Time trends of process and impact indicators in Italian mammography screening programmes – 1996-2004

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Abstract

Since 1990, the Italian Group for Mammography Screening (GISMa) has been promoting the development of new organised programmes and performing a yearly systematic survey of data activity. The screening extension has increased over time, reaching an overall 76.4% of coverage in 2005. The geographical extension is still heterogeneous, with a higher distribution in Northern and Central Italy compared with Southern and Insular Italy, where the screening activity was implemented only recently. Notwithstanding the continuity in implementation, the actual coverage reached only 50.3% of the target population, due to a reduced flow of invitations over time as a consequence of a chronic lack of invested resources and of well-planned policies. The overall Italian rate for crude attendance was above the acceptable 50% standard even though a North-South trend is still confirmed; in Southern/Insular Italy participation was still inadequate (<40%) and did not reach the standard considered acceptable. Participation was higher in centralised programmes compared with those without regional coordination (+5-8%). The time trends for the other key performance indicators showed good average performance: the benign/malignant surgical biopsy ratio (B/M ratio) progressively decreased, reaching an 0.25 ratio (both for first and subsequent screening) in 2004; overall detection rate, detection rate for in situ and small cancers (≤10 mm) showed a good trend, reaching 6.7‰, 0.7‰, and 1.6‰, respectively, for the first screening, and 5.1‰, 0.9‰, and 1.7‰ for the subsequent screening in 2004. The only exception was the referral rate (RR) at first screening, which exceeded standards (>7% in 2002-2004). Data comparing activity volume and programme duration were also analysed. In programmes with greater activity (average test number: 22,506) the referral rate for the first screening was higher, but still within acceptable standards: 6.3%; RR: 1.01 (0.98-1.04). This performance is compensated by better specificity and sensitivity: Positive Predictive Value (PPV):12.8; RR:1.16 (1.05-1.27); overall detection rate: 8.1‰, RR 1.19 (1.07-1.31). An improvement in quality with the increase of programme experience is evident: programmes with more than 6 years of activity, compared with newer programmes, show a recall rate in first screening of 6.5 %; RR: 0.87 (0.84-0.89), a PPV of 11.7; RR:1.61 (1.48-1.75) and an overall detection rate of 7.6‰, RR:1.41 (1.29-1.55). These results are consistent with those observed in other European programmes and encourage to explore new analysis strategies. The website of the National Centre for Screening Monitoring (ONS) is http://www.osservatorionazionalescreening.it.

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Keywords: mammography screening, breast, trend survey, Italy

Since 1990, GISMa has been promoting the development of new organised screening programmes in Italy and comparing the protocols adopted and the results obtained by different centres. Every year, GISMa carries out systematic surveys for the National Centre for Screening Monitoring, collecting data on the activity of the mammography screening programmes implemented in Italy. Aggregated data is

Indicator Definition	Standard acceptable	 desirable
Participation rate Number of women invited that attend screening. We can distinguish between the following: **crude attendance:** women that attend screening out of the total population invited excluding women that didn't receive the invitation letter (if the programme was able to recognise them); **actual attendance:** women that attend screening excluding women that didn't receive the invitation letter (if the programme was able to recognise them) and women with recent examination (undergone in the past twelve months).	**GISMa** At first screening and at repeat screening Crude attendance: ≥50% Actual attendance: ≥60% **European Guidelines 2006** First and repeat screening: >70%	**GISMa** At first screening and at repeat screening Crude attendance: ≥70% Actual attendance: ≥75% **European Guidelines 2006** First and repeat screening: >75%
Recall rate – Further assessment rate Proportion of women undergoing further assessments out of women that attend screening	**GISMa** First screening: <7% Repeat screening: <5% **European Guidelines 2006** First screening: <7% Repeat screening: <5%	**GISMa** First screening: <5% Repeat screening: <3% **European Guidelines 2006** First screening: <5% Repeat screening: <3%
Benign to malignant open surgical biopsy ratio Ratio between benign and malignant cancers in women that undergo core biopsy or surgery	**GISMa** First screening: ≤1:1 Repeat screening: ≤0,5:1 **European Guidelines 2006** First and repeat screening: ≤1:2	**GISMa** First screening: ≤0,5:1 Repeat screening: ≤0,25:1 **European Guidelines 2006** First and repeat screening: ≤1:4
Breast cancer detection rate – DR Ratio between invasive screen-detected cancers and women that attend screening	**GISMa** There is no reference standard since it depends on the expected incidence **European Guidelines 2006** Indication only for prevalence/incidence ratio	**GISMa** There is no reference standard since it depends on the expected incidence **European Guidelines 2006** Indication only for prevalence/incidence ratio.
Invasive screen-detected cancers ≤10 mm detection rate Ratio between the number of women with screen-detected invasive cancer ≤10 mm and women that attend screening	**GISMa** No standard, suggestion on how to calculate the rate **European Guidelines 2006** Not considered	**GISMa** No standard, suggestion on how to calculate the rate **European Guidelines 2006** Not considered
Proportion of invasive screen-detected cancers ≤10 mm Proportion of invasive screen-detected cancers ≤10 mm out of the total number of women with screen-detected invasive cancers	**GISMa** First screening: ≥20% Repeat screening: ≥25% **European Guidelines 2006** First screening: not applicable Repeat screening: ≥25%	**GISMa** First screening: ≥25% Repeat screening: ≥30% **European Guidelines 2006** First screening: ≥25% Repeat screening: ≥30%
Screen-detected DCIS detection rate Ratio between screen-detected cancers with a DCIS diagnosis and women that attend screening	**GISMa** No reference standard, suggestion on how to calculate the rate **European Guidelines 2006** Not considered	**GISMa** No reference standard, suggestion on how to calculate the rate **European Guidelines 2006** Not considered.
Proportion of DCIS screen-detected cancers Proportion of DCIS screen-detected cancers and women with screen-detected invasive cancers	**GISMa** First and repeat screening: 10% **European Guidelines 2006** First and repeat screening: 10%	**GISMa** First and repeat screening: 10-20% **European Guidelines 2006** First and repeat screening: >15%
From: Giordano L et al, 2006.		

Table 1: Indicators and reference standards.

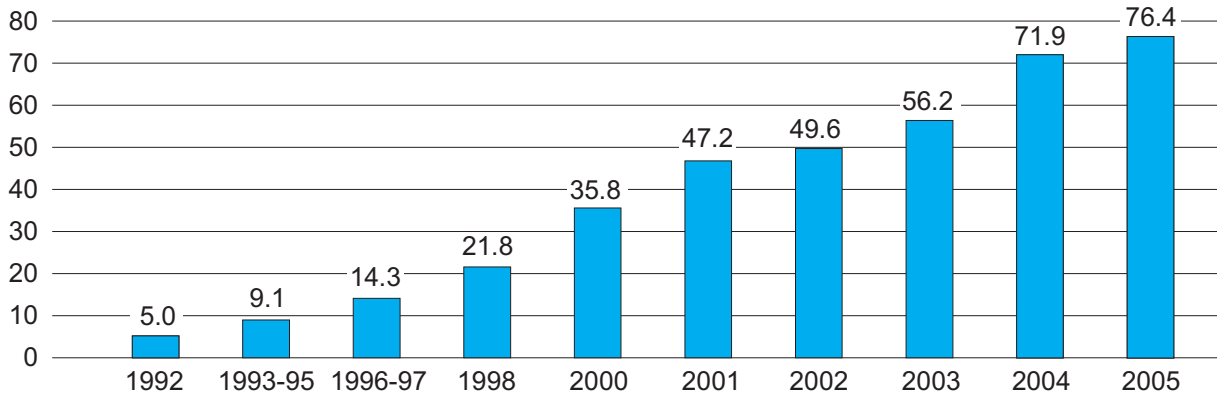


Figure 1: Percentage of women enrolled in mammography screening programmes out of the total female population of 50-69 years of age (1992-2005).

gathered yearly through a standardised form, in order to calculate process and impact parameters. These parameters have been agreed on at a national level and were recently updated by the group.[1] The data observed have constantly been compared with both national and European outcomes, and this comparison, together with regular monitoring of activity, has represented a very important basis for programme improvement.

Over the last few years, many efforts have been made to reduce heterogeneity between the Italian areas involved in mammography screening.

Differences in starting dates and level of implementation, in organisation and management, and in the levels of awareness of the target populations have been overcome thanks to a major common effort by screening operators, and ongoing multidisciplinary exchange of information.

Annual collection, presentation, and discussion of data have been an instrument of this exchange, which has consolidated over time.

The creation of the ONS, the inclusion of cancer screening programmes in the Basic Healthcare Parameters (LEA) and the regional structure of screening activities have greatly improved the quality of the data collection, reaching higher levels of standardisation and completeness.

Since more than fifteen years, GISMa surveys provide a clear, comprehensive picture of the implementation and progress of organised mammography screening in different areas and over time. Besides being a useful source for comparison and discussion between programmes, these surveys also constitute a key to improving prevention policies. With this in mind, this document presents and discusses time trends of the most relevant process and diagnostic indicators usually collected for evaluating the quality of screening programmes.

Table 1 reports, for each parameter, the definition and the correlated standard which has been recommended both at national and European level. Besides, with respect to time trends, data is also analysed according to other variables, such as the duration and volume of single programmes, highlighting potential relations between these sensitivity and specificity indicators and programme features and organisational modalities. This is an update of a previous report, published in the previous edition of the official annual ONS Report.[2] Comparisons mostly relate to screening programmes active during 1996-2004. For some indicators (coverage and attendance), 2005 data were available at the time of writing and are reported.

Geographical extension

Figure 1 shows a positive time trend in the extension of the mammography screening activity in Italy. The number of new screen-

Figure 2: Geographical distribution of mammography screening programmes. Year 1992.

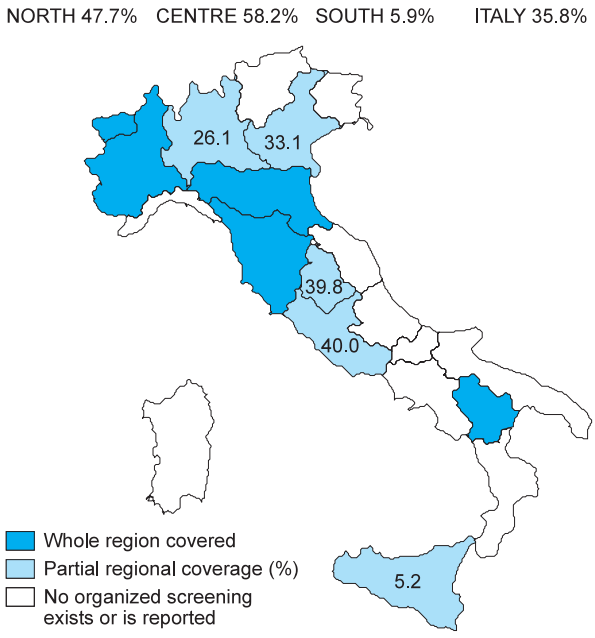


Figure 3: Geographical distribution of mammography screening programmes. Year 2000.

ing programmes has constantly increased over time. After the early 90's, when screening activity was present only in a few small/medium-sized areas in Northern and Central Italy (with the only exception of the city of Palermo, where, however, activity was suspended several times in the following years), in the second half of the 90's, coverage reached 14.3% of the target population, mostly on account of the implementation of several programmes in the Emilia-Romagna region. It was predominantly after 2000 that extension increased, doubling in five years the number of women involved in a mammography screening activity (from 35.8% in 2000 to 76.4% in 2005).

In addition to the great efforts made by the screening operators, a strong impulse to the diffusion of mammography screening came from the National Oncological Commission guidelines published in 1996: the guidelines underlined the need for implementing high-quality screening on a national basis, with proper control of all the phases of the screening process.[3] The guidelines were followed by several initiatives: the inclusion of Mammography Screening Programmes Among priorities in regional Health Plans,[4] the above-mentioned creation of the ONS and the inclusion of cancer screening activities in the Basic Healthcare Parameters.

Figures 2-5 illustrate the geographical distribution of Italian programmes active in 1992, 2000, 2003, and 2005.

In 2005, 76.4% of the 7.2 million Italian women in the 50-69 year age range lived in areas where an organised screening activity was implemented, and 18 out of 21 Italian regions were involved. The regional extension was complete for 9 regions and for the self-governing provinces of Bolzano and Trento, with an increment of 4.5% compared with 2004. As already highlighted in previous reports, geographical extension of screening is still heterogeneous, with a higher distribution in Northern/Central Italy compared with Southern/Insular Italy (figure 6). Only recently (2003-2005) the screening activity in Southern Italy has greatly improved. Comparing the screening activity in the period 2000-2005, coverage varied from 47.7% to 92.4 % in Northern Italy, from 58.2% to 98.6% in Central Italy and from 5.9% to 39.3% in Southern and

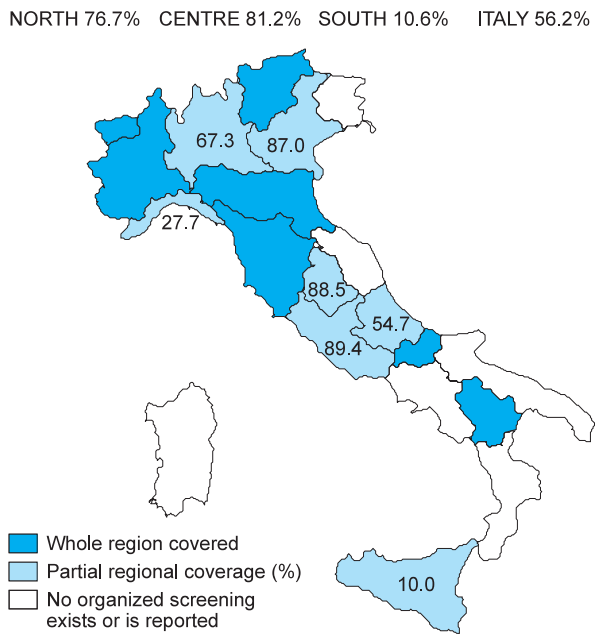


Figure 4: Geographical distribution of mammography screening programmes. Year 2003.

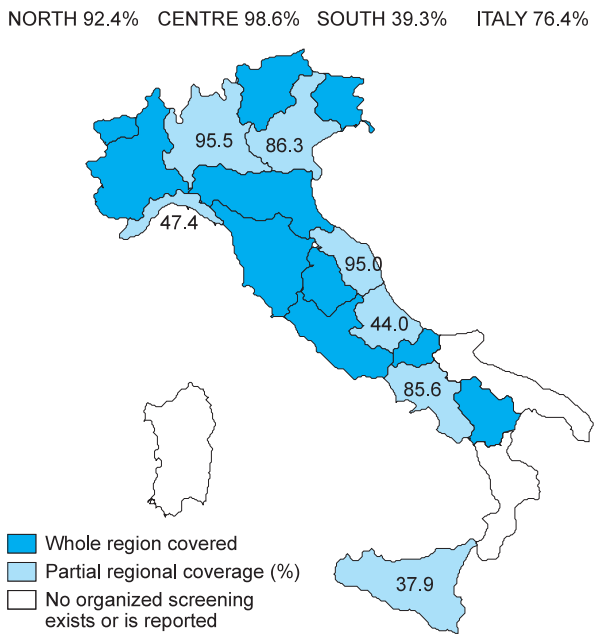


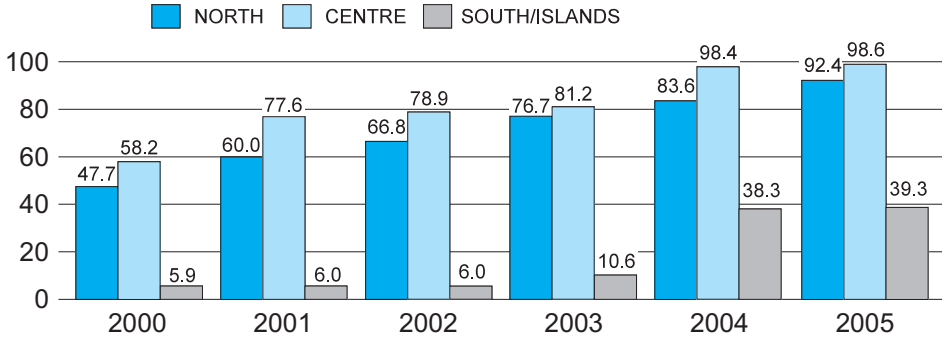
Figure 5: Geographical distribution of mammography screening programmes. Year 2004.

Insular Italy. It is still worth noting that, in spite of this improvement in Southern and Insular Italy (mostly thanks to the recording of screening activity in Campania, which almost tripled the coverage rate), during the last year the increment was less appreciable (about 1%). The only three Italian regions with no organised screening coverage are in the Southern/Insular area: Calabria, Puglia, and Sardegna.

The regional coordination of screening activity reinforced the stability of the programmes, reducing the number of programmes starting up and ceasing to exist within a short period of time. This occurred particularly in the first (few) years, often in settings where screening was dependent on small local units operating in areas where a larger regional diffusion of screening faced major difficulties. The regional coordination also improved data monitoring organisation, reducing the number of programmes which, owing to their limited data management system, were not able to comply with the required deadline for sending data and to provide information with an exhaustive level of completeness and quality.

Despite ongoing implementation, data analysis reveals a substantial discrepancy between the annual theoretical coverage, i.e. the target population to be invited every year, and the annual actual coverage, i.e. the fraction of target population actually invited each year to screening (figure 7). Considering the 2004-2005 activity, this discrepancy was 20% in 2004 and 26% in 2005 on a national basis.

Figure 6: Percentage by geographical area of women enrolled in mammography screening programmes out of the total female population of 50-69 years of age (2000-2005).



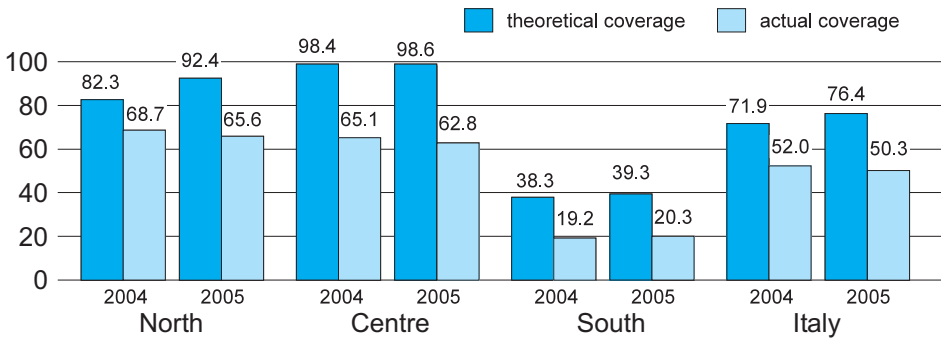


Figure 7: Comparison between theoretical and actual coverage (%) by organised screening (2004-2005 activity).

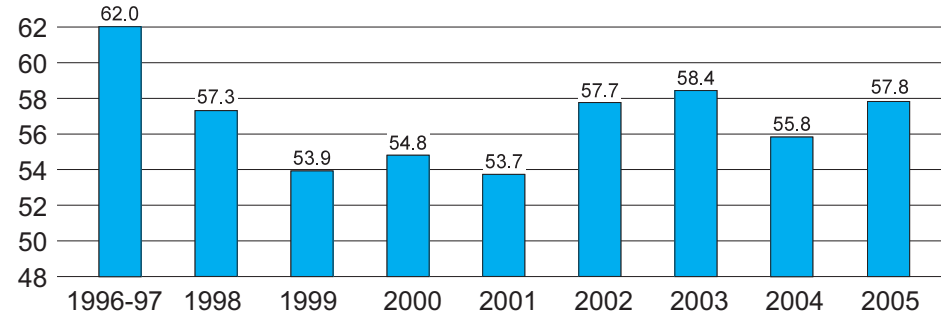


Figure 8: Overall crude attendance (%).

During 2005, 76.4% of Italian women aged 50-69 years were officially enrolled in organised screening programmes, but only 50.3% were actually invited. The discrepancy is present in all regions but it is higher in Central Italy (33% in 2004, 35.8% in 2005). Comparing the last two years, this difference has grown (+ 6%).

Attendance rate

The attendance of women to screening invitation is a key indicator of the impact and efficacy of a screening programme in reducing breast cancer mortality. Crude attendance (i.e. women attending out of those invited) over the years has been above the acceptable 50% standard (figure 8, table 1). This indicator was calculated considering all programmes adhering to the GISMa survey since 1996-1997, when monitoring reached good levels of standardisation and completeness.

When evaluating time trends of attendance rates, a high prevalence of newly implemented programmes during 1999-2001 may at least partially explain a substantial decrease in attendance rates in that period.

Evaluating the attendance rates in the period 2003-2005, a higher level of participation was still observed in Northern and Central Italy compared to Southern and Insular Italy. In the latter area, attendance rates are still inadequate and do not reach the acceptable standard (figure 9).

Figure 10 compares the 2004-2005 attendance rates by type of organisational and evaluation system. In programmes where a regional coordination exists, the participation rates are higher compared to those without a centralised management. The difference between the two systems is about 5-8%.

Since 1999, indicators have also been available with stratification by 5-year age classes: table 2 shows adjusted attendance (excluding from the denominator those women reporting a recent mammography

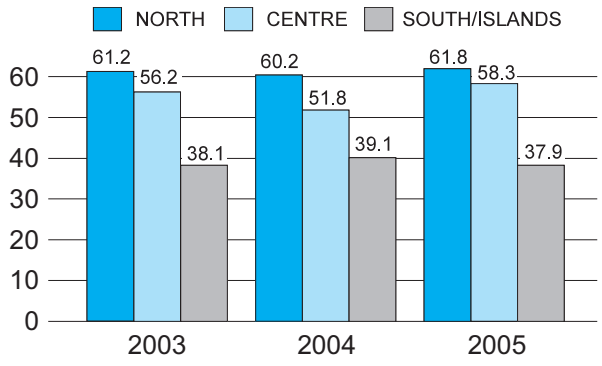


Figure 9: Total crude attendance (%) in Northern, Central and Southern Italy (2003-2005).

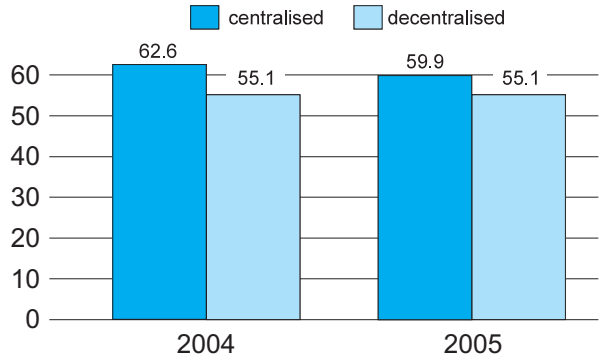


Figure 10: Attendance rates (%): comparison between centralised and decentralised programmes (2004-2005).

outside the programme) by age classes during 1999-2005. Younger women have a higher attendance rate over the whole study period with the exception of the age-class 50-54, where compliance was lower in the last two years (2004-2005). This result must be cautiously interpreted, due to the incompleteness of the data collection; subsequent verification is needed.

1999-2004 activity

Time trends of overall referral rates, benign/malignant biopsy ratio, overall detection rate, detection rate of cancers ≤10mm and detection rate of in situ carcinomas

Figures 11-15 illustrate the time trend of these indicators at first or repeat screening. Programmes active and providing data for the whole period were considered: Valle d'Aosta, Basilicata, Belluno, Bologna città, Bologna nord, Cesena, Ferrara, Firenze, Livorno, Milano, Modena, Padova, Perugia, Pisa, Pistoia, Ravenna, Reggio Emilia, Rimini, Roma H, Siena, Torino, Verona. Table 1 summarises major performance indicators and their reference standards.

Women referred for further assessments (referral rate)

The proportion of screened women referred for diagnostic assessments at first screening was within acceptable standards during the first years, but exceeded standard values during 2002-2004. Good performance for this indicator was achieved at repeat screening (acceptable GISMa standard is <7% or <5% at first or repeat screening, respectively). Excess referral rate at first screening will need further investigations to assess its persistence over time (if present) and to identify possible causes.

Benign/Malignant (B/M) surgical biopsy ratio

The benign to malignant surgical biopsy ratio maintained a good performance over time, although this time trend needs to be cautiously interpreted. B/M ratio, even though decreasing over time, is strongly influenced by the increasing use of new microinvasive diagnostic techniques, such as classic or vacuum-assisted percutaneous core biopsy, which might deserve a specific evaluation. It is therefore necessary to plan more detailed analysis, taking into account the diagnostic procedures used and their impact on data interpretation. Similar considerations have been made within the European Group for Breast Cancer and a further reduction of the acceptable standard for B/M (acceptable ≤1:2; desirable ≤1:4) has been included in the new edition of the *European guidelines for quality assurance in breast cancer screening and diagnosis*.[5]

Overall detection rate, detection rates of cancers ≤10mm and in-situ carcinomas

In the period 1999-2004 the time trends of

Age class	1999	2000	2001	2002	2003	2004	2005
50-54	62.3	62.8	63.4	62.7	62.0	61.9	56.4
55-59	65.9	61.8	65.2	64.1	67.0	66.9	62.5
60-64	60.8	60.7	64.1	63.0	66.2	66.2	63.0
65-69	52.0	54.6	57.6	55.2	59.0	58.8	59.1
Total	59.7	60.6	60.2	60.8	62.4	62.7	60.2

Table 2: Adjusted attendance (%) by 5-year age classes (1999-2005).

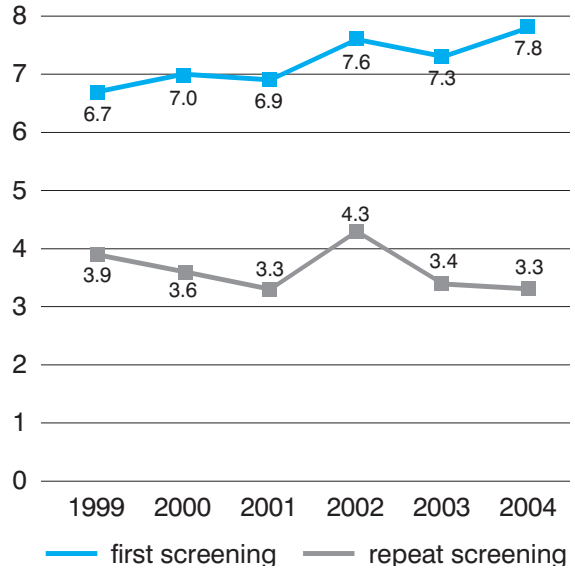


Figure 11: Time trend of referral rates (1999-2004).

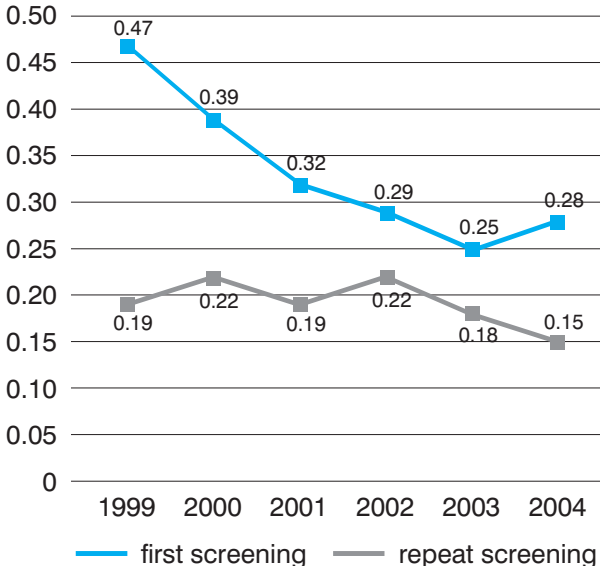


Figure 12: Time trend of B/M biopsy ratio (1999-2004).

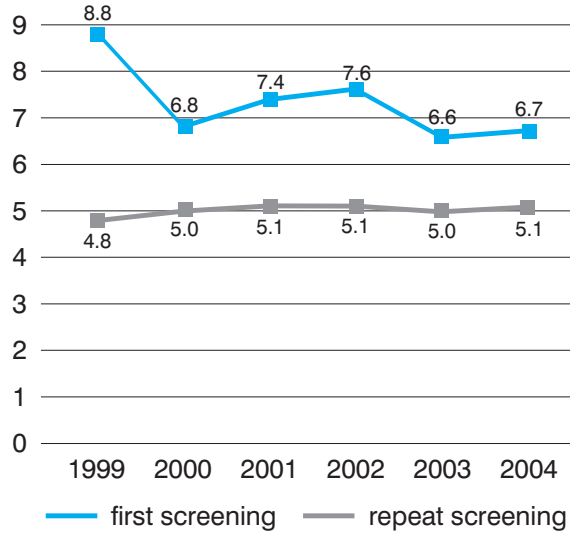


Figure 13: Time trend of overall detection rate (1999-2004).

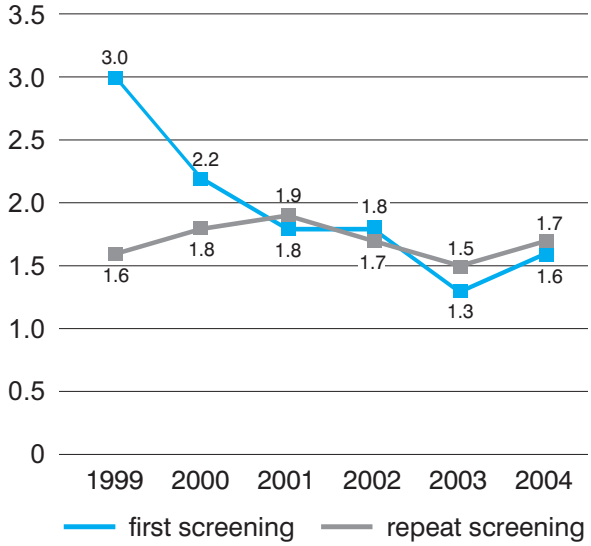


Figure 14: Time trend of detection rate of cancer ≤1 cm (1999-2004).

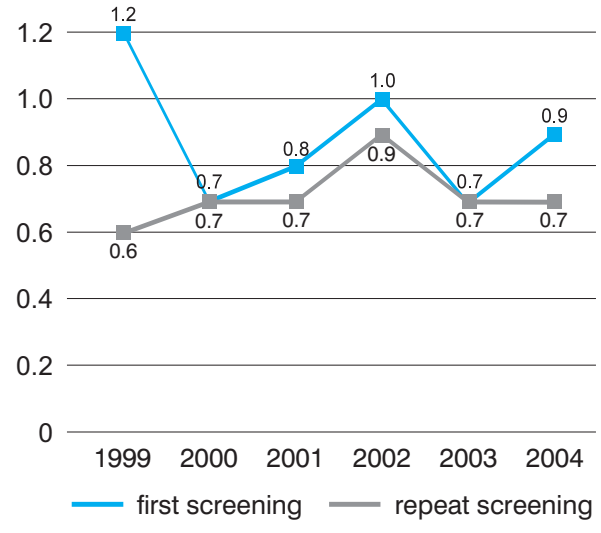


Figure 15: Time trend of detection rate of in situ cancer (1999-2004).

these early indicators of screening efficacy showed a good performance. The Italian representation of these indicators, useful to provide a general picture, needs to be carefully interpreted because of limits due to the different cancer incidence in the Italian geographical areas, the different stratification by age of the target population, and the lack of uniformity in the level of completeness of the data collection.

Time trends according to average programme activity volume and duration

This analysis considered programmes that provided data for the entire 1999-2004 pe-

Programme size	First screening						
	screened women	average size (range)	referrals	cancers	invasive cancers	cancers ≤1 cm	
Small	65,661	4,865 (2,681-6,191)	4,249	457	398	130	
Medium	268,043	10,840 (6,760-15,076)	19,752	1,699	1,478	571	
Large	257,865	22,506 (17,503-36,046)	16,979	2,077	1,781	650	
	referral rate RR (95% CI)	**detection rate** RR (95% CI)	**detection rate invasive** RR (95% CI)	**detection rate cancers ≤1 cm** RR (95% CI)	**% cancers ≤1 cm** RR (95% CI)	**% cancers in situ** RR (95% CI)	**PPV** RR (95% CI)
Small	**6.2** 1	**7.0** 1	**6.1** 1	**2.0** 1	**32.7** 1	**12.9** 1	**11.3** 1
Medium	**7.3** 1.18 (1.15-1.22)	**6.3** 0.91 (0.82-1.01)	**5.5** 0.92 (0.82-1.03)	**2.1** 1.08 (0.89-1.30)	**38.6** 1.18 (1.00-1.38)	**13.0** 0.93 (0.72-1.19)	**8.7** 0.77 (0.70-0.85)
Large	**6.3** 1.01 (0.98-1.04)	**8.1** 1.19 (1.07-1.31)	**6.9** 1.18 (1.06-1.32)	**2.5** 1.30 (1.08-1.57)	**36.5** 1.09 (0.93-1.28)	**14.3** 1.02 (0.80-1.31)	**12.8** 1.60 (1.05-1.27)
	Repeat screening						
	screened women	average size (range)	referrals	cancers	invasive cancers	cancers ≤1 cm	
Small	100,536	4,865 (2,681-6,191)	3,528	483	407	177	
Medium	439,544	10,840 (6,760-15,076)	17,378	2,108	1,843	760	
Large	620,540	22,506 (17,503-36,046)	22,062	3,287	3,022	1,068	
	recall rate RR (95% CI)	**detection rate** RR (95% CI)	**detection rate invasive** RR (95% CI)	**detection rate cancers ≤1 cm** RR (95% CI)	**% cancers ≤1 cm** RR (95% CI)	**% cancers in situ** RR (95% CI)	**PPV** RR (95% CI)
Small	**3.5** 1	**4.8** 1	**4.1** 1	**1.8** 1	**43.5** 1	**15.7** 1	**13.9** 1
Medium	**3.8** 1.27 (1.22-1.32)	**4.8** 1.00 (0.91-1.11)	**4.2** 1.02 (0.92-1.14)	**1.7** 1.06 (0.90-1.26)	**41.2** 1.06 (0.93-1.22)	**12.6** 0.88 (0.69-1.12)	**12.8** 0.79 (0.72-0.86)
Large	**3.2** 1.08 (1.04-1.12)	**5.3** 1.11 (1.01-1.22)	**4.4** 1.06 (0.96-1.18)	**1.7** 0.93 (0.74-1.17)	**39.4** 0.95 (0.83-1.09)	**17.6** 1.25 (0.99-1.58)	**16.7** 1.01 (0.93-1.11)

RR: Relative Risk; PPV: Positive Predictive Value; CI: 95% Confidence Interval
RR (95% CI) is weighted on the age class distribution of the target population

Table 3: 1999-2004 activity. Association of some indicators with the programmes' average activity volume.

riod, stratified by first or repeat screening. Data were analysed to compare the trends of some quality and outcome indicators (referral rate, overall detection rate, detection rate of cancers ≤10 mm, proportion of in situ carcinomas, positive predictive value of referral) according to average activity volume and programme duration. Volume activity was analysed by percentile distribution (1-25th; 26-75th; 76-100th) of average number of screening tests performed by each programme in the considered time interval. Thus, three activity volume classes were defined (small, medium, large) with an average number of 4,865, 10,840, and 22,506 tests, respectively (table 3). Programme duration was measured from programme start to December 31st of each year considered; thus,

Programme duration	First screening						
	screened women	referrals	cancers	invasive cancers	cancers ≤1 cm		
<2 years	116,252	8,158	738	683	271		
3-4 years	154,915	9,778	1,040	893	339		
5-6 years	128,701	10.073	1,006	658	313		
>6 years	185,586	12,581	1,414	1,194	420		
	recall rate RR (95% CI)	**detection rate** RR (95% CI)	**detection rate invasive** RR (95% CI)	**detection rate cancers ≤1 cm** RR (95% CI)	**% cancers ≤1 cm** RR (95% CI)	**% cancers in situ** RR (95% CI)	**PPV** RR (95% CI)
<2 years	**7.0** 1	**7.0** 1	**5.9** 1	**2.3** 1	**39.7** 1	**7.5** 1	**9.1** 1
3-4 years	**6.2** 0.87 (0.84-0.89)	**6.7** 1.13 (1.03-1.24)	**5.8** 1.05 (0.95-1.16)	**2.2** 1.01 (0.86-1.19)	**38.0** 0.88 (0.77-1.00)	**14.1** 1.89 (1.41-2.55)	**10.8** 1.30 (1.18-1.42)
5-6 years	**7.5** 1 (0.98-1.03)	**7.8** 1.33 (1.21-1.46)	**6.7** 1.24 (1.12-1.37)	**2.4** 1.13 (0.96-1.34)	**36.5** 0.85 (0.74-0.97)	**14.7** 1.80 (1.33-2.43)	**10.5** 1.36 (1.24-1.49)
>6 years	**6.5** 0.87 (0.84-0.89)	**7.6** 1.41 (1.29-1.55)	**6.4** 1.29 (1.17-1.42)	**2.2** 1.17 (1.00-1.36)	**35.2** 0.82 (0.72-0.93)	**15.6** 2.12 (1.59-2.82)	**11.7** 1.61 (1.48-1.75)
	Repeat screening						
	screened women	referrals	cancers	invasive cancers	cancers ≤1 cm		
< 4 years	142,739	5,839	615	535	216		
5-6 years	305,788	12,404	1,531	1,318	533		
> 6 years	712,068	24,712	3,732	3,105	1,255		
	recall rate RR (95% CI)	**detection rate** RR (95% CI)	**detection rate invasive** RR (95% CI)	**detection rate cancers ≤1 cm** RR (95% CI)	**% cancers ≤1 cm** RR (95% CI)	**% cancers in situ** RR (95% CI)	**PPV** RR (95% CI)
<4 years	**4.1** 1	**4.3** 1	**3.8** 1	**1.5** 1	**40.4** 1	**13.0** 1	**10.06** 1
5-6 years	**3.7** 0.88 (0.85-0.90)	**5.0** 1.16 (1.06-1.28)	**4.3** 1.15 (1.04-1.27)	**1.7** 1.15 (0.98-1.35)	**40.4** 0.99 (0.87-1.12)	**13.9** 1.09 (0.86-1.38)	**13.4** 1.33 (1.22-1.45)
>6 years	**3.2** 0.79 (0.76-0.81)	**5.2** 1.20 (1.10-1.31)	**4.4** 1.14 (1.09-1.25)	**1.8** 1.13 (0.98-1.31)	**40.4** 0.95 (0.85-1.07)	**16.8** 1.29 (1.04-1.61)	**16.6** 1.54 (1.42-1.67)

DR:*Detection Rate*; RR: Relative Risk; PPV: Positive Predictive Value; CI: 95% Confidence Interval
RR (95% CI) is weighted on the age class distribution of the target population

Table 4: 1999-2004 activity. Trends of some indicators according to programme duration.

four duration classes were defined: <2, 3-4, 5-6, and >6 years (table 4). This preliminary analysis gives rise to some considerations about the impact of activity volume and programme duration on performance indicators. In programmes with greater activity (average test number: 22,506) the referral rate for first screening is higher, but still within acceptable standards: 6.3%; RR: 1.01 (0.98-1.04). The performance is compensated by better specificity and sensitivity: PPV=12.8; RR:1.16 (1.05-1.27); overall detection rate=8.1‰, RR 1.19 (1.07-1.31). This is particularly true for large-volume programmes, whereas for medium-sized programmes figures are less stable.

The association of indicators with programme duration is evident with a progressive improvement in quality with increasing programme experience. Programmes with

more than 6 years of activity, compared with newer programmes, show a recall rate in first screening of 6.5 %; RR: 0.87 (0.84-0.89), a PPV of 11.7: RR:1.61 (1.48-1.75) and an overall detection rate of 7.6‰, RR: 1.41 (1.29-1.55). At the same time, the 2004-2005 trends of participation by duration of the programme are higher in programmes active for a long time (figure 16).

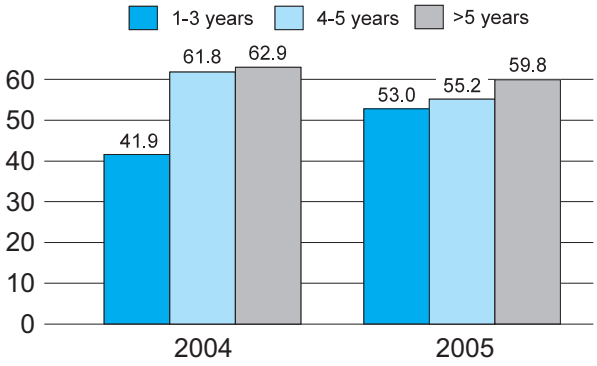


Figure 16: Crude attendance (%) by programme duration.

Conclusions

GISMa surveys have undergone a progressive transformation and have become increasingly more complete and systematic.

Thanks to the work of several people and organisations, data collection makes it possible to evaluate the quality of the programmes, to produce local and national statistics, and to compare different screening areas through standardised indicators. These investigations and comparisons are important in helping screening staff to properly manage their activity and improve programme effectiveness and quality. However, GISMa surveys still have some limitations: data collected is aggregated and not all programmes, particularly those covering large areas and with several territorial screening units, are able to provide a complete data set every year.

The analysis of the results of Italian breast screening programmes in 2004, though it must be taken with proper caution, shows a good average quality of screening performance, which is maintained over time. However, some failures in screening offer or functioning, rather than in the diagnostic process, must be mentioned. The discrepancy between Northern and Southern Italy persists. Although there has been a substantial increase in coverage as the years go, a major imbalance is observed in Southern and Insular Italy, where there is no organised screening activity or where the coverage is partial (with the only exception of Campania, where screening activities have recently experienced a significant increase). A critical aspect (more evident in 2005) is the imbalance between theoretical and actual coverage, due to the programmes' failure to maintain a constant flow of invitations over time. In many Italian settings, difficulties in management and organisation, as well as a chronic lack of dedicated professionals, invested financial resources, and clear-cut and well-planned policies for prevention, contribute to reduce the number of women who actually receive an invitation to screening. Unlike other screening indicators, the gap between theoretical and actual coverage does not record a Northern-Southern variability (it is higher in Central Italy) showing the widespread difficulty in guaranteeing adequate activity levels. More in-depth investigation is needed to evaluate this discrepancy in order to suggest and discuss corrective strategies.

At the same time, the fraction of women undergoing spontaneous screening (quite relevant in some Italian settings) should also be assessed for a better understanding of the situation. The presence of opportunistic screening in some Italian areas can explain both the difficulty for the programmes to invite all the target population and the wide heterogeneity in participation rates within the same regions.

Participation rate is a key indicator for measuring and comparing the quality of screening, essential for stakeholders to evaluate the effectiveness of their choices. Low attendance can make ineffective the screening organisa-

tional and economic efforts. Although there appears to be a constant and positive time trend, reaching and exceeding the acceptable standard, a great variability among Central-Northern and Southern/Insular programmes and within the same region still persists.

The attendance rate can be influenced by many factors. Besides individual and social/cultural conditions, organisational aspects can play an important role.

A centralised organisation, such as exists in many Italian regions, can stimulate useful synergies between the different screening phases, resulting in a wider and more successful involvement of the target population. Resources and efforts should move in this direction, together with a strong monitoring and regulation of the opportunistic activity that can interfere with the efforts made by organised screening.

The assessment of diagnostic indicators confirms the previously observed trend. The referral rate exceeds maximum standards, calling for further consideration. These values, referred to programmes that have already been running for several years, cannot be ascribed to the 'learning curve effect' typical of newly implemented programmes. To better assess this trend, it would be useful to evaluate the referral rate by screening unit and by radiologist. Multidisciplinary sessions on screen-detected lesions, collective revision of atypical outcomes, and reinforcement of the training procedures can represent some practical approaches to improve the performance of the programmes.

As in the past, similar experiences in other European screening centres encourage to implement new investigation strategies, such as the analysis of the association of sensitivity and specificity indicators with programme activity volume and duration.

The results of these analyses may be limited by the lack of information on factors determining performance, such as the number of screening units and involved operators, or the fraction of the screened women who had a previous mammography outside the programme, but they are consistent with those observed in other European programmes.[6]

Data collected annually by GISMa provides an important background regarding early detection of breast cancer in Italy.

These results, albeit derived from aggregated data, continue to be reassuring and confirm the great effort undertaken by all the screening operators over time. It is therefore important to maintain the level of cooperation and participation in screening experiences and support and reinforce the surveillance of indicators. In addition, more opportunities for discussing observed difficulties must be offered to the Italian screening community, in order to suggest, test, and evaluate strategies for continuous improvement.

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