

Post Covid Stage - Role of Chemists, Scientists and Manufacturers on the Decision Making Front

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As we speak, the entire global socio-economic matrix is resentfully affected by the new Severe – Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2) which initially had its outbreak in the Wuhan Province of China in December 2019. The recently emerged virus strain that causes this disease (now known as Covid-19) is found to be highly contagious among humans. Thus the World Health Organization (WHO) identified it as an ongoing global pandemic (World Health Organization, 2020). The total number of infected cases are currently reported to exceed 38 million with over 1 million deaths from around the world (World Health Organization, 2020).

In an attempt to understand the most common and viable modes of the virus transmission, scientists confirmed that the respiratory droplets ejected through a sneeze or a cough of an infected person could carry the virus into a healthy individual who is at a distance, due to the ability of the droplets to travel through air. Carolyn Machamer, a Professor of Cell Biology at the Johns Hopkins School of Medicine U.S, reveals information on the possible spread of the virus. She states that the Covid-19 virus is active for up to 72 hours on plastics, 48 hours on stainless-steel, 24 hours on cardboard, 4 hours on copper and around 3 hours in the air. Her article in the New England Journal of Medicine iterates that the primary mode of the transition of the virus is through direct contact of the respiratory particles of an infected patient (Machamer, 2020).

The accelerated spread of this highly contagious virus has led a large part of the world into a high socio-economic stress. With the daily increase in the number of patients, hospitals started running out of intensive care unit (ICU) beds to treat many patients simultaneously. Various actions such as country wise and state wise lockdowns, travel restrictions, limited crossing of geographical borders, long term temporal closures of businesses and import bans have driven

societies into different dimensions in terms of lifestyle, now commonly termed as the “New Normal”. The only response that could be given to curtail the quick spread of the corona virus was to adapt altered ways of living, such as minimizing physical social interactions and avoiding public gatherings. Many developed countries with developed economies and markets, were rapidly facing the repercussions of extended lockdowns. Among such economies are the world’s largest; China, India, Japan, Italy, France, U.K and Canada to name a few. The term “New Normal” was frequently used by many companies to refer to new ways of living, working, and doing business. “A New Normal” is a “state” where economies and societies attempt to settle in, post a crisis. This “state” is way different from the previous lifestyles and life circumstances prior to the crisis (Pye, 2020)

The basic principles of carrying out businesses changed rapidly within a short period; the needs and wants of communities were not the same compared to the pre pandemic times. This could be considered a turning point, where professionals from different backgrounds had to synergize to ensure a country’s social and economic activities are brought back to normal quickly. With the breakout of Covid-19, there was an increased need for sanitation and personal hygiene. A simple disinfectant such as a mixture of ethanol (62% - 71%), hydrogen peroxide (0.5%) or sodium hypochloride (0.1%) diluted with water is identified as a feasible mixture to break the delicate lipid envelope that surrounds the virus (Rajapakse, 2020).

From a consumer point of view, the “soap activity” was never considered as a specialized and an important area of concern. Instead, they were more focused on factors such as value for money, fragrance and germ protection etc. at the point of purchase of a bar of soap. In such situations, the chemists have a huge role to play in working hand in hand with soap manufacturers to develop new innovations. The liquid form of a basic soap

(commonly known as a handwash with active disinfectant properties), skin cleansing agents with disinfectant properties coupled with other active features such as skin moisturizing, fragrance, age and gender specific variants are some of the options available for chemists to develop and an opportunity to, synergistically, work with product development and marketing professionals. Other hand sanitizing products such as hand sanitizing liquids, gels, sprays and wet tissues [which were minor product categories pre Covid-19 period], have now grown in volumes during the post Covid 19 period. By nature, chemists are known to be creative; thus, have an opportunity to probe and find complementary properties that could be structurally coupled with the basic 70% ethanol hand sanitizers currently in the market. With increased frequency of the usage of hand sanitizers, there would arise a need for the alcoholic sanitizer to provide for skin moisturizing and aromatic properties at an affordable rate. Consequently, a requirement may arise where hand sanitizer bottles need to be produced from recyclable or bio-degradable material to achieve business sustainability targets of their manufacturers. Hence, chemists would turn out to be professionals who are recognized for their product development and synthesizing skills.

It is recommended to use fatty acids (soap) based cleansing agents and ethanol-based hand sanitizers to disrupt the lipid outer coating of the deadly virus to eventually kill its activity and thus, prevent its spread. Such work involving structural elucidation and development may be regarded as a joint effort of a chemist and a biologist (Rajapakse, 2020).

Household disinfectant may be a mandatory item in the shopping list in future. Recommendations on suitable concentrations, frequency of application of the disinfectant and health effects are some of the characteristics sought after by manufacturers. Such household disinfectant products which were once in the market solely to serve the basic cleansing, disinfecting and stain removal purposes will now be modified into products with additional features such as fragrance, formats (sprays, diluted liquids, ready-to-use mixes, and automatic spray refill bottles) and specialized products for different surfaces etc. The need to constantly keep surfaces clean and “virus-free” was a basic and a primary need before. Claiming that a venue or a surface is sanitized,

is considered more of a “value added requirement” at present. In order to recommend such simple but effective and variable methods of destroying the virus, a chemist’s knowledge on the chemical structure of the virus and its 3-D arrangements is required (Rajapakse, 2020).

Due to the ability of the virus to remain active for a significant period of time on common surfaces, hospital wards and other venues, new disinfectant mechanisms have to be developed. Paint industry will not be the same as before. Back then, when purchasing paint for a house or industrial purposes, consumers only looked for quality, durability, value for money, ease in cleaning and variety of shades. Presently, antiviral paints that could be used on walls and floors are already being produced by industrial chemists for the purpose of usage in hospitals. Application of such paint on walls and floors would significantly reduce the spread of the virus out of the wards and also provide some protection for the medical staff working within the wards. Chemists found that silver nanoparticle-containing wall and floor paint coatings would serve the purpose; apparently, it was even used at Wuhan province hospitals (Rajapakse, 2020). Silver nanoparticles are identified as antiviral agents; such antimicrobial paints will soon be an industrial hit. Consumers will discretely look for paint with antiviral properties, a part of what is called the new normal, in the near future.

Sri Lanka was one country which was adversely affected by the downfall of the apparel industry, despite it making a huge contribution to the country’s GDP through the export sector. Fashionable and trendy garments which was once dominant in the market would not be perceived the same way in the New Normal. It may sound fictional, but special materials are already in the market with antiviral or virus resistance properties. An affordable version of it could even be used for medical staff working in Covid-19 wards. Although it is not commercially popular yet, the time has come for apparel manufacturers to assess the market potential for such garments to be used on a daily basis. The effectiveness versus affordability of such material may be a key determining factor in this respect.

This phenomenon would also extend to laundry cleaners. Laundry cleaning bars, powders, liquids, tablets, will be mandatorily carrying antiviral and antibacterial qualities. Although there are few laundry cleaners with

antibacterial properties in the market, the consumer under the “new normal” phase would increasingly look for such properties. The chemists, in turn could attract the manufacturers by offering ranges of options to suit their customers’ needs. It sounds like a fable, but soon the consumer will look for creative and interesting options to clean their laundry, with priority on sanitation. Commercial laundries will have to re-position themselves as a service provider that washes and cleans the clothes with antiviral detergents, usage of antivirus after washes and fabric conditioners and finally steam iron using antivirus solvents. These are some of the few areas where there is potential for chemists to carry out patentable innovations.

Airlines is one of the main industries that suffered huge losses due to Covid-19. The International Air Transport Association (IATA) states that international travel numbers will not return to the pre pandemic level until 2024 (Pearce, 2020). The main point of caution is the enclosed environment in the airplane cabin. Almost all airlines claim to have the best air purification systems within the cabin air ensuring safety of their passengers, but the lack of knowledge on the behavior of the droplets carrying the virus may turn down passengers who may use travel for non-essential purposes. Chemists and cell biologists could combine their knowledge and skills in the development of sanitation mechanisms of these cabin air purification systems. It could be a life-saving exercise for the entire industry.

A similar approach may be necessary for air-conditioners. Efficiency and durability were sought after factors in air-conditioners. Consumers will now be ready to pay a premium price for an option with automatic air purification including sanitation that could ensure deactivation of any viral and bacterial particles hovering in ambient air. Such novel technology will not only be useful in the domestic front but also in commercial places, hospitals etc. It could be adaptable in automobile air conditioning and purification systems as well. Lighting systems too could be developed as sanitizing agents which dissipates “anti-viral radiation” apart from its generic requirement of simply lighting up a venue.

The “New Normal” spoken amongst almost all economies will now have new methods of associating products and services to cater to the present requirements (post pandemic) as compared to the pre pandemic times. Some industries may be suffocating during this phase; however, it has also given an opportunity to diverge into areas which were never thought of otherwise. Thus, when manufacturers alter their mindset in re-directing industries to cater to the new normal, there lie huge opportunities for industrial scientists to innovate and cater for these needs. Not only should the chemists, cell biologists and virologists be in the fore-front of innovations but also in the advisory front to spread scientific awareness towards curtailing the spread of the pandemic.

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