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.

step or the end of desensitization. Desensitization was terminated in patient 2 owing to hemorrhagic complications.

As platelet-avid antibodies are exclusively detected by flow cytometry during oxaliplatin exposure, the increased infusion time during desensitization may place oxaliplatin hypersensitivity patients with OIIT at a higher risk of OIIT complications. Allergists who perform oxaliplatin desensitization should be aware of this potentially life-threatening complication. Acute thrombocytopenia in OIIT can lead to hemorrhagic complications, DIC, and require transfusion support. In patients with thrombocytopenia suspected to be due to oxaliplatin, complete blood cell count with differential, peripheral blood smear, liver function tests, prothrombin time, activated partial thromboplastin time, international normalized ratio, fibrinogen, fibrin degradation products or D-dimer, lactate dehydrogenase, haptoglobin, and importantly, drug-dependent platelet antibody immunofluorescence by flow cytometry, should be checked.

In patients with an acute and significant platelet decrease after oxaliplatin infusion owing to OIIT in the setting of hypersensitivity, alternative chemotherapeutic agents should be considered. If no alternative exists, risks and benefits need to be carefully discussed given the potential for continued, life-threatening hemorrhagic complications as OIIT can recur despite dose reduction. The authors suggest that after OIIT is diagnosed, if oxaliplatin therapy is continued, platelet counts should be closely monitored, with platelet count measured immediately before and after oxaliplatin infusion, with any symptoms, and 48 to 72 hours after, to not to miss a platelet nadir and potential risk of hemorrhagic complications.

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Investigating air pollution as a contributor to health disparities during the coronavirus disease 2019 pandemic

The high rates of morbidity and mortality from coronavirus disease 2019 (COVID-19) among Black patients have been a ubiquitous component of media coverage of the pandemic.[1] Although the association between race and COVID-19 is likely multifactorial owing to household crowding, socioeconomic status, and percentage of essential workers,[2] the association between air pollution and the disproportionate exposure of COVID-19 for minority communities has not been adequately explored. Emerging evidence has shown that there is a relationship between exposure to increased levels of air pollution and adverse COVID-19 outcomes and displayed that race is a significant predictor of living in a polluted area within the United States.[1] Prolonged exposure to air pollution leads to chronic inflammatory stimulation with a link between race, pollution, and respiratory conditions in vulnerable populations.[3] Although race is often cited as an independent risk factor for poor outcomes in respiratory diseases such as asthma, environmental factors that disproportionately affect communities of color play a significant role in health disparities across the United States. As such, the higher rates of pollution in areas with a greater proportion of Black residents may also contribute to the data indicating poor COVID-19 outcomes among Black patients.[1] A nationwide cross-sectional study revealed that a 1 $\mu g/m^3$ increase in fine particulate matter ($PM_{2.5}$) was significantly correlated with an 11% increase in the COVID-19 death rate.[4] Regional percentage of Black residents was an additional predictor of COVID-19 mortality.[4] Populations exposed to increased air pollution levels in China and Italy were found to have a higher COVID-19 incidence and mortality.[3,5]

Evidence regarding COVID-19 suggests that a severe inflammatory response syndrome, marked by fever, hypoxia, and increased serum inflammatory markers, is a significant factor in morbidity and

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Table 1
Atmospheric Pollutants and Sources With Associated Overexpressed Inflammatory Markers

	$PM_{2.5}$	PM_{10}	NO_2	SO_2	O_3
Major sources of pollutant	Industries, power plants, incinerators, motor vehicles. construction activity, fires, and natural windblown dust		Power generation and transport	Power generation: industry, domestic, and commercial heating	Secondary pollutant formed from hydrocarbon and NO_2
Inflammatory markers					
PDGF	X	X			
VEGF	X	X			
TNF-α	X	X		X	X
IL-1	X	X			
IL-1β		X			
IL-6	X	X	X	X	X
IL-8		X			
IL-17				X	X

Abbreviations: IL-1, interleukin-1; IL-1β, interleukin 1 beta; IL-6, interleukin 6; IL-8, interleukin 8; IL-17, interleukin 17; NO_2, nitrogen dioxide; O_3, ground-level ozone; PDGF, platelet-derived growth factor; PM, particulate matter; SO_2, sulfur dioxide; TNF-α, tumor necrosis factor alpha; VEGF, vascular endothelial growth factor.
NOTE. References:[3,8].

mortality related to the virus.[6] Therefore, racial minorities with an increased risk of inflammatory stimulation due to air pollution exposure may be at the greatest risk for severe consequences of COVID-19. Few studies to date, however, have investigated the possible biological mechanisms behind such disparities.[4] This letter reviews the relationship between COVID-19, racial health disparities, and atmospheric pollutants, including $PM_{2.5}$, particulate matter-10 (PM_{10}), nitrogen dioxide, sulfur dioxide, and ground-level ozone. We then summarize implications for future research to investigate such links.

COVID-19 morbidity and mortality has been correlated with physiologic factors that may be influenced by air pollution. High levels of air pollutants have been found to impair the function of cilia in airway host defense, leaving individuals more susceptible to viral respiratory infections.[7] Exposure to sustained elevations in air pollution has been associated with an increase in type 1 inflammatory cytokines[3] (Table 1), which suggests that air pollution can drive a type 1 inflammatory state. The severity of COVID-19 infection has also been associated with a heightened type 1 inflammatory response with elevated serum levels of interleukin (IL)-1, IL-6, and tumor necrosis factor alpha in patients with COVID-19 requiring hospitalization and intensive care unit—level care and those with acute respiratory distress syndrome.[6] In addition, as endothelial damage seems to be a distinguishing feature of COVID-19 infection compared with other viral infections, it is worth noting that $PM_{2.5}$ and PM_{10} have been associated with overexpression of the platelet-derived growth factor and vascular endothelial growth factor, 2 potential contributors to cardiovascular disease.[3] Thus, air pollution may contribute to the underlying health conditions that make individuals more susceptible to severe COVID-19 infections, thus conferring an additional stressor on minority communities.

Several study models to determine the relationship between inflammatory markers and COVID-19 are promising. A prospective cohort model could follow patients after measuring a series of baseline inflammatory markers and evaluate changes in such markers among those in the cohort infected with COVID-19. This model would allow for the consideration of simultaneous comorbidities among patients that involve systemic inflammation, such as atherosclerosis or type II diabetes mellitus. A larger population study might compare inflammatory markers in demographically similar populations differentiated by air pollution exposure and track incidence and prevalence of respiratory conditions, including COVID-19 and subsequent respiratory impairment, over a lifetime. This may also help understand whether continued type 1 inflammation from air pollution influences the incidence of COVID-19 "long haulers." Studies of inflammatory biomarkers may provide more targeted anti-inflammatory medications to populations. In addition, investigating biological mechanisms may change the discourse on race alone as a risk factor, in favor of understanding the additional underlying environmental factors disproportionately affecting specific communities.

As air pollution drives environmental factors that may create a heightened risk for severe disease and mortality from COVID-19 in Black communities, it is crucial that future research addresses the role of pollutants in driving health care outcomes in these communities. We must find a meaningful way to consider environmental influences on our epidemiologic findings, health equity data, and clinical samples. Air pollution exposure should be factored into respiratory health studies, particularly in mechanistic studies involving airway epithelium, as the local inflammatory milieu may be differentially influenced by air pollution exposure. A national research initiative into the health disparities in COVID-19 severity is needed to compare community results across different geographic regions with differing baseline air pollution levels. As air pollutants vary in sources and seasonality,[8] each may be differentially relevant across communities. In addition, it will be important to understand the short-term and long-term exposure impact of air pollution on COVID-19. Evaluating the short-term impact may include assessing trends in COVID-19 cases with short-term changes in air pollution, secondary to stay-at-home orders. Communities of color make up a higher number of essential workers who have been unable to shelter-in-place during the pandemic.[9] Therefore, these communities may not see as dramatic a change in air pollution levels compared with other settings. The long-term impact of adjustments to public policy, transportation, and city planning on air pollution and disease severity must also be evaluated. Research should evaluate national trends in air pollution over time in relation to COVID-19 outcomes and compare community results across regions implementing different lockdown or social distancing policies. As the world grapples with COVID-19 and future respiratory viral illnesses, there is a need to understand how air pollution may drive severe COVID-19 outcomes, especially in vulnerable populations.

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Oral immunotherapy in infants

Immunoglobulin E (IgE)–mediated food allergy presents an increasing public health burden in the developed world.[1] An estimated 4% to 10% of children have an IgE-mediated food allergy by 1 year of age.[2-4] The Learning Early About Peanut Allergy trials revolutionized our understanding of food allergy development and shifted recommendations toward early introduction of peanut into the diet as a preventative measure.[5,6] Early introduction has also revealed promising results for the prevention of egg allergy.[7] Unfortunately, early introduction is insufficient to prevent all food allergies. There is tremendous interest in developing a safe and effective strategy to reverse or cure food allergy in those already afflicted.

In children 4 years and older, peanut oral immunotherapy (OIT) is approved by the Food and Drug Administration.[8] In this age cohort, the limitations of peanut OIT include a twofold increase in need for injectable epinephrine vs avoidance alone and low rates of sustained unresponsiveness (cure).[9] Vickery et al[10] suggested that outcomes may improve if desensitization is performed earlier in life. There may be greater immunoplasticity in younger children, and as such, infancy may serve as a critical window for a safe and efficacious OIT.[10]

Although strict avoidance remains the standard of care in infants with food allergy, it is increasingly apparent that physicians and patients are sometimes attempting OIT on their own. Rather than endorsing this approach, we seek to share a few stories brought to our attention to add to the meager data currently available regarding OIT in infants. Although these cases of infant OIT were performed separate from a medical institution, we have reviewed each case history and photographs in detail and believe that these cases will promote important discussion on OIT in infancy. Here, we present 3 infants who independently underwent OIT in their home under the guidance of physician parents trained in recognizing and treating allergic reactions. Each had antihistamines and injectable epinephrine readily available and none had access to clinic-based infant OIT in their community.

The first case was a 4-month-old female infant with eczema who developed diffuse urticaria and irritability with no additional symptoms within minutes after her first ingestion of a small bite of peanut butter (PB). She was given diphenhydramine with prompt resolution of symptoms. During a graded oral food challenge (OFC) with PB at 5 months, she tolerated a smear of PB but developed a diffuse urticarial rash on her face and body with no additional symptoms minutes after ingesting 300 mg peanut protein (PNP). OIT was started at 7 months with approximately 17 mg PNP. By 13 months, she was ingesting 300 mg of PNP daily with no symptoms.

The second case was a healthy 5-month-old male infant who initially ingested PB without symptoms, though 15 days later experienced an immediate-onset urticarial rash around his mouth and face with lip edema after ingestion of a small bite of PB. The rash lasted 60 minutes and self-resolved without treatment. During a blinded OFC, he developed an erythematous perioral rash minutes after ingestion of a pea-sized bite of dilute PB with no contact exposure. He had no symptoms ingesting 5 mL almond butter. At 6 months of age, OIT was initiated with approximately 24 mg PNP daily. During the first several weeks, he frequently developed perioral hives after his daily dose that self-resolved without treatment. The disappearance of rashes was interpreted as a sign to increase the dose. At 9 months, he was tolerated several grams of PNP daily and had no symptoms with an OFC to 3600 mg PNP, after which he transitioned to variable amounts of daily PNP maintenance.

The third case was a healthy 9-month-old female infant who developed a diffuse urticarial rash associated with swollen eyelids within minutes of ingesting several bites of cashew butter (Fig 1). She was given diphenhydramine with resolution within hours. OIT in the form of weighed cashew butter was initiated at 10 months with a starting dose of roughly 1 mg of cashew protein (CP). This was gradually increased over time until perioral hives developed, maintained until no hives were noted, then increased again. After gradual build-up over approximately 3 months, she tolerated an OFC with 5000 mg CP. She then transitioned to daily maintenance of variable amounts of daily CP.

Of note, 5 weeks into cashew OIT, infant 3 developed an immediate-onset urticarial rash after exposure to approximately 50 mg pistachio protein (PIP). She then abstained from pistachio ingestion until tolerating multiple grams of CP, at which point she consumed a higher dose of PIP without symptoms. At 16 months of age, she abstained from cashew and pistachio for 32 days after which she had no symptoms with ingestion of each nut protein.

In each case of infant OIT, there was no need for antihistamines, injectable epinephrine, emergency room visits, or hospitalization. These cumulative findings warrant further investigation as to whether infant OIT is a safe therapeutic modality in infants as young as 6 months. The short time to desensitization observed may be a reason to consider OIT in infants. It remains to be seen whether infant OIT may increase the likelihood of achieving sustained

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