

Examen teoretic – exemple de intrebari –

Statistică descriptivă

- *Într-un studiu cercetătorul măsoară gradul de înclinare al premolarului din dreapta sus pentru 10 pacienți. El obține 10 valori diferite ale înclinării dinților, una pentru fiecare pacient: 10, 70, 20, 50, 50, 30, 90, 80, 40, 60. Care dintre următoarele sunt media, mediana și modulul?
- A. 50, 40, 50
- B. 59, 40, nu exista modul
- C. Nici un raspuns nu este corect
- **D. 50, 50, 50**
- E. 50, 50, nu exista modul

Examen teoretic – exemple de intrebari

- Următoarele afirmații despre mediană sunt ADEVĂRATE:
- A. Nu este influentata de valori extreme
- B. Este un parametru util pentru datele nominale
- C. Are o stabilitate slabă depinzand de marimea eșantionului
- D. Este influentata de distribuția asimetrica a datelor
- E. Este utila pentru date discrete cantitative

Examen teoretic – exemple de intrebari

- *Într-un studiu un cercetător este interesat de igiena orală a copiilor. Acesta întreabă 10 copii (un esantion) despre numărul de periaje dentare pe zi. Acestea sunt răspunsurile lor: 1, 2, 3, 2, 1, 0, 2, 0, 2, 2. Care dintre următoarele sunt media și abaterea standard?
 - A. 1.5, 0.97
 - B. 1.5, 0.92
 - C. 1.5, 0.87
 - D. Nici un raspuns nu este corect
 - E. 1.5, 0.85

Examen teoretic – exemple de intrebari

- Următoarele date reprezintă vârsta primului episod de infarct miocardic la o serie de pacienți de sex masculin. Valorile cvartilelor sunt următoarele: $Q1 = 55,5$, $Q2 = 65$ și $Q3 = 74,5$. Următoarele afirmații sunt adevărate:
- A. Datele sunt distribuite aproximativ simetric
- B. Datele sunt distribuite simetric
- C. Datele sunt distribuite asimetric
- D. $Q3 - Q2 = 9.5$
- E. $Q2 - Q1 = 9.5$

Exemple de articole stiintifice publicate – cu
statistici descriptive

Numele revistei

Titlul articolului

OPEN ACCESS PEER-REVIEWED RESEARCH ARTICLE

Intrinsic ankle stiffness during standing increases with ankle torque and passive stretch of the Achilles tendon

Tania E. Sakanaka, Jaspreet Gill, Martin D. Lakie, Raymond F. Reynolds

Published: March 20, 2018 <https://doi.org/10.1371/journal.pone.0193850>

Article	Authors	Metrics	Comments	Media Coverage
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Abstract

Introduction
Methods

Autori

Acknowledgments

References

Reader Comments (0)

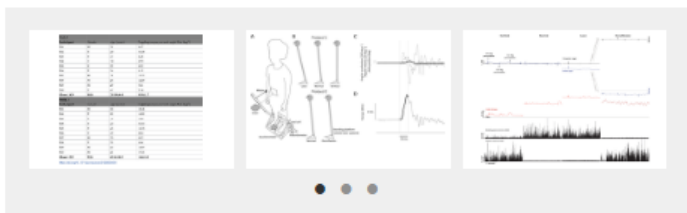
Media Coverage (0)

Figures

Abstract

Individuals may stand with a range of ankle angles. Furthermore, shoes or floor surfaces may elevate or depress their heels. Here we ask how these situations impact ankle stiffness and balance. We performed two studies (each with 10 participants) in which the triceps surae, Achilles tendon and aponeurosis were stretched either passively, by rotating the support surface, or actively by leaning forward. Participants stood freely on footplates which could rotate around the ankle joint axis. Brief, small stiffness-measuring perturbations (<0.7 deg; 140 ms) were applied at intervals of 4–5 s. In study 1, participants stood at selected angles of forward lean. In study 2, normal standing was compared with passive dorsiflexion induced by 15 deg toes-up tilt of the support surface. Smaller perturbations produced higher stiffness estimates, but for all perturbation sizes stiffness increased with active torque or passive stretch. Sway was minimally affected by stretch or lean, suggesting that this did not underlie the alterations in stiffness. In quiet stance, maximum ankle stiffness is limited by the tendon. As tendon strain increases, it becomes stiffer, causing an increase in overall ankle stiffness, which would explain the effects of leaning. However, stiffness also increased considerably with passive stretch, despite a modest torque increase. We discuss possible explanations for this increase.

Figures



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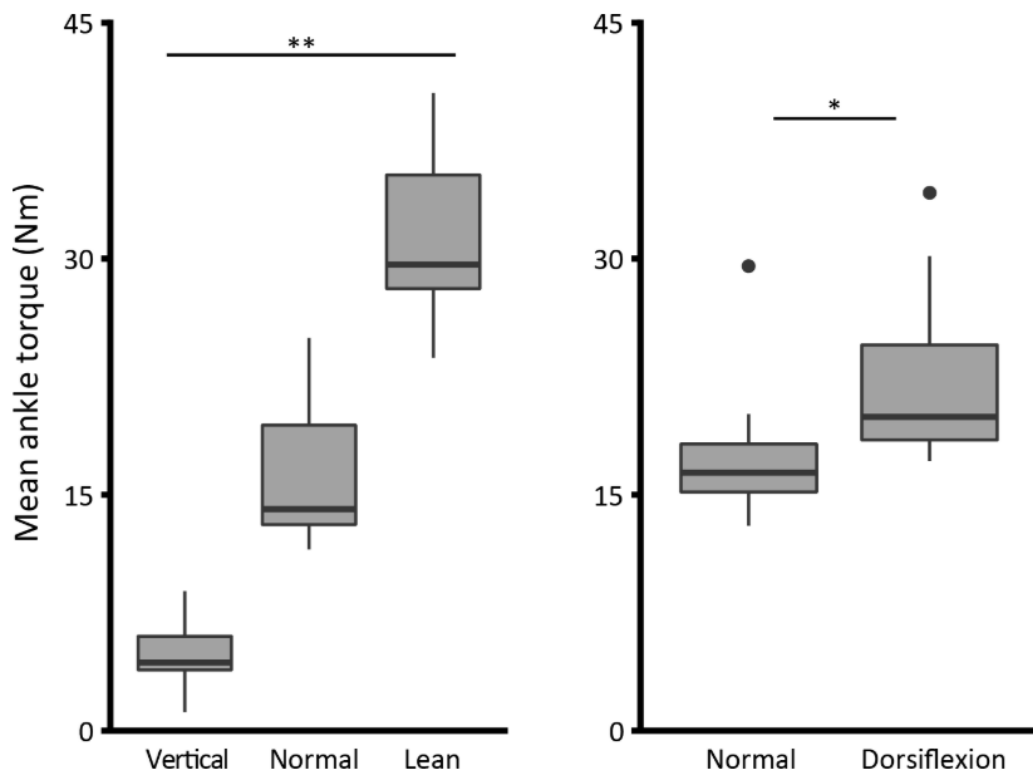
Subject Areas

- Ankles
- Torque
- Stiffness
- Tendons
- Gastrocnemius muscles
- Soleus muscles
- Electromyography
- Musculoskeletal system

Grafic cutie cu mustăți

Mean ankle torque (Nm).

(*) indicates significance of $P < 0.05$, and (**) indicates $P < 0.001$. This and the following box plots show first (bottom), second (band inside the box) and third (top) quartiles; whiskers show 1.5 IQR (Tukey box plot).



doi: <https://doi.org/10.1371/journal.pone.0193850.g003>

Effect of light pollution on self-reported sleep quality and its components: Comparative assessment among healthy adult populations in a rural and an Urban area of West Bengal, India

Arista Lahiri¹, Arup Chakraborty², Amal Kumar Sinha Roy³, Urmila Dasgupta⁴, Krishnadas Bhattacharyya⁵

Abstract

Background: Light pollution is inappropriate or excessive use of artificial light. Nighttime sky radiance is an effective measure to study its effects on individual sleep quality. **Objectives:** The study is aimed to measure the effect of light pollution on the sleep quality and compare among people residing in selected rural and urban areas of West Bengal, India. **Methods:** A comparative cross-sectional study was conducted during September–October 2018 in 10 villages of Barasat II block and 10 wards of Kolkata Municipal Corporation. Two hundred and sixty-three participants from urban and 249 participants from rural areas were selected through multi-stage sampling. Data regarding sleep quality and other selected factors were geotagged along with the radiance data. Multi-level linear regression models were built. **Results:** The mean age of the participants from rural and urban areas were respectively 37.65 (± 10.77) years and 38.10 (± 11.02) years. Gender-wise the participants were distributed almost evenly in urban and rural areas. Among the urban and rural population, the observed mean global Pittsburgh Sleep Quality Index scores were 12.63 (± 3.04) and 9.23 (± 2.27), respectively. Poorer sleep quality was observed to be statistically significant with increasing level of exposure. Multi-level models show that, at an exposure of $>40.0 \text{ nW/cm}^2/\text{sr}$ the adjusted coefficient was 11.52 (95% confidence interval [CI]: 9.65, 13.40) in the overall model and 12.84 (95% CI: 12.31, 13.37) for urban participants. **Conclusion:** The disturbance in sleep is associated with higher levels of night-time radiance of the sky strongly observed among the urban population.

Keywords: Light pollution, multi-level, Pittsburgh sleep quality index, radiance, sky glow, sleep quality

Lumina artificiale
din timpul noptii
(iluminatul stradal)
si calitatea somnului

- 263 participanti
din mediul urban
- 249 participanti
din mediul rural

Effect of light pollution on self-reported sleep quality and its components: Comparative assessment among healthy adult populations in a rural and an Urban area of West Bengal, India

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Titlul
articolului

Numele
revistei

Autori

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The mean global PSQI score was 10.98 (± 3.18), with an overall median of 11. Among the urban and rural population, the observed mean scores were respectively 12.63 (± 3.04) and 9.23 (± 2.27). A better sleep quality (PSQI global score \leq median) was observed among 82.30% of the rural respondents, while 69.20% of the urban participants had a poor sleep quality (PSQI global score $>$ median) based on the cumulative component scores. The differences were statistically significant. [Figure 1] depicts the distribution of PSQI global scores in urban and rural areas as per exposure category for night time radiance. In unadjusted analysis the trend of higher PSQI global score, i.e., poorer sleep quality was observed to be statistically significant with increasing level of exposure.

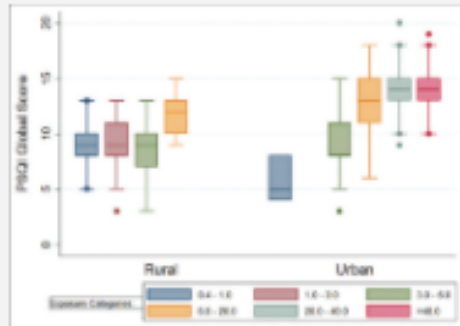


Figure 1: Box and whisker plot showing comparison of Pittsburgh Sleep Quality Index global scores' distribution as per different levels of exposure among the rural and urban respondents.

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Figura se
mentioneaza in
text

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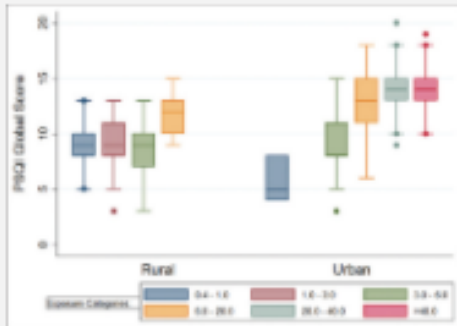


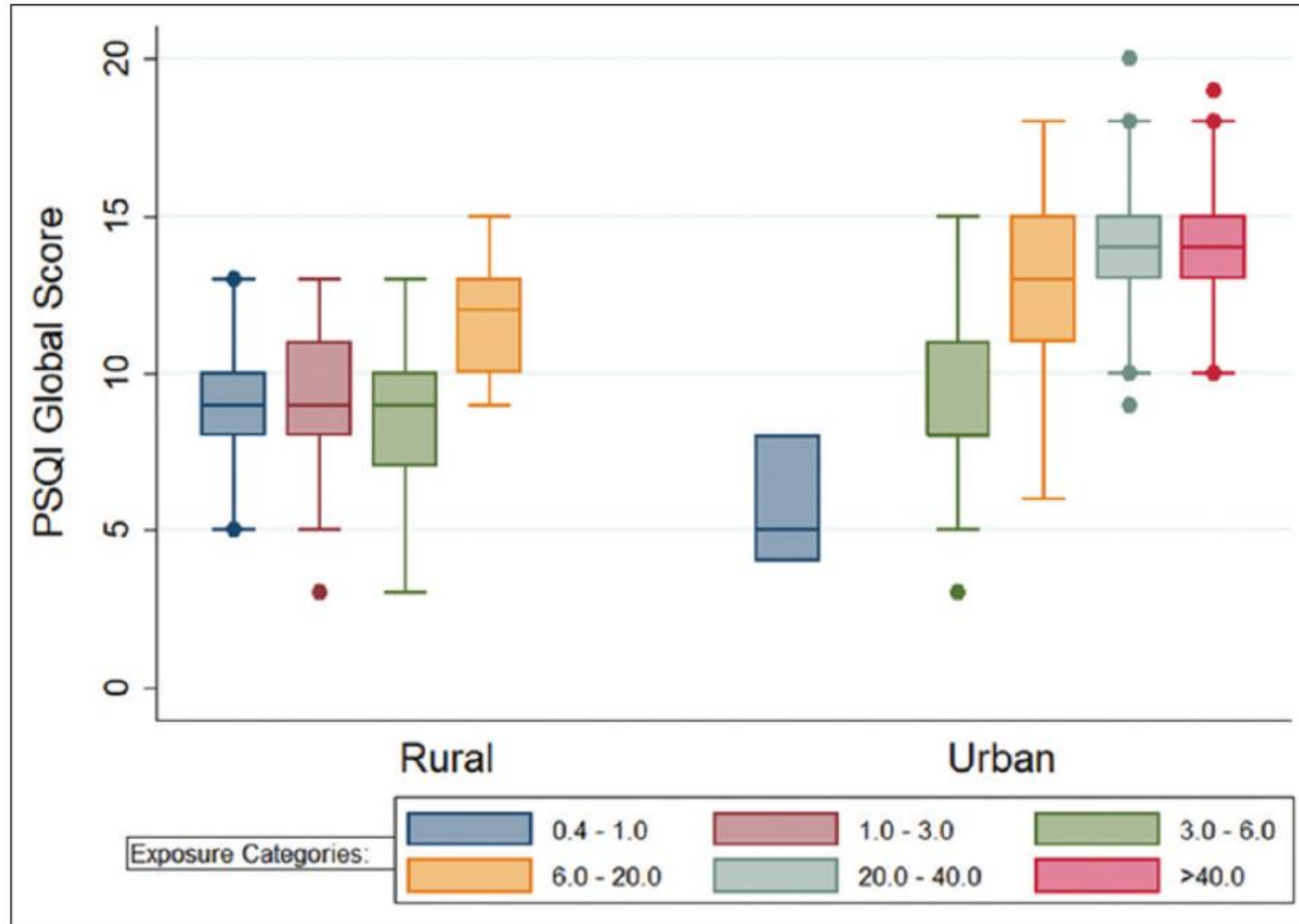
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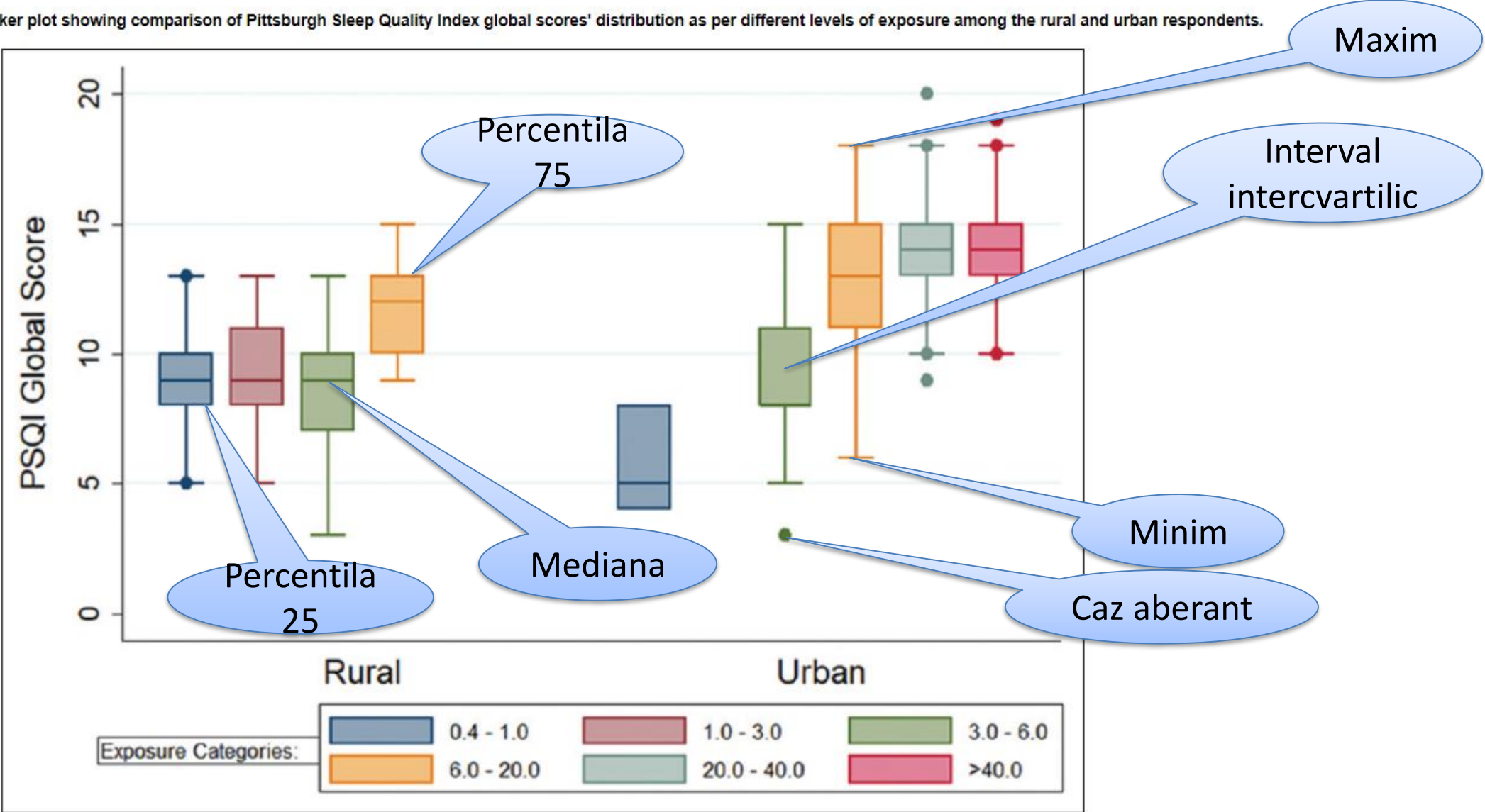
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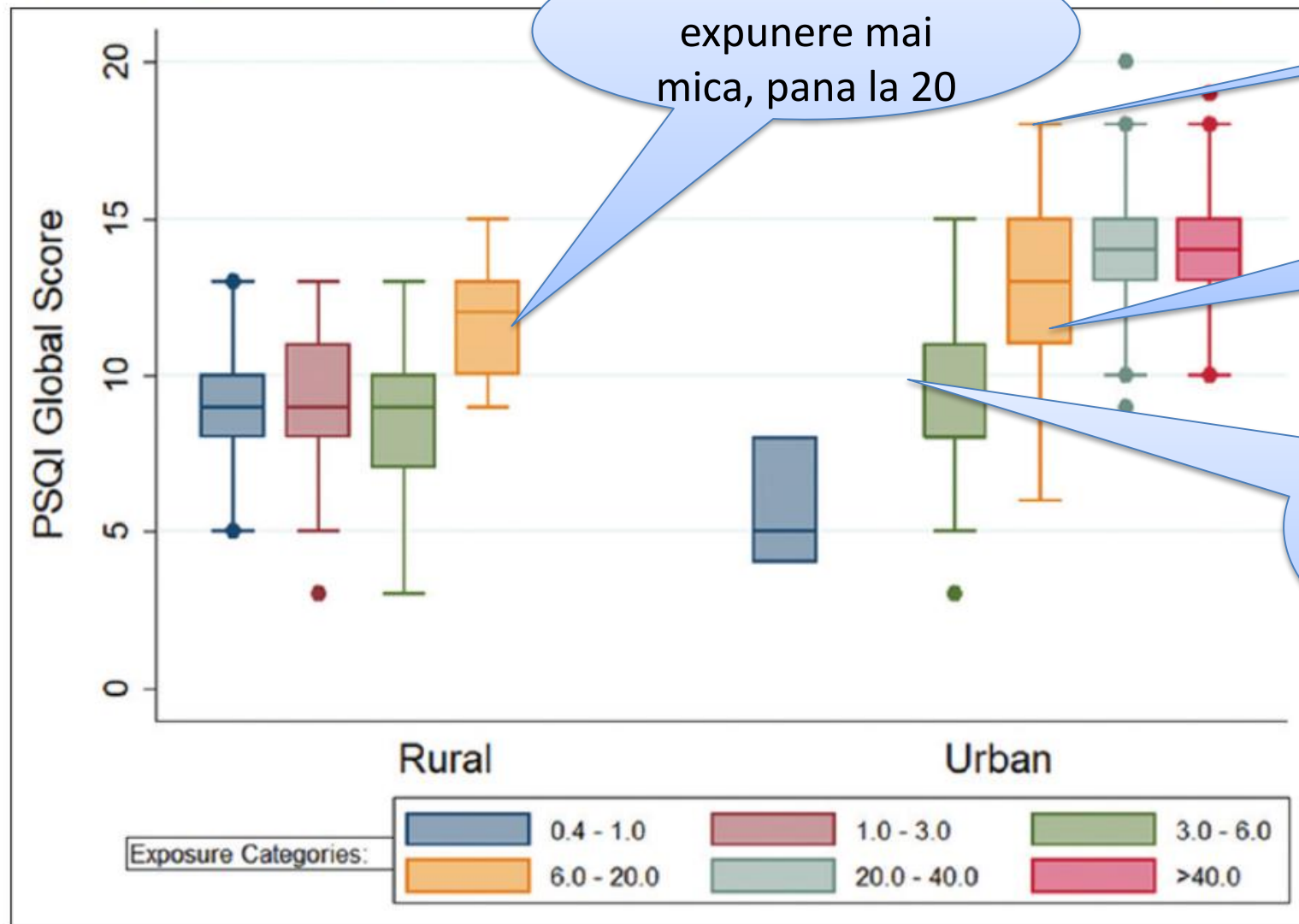
- 2 grupuri: urban / rural
- Impartite in 4 categorii de expunere la lumina artificiala in timpul somnului (variabila calitativa ordinala)
- PSQI scor - variabila calitativa ordinala)

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Lahiri A, Chakraborty A, Roy AK, Dasgupta U, Bhattacharyya K. Effect of light pollution on self-reported sleep quality and its components: Comparative assessment among healthy adult populations in a rural and an Urban area of West Bengal, India. Indian J Public Health 2020;64:229-35

Figure 1: Box and whisker plot showing comparison of Pittsburgh Sleep Quality Index (PSQI) Global Score among different levels of exposure among the rural and urban respondents.



In rural exista
expunere mai
mica, pana la 20

Maxim

De la 20 in sus
avem scor
PSQI mai mare

Chiar si la aceeasi
categorie de
expunere avem
diferente intre rural
si urban



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Keywords

1. Introduction

2. Experimental

3. Results

4. Discussion

5. Conclusion

Acknowledgement

Appendix A. Supplementary data

References

Show full outline

Figures (7)



ELSEVIER

Polymer

Volume 164, 15 February 2019, Pages 174-182



Titlul
articolului

The effect of boehmite nanoparticles (γ -AlOOH) on nanomechanical and thermomechanical properties correlated to crosslinking density of epoxy

Autori

Media Ghasem Zadeh Khorasani ^{a, b}, Dorothee Silbernagl ^a, Paulina Szymoniak ^{a, b}, Vasile-Dan Hodoroaba ^a, Heinz Sturm ^{a, b}

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<https://doi.org/10.1016/j.polymer.2018.12.054>

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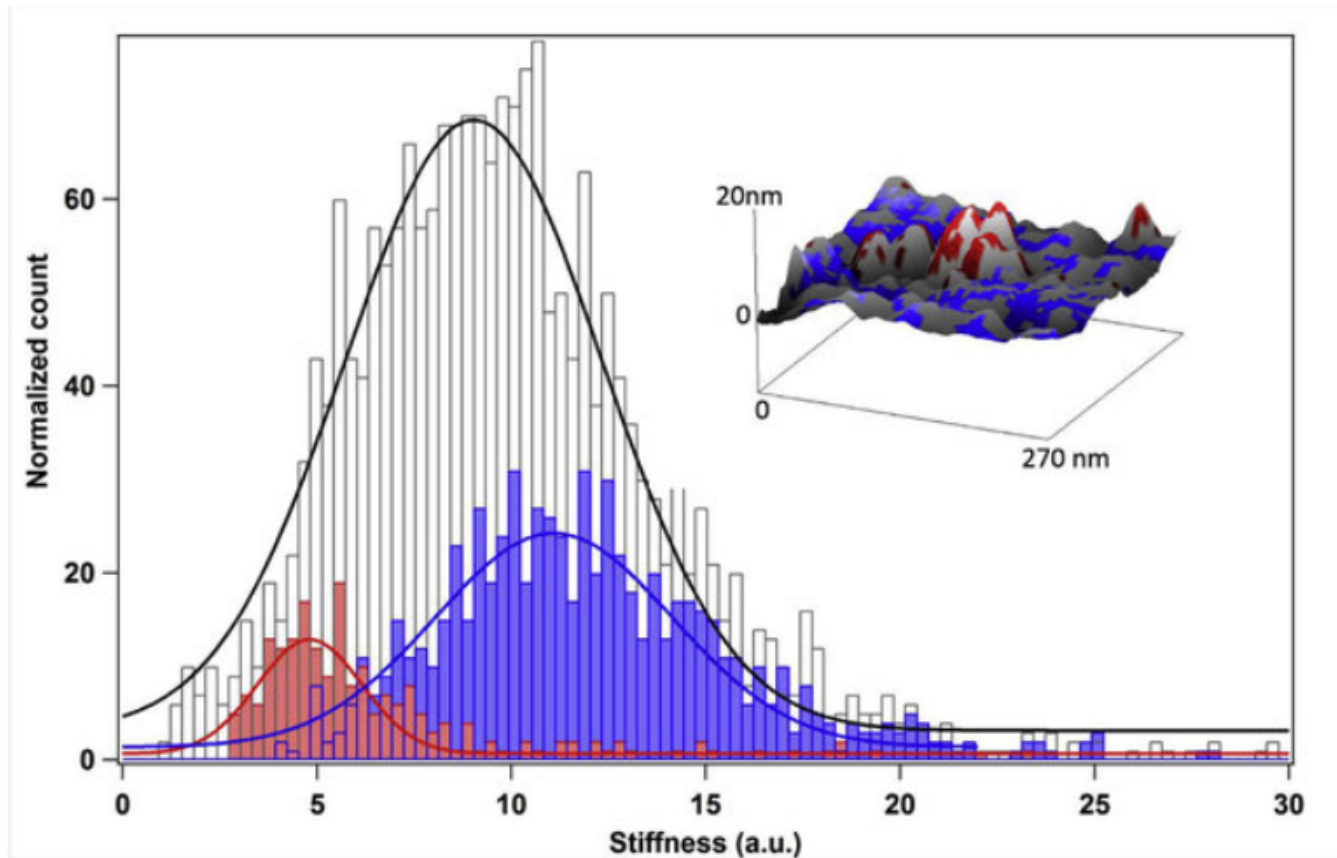
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Article Metrics

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Stiffness of a composite 2D histogram and 3D histogram



Figure

Caption

Fig. 3. Stiffness histogram from ImAFM measurements on EP/BNP15. The white bars show the histogram from the overall scanned area shown in the 3D topography including both particles and matrix. Blue bars are related to the stiffness histogram of epoxy phase (blue pixels on the 3D topography inset image) and red bars are related to stiffness BNPs (red pixels in the 3D topography inset image). Gaussian fits are shown as solid lines.

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Date despre 1099 de pacienti cu Coronavirus internati in China in ianuarie 2020

Clinical Characteristics of Coronavirus Disease 2019 in China

Wei-jie Guan, Ph.D., Zheng-yi Ni, M.D., Yu Hu, M.D., Wen-hua Liang, Ph.D., Chun-quan Ou, Ph.D., Jian-xing He, M.D., Lei Liu, M.D., Hong Shan, M.D., Chun-liang Lei, M.D., David S.C. Hui, M.D., Bin Du, M.D., Lan-juan Li, M.D., [et al.](#), for the China Medical Treatment Expert Group for Covid-19*

[Article](#) [Figures/Media](#)

[Metrics](#)

[24 References](#) [12 Citing Articles](#)

Abstract

BACKGROUND

Since December 2019, when coronavirus disease 2019 (Covid-19) emerged in Wuhan city and rapidly spread throughout China, data have been needed on the clinical characteristics of the affected patients.

METHODS

We extracted data regarding 1099 patients with laboratory-confirmed Covid-19 from 552 hospitals in 30 provinces, autonomous regions, and municipalities in mainland China through January 29, 2020. The primary composite end point was admission to an intensive care unit (ICU), the use of mechanical ventilation, or death.

February 28, 2020

DOI: [10.1056/NEJMoa2002032](#)

[Chinese Translation](#) [中文翻译](#)

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EDITORIAL FEB 28, 2020

[Covid-19 — Navigating the Uncharted](#)

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Table 1. Clinical Characteristics of the Study Patients, According to Disease Severity and the Presence or Absence of the Primary Composite End Point.*

Characteristic	All Patients (N = 1099)	Disease Severity		Presence of Primary Composite End Point†	
		Nonsevere (N = 926)	Severe (N = 173)	Yes (N = 67)	No (N = 1032)
Age					
Median (IQR) — yr	47.0 (35.0–58.0)	45.0 (34.0–57.0)	52.0 (40.0–65.0)	63.0 (53.0–71.0)	46.0 (35.0–57.0)
Distribution — no./total no. (%)					
0–14 yr	9/1011 (0.9)	8/848 (0.9)	1/163 (0.6)	0	9/946 (1.0)
15–49 yr	557/1011 (55.1)	490/848 (57.8)	67/163 (41.1)	12/65 (18.5)	545/946 (57.6)
50–64 yr	292/1011 (28.9)	241/848 (28.4)			16 (28.6)
≥65 yr	153/1011 (15.1)	109/848 (12.9)			16 (12.8)

45.0 (34.0–57.0)

52.0 (40.0–65.0)

Date despre 1099 de pacienti cu Coronavirus internati in China in ianuarie 2020

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50–64 yr	292/1011 (28.9)	241/848 (28.4)	51/163 (31.3)	21/65 (32.3)	271/946 (28.6)
≥65 yr	153/1011 (15.1)	109/848 (12.8)	44/163 (27.0)	32/65 (49.2)	121/946 (12.8)

Mediana (IQR) pentru Varsta la cazurile severe: 52 (40-65)
ceea ce înseamnă că 25% din cazurile severe au avut mai puțin de 40 de ani,
25% între 40 și 52; alte 25% între 52 și 65 de ani, iar ultimii 25% au fost
peste 65 de ani.

Date despre 1099 de pacienti cu Coronavirus
internati in China in ianuarie 2020

Table 1. Clinical Characteristics of the Study Patients, According to Disease Severity and the Presence or Absence of the Primary Composite End Point.*

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		Nonsevere (N = 926)	Severe (N = 173)	Yes (N = 67)	No (N = 1032)
Median incubation period (IQR) — days‡	4.0 (2.0–7.0)	4.0 (2.8–7.0)	4.0 (2.0–7.0)	4.0 (1.0–7.5)	4.0 (2.0–7.0)
Fever on admission					
Patients — no./total no. (%)	473/1081 (43.8)	391/910 (43.0)	82/171 (48.0)	24/66 (36.4)	449/1015 (44.2)
Median temperature (IQR) — °C	37.3 (36.7–38.0)	37.3 (36.7–38.0)	37.4 (36.7–38.1)	36.8 (36.3–37.8)	37.3 (36.7–38.0)

Median incubation period (IQR) — days‡

4.0 (2.0–7.0)

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Median temperature (IQR) — °C	37.4 (36.7–38.0)	37.3 (36.7–38.0)	37.4 (36.7–38.1)	36.8 (36.3–37.8)	37.3 (36.7–38.0)

Mediana (IQR) pentru perioada de incubație: 4 (2-7) zile ceea ce înseamnă că 25% din cazuri au avut mai puțin de 2 zile perioada de incubație, 25% între 2 și 4; alte 25% între 4 până la 7, iar ultimele 25% mai mult decât 7 zile.

Întrebare pentru examenul teoretic: Cum interpretăm temperatura dacă stim mediana (IQR) = 37,4 (36,7-38,1) grade Celsius în cazurile severe?

Date despre 1099 de pacienti cu Coronavirus internati in China in ianuarie 2020

Exemplu tabel

titlu deasupra
tabelului

denumirea
coloanelor

Table I. Comparisons between groups for age, sex, and numbers of teeth and roots per patient

<i>Parameters</i>	<i>Total (n = 128)</i>	<i>Hypodivergent (n = 30)</i>	<i>Normodivergent (n = 64)</i>	<i>Hyperdivergent (n = 34)</i>
Age (y)	12 (9-17)	14 (10-19)	12 (9.5-17)	11 (9-14)
Male, n (%)	38 (29.7)	8 (26.7)	20 (31.3)	10 (29.4)
Teeth per patient	6.5 (2-8)	8 (4-8)	7.5 (2-8)	4 (2-8)
Roots per patient	15 (6-18)	16 (10-18)	15 (6-18)	10 (6-18)

Median and interquartile interval/absolute and relative frequencies are given.
Kruskal-Wallis test; †chi-square test.

numărul total
de indivizi

denumirea
liniilor

legenda



Cosmina Ioana Bondor – autor

Probabilități



ALWAYS



SEEK



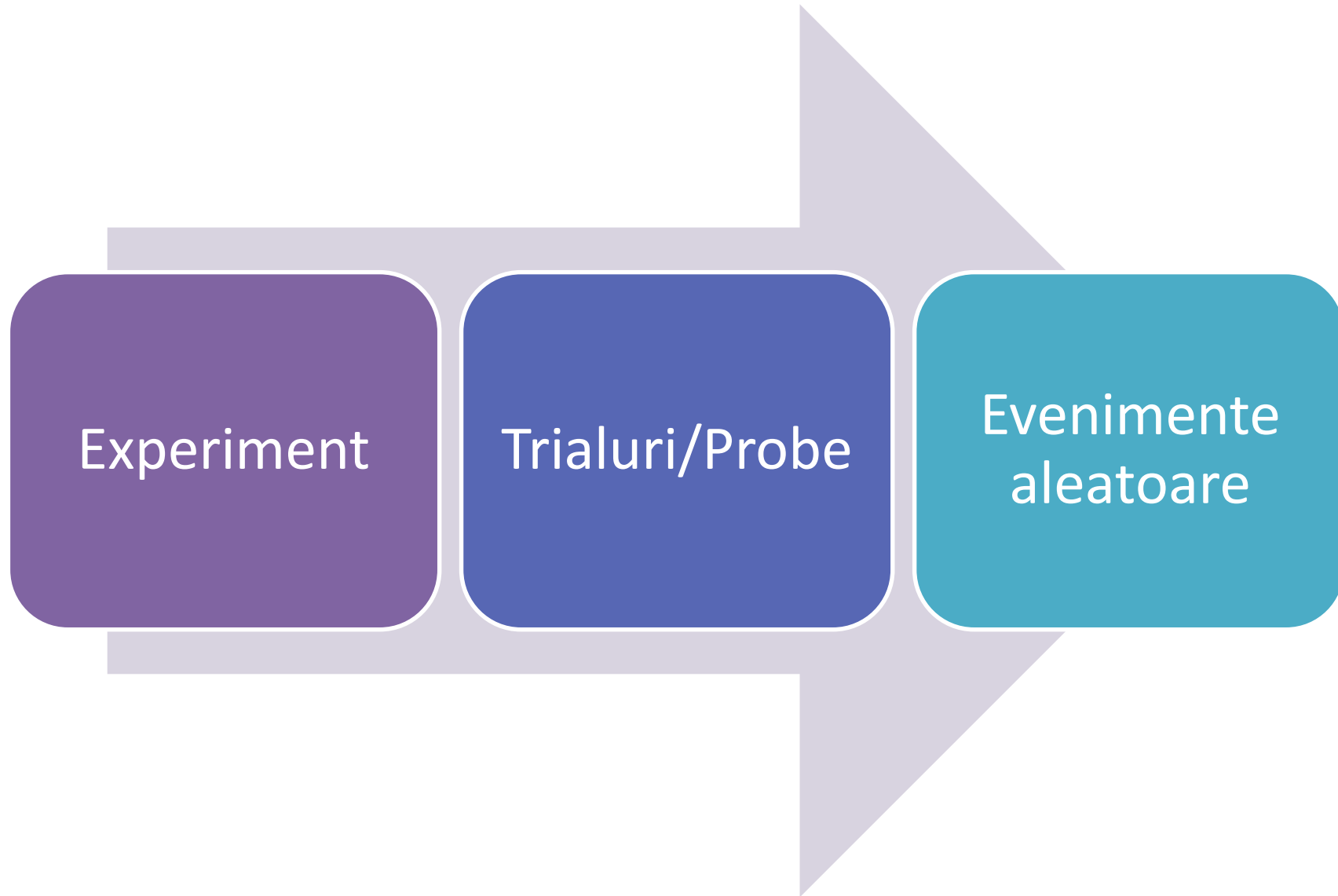
KNOWLEDGE

Objective

- Semnificația termenului probabilitate
- Calcule cu probabilitati
- Probabilitati conditionate
- Exemple

Teoria probabilitatilor – parte a stiintei matematice

- Studiază legile după care se manifestă fenomenele imprevizibile
- Cu caracter de masă
- În diverse domenii de interes (natură, societate, biologie, medicină etc.).



Definiția probabilității teoretice

- **Definiție:** probabilitatea unui eveniment A $Pr(A)$ este definita prin:

$$Pr(A) = \frac{\text{Numărul de cazuri favorabile evenimentului } A}{\text{Numărul de cazuri posibile}}$$

Probabilitatea

- Teoretică (cum ne așteptăm să fie)
- Experimentală (cum este în realitate)
- Ex. genul:
 - probabilitatea teoretica a nasterii unui baiat este 0,5 (50% dintre nasteri),
 - probabilitate empirica a nasterii unui baiat in Romania in 2001 a fost de 0,494

Probabilitatea empirica

- Probabilitatea empirică – frecvența relativă
- Probabilitatea teoretică poate fi estimată cu probabilitatea empirică (adică cu frecvența relativă)

Probabilitatea $\Pr(X)$

- $\Pr(X) \geq 0$ și $\Pr(X) \leq 1$,
unde X orice eveniment

$$0 \leq \Pr(X) \leq 1$$



Exemplul 1

Exemplu 1 – Ebola virus

- Ebola – infecție acută cu risc mare de mortalitate.
- 2014 Outbreack CDC. 2014 Ebola Outbreak in West Africa - Case Counts. Nov.2015.
Available at: <http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html>

Țara	Cazuri	Decese	Supraviețuiri	Probabilitate	Probabilitatea
Siera Leone	14.122	3.955			

Trial: un individ se infectează cu virusul Ebola
Evenimente posibile: moarte sau supraviețuire (sunt rezultate imprevizibile)

Am notat cu A evenimentul de deces după infecția cu virusul Ebola

În populația Siera Leone au fost 14.122 de cazuri de infecție, din care 3.955 au decedat

Exemplu 1 – Ebola virus

Țara	Cazuri	Decese	Supraviețuiri	Probabilitatea decesului	Probabilitatea supraviețuirii
Siera Leone	14.122	3.955	=14.122-3.955		

Exemplu 1 – Probabilitatea decesului

$$P(A) = \frac{nr. \text{ evenimente}}{total}$$

Țara	Cazuri	Decese	Supraviețuiri	Probabilitatea decesului	Probabilitatea supraviețuirii
Siera Leone	14.122	3.955	10.167	=3.955/14.122	

Exemplu 1 – Probabilitatea decesului

$$P(A) = \frac{nr. \text{ evenimente}}{total}$$

Țara	Cazuri	Decese	Supraviețuiri	Probabilitatea decesului	Probabilitatea supraviețuirii
Siera Leone	14.122	3.955	10.167	0,28	

Exemplul 2

Exemplu 2 – Ebola virus

Deces \longleftrightarrow Supraviețuire

Evenimente complementare

Nr. de decese + Nr. de supraviețuitori = Total

Decese (%) + Supraviețuire (%) = 100 %

Exemplu 2 – Evenimente complementare

$$\text{Supraviețuire (\%)} = 100 \% - \text{decese (\%)}$$

Țara	Cazuri	Decese	Supraviețuiri	Probabilitatea decesului	Probabilitatea supraviețuirii
Siera Leone	14.122	3.955	10.167	0,28	=1-0,28

Exemplu 1 – Probabilitatea supraviețuirii

$$Pr(A) + Pr(nonA) = 1 \Rightarrow Pr(nonA) = 1 - Pr(A),$$

A și $nonA$ – evenimente complementare

Țara	Cazuri	Decese	Supraviețuiri	Probabilitatea decesului	Probabilitatea supraviețuirii
Siera Leone	14.122	3.955	10.167	0,28	0,72

Exemplul 3

$$\Pr(A \cap B) = \Pr(\text{Tip } 0 \cap \text{Tip } A) = ?$$

Grupa sanguină	Frecvența	Pr(Grupa sanguină)
O	400	0,40
A	450	0,45
B	142	0,142
AB	8	0,008
Total	1000	1,0

$\Pr(A \cap B) = 0$ pentru evenimente mutual exclusive

Grupa sanguină	Frecvența	Pr(Grupa sanguină)
O	400	0,40
A	450	0,45
B	142	0,142
AB	8	0,008
Total	1000	1,0

$\Pr(\text{Tip 0} \cap \text{Tip A}) = ?$

Tip 0 și Tip A sunt mutual exclusive:

$$P(\text{Tip 0} \cap \text{Tip A}) = 0$$

Două evenimente sunt mutual exclusive = nu se pot întâmpla în același timp

Exemplul 4

$$\Pr(A \cup B) = \Pr(A \text{ sau } B) = \Pr(\text{Tip 0 sau Tip A}) = ?$$

Grupa sanguină	Frecvența	Pr(Grupa sanguină)
O	400	0,40
A	450	0,45
B	142	0,142
AB	8	0,008
Total	1000	1.0

$\Pr(A \cup B) = \Pr(A) + \Pr(B)$ pentru evenimente mutual exclusive

Grupa sanguină	Frecvența	Pr(Grupa sanguină)
O	400	0,40
A	450	0,45
B	142	0,142
AB	8	0,008
Total	1000	1.0

$$\begin{aligned}\Pr(\text{Tip 0} \cup \text{Tip A}) &= \Pr(\text{Tip 0 sau Tip A}) = \Pr(\text{Tip 0}) + \Pr(\text{Tip A}) = \\ &= \frac{400}{1000} + \frac{450}{1000} = \frac{950}{1000} = 0,95\end{aligned}$$

Două evenimente sunt mutual exclusive = nu se pot întâmpla în același timp

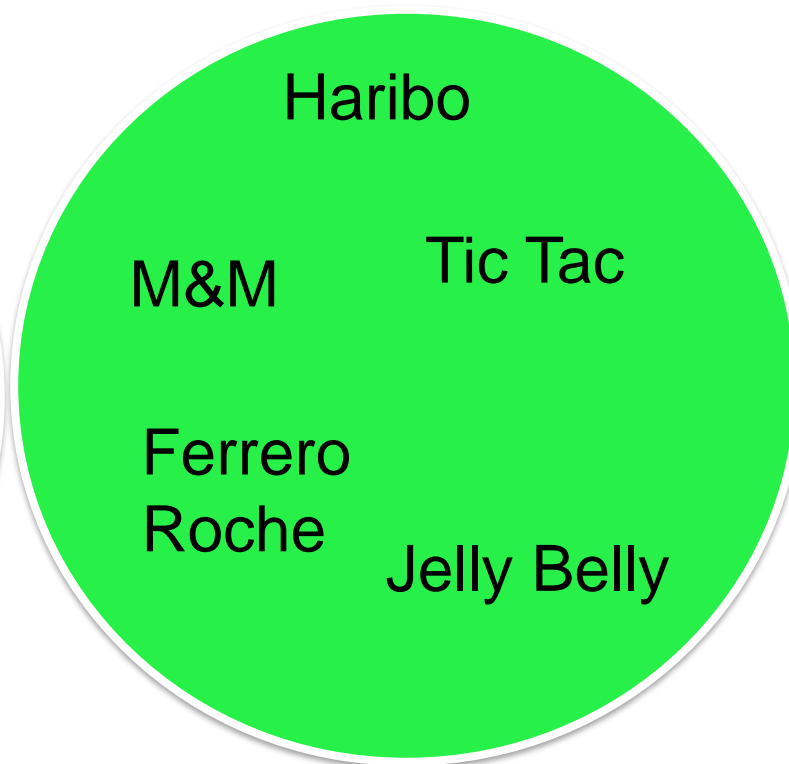
Exemplul 5

$\Pr(A \cup B) = \Pr(A \text{ sau } B) = ?$ pentru oricare A, B

- Ciocolată



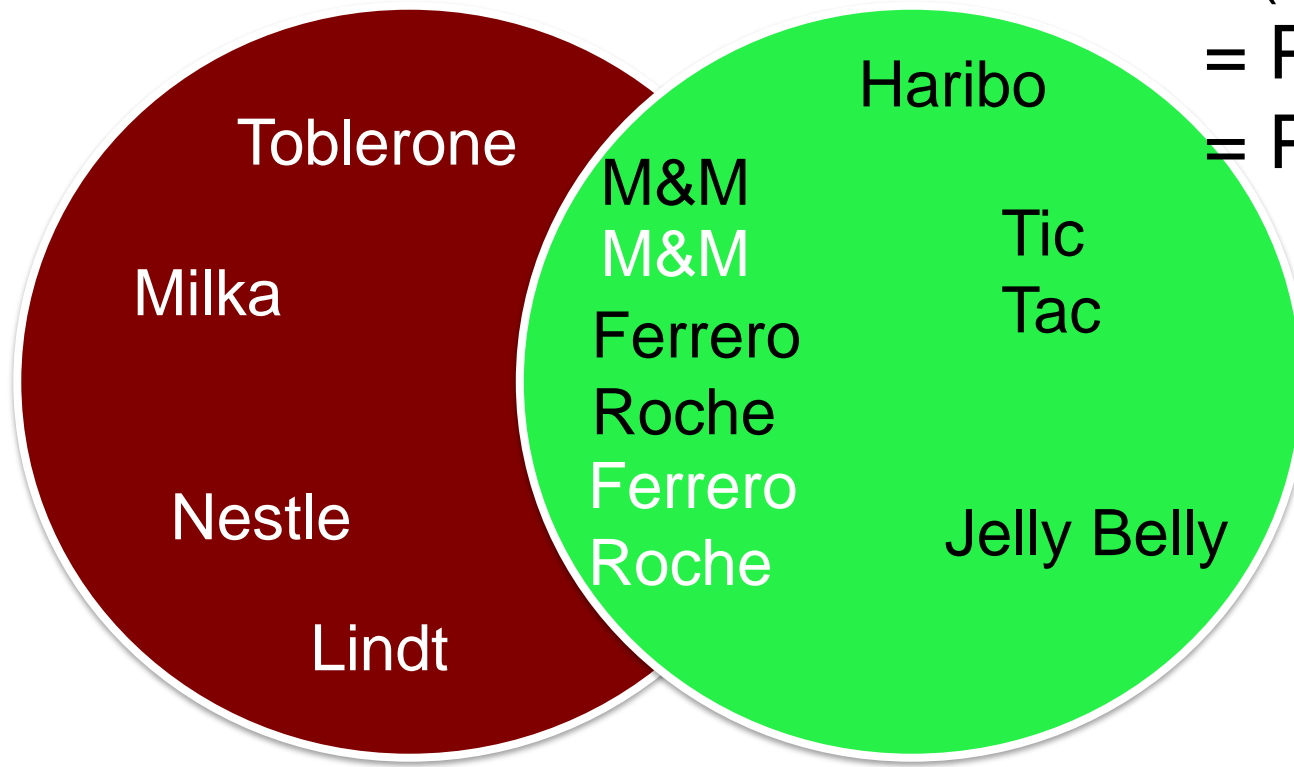
- Bomboane



$$\Pr(A \cup B) = \Pr(A) + \Pr(B) - \Pr(A \cap B)$$

oricare A, B

- Ciocolată



- Bomboane

A și B sunt independente

$$P(A \text{ sau } B) =$$

$$= \Pr(\text{ciocolată sau bomboane}) =$$

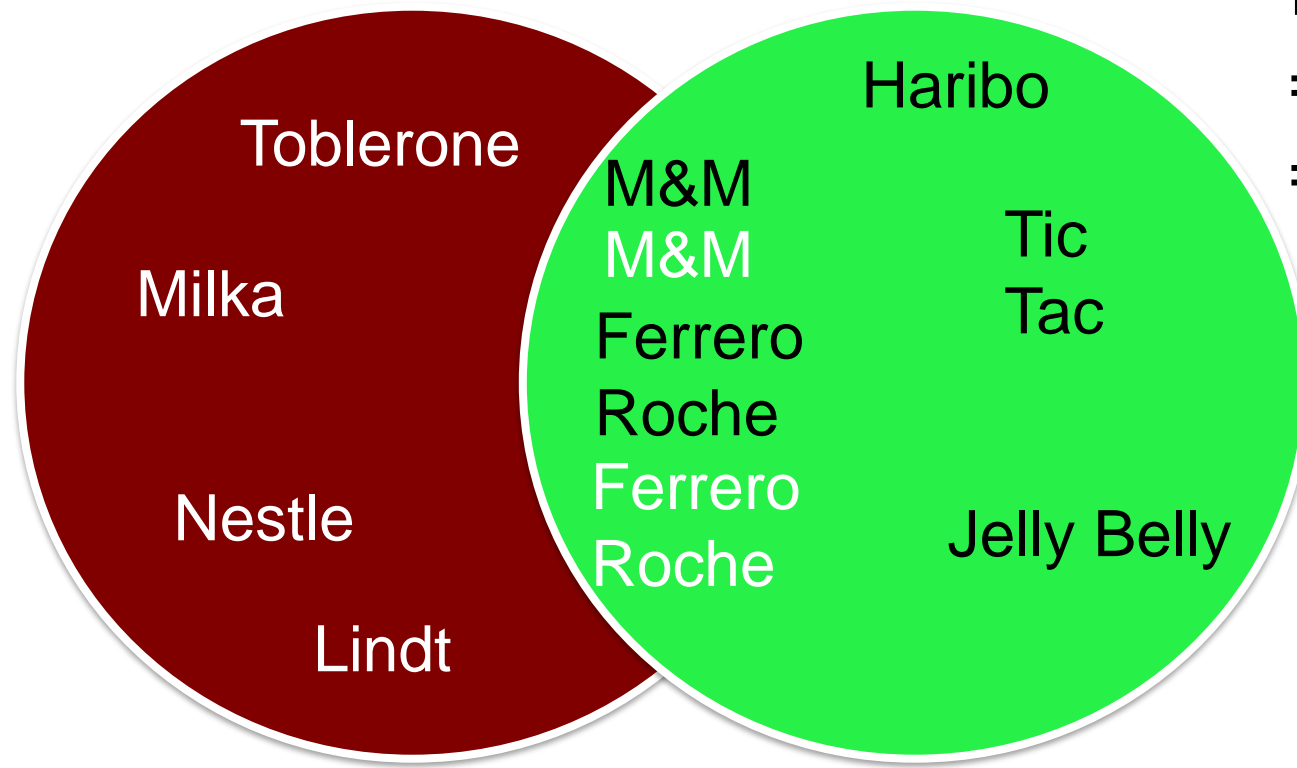
$$= \Pr(A) + \Pr(B) - \Pr(A \text{ și } B)$$

$$\Pr(A \cup B) = \Pr(A) + \Pr(B) - \Pr(A \cap B)$$

oricare A, B

- Ciocolată

- Bomboane



A și B sunt independente

$\Pr(A \text{ sau } B) =$

$= \Pr(\text{ciocolată or bomboane}) =$

$= \Pr(A) + \Pr(B) - \Pr(A \text{ și } B)$

- A și B sunt independente – atunci când probabilitatea apariției lui A nu afectează probabilitatea apariției lui B și probabilitatea apariției lui B nu afectează probabilitatea apariției lui A

$\Pr(A \cap B) = \Pr(A) * \Pr(B)$ – pentru evenimente independente

Evenimente dependente

- A și B sunt dependente – atunci când probabilitatea apariției lui A influențează probabilitatea apariției lui B sau probabilitatea apariției lui B influențează probabilitatea apariției lui A

A,B două evenimente dependente:

$$\Pr(A \cap B) = \Pr(A \text{ dependent de } B) * \Pr(B)$$

$$\Pr(A \cap B) = \Pr(A|B) * \Pr(B)$$

- $\Pr(A|B) = \Pr(A \text{ dependent de } B)$

Rezumat

$\Pr(A)$

$$\bullet = \Pr(\text{non } B) = 1 - \Pr(B)$$

B eveniment complementar
lui A

$\Pr(A \cap B)$ adică $\Pr(A \text{ și } B)$

$$\begin{aligned}\bullet &= \Pr(A) * \Pr(B) \\ \bullet &= \Pr(A|B) * \Pr(B) \\ \bullet &= 0\end{aligned}$$

evenimente

- independente
- dependente
- mutual exclusive

$\Pr(A \cup B)$ adică $\Pr(A \text{ sau } B)$

$$\bullet = \Pr(A) + \Pr(B) - \Pr(A \cap B)$$

$P(A | B)$ = probabilitatea conditionată

- Probabilitatea ca evenimentul A să apară dacă evenimentul B s-a realizat deja

$$Pr(A|B) = \frac{Pr(A \cap B)}{Pr(B)}$$

- test diagnostic aplicat la n persoane:

Boală / Test nou	B Cu boală	non(B) Fără boală	Total
T test nou pozitiv	a (AP)	b (FP)	$a+b$
non (T) test nou negativ	c (FN)	d (AN)	$c+d$
Total	$a+c$	$b+d$	n

Valoarea predictiva pozitiva PPV

- Probabilitatea ca un test nou pozitiv să indice boala (să fie corect):

$$VPP = Pr(B|T) = \frac{Pr(B \cap T)}{Pr(T)} = \frac{\frac{AP}{n}}{\frac{AP + FP}{n}} = \frac{AP}{AP + FP} = \frac{a}{a + b}$$

Boala / Test	B Cu boala	non(B) Fara boala	Total
T Test pozitiv	a (AP)	b (FP)	a+b
non (T) test negativ	c (FN)	d (AN)	c+d
Total	a+c	b+d	n

Valoarea predictivă negativă VPN

- Probabilitatea ca un test nou negativ să nu indice boala (să fie corect):

$$VPN = \Pr(nonB / nonT) = \frac{\Pr(nonB \cap nonT)}{\Pr(nonT)} = \frac{AN}{FN + AN} = \frac{d}{c + d}$$

Boala / Test	B Cu boala	non(B) Fara boala	Total
T Test pozitiv	a (AP)	b (FP)	a+b
non (T) test negativ	c (FN)	d (AN)	c+d
Total	a+c	b+d	n

Sensitivitatea testului Se

- Probabilitatea ca un bolnav să aibă test nou pozitiv:

$$Se = \Pr(T / B) = \frac{AP}{AP + FN} = \frac{a}{a + c} = \frac{\frac{a}{n}}{\frac{a + c}{n}} = \frac{\Pr(T \cap B)}{\Pr(B)}$$

Boala / Test	B Cu boala	non(B) Fara boala	Total
T Test pozitiv	a (AP)	b (FP)	a+b
non (T) test negativ	c (FN)	d (AN)	c+d
Total	a+c	b+d	n

Specificitatea testului Sp

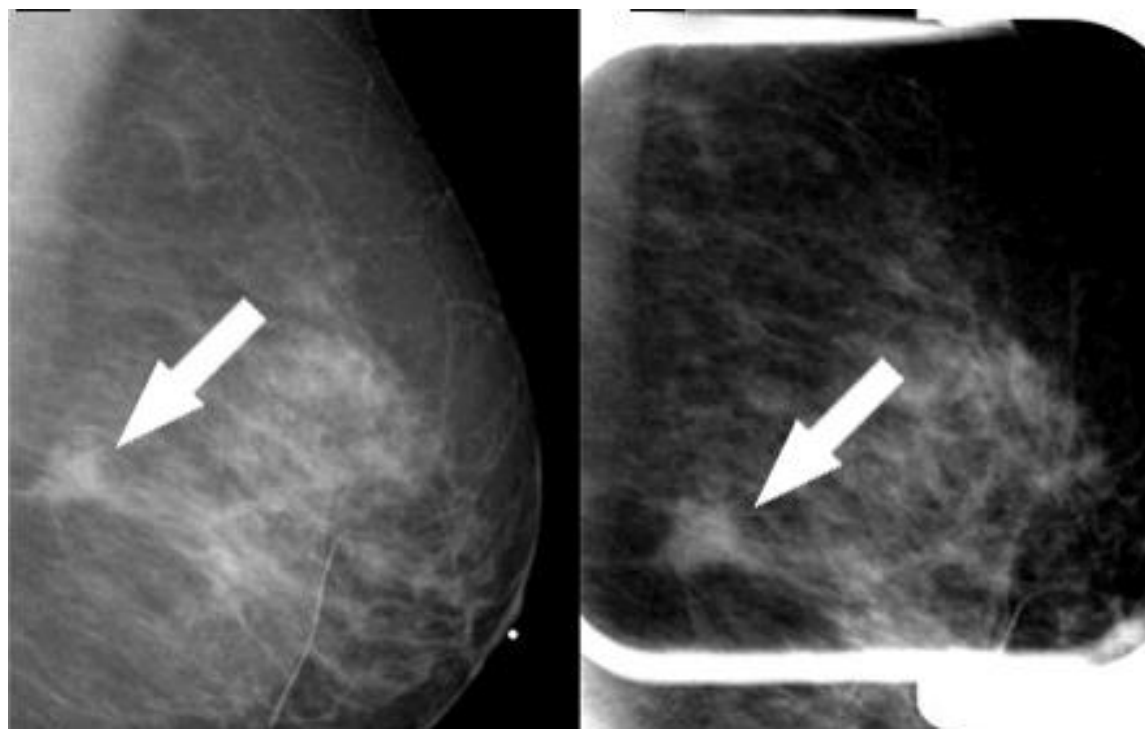
- Probabilitatea ca un indemn de boală să aibă test nou negativ:

$$Sp = \Pr(\text{non}(T) / \text{non}(B)) = \frac{AN}{FP + AN} = \frac{d}{b + d} = \frac{\frac{d}{n}}{\frac{b + d}{n}} = \frac{\Pr(\text{non}T \cap \text{non}B)}{\Pr(\text{non}B)}$$

Boala / Test	B Cu boala	non(B) Fara boala	Total
T Test pozitiv	a (AP)	b (FP)	a+b
non (T) test negativ	c (FN)	d (AN)	c+d
Total	a+c	b+d	n

EXEMPLU

- Se recomandă femeilor peste 50 de ani să își facă o mamografie odată la 1-2 ani; testul de “aur” pentru cancerul de sân este biopsia dar este prea invaziv



EXEMPLU

- Test negativ incorect
 - Din 100.000 de femei cu mamografii negative 20 au cancer de sân
- Test pozitiv incorect
 - Din 10 femei cu mamografii pozitive 1 are cancer de sân
- Calculați Se, Sp, VPP, VPN
- Pragul de interpretare 0,80

Exemplu: Se, Sp, VPP, VPN

Prevalenta=21/100.010=0,21 la mie

Afecțiunea / Testul	Subiecți care au dezvoltat afecțiunea	Subiecți sănătoși	Total
Mamografie pozitivă	1	9	10
Mamografie negativă	20	99.980	100000
Total	21	99.989	100.010

$$VPP = 1/10 = 0,1$$

$$VPN = 99.980/100.000 = 0,99$$

$$Se = 1/21 = 0,047$$

$$Sp = 99.980/99.989 = 0,99$$

Măsurarea riscului: RR

Riscul relativ RR

= raportul dintre cazurile de îmbolnăvire la cei cu expunere la factorul de risc și cazurile de îmbolnăvire la cei fără expunere la factorul de risc

$$RR = \frac{P(B|A)}{P(B|\bar{A})}$$

Non A

$$RR = \frac{P(Boala|Factor\ de\ risc)}{P(Boala|\overline{Fără\ factor\ de\ risc})}$$

Exemplu

- 200 fumători din 10.000 fac cancer de plămâni

$$P(\text{cancer} | \text{fumători}) = \frac{200}{10.000} = 0,02$$

- 10 nefumători din 10.000 fac cancer de plămâni

$$P(\text{cancer} | \text{nefumători}) = \frac{10}{10.000} = 0,001$$

- riscul relativ

$$RR = \frac{P(\text{cancer} | \text{nefumători})}{P(\text{cancer} | \text{fumători})} = \frac{0,02}{0,001} = 20$$

Interpretare RR

$$RR=1$$

Nu există risc de îmbolnăvire la persoanele expuse

200 fumători din 10.000 fac cancer de plămâni

$$P(\text{cancer}|\text{fumători}) = 0,02$$

200 nefumători din 10.000 fac cancer de plămâni

$$P(\text{cancer}|\text{nefumători}) = 0,02$$

riscul relativ

$$RR = \frac{0,02}{0,02} = 1$$

$$RR>1$$

Există risc de a face boala dacă există expunere la factorul de risc

200 fumători din 10.000 fac cancer de plămâni

$$P(\text{cancer}|\text{fumători}) = 0,02$$

10 nefumători din 10.000 fac cancer de plămâni

$$P(\text{cancer}|\text{nefumători}) = 0,001$$

riscul relativ

$$RR = \frac{0,02}{0,001} = 20$$

$$RR<1$$

Expunerea este factor de protecție pentru boală

10 fumători din 10.000 fac cancer de plămâni

$$P(\text{cancer}|\text{fumători}) = 0,001$$

200 nefumători din 10.000 fac cancer de plămâni

$$P(\text{cancer}|\text{nefumători}) = 0,02$$

riscul relativ

$$RR = \frac{0,001}{0,02} = 0,05$$

Interpretare RR

$$RR=1$$

Nu există risc de îmbolnăvire la persoanele expuse

$$RR=20$$

Există risc de 20 de ori mai mare de a face boala dacă există expunere la factorul de risc

$$RR=0,05$$

Există risc de 20 de ori mai mic de a face boala dacă există expunere la factorul de risc

Cauzalitatea!!!

A dependent de B echivalent cu dacă B atunci A ($B \Rightarrow A$)

! Non B ~~\Rightarrow~~ non A

Non A \Rightarrow non B

Eroare logică !!!

În 1970 - 1980 au fost realizate studii:

- dieta bogată în grăsimi => hipercolesterolemie

- dieta săracă în grăsimi ~~=>~~ normocolesterolemie

1977-2016:

Sfatul: Reduceți grăsimile din dietă

Studiile au arătat altceva

ex. 2011 “There is no firm evidence of the long-term effects of low-fat diets for otherwise healthy people with hypercholesterolaemia”

2020 “People diagnosed with familial hypercholesterolemia have long been instructed to minimize their consumption of saturated fats to lower cholesterol and reduce their risks of heart disease. But a new study found no evidence to support those claims”

2024 “diet only affects about 20% to 30% of the cholesterol”

2017 – prezent Sfatul: O masă/săptămână carne de porc

Teorema lui Bayes

Evenimente dependente (cauză și efect)

Probabilitatea condiționată - probabilitatea unui rezultat care depinde de un rezultat anterior.

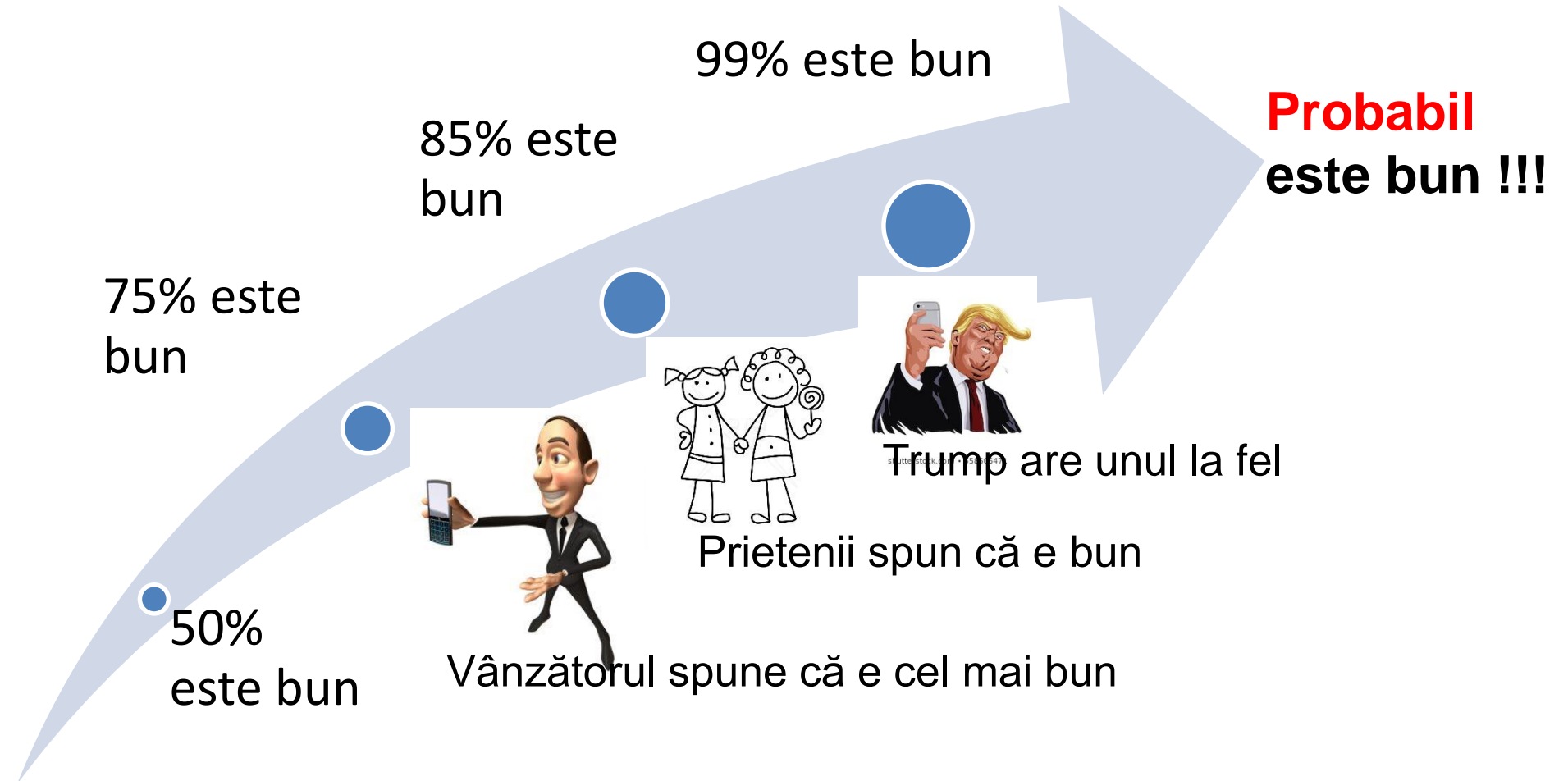
$$Pr(A | B) = \frac{Pr(B | A) * Pr(A)}{Pr(B)}.$$

Implicată în luarea deciziilor medicale - teste diagnostice.

Teorema lui Bayes - după producerea unui nou eveniment îmbunătățim ceea ce știm deja

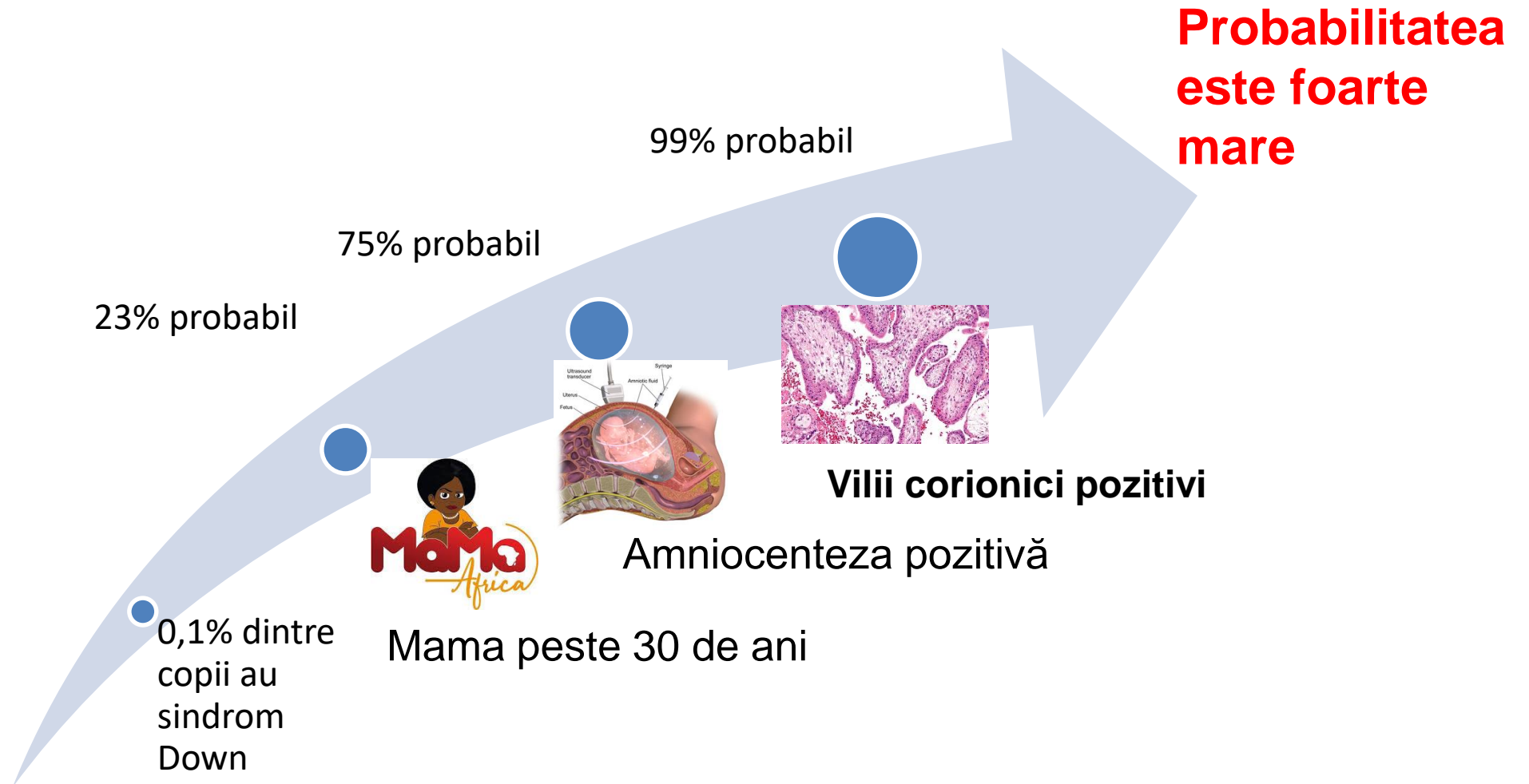
- Așa învață calculatoarele
- Așa funcționează filtrele de spam
- Așa pun medicii diagnosticele
- Așa știm ce le place prietenilor noștri

Vreau să cumpăr un telefon smart Apple. Este bun sau nu?



Sindrom Down la făt în timpul sarcinii?

Prezintă fătul afecțiunea? Putem să fim destul de siguri ca să facem o întrerupere de sarcină?



Exemple de intrebari de la examenul teoretic

*Într-un cabinet stomatologic au fost executate 10.000 intervenții. Numărul de extracții de canin stâng superior a fost 1500. Calculați probabilitatea empirică de a fi extras caninul stâng superior.

A. 85

B. 15

C. 0,15

D. 8500

E. 0,85

Exemple de intrebari de la examenul teoretic

*Într-un cabinet stomatologic au fost executate 10.000 intervenții. Numărul de extracții de canin stâng superior a fost 1500. Numărul de extracții de canin drept superior a fost 500. Calculați probabilitatea de a extrage caninul stâng **sau** drept superior dacă presupunem că aceste evenimente sunt independente.

A. 1500

B. 0,1925

C. 0,1500

D. 19,25%

E. 0,05

Exemple de intrebari de la examenul teoretic

*Într-un cabinet stomatologic au fost executate 10.000 intervenții. Numărul de extracții de canin stâng superior a fost 1500. Numărul de extracții de canin drept superior a fost 500. Calculați probabilitatea de a extrage caninul stâng **si** drept superior dacă presupunem că aceste evenimente sunt independente.

A. 1500

B. 0,0075

C. 0,1500

D. 0,75%

E. 0,1925

Exemple de intrebari de la examenul teoretic

Mirela a avut frecvente episoade de alergie in copilarie, când a prezentat rinoree (secreții nazale). Acum este adolescentă. Probabilitatea ca un individ să aibă cel puțin un episod de tract respirator în acest sezon de iarnă este de 0,80. Printre simptomele virusurilor respiratorii se numără tuse, rinoree și dureri în gât. Dacă Mirela are un episod respirator în acest sezon, care dintre următoarele afirmații știm că sunt adevărate, având în vedere istoricul ei de episoade de alergie?

- A. Este mai probabil să apară „tuse” sau „secreție nazală” decât „tuse și secreție nazală”
- B. „Tuse și secreții nazale” sunt mai probabile decât doar „tuse”
- C. „Tuse și secreții nazale” sunt mai probabile decât „tuse, secreții nazale și dureri în gât”
- D. Este mai probabil să prezinte doar „tuse” decât „tuse și secreții nazale”.
- E. „Tuse și secreții nazale” sunt mai probabile decât „tuse sau secreții nazale”

Exemple de intrebari de la examenul teoretic

Prevalența HIV în România la femei este de 0,0001. Din 10.000 de persoane bolnave, testul HIV a depistat 9999. Din 10.000 de persoane care nu sunt bolnave (fără HIV), testul HIV a fost detectat ca fiind negativ 9999. Care dintre următoarele sunt adevărate?

- A. Sensibilitatea testului HIV este 0,9999
- B. Valoarea predictivă pozitivă a testului HIV este 0,50
- C. La 10.000 de femei ne așteptăm ca una să fie infectată cu HIV și va avea aproape sigur un test HIV pozitiv. Dintre cele 9999 de femei neinfectate, una va avea testul HIV pozitiv, deci vom avea două care au testul pozitiv. Dintre cele două teste pozitive, doar una are HIV.
- D. Valoarea predictivă pozitivă a testului HIV este 0,9999
- E. nici o propoziție nu este adevărată

Nume jurnal, anul publicarii,
volum, pagini

Eur J Vasc Endovasc Surg 14, 273–283 (1997)

Effects of Vascular Surgery on Amputation Rates and Mortality

L. Karlström¹ and D. Bergqvist²

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²Kirurgkliniken, Akademiska Sjukhuset, S-75185 Uppsala, Sweden

Objectives: To study the relation between rates of vascular interventions, amputations and mortality in a defined population.

Design: Retrospective comparison between two consecutive 4-year periods.

Setting: Swedish district hospital

Material: Three hundred and sixty-s

Results: The number of legs treated f
from 269 to 289. The rate of vascular
period by 65%, while the rate of amp
53% ($p<0.0000$). The reduced ampu
amputation for patients treated in the
0.49, $p=0.0001$), while mortality wa
legs was higher in the second period
deceased patients.

Conclusion: Increased vascular inte
important for both ethical and econon
initial treatment will only influence l

Key Words: Vascular surgery; Limb-i

Material: Three hundred and sixty-seven lower limb amputations and 1080 vascular procedures.

Results: The number of legs treated for limb-threatening ischaemia with either revascularisation or amputation increased from 269 to 289. The rate of vascular interventions for limb-threatening ischaemia increased from the first to the second period by 65%, while the rate of amputations decreased by 23%. Limb salvage rate at 30 months increased from 37% to 53% ($p<0.0000$). The reduced amputation rate was entirely related to primary amputations. The adjusted risk of amputation for patients treated in the second period was half of that for patients treated in the first period (relative risk = 0.49, $p=0.0001$), while mortality was similar in both periods. Among survivors, the proportion of patients with intact legs was higher in the second period than in the first, while no difference was found between the two periods among deceased patients.

Titlu, autori

Introduction

Despite a marked increase of vascular procedures during the last decades, and despite the fact that a

by different attitudes to, and thereby rates of, vascular reconstructions. Special attention was paid to account separately for primary and secondary amputations and the indications for the vascular procedures.

Riscul relativ <1 , deci
tratamentul este factor de
protecție pentru amputații

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J Diabetes Complications. 2007 Nov-Dec;21(6):353-8.

Sensitivity and specificity of a new indicator test (Neuropad) for the diagnosis of peripheral neuropathy in type 2 diabetes patients: a comparison with clinical examination and nerve conduction study.

Papanas N¹, Giassakis G, Papatheodorou K, Papazoglou D, Monastiriotis C, Christakidis D, Piperidou H, Maltezos E.

Author information

Abstract

OBJECTIVE: The objective of this study was to evaluate the sensitivity and specificity of a new indicator test (Neuropad) for the diagnosis of peripheral neuropathy in type 2 diabetes patients as compared with clinical examination and nerve conduction study (NCS).

PATIENTS AND METHODS: This study included 120 type 2 diabetes patients (58 men) with a mean age of 67.3 +/- 5.9 years and a mean diabetes duration of 13.1 +/- 3.2 years. Diabetic neuropathy was diagnosed through the Neuropathy Disability Score. An NCS was performed on radial, ulnar, and sural nerves. The sensitivity of the indicator test for clinical neuropathy was 95.2%, and its specificity was 67.6%. The sensitivity of NCS for clinical neuropathy was 94%, and its specificity was 62.1%.

RESULTS: Neuropathy was diagnosed by clinical examination in 83 (69.2%) patients. The sensitivity of the indicator test for clinical neuropathy was 95.2%, and its specificity was 67.6%. The sensitivity of NCS for clinical neuropathy was 94%, and its specificity was 62.1%. The sensitivity of the indicator test for abnormal NCS was 97.8%, and its specificity was 96.4%. The sensitivity of the indicator test for abnormal NCS was 97.8%, and its specificity was 96.4%.

CONCLUSIONS: The new indicator test has a very high sensitivity not only for the diagnosis of clinical neuropathy but also for the diagnosis of neurophysiological neuropathy. Specificity is moderately high for the diagnosis of clinical neuropathy, while it is not for the diagnosis of neurophysiological neuropathy. The indicator test has a validity comparable to that of NCS for the diagnosis of neuropathy. Finally, the time to complete color change of the test is associated with the severity of nerve conduction abnormalities.

PMID: 17967706 DOI: [10.1016/j.jdiacomp.2006.08.003](https://doi.org/10.1016/j.jdiacomp.2006.08.003)

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Timed Vibration Sense and Joint Position Sense

Multumesc!