Monitoring caesarean section

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Training Course in Sexual and Reproductive Health Research
Geneva, February 2009

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Background

- Increased rates – unknown consequences

- Controversial optimal rate

- Developed countries – best practices?

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Background

- Objective, consistent classification

- Valid comparisons over time in one unit and between different units

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Global estimates by region

	CS (%)	Coverage (% live births)
Africa	3.5	83
Asia	15.9	89
Europe	19	99
Latin America & Caribbean	29.2	92
Northern America	24.3	100
Oceania	14.9	92

Source: Betrán AP et al. Paediatric and Perinatal Epidemiology 2007, 21:98-113

Country CS rates by region

Source: Betrán AP et al. Paediatric and Perinatal Epidemiology 2007, 21:98-113

Caesarean section rates vs maternal mortality

Caesarean section rates vs maternal mortality Countries with CS > 15%
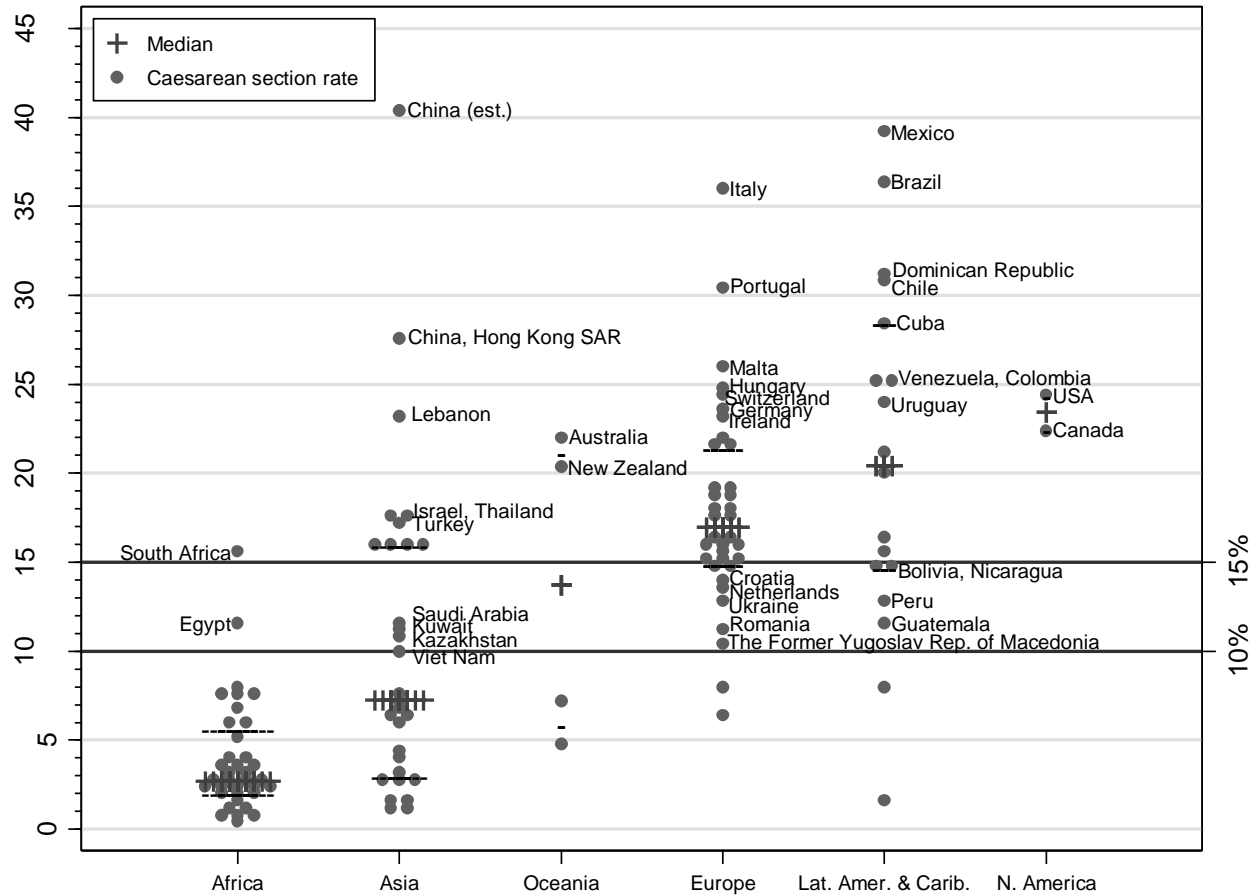
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How to look at CS rates

- By indication

- Overall rates

- Subgroup of women – "Standard primiparous women": caucasian, 20-34, >155cm, single, cephalic, <37weeks gestation in the unit that she was booked.
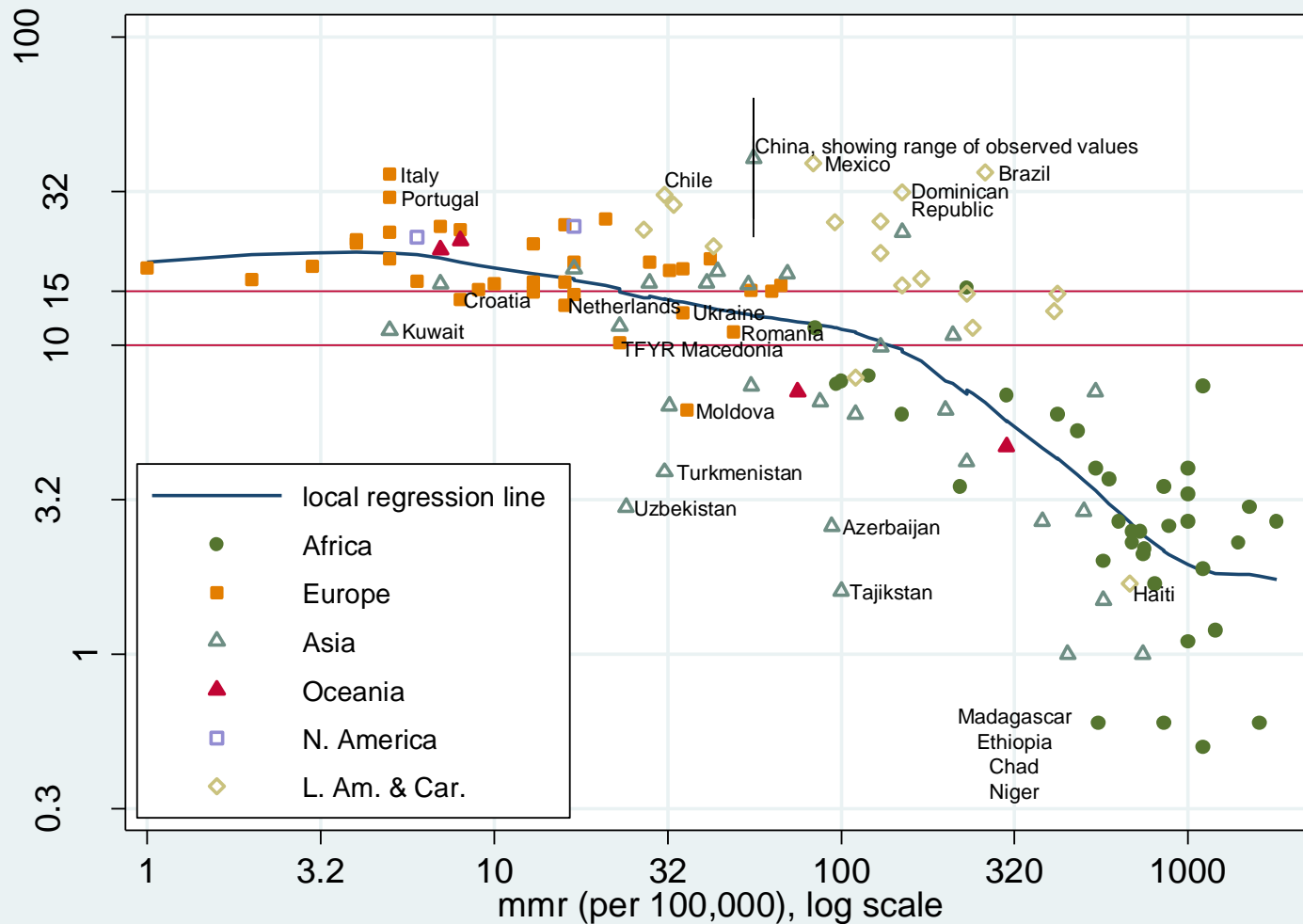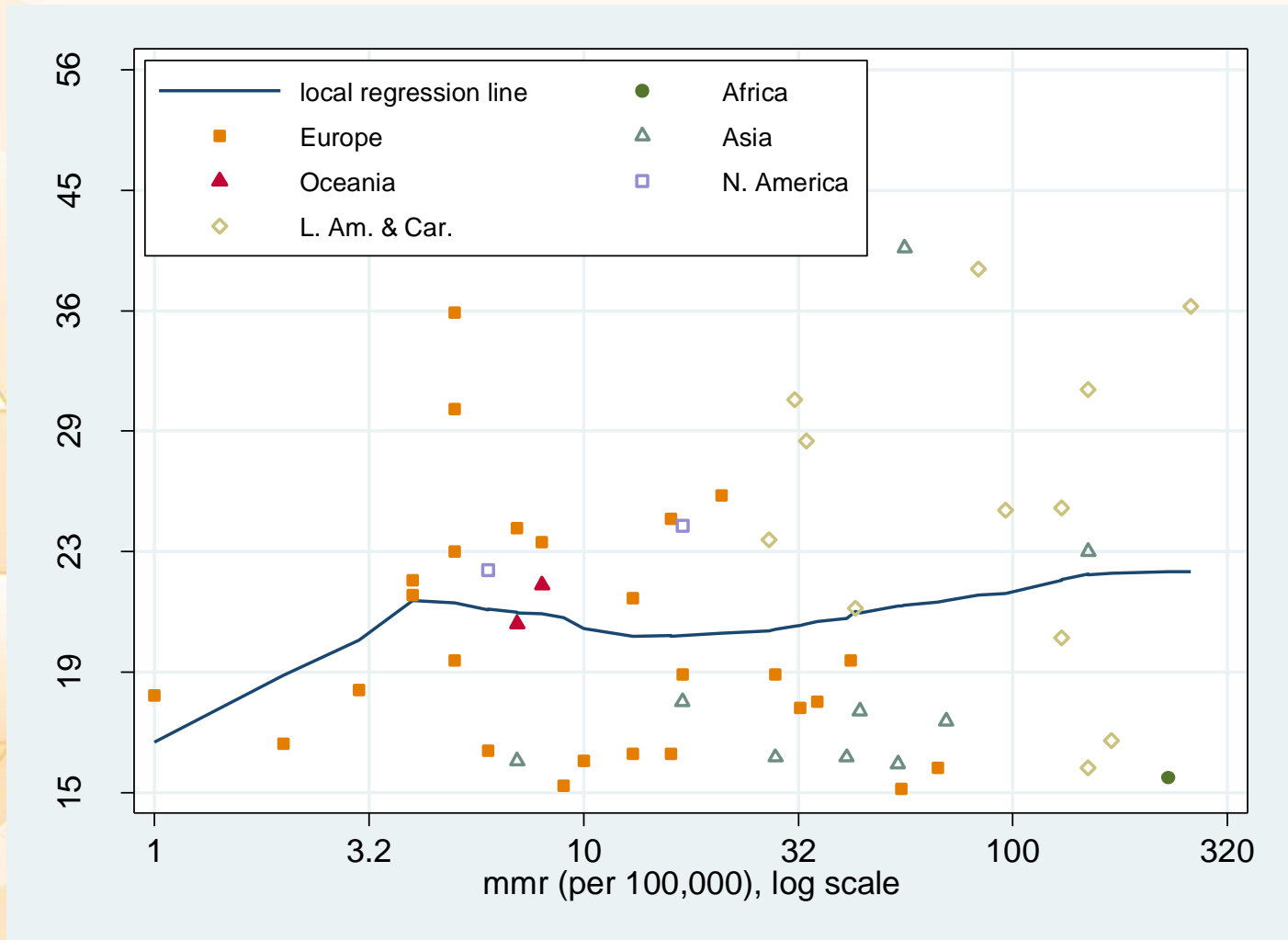
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Principles for a CS classification

- Simple to understand and implement
- Useful and informative
- Robust
- The groups of women must be
  - Carefully defined
  - Mutually exclusive
  - Totally inclusive
  - Objective – different professionals
  - Prospectively identifiable
  - Clinically relevant

Source: Robson MS. Classification of Caesarean Sections. Fetal and Maternal Review 2001; 12:23-39.

WHO

- Systematic review of available classifications of CS

- DELPHI among worldwide experts

- Evaluation for final guidelines on monitoring CS

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Classifying CS: the 10 groups
Concepts used

- Previous obstetric record

- Category of pregnancy

- Course of labour and delivery

- Gestational age

Source: Robson MS. Classification of Caesarean Sections. Fetal and Maternal Review 2001; 12:23-39.

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Classifying CS: the 10 groups
Concepts used

- Previous obstetric record

- Category of pregnancy

- Course of labour and delivery

- Gestational age

- Nulliparous
- Multiparous (without scar)
- Multiparous (with scar)

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Classifying CS: the 10 groups
Concepts used

- Previous obstetric record
- Category of pregnancy
- Course of labour and delivery
- Gestational age

  - Single cephalic
  - Single breech
  - Single oblique or transverse lie
  - Multiple

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Classifying CS: the 10 groups
Concepts used

- Previous obstetric record
- Category of pregnancy
- Course of labour and delivery
- Gestational age

- Spontaneous
- Induced
- CS before labour

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Classifying CS: the 10 groups
Concepts used

- Previous obstetric record
- Category of pregnancy
- Course of labour and delivery
- Gestational age

In complete weeks at the time of delivery

Classifying CS: the 10 groups

One	Nullip single ceph ≥37 wks spon labour
Two	Nullip single ceph ≥37 wks ind. or CS before labour
Three	Multip (excl prev CS) single ceph ≥37 wks spon labour
Four	Multip (excl prev CS) single ceph ≥37 wks ind or CS before labour
Five	Previous caesarean section single ceph ≥37 wks
Six	All nulliparous breeches
Seven	All multiparous breeches (incl previous CS)
Eight	All multiple pregnancies (incl previous CS)
Nine	All abnormal lies (incl previous CS)
Ten	All single ceph <= 36 wks (incl previous CS)

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Classifying CS: the 10 groups - Reporting

Group	CS / Deliveries	%	CS (%)	Contribution to CS (%)
One				
Two				
Three				
Four				
Five				
Six				
Seven				
Eight				
Nine				
Ten				
Total				

Global Survey – Latin America

Group	CS / Deliveries	%	CS (%)	Contribution to CS (%)
One	6172 / 26576	27.7	23.2	6.4
Two	5142 / 8376	8.7	61.4	5.4
Three	3044 / 30909	32.3	9.9	3.2
Four	2822 / 6704	7.0	42.1	3.0
Five	9042 / 10890	11.4	83.0	9.4
Six	1258 / 1409	1.5	89.3	1.3
Seven	1482 / 1794	1.9	82.6	1.6
Eight	690 / 954	1.0	72.3	0.7
Nine	1335 / 1419	1.5	94.1	1.4
Ten	2913 / 6773	7.1	43.0	3.0
Total	33900 / 95804	100.0	35.4	

Global Survey – Mexico

	Mexico					**NMH, Dublin, 2006**			
Group	CS / Deliveries	%	CS (%)	Contrib CS (%)		CS / Deliveries	%	CS (%)	Contrib CS (%)
One	1302 / 4827	23.1	27.0	**6.2**		144/2154	27.0	**6.7**	**1.8**
Two	1103 / 1826	8.7	60.4	**5.3**		354/1006	12.6	35	**4.4**
Three	761 / 6958	33.4	10.9	3.7		26/2512	31.5	**1.0**	0.3
Four	684 / 1681	8.1	40.7	3.3		96/825	10.3	12	1.2
Five	2087 / 2611	12.5	79.9	**10.0**		434/744	9.3	58	**5.4**
Six	180 / 205	1.0	87.8	0.9		153/167	2.1	91	1.9
Seven	291 / 335	1.6	86.9	1.4		87/98	1.2	88	1.1
Eight	132 / 161	0.8	82.0	0.6		52/102	1.3	51	0.7
Nine	441 / 477	2.3	92.5	2.1		32/32	0.4	100	0.4
Ten	902 / 1785	8.5	50.5	4.3		131/346	4.3	38	1.6
Total	7883 / 20866	100	37.8			1509/7986	100	18.9	

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Global Survey - By Country - Summary
CS Rates by Group

Group	Argentina	Brazil	Cuba	Ecuador	Mexico	Nicaragua	Paraguay	Peru
One	21.2	13.9	16.8	37.2	27.0	25.0	31.3	22.2
Two	74.0	63.5	58.4	49.6	60.4	41.7	69.5	72.1
Three	4.5	5.2	10.1	17.3	10.9	10.5	14.1	8.5
Four	47.2	40.9	50.4	22.8	40.7	30.1	51.1	60.4
Five	83.4	76.9	95.9	87.2	79.9	90.8	85.1	78.3
Six	88.3	87.6	89.9	86.1	87.8	91.0	90.9	82.2
Seven	87.3	78.3	83.3	82.7	86.9	82.6	88.1	77.8
Eight	76.1	74.2	63.6	68.1	82.0	67.6	64.9	69.6
Nine	86.7	77.6	92.2	95.6	92.5	100.0	96.4	99.6
Ten	46.8	32.8	32.8	43.7	50.5	33.4	47.3	44.7
Total	35.1	29.6	35.6	40.3	37.8	30.8	42.0	33.9

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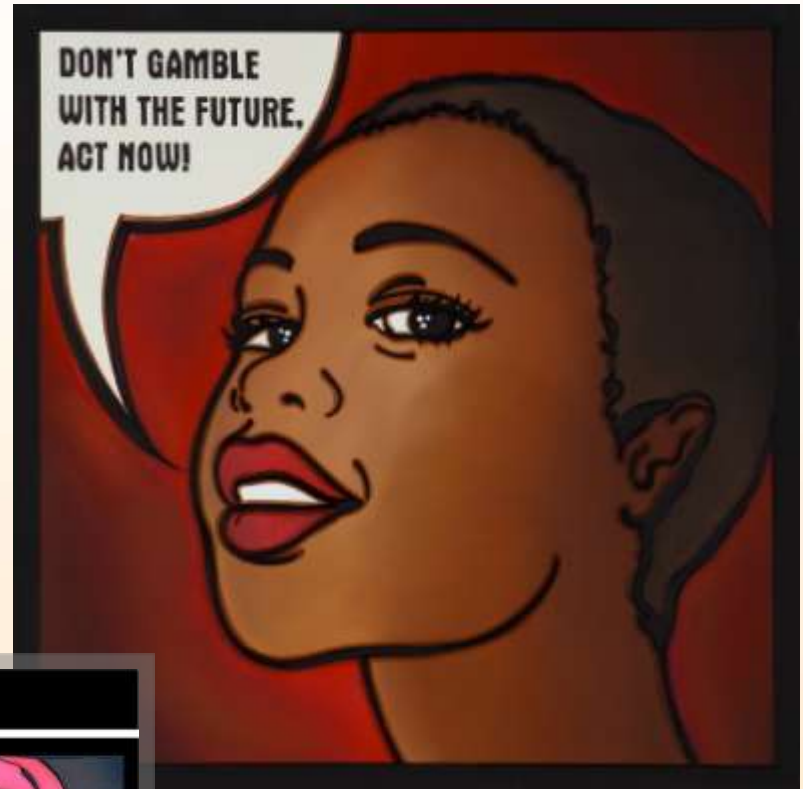Reproductive Health and Research

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Conclusion

- Simple classification

- Data easily available, basic data

- Allows for clinically relevant groups of women in which focus efforts to "reduce" CS

- Allows for objective comparison across units and time

- Empowering countries/facilities for knowledge translation

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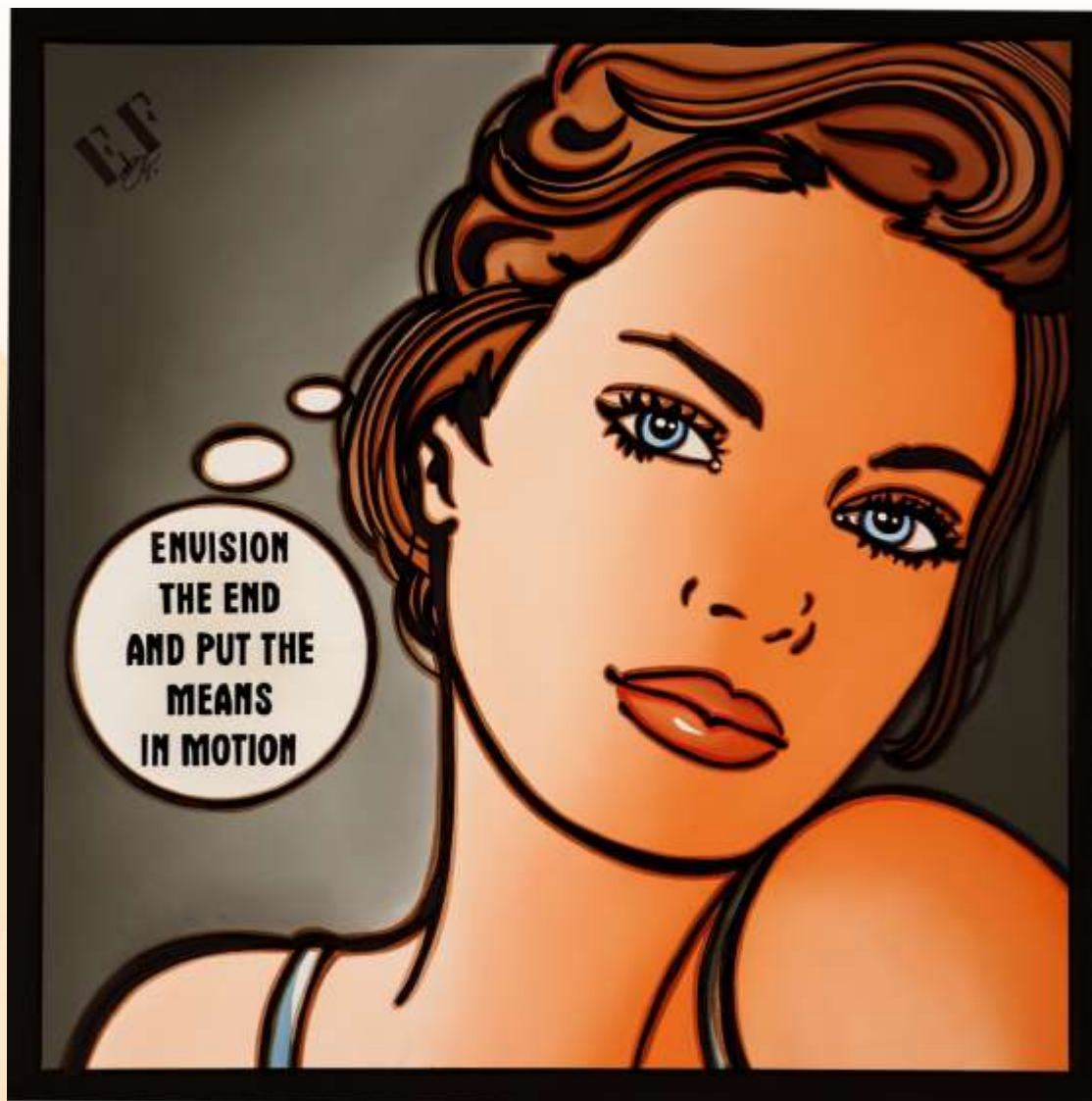and Research Training in Human Reproduction

Thank you

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Global Survey - By Country - Summary
Contribution of Each Group

Group	Argentina	Brazil	Cuba	Ecuador	Mexico	Nicaragua	Paraguay	Peru
One	27.7	28.6	30.2	26.9	23.1	27.9	25.0	32.2
Two	8.5	10.2	14.3	5.6	8.7	9.6	6.6	5.8
Three	33.0	30.9	26.4	34.8	33.4	33.8	32.2	33.6
Four	4.1	7.2	10.5	6.7	8.1	10.0	6.9	3.8
Five	13.6	11.1	8.7	12.3	12.5	8.7	14.1	10.5
Six	1.7	1.5	2.0	1.0	1.0	1.2	1.6	1.9
Seven	1.9	1.5	1.6	2.0	1.6	1.6	2.5	2.7
Eight	1.3	1.2	1.0	0.6	0.8	0.6	1.1	1.3
Nine	0.4	0.4	0.6	3.8	2.3	0.5	0.8	1.5
Ten	7.9	7.4	4.7	6.3	8.5	6.1	9.2	6.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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Global Survey - By Country - Summary
Contribution to CS by Group

Group	Argentina	Brazil	Cuba	Ecuador	Mexico	Nicaragua	Paraguay	Peru
One	5.9	4.0	5.1	10.0	6.2	7.0	7.8	7.2
Two	6.3	6.5	8.4	2.8	5.3	4.0	4.6	4.1
Three	1.5	1.6	2.7	6.0	3.7	3.5	4.6	2.9
Four	1.9	2.9	5.3	1.5	3.3	3.0	3.5	2.3
Five	11.3	8.5	8.4	10.7	10.0	7.9	12.0	8.2
Six	1.5	1.3	1.8	0.9	0.9	1.1	1.5	1.8
Seven	1.6	1.2	1.3	1.6	1.4	1.4	2.2	2.1
Eight	1.0	0.9	0.6	0.4	0.6	0.4	0.7	0.9
Nine	0.4	0.3	0.5	3.6	2.1	0.5	0.8	1.4
Ten	3.7	2.4	1.5	2.8	4.3	2.0	4.3	3.0
Total	35.1	29.6	35.6	40.3	37.8	30.8	42.0	33.9