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Analysing the Utilisation of Nudge Theory in India's Fight against the COVID-19 Pandemic

Laavanya Dhawan[1], Shree Bhattacharyya[2] and Hansa Mukherjee[3]

[1] *B.Tech, Information Technology (Network Security), Netaji Subhas University of Technology, Delhi, India*
[2] *B.A. Hons., Ashoka University, Haryana, India*
[3] *B.A. Hons. Economics, Lady Shri Ram College for Women, University of Delhi, India*

Abstract

This paper aims to explore and analyse the utilisation of the Nudge theory, popularised by Nobel laureate Richard Thaler and scholar Cass Sunstein, in the fight against COVID-19 in India. With the University of Cambridge study "India nudges to contain COVID-19 pandemic: A reactive public policy analysis using machine-learning based topic modelling" as the foundation, we examined the magnitude of nudge theory's utilization in the areas of social distancing, hoarding and handwashing by employing data visualization techniques and analyzing the raw data to find a correlation between the nudge policy and measure the extent of its influence. Throughout the paper, we also highlight reasons as to why the Nudge Theory has been a success, and conclude with an array of suggestions that can be applied going ahead.

Keywords: *Nudge Theory, COVID-19, human behaviour, technology, Digital Technology*

1.0 Introduction

In a meeting on January 30, 2020, the Director-General of the World Health Organization (WHO) officially declared the novel coronavirus outbreak a Public Health Emergency of International Concern (PHEIC) as it had spread to 18 countries and was rapidly spreading all over the world (WHO Director-General's statement 2020). The Coronavirus pandemic, which has recorded over 9,95,66,486 cases worldwide (Worldometers.info 2020), first reached India on 31 January 2020 (BMJ 2020). Since then, the country has been fighting the virus relentlessly, with the help of scientists, health care workers, and the nation's solidarity in abiding by the government rules and policies. As of January 24th, 2021, India is now battling over 1,06,68,356 cases (Worldometers.info 2021), however, according to the study, "India nudges to contain COVID-19 pandemic: A reactive public policy analysis using machine-learning based topic modelling", by the University of Cambridge, India would have been in a much more dire situation had the Indian Government not used the 'Nudge Theory' to contain the virus, and enforce a strict lockdown during the first quarter of the year. (Debnath and Bardhan 2020).

The Indian Government had the foresight and ingenuity to use small economic behavioural signals to influence the general population in a subtle but essential way. This method of nudging, developed from the Nudge Theory popularised by behavioural economists Richard Thaler and Cass R Sunstein, was an essential component of India's response to the COVID-19

pandemic. Nudge Theory states that people can be "nudged" in particular directions and that small or subtle solution (or 'nudges') can lead to cost-effective, positive, and beneficial outcomes (Thaler and Sunstein 2009). On 29th March 2020, Prime Minister Shri Narendra Modi addressed the entire nation, and in his speech, he outlined that the country would have to go into lockdown. He invoked national sentiment and togetherness by bringing up India's 'values and culture' (Press Information Bureau 2020). Through this speech and other similar addresses, Prime Minister Modi used sentiments of nationalism and values as keywords to influence or 'nudge' the people of India to abide by the quarantine rules, and brought forth a positive consequence where the overall cases were less than what they would've been, had the Nudge Theory not been used.

Thaler and Sunstein, in their influential book *Nudge: Improving Decisions About Health, Wealth and Happiness,* define nudges as 'any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives' (Thaler and Sunstein 2009). The study by the University of Cambridge used a machine-learning-based Topic Modelling (TM) and the Latent Dirichlet Allocation (LDA) algorithm, through which they identified keywords that have 'nudged' the nation in particular directions. (Debnath and Bardhan 2020)

This paper, using the University of Cambridge study as a foundation, further analyses nudging by the Indian government in the area of hand washing, hoarding, and social distancing which were the three cornerstones of keeping the population's health secure. Further, this paper builds on the ML-based Topic Modelling and the LDA algorithm and identifies similar patterns of probability and key phrases that have helped nudge the people of India to get tested more, wash hands more, wear masks more frequently, and overall help reduce the spread of the virus (Debnath and Bardhan 2020). In previous studies such as the Cambridge research article, the importance of nudging and its influence, especially in India, has been recorded. However, this paper not only explores the past influence of nudging but also intends to highlight future suggestions and opportunities for the Nudge Theory to be used in the ongoing fight against the Coronavirus outbreak.

2.0 Literature Review

Although elements of nudge theory have been found in the science of behavioural analysis (Simon and Amarilli 2018), it was popularised later in 2008 as a distinct theory by behavioural economist Richard Thaler and scholar Cass Sunstein. Nudge theory has since been applied to aid governments and businesses alike in multiple ways. But the Nudge theory's role in battling the pandemic has been its biggest victory yet.

While scientists around the world clamoured to make the vaccine, governments were left with limited resources to fight a situation never faced on such a large scale. All over the world, the virus threatened to shake the very bases of entire countries. With India's Densely populated land one of the key steps to tackle the spread of this virus was social distancing, which was difficult to implement in a country with entire slums that had thousands of people using the same water source and bathrooms. A key issue that the country was facing at this time was delivering complicated information to the masses when many were not literate.

Nudge solved these problems. Social distancing refers to a host of public health measures aimed at reducing social interaction between people based on touch or physical proximity (Arierly 2010). It is a non-pharmaceutical intervention to slow the spread of infectious diseases in the communities (Mishra and Majumdar 2020). The message of social distancing began spreading not through complicated graphs but SMS forwards and caller tunes in one's regional language. The Aarogya Setu app with its tracking feature became a contact tracing app that could be used to assess one's risk level and further encourage people to take better precautions. Even after the strict lockdown was lifted, these measures ensured that people would continue to maintain social distance.

The importance of the SMS was also explored by a large-scale messaging campaign in West Bengal, India. Twenty-five million individuals were sent an SMS containing a 2.5-minute clip and these SMSs were delivered by the 2019 Nobel laureate Abhijit Banerjee, as recorded in the paper "Messages on COVID-19 prevention in India Increased Symptoms Reporting and Adherence to Preventive Behaviors Among 25 Million Recipients with Similar Effects on Non-recipient Members of Their Communities". The paper highlighted one of the key points that nudge is based on. Each message sent in this campaign was sent with a motivation involved, with

effects either on oneself or everyone around, which acted as a positive reinforcement for people to participate in the action. This could also be attributed to the framing effect. Framing effect refers to the fact that individuals' choices often depend on the way the choices are described, or framed, and that these choices are often affected by whether the possible outcomes are framed in terms of the gains or the losses (Daniel Kahneman and Amos Tversky 1979).

The paper also touched on two very important points that could be the hidden reason for why nudge worked. Firstly, although wearing a mask was never even mentioned, the habit increased just because of its association with the other two positively framed habits of social distancing and maintaining personal hygiene. Social distancing and maintaining personal hygiene also increased in sample sizes where one of the terms was used but not the other. This indicates that the Indian government's efforts in spreading encouragement for indulging in any of these habits would result in a safer and more secure society. Secondly, the message reached people in the communities that had not even been given the message. This is important because even in this age of technology, there would be many in India with no means to access it. Information being disseminated even in this manner would be useful in spreading the message of inculcating these life-saving habits because of herding behaviour. Herding behaviour occurs when people consider a certain behaviour to be good or bad based on the behaviour of other people and mimic their observed behaviours (Ariely 2008). This is one of the main reasons why nudge was successful in fighting the pandemic.

The other two areas in which the nudge theory showed improvement was that of handwashing to reduce the spread of the virus via contact, and the hoarding of essential supplies.

Hand washing was encouraged through advertisements by various soap companies. Sanitisers stationed in public places further prompted people to adhere to this habit. During and after the days of the lockdown, the Indian market was susceptible to rampant panic buying and hoarding, examples of which had been seen during the bubonic plague outbreak in Surat during 1994 caused by lack of proper steps taken by the government (Rubin and Dickmann 2010). However, this time around that was not the case. The Indian Railways gave dual support by not only converting old trains into isolation wards but also ensuring a resilient supply chain of essential goods (Debnath and Bardhan 2020). In a matching move, the mission "Lifeline UDAAN" forged by the Ministry of Defence and Ministry of Civil Aviation ensured the timely

supply of essential medicines and devices (Debnath and Bardhan 2020). This created a sense of security amongst the general public that stopped them from taking part in stockpiling or hoarding.

The paper, "India nudges to contain COVID-19 pandemic: A reactive public policy analysis using machine-learning based topic modelling" outlines the number of ways in which the Indian government exercised the nudge theory. The paper found that the government urged small businesses to manufacture PPE kits, masks, hand sanitisers, and other necessary supplies because of the shortage and then in turn even encouraged the citizens to buy from these small enterprises (Debnath and Bardhan 2020). The government also promoted home-schooling through advertisements of their National Digital Library of India. The special focus on culture and solidarity appealed to the masses and ultimately nudging emerged victorious in India.

3.0 Data Analysis

Around the time when an unprecedented 3 week nationwide lockdown was imposed starting from March 25, 2020, The Center for Disease Dynamics, Economics & Policy (CDDEP), came out with a report on Coronavirus in India in collaboration with John Hopkins University, stating that India was likely to see as many as between 12.5 crore to 24 crores of its people being infected with the deadly COVID-19 virus in the best and worst-case scenarios respectively (CDDEP-John Hopkins report 2020). As of 22 January 2021, India currently has a caseload of 1.05 crore cases with the active cases on a downward slope, as seen in Figure 1.

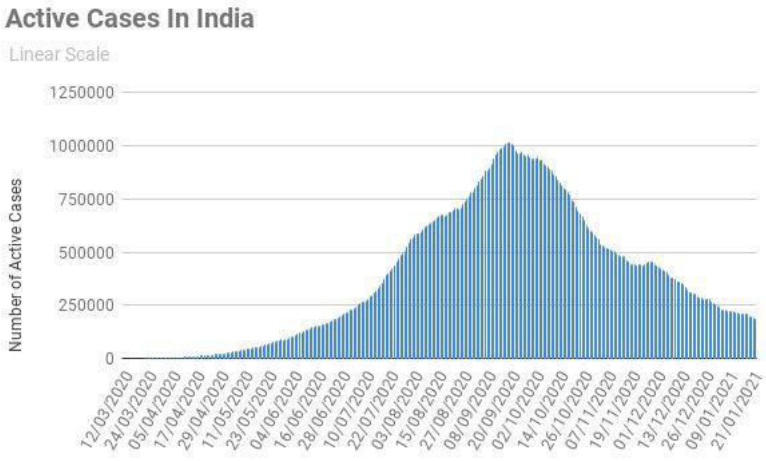

Figure 1: Active Cases in India

India successfully avoided this horrifying prognosis and Nudge Theory played a crucial role in curtailing the pandemic well within time. The University of Cambridge study analysed a total of 396 documents released by the Press Information Bureau (PIB) from January 2020 to April 2020. The study employed the Latent Dirichlet Allocation (LDA) algorithm, an unsupervised machine learning algorithm that works on the idea that each document can be described by a distribution of topics and each topic can be described by a distribution of words. The study identified the reactive nudge policies employed by the Government of India based on high frequency and co-occurrence of certain words in government press briefings and social awareness campaigns. High co-occurrence of words like 'government' with 'help' and 'facility' as mentioned in the Cambridge study, reinforced to the Indian public that the government of India had taken extensive public policy and infrastructural measures to assist the Indian population with COVID-19 testing, availing essential services during the lockdown and accessing healthcare facilities (Debnath and Bardhan 2020). This helped the Indian public gain confidence, trust the course of action, follow the public policies the government put forward and abide by the stringent lockdown measures enforced. The lockdown prevented as many as 14-29 lakh COVID-19 cases and 37,000 to 78,000 deaths by mid-May according to The Ministry of Statistics and Programme Implementation. The shift in the frequency of certain words like 'testing', as seen in Figure 2, from February to April further highlights how the Government shifted its focus onto mass testing and persuaded the public to get tested at the earliest if symptoms arise. The government cautioned the public and gave multiple reminders for preventing the spread of this virulent disease by inculcating habits like wearing masks and washing hands. This is indicated by the high probability of occurrence of words like Hand Washing (probability=0.060) and mask (probability= 0.120) in the Press Releases by the Office of the Principal Scientific Advisor to the Government of India as seen in Figure 2.

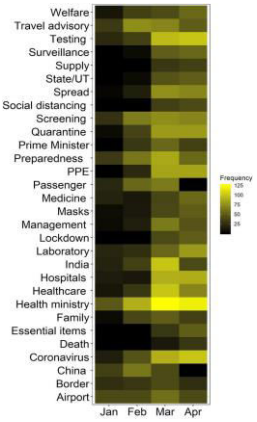

Figure 2: Frequency of certain words in the health sector in the first four months of the pandemic as determined by the LDA algorithm; Source: Debnath and Bardhan 2020

Topic 1	Prob. (β)	Topic 2	Prob. (β)
Develop	0.110	Test	0.150
Health	0.070	Mask	0.120
Facility	0.050	DST	0.040
Time	0.030	Patients	0.050
Rapid	0.028	Hand wash	0.060

Figure 3: Topic extracted by LDA for the Science and Technology sector along with the probability of occurrence of certain high-frequency words
Source: Debnath and Bardhan 2020

The government worked on sensitizing the public, making them alert and highlighting the severity of the pandemic. The success of this Nudge campaign is revealed through a McKinsey and Company COVID-19 survey done in India in November 2020. It found that 68% of the consumers were worried about visiting an outdoor crowded place and attending large events (Chan, Das, Inoue, and Malhotra 2020). The Indian government was victorious in its efforts to dissuade the public from visiting crowded spaces, making them cautious and ensuring that they take precautionary measures at a nationwide level.

Kommentar [1]: Kindly mention source!

The long-term positive impact of this nudge campaign helped the nation become familiar with the "New Normal" and not become careless as the months go by. Even though the government lifted many lockdown restrictions and headed towards a phased Unlock in various parts of the country, the daily new cases have been dwindling since mid-September 2020 even withstanding the local body and assembly elections in several states during that time frame.

Doubling time refers to the number of days required for the number of cases in a pandemic to double (Patel and Pate 2020). Using doubling time, we can understand whether or not the growth of the infection is in the exponential phase or not. The slope of the line in the Cumulative Cases graph of India (Logarithmic scale) is the effective rate of exponential growth and effective doubling time is log (2) divided by the rate of growth (Athreya and Mishra 2020). As we can observe from Figure 4, where the different phases of the lockdown have been assigned different colours, the doubling rate has been increasing since September 2020 and currently stands at 123.109 days regardless of Unlocks.

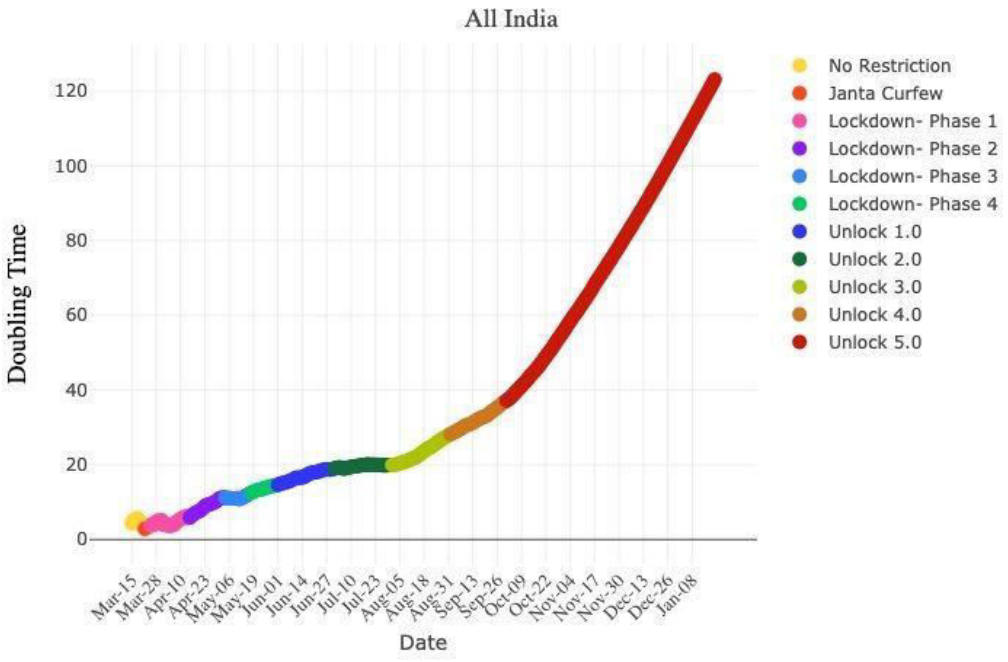

Figure 4: Doubling time for COVID-19 in India
Source: Manasee Mishra and Piyush Majumdar. 2020

Burdened by the shortage of PPE equipment and disrupted supply chain worldwide, India turned its attention to its domestic manufacturing potential, and by April 2020 production capacity increased to making 12,000 units per day. This number then increased to around 2,00,000 units being manufactured a day in the first week of May 2020. Within a mere two weeks, India had more than doubled its production and was now producing nearly 4,50,000 PPE kits daily. This was possible because the Government provided concession and extension of 50% discount offer on Annual membership in MSME mart to Micro, Small and Medium Enterprises (MSME) that nudged them to join the fight against coronavirus by mass-producing PPE and masks (Press Information Bureau 2020.

4.0 Conclusion

Although the use of the nudge theory is visible in most government sectors that are trying to bring society back to normalcy, there are several methods involving nudge that have either not been utilised at all or have been underutilised. Suggestions for some of those methods are-

1. Using nudge to fight misinformation and ensuring maximum people are vaccinated. The Bharat Biotech International Ltd and state-run Indian Council of Medical Research have finally developed the COVAXIN and now the Indian government has the task of ensuring there is a successful vaccine rollout and this can be ensured by employing the concepts of Nudge theory. The government needs to fight misinformation and scepticism regarding the vaccine by ensuring that information reaches the public transparently especially to the illiterate and poor through trusted government sources and community doctors. Giving the public social incentives will ensure a high vaccination turnout. The Government of India can develop apps to identify the nearest vaccination centre and give reminders in the form of notifications to complete the vaccination course.
2. Using public figures as the messengers of government guidelines regarding COVID-19. Brands worldwide have shifted their focus from expensive advertisement campaigns to endorsing their products with the help of famous personalities. A similar tactic should be incorporated by the government to spread the message about safe practices like wearing a mask and social distancing. Famous

personalities asserting that they religiously follow these practices and encouraging the masses to do the same would create a change on a national level. This technique would also strike a chord with people of every age because of identification. Identification, conceptualised by S.M. Mohsin, means that because the target (viewers) have a liking for the source (public figure), the targets will be more likely to listen and act the way the source does (Mohsin 1990).

The Comprehensive Rural Health Project (CRHP), aims to create a healthy environment among rural communities, and through a method of nudging has achieved widespread success. The project started as a way to analyse and weigh the villager's health status, however, this project became a symbol of the Nudge Theory when the entire village's health statistics were put on a poster in the front door of the local clinic. Parents came to check their children's health comparative to the other children, and this created a competitive environment and a healthier lifestyle. Using the poster as a nudge can be translated into a large scale, where the various states of India can be nudged to compete for a better statistical record in regards to the COVID-19 pandemic. Mirroring the poster on the local clinic, an online arena can be created, where the numbers of each state can be displayed, which in turn will invigorate State Governments to improve and invest in better health facilities and regulations amid the Coronavirus pandemic (A little healthy parental competition).

Even with the use of the nudge theory, the response of the Indian government to the pandemic was far from perfect. The unorganised working sector was left jobless amidst the lockdown and staggered reopening, and with almost ninety per cent of India's population working in the unorganised sector, it led to worsening of the life-threatening situation (Sengupta and Jha 2020). The mass migration this caused left the lockdown ineffective in places (Rajan, Sivakumar and Srinivasan 2020). The migration also caused multiple deaths (Dutta 2020). Apart from that, India's healthcare infrastructure was not ready to handle a pandemic with an acute shortage of beds felt in various hospitals (Anuradha 2020). Had it not been for the extensive Nudge campaign by the Indian Government, the COVID-19 pandemic could have infected an even greater percentage of the Indian population as the CDDEP-John Hopkins report had initially predicted.

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