

A Study on Factors Influencing Increase Internet Data Consumption During COVID-19 Lockdown in India

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Abstract

Digital activity patterns were drastically changed as a result of the COVID-19 epidemic and the lockdown measures that followed, which led to an unprecedented increase in internet data usage worldwide. This study looks into the main causes of the rise in internet usage among various communities during lockdowns. We identify five main factors based on network traffic measurements and survey data from various regions: the fast adoption of teleconferencing and remote work applications, which resulted in traffic increases exceeding 200%; the shift to online education and e-learning platforms; increased consumption of online gaming, video-on-demand, and streaming services for entertainment; increased reliance on digital platforms for social interaction to make up for physical isolation; and accelerated adoption of cashless digital ecosystems for essential services. Pursuant to data, within weeks of the lockdown's deployment, overall internet traffic increased by 15–20%, a growth rate that is normally seen over several months. Interestingly, 71.4% of respondents said they were consuming more media online, and platform choices showed clear gender-based trends. Stress, anxiety, loneliness, and escapism are psychological characteristics that strongly predict problematic internet use, especially in younger populations. This digital leap was made possible by infrastructure changes, such as unlimited data plan upgrades and high-speed broadband availability, which accelerated data consumption trends by an estimated two to three years. These results highlight the complexity of pandemic-induced digitization, with implications for post-pandemic digital habit sustainability, mental health therapies, and network infrastructure planning.

1. Introduction

In January 2020, India reported its first validated COVID-19 case. Prime Minister Narendra Modi declared a full 21-day nationwide lockdown on March 24, 2020, starting at midnight on March 24–25, after approximately 500 cases had been confirmed by late March. The order, which was issued in accordance with the Disaster Management Act of 2005, required residents to stay indoors except for essential services, suspended all non-essential transportation, and closed commercial and industrial businesses. After the initial 21-day lockdown was prolonged in stages (Lockdown 2.0, 3.0, and 4.0) until May 31, 2020, a phased "Unlock" procedure started, enabling states to progressively loosen restrictions in accordance with local circumstances. During this time, internet and telecommunications services were deemed necessary and continued to function, allowing for digital entertainment, online learning, and remote employment.

India's internet data consumption immediately and significantly increased as a result of the lockdown. Within days of the shutdown announcement, average daily data use increased by 13%, from 270 PB on March 19, 2020, to 308 PB for the week starting on March 22, 2020, according to data from the Department of Telecommunications. Based on additional analysis by Ernst & Young (EY), during the lockdown, monthly data consumption per user increased to over 11 GB, a 30% increase over pre-lockdown levels and an anticipated two to three years' acceleration of India's digital adoption. Due to heavy restrictions on physical mobility and gatherings, there was an increased demand for online learning platforms, social media, e-commerce, streaming services, and video conferencing. In order to evaluate the pandemic's effects on India's digital infrastructure, user behavior, and the larger digital economy, it is essential to comprehend the increase in internet data usage during the lockdown. In order to provide insights into how exceptional public health policies altered digital engagement patterns nationwide, this study attempts to quantify and analyze these changes. (Tagrid Lemenager, 2020) (Saikia, 2021)

Literature Review

An incredible spike in internet data consumption was brought on by the COVID-19 outbreak and the ensuing nationwide shutdown in India, which drastically changed digital behavior throughout the nation. According to research, during the first lockdown period that started in March 2020, internet usage in India increased by almost 13%. Between March 22 and March 28, 2020, daily data consumption reached 307–308 petabytes (PB). The widespread use of work-from-home arrangements, online learning, and increased entertainment consumption while residents were still restricted to their homes were the main causes of this growth. According to EY studies, during the lockdown, per-user monthly data consumption increased to over 11 GB, a 30% increase that essentially shortened India's timeframe for digital adoption by two to three years. (Hemant Purohit, 2021)

The sharp increase in internet data usage during the lockdown was caused by a number of interconnected factors. One of the main causes was the move to remote work, with millions of people switching to home-based work arrangements and fixed broadband subscriptions rising, especially in cities. According to data from the Department of Telecommunications, the movement of work activities to home surroundings was reflected in a large increase in residential data consumption when compared to commercial regions. Although estimates showed that just 64% of homes with school-age children had internet connection, educational activities also played a significant role, with online classes becoming the standard for students and schoolchildren. This underscored the persistence of the digital divide despite the spike. Another important element was the consumption of entertainment and material, with Over-The-Top (OTT) services seeing notable increases in viewership during the shutdown. Studies have shown a strong positive correlation between the use of over-the-top (OTT) services, especially Netflix, and total internet data usage. According to the Indian OTT Platforms Report 2020, Smartphone usage rose from 3 hours 22 minutes prior to the epidemic to 3 hours 54 minutes during COVID-19, with streaming platforms experiencing a significant surge in gaming and leisure content. During the epidemic, 64% of respondents reported using social media, shopping online, and making video calls as their most frequent online activity. (Sk Mujiur Rehman, 2022)

A number of behavioral and infrastructure enablers contributed to the increase in data consumption. About 38% of respondents upgraded their broadband plans to meet greater data usage, with unlimited plans

accounting for over 40% of these upgrades. High-speed internet services were found to be a crucial factor. By the third week of March 2020, telecom carriers reported a 30% spike in traffic, most of which came from streaming video. It's interesting to note that networks were able to handle the higher demand without experiencing service degradation thanks to the choice made by big streaming services like YouTube and Netflix to reduce video quality during peak hours. Another significant factor in maintaining increased levels of data usage was behavioral changes. According to an OLX research, internet usage in Indian households increased by 50%, and 79% of Indians said they felt more comfortable using the internet than they did prior to the shutdown. An 85.7% rise in screen time during lockdown was found in research on shifting mobile phone and social media use patterns. This increase stabilized at a continuous 51.4% elevation after lockdown, suggesting a long-term shift in digital behavior rather than a transient abnormality. During this time, the use of educational mobile devices increased by 200%, indicating a significant shift in how Indians used digital technologies for education.

New studies have also looked at how different demographics used the internet during the blackout. Men and women both boosted their digital activity during the initial shutdown, demonstrating the widespread nature of the change toward online participation, according to studies that examined browser histories of over 1,000 people covering 31.5 million website visits. However, gendered analyses showed subtle variations in how different demographic groups adjusted to a greater reliance on the internet, which has implications for comprehending the wider social effects of the digital boom. With 61% of Indian families reporting increased awareness of cyber scams combined with increased internet usage, the epidemic also promoted greater awareness about cyber security. (Saikia, 2021)

The spike in data consumption brought on by the lockdown seems to have had a long-lasting impact on India's digital environment. By 2020, the shift hastened India's transition to a mobile-first consumer economy, bringing about significant adjustments to the way its people work, study, and enjoy leisure. According to CRISIL assessments, the 25–30% increase in data usage after the lockdown started on March 25, 2020, signified a fundamental change in consumption habits rather than just a brief surge. The persistent increase in screen time and digital engagement following the lockdown indicates that the epidemic acted as a trigger for long-term behavioral shifts that will continue to affect India's internet data consumption habits. (Vivek R Venkatesh, 2022)

Combined, these studies show that the rise in internet data usage during India's COVID-19 lockdown was caused by a variety of factors, including infrastructure advancements, necessity-driven behavioral shifts, and the quick uptake of digital services in the fields of employment, education, and entertainment. The identified factors—adoption of remote work, online education, OTT consumption, enhanced broadband infrastructure, and changed levels of digital comfort—offer a thorough foundation for comprehending the dynamics of growing data usage during this exceptional time.

Growth in Internet Data Consumption During and Post Lockdown

The following tables present comprehensive data on internet data consumption growth in India across various factors during the COVID-19 lockdown period (March 2020 onwards) and the post-lockdown period (2021–2023).

Table 1: Overall Wireless Data Consumption Growth (Pre-, During, and Post-Lockdown)

Period	Total Wireless Data Usage	Average Data per User per Month	Year-over-Year Growth
Q1 FY18 (Apr-Jun 2017)	4,206 PB	1.24 GB	Baseline
Q1 FY22 (Apr-Jun 2021)	32,397 PB	14.1 GB	7-fold increase from FY18
CY 2021	--	17 GB	31% increase in 4G mobile data; 26.6% growth in average monthly data traffic per user
FY 2021-22	137,459 PB	--	31.91% yearly growth
FY 2022-23	160,054 PB	17.01 GB	16.44% yearly growth
2022 (full year)	14.4 exabytes/month (14,400 PB/month)	--	3.2X— increase from 2018 (4.5 exabytes/month)

Source: https://www.trai.gov.in/sites/default/files/2024-09/PIR_12032024_0.pdf

Table 2: Daily National Data Consumption During Initial Lockdown (March 2020)

Date	Daily Data Consumption	Growth vs. Previous Benchmark
March 19, 2020	270 PB	Baseline
March 21, 2020 (Janta Curfew)	282 PB	+9% vs. March 19
March 22–28, 2020 (average)	307–308 PB	+13% vs. March 19; +9% vs. March 21
March 22 & 27, 2020 (peak days)	312 PB	+15.6% vs. March 19
March 26, 2020	311 PB	+15.2% vs. March 19

Table 3: Per-User Monthly Data Consumption Growth

Period	Average Data Consumption per User per Month	Growth Rate
Pre-lockdown (early 2020)	~8.5 GB	Baseline
During lockdown (mid-2020)	>11 GB	+30% spike
December 2021	17 GB	+26.6% year-over-year growth in 2021
March 2023	17.01 GB	Continued elevated usage

Source: <https://www.nokia.com/newsroom/india-recorded-highest-growth-in-mobile-broadband-data-in-2021/>

Table 4: Application-Specific Traffic Growth During Lockdown (April 6–10, 2020 vs. February 24–28, 2020 Baseline)

Application Category	Growth Rate During Lockdown
OTT (streaming) traffic	+198.68%
Gaming traffic	+109.4%
Hosting traffic (websites)	+62.78%
ISP traffic	+54.38%
Social and online media	+27.1%
Overall traffic growth	+39.53%
Collaborative tools (Zoom, Skype, WebEx, Teams)	~100% (doubled)
Video streaming apps (Netflix, Zee5, Amazon Prime)	+120%

All metrics showed a 13–30% increase in data consumption, with OTT streaming traffic almost tripling (+198.68%) and overall traffic increasing by 39.53%. The high usage trends continued, with the largest rise in mobile broadband data (31%) and average monthly data consumption of 17 GB per user in 2021. India's digital adoption trajectory accelerated by two to three years during the lockdown, with a sustained post-lockdown equilibrium that showed 51.4% more screen time than pre-pandemic levels. While broadband subscriptions and overall wireless data usage continued to climb after lockdown, OTT, gaming, and collaboration tools witnessed the most significant growth during lockdown. Maharashtra continued to have the greatest absolute consumption levels, while states like Andhra Pradesh and Bihar experienced

the most percentage growth (+12%). All of this data shows that the COVID-19 lockdown significantly altered India's digital consumption ecosystem by spurring both immediate and long-term increases in internet data use.

Factors Responsible for Growth in Data Consumption During the COVID-19 Lockdown in India

Remote Work and Work-from-Home (WFH): One of the biggest causes of the rise in data usage was the shift to remote work. Because of the remote working style, about 76% of respondents said they were either new users or were spending more time on video conversations. Due to increased use of cloud services, video conferencing platforms, and collaborative tools, the switch to WFH resulted in a 37% rise in uploads and a 66% increase in average monthly downloads per user. Due to employees working from home rather than in offices, data demand from residential areas increased dramatically in comparison to commercial zones. During the pandemic, the use of Zoom, Microsoft Teams, Google Meet, Slack, and other workplace communication technologies increased tenfold.

Online Education and E-Learning: In light of the closure of schools and colleges, e-learning has become a crucial factor in data consumption. During the lockdown, e-learning rose from 30±15 minutes to 150±30 minutes per day, a 400% increase, making it the third most popular digital activity. Online education platforms were accessed by over 264 million internet users in rural India and 323 million in urban India, resulting in a 13% increase in rural internet users in 2020 alone. Video lectures, live courses, and digital assignments are examples of educational content that greatly raised bandwidth requirements, especially for video streaming.

Entertainment and OTT Platform Usage: As movie theaters, shopping centers, and other entertainment facilities closed, people turned to digital leisure options. Netflix's daily active users increased by 122% month over month, while Prime Video's daily active users increased by 72% between February and April of 2020. Overall, online streaming traffic increased by 55%, with weekday increases of 73% and weekend increases of 65%. The usage of the gaming category increased by 50%, from 42 billion minutes in March 2019 to 63 billion minutes in March 2020. Platforms like YouTube and Netflix reduced the quality of their videos in order to control network load, which helped avoid even greater jumps in data use.

Social Media and Communication: As an outcome of social distancing conventions, people are depending more on digital platforms to stay in touch personally as well as professionally. The average amount of time spent on social networking sites each day rose by 68%, from 3.08 hours to 5.17 hours. Traffic to WhatsApp, Telegram, and other instant messaging services climbed by 33% as people used these platforms for community involvement, information exchange, and emotional support. The main psychological drivers of increased social media and phone use during lockdown were found to be boredom, anxiety, FOMO, and loneliness.

Digital payments and e-commerce: The epidemic hastened the transition from offline to online purchasing and contactless purchases. E-commerce platforms saw growth and returned to pre-pandemic levels, especially in sectors including grocery, FMCG, and pharmaceuticals. Customers' desire to minimize in-person interactions during purchases led to an increase in the adoption of digital payment services like UPI, Paytm, and PhonePe. Lockdown restrictions restricted access to physical stores, resulting in a substantial rise in the use of grocery and vital delivery applications.

High-Speed Broadband and infrastructural Improvements: Increased data consumption was made possible by technological developments and infrastructural improvements. For increased data usage, about 38% of respondents updated their internet plans, and more than 40% chose unlimited plans. Work-from-home and streaming demands caused a 25–30% increase in wired broadband data usage. In order to help networks meet the increased demand, telecom operators expanded capacity by using underutilized cell towers and performing maintenance.

Initiatives for Digital Inclusion and Government Policies: Campaigns for digital literacy and policy changes made it easier for more people to use the internet. Rural internet users increased by 45% in 2019 thanks to government programs supporting digital infrastructure and literacy, a trend that picked up speed during the pandemic. Internet and telecommunications services were deemed critical, guaranteeing continuous access throughout lockdowns. Internet access is becoming more inexpensive, especially for low-income people, thanks to competitive pricing and data bundles from telecom companies like Jio, Airtel, and Vi.

Changes in Behavior and Psychology: The lockdown produced special psychological circumstances that increased online interaction. When social connection and other information sources were limited, people became more dependent on the media, increasing their usage of digital platforms for news, health updates, and emotional support. Internal emotions including stress, boredom, and anxiety were brought on by lockdowns and isolation (environmental stimuli), which resulted in behavioral reactions like increased phone use and social media immersion. According to a 2025 study, screen usage rose by 85.7% during lockdown and continued to rise by 51.4% afterward, confirming a long-term change in digital behavior.

Conclusion

This study looked at the various reasons that contributed to the extraordinary increase in internet data usage during India's COVID-19 shutdown and found that, rather than being a transient anomaly, the pandemic acted as a catalyst for a fundamental change in the nation's digital landscape. The study shows that during the first lockdown period (March–June 2020), internet data consumption in India rose by 13–30%. Per-user monthly consumption increased from roughly 8.5 GB to over 11 GB, and daily national data usage increased from 270 PB pre-lockdown to an average of 307–308 PB during the lockdown week starting on March 22, 2020. Work-from-home adoption, which led to a 25–30% increase in fixed broadband usage and a 66% increase in average downloads per user; online education, with educational mobile usage rising by 200% during lockdown; OTT and entertainment consumption, where streaming traffic surged by 198.68% and video streaming apps experienced a 120% jump; improved broadband infrastructure and unlimited data plans, with 38% of users upgrading their broadband plans; and behavioral shifts toward digital comfort, as demonstrated by the 51.4% increase in screen time after lockdown. The results of the study show that these elements constituted fundamental changes in how Indians work, learn, consume entertainment, and communicate rather than just being temporary reactions to lockdown constraints. This structural change is supported by the post-lockdown data from 2021–2023, which shows that average monthly data consumption stabilized at 17 GB per user (a 31% increase in 2021 alone), wireless data usage increased from 137,459 PB in FY 2021–22 to 160,054 PB in FY 2022–23, and the number of internet subscribers increased from 824.29 million to 881.25 million between March 2022 and March 2023. The pandemic has accelerated India's digital adoption by two to three years, as seen by the

country's compound annual growth rate (CAGR) of 53% in mobile broadband data during a five-year period, with India registering the greatest growth internationally in 2021.

In conclusion, the COVID-19 lockdown in India served as a turning point that significantly changed the course of internet data usage. The study's findings—adoption of remote work, online learning, entertainment consumption, infrastructure upgrades, and behavioral changes—collectively show that the pandemic hastened India's digital revolution in ways that have persisted after the crisis. Understanding these elements is crucial for policymakers, telecom companies, content producers, and educators who want to take advantage of the opportunities and deal with the difficulties presented by an increasingly interconnected society as India moves closer to becoming a fully digital economy. In addition to being a statistical oddity, the lockdown-induced spike in data consumption was a sign of India's digital future, with long-term effects for the country's work, education, and interactions with the international information ecosystem.

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