www.directivepublications.org

The Journal of Clinical Oncology

ISSN 3064-7002

*Research Article*

# The Access Of Oncological Patients To Medical Care Amid The Rigid Social Restriction Context Related To The Covid-19 Pandemic.

**Bruno Michelassi Bernardes De Oliveira, Henrique Chiarini Batistella, Bruna Granig Valente, Silvia Raquel Fricke Matte, Luciano Augusto Reganin, and Cintia Kelly Bittar.**

1. ***Bruno Michelassi Bernardes de Oliveira.*** *HIGHEST ACADEMIC DEGREE: Graduate student of medicine, scholarship holder of the Scientific Initiation Support Fund – FAPIC/Reitoria – Pontifícia Universidade Católica de Campinas. INSTITUTION AND DEPARTMENT: Pontifícia Universidade Católica de Campinas, School of Medical Sciences, Campinas, SP, Brazil. CONTACT INFORMATION: bruno.mbo@puccampinas.edu.br, https://orcid.org/0009-0000-6983-9152*
2. ***Henrique Chiarini Batistella.*** *HIGHEST ACADEMIC DEGREE: Graduate student of medicine. INSTITUTION AND DEPARTMENT: Pontifícia Universidade Católica de Campinas, School of Medical Sciences, Campinas, SP, Brazil. CONTACT INFORMATION: henrique.cb1@puccampinas.edu.br, https://orcid.org/0009-0008-6814-6723*
3. ***Bruna Granig Valente.*** *HIGHEST ACADEMIC DEGREE: Graduate student of medicine. INSTITUTION AND DEPARTMENT: Pontifícia Universidade Católica de Campinas, School of Medical Sciences, Campinas, SP, Brazil. CONTACT INFORMATION: brunavalente2f7@gmail.com, https://orcid.org/0000-0002-3281-9235*
4. ***Silvia Raquel Fricke Matte.*** *HIGHEST ACADEMIC DEGREE: Orthopedic and Traumatology doctor that woks as a medical assistant at the Celso Pierro Hospital and Maternity of PUC-Campinas, specialized in Orthopedic Oncology. INSTITUTION AND DEPARTMENT: Celso Pierro Hospital and Maternity of PUC-Campinas, Orthopedics and Traumatology Ambulatory, Campinas, SP, Brazil. CONTACT INFORMATION: drasrfrickematte@gmail.com, https://orcid.org/0009-0002-7906-8130*
5. ***Luciano Augusto Reganin.*** *HIGHEST ACADEMIC DEGREE: Orthopedic and Traumatology doctor that woks at the Celso Pierro Hospital and Maternity of PUC-Campinas as chief of the PUCCAMP's Tumor Ambulatory, specialized in hip surgery and Orthopedic Oncology. INSTITUTION AND DEPARTMENT: Celso Pierro Hospital and Maternity of PUC-Campinas, Orthopedics and Traumatology Ambulatory, Campinas, SP, Brazil. CONTACT INFORMATION: lreganin@gmail.com, https://orcid.org/0000-0002-0043-4410*
6. ***Cintia Kelly Bittar.*** *HIGHEST ACADEMIC DEGREE: Orthopedic and Traumatology doctor and research professor at the Medicine College of PUCCAMP. INSTITUTION AND DEPARTMENT: Pontifícia Universidade Católica de Campinas, School of Medical Sciences, Campinas, SP, Brazil. CONTACT INFORMATION: cintia.bittar@puc-campinas.edu.br, https://orcid.org/0000-0002-1997-5372*

## Abstract

The main objective of this study is to prove that the social restriction and isolation measures used in Campinas during the SARS-CoV-2 virus pandemic limited drastically the access of oncological patients to medical care for a long period of time in this city, being enough time to risk worsening the prognosis for these patients mainly through the delay of diagnosis and treatments. The methods for this research involved a collection of data from the medical records eletronic system of the Pontifical Catholic University of Campinas's (PUCCAMP) hospital and ambulatory clinics about oncological patients admitted during the period that social restriction measures were at use in Campinas, analazying the variation on the numbers of neoplasm diagnosis, neoplasm related surgeries, and of neoplasm patient admissions in these institutions throughout this period. Between march and december of 2020, there was 13 diagnosis of neoplasm, 17 surgeries, and 1209 admissions. Throughout 2021, there was 31 diagnosis of neoplasm, 25 surgeries, and 2172 admissions. Throughout 2022, there was 82 diagnosis of neoplasm, 49 surgeries, and 3104 admissions. According to the results obtained, the numbers of diagnosis, surgeries and admissions for oncological patients increased as the years passed and, therefore, as the social restriction measures became slowly less rigid throughout these years, implying a relation of cause and effect between the high rigidity of social restriction norms and the loss of accessibility to medical care by oncological patients.

**Keywords:** Neoplasm. Pandemic. Diagnosis. Admissions. Surgery

***Corresponding Author:** Dr. Bruno Oliveira, HIGHEST ACADEMIC DEGREE: Graduate student of medicine, scholarship holder of the Scientific Initiation Support Fund – FAPIC/Reitoria – Pontifícia Universidade Católica de Campinas. INSTITUTION AND DEPARTMENT: Pontifícia Universidade Católica de Campinas, School of Medical Sciences, Campinas, SP, Brazil. **Email:** bruno.mbo@puccampinas.edu.br, https://orcid.org/0009-0000-6983-9152

**Received:** 01-Feb-2025, Manuscript No. TJOCO-4490 **; Editor Assigned:** 02-Feb-2025 **; Reviewed:** 16-Feb-2025, QC No.TJOCO-4490 **; Published:** 07-Mar-2025, **DOI:** 10.52338/tjoco.2025.4490

**Citation:** Dr. Bruno Oliveira. The Access Of Oncological Patients To Medical Care Amid The Rigid Social Restriction Context Related To The Covid-19 Pandemic. The Journal of Clinical Oncology. 2025 March; 10(1). doi: 10.52338/tjoco.2025.4490.

**Copyright** © 2025 Dr. Bruno Oliveira. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

## INTRODUCTION

The COVID-19 pandemic brought many challenges to the public health in general in a global scale, mainly due to the overload of the healthcare systems worldwide, which had to treat an enormous amount of patients at the same time. Therefore, as a way of controlling this abrupt increase in demand for medical care during this context, many governments decided to implement social restriction and isolation norms as a way to reduce the virus contagion, and the government of Campinas was one of them. The use of such methods started in this city on march of 2020 [1], using the São Paulo Plan as guidance [2]. As the numbers of ICU bed occupied increased [3], Campinas's government needed to intensify these norms, adopting the phase "red" of the São Paulo Plan for the first time on 06/07/2020 [4], which was used for the last time on 12/04/2021 [5].

Throughout this vast period of time in which rigid social restriction measures were at use, Campinas's citizens may have lost a lot of access to the healthcare institutions (such as hospitals and ambulatory clinics), which may have also delayed the diagnosis, management and treatment of many desieses, such as the neoplasm related ones. The findings of many scientific studies about the negative effect of the COVID-19 pandemic on the numbers of oncological patient admissions contribute to this concern. One of these studies was published in the "Einstein (São Paulo)" journal stating that, throughout the COVID-19 pandemic period, there was a decline in the numbers of medical appointments and of patients undergoing treatment (including surgeries) for oncological cases at the São Paulo city's hospitals [6]. Another one of these studies was published in the "Saúde em Debate" journal with the aim of evaluating the continuity of medical care for patients with chronic noncommunicable disease (NCD's) in the São Paulo state during the first stage of the COVID-19 pandemic, revealing that 95,7% of the São Paulo's municipalities revealed some sort of discontinuity on their health services related to the attention to NCT's, with emphasis on the 15,9% that had a partial interruption on their activities associated with the diagnosis and treatment of cancer [7].

Considering the possible effects of this pandemic context on the access of oncological patients to medical attention, as well as the fact that the prognosis of these patients depend a lot on an early diagnosis and treatment of their conditions[8], it would be valid to contribute to the investigation done by the studies mentioned above (about the influence of the COVID-19 pandemic's social restriction on the access of oncological patients to medical care) through a new original study using the database from the PUCCAMP hospital and ambulatory clinic's medical record electronic system. This study would innovate on the approach to this research mainly through the expansion of the period studied, collecting data from the entire period in which social restriction and isolation norms were used in Campinas during the COVID-19 pandemic. Through this, it would be possible to determine how severely the prolonged use of social restriction and isolation measures in Campinas compromised the diagnosis, follow-ups and treatments of neoplasm patients from this city in the long run. Furthermore, it would be appropriate to highlight the possible consequences of this effect of the pandemic, mainly in regards to the worsening of these oncological patients prognosis.

## MATERIALS AND METHODS

The methods involve a retrospective statistical study with data collected from the medical records eletronic system of the PUCCAMP's hospital and ambulatory clinic. There, information about patients treated in these facilities between march of 2020 and January of 2023 (covering the complete period that this city's government used social restriction and isolation measures amid the COVID-19 pandemic) is stored and was planed to be analyzed for this study. The project for this research was approved by the PUCCAMP's ethics committee (CEP: 13.087-571).

The main objective of this study (intended to be achieved mainly through a statistical analysis) is to prove that the social restriction and isolation measures established during the SARS-CoV-2 virus pandemic limited drastically the access of oncological patients to medical care for a very long period of time in Campinas possibly delaying the diagnosis and treatment of these patients. The secondary objective of this study is to exemplify (with mentions of real clinical cases obtained through the medical records analysed for this study) and explain (through citations of concepts explained in different scientific sources) how the delay in neoplasm diagnosis could drastically worsen the prognosis of neoplasm patients.

Overall, the data collection focused on three main topics: the dates of the neoplasm diagnosis, the dates scheduled for surgeries with the aim of treating neoplasm patients, and the total annual admissions of these patients to the PUCCAMP's healthcare institutions. The data for these topics was obtained through different tools present in the PUCCAMP's medical record eletronic system.

After the data collection, the total numbers obtained for each topic was counted, determining how many of these were from the period between march and december of 2020, from the entire year of 2021, or from the entire year of 2022, highlighting how many of those were about neoplasms of benign, malignant, or of uncertain origin. Using the results, statistical graphs were made to provide an easy visual interpretation of the cronological variation of these results,

and the Wilcoxon test was carried out afterwards (with the aim of confirming whether there was or not a true annual variation on the numbers of admissions for neoplasm patients throughout the years studied). Therefore, if the results obtained reveal that there was a true statistical difference between each period studied (in regard to the three topics stablished), and that the numerical results were at its lowest specifically when those social restriction and isolation measures were more rigid in Campinas, a "cause and effect" relation could be suggested afterwards, for the influence of the social restriction and isolation norms's high rigidity on the numeric results obtained for each of these periods of the pandemic.

## RESULTS AND DISCUSSION

Between march and december of 2020, 13 diagnosis of neoplasm were made (all of them being of malignant neoplasms), 17 surgeries have been scheduled for this period (13 for malignant cases and four for benign cases) and 1209 admissions occured. Throughout 2021, 31 diagnosis of neoplasm were made (18 of malignant neoplasms, 11 of benign neoplasms and two about neoplasms of uncertain origin), 25 surgeries have been scheduled for this period (17 for malignant cases and eight for benign cases) and 2172 admissions occured. Throughout 2022, 82 diagnosis of neoplasm were made (39 of malignant neoplasms and 43 of benign neoplasms), 49 surgeries have been scheduled for this period (21 for malignant cases and 28 for benign cases) and 3104 admissions occurred. Using these results obtained, four graphs were created (**Figure 1, Figure 2, Figure 3 and Figure 4**). The avarage number of admissions per patient was six on 2020, 12 on 2021 and 17 on 2022, while the avarage number of admissions per day was four on 2020, six on 2021 and nine on 2022, indicating, in both cases, an annual increase in the avarage number of patient admissions as the time line moves closer to 2023.

Acording to the results gathered, there was a gradual annual decline on the numbers of diagnosis of neoplasms, neoplasm related surgeries and of general oncological patient admissions. Also, the Wilcoxon test results statistically confirmed that there was a true variation on the numbers of admissions throughout the years, as the absolute number of "Z" is higher than the "critical z-value", which allows for a rejection of the null hypothesis (**Table 1**).

**Table 1.** Wilcoxon Test results, using the number of neoplasm patient admissions at the PUCCAMP's hospital and ambulatory clinic throughout the period when social restriction and isolation measures were adopted in Campinas.

| Wilcoxon Test | 2020 - 2021 | 2021 - 2022 |
|---|---|---|
| n | 188 | 188 |
| N Rank 0 (%) | 59 (31.38) | 8 (0.042) |
| n - N (%) | 129 (68.62) | 180 (95.74) |
| Sum of the Negative Ranks | 4134 | 5709 |
| Sum of the Positive Ranks | 11754 | 12019 |
| Critical z-value (alpha 0.05) | 1,96 | 1,96 |
| Z | 24,9925 | 7,7938 |

Each one of the biostatistical graphs created with the results obtained suggests different theories that, in general, contribute to one that infers a lack of patient accessibility to medical attention in Campinas during the periods when social restriction and isolation measures were more rigid (**Figure 1, Figure 2, Figure 3 and Figure 4**). The pattern of gradual annual increase on the numbers throughout the complete period studied appears to be generated by the gradual decline on the rigidity of such measures throughout this same period, suggesting a relation of "cause and effect" between the presence of rigid social restriction and isolation norms and the lack of patient accessibility to medical attention in Campinas, respectively.

Cancer is a disease that progresses gradually, beginning as a benign neoplasm but, within a certain period of time, potentially growing into an invasive and potentially letal malignant neoplasm, with one of its main complications being the metastasis, which reduces drastically the chances of cure [9]. Therefore, in order to insure a better prognosis for oncological patients, an early diagnosis is crucial, which would be possible through a relatively frequent visit to a doctor for na evaluation [8]. However, amid the long period in which there was a low accessibility to medical attention in Campinas during the pandemic, many oncological patients were unable to make these frequent visits to a doctor, which creates an opportunity for new neoplasms to emerge and/or grow without being detected, possibly hindering the prognosis for these patients.

Those risks for neoplasm patients could be exemplified by two clinical case report articles from Brazil (but from scientific sources outside of this new study). In one of them, provided by Bonfim et al, a 13-year-old girl diagnosed with a benign fibroeppithelial lesion was treated through a mastectomy, but had to undergo a new quadrantectomy only three months after that first surgery, because a new benign tumor was detected on the right breast [10]. In the other case report, provided by Kronka

et al, a 70-year-old woman was received by the emergency service of a hospital two times (with the second one happening four days after the first), being transferred to the surgery center soon after the second reception, where the surgeons detected a tumor in the jejunum and na enterectomy had to be done to resolve the intestinal obstruction caused by the tumor (which would possibly risk her survival)[11].

**Figure 1.** Total number, per year, of neoplasm patient admissions that happened at the PUCCAMP's hospital and ambulatory clinic throughout the period when social restriction and isolation measures were adopted in Campinas.

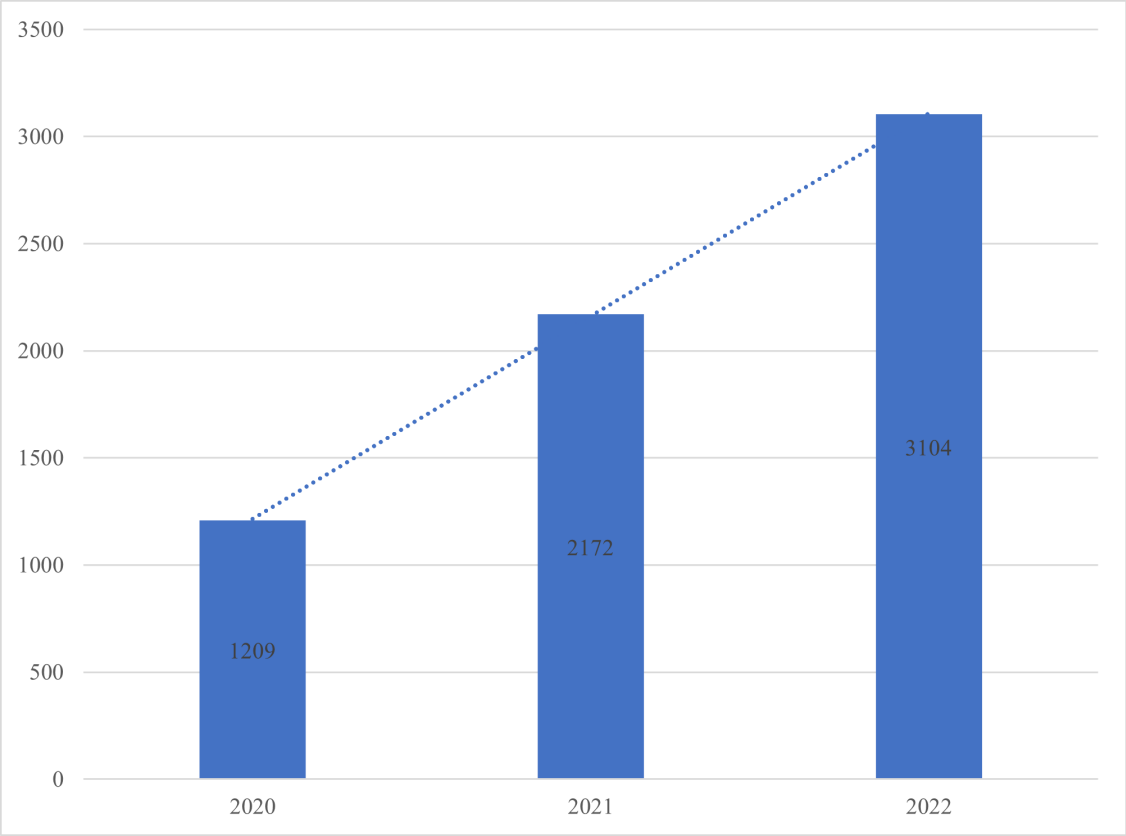



**Figure 2.** Total number of neoplasms diagnosed per year at the PUCCAMP's hospital and ambulatory clinic throughout the period when social restriction and isolation measures were adopted in Campinas.

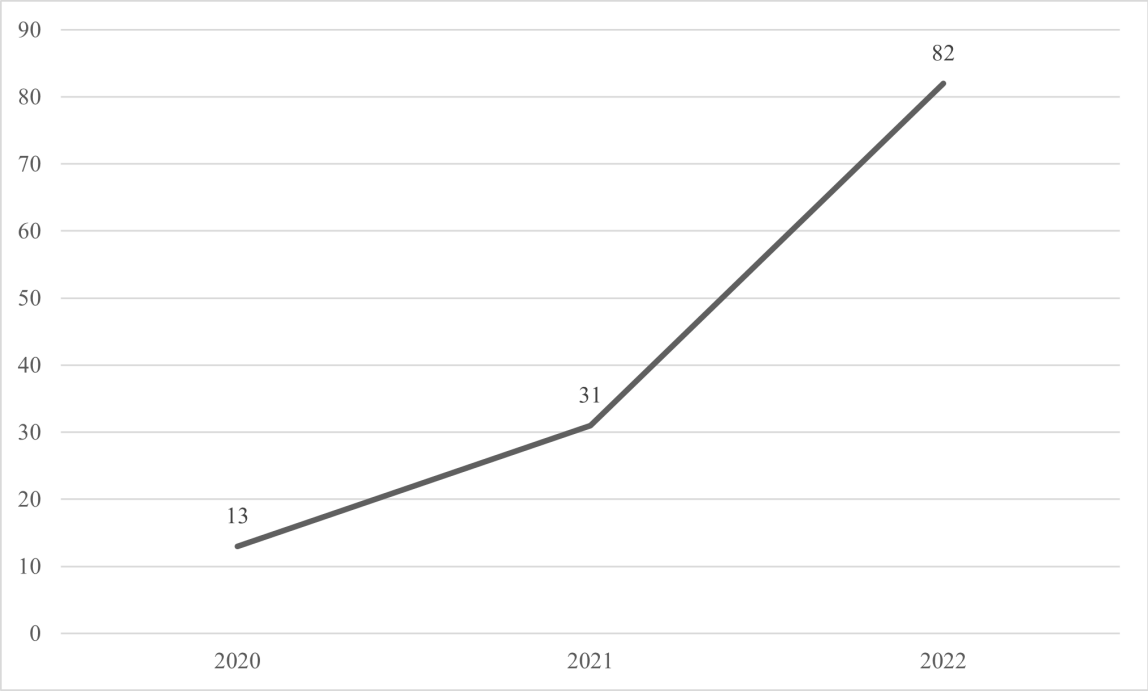


**Figure 3.** Total number of malignant neoplasms, benign neoplasms and neoplasms of uncertain origin diagnosed per year at the PUCCAMP's hospital and ambulatory clinic, throughout the period when social restriction and isolation measures were adopted in Campinas.

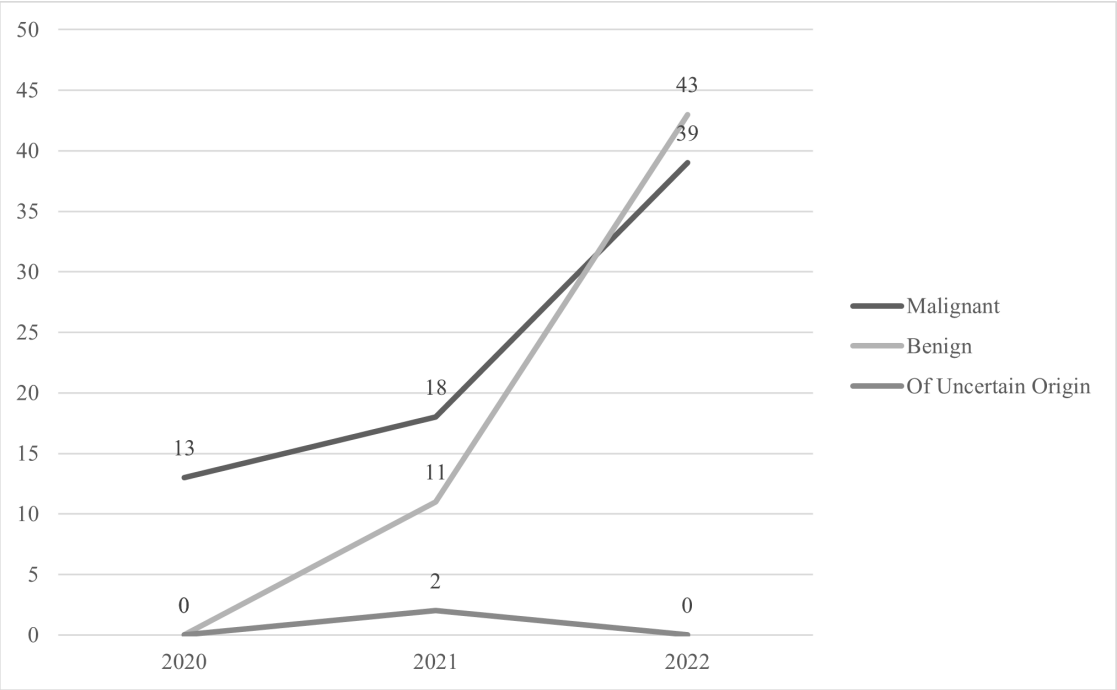
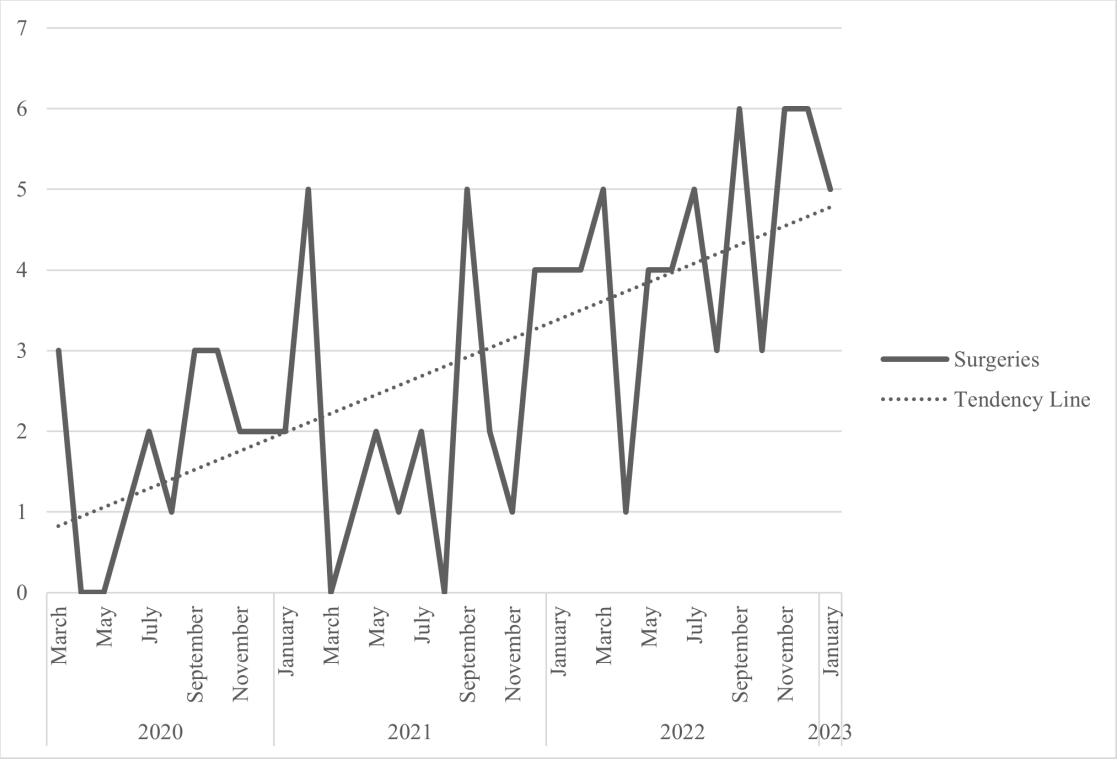



**Figure 4.** Total number, per month, of surgeries performed with the aim of treating neoplasm patients at the PUCCAMP's hospital, throughout the period when social restriction and isolation measures were adopted in Campinas.




In both cases discussed above, the neoplasms involved were able to grow and threaten the well-being of those patients in less than six months, with this time period being a lot shorter than the one represented by the period of government use of social restriction and isolation norms in Campinas (approximately two years and 10 months in total) during the COVID-19 pandemic [10,11]. However, this potential of such norms to establish a favorable context for the development and/or worsening of neoplasm cases could also be observed in two different clinical evolutions present in medical records from PUCCAMP's data base, which

will be briefly cited. The first following clinical case exemplifies the capability of certain malignant neoplasms to worsen the patient's prognosis when not diagnosed in its early stages of development, and the next one exemplifies the direct influence of the social restriction and isolation measures on the low numbers of neoplasm patient admissions.

A 44-year-old man, sought medical help at the PUCCAMP's healthcare institutions on December of 2021, having been diagnosed there on January of 2022 with malignant neoplasms located in various bones and soft tissues of his body (suggesting that a metastasis may have already occurred), which was later discovered to be na Ewing Sarcoma. As Nathalie explained in her article, the Ewing Sarcoma is na aggressive Sarcoma located specifically in bones and soft tissues [12]. The treatment for patients with this disease could involve surgeries, chemotherapy and/or radiotherapy, and the main factor that determines the prognosis of these patients is whether metastatic status was already detected at diagnosis or not [12]. Anyway, after approximately one year of a non successful treatment, this patient's death was confirmed and declared on February of 2023, at the PUCCAMP's hospital, with a non specified sepsis being the main hypothesis for the cause of death. It's important to note about this clinical case, considering the relationship between sepsis and cancer explained by Mirouse, that the presence of this patient's cancer could possibly represent one of the main factors that facilitated the occurrence of his sepsis, as patients with cancer, when compared with patients without it, have a 10 times higher risk of suffering sepsis [13].

A 66-year-old man diagnosed with Giant Cell Tumor of Bone (GCTB) on 2014, at the PUCCAMP's healthcare institutions, was subjected to a tumor removal surgery at the PUCCAMP's hospital on October of 2014. Byeong-Joo et al (2018) describes GCTB as a benign but agressive neoplasm, which brings the risk of turning into malignant and undergoing metastasis [14]. To keep up with these risks, his doctors recommended that he keeps segment with the PUCCAMP's tumor ambulatory after the surgery, which he has since then. However, when analyzing his history of admissions, it's revealed that he lost segment at the end of 2019, only coming back for new segments on March of 2022. When questioned by doctors about the reasons for these losses, the patient pointed out the pandemic as the major cause.

## CONCLUSION

The reduced absolute numbers of diagnosis, surgeries and admissions for neoplasm patients in the PUCCAMP's healthcare institutions, specifically during periods closer to when the social restriction and isolation measures were more rigid in Campinas, as well as the gradual increase on these numbers as the measures get slowly more flexible afterwards, could suggest that these social restriction norms compromised the oncological patient's access to this healthcare system for a long period of time. This could have generated a favorable environment for the development and progression of neoplasms and, consequently, the possible worsening of the prognosis for these patients.

### Disclaimer

This manuscript is not under consideration and will not be submitted to publication in another journal. The views expressed in this submitted article are of the author, and not an official position of the institution or funder.

## REFERENCES

1. Prefeitura de Campinas. Prefeito anuncia novas medidas para conter o coronavírus em Campinas. Noticias | Corona Vírus – Covid-19: Campinas [Internet]. 2020 mar [acesso em 23 jan. 2023]. Disponível em: https://portal.campinas.sp.gov.br/noticia/3827.

2. Estado de São Paulo. Plano SP | Plano de endurecimento e flexibilização das medidas restritivas. Governo do Estado de São Paulo [Internet]. 2020 jan [acesso em 26 jan. 2023] . Disponível em: https://www.saopaulo.sp.gov.br/planosp/.

3. Prefeitura de Campinas. Ocupação dos leitos de UTI para Covid está em 88,17% nesta quinta, 2. Noticias | Corona Vírus – Covid-19: Campinas [Internet]. 2020 jul [acesso em 25 jan. 2023]. Disponível em: https://portal.campinas.sp.gov.br/noticia/38919.

4. Prefeitura de Campinas. Campinas passa para a Fase Vermelha; medida entra em vigor na segunda, 6. Noticias | Corona Vírus – Covid-19: Campinas [Internet]. 2020 jul [acesso em 27 jan. 2023]. Disponível em: https://portal.campinas.sp.gov.br/noticia/38924.

5. Prefeitura de Campinas. Campinas avançará para a Fase Vermelha do Plano São Paulo, a partir de 2ª. Noticias | Corona Vírus – Covid-19: Campinas [Internet]. 2021 abr [acesso em 28 jan. 2023]. Disponível em: https://portal.campinas.sp.gov.br/noticia/40127.

6. Araujo SEA, Leal A, Centrone AFY, Teich VD, Malheiro DT, Cypriano AS, et al. Impacto da COVID-19 sobre o atendimento de pacientes oncológicos: experiência de um centro oncológico localizado em um epicentro Latino-Americano da pandemia. Einstein (São Paulo). 2021;19:1-8. Doi: 10.31744/einstein_journal/2021AO6282.

7. Duarte LS, Schirassu MM, Atobe JH, Moraes MA, Bernal RTI. Continuity of health care for chronic diseases in the state of São Paulo during the COVID-19 pandemic. Saúde Debate. 2021;45(especial 2):p. 68–81. Doi: 10.1590/0103-11042021E205.

8. Crosby D, Bhatia S, Brindle KM, Coussens LM, Dive C, Emberton M, et al. Early detection of cancer. Science. 2022; 375(1): 1-11. Doi: https://doi.org/10.1126/science.aay9040.

9. Hoff PMG, editores. Tratado de Oncologia. 1ª ed. São Paulo: Editora Atheneu; 2013. 2860 p.

10. Bonfim RJA, Vidal FCB, Silva DF, Bezerra GFB, Brito LMO,, Silva MACN, et al. Phyllodes tumor in adolescent: a case report of a 13-year-old girl. Rev Bras Mastologia, v. 23, n. 4, p. 135-140, 22 Ago 2014. Doi: DOI 10.5327/Z201300040008RBM. Acesso em 20 Jan 2023.

11. Kronka FC, Miduati FB, Quagliato FF, Gallo JRB, Espsda PC, Baitello AL, et al. Case Report: Carcinoid Tumor. Arq Ciênc Saúde 2006 jan-mar;13(1):48-50. Available at: https://pesquisa.bvsalud.org/portal/resource/pt/lil-463662.

12. Gaspar N, Hawkins DS, Dirksen Uta, Lewis IJ, Ferrari S, Deley MCL, et al. Ewing Sarcoma: Current Management and Future Approaches Through Collaboration. Journal of Clinical Oncology, v. 33, n. 27, 24 Ago 2015. Doi: DOI 10.5327/Z201300040008RBM.

13. Mirouse A, Vigneron C, Llitjos JF, Chiche JD, Mira, JP, Mokart D, et al. Sepsis and Cancer: Na Interplay of Friends and Foes. American Journal of Respiratory and Critical Care Medicine, v. 202, n. 12, p. 1625-1635, 18 Ago 2020. Doi: 10.1164/rccm.202004-1116TR.

14. Noh BJ, Park YK. Giant Cell tumor of bone: updated molecular Pathogenesis and tumor biology. Elsevier, v. 81, p. 1-8, 15 Jun 2018. Doi: DOI https://doi.org/10.1016/j.humpath.2018.06.017.