

UNIVERSITATEA DE MEDICINA SI FARMACIE “Victor Babeş” TIMISOARA

DISCIPLINA DE INFORMATICA MEDICALA

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BIOSTATISTICA

Curs pentru
Studii Doctorale

Cursul 5

CURSUL 5

- **1. Analiza factorilor de risc si prognostici**
 - Factori de risc, factori protectivi
 - Tipuri de studii: cohort, case-control
 - Tabele de contingenta
 - Indicatori de risc: odds ratio, risc relativ, teste
- **2. Alegerea metodei de analiza a datelor**

1. Biostatistica în Epidemiologie

ANALIZA RISCULUI

- **1.1. FACTORI DE RISC**

- **a) DEFINITIE :**

Cauza ipotetica pentru aparitia sau facilitarea aparitiei unei boli

- **b) CLASIFICARE DUPA NATURA:**

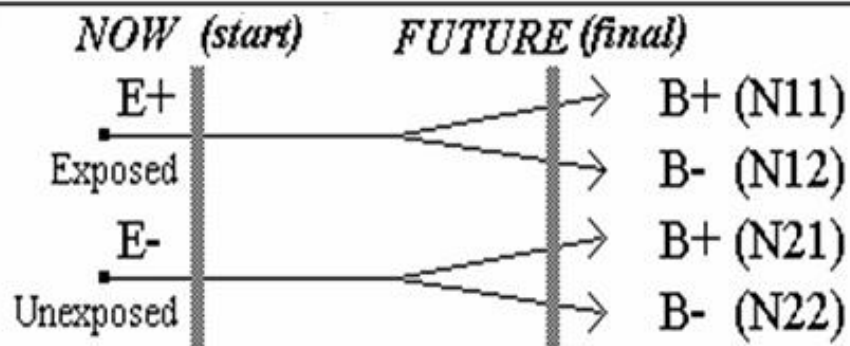
- *Factori de mediu* *Biologici*
 - *Sociali* *Comportamentali*

- **c) CLASIF. DUPA NIVEL PREVENTIE:**

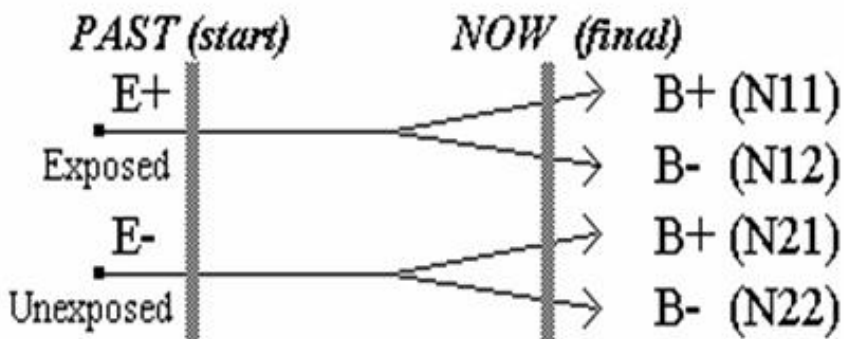
- *Primari – imbolnavire*
 - *Secundari – recadere*
 - *Tertiari - deces*

1.2. METODE

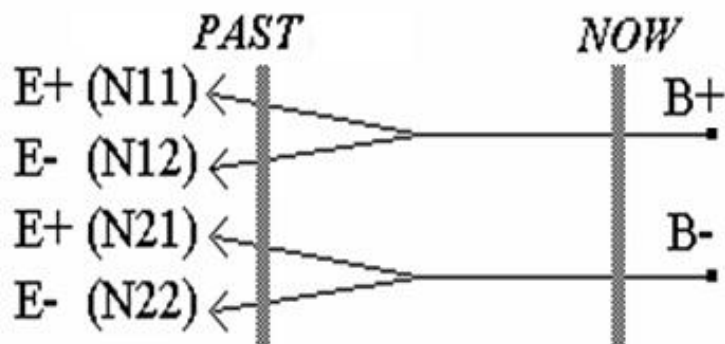
- **EXPERIMENTALE**
 - *CONTROLUL FACTORULUI DE RISC*
 - *DEZAVANTAJ: MOTIVE ETICE*
- **OBSERVATIONALE**
 - *TRANSVERSALE – la un moment dat*
 - *LONGITUDINALE – in timp*
 - *PROSPECTIVE – COHORT (E+/E-)*
 - *RETROSPECTIVE – CASE-CONTROL (B+/B-)*



a. Study type:
"cohort-prospective"



b. Study type:
"cohort-retrospective"



c. Study type:
"case-control"
retrospective

1.3. TABELE DE DATE

a) Loturi independente (nepereche)

- **Studii transversale (cross-sectional):**
 - Se culeg direct N11, N12, N21, N22
- **Studii Longitudinale:**
 - **Cohort:**
 - Se aleg L1, L2
 - Se culeg N11, N21
 - **Case-control**
 - Se aleg C1, C2
 - Se culeg N11, N12

Tabelul de contingenta

Loturi independente (nepereche)

	D+ (boala)	D- (boala abs)	Total linii
E+ (expusi)	N11	N12	L1
E- (neexpusi)	N21	N22	L2
Total coloane	C1	C2	N

Loturi pereche (matched)

- **Studii Longitudinale:**
 - **Cohort:**
 - Se alege N
 - Se culeg N11, N12, N21, N22 –
– sunt nr de perechi!
 - **Case-control**
 - Se alege N
 - Se culeg N11, N12, N21, N22 –
– sunt nr de perechi!

b) Tabel de contingenta

Loturi pereche (matched) – cohort

$N_{11}, N_{12}, N_{21}, N_{22}$ = perechi (expl)

		Ne-expusi (E-)		Total linii
		D+(boala)	D- (boala abs)	
E+ expusi	D+ (boala)	N11	N12	L1
	D- (boala abs)	N21	N22	L2
	Total coloane	C1	C2	N

c) Tabel de contingenta

Loturi pereche (matched) – case-control

N11, N12, N21, N22 = perechi (expl)

		D- (boala abs)		Total linii
		E+ Expusi	E- Ne-expusi	
D+ (boala)	E+ Expusi	N11	N12	L1
	E- Ne-expusi	N21	N22	L2
	Total coloane	C1	C2	N

1.4. PARAMETRII FUNDAMENTALI IN EPIDEMIOLOGIE

(cross-sectional si cohort)

- ***RISCUL 'ABSOLUT' (rata de succes):***

$$R(E+) = P(D+/E+) = N11 / L1$$

$$R(E-) = P(D+/E-) = N21 / L2$$

- ***RISCUL RELATIV (RR):***

$$RR = R(E+) / R(E-)$$

$$RR = N11 \cdot L2 / N21 \cdot L1$$

RISCVL ATRIBUTABIL:

(EXCESUL DE RISC DATORAT EXPUNERII)

$$AR = P(D+/E+) - P(D+/E-)$$

RISCVL ATRIBUTABIL POPULATIEI:

(EXCESUL DE RISC AL BOLII IN POPULATIE)

$$PAR = AR \times P(E+)$$

FRACTIUNEA ATRIBUTABILA

(AR %, FRACTIUNE ETIOLOGICA)

$$AF_E = AR / P(D+/E+) = (RR-1) / RR$$

FRACTIUNEA ATRIBUTABILA POPULATIEI

(PAR %, FRACTIUNE ETIOLOGICA TOTALA)

$$AF_T = PAR / P(D+)$$

- **INDICELE ‘ODD’ (succes / esec):**

-pentru cohort si cross-sectional:

$$ODD (D+/E+) = P(D+/E+)/P(D-/E+) = N11 / N12$$

$$ODD (D+/E-) = P(D+/E-)/P(D-/E-) = N21 / N22$$

-pentru case-control:

$$ODD (E+/D+) = P(E+/D+)/P(E-/D+) = N11 / N21$$

$$ODD (E+/D-) = P(E+/D-)/P(E-/D-) = N21 / N22$$

- ***ODDS RATIO (OR) – loturi independente***

- *Pentru cohort si cross-sectional*

$$***OR = ODD(D+/E+) / ODD(D+/E-)***$$

- *Pentru case-control*

$$***OR = ODD(E+/D+) / ODD(E+/D-)***$$

$$***OR = N11 . N22 / N21 . N12***$$

- ***ODDS RATIO (OR) – loturi pereche***

- *Pentru cohort*

$$\mathbf{OR = ODD(D+/E+) / ODD(D+/E-)}$$

- *Pentru case-control*

$$\mathbf{OR = ODD(E+/D+) / ODD(E+/D-)}$$

$$\mathbf{OR = N12 / N21}$$

- ***Uzual OR > RR***

- ***Daca OR > 1 (RR > 1) ==> RISC !***

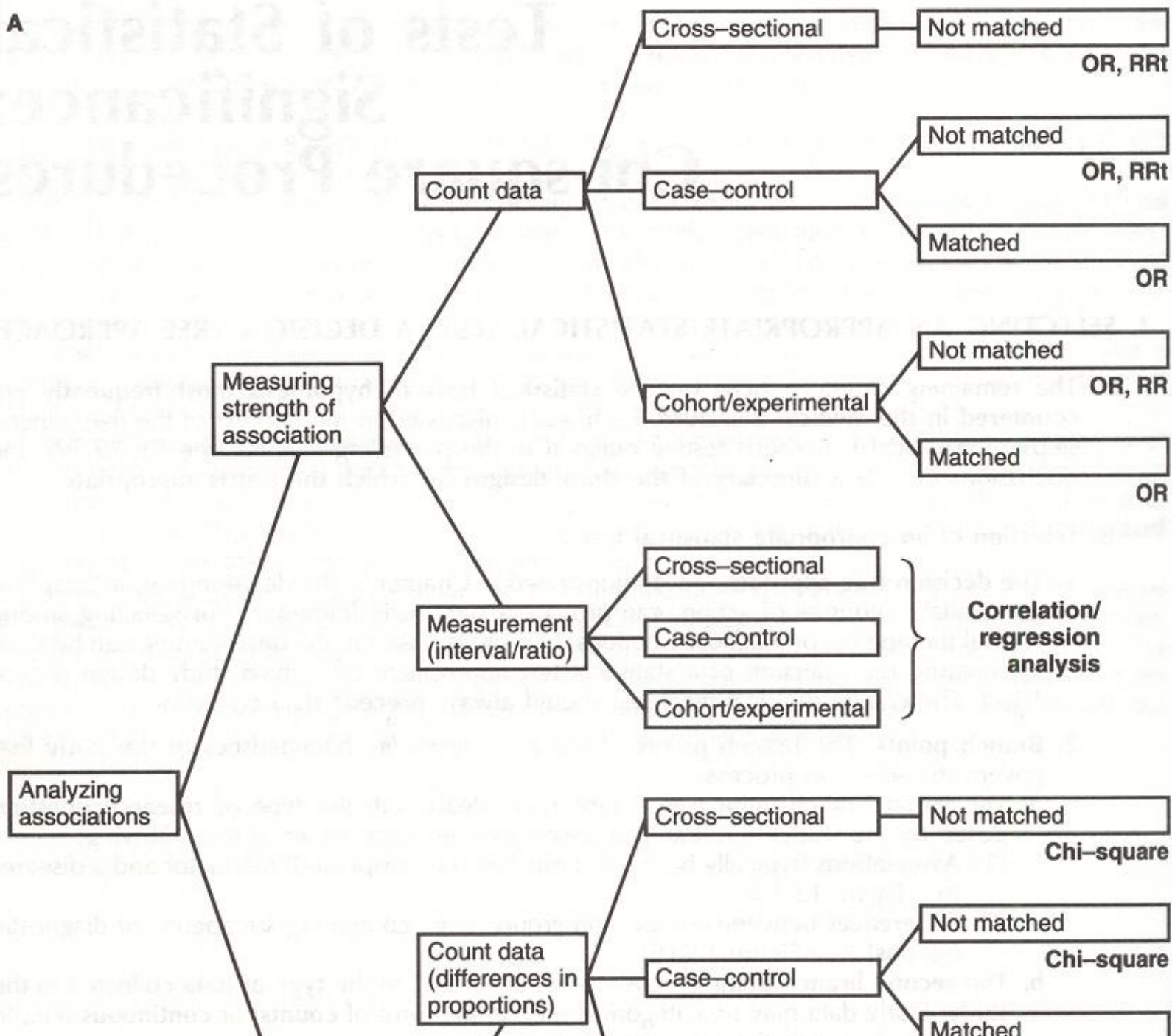
Intervale de incredere

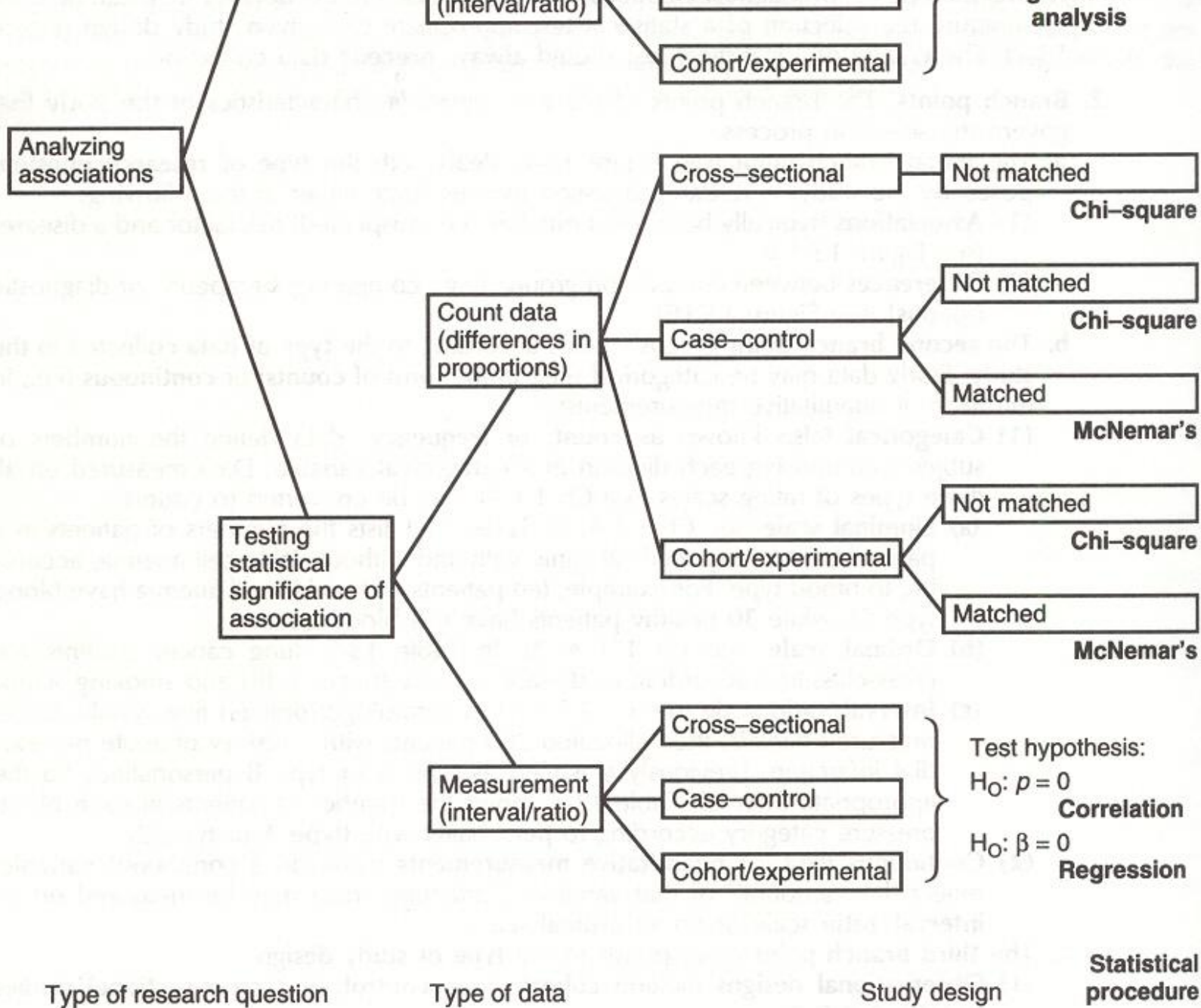
- Limite pentru OR: UP=upper limit, LL=lower...
 - Pentru 95%:

$$\ln (\text{UL} \ \& \ \text{LL}) = \ln (\text{OR}) \pm 1.96 \times \sqrt{\frac{1}{N_{11}} + \frac{1}{N_{12}} + \frac{1}{N_{21}} + \frac{1}{N_{22}}}$$

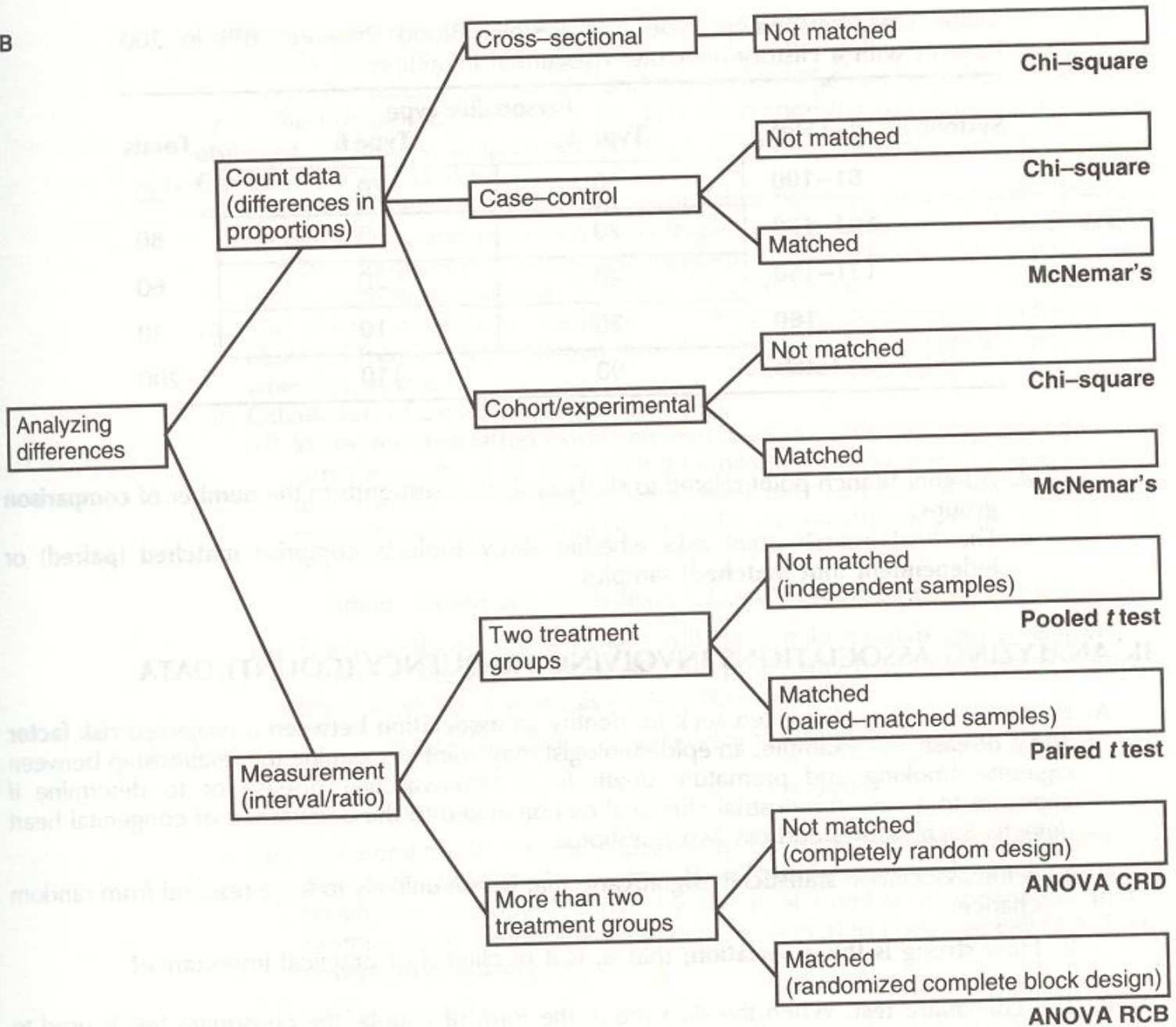
- Daca $\text{LL} < 1 < \text{UL} \rightarrow$ nu putem afirma ca exista RISC

2. ALEGEREA TIPULUI DE ANALIZA





B



Type of research question

Type of data

Study design

Statistical procedure

~ Sfârșit ~