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A Second Pandemic? Perspective on information overload in the COVID-19 Era

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Abstract

The outbreak of COVID-19 has impacted the globe in previously unimaginable ways, with far-reaching economic and social implications. It has also led to an outpouring of daily, ever-changing information. To assess the amount of data that was emerging, a PubMed search related to COVID-19 was performed. Nearly 8000 articles have been published since the virus was defined four months ago. This number has grown exponentially every month, potentially hindering our ability to discern what is scientifically important. Unlike previous global pandemics, we exist in a world of instantaneous access. Information, accurate or otherwise, is flowing from one side of the world to the other via word of mouth, social media, news, and medical journals. Changes in practice guidelines should be based on high-quality, well-powered research. Our job as healthcare providers is to mitigate misinformation and provide reassurance to prevent a second pandemic of misinformation.

Background

The outbreak of the novel coronavirus disease 2019 (COVID-19) has impacted the globe in previously unimaginable ways. It has had far-reaching economic, social, and cultural implications. This has universally changed our daily lives, decimated global economies, prompted rapid changes in healthcare systems, and even inspired new colloquial terminology, such as "social distancing."

The global impact of COVID-19 has also led to an outpouring of ever-changing information. Daily, we hear about new, and potentially unproven, medical treatments and breakthroughs. Unlike previous pandemics, we exist in a world of instantaneous access. Information, accurate or otherwise, is flowing from one side of the world to the other via word of mouth, social media, and medical journals. Although there are benefits to global connection, this deluge of information—spurred by the public's insatiable appetite for information—threatens to drown out the critical and scientifically sound data. While peer-reviewed publications have begun to objectively investigate the scientific underpinnings of COVID-19, many recommendations may have limited basis in fact.

Discussion

Research has shown that consumers offered too many choices are less likely to buy anything at all. We sought to quantify the amount of COVID-19 data that is emerging in the literature to objectively demonstrate the information overload that we are experiencing. A comprehensive literature review was performed to identify articles related to COVID-19 using PubMed. Key search terms and synonyms included: COVID-19, COVID, novel coronavirus, and SARS-CoV-

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2. Citations for all relevant articles—including peer-reviewed manuscripts and health care association guidelines—were exported to excel and publication dates were analyzed. Irrelevant articles and articles without specific publication dates were excluded. The number of articles published per month was calculated for each month following the identification of COVID-19, which included January 2020 to April 2020 (Table 1).

A similar search was performed for articles related to the Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) outbreaks. Search terms included: SARS, severe acute respiratory syndrome, SARS-CoV, MERS, middle east respiratory syndrome, and MERS-CoV. A similar calculation was performed to identify the number of articles published per month in the four months after each virus was defined (Table 1). Date range included March 2003 to June 2003 for SARS, and May 2013 to August 2013 for MERS. For the COVID-19 related search terms, a total of 7719 articles met criteria for inclusion. In comparison, 277 and 58 articles met similar criteria for SARS and MERS, respectively.

An outbreak of an unknown respiratory illness in Wuhan, China was initially reported to the WHO China Country Office on December 31, 2019.[1] A new type of coronavirus was isolated on January 7, 2020, and on February 11, 2020, the official name "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2) was adopted.[2] With the discovery of the genetic makeup of the virus and the rapid spread of the disease in China, scientific research blossomed. During the month of February, there were over 300 publications related to COVID-19. The majority of these publications detailed basic science and clinical experiences managing COVID-19. However, as the virus spread throughout the world, there was exponential growth in information as the virus

captivated the world's attention. In the month of March, nearly 1800 peer-reviewed articles were published regarding COVID-19. The following month, that number peaked 5600, averaging to almost 200 articles daily.

To place this into perspective, SARS and MERS generated 3.6% and 0.75% as many academic papers respectively within the first four months of each pandemic. In the 17 years that have elapsed since the emergence of SARS, the total number of peer-reviewed publications regarding SARS has not surpassed the number of COVID-19 articles produced within the first four months of the pandemic. Unlike SARS and MERS, COVID-19 has caused an exponential increase in PubMed activity (Figure 1).

Most notably, this is the first pandemic in the era of social media. Our enhanced ability to distribute and consume information virtually connects us, but also contributes to the dissemination of falsehoods and miscommunication. In a time of widespread immediate access, conflicting advice and data leads to an overly informed public, which translates to a worried and uninformed public. We are bombarded with contradictory headlines: practice social distancing; promote herd immunity; there is no cure; there are many cures. With little time to discern due to an underlying current of distraction—heightened by the daily stresses of navigating life during a pandemic—even highly educated individuals lack the mental stamina to process the emerging facts and fictions.

It is no surprise that on March 28, UN Secretary-General António Guterres called for the scientific community to "urgently promote facts and science" and to address the "growing surge

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of misinformation" about COVID-19. While many peer reviewed publications contain important information regarding the epidemiology and management of COVID-19, this relevant information is being drowned out by the sheer quantity of publications. This abundance of information is contributing to wide variability in practice, causing confusion, and impacting ability to provide adequate patient care. Best practices are changing not only week to week, but day to day. We need to be mindful of the current literature, and not emphasize quantity over quality. Changes in practice guidelines should only be based on high-quality, well-powered research, which will only come to fruition with time. Our job as healthcare providers is to mitigate misinformation and provide reassurance. We must remain vigilant and objective in order to manage this second pandemic of misinformation.

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Table 1: The number of new articles published per month, for the four months, after each disease entity was defined.

		Number of Articles Published		
		COVID-19	SARS	MERS
Months Elapsed Since Virus Defined	0	55	1	4
	+1	341	23	11
	+2	1728	76	15
	+3	5595	177	28
	Total	7719	277	58

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Figure 1: Graphical depiction of the number of new articles published per month, for the four months, after each disease entity was defined.

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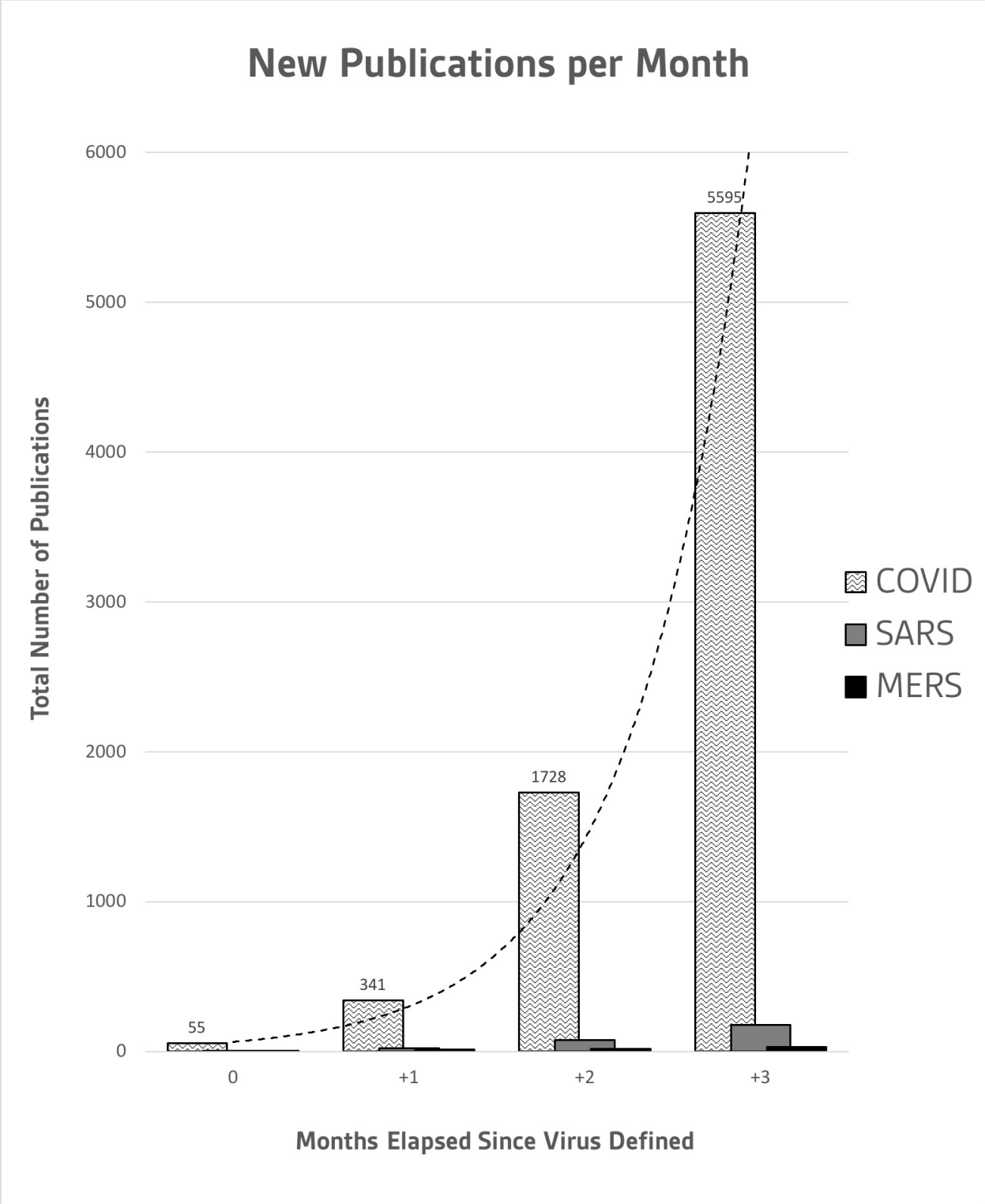

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