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Dietary supplements and nutraceuticals market growth during the coronavirus pandemic – Implications for consumers and regulatory oversight

Nutraceuticals and dietary supplements are products derived from natural sources with purported health benefits that have become widely available over the last two decades. Defining these products has been challenging. It is generally considered that nutraceuticals are supplements with health benefits that extend beyond their basic nutritional value, by not only supplementing the diet, but they also contribute to the prophylaxis and/or treatment of a disease or disorder [1], whereas a dietary supplement does not. However, these types of products are often met with skepticism due to efficacy and safety concerns, in part due to the well-documented lack of regulation and oversight in the nutraceuticals sector [2].

Despite these concerns, the global nutraceuticals and supplements market has steadily grown over the past decade and was reported to be worth almost \$353 billion USD in 2019 [3]. Research in the field has also grown, with over 70,000 published articles available in PubMed relating to nutraceuticals or dietary supplements respectively between 2010 and 2020. The occurrence of the coronavirus disease 2019 (COVID-19) pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) starting in November 2019 led to an even greater increase in sales of dietary supplements and nutraceuticals in early 2020. In the grips of a devastating global pandemic, consumers sought additional protections from viral infection and disease based on the assumption that supplement products may offer health benefits or “immune-boosting” effects if consumed [1,4,5].

In the United States prior to the pandemic, dietary supplement sales increased by 5% (\$345 million) in 2019 compared to the previous year. However, there was a 44% (\$435 million) increase in sales in the six weeks preceding April 5th, 2020, during the first wave of the pandemic, relative to the same period in 2019 [6]. In the U.S., it was reported that the demand for multivitamins spiked in March 2020 with sales rising by 51.2%, with total sales of vitamins and supplements reaching almost 120 million units for that period alone [7]. In the UK, vitamin sales alone increased by 63% and in France sales grew by approximately 40–60% in March 2020 versus the same period the previous year [8]. In Poland, online consumer search trends relating to supplements increased during the first wave of the pandemic, which was sustained through the second wave of the pandemic [9]. The increased global supplement sales have largely been propelled by the intense interest in supplements as possible prophylactics of COVID-19 via maintaining or improving immune function [9].

The scientific community has also been interested in investigating the purported antiviral and immunomodulatory effects of several dietary supplements and nutraceuticals candidates for the prophylaxis and/or treatment of COVID-19. These include multivitamins, probiotics,

zinc, vitamin C, curcumin, selenium, and melatonin to name a few [10–12]. Surprisingly, data from the University of Oxford’s Evidence-Based Medicine Data Lab’s COVID-19 TrialsTracker indicates that traditional medicines are the most common intervention registered for clinical trials against COVID-19, with vitamin D, vitamin C, and probiotics also present on the list amongst the many pharmacological interventions under investigation [1,13,14]. Of all the supplements of interest, vitamin D has caught the attention of scientists and many individuals on social media [15]. This occurred in part because vitamin D deficiency was widely reported amongst COVID-19, and it was associated with COVID-19 incidence. Vitamin D has immunomodulatory roles in humans [16,17]. Therefore, the relationship between COVID-19 and vitamin D is now the focus of intense research and is the subject of numerous clinical trials [16].

The impressive growth trends observed in the nutraceuticals and supplements market is unlikely to continue and it is expected that the market growth will normalize to prepandemic rates in the near future [18]. However, other concerns exist surrounding the regulatory oversight of the industry with regards to efficacy, safety, and consumer exploitation, which was apparent in some instances during the pandemic. Indeed, the Food and Drug Administration (FDA) in the United States wrote several letters to supplement companies in response to false advertisements claiming that components of their products could prevent SARS-CoV-2 infection or even cure COVID-19 [1]. Some products claimed to offer protection from COVID-19 for an exploitative fee of \$23,000 USD, whereas other companies and individuals enticed customers to purchase herbal supplements, essential oils, exotic extracts, multivitamins, etc., all parading various fraudulent claims. Some products touted, such as oleandrin, were even potentially toxic if consumed. Almost 200 other products with fraudulent claims relating to COVID-19 can be viewed on the FDA website [19]. Similar issues have been documented by Health Canada [20] and the State Administration for Market Regulation in China [21].

Considering the consumption of dietary supplements is on the rise globally, and because of the observations during the pandemic, it is not surprising that regulatory authorities are scrutinizing the industry further. Indeed, authorities in the United Kingdom have been considering new laws to deal with oversight gaps in the nutraceutical industry [22]. It is likely that other international regulatory authorities will also move to re-evaluate current regulations, but certainly a common international framework [2] should be considered in order to protect consumers and add credibility to the industry across international borders.

It is important that any future regulatory oversight must protect consumers from false, misleading, or harmful products. Moreover,

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authorities must also ensure that any new regulations introduced do not stifle the creativity of potential new companies or products, which could lead to future therapeutics or prophylactics.

It is likely that the requirement of clinical evidence at a standard akin to pharmaceutical trials may asphyxiate innovations within the nutraceutical sector due to the sheer scale and costs required to run such trials. This may dissuade smaller companies from developing nutraceuticals. Nutraceutical trials may be confounded by multiple factors including dietary changes, which is particularly important to recognize in a field where effects sizes are likely to be small. These confounding factors likely contribute to why there is still ongoing debates about the efficacy of many nutraceuticals and dietary supplements, such as omega-3 fish oils for cardiovascular health [23,24]. However, trials are important to conduct as in addition to the relevant safety and efficacy data to support the products being investigated, they can also provide mechanistic evidence, supporting information for dosing ranges, and credibility to the product. The fine balance between protecting consumers versus the potential for overregulation and stifling of the nutraceutical market is an important consideration for regulatory bodies. Classifying nutraceuticals as a medicine for the purpose of product regulation is likely to lead to less innovation in the nutraceuticals sector for the reasons outlined. Although it is not clear what influence the COVID-19 pandemic may have on future regulatory oversight. In any case, it is important that separate transparent regulatory frameworks are created for nutraceuticals outside the purview of medicinal products but elevated above dietary supplements to support the nutraceutical sector. To achieve this, it is important to have consultation between both regulatory authorities, scientists, and leaders in the industry to ensure that any future regulations are adept to the specifics of the nutraceutical sector.

Future pandemics are inevitable, and while the COVID-19 pandemic is not over yet, it is important that scientific and regulatory stakeholders of the dietary supplements and nutraceuticals industry keep one eye on preparing for the next pandemic.

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