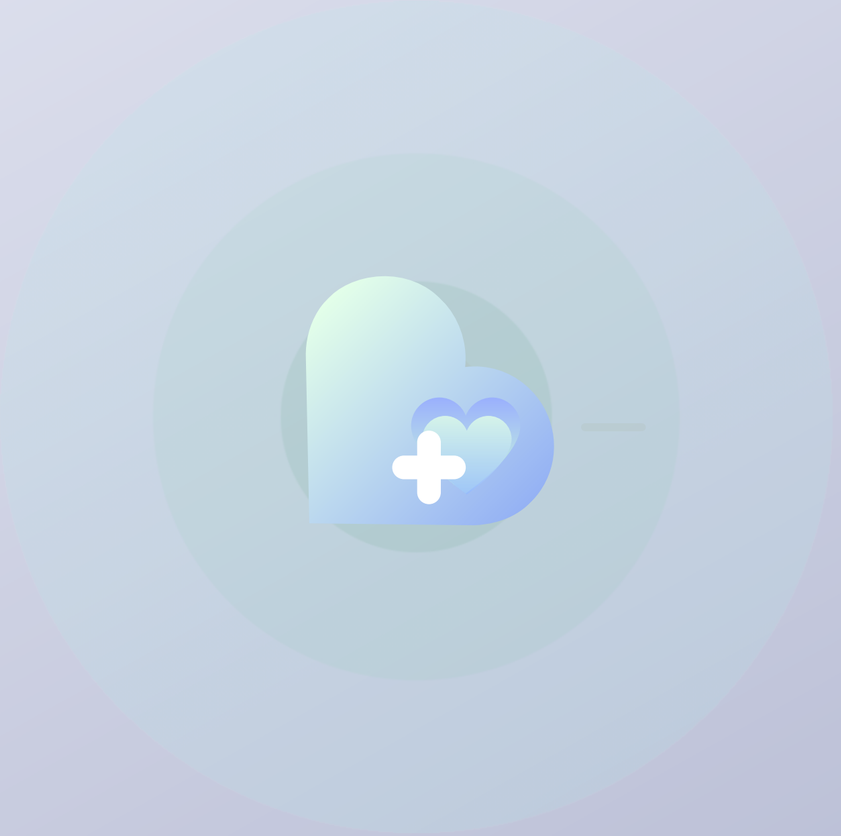
INE5111 - **Applied Statistics I**

Testing hypotheses to analyze the Brazilian obstetric scenario



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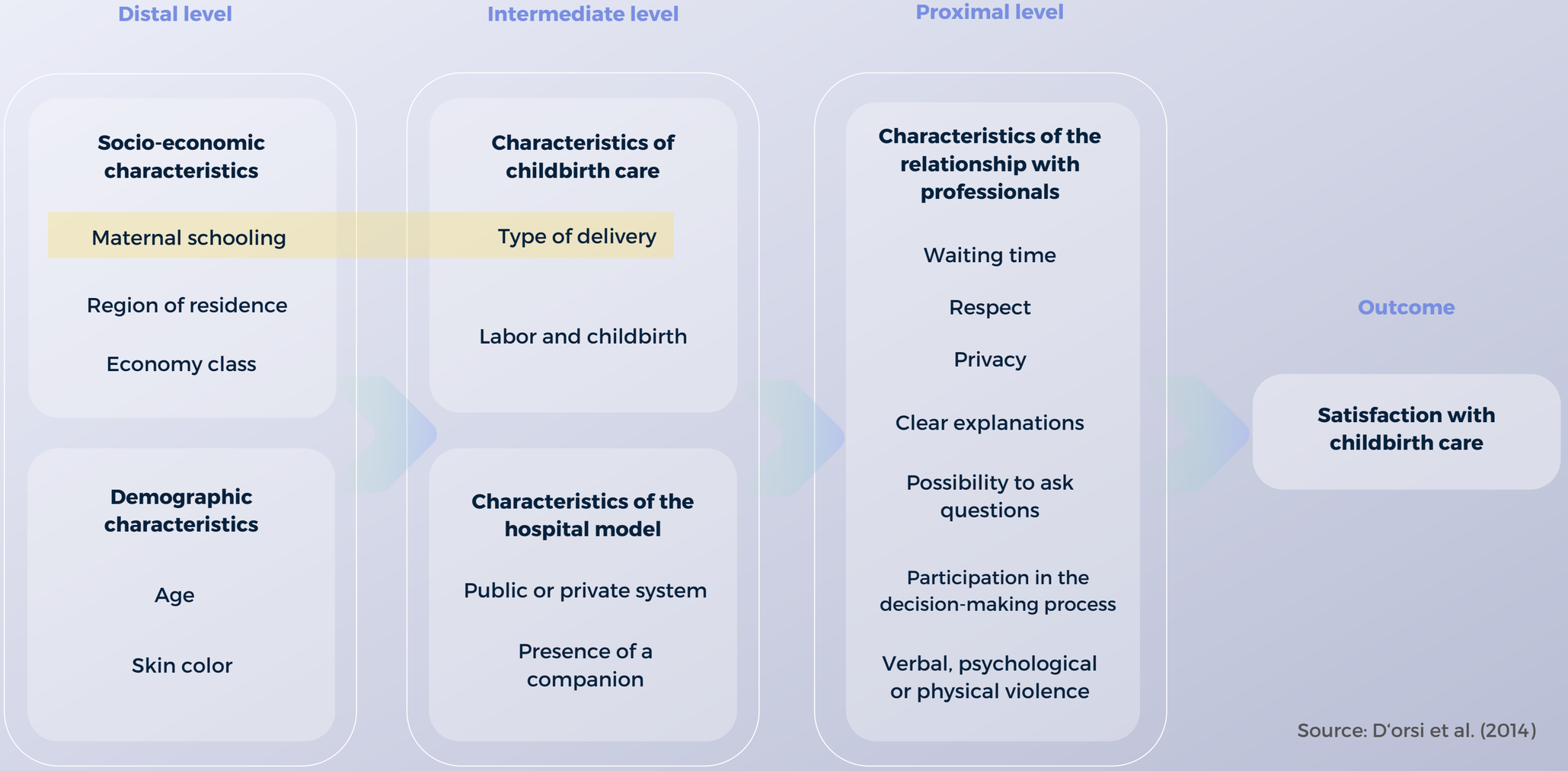

Source: D'orsi et al. (2014)

Cesarean = Rare event

Alternative for emergencies seeking to reduce maternal morbidity and mortality

WHO recommendation between **10%** and **15%** because it can lead to damage to the health of the mother and baby.

Cesaria = Epidemic in Brazil

INFORMATIONAL OBSTETRIC VIOLENCE

Promoting 'non-violence' is also giving the option of **not causing harm** through the ability to inform another individual of their choices. (RUSSO & CARRARA, 2015)

Information as a precondition in health to **reduce vulnerability**

DATASUS
Departamento de Informática do SUS

Live Birth Information System
(SINASC) - 1991 to 2021

Line: Capital of the country

Column: Type of delivery

Filter: Education

Primary education

Capital	Vaginal	Cesário	Fórceps/outro	Ignorado	Total
Porto Velho	3.633	2.399	2	39	6.073
Rio Branco	5.232	2.250	-	40	7.522
Manaus	11.639	7.642	8	113	19.402
Boa Vista	4.212	1.447	-	6	5.665
Belém	14.180	13.214	23	16	27.433
Macapá	5.971	1.077	7	-	7.055
Palmas	1.648	842	1	9	2.500
São Luís	8.936	4.125	45	90	13.196
Teresina	6.577	5.310	9	30	11.926
Fortaleza	20.841	11.473	57	366	32.737
Natal	13.643	5.452	66	15	19.176
João Pessoa	1.656	2.041	2	32	3.731
Recife	10.328	7.181	100	15	17.624
Maceió	6.797	3.478	6	12	10.293
Aracaju	746	340	-	8	1.094
Salvador	37.594	11.684	150	273	49.701
Belo Horizonte	16.075	13.000	306	59	29.440
Vitória	2.175	1.958	-	-	4.133
Rio de Janeiro	55.039	48.164	230	250	103.683
São Paulo	50.070	40.762	680	973	92.485
Curitiba	14.594	14.385	175	106	29.260
Florianópolis	3.866	2.254	2	42	6.164
Porto Alegre	15.599	7.065	315	6	22.985
Campo Grande	3.035	6.675	7	26	9.743
Cuiabá	3.584	4.634	38	71	8.327
Goiânia	7.003	11.699	22	102	18.826
Brasília	25.743	13.103	55	27	38.928
Total	350.416	243.654	2.306	2.726	599.102

High school

Capital	Vaginal	Cesário	Fórceps/outro	Ignorado	Total
Porto Velho	607	1.294	3	39	1.943
Rio Branco	675	651	3	6	1.335
Manaus	3.561	4.704	11	79	8.355
Boa Vista	646	409	-	2	1.057
Belém	3.327	6.979	19	4	10.329
Macapá	1.659	640	7	-	2.306
Palmas	234	275	-	3	512
São Luís	2.553	3.772	30	78	6.433
Teresina	1.525	3.302	13	16	4.856
Fortaleza	2.648	3.932	78	65	6.723
Natal	2.732	3.133	79	21	5.965
João Pessoa	572	1.279	6	9	1.866
Recife	3.612	6.044	120	10	9.786
Maceió	2.623	2.957	7	14	5.601
Aracaju	284	262	2	3	551
Salvador	8.738	9.642	260	140	18.780
Belo Horizonte	5.460	8.673	376	33	14.542
Vitória	760	1.785	1	5	2.551
Rio de Janeiro	14.248	26.328	262	161	40.999
São Paulo	3.327	7.073	781	273	11.454
Curitiba	4.297	7.955	241	76	12.569
Florianópolis	835	1.294	7	54	2.190
Porto Alegre	4.638	4.759	399	6	9.802
Campo Grande	574	2.852	4	19	3.449
Cuiabá	775	2.331	30	44	3.180
Goiânia	1.971	7.041	17	58	9.087
Brasília	9.086	9.195	66	13	18.360
Total	81.967	128.561	2.822	1.231	214.581

Undergraduate studies

Capital	Vaginal	Cesário	Fórceps/outro	Ignorado	Total
Porto Velho	66	277	-	8	351
Rio Branco	67	180	1	4	252
Manaus	329	877	3	25	1.234
Boa Vista	58	82	-	-	140
Belém	427	2.425	1	-	2.853
Macapá	136	149	1	-	286
Palmas	12	89	-	-	101
São Luís	137	929	2	10	1.078
Teresina	122	603	-	1	726
Fortaleza	486	1.628	18	15	2.147
Natal	292	1.172	15	8	1.487
João Pessoa	94	339	1	2	436
Recife	803	3.722	22	1	4.548
Maceió	475	1.357	-	6	1.838
Aracaju	79	104	1	3	187
Salvador	719	3.401	61	29	4.210
Belo Horizonte	1.781	4.914	186	11	6.892
Vitória	147	1.141	1	1	1.290
Rio de Janeiro	4.342	14.787	68	106	19.303
São Paulo	1.238	4.997	436	120	6.791
Curitiba	1.319	4.437	137	42	5.935
Florianópolis	310	884	1	25	1.220
Porto Alegre	1.654	3.162	235	3	5.054
Campo Grande	169	1.211	3	12	1.395
Cuiabá	164	769	9	7	949
Goiânia	416	2.414	3	24	2.857
Brasília	1.584	4.276	18	3	5.881
Total	17.426	60.326	1.223	466	79.441

Primary education

Amostra:	**599.102**
Cesárias:	**243.654**
Proporção	**41%**

High school

Amostra:	**214.581**
Cesárias:	**128.561**
Proporção	**60%**

Undergraduate studies

Amostra:	**79.441**
Cesárias:	**60.326**
Proporção	**76%**

CHI-SQUARE TEST

To assess the existence of an association between variables

HO - Null hypothesis: Non-significant association (variables are independent)

H1 - Alternative hypothesis: Significant association (the variables are dependent)

Distribuição | Estatística

Teste Qui-Quadrado

Linhas 2

Colunas 3

☐ Linha % ☑ Coluna % ☐ Contagem Esperada ☐ Contribuição X²

	Até fundamental	Segundo grau	Superior
Cesária	243654	128561	60326
	41.0144%	61.066%	77.5877%
Vaginal	350416	81967	17426
	58.9856%	38.934%	22.4123%
	594070	210528	77752

Resultado

Teste Qui-Quadrado

df	2
X²	52851.2311
p	0

With a significance level of 5%, where $p < 0.05$, the **null hypothesis was rejected**.

There is a statistically significant difference between the number of vaginal and caesarean deliveries at the first degree, second degree and higher education levels over the years 1991 to 2021.

CONTINGENCY TEST

Assess the level of association between variables

$$\sqrt{\frac{x^2}{(x^2 + n)}} \cong 0{,}23$$

C = 23%, i.e. close to 0, indicating a low level of association

Hypotheses for a trend towards an increase in the number of caesarean sections as schooling increases.

False idea of status based on the perception of caesarean section as a **more controlled and safer option**.

A pessimistic view of the female body, which treats childbirth as a high-risk pathological event, **dependent on technology and unnecessary interventions.**

Factors of **medical convenience**, embedded in the **health insurance** system, influence women's opinions during their journey, leading to reckless care.

Rates represent levels beyond those recommended by the WHO, demonstrating that even with the existence of international parameters that authenticate the right to informed choice, **gender archetypes have limited the real projection of legal determinations.**

Thank you

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