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## Admissions due to Primary Care Sensitive Conditions: is there an association with the acquisition of Healthcare-Associated Infection?

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**Brazil**

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### Background

## Brazil

- Healthcare-associated infection (HAI) is a major public health problem.
- Primary Care:
  - Key component of healthcare
  - Integrating element of the healthcare system.
  - Potential to prevent unnecessary hospital thus indirectly prevents exposing the patient to iatrogenic risks, such as HAI.
- Primary Care Sensitive Conditions (PCSC): indicator that measures the effectiveness of primary care.



Region  
 State  
 People per km²  
 <15  
 15-25  
 25-50  
 50-100  
 >100

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## Objective



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To identify whether there is an association between PCSC and HAI.

- Hypothesis: are PCSC patients admitted more susceptible to HAI?
- Literature: no previous study investigating the association of PCSC with HAI

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**Methods**



- Study design: prospective cohort.
- Setting: Clinics Hospital, tertiary and reference in São Paulo.
  - 910 beds (107 beds for intensive care)
- Annually: 26,000 elective surgeries; 37,000 consultations (high complexity patients)
- from May 2018 to December 2018
- Sample: 605 inpatients
- This project was approved by our institutional Ethics Committee

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**Methods**



Data Collection Sources	Criteria
<ul style="list-style-type: none"> <li>• Patients' interviews: structured questionnaire to characterize the potential social determinants of the participants.</li> <li>• Patients' medical records: PCSC and other variables</li> <li>• Identification of HAI cases: as per routine of infection control team</li> </ul>	<p><b>Inclusion:</b> more than 48 hours of hospitalization</p> <p><b>HAI:</b></p> <ul style="list-style-type: none"> <li>• Brazilian standardized criteria, adapted from CDC, EUA.</li> </ul> <p><b>PCSC:</b></p> <ul style="list-style-type: none"> <li>• Brazilian national list</li> </ul>

**Analysis:** descriptive statistic and univariate analysis; significance of <0.05.

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### Results

- Patients were 57% females (n=345)
- The majority of patients were black or brown (n= 524; 86.6%)
- Average age: 52.8 years
- Average schooling: 8.5 years
- Average family income: 2.5 national minimum wage;

- The Human Development Index (HDI) of origin: varied from 0.72 to 0.81
- Gini Index varied from 0.41 to 0.67.

Figure 1. Distribution of the origin of participants. São Paulo, 2018

Source: Generated with Tabwin (<http://www2.datasus.gov.br/DATASUS/index.php?area=060803>)

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### Results

Patients with PCSC and HAI: OR 1.93 (95% IC -0.714-5.252), p=0.199.  
**Risk Difference: 4.2**

**HAI n=32 (5.3%)**  
Most frequent:  
Surgical Site: n=7 (21.8%)  
Catheter-related bloodstream: n= 7 (21.8%)  
Catheter-related urinary tract : n= 6 (18.8%)

**PCSC n=55 (9.1%)**  
Most frequent:  
Cerebrovascular disease: n= 17 (30.9%)  
Diabetes mellitus: n= 10 (18.2%)  
Kidney & urinary tract infection: n= 8 (14.5%)

Table 1. Distribution of HAI and PCSC. São Paulo, 2018.

Variable	No HAI N(%)	With HAI N(%)
No PCSC	523 (91.3)	27 (84.4)
With PCSC	50 (8.7)	5 (15.6)
<b>Total</b>	<b>573 (100%)</b>	<b>32 (100%)</b>

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### Results

Table 2. Characteristics of patients with HAI & PCSC. São Paulo, 2018.

Patient	CID 10	PCSC	Other comorbidities	HAI	Etiologic agent
1 F, 69	N39	Urinary tract infection, unspecified	Systemic lupus erythematosus Arthritis Non-dialytic renal disease Diabetes mellitus	Osteomyelitis	<i>A. baumannii</i> resistant to carbapenems
2 M, 79	E 10.5	Insulin-dependent diabetes mellitus + peripheral circulatory complications	None	Osteomyelitis	<i>S. aureus</i> methicillin resistant
3 M, 80	E10.5	Insulin-dependent diabetes mellitus + peripheral circulatory complications	None	Osteomyelitis	<i>S. aureus</i> methicillin resistant
4 M, 50	J15.9	Bacterial pneumonia, unspecified	Diabetes mellitus	Cateter-related Bloodstream infection	<i>Salmonella spp</i>
5 M, 70	E43	Severe protein-calorie malnutrition, unspecified	None	Catheter-related Urinary tract	<i>C. freundii</i> complex

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**Results**



No relevant differences among selected individual or social indicators when comparing patients with or without HAI

**Table 3.** Characteristics of patients with HAI or without HAI. São Paulo, 2018.

Variable	With HAI	Without HAI
Age, years (mean)	57	52.6
Charlson comorbidity index comorbidity	2.7	2.2
Schooling, years (mean)	8.8	8.5
Monthly wage (average)	R\$2,507	R\$2,751
HDI	0.74-0.86	0.71-0.88
Gini index	0.45-0.67	0.41-0.67

HDI: Human Development Index

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**Discussion**



- Paker et al (2015): no overall association between Scottish Index of Multiple Deprivation and HAI.
- Fisman et al (2014): regions with lower gross domestic product dedicated to healthcare and proximity to Equator with higher probability of bloodstream infections caused by Gram-negatives
- Nomamiukor et al (2015): living conditions associated with increased antibiotic resistance in community isolates of *E. coli*.

Fisman et al. Plos One 2014; 9(12)  
 Nomamiukor et al. J Antimicrob Chemother 2015; 70(11):3154-8.  
 Paker et al. Journal of Hospital Infections 2015; 91: 351-357

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**Conclusions**



- No statistical association between PCSC and HAI
- The overall risk difference pointed out that other studies are necessary to evaluate our hypothesis.
- Next step: a multilevel analysis will be performed to eliminate potential confounders that may abstruse the deep understanding of this phenomenon.

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Thank you! [padoveze@usp.br](mailto:padoveze@usp.br)

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