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.

Transfusion and Apheresis Science 60 (2021) 103272

Contents lists available at ScienceDirect

Transfusion and Apheresis Science

journal homepage: www.elsevier.com/locate/transci

Letter to the Editor

The impact of climate change and emerging infectious diseases on the blood supply

The blood supply is under constant threat from myriad infectious diseases, evidenced by the devastating consequences wrought by hepatitis and human immunodeficiency virus (HIV) during the mid-to-late 20th century. More recently, malaria, West Nile, and Zika have influenced the blood donation and infectious disease screening process. For the previous 18 months, attention has focused on COVID-19 as the most recent possible transfusion-transmitted infection. Fortunately, there is no evidence that this disease is transmitted via blood transfusion. Nevertheless, these examples illustrate the ever-present risk of the introduction of new or unknown pathogens into the blood supply.

Many of the emerging infectious diseases that pose a risk to humans are zoonotic in origin, and most have yet to be detected or fully characterized [1]. While the blood supply is safer now than it has ever been, climate change and anthropological alterations in the natural environment are resulting in an increased incidence of emerging infections in locations where they were previously absent [1,2]. One example of this impact on the blood supply is highlighted by the United States (US) Food and Drug Administration's (FDA) implementation of required screening for babesia in blood donors in high-risk locations. Research has shown that the habitable range for the babesia tick vector may potentially expand secondary to climate change, placing an increased population, and therefore the blood supply, at risk [3]. Additional vector-borne diseases such as malaria and dengue are predicted to affect a larger population due to climate change and warmer temperatures [2].

Crimean-Congo hemorrhagic fever (CCHF) is one vector-borne disease that represents a prototypical zoonotic emerging infectious disease that may potentially threaten the blood supply. First described in the 1940s, this tick-borne virus was historically considered obscure, largely confined to agricultural workers in rural regions of eastern Europe, the Middle East, and sub-Saharan Africa where robust public health surveillance and blood screening infrastructure are limited [4].

Similar to the expanding habitat for the tick that transmits Lyme disease and babesiosis in North America, data have shown that climate change may allow for expansion of the CCHF tick vector's habitable range, placing new populations at risk, particularly in areas of southern and western Europe where public awareness of this disease is essentially absent [5–7]. While definitive cases of transfusion-transmitted CCHF have not been reported, person-to-person transmission via blood or bodily fluids, including in the nosocomial setting, does occur [4]. Given that viremia is not uncommon [4], and studies have shown serologic evidence of asymptomatic infections in blood donors in Spain [8], the theoretical risk to the blood supply warrants increased attention as climate change expands the susceptible population.

Like many emerging infectious diseases, there is currently no licensed screening test for CCHF in blood donors [9,10]. While the US FDA's deferrals for malaria and HIV have typically excluded much of the population at risk for CCHF [9], these questions will not be as effective if the disease emerges further into Europe. Enhanced surveillance measures and heightened awareness of individuals at risk, with concomitant development of laboratory diagnostics, are necessary. Clinicians, particularly transfusion medicine physicians, and those involved in blood collection activities must recognize that blood donors may be at risk for CCHF in areas where the disease has not previously been considered endemic. Thus, knowledge of questions pertaining to exposure, occupation, and symptoms is crucial to mitigate the potential threat of CCHF to the blood supply. This heightened vigilance is mandatory, since absent the use of pathogen reduction, transfusion transmission must be recognized before preventative measures are taken.

Funding

The research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The author declares no competing interests.

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Received 1 September 2021
Available online 6 September 2021

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