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.

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Non-evidenced based treatment: An unintended cause of morbidity and mortality related to COVID-19

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In light of the Coronavirus Disease 2019 (COVID-19) pandemic, world leaders and the media have propelled various treatment modalities that have not been approved by the US Food and Drug Administration (FDA) to prevent or cure acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Such treatments include nucleotide analogs (remdesivir), anti-malarial drugs (chloroquine and hydroxychloroquine), protease inhibitors (lopinavir/ritonavir), interferon-β, nonsteroidal anti-inflammatory drugs (NSAIDs), and renin angiotensin aldosterone system (RAAS) antagonists [1-3]. The unprecedented circumstances surrounding this pandemic does not discard the responsibility of respecting medical ethics, ensuring that medical information is accurate, and the published data meets expected scientific standards. Clinical trials testing the efficacy of single and combination treatments are needed to make clear recommendations for treating COVID-19. To date, there are no evidence-based treatments for COVID-19.

Non-evidence-based remedies are spreading across different populations and endangering the lives of individuals, particularly those with low health literacy. For example, given the sacredness of cows in India, some Hindus are drinking cow urine to prevent COVID-19, a practice backed by government officials [4]. In Iran, social media accounts circulated false stories of curing COVID-19 by drinking high-proof alcohol, poisoning over 2000 people due to the inadvertent consumption of methanol with bleach to hide its color [5]. The quick spread of misinformation regarding non-evidence-based treatments for COVID-19 may be due to feelings of fear, helplessness, and hope. Because there is no definitive treatment for COVID-19, people seek remedies based on their level of knowledge and personal or popular beliefs, which is detrimental to both their own health and the public's health.

In the United States, there has been controversy over discussions about injecting disinfectants into patients with SARS-CoV-2 infection or treating them with ultraviolet rays [6]. Disinfectants are poisonous when mishandled, but when these concepts are circulated to populations with low health literacy, people may poison themselves from self-administration. Of note, there had been a 20% increase in calls to U.S. poison centers related to disinfectants and cleaning products compared to last year [7]. While some of these calls are related to accidental pediatric exposures, others involve inadvertent misuse of the product [7]. There were notable increases in inhalational exposures, as well as exposures to bleach products and alcohol-based sanitizers [7]. Even though chloroquine derivates are not approved treatments for COVID-19, there has been a great deal of media attention surrounding the potential therapeutic benefit of the drugs. Due to the media attention surrounding chloroquine, an Arizona man died after ingesting chloroquine phosphate (an additive to household products meant to treat fish parasites) in an effort to prevent himself from getting infected with coronavirus. [8]. In Madagascar, there were claims of an herbal coronavirus "cure" produced from the artemisia plant, yet the WHO stated that the tonic is not evidence-based and is potentially toxic [9]. Promoting unproven COVID-19 treatments will only worsen the current healthcare crisis, as people will certainly experiment with these remedies. As a result, health care systems will become overwhelmed with many critically ill patients, from both COVID-19 and those with toxicity from nonevidence-based treatments.

There has also been increased media coverage for "alternative" remedies to prevent and treat SARS-CoV-2 infection. For example, it is common in China to use of herbal plants to fight the virus including jinhua qinggan capsules, lianhua qinwen capsules, and shufeng jiedu capsules [10]. These herbal formulas contain a combination of many herbs and the exact proprietary mixture is not available, posing a major health risk to patients due to their potential toxicity, contamination, or adulteration [10]. Although traditional medicine techniques were widely used during past epidemics such as severe acute respiratory syndrome (SARS) and H1N1 influenza, a Cochran Review found that Chinese herbs combined with western medicine did not decrease mortality versus western medicine alone [11]. Use of Chinese herbal products for treating viruses is not guided by viral pathology, rather herbs are prescribed by herbalists according to Chinese diagnostic patterns (inspection, listening, smelling, inquiry, and palpitation) [12,13]. The implications of medicating with herbal-based formulas are serious and dangerous because there is no scientific evidence suggesting that these alternative remedies can prevent or cure COVID-19. There are several adverse effects noted with herbal medications, such as hepatotoxicity, and there have been numerous reports of toxic contaminants, including pesticides and heavy metals [14]. Furthermore, although supplementing with vitamins and minerals may improve immune function, there is no evidence to suggest that the use of any supplement will prevent or cure COVID-19. Similarly, "cures" spread by social media accounts (which include gargling vinegar and rosewater or salt, and drinking concoctions of mint or white willow with saffron, turmeric, and cinnamon) are not evidence-based, though they may have other nutritional benefits [15]. Medicating with these herbal formulas or supplements may lead to adverse health effects due to imprecise dosing of the supplement or herb, inherent toxicity of the herb itself, or toxicity of the contaminants in the product, thus complicating the clinical picture.

The spread of nonevidence-based COVID-19 treatments or cures will undoubtedly worsen the magnitude of the pandemic. As people turn to traditional and nonevidence-based medicine techniques, it may further stress an already overwhelmed heath care system. Like the WHO Information Network for Epidemics (EPI-WIN), future efforts from world leaders and the media should promote the

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communication of accurate, reliable, and data-driven content to avoid the spread of misinformation [16].

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