
35-40	52.8%	13.6%	44.0%	29.3%
41-45	57.8%	13.2%	43.1%	34.0%
46-50	59.0%	12.7%	47.2%	29.3%

Colleoni M et al. Ann Oncol 2002;13:273-279

Annals of Oncology

Expression of ERs, PgRs, presence of peritumoral VI, grading (G), expression of Ki-67, overexpression of HER2/neu, as percentage of the respective age cohorts.



	ER<10%	PgR<10%	ki-67>=20%	VI present	G3	HER2/neu>=10%
<35	38.8%	49.1%	71.4%	48.6%	61.9%	39.6%
35-40	26.9%	40.6%	66.1%	44.4%	48.4%	40.1%
41-45	20.0%	31.2%	55.8%	36.1%	35.6%	30.7%
46-50	19.0%	35.1%	48.7%	33.1%	31.0%	41.0%

Colleoni M et al. Ann Oncol 2002;13:273-279

Annals of Oncology

Association between very young age and adverse characteristics of breast cancer at presentation amongst Israeli women

- Of 1448 newly diagnosed breast cancer patients Sixty-one very young (<35) and 94 less-young (40-50) patients were identified.
- Significantly more very young patients had metastatic disease at presentation (20% vs. 3%, respectively, P = 0.0007).
- The very young patients were more likely to have high grade, HR- tumors than the less young patients.
- After controlling for stage and tumor grade, very-young age was not shown to be an independent risk factor for reduced survival.

Paluch-Shimon S. Am J Clin Oncol 2011

Survival by age

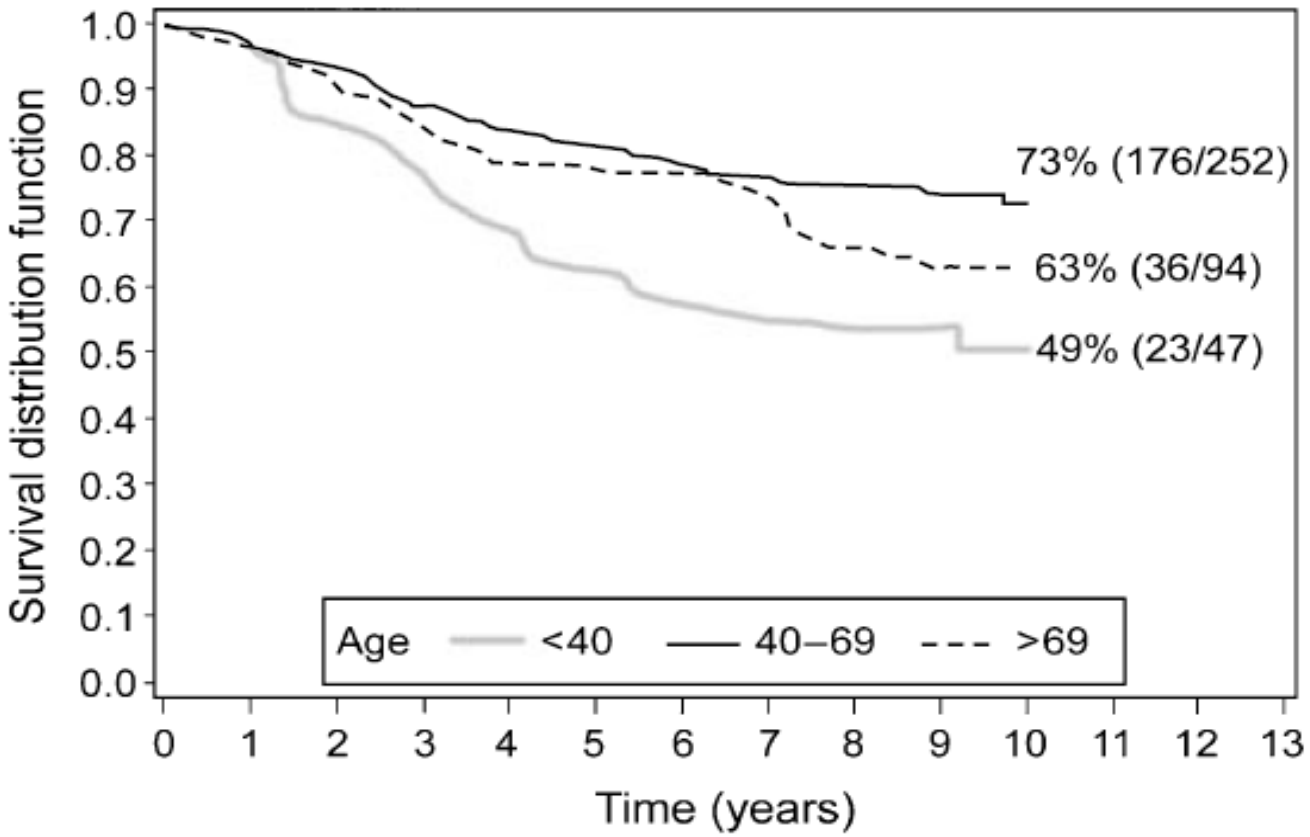
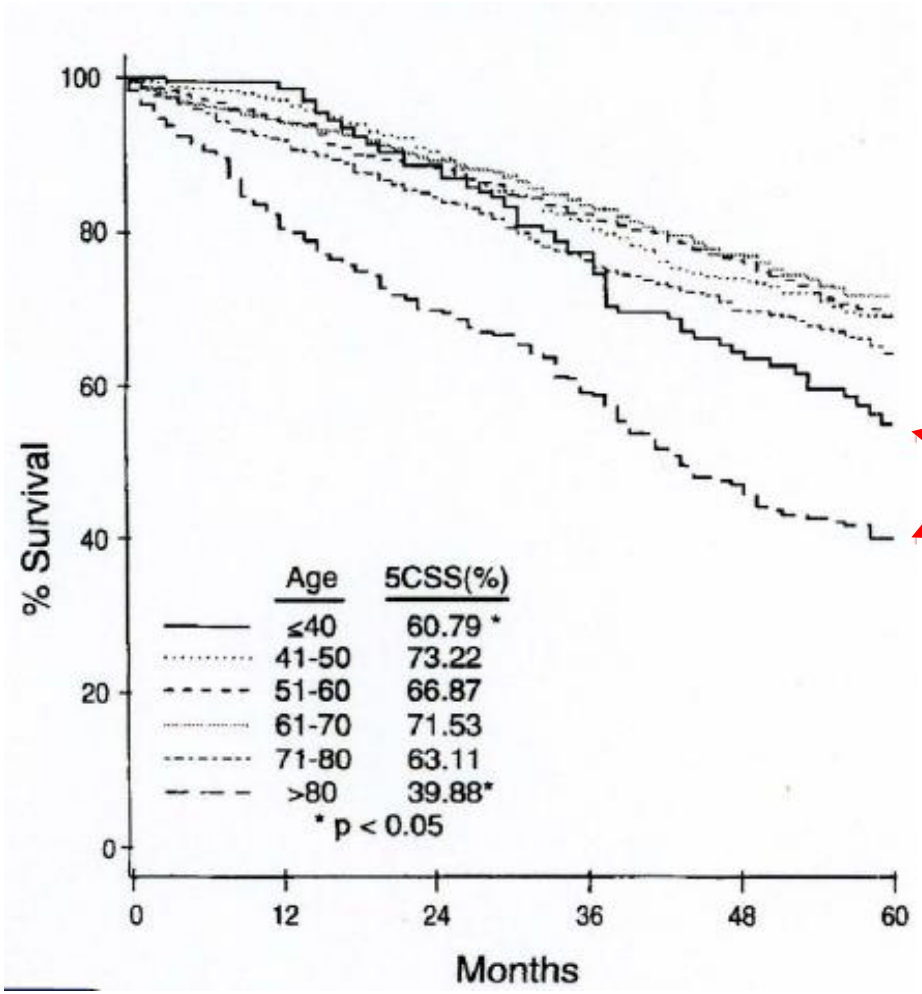


Fig. 1. Overall 10-year survival for age. Numbers in parentheses indicate total number and number at risk.

Jayasinghe ANZ J Surg. 2005

Disease Free Survival by Age



Only women over 80 do worse

Other issues:

- Early onset menopause
- Fertility preservation
- Sexual disfunction
- Pregnancy after breast cancer
- Psycho-social issues

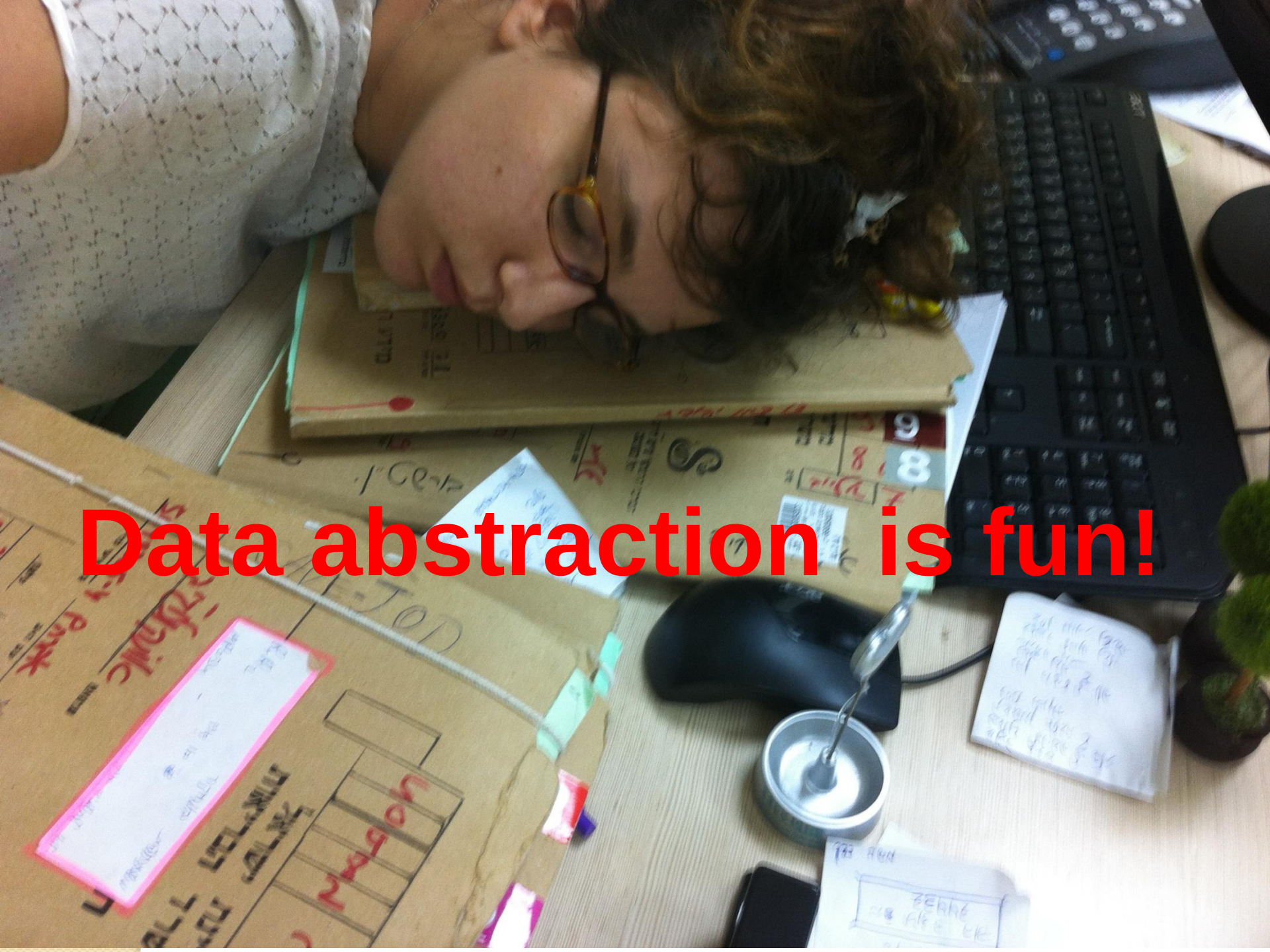
Ongoing studies

Objective

- Little research performed specifically on breast cancer in young women
- Age as an independent risk factor
- Conclusions regarding screening, prognosis & treatment

Method - Clinical data base

- Data abstraction
- 200 young patients
- descriptive analysis


Data abstraction is fun!

Goals

Characterization of breast cancer in young women – before treatment

	40 >	50 <
Mode of diagnosis		
Shown on mammography		
Shown on ultrasound		
Shown on MRI		
TNM Stage		
Estrogen		
Progesteron		
Her-2		
Family history (cancer)		
Family history (breast cancer)		
Genetics		

Goals

Characterization of breast cancer in young women - before treatment

	40 >	50 <
Mode of diagnosis		
Shown on mammography	? ?	
Shown on ultrasound		
Shown on MRI	?	
TNM Stage		
Estrogen		
Progesteron		
Her-2		
Family history (cancer)		
Family history (breast cancer)		
Genetics		

Goals

- Assessing treatment effectiveness – example: Relumpectomy
- Age as an independent risk factor for bad prognosis (stage per stage)
- Long term outcome

Method – prospective study

- International study – Dana-Farber
- Epidemiological questioners

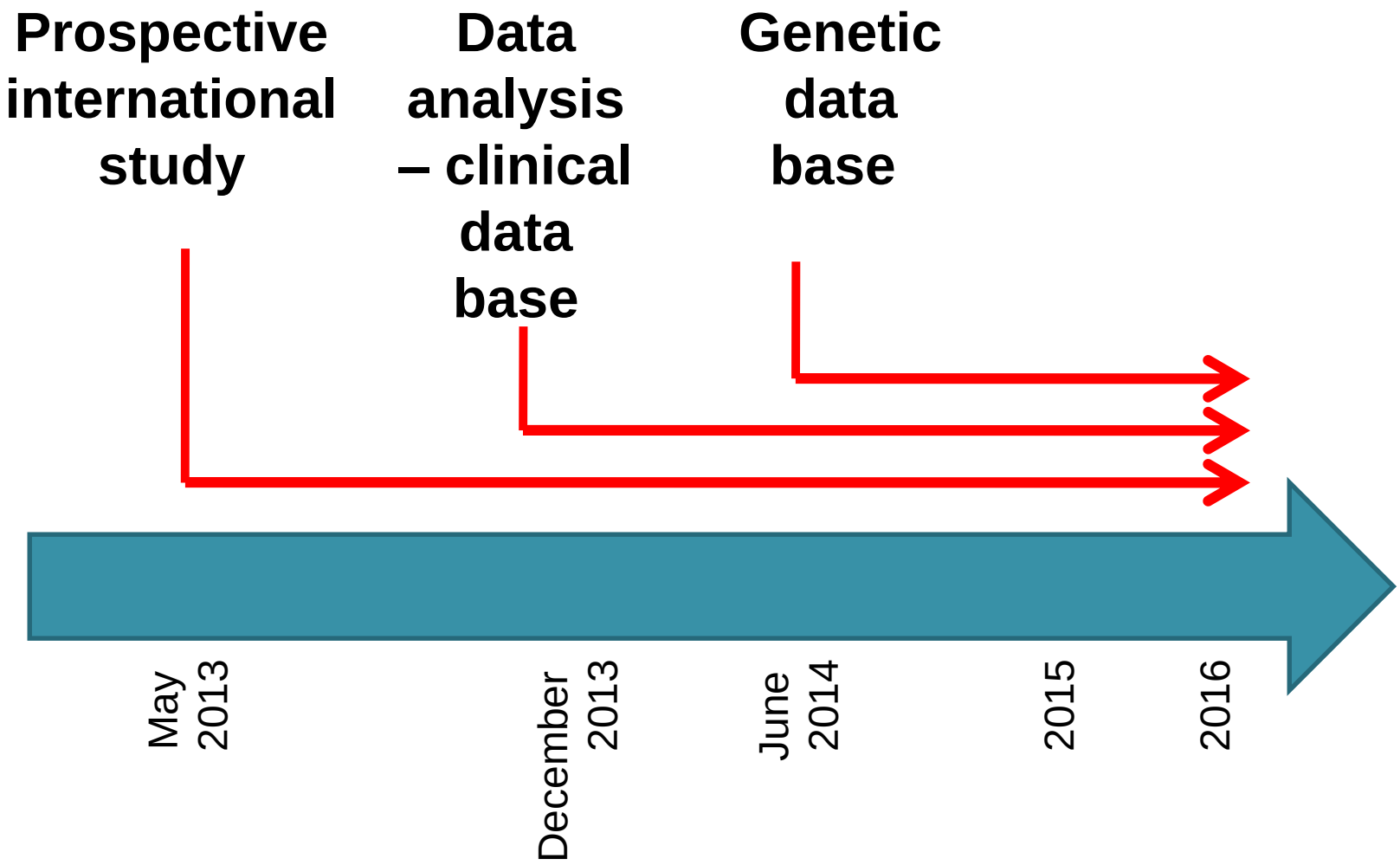
Goals

- Etiology - Risk factors
- Psychosocial effects
- Quality of life - Treatment side effects
- Clinical character

Method – prospective study

- Genetic epidemiological study
- New mutations in young women
- Genetic data base

Timeline:


Prospective international study
Data analysis – clinical data base
Genetic data base
May 2013
December 2013
June 2014
2015
2016

Thank you!