

Latin American results in diagnostic mammography under IAEA Programme: Radiological Protection of Patients in Medical Exposures (TSA3)

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Introduction

- Incidence and mortality of breast cancer among LA women present same behavior as worldwide:
 - Incidence has increased in the last 20 years
 - Marked increased for women 50 years and older
 - 1st / 2nd place in incidence and mortality

- Diagnostic mammography is carried out in all countries

- IAEA Regional Project Radiological Protection of Patients in Medicine (TSA3): dose survey



Methodology

- Project had 2 phases: 2007-2009 and 2010-2011
- Regional training course to review methodology and data collection using specially designed spread sheets.
- D_G was estimated using the incident air kerma and relevant conversion coefficients for both projections (CC and MLO)
(IAEA protocols)
- Countries received necessary equipment
- Sample size:
 - 25 patients for CC and MLO
 - 4-6 cm compressed breast
 - 50%/50% glandularity

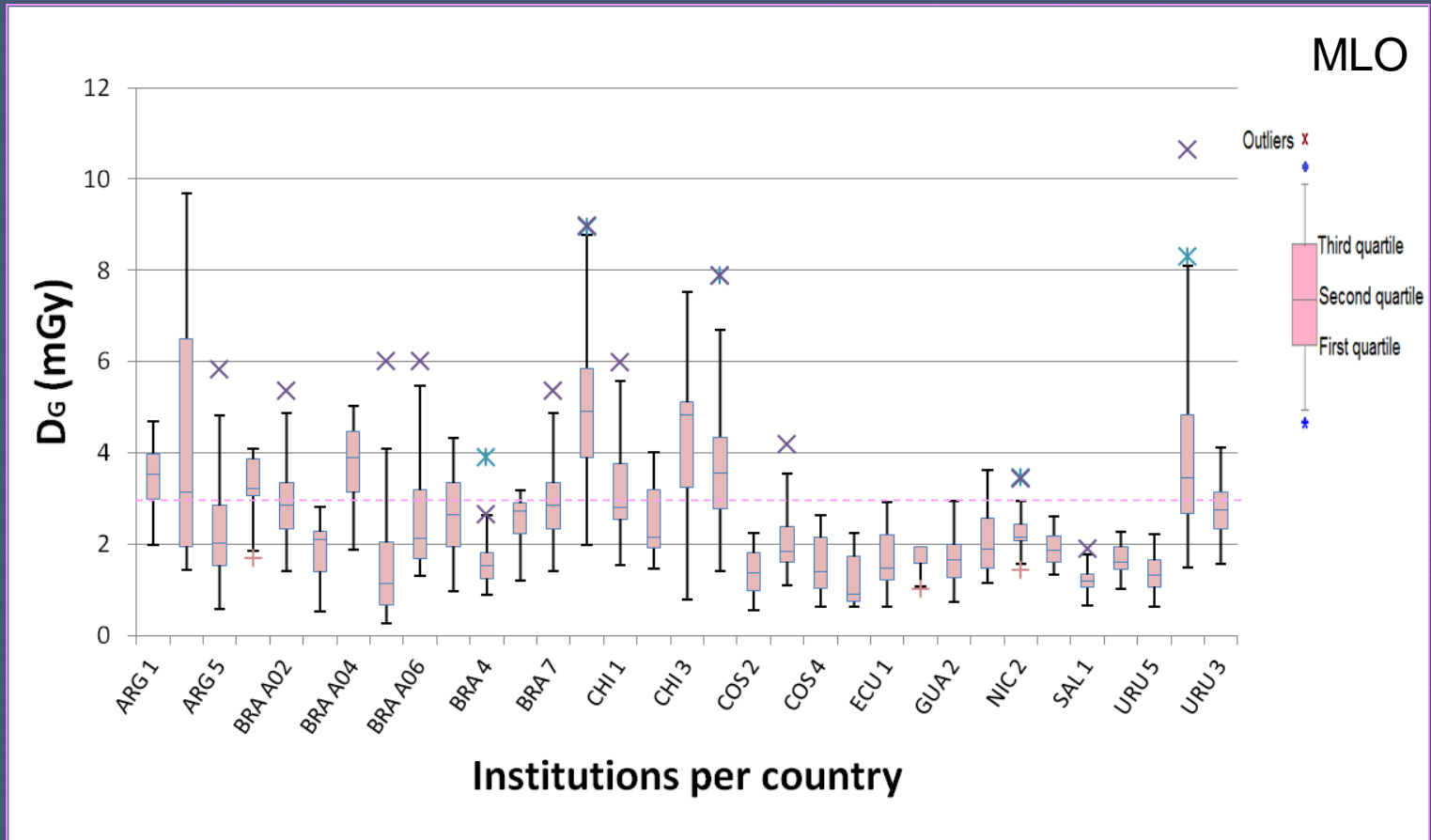


Results

Country	RLA /9/057	RLA /9/067		TOTAL
	Analog	Analog	Digital	
ARG	1	2	2	5
BRA	10	1	10	21
CHI	2	1	-	3
COS	4	-	3	7
CUB	-	1	-	1
ECU	1	-	-	1
GUA	-	2	1	3
MEX	-	-	1	1
NIC	1	1	-	2
PAR	1	-	1	2
SAL	-	1	-	1
URU	4	-	-	4
VEN	-	-	2	2
TOTAL	24	9	20	53

- Total of 53 institutions:
 - 33 analog
 - 20 digital:
 - 10 CRs and 10 DRs
- Some countries participated in only one phase
- Countries entering during Phase II received IAEA expert mission

Figures 1 and 2: D_G (mGy) for each participating institution with ANALOG equipment for CC and MLO



Figures 3 and 4: D_G (mGy) for each participating institution with DIGITAL equipment for CC and MLO

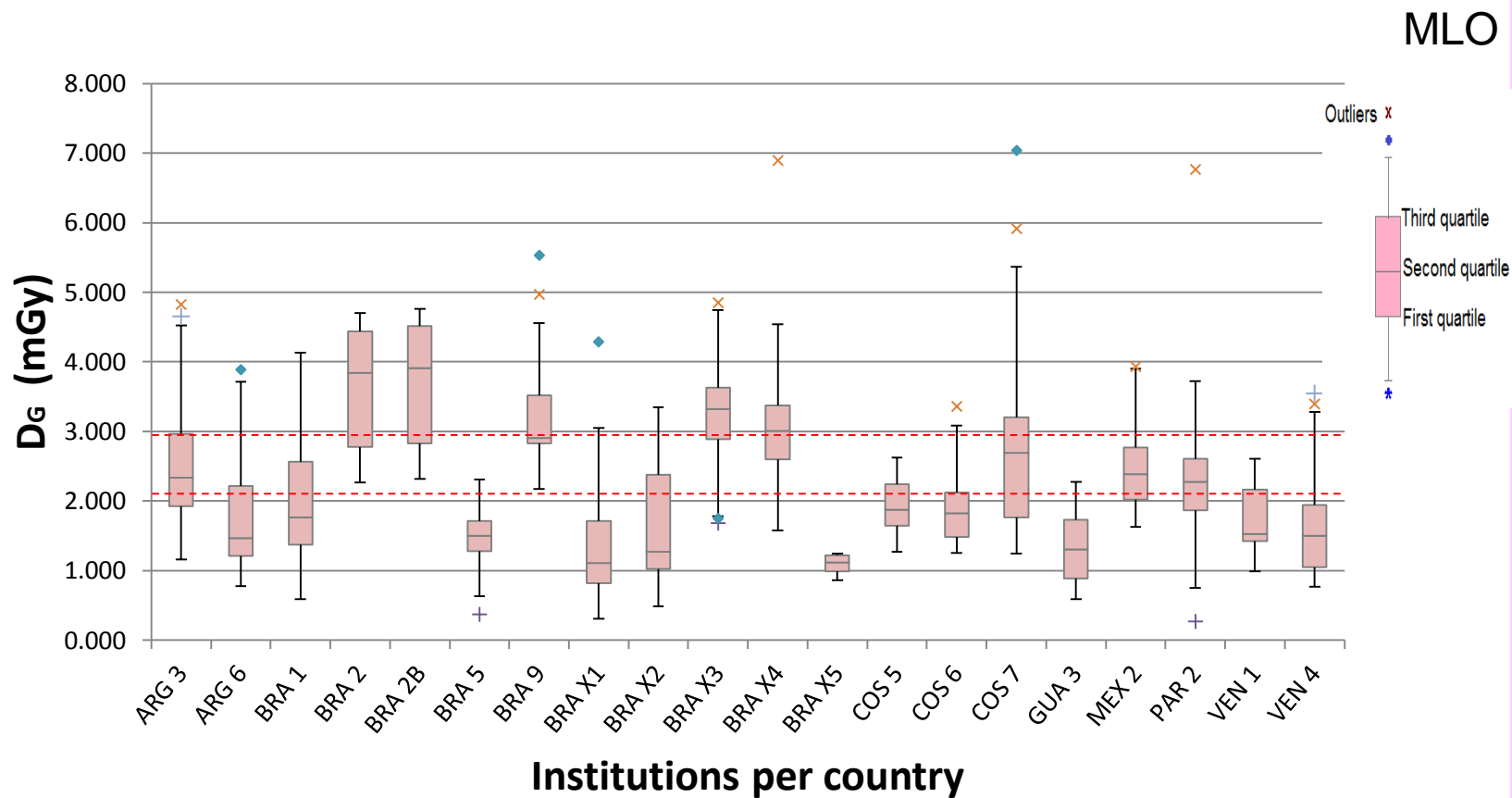
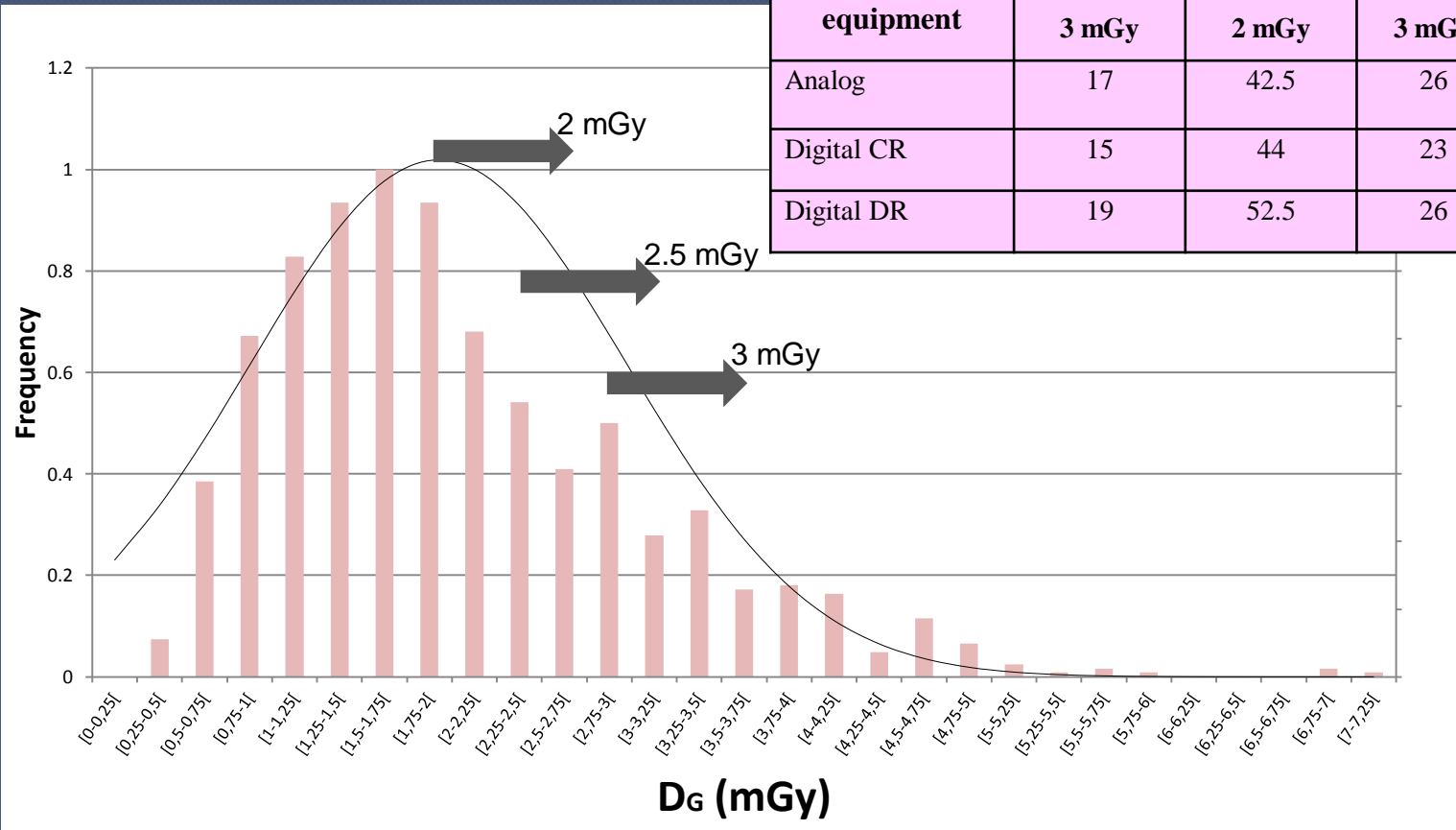




Table 2. Percentage of patient doses above 3 and 2 mGy.



Type of equipment	CC view		MLO view	
	3 mGy	2 mGy	3 mGy	2 mGy
Analog	17	42.5	26	57
Digital CR	15	44	23	52
Digital DR	19	52.5	26	66



Table 3. DRLs for mammography for each country and for the region

Country	CC			MLO		
	Analog	CR	DR	Analog	CR	DR
ARG	3.37	2.21	2.96	4.14	2.15	3.06
BRA	2.97	2.80	3.31	3.44	3.03	3.46
CHI	3.89	-	-	4.30	-	-
COS	1.98	3.20	2.24	3.36	3.97	2.70
CUB	1.18	-	-	1.73	-	-
ECU	1.27	-	-	2.22	-	-
GUA	1.32	1.73	-	1.94	1.95	-
MEX	-	-	2.77	-	-	2.80
NIC	2.11	-	-	2.46	-	-
PAR	1.62	-	2.61	2.18	-	*
SAL	0.85	-	-	1.35	-	-
URU	2.62	-	-	3.06	-	-
VEN	-	2.17	1.94	-	2.89	1.75
REGIONAL	2.63	2.59	2.93	3.17	2.78	3.04

- Countries have DRLs for D_G
- New information for digital equipment.
- Regional values close to 3 mGy
- Information for digital equipment: no decrease in dose
- Correlation of D_G with image quality for analog: not completely satisfactory
 - Phase III: digital equipment



Conclusions

- There is a wide spread in doses among all countries
(not uniform among institutions)
- Many institutions have DRLs for $D_G > 3\text{mGy}$
- On individual patient doses actions need to be implemented
(if acceptable value of $D_G \leq 2.5\text{ mGy}$ and achievable $D_G \leq 2\text{ mGy}$ are considered)
- Regional activities will be focused on:
 - increasing the number of trained medical physicist and radiographers
 - implementation of QC/QA programs
 - transition from analog to digital
 - reinforcement of regulations
 - general awareness on importance of QC programs



Summary

- First dose survey with 2600 patients (analog and digital)
- Common methodology was implemented
- Regional DRLs for D_G close to 3 mGy
- Enough room for optimization
 - (2.5 and 2 mGy new recommended values)
- Challenge with new digital equipment
- Future actions to optimize diagnostic mammography practice have been identified

Thank you!
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