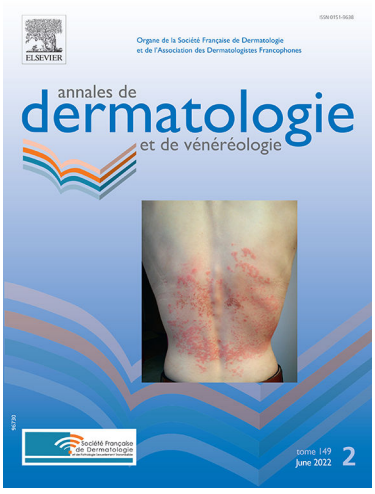

Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Journal Pre-proofs




Research letter

# Impact of the COVID-19 lockdown on the severity of newly-diagnosed primary cutaneous melanoma: a retrospective regional study in France

L. Klepfisch, A. Carbonnelle-Puscian, M. Faisant, J. Godeneche, N. Provencal, C. Lacoste, F. Skowron

PII: S0151-9638(22)00084-9
DOI: https://doi.org/10.1016/j.annder.2022.09.002
Reference: ANNDER 3164

To appear in: *Annales de Dermatologie et de Vénéréologie*

Received Date: 29 December 2021
Revised Date: 4 April 2022
Accepted Date: 1 September 2022

Please cite this article as: L. Klepfisch, A. Carbonnelle-Puscian, M. Faisant, J. Godeneche, N. Provencal, C. Lacoste, F. Skowron, Impact of the COVID-19 lockdown on the severity of newly-diagnosed primary cutaneous melanoma: a retrospective regional study in France, *Annales de Dermatologie et de Vénéréologie* (2022), doi: https://doi.org/10.1016/j.annder.2022.09.002

**Research Letter**

# Impact of the COVID-19 lockdown on the severity of newly-diagnosed primary cutaneous melanoma: a retrospective regional study in France

L. Klepfisch[1*], A. Carbonnelle-Puscian[2], M. Faisant[2], J. Godeneche[2], N. Provencal[2], C. Lacoste[2], F. Skowron[1]

[1]Department of Dermatology, Hôpitaux Drome Nord, 607 avenue Geneviève De Gaulle-Anthonioz - 26102 Romans-sur-Isère, France

[2]Dermatopathology laboratory, Cypath-Dermapath, 201 Route de Genas, 69100 Villeurbanne, France

*** Corresponding author**

E-mail: l.klepfisch@gmail.com (Lucas Klepfisch)

Service de Dermatologie Hôpitaux Drome Nord, 607 avenue Geneviève De Gaulle-Anthonioz

26102 Romans-sur-Isère, France

**Keywords:** COVID-19, young adults, epidemiology, primary cutaneous invasive melanoma, prognosis, time to diagnosis

In 2020, a 55-day COVID-19 pandemic-imposed national lockdown began on March 16th and led to cancellation of all non-vital medical care. Consequently, delayed cancer staging together with higher-stage diagnosis were thus anticipated. Assessment of the impact on the severity of primary cutaneous melanoma newly diagnosed after lockdown varied, with some studies identifying thicker melanomas, while others found no difference [1-4]. The aim of our study was to determine the effects of the lockdown on the clinical and histopathological characteristics of invasive cutaneous melanomas newly diagnosed in private practice.

## 1. Patients and methods

We compared three periods: the pre-lockdown period (Pre-LD, August 29, 2019, to March 16, 2020), the lockdown period (LD, March 17 to May 11, 2020), and the post-lockdown period (Post-LD, May 12 to November 28, 2020) in a retrospective cohort, based on the Dermapath private-practice database (run by the dermatopathologist network of the Rhône-Alpes region). Pre-LD is the reference period for statistical comparisons. Statistical analyses were performed using R statistical software (version 4.0.5, R Core Team, Vienna, Austria). A Kruskal-Wallis test and Fisher's exact test were performed. All tests were 2-sided and the level of significance was set at 0.05.

## 2. Results

One thousand and forty-six patients were included. Age and gender showed no difference between the 3 periods. Fewer melanomas were diagnosed per day during LD than during Pre-LD and Post-LD (1.1, 2.45 and 2.48 respectively, $p < 0.01$). Melanoma thickness, mitotic rate, histologic subtypes and pT staging (AJCC 8th ed.) were similar during the 3 periods (Table 1). Melanomas were more ulcerated during LD compared to Pre-LD (16.7% vs. 7.6%, $p = 0.02$), with a greater tendency to be located on the head and neck (9.0% vs. 16.7%, $p = 0.10$). We observed no difference between Pre-LD and Post-LD regarding all clinical and histopathological characteristics.

## 3. Discussion

As reported previously in the literature, we observed a reduction in new cases during the complete 55-day lockdown [2, 3]. This may be explained by cancelation of appointments and by patients' fear of contracting COVID-19 at visits. During lockdown, melanomas were more ulcerated and perhaps more frequently located on the head and neck, suggesting that the most highly symptomatic patients may have consulted during the pandemic. After lockdown, we found no clinical or histopathological differences compared to the pre-lockdown period, thus militating in favor of minimal impact of COVID-19 lockdown on the severity of cutaneous melanoma. Some studies found more aggressive, thicker, reported diagnosis of more ulcerated melanomas after lockdown compared to a similar period before the pandemic [2, 3, 5]. However, other smaller studies showed no difference in the severity of melanomas after lockdown [1, 6], with similar results being seen in a very large national study, although ulceration was not analyzed [4].

Our study had some limitations. The timeframes are potentially too short to enable detection of late impact. Indeed, had there been a stable incidence of melanoma, we would normally expect to have detected ~135 new melanomas during lockdown, which was not the case (n = 60 during LD), and there was no rebound Post-LD. This raises the question of the fate and prognosis of these potentially undiagnosed melanomas (Fig. 1). Moreover, there is generally reduced activity in August in France because of the summer holidays, which could result in underestimation of the number of melanomas per day in Post-LD. Further studies examining longer timeframes are necessary to better define the course of melanomas with delayed diagnosis. Further, it has been shown that more stage III and IV were diagnosed, with poorer patient tumor characteristics after lockdown [7]. Our study focused on pT stage melanoma, and we did not include patients with advanced melanoma.

In conclusion, our results are fairly reassuring regarding outpatient management of melanoma, and they highlight the critical importance of ensuring continuity of care (maintaining emergency dermatology consultations and increasing teledermatology) in such sanitary or social crises in order to avoid delayed mortality, morbidity and financial burden.

**Disclosure of interest**

The authors did not disclose any details of conflicts of interest.

**References**


[1] Gaunt N, Green RL, Motta LF, Jamieson LA. Skin cancers in lockdown: no impact on pathological tumour staging. *Br J Dermatol* 2021, 185(4):844-846.

[2] Molinier R, Roger A, Genet B, Blom A, Longvert C, Chaplain L, et al. Impact of the French COVID-19 pandemic lockdown on newly diagnosed melanoma delay and severity. *J Eur Acad Dermatol Venereol* 2022, 36(3):e164-e166.

[3] Ricci F, Fania L, Paradisi A, Di Lella G, Pallotta S, Sobrino L, et al. Delayed melanoma diagnosis in the COVID-19 era: increased breslow thickness in primary melanomas seen after the COVID-19 lockdown. *J Eur Acad Dermatol Venereol* 2020, 34(12):e778-e779.

[4] Sangers TE, Wakkee M, Kramer-Noels EC, Nijsten T, Louwman MWJ, Jaspars EH, et al. Limited impact of COVID-19 related diagnostic delay on cutaneous melanoma and squamous cell carcinoma tumor characteristics: A nationwide pathology registry analysis. *Br J Dermatol* 2022.

[5] Davis CH, Ho J, Greco SH, Koshenkov VP, Vidri RJ, Farma JM, et al. COVID-19 is Affecting the Presentation and Treatment of Melanoma Patients in the Northeastern United States. *Ann Surg Oncol* 2022, 29(3):1629-1635.

[6] Gedeah C, Damsin T, Absil G, Somja J, Collins P, Rorive A, et al. The impact of COVID-19 on the new diagnoses of melanoma. *Eur J Dermatol* 2021, 31(4):565-567

[7] van Not OJ, van Breeschoten J, van den Eertwegh AJM, Hilarius DL, De Meza MM, Haanen JB, et al. The unfavorable effects of COVID-19 on Dutch advanced melanoma care. *Int J Cancer* 2022, 150(5):816-824.


.

**Figure 1.** Numbers of melanomas diagnosed in the 3 periods (pre-lockdown, lockdown and post-lockdown) and estimated number of undiagnosed melanomas during the lockdown

**Table 1.** Patient and tumor characteristics of melanomas diagnosed from August 29, 2019, to November 28, 2020.

| | Pre-lockdown period, 200 days (n = 490) | Lockdown period, 55 days (n = 60) | Post-lockdown period, 200 days (n = 496) | p-value Pre-LD vs. LD | p-value Pre-LD vs. Post-LD |
|---|---|---|---|---|---|
| Age (years) Mean, SD (range) | 64.1, 14.5 (22-97) | 62.2, 16.2 (22-90) | 63.1, 15.1 (19-97) | 0.62 | 0.46 |
| Age-group at diagnosis for three groups, n (%) | | | | 0.79 | 0.71 |
| [18-45] | 54 (11.0) | 8 (13.3) | 67 (13.5) | | |
| [45-65] | 201 (41.0) | 25 (41.7) | 177 (35.7) | | |
| [65-100] | 235 (48.0) | 27 (45) | 252 (50.8) | | |
| Sex, female (%) | 223 (45.5) | 22 (36.7) | 227 (45.8) | 0.22 | 0.95 |
| Melanoma thickness (mm), mean (±SD) | 1.1 (±2.0) | 1.2 (±1.7) | 1.1 (±1.8) | 0.51 | 0.41 |
| Ulceration, n (%) | 37 (7.6) | 10 (16.7) | 45 (9.1) | 0.02 | 0.39 |
| Mitotic count | | | | 0.50 | 0.82 |
| 0/mm$^2$ | 355 (72.4) | 40 (66.7) | 367 (74.0) | | |
| ≤ 1/mm$^2$ | 49 (10.0) | 6 (10) | 49 (9.9) | | |
| > 1//mm$^2$ | 86 (17.6) | 14 (23.3) | 80 (16.1) | | |
| T pathologic staging (AJCC 8$^{th}$ ed.) | | | | 0.63 | 0.63 |
| pT1, n (%) | 375 (76.5) | 44 (73.3) | 372 (75) | | |
| pT2, n (%) | 54 (11.0) | 6 (10.0) | 60 (12.1) | | |
| pT3, n (%) | 26 (5.3) | 3 (5.0) | 34 (6.9) | | |
| pT4, n (%) | 35 (7.1) | 7 (11.7) | 30 (6.0) | | |
| Melanoma subtype | | | | 0.18 | 0.60 |
| SSM, n (%) | 444 (90.6) | 51 (85) | 459 (92.5) | | |
| LMM, n (%) | 23 (4.7) | 7 (11.7) | 15 (3.0) | | |
| ALM, n (%) | 1 (0.2) | 0 (0) | 1 (0.2) | | |
| NM, n (%) | 9 (1.8) | 0 (0) | 6 (1.2) | | |
| Unknown, n (%) | 13 (2.7) | 2 (3.3) | 15 (3.0) | | |
| Topography | | | | 0.10 | 0.91 |
| Head/neck, n (%) | 44 (9.0) | 10 (16.7) | 43 (8.7) | | |
| Trunk, n (%) | 214 (43.7) | 29 (48.3) | 216 (43.5) | | |
| Upper limb, n (%) | 116 (23.7) | 9 (15) | 108 (21.8) | | |
| Lower limb, n (%) | 109 (22.2) | 10 (16.6) | 121 (24.4) | | |
| Unknown, n (%) | 7 (1.4) | 2 (3.3) | 8 (1.6) | | |

Pre-LD: pre-lockdown period (2019-08-29 to 2020-02-26), 200 days); LD: lockdown period (2020-03-17 to 2020-05-11); Post-LD: post-lockdown period (2020-05-21 to 2020-11-28); AJCC: American Joint Committee on Cancer; SSM: superficial spreading melanoma; LMM: lentigo maligna melanoma; ALM: acral lentiginous melanoma; NM: nodular melanoma; SD, standard deviation.