Thermal Screening in COVID-19: Why Is It Commonplace?

To the Editor: Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2, disrupted human life as we know it and brought us to a standstill in a matter of months. Considering fever is one of the earliest and most common symptoms, temperature-based screening promptly became the focus for identifying infected cases and for checking the spread of the virus.[1] This was, and still is, being performed using noncontact infrared thermometers and/or thermal scanners at entry/exit points (eg, airports) and doorways to different establishments such as hospitals, workplaces, grocery stores, and restaurants. This was meant to be applied as part of a composite program in combination with self-reporting of relevant symptoms, contact, and travel history. The idea was that people who have a rise in body temperature be treated as a suspected case of COVID-19 and be isolated until definite test results are obtained.

Per contra, what seemed like a simple yet effective measure to identify cases then has now transpired to be a futile endeavor. More than a year into the pandemic, we now know that almost half the patients with COVID-19 do not have fever.[2] Consequently, asymptomatic and presymptomatic cases might go undetected. Among cases that present with fever, the use of antipyretic drugs (which is oftentimes not self-reported) can result in false-negative results. Furthermore, readings obtained with these devices are influenced by a myriad of factors. These include the person's age, sex and race, alcohol consumption, application of cosmetics, and physical activity preceding measurement. Environmental factors such as subject-to-sensor distance, ambient temperature, and humidity also affect the readings.[3] Such factors may lead to an underestimation of febrile cases, leading to a false sense of security; conversely, it may also overestimate the number of febrile patients generating unnecessary further testing, increased cost, and undue stress for individuals and authorities involved.[4]

Nowadays, temperature checks have come to be a daily ritual for many of us. Although not particularly resource intensive, the propensity to miss a substantial proportion of the cases and the multitude of variables that could render the results unreliable compel us to consider the cost-benefit of this screening measure. A review of the evidence of noncontact thermal screening for identifying cases of COVID-19 concluded that thermal screening is ineffective in limiting the spread of severe acute respiratory syndrome coronavirus 2.[4] With little discernible benefit, it begs the question: Why do we allow thermal screening to be commonplace?

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COVID-19 Vaccine Effectiveness in a Diverse Urban Health Care Worker Population

To the Editor: Whereas there is emerging, real-world research investigating COVID-19 vaccine effectiveness (VE) on health care workers (HCWs),[1,2] specific VE data from hospital settings with diverse urban employee populations are lacking. In addition, most studies have not controlled for demographic characteristics, including race and background community COVID-19 incidence, which are risk factors among HCWs.[3]

We investigated the COVID-19 VE among employees in our ethnically diverse community health care system in Massachusetts (44% of our HCWs are non-White) during its initial immunization campaign. The HCWs of the system were retrospectively included from the beginning of a COVID-19 vaccination program (December 16, 2020) until March 31, 2021. Those with a prior COVID-19 infection before December 15 were excluded. The Occupational Health department of the system ran a COVID-19 screening and testing referral program for workers, consistently throughout the study period. A master database comprising the demographic characteristics,

Status	Person-days	No. of infections	Rate per 10,000 person-days	Unadjusted vaccine effectiveness, % (95% CI)	Adjusted vaccine effectiveness, % (95% CI)[a]
Unvaccinated	172,845	133	7.69	Not applicable	Not applicable
First dose (<14 days)	40,344	28	6.94	26.9 (−17.6 to 54.5)	28.1 (−15.9 to 55.4)
First dose (14+ days)	40,577	8	1.97	80.1 (57.8-90.6)	80.2 (57.5-90.8)
Second dose	41,817	2	0.48	95.4 (80.8-98.9)	95.2 (80.0-98.8)
Fully vaccinated	148,475	4	0.27	97.2 (92.5-99.0)	95.5 (88.2-98.3)

TABLE. Rate of Infection During the Study Period Across the 5 Vaccination Categories (Separating Period With First Dose Only to <14 and 14+ Days and Excluding 318 people Infected Before December 15, 2020)

Vaccine effectiveness (95% CI) derived from the Andersen-Gill extension of the Cox proportional hazards model.

[a]Adjusted for age, sex, race, and the Massachusetts statewide 7-day average of new cases at the date for the first vaccine dose. Those with the race of "American Indian or Alaska Native," "Hawaiian or Pacific Islander," or "Two or More" were pooled into 1 level, "other race."

COVID-19 polymerase chain reaction assays, and vaccinations of each HCW had been established (described previously[4]) and updated. The database was deidentified, and the study was exempted by the Cambridge Health Alliance Institutional Review Board (4/29/202-003).

The Pfizer and Moderna vaccines were made available to HCWs starting on December 16 and December 23, 2020, respectively, and opened to all employees on December 29. Participation was voluntary at conveniently located hospital-based vaccination sites; no appointment was required. After Emergency Use Authorization in February 2021, a limited number of J&J/Janssen vaccine doses were available. Fully vaccinated employees with breakthrough infections were telephonically interviewed by our Occupational Health medical staff following the screening/referral protocol.[4] We built an Andersen-Gill extension of the Cox proportional hazards models to account for correlated data and further adjusted for potential confounders: age, sex, race, and the Massachusetts statewide 7-day average of new cases[5] on the date of the first vaccine dose. The VE was calculated as 100% × (1 − hazard ratio).

Among the 4317 eligible HCWs, 3249 (75%) received any vaccination during the study period. Vaccinated HCWs were older (45.7±13.5 years vs 41.3±12.8 years; P<.001) and more likely to be non-Hispanic Whites. In addition, medical providers were more likely to be vaccinated compared with other HCWs (89% vs 73%; P<.001). After adjusting for potential confounders, we observed a VE of 80.2% (95% CI, 57.5% to 90.8%) for 14 or more days after the first dose of Pfizer/Moderna and 95.5% (95% CI, 88.2% to 98.3%) among those fully vaccinated (ie, ≧14 days after the second dose of Pfizer/Moderna or the single dose of J&J/Janssen; Table). During the study period, there were 6 breakthrough infections, all paucisymptomatic or asymptomatic, with no hospitalizations or death. No variants of concern were discovered among the genotyped samples.

Our findings show that COVID-19 vaccines are promising, and these data in concert with culturally appropriate outreach may decrease vaccine hesitancy. The study has strengths, including that other than age and sex, we adjusted for race/ethnicity and 7-day incidence in Massachusetts at the time of vaccination to account for the background rate. Our population is multiethnic, allowing us to draw better conclusions about populations underrepresented in clinical trials.

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mRNA COVID-19 Vaccine—Related Anaphylactoid Reaction and Coronary Thrombosis

To the Editor: The emergence of vaccines, with clear evidence of their efficacy, has been key to tackling the coronavirus disease 2019 (COVID-19) pandemic. However, as these vaccines are rolled out to larger numbers of patients, rare complications are inevitable, and clinicians should be aware of this possibility. We present a case of a young man who presented with an anaphylactoid reaction a day after having the Pfizer-BioNTech COVID-19 vaccine with thrombotic occlusion of his left anterior descending (LAD) artery.

Paramedics attended a 38-year-old man with a sudden onset widespread erythematous rash, dyspnea, and stridor 18 hours after receiving his first dose of the Pfizer-BioNTech COVID-19 vaccine. Past medical history was notable for asthma and eczema but no known allergies. He was treated with 500 μg of adrenaline intramuscularly with initial good response; however,

he developed severe central chest pain. Serial electrocardiograms revealed evolving ST-segment elevation — initially inferiorly and then anteriorly (Figure, A). He was therefore transferred to hospital and underwent urgent coronary angiography which surprisingly showed severe thrombotic stenosis of the proximal LAD with distal embolization (Figure, B). Optical coherence tomography confirmed significant LAD thrombus (Figure, C; white arrows) but no evidence of underlying atherosclerotic plaque rupture and normal smooth vessel wall segments (Figure, C; interrupted blue arrows). Multiple thrombus aspiration runs were undertaken, and the patient was started on a glycoprotein 2b/3a inhibitor with improvement of the angiographic appearances. Transthoracic echocardiography showed an apical left ventricular thrombus. Subsequent angiography 2 days later was reassuring with reduced thrombotic burden and no features suggestive of plaque rupture (Figure, D and E). Given the absence of coronary stenosis from an atherosclerotic plaque, a coronary stent was not deployed. The patient was managed medically with dual-antiplatelet therapy and a direct oral anticoagulant. On further questioning, he denied any insect bites or taking any drugs, and had been fasting for 12 hours. Interestingly, his mast cell tryptase was normal (10.7 ng/mL) and no cocaine metabolites were seen on urinalysis. The patient had an uneventful recovery and an EpiPen issued before discharge. The adverse event was reported to the Medicine and Healthcare products Regulatory Agency of the Department of Health and Social Care in the United Kingdom.

Importantly, the Pfizer-BioNTech COVID-19 vaccine has been shown to be safe and effective