

University of Pittsburgh

### Ten Years in the Austrian Screening Program: Benchmarks in the International Context

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- Voluntary Chief Scientific Advisor to DenseBreast-info.org
- Voluntary Associate Editor to Journal of Breast Imaging

# History

- March 2011 convened in Vienna a group of international experts to advise the Austrian Social Security and Ministry of Health on design of breast screening program
- Important results from Dr. Buchberger and others on screening US in addition to mammography in women with dense breasts

### 2011 Consensus

- Start screening at age 45, up to 74
- Interval: 18 months
- Add screening US (radiologist performed) for women with dense breasts (cat. C/D)
- Opt in for women > age 40 or > age 74
- MRI for high-risk women

# Actual Austrian BKFP

- 2014-2022, invitation ages 45-69, every 2 years
  - Could opt in at age 40, beyond age 69
  - Supplemental US for those with dense breasts or at discretion of radiologist
- In 2023, 45-74, opt in for ≥ 75
- Women can be referred for MG in off years—symptoms, high risk
- High-risk women: screening MRI age 25 (or 5 yrs prior to youngest family member), add MG > age 35,annual

B R E An Educat	Comparative Analysis of National Breast Screening Guidelines in Europe									
	Country	Age to Start / Stop	Recommended Screening Interval	Breast Density in Medical Mammography Reports (BI-RADS® categories used)	Screening Guidelines for Dense Breasts in Addition to Mammography					
	Albaniaª	40 / 69	Every 2-3 years (40-50) Every 1-2 years (age 50+)	Variable	Supplemental ultrasound is recommended.					
	Austria	45 <sup>b</sup> / 74 <sup>b</sup>	Every 2 years	Yes	Supplemental ultrasound is standard.					
	Bulgaria	50 / 69	Every 2 years	Yes	Opportunistic screening: Supplemental ultrasound is recommended.					
	Croatia	50 / 69	Every 2 years	Yes	Supplemental ultrasound is recommended.					
	Cyprus	45 / 74	Every 2 years	Yes (for density categories C and D)	Supplemental ultrasound, beginning 6 months after mammogram and continuing annually.					
	France	50 / 74	Every 2 years	Yes	Supplemental ultrasound is recommended.					
	Germany	50 / 69	Every 2 years	No	No national guidelines.					
	Greece	50 / 69	Every 2 years	Yes	Supplemental ultrasound is recommended					
	Hungary	45° / 65°	Every 2 years	Yes	Supplemental ultrasound is standard.					
	Iceland	40 / 69 <sup>d</sup>	Every 2 years	No	No national guidelines.					
	Ireland (Republic of)	50 / 69	Every 2 years	No	No national guidelines.					
	Italy	50° / 69°	Every 2 years	No	No national guidelines.					

BRE An Educo	Comparative Analysis of National Breast Screening Guidelines in Europe									
	Country	Age to Start / Stop	Recommended Screening Interval	Breast Density in Medical Mammography Reports (BI-RADS® categories used)	Screening Guidelines for Dense Breasts in Addition to Mammography					
	Lithuania <sup>b</sup>	50 / 69	Every 2 years	Yes	Opportunistic screening: Supplemental ultrasound is recommended.					
	The Netherlands	50 / 75	Every 2 years	No, screening program Yes, diagnostic reports	No national guidelines.					
	Norway	50 / 69	Every 2 years	No	No national guidelines.					
	Portugal	50 <sup>f</sup> / 69 <sup>g</sup> 45 <sup>h</sup> / 74 <sup>i</sup>	Every 2 years	Variable	No national guidelines.					
	Serbia	50 / 69	Every 2 years	Yes	Supplemental ultrasound is recommended.					
	Slovenia	50 / 69	Every 2 years	No <sup>j</sup>	No national guidelines.					
	Spain	50 / 69	Every 2 years	Not mandatory	Supplemental ultrasound is recommended.					
	Sweden	40 / 74	18-24 months	No <sup>k</sup>	No national guidelines.					
	Switzerland	50 / 74	Every 2 years	Yes	Supplemental ultrasound is recommended.					
	Turkey	40 / 69	Every 2 years	Low sensitivity of mammography in dense breasts included	No national guidelines.					
	United Kingdom	50 / 70 <sup>d</sup>	Every 3 years	No	No national guidelines.					

### 2024 USPSTF expanded guidelines to include women age 40-74

Recommenda	ation Summary						
Population	Recommendation	Grade					
Women ages 40 to 74 years	The USPSTF recommends biennial screening mammography for women ages 40 to 74 years.	В					
Women age 75 years or older	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening mammography in women age 75 years or older.	I					
Women with dense breasts	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of supplemental screening for breast cancer using breast ultrasonography or magnetic resonance imaging (MRI) in women identified to have dense breasts on an otherwise negative screening mammogram.	I					
	See the "Practice Considerations" section for more information on the patient population to whom this recommendation applies and on screening mammography modalities.						
Published April 30, 2024 in JAMA							





## Annual vs. Biennial Screening

- Overall survival (OS), after adjusting for potential lead time
  - HR of death of 1.39 (95%CI 1.08, 1.78) for biennial vs. annual screening
  - HR of 2.01 (95%CI 1.58, 2.55) for intermittent vs. annual screening
- Did not look at breast-cancer specific survival
- Women with reduced OS may also have other health issues and reduced screening compliance

# Why isn't screening more effective at reducing mortality?

- Nonparticipation
- Cancer not detected
- Cancer has already spread at time of detection

### Webb ML et al Cancer 2013

- Failure analysis 609 breast cancer deaths
- Invasive breast cancers Partners Health dx 1990-1999, followed through 2007, median 12.5 yrs
- Median age at dx of fatal cancer = 49 yrs
- 118 (19.4%) deaths screen-detected ca, already spread at dx
- 60 (9.8%) from interval cancers (lumps)
- 395 (64.9%) in women never screened
  - 36 (5.9%) in women screened > 2 yr prior
  - 71% of deaths in women without regular screening

## **BI-RADS<sup>®</sup> Breast Density**

- A. Almost entirely fatty
- B. Scattered fibroglandular density
- C. Heterogeneously dense which could obscure detection of small masses
- D. Extremely dense, which lowers the sensitivity of mammography





### MG Performs Poorly in Dense Breasts

Van der Waal D et al IJC 2016 epub 15-Sept 2016

- Dutch screening program 1975-2008, ages 50-74 biennial screening
- Overall odds of death in screened cases vs. controls 0.67 (0.52 to 0.86)
- Mortality reduction smaller in women with dense breasts than fatty breasts

RR 0.87 (0.52 to 1.45) vs. RR 0.59 (0.44 to 0.79)



# High Risk→ MRI

- Known or suspected disease-causing mutation
- Prior chest XRT by age 30, at least 8 yrs prior
- Personal hx breast cancer
  Esp. if dense breasts or diagnosis by age 50
- Lifetime risk ≥20% when consider breast density, family history, breast biopsies
- Annual MRI recommended

# **DENSE** Trial

Bakker MF et al NEJM 2019;381:2091-102

- 8061 women in The Netherlands with extremely dense breasts invited to have screening MRI after negative 2D mammogram; 32,312 only 2D
- Two rounds of screening q 2 years

# DENSE Trial, Year 1

4783 women having MRI after negative MG

- 79 women dx with cancer (16.5/1000)
- 64 women invasive cancer (13.4/1000)
- 55 (86%) node negative
- 375 (80 per 1000) false positive recall

## **DENSE Trial Year 2**

Veenhuizen et al Radiology 2021;299:278-286

- 3436 women had 2<sup>nd</sup> round MRI screen 24 mo
- 20 women dx cancer (5.8/1000)
- 14 women invasive cancer (4.1/1000)
- 80 (2.3/1000) false positive recall
- 20/84 (24%) biopsies malignant

### MRI Reduced Interval Cancers

### DENSE trial

- MRI-invited group 2.5 per 1000 vs.
   5.0/1000 in control group
  - 0.8/1000 among women actually having MRI
  - 4.9/1000 among women declining MRI



Comstock C et al JAMA 2020;323:746-56

- 1444 women with dense breasts had both AB-MRI and DBT in 48 centers
- 23 women with cancer (17 invasive)
  - 17 invasive and 5/6 DCIS seen on AB-MRI
  - 7 invasive and 2/6 DCIS seen on DBT (39% sensy)
  - Net ICDR of MRI = 10/1000; invasive 7/1000
- Recall rate AB-MRI 7.5% (vs. 10.1% DBT)

### Second Round EA1141

Kuhl CK et al 2023 ASCO

- 1291 women completed incidence screen
- 9 women with cancer (3 DCIS, 6 invasive)
  - 6 invasive seen on AB-MRI, all NO
  - 3 DCIS and 2/6 invasive seen on DBT
  - Net ICDR of AB-MRI = 4/1291, 3.1/1000
- 1 interval cancer/2677 person-years, 0.4/1000
- Recall rate 3.7% for AB-MRI, 7.9% for MRI

## **EUSOBI Guideline 2022**

Mann RM et al Eur Radiol 2022; epub 3/8/22

- Women aged 50-70 should be informed of their breast density
- In women with extremely dense breasts, MRI every 2-4 yrs, even standalone
- Where MRI not an option, consider US

# MRI is Recommended

- But...limited capacity for screening MRI even with AB-MR
- Not every patient can tolerate MRI
  - Claustrophobia, weight > 350 pounds, pacemaker, unable to lie on stomach, pregnancy
  - 42% of women offered MRI at no cost declined (Berg WA et al Radiology 2010)
  - 41% of women invited to MRI in DENSE trial did not participate (deLange DV et al Clin Radiol 2018)

# Patients Prefer CEM to MRI

Berg WA et al JACR 2023;20:758-768

- 151/222 (71%) women who had both CEM and MRI preferred CEM
- Of those for whom claustrophobia was a concern, 97% (37/38) prefer CEM
- Of those for whom positioning was an issue, 54% (40/74) prefer CEM
- Should inform shared decision making

#### Dense Breasts Mask Cancer

Screening US is usually performed in women with dense breasts where mammography is more limited



Fatty breastDense breastCopyright Dr. Wendie Berg and DenseBreast-info.org

### **EXPECTED RESULTS** SCREENING US

### Surrogate Endpoints

- No studies of breast cancer mortality reduction other than for film MG
- Increased detection of N0 invasive dz
- Reduced interval cancers (< 1/1000)</p>
- Reduced late-stage disease
- Cost per QALY from modeling studies (ICER)
- Patient acceptance/tolerance

### Screening US Results, Nearly All Dense

Berg WA and Vourtsis A JBI 2019; > 400,000 US exams

	CDR per 1000	Added Recalls per 1000	PPV <sub>3</sub> Bx (%)	% Invasive	% Node Negative
HHUS-MD	2.0	76	10.8	87.8	89.7
HHUS-Tech	2.7	75	9.0	86.1	82.9
AUS	2.5	106	8.5	91.3	90.0

## **SCREENING US AFTER DBT**

## US Yield after DBT

	Total N Cancers	N Women	Cancers only DBT	Cancers only US
Tagliafico 2016	24	3231	1	11
Destounis 2017	39	7146	4	17
Tagliafico 2018	29	5300	3	14
Dibble 2019	11	1668	4	5
Yi 2021	12	1003	1	3
Overall	115	18,348	13	50

Overall yield of US = 50/18,348 = 2.7 per 1000



58F extremely dense breasts, 3D negative

Berg WA et al AJR 2021;216:275-94



## DBTUST

Berg WA et al JCO 2023, epub 1/10/2023

- Prospective multicenter study of technologistperformed HHUS after DBT in women with dense breasts in western PA
- 3 rounds of screening US, one year follow-up
- Supported by NCI and PBCC
- Double reading but otherwise routine practice

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K		

126 cancer events in 17,552 screens, 6179 women

	DBT	DBT+US	Diff	P-value
Year 1	5/1000	6.3/1000	1.3/1000	.005
Years 2,3	4.9/1000	5.9/1000	1.0/1000	<.001
	4.9/1000	5.9/1000	1.0/1000	<.001

#### Sensitivity

	DBT (%)	DBT+US (%)	Diff	P-value
Year 1	68.9	86.7	+17.8	.005
Year 2,3	69.1	82.7	+13.5	<.001

# DBTUST

### False-positive recall rates, PPV3 of biopsies

	DBT (%)	DBT+US (%)	Diff	P-value
FPR				
Year 1	7.0	11.5	4.5	<.001
Year 2,3	5.9	9.7	3.7	<.001
PPV3 (pt)				
Year 1	35.6	18.5	-17.1	<.001
Year 2,3	33.9	21.8	-12.1	<.001

Cumulative 3.7% false-positive biopsy rate due to US over 3 years

# AUS after DBT

Aribal E et al Int J Ca 2024

- 3466 women ≥ age 39, density B-D, AUS and DBT MLO/2D CC view
- CDR ABUS alone 8.4/1000, DBT 7.5/1000
  - Added CDR of ABUS was 0.9/1000
- Specificity ABUS 88% vs. DBT at 95%

## **RESULTS BKFP SCREENING**

## Austria

- 2014-2022, invitation ages 45-69, every 2 years
  - Can opt in at age 40, beyond age 69
  - Supplemental US for those with dense breasts or at discretion of radiologist
- In 2023, 45-75, opt in beyond 75
- Women can be referred for MG in off years, data included
- High-risk women: screening MRI starting at age 25 (or 5 yrs prior to youngest family member), add MG beyond age 35,annual screening





## **Tomosynthesis Facilities**

- 63/182 (37.7%) DBT capable in 2019
- 86/185 (49.4%) in 2020
- 117/181 (64.6%) in 2021
- 121/181 (66.9%) in 2022
- 127/180 (70.6%) in 2023

## Cancer Detections BKFP

Years	N Screens	R1 MG	N US	RI US
2014/15	546,890	2083 (3.8/1000)	412,365	130 (0.32/1000)
2016/17	628,210	2662 (4.2/1000)	510,839	133 (0. <mark>26/1000</mark> )
2018/19	635,780	2604 (4.1/1000)	442,696	155 (0 <mark>.35/1000</mark> )
2020/21	613,792	2442 (4.0/1000)	457,449	106 (0. <mark>23/100</mark> 0)

## Ultrasound 2020/2021

- 457,449 US exams of 617,432 total screens (74.1%)
  - 221,691 (48.5%) of those having US were for dense breasts
- 27,086 (5.9%) additional testing
  - 5017/221,691 (2.3%) of screening US recalled
- 4053 (0.89%) biopsy
- 106 invasive cancers (PPV3=2.6%); CDR 0.23/1000

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MA-Erstbefund	2.083	65,0 %	98,8 %	2.662	68,5 %	98,8 %	2.604	81,3 %	98,7 %
MA-Erstbefund und US (vs. MA- Erstbefund)	2.213 (+130)	69,1 %	98,6 %	2.795 (+133)	71,9%	98,6 %	2 759	86,1 %	98,5 %
MA-Erstbefund (ohne US) und MA- Zweitbefund (vs. MA-Erstbefund)	2.112 (+29)	65,9 %	98,8 %	2.687 (+25)	69,2 %	98,8 %	2.637 (+33)	82,3 %	98,7 %
MA-Erstbefund und US und MA- Zweitbefund (vs. MA-Erstbefund und US)	2.224 (+11)	69,4 %	98,6 %	2.802 (+7)	72,1 %	98,6 %	2.768	86,4%	98,5 %

# **Double Reading**

- Double read MG, consensus discussion if disagreement
- 2020/21 2442 invasive cancers first reader on MG; 106 on US
- 142/617,432 (0.023%) changed readings
- 9 additional invasive cancers detected = 0.015/1000
- Could not find data for 2014-2019 double reading

# Anatomic Stage Distribution

	Total	0	Ι	II	III	IV
2014/15	1489	62 (4.2)	1051 (70.6)	303 (20.3)	58 (3.9)	15 (1.0)
2016/17	1618	42 (2.6)	1208 (74.7)	312 (19.3)	44 (2.7)	12 (0.7)
2018/19	1623	47 (2.9)	1193 (73.5)	335 (20.6)	42 (2.6)	6 (0.4)
2020/21	1337	46 (3.4)	1008 (75.4)	251 (18.8)	18 (1.3)	14 (1.1)
Overall	6067	197 (3.2)	4460 (73.5)	1201 (19.8)	162 (2.7)	47 (0.8)

Note: Cases receiving NAC are excluded, which will shift results to lower stages. Staging is missing for more than half of all cancers. Anatomic stage will appear higher than pathologic prognostic stage.

# Quality Indicators 2020/21

		EU1	BKFP	BCSC DBT <sup>2</sup>	BCSC DM <sup>2</sup>
Proportion Invasive Ca		≤ 90%	85%	78.5%	73.1%
Median Inv. size, mm				12 (IQR 7-18)	13 (IQR 8-20)
Invasive Cancers	≤ 10 mm	0 mm 25-30% 4		41.7%	38.9%
	< 15 mm	50%	77.9%	61.2%	63.4%
	≥ Stage II	25-30%	21.2%	20.3%	21.9%
	NO	70-75%	75%	78.8%	72.2%
Recall Rate		< 5%	2%	8.3%	10.3%

 $^1$  N Perry et al 2006 4th edition European guidelines for quality assurance  $^2$  Lee CI et al Radiology 2023

# Quality Indicators 2020/21

		EU1	BKFP	BCSC DBT <sup>2</sup>	BCSC DM <sup>2</sup>
Proportion Invasive Ca		≤ 90%	85%	78.5%	73.1%
Median Inv. size, mm				12 (IQR 7-18)	13 (IQR 8-20)
Invasive Cancers	≤ 10 mm	25-30%	42.6%	41.7%	38.9%
	< 15 mm	50%	77.9%	61.2%	63.4%
	≥ Stage II	25-30%	21.2%	20.3%	21.9%
	NO	70-75%	75%	78.8%	72.2%
Recall Rate		< 5%	2%	8.3%	10.3%

 $^1\,\text{N}$  Perry et al 2006 4th edition European guidelines for quality assurance  $^2\,\text{Lee}$  CI et al Radiology 2023

## Interval Cancer Rates (ages 45-69)

	N Screens	BKFP Cancers	Interval Ca 0-11 mo	Interval Ca 12-23 mo	% that are Interval Cancers
2014/2015	546,890	2626	428 (0.78/1000)	617 (1.1/1000)	1045/3671 (28.5)
2016/2017	628,210	3315	281 (0.44/1000)	655 (1.0/1000)	936/4251 (22.0)
2018/2019	635,780	3241	290 (0.45/1000)	627 (1.0/1000)	917/4158 (22.1)
2020/2021	613,792	ND	ND	ND	ND

# Quality Indicators 2018/19

		EU	BKFP	BCSC DBT	BCSC DM
Interval Cancer Rates relative to background 2000-10					
	0-11 months	< 30%	20.5	12.6%	12.4%
	12-23 months	< 50%	45.4		

N Perry et al 2006 4th edition European guidelines for quality assurance

ID	Indicator	Acceptable	Target	BKFP 2020/2021
EU-5	Participation rate	> 70 %	> 75 %	40 %
EU-8	Proportion of examinations that are radiologi- cally acceptable	97 %	> 97 %	99.88 %
EU-10	Proportion of examinations that were repeated due to technical reasons	< 3 %	< 1 %	0.02 %1
EU-11	Proportion of screening examinations with additional diagnostic imaging examination	< 5 %	< 1 %	74 % (ultrasound) <sup>2</sup>
EU-12	Assessment rate/recall rate for further assessment (follow-up screening)	< 5 %	< 3 %	2.0 %
EU-13	Early recall rate after assessment	< 1 %	0 %	4.6 % (after screening) <sup>3</sup>
EU-14	Breast cancer detection rate in relation to the assumed background incidence (breast cancer incidence without screening, IR) for follow-up screening	1.5 × IR	> 1.5 × IR	2.0  imes IR
EU-15	Interval carcinoma rate in relation to assumed background incidence rate Months 0-11 (first year) Months 12-23 (second year)	30 % 50 %	< 30 % < 50 %	20.5 % (2018/2019) 45.4 % (2018/2019)
EU-16	Proportion of invasive carcinomas	90 %	80-90 %	85 %
EU-17	Proportion of carcinomas with tumour stage II+ (II, III or IV) for follow-up screening	25 %	< 25 %	21.2 %
EU-18	Proportion of invasive carcinomas without lymph node involvement for follow-up screening	75 %	> 75%	75 %4
EU-19	Proportion of invasive carcinomas with a size $\leq$ 10 millimetres (for follow-up screening)	≥ 25 %	≥ 30 %	42.6 %4
EU-20	Proportion of invasive carcinomas with a size < 15 millimetres	50 %	> 50 %	77.9 %4
EU-38.1	Duration (in working days (WD)) between mammography screening and findings	15 WD	10 WD	1.60 WD <sup>5</sup>

ID	Indikator	akzeptabel	erwünscht	BKFP 2020/2021	
EU-5	Teilnahmerate	> 70 %	> 75 %	40 %	Supp
EU-8	Anteil der Untersuchungen, die radiologisch akzeptabel sind	97 %	> 97 %	99,88 % <sup>1</sup>	
EU-10	Anteil der Untersuchungen, die aus technischen Gründen wiederholt wurden	< 3 %	< 1 %	0,02 %1	
EU-11	Anteil der Screeninguntersuchungen mit zusätzlicher bildgebender Untersuchung	< 5 %	< 1 %	74 % (Ultraschallrate) <sup>2</sup>	US is pro
EU-12	Abklärungsrate/Recall-Rate für weiteres Assessment (für Folgescreening)	< 5 %	< 3 %	2,0 %	
EU-13	Early-Recall-Rate nach Assessment	< 1 %	0 %	4,6 % (nach Scree- ning) <sup>3</sup>	National c
EU-14	Brustkrebsdetektionsrate im Verhältnis zur an- genommenen Hintergrundinzidenz (Brustkrebs- inzidenz ohne Screening, IR) für Folgescreening	1,5 × IR	> 1,5 × IR	2,0 × IR	
EU-15	Intervallkarzinomrate im Verhältnis zur ange- nommenen Hintergrundinzidenz 0-11 Monate (erstes Jahr) 12-23 Monate (zweites Jahr)	30 % 50 %	< 30 % < 50 %	20,5 % (2018/2019) 45,4 % (2018/2019)	•
EU-16	Anteil invasiver Karzinome	90 %	80-90 %	85 %	
EU-17	Anteil der Karzinome mit Tumorstadium II+ (II, III oder IV) für Folgescreening	25 %	< 25 %	21,2 %	
EU-18	Anteil invasiver Karzinome ohne Lymphknoten- befall für Folgescreening	75 %	> 75%	75 %4	
EU-19	Anteil invasiver Karzinome mit der Größe ≤ 10 Millimeter (für Folgescreening)	≥ 25 %	≥ 30 %	42,6 %4	
EU-20	Anteil invasiver Karzinome mit der Größe < 15 Millimeter	50 %	> 50 %	77,9 %4	
EU-38.1	Zeit (in Arbeitstagen) zwischen Screeningmammografie und Befund	15 AT	10 AT	1,60 AT <sup>5</sup>	



## Observations

- Yield of US is extremely low
  - Do not have precise numbers for screening US, but yield likely even lower than for combined screening and diagnostic #s
  - Would be nice to have US #s by density
- No loss in specificity with addition of US

# Observations

- Yield of human double reading is extremely low
  - AI being implemented in other European countries for double reading
  - Benefit to compliance with minimum reading requirements of 2000 mammograms/year

#### **Observations**

- Interval cancers include those detected by screening MRI and screening MG outside of BKFP (e.g. at 1 year)
- Ideally could distinguish symptomatic interval cancers



# Observations

 Recall rates are underestimated as nearly all screening is performed "online" with patient receiving additional imaging (esp. US) at the time of screening appointment, not recorded as "recall"

# Questions

- Is MRI being utilized in accord with EUSOBI guidelines?
- Data collection on MRI utilization
  - Invite women with extremely dense breasts?
- Evaluation of contrast-enhanced mammography?

# To Do

- Failure analysis
  - Who is still dying from breast cancer
  - Is it women not attending screening at all?
  - Lobular subtype?
  - Aggressive subtypes more advanced stage?

## Austria

Illic L et al Scientific Reports 2022; Outcomes 1983-2017

- 163,694 breast cancer cases
- 53,133 breast-cancer specific deaths





















#### Wilkinson AN, et al. Current Onc 2024;31:5544-5556 Canada Subtypes

	Histologic Subtype						
Age Group/Stage	Infiltrating Ductal Carcinoma	Lobular Carcinoma	Other				
	n = 79,039	n = 9369	n = 18,863				
Age group							
15-39	5.0%	1.1%	3.9%				
40-49	14.9%	10.4%	11.8%				
50-59	24.7%	20.7%	20.8%				
60–69	27.3%	29.7%	25.4%				
70–79	17.8%	23.6%	21.6%				
80–99	10.3%	14.5%	16.4%				
Stage at diagnosis							
I	45.9%	32.6%	40.4%				
П	37.1%	40.6%	36.4%				
Ш	11.6%	18.1%	12.8%				
IV	4.5%	6.6%	8.0%				
Unknown	0.8%	1.1%	2.4%				

65% invasive lobular carcinoma diagnosed at stage II, III, IV, vs. 53% of invasive ductal carcinoma

Willingon AN ot al	Current One 2024	·21. EEAA EEEC	Canada Cubturas
Wilkinson AN, et al.	Current Onc 2024	,31:3344-3330	Canada Subtypes

	Molecular subtype								
Age group/stage	All subtypes	Luminal A	Luminal B	Luminal B like	HER-2 enriched	Triple negative	Unknown		
	n = 107,271	n = 50,394	n = 19,859	n = 10,854	n = <mark>4684</mark>	n = 10,220	n = 11,260		
Age group									
15–39	4.5%	2.2%	5.5%	8.1%	7.7%	8.5%	4.0%		
40-49	14.0%	12.5%	14.0%	19.3%	18.0%	16.2%	11.9%		
50-59	23.7%	22.9%	23.7%	28.0%	29.7%	24.7%	19.4%		
60–69	27.2%	30.0%	27.2%	23.3%	23.8%	24.4%	22.2%		
70–79	19.0%	21.8%	18.3%	13.3%	13.2%	16.2%	18.1%		
80–99	11.7%	10.7%	11.2%	7.9%	7.7%	10.0%	24.3%		
Stage at diagnosis		$\sim$							
I	43.8%	57.3%	33.1%	31.7%	28.2%	29.1%	34.1%		
П	37.3%	32.8%	46.4%	42.3%	39.1%	46.9%	26.8%		
III	12.4%	7.5%	15.3%	18.4%	22.7%	17.3%	15.0%		
IV	5.3%	1.8%	4.6%	7.1%	9.4%	6.0%	18.3%		
Unknown	1.1%	0.6%	0.5%	0.5%	0.5%	0.7%	5.8%		

# Summary

- Except for attendance rates, Austria meets standards
- Overall performance of MG+US, screening+diagnostic meets international benchmarks!
  - Ideal to know outcomes from screening US distinct from MG
- Failure analysis—due to inattendance at screening?
- Would be ideal to know outcomes for those screened annually vs. biennially and revisit invitation frequency
- Worth a closer look at 40-44 y/o group
- Worth a look at risk assessment all women at age 25

