

Unveiling the impact of COVID 19 on melanoma diagnosis

Dilki Jayasinghe¹, Lejie Zheng¹, Monika Janda¹

¹ Centre for Health Services Research, The University of Queensland, Woolloongabba, QLD, Australia

1 Context

Observational studies indicate a significant increase in the detection of in situ and thin melanomas without a commensurate decrease in melanoma mortality¹. This increase is likely due to advanced diagnostic tools and increased awareness, and according to some research, these patterns could suggest considerable overdiagnosis of melanoma².

Lockdown restrictions to medical services during the COVID-19 pandemic provided an opportunity to investigate the contribution of diagnostic scrutiny by observing the natural progression of melanoma when access to medical services was limited.

2 Aim

To assess whether there were significant differences in trend in melanoma cases between the pre-COVID and during-COVID periods in Queensland, Australia

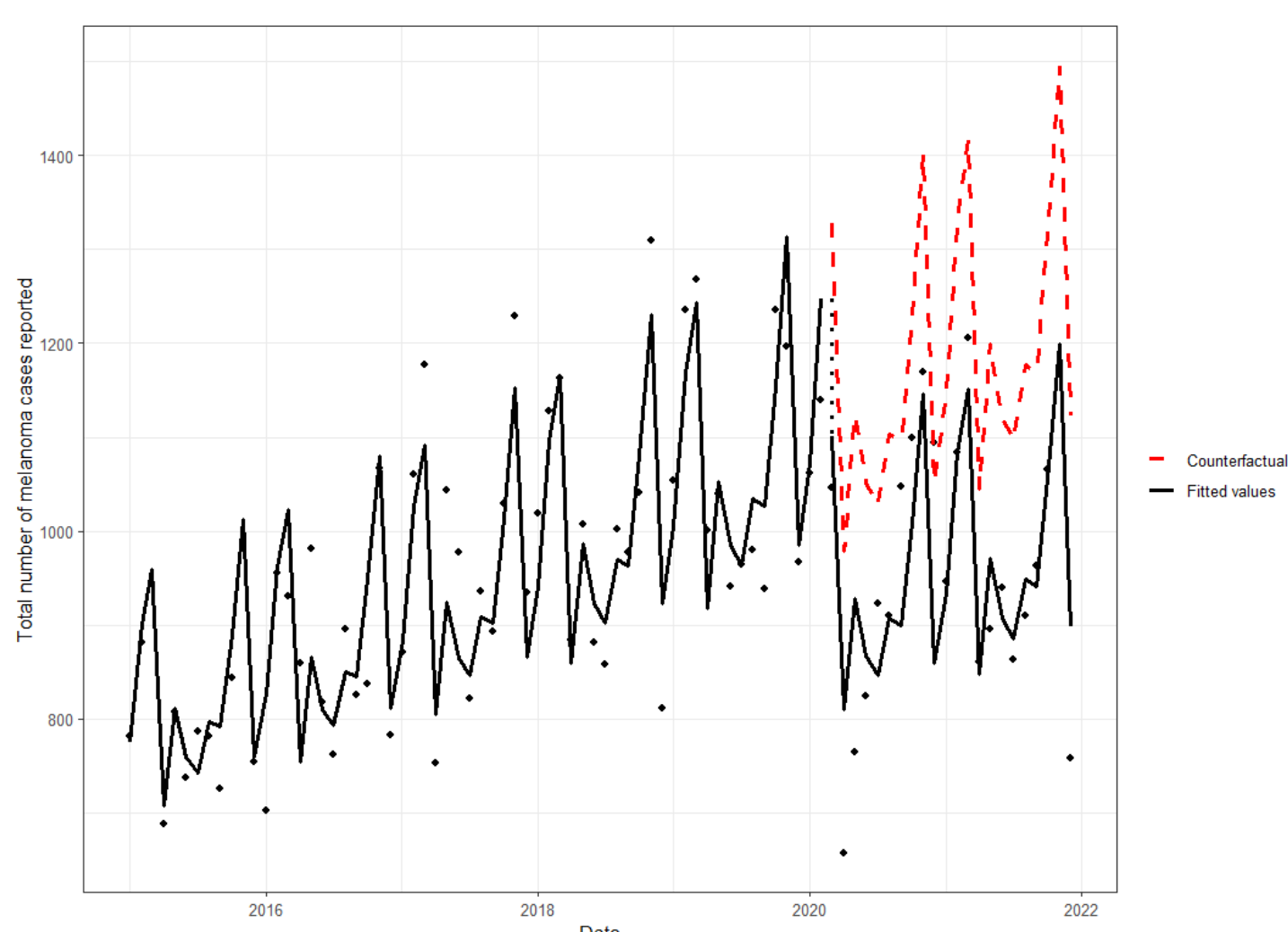


Figure 1. Interrupted Time Series analysis for total melanoma cases reported in Queensland from January 2015-December 2021
Black dots reflect the actual melanoma cases observed in each month; the black solid line represents the predicted pattern of reported melanoma cases per month by the model; the red dashed line refers to the anticipated pattern of reported melanoma cases per month had the COVID restrictions not been imposed.

3 Methods

- Data:
 - Monthly melanoma cases reported in QLD
 - Time divided into two periods:
 - Pre-COVID: January 2015 - February 2020
 - During-COVID: March 2020 - December 2021
- To descriptively compare melanoma cases before and after COVID restrictions: Equal number of months before and after their implementation in March 2021.
- To account for temporal variation and effect of COVID-19 restrictions: An interrupted time series analysis
 - Model: Poisson regression model adjusted for overdispersion and seasonal effects
 - Outcome: Effect size defined by the mean relative risk (RR)³.

4 Findings

Group	Covid-19 immediate effect* (95% CI)	P value	Covid-19 sustained effect** (95% CI)	P value	Covid-19 combined effect† (95% CI)	P value
MIS	-0.22 (-0.31, -0.13)	<0.001	-0.002 (-0.009, 0.004)	0.526	0.78 (0.73, 0.84)	<0.001
≤1mm	-0.18 (-0.28,-0.09)	<0.001	-0.002 (-0.01,0.00)	0.626	0.82 (0.76,0.88)	<0.001
1.01-2mm	-0.01 (-0.19,0.16)	0.887	0.00 (-0.01,0.01)	0.925	0.98 (0.86,1.12)	0.78
2.01-4mm	0.08 (-0.10,0.27)	0.373	-0.01 (-0.02,0.01)	0.284	1.01 (0.87,1.17)	0.90
>4mm	0.04 (-0.20,0.27)	0.737	0.00 (-0.01,0.02)	0.691	1.08 (0.89,1.30)	0.43
All invasive	-0.13 (-0.21,-0.05)	0.003	0.00 (-0.01,0.00)	0.709	0.87 (0.82,0.93)	<0.001
Total	-0.19 (-0.27, -0.11)	<0.001	-0.002 (-0.007, 0.004)	0.551	0.81 (0.77, 0.87)	<0.001

Table 1. Regression coefficients (and 95% CI) with the Relative Risk (RR) for the changes in melanoma cases during compared to pre-COVID-19

* Immediate effect represents the change in level (a rise or drop) between the pre- and post-COVID trend line segments

** Sustained effect represents the change in trend of melanoma cases per month during COVID restrictions compared to the pre-COVID trend

† Combined effect considers both the immediate and sustained effects, as predicted by the Poisson regression models

Descriptive Analysis

- An average monthly decrease of 52 melanoma in situ (MIS) cases (7.7% decrease) and decrease of 25 invasive melanoma cases (7.1% decrease) during-COVID compared to pre-COVID period
- Largest reduction occurred in invasive melanomas with a thickness of ≤1mm (-10.5% per month)
- A notable increase of 12.4% invasive melanomas thicker than 4mm per month

Interrupted Time Series Analysis (Table 1)

- An immediate reduction in total melanoma counts was observed following the implementation of COVID-19 restrictions (RR: -0.19; 95% CI: -0.27, -0.11; p<0.001)
- The reduction primarily attributed to a decrease in both MIS (RR: -0.22; 95% CI: -0.31, -0.13; p<0.001) and ≤1mm invasive melanoma cases (RR: -0.18, 95% CI: -0.28, -0.13; p<0.001).
- Imposing COVID restrictions did not have a sustained effect on the trends compared to pre-COVID periods across all thickness groups

5 Conclusions

- Considering only the before and after averages of reported melanoma cases would suggest a heightened increase in the number of melanoma >4mm, while failing to account for the overall decrease in cases.
- When the temporal information in the data were considered in the interrupted time series analysis, a significant immediate drop in the number of melanoma cases was observed.
- This drop appeared to be primarily driven by a substantial reduction in cases of MIS and melanomas less than 1mm, with no significant increase in the number of thick melanomas.
- No sustained significant effects were observed in the number of melanoma cases reported – could be due to the limited post-COVID observation time, additional thick melanomas may yet be discovered in subsequent years, COVID restrictions were not long enough to have an effect
- Since COVID-19 lockdowns and restrictions vary globally, the findings of this analysis may not be universally applicable.

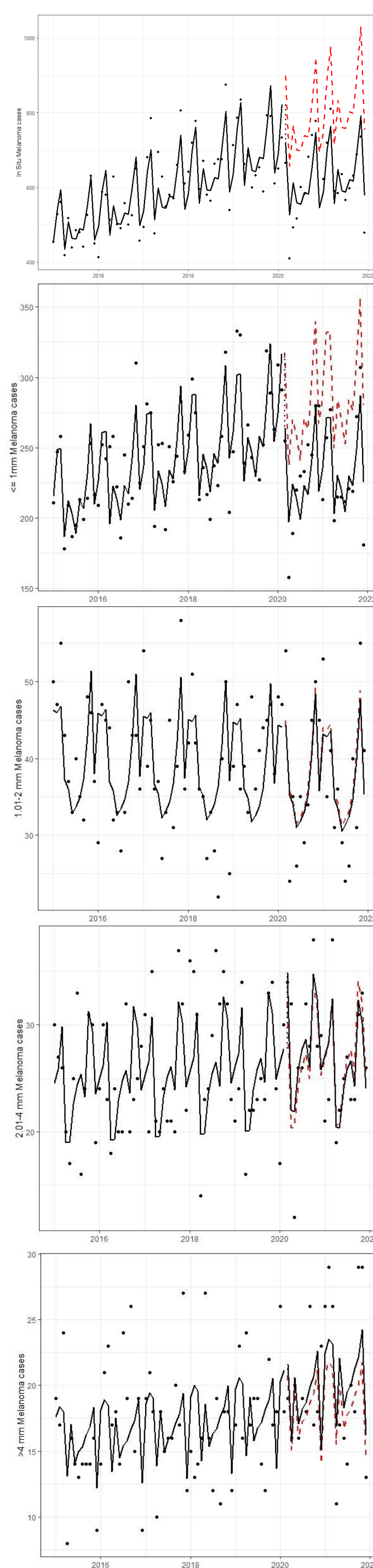


Figure 2. Interrupted Time Series analysis for total melanoma cases reported by thickness groups

References

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