

Temperature should not be measured on forearm with infrared thermometers for Covid-19 screening

Dear editor: Fever is the most common symptom of Covid-19, as up to 88.5% of infected patients have it at diagnosis.¹ As countries begin to lift quarantine and social distancing restrictions, and individuals return to public spaces, screening methods have gained notable importance. Although its role as a screening device is disputed, the non-contact handheld cutaneous infrared thermometer has become increasingly popular as a screening method for Covid-19 at the entrance of enclosed public spaces.² However, despite the device's innocuousness, recent misinformation campaigns have resulted in the public's fear of the device's safety. Particularly, unfounded beliefs of brain damage have led to measuring of temperature in body sites not indicated for this, such as the forearm, at individuals' requests. The presence of misleading information on social media, as well as the deliberate spread of misinformation has made it harder for authorities to enact public health recommen-

dations to reduce the spread of Covid-19. For example, an analysis of the first 110 results of Covid-19 on a search engine revealed that only 10% fulfilled the JAMA benchmark criteria for quality of health information, and that five out of 36 websites evaluated contained outright false news.³ Thus, regarding current practices in the use of infrared thermometers, although empirical evidence points to disagreements between measurements at the indicated site on the forehead, and sites such as the forearm, few studies back this. Therefore, we used three of such devices to measure the temperature on three different body parts (forehead, neck, and forearm) of all individuals entering our institution in a given time frame and compared the results statistically (table I). Mean body temperature for the forehead was 36.2 °C, 36.15 for the neck, and 35.02 for the forearm. These differences were statistically significant. When comparing the mean temperature of the forehead versus the neck, we found no statistical difference. Contrariwise, when comparing the mean temperature of the head or neck versus the forearm, we found a statistically significant difference. Furthermore, there was a significant percentage of reading

errors at the forearm, which could be confused with absence of fever, which can lead to the non-detection of individuals that could potentially transmit Covid-19. When infrared non-contact thermometers are used to determine skin temperature, the forearm is not an adequate location as the recorded temperature is lower, and the temperature range wider. Temperature on the neck showed no difference from that of the forehead and could be a valid alternative when individuals refuse this measurement. We recommend that users should conform to the device's intended use as per the manual.

Declaration of conflict of interests. The authors declare that they have no conflict of interests.

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Table I
MEAN TEMPERATURE ACCORDING TO SITE OF MEASUREMENT (N=103).
MEXICO CITY 2020

Variable	Mean	SD	p*
Forehead temperature, °C	36.2	0.97	
Neck temperature, °C	36.15	0.75	<0.001
Forearm temperature, °C	35.02	1.41	
Variable			p [‡]
Forehead vs. neck temperature			0.08
Forehead or neck vs. forearm			<0.001

SD: Standard deviation. *p-value calculated with ANOVA ‡ p-value calculated with Student's t-test

References

- Li LQ, Huang T, Wang YQ, Wang ZP, Liang Y, Huang TB, et al. COVID-19 patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis. *J Med Virol.* 2020;92(6):577-83. <https://doi.org/10.1002/jmv.25757>
- Aw J. The non-contact handheld cutaneous infra-red thermometer for fever screening during the COVID-19 global emergency. *J Hosp Infect.* 2020;104(4):451. <https://doi.org/10.1016/j.jhin.2020.02.010>
- Cuan-Baltazar JY, Muñoz-Perez MJ, Robledo-Vega C, Pérez-Zepeda MF, Soto-Vega E. Misinformation of COVID-19 on the Internet: Infodemiology Study. *JMIR Public Heal Surveill.* 2020;6(2):e18444. <https://doi.org/10.2196/18444>