



# **Social Distancing: Role of Smartphone During Coronavirus (COVID – 19) Pandemic Era**

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**Abstract**— In December 2019, an outbreak of severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) infection occurred in Wuhan, Hubei Province, China and spread across China and beyond. On February 12, 2020, WHO officially named the disease caused by the novel coronavirus as Coronavirus Disease 2019 (COVID-19). On January 30, 2020, WHO declared COVID-19 as the sixth public health emergency of international concern. An outbreak has posed significant threats to international health and the economy. It has raised intense attention not only within China but internationally. It has been declared a pandemic by the World Health Organization. WHO calls for social distancing with several measures such as Isolation, Quarantine, Closing schools, working from home instead of at the office, Restricting movement of people and the cancellation of mass gatherings, Cancelling or postponing conferences and large meetings, and not taking public transportation, including buses, subways, taxis, and rideshares. This leads to lockdown. Smartphone installed with relevant app brings people together even when this coronavirus (COVID-19) pandemic forces us apart. Life has to go on. Students need education, people need food and medication, and economy has to be stable. Social distancing should not be complicated. These apps make your loved ones, team members and favourites accessible. It makes people not feeling as if they are jailed, but take social distancing as a social responsibility. The apps are categorized into video conferencing, social video chats, medical, entertainment, health & fitness, food & drinks, and apps for visual & hearing impairments.

**Keywords**— Coronavirus, Covid-19, Social distancing, Physical distancing, Smartphone, Apps, Stay home, Stay safe, Wuhan, Quarantine, Isolation

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## **I. INTRODUCTION**

A pandemic is an epidemic (the extremely fast spread of a particular highly infectious disease to a populace in a short time) that crosses international boundaries [1]. It is an epidemic occurring over a very wide area affecting large number of people. This can happen when new strains emerge for which people have very less resistance and there are no readymade vaccines available and hence the disease spreads while preventive and medical care is developed to overcome the situation [2]. Pandemic spread of an infectious disease is one of the biggest threats to society because of the potentially high mortality and high economic costs associated with such an event [3].

An outbreak of a novel coronavirus (COVID- 19 or 2019- CoV) infection has posed significant threats to international health and the economy [4]. It has raised intense attention not only within China but internationally [5].

COVID-19, the disease caused by the SARS-CoV-2 virus, has been declared a pandemic by the World Health Organization, with over 294,000 cases as of March 22, 2020 [6]. Symptoms include fever, dry cough, fatigue, anosmia (loss of smell), shortness of breath, muscle/ joint pain, excessive sputum production, sore throat, headache, chills, nausea/ vomiting, nasal congestion, diarrhea, haemoptysis and conjunctival congestion [1].

Primary transmission is largely due to close physical contact without good barrier protection (masks, gloves); the virus is detectable up to 24 hours on cardboard and up to 3 days on plastic and steel surfaces if droplets fall on their surface. Incubation period is between 2 to 14 days, averaging at 5 days. Particularly vulnerable are those with low immune defences [1].

Throughout history, people have been congregating for social, religious, cultural, economic, political, and other reasons [7]. Although these gatherings can confer tremendous benefits to mankind, they also increase risks to global health security [7].

The WHO checklist for influenza pandemic preparedness planning, calls out for social distancing and quarantine, travel restrictions and at the same time stresses on maintaining essential services [2].

This paper gives insights of how smartphones can be used during social distancing while maintaining essential services such as studying, and working.

### A. SOCIAL DISTANCING

Social distancing, or physical distancing, is a set of non-pharmaceutical interventions or measures taken to prevent the spread of a contagious disease. It is done by maintaining a physical distance between people and reducing the number of times people come into close contact with each other.

During the 2019–2020 coronavirus pandemic, the Centers for Disease Control and Prevention (CDC) revised the definition of social distancing as "remaining out of congregate settings, avoiding mass gatherings, and maintaining distance (approximately 6 feet or 2 meters) from others when possible.

By reducing the probability that a given uninfected person will come into physical contact with an infected person, the disease transmission can be suppressed, resulting in fewer deaths.

The speed of the community transmission may decelerate if such social distancing works effectively in controlling exposure [8].

Many cities and states have ordered social distancing, including closing schools, altering business operations, instituting curfews, and prohibiting large gatherings. Studies suggest that banning all large gatherings would significantly diminish the spread of SARS-CoV-2 [9].

### B. MEASURES OF SOCIAL DISTANCING

To slow down the spread of infectious diseases and avoid overburdening healthcare systems, particularly during a pandemic, several social distancing measures are used, including;

- Isolation: According to [10] Isolation is defined as separating sick individuals from healthy ones. It is an integral public health measure for preventing transmission of infectious diseases. Authors [11] define Isolation as a Separation of or restricting movements of individuals who are ill with a communicable disease. Restriction may last as long as individual is infectious.
- Quarantine: Quarantine is restriction of movements of individuals who are not ill, but might have been exposed to a communicable disease. Restriction last as long as the incubation period of the disease [11]. According to [11] quarantine will likely never be a comfortable experience for anyone, but there are concrete steps that can be taken to improve the experience and help shift perceptions of quarantine from punishment to social responsibility.
- Restricting movement of people and the cancellation of mass gatherings: When the public health authorities issue an alert on the risk of massive community transmission of the disease, public awareness sometimes threatens potential travellers into refraining from travels. Then it becomes less probable that infectious travellers enter across national or regional borders [8].
- Closing schools or switching to online classes.
- Working from home instead of at the office.
- Visiting loved ones by electronic devices instead of in person.
- Cancelling or postponing conferences and large meetings.
- Not taking public transportation, including buses, subways, taxis, and rideshares.

Such measures have been successfully implemented in several previous epidemics.

### C. SMARTPHONE

Fig. 1 below shows an example of a smartphone.



Fig. 1 Smartphone

The recent advances in technology have enabled the use of electronic gadgets in everyday life [12]. Everything is getting automatic and smarter with the passing of days.

The use of smartphones around the world is developing at a rapid rate. In 2013, there were almost as many mobile subscriptions as people on the planet [13]. Over the last decade, the popularity of handheld devices such as smartphones has increased tremendously [14]. The number of smartphone users and mobile application offerings are growing rapidly nowadays. [15].

A smartphone is a category of mobile device that provides advanced capabilities beyond a typical mobile phone. Smartphones have a complete operating software system that provides a standardized interface and platform for application developers. They allow users to carry a mobile phone, games console, music player, camera, calendar and internet browser all in one small handheld device, with their limitations governed only by the types of applications (apps) downloaded onto them [16].

According to [17], smartphones can be thought of as the combination of a cellular telephone and a handheld computer. They offer the communication ability of a cell phone to send and receive voice and text messages as well as the ability of a Personal Digital Assistant (PDA) to run computer programs. All smartphones come with several built-in features, usually including the ability to access the internet and e-mail, use electronic calendars and notes, take pictures and videos, view multimedia, and provide access to GPS. Smartphones, like computers, also run a hardware operating system (OS), which allows for the download of supplemental software applications (apps) to be run on the phone.

### D. PROBLEM STATEMENT

An outbreak of a novel coronavirus (COVID- 19 or 2019- CoV) infection has posed significant threats to international health and the economy. It has raised intense attention not only within China but internationally. It has been declared a pandemic by the World Health Organization. WHO calls for social distancing with several measures such as Isolation, Quarantine, Closing schools, working from home instead of at the office, Restricting movement of people and the cancellation of mass gatherings, Cancelling or postponing conferences and large meetings, and not taking public transportation, including buses, subways, taxis, and rideshares. This leads to lockdown. However, life has to go on.

This study proposes smartphone as a solution. Smartphone installed with relevant app brings people together even when this coronavirus (COVID-19) pandemic forces us apart. Life has to go on. Students need education, people need food and medication, and economy has to be stable. Social distancing should not be complicated. These apps make your loved ones, team members and favourites accessible. It makes people not feeling as if they are jailed, but take social distancing as a social responsibility. The apps are categorized into video conferencing, social video chats, medical, entertainment, health & fitness, food & drinks, and apps for visual & hearing impairments.

### E. PAPER ORGANIZATION

The remainder of the paper is organized as follows. Section 2 identifies related works. Section 3 presents useful smartphone apps for social distancing. Next, Section 4 offers some concluding remarks, finally section 5 gives acknowledgement.

## II. RELATED STUDIES

Authors [18] developed a Smartphone - software that is able to implement certain elements of the educational process. Instant messaging application includes a convenient and effective set of tools to provide quick access to all information. They provide support for advanced features such as remote procedure call, group chat, file transfer, invisible mode.

In their study, [19] present a new framework to diagnose the coronavirus disease COVID-19 using onboard smartphone sensors. The framework provides a low cost solution, since most of the radiologists have already have smartphones for different daily-purposes. People can use the framework on their smartphones for COVID-19 diagnosis.

Authors in [20] aim to develop an application with the menu items such as the outbreak areas, and symptoms, and prompt reports of the foot and mouth disease so that stock farmers can download it through Smartphone and tablet PC web markets

A study by [21] reports the positive influence of smartphones in professional environments such as healthcare coordination, and infrastructure monitoring, or simply emphasize their value in promoting socialization with geographically distant individuals.

### III. USEFUL SMARTPHONE APPS FOR SOCIAL DISTANCING

Keeping contact with co-workers, classroom, medical practitioners, restaurants, friends and family will make your social distancing more bearable. The following smartphone apps are going to pull you through.

According to [22] Smartphones and the applications (Apps) that can be downloaded to smartphones are inventions that keep individuals connected to society. Smartphone social media apps give the user the ability to check their social media sites anywhere, anytime instead of having to sit in front of their computer screen.

In this article, useful smartphone apps are categorized into: video conferencing; social video chats; medical apps; entertainment; health & fitness; food & drinks; and apps for visual & hearing impairments. These apps might be used during social distancing to make life going on smoothly as if nothing has happened.

#### A. VIDEO CONFERENCING

1) *Microsoft Teams*: A study by [23] provides evidence that Microsoft Teams is an effective platform for collaborative knowledge building. Students are comfortable giving and receiving constructive feedback, and they don't mind having their contributions visible to the course instructor or teaching assistant. They found MS Teams to be easy to learn and use, and more useful than other collaboration tools they have used in the past.

As suggested by [24] Microsoft teams has the following strengths: Instructor-led instantaneous student registration; Offline functionality available after syncing of associated apps (e.g., OneNote, Class Notebook, OneDrive); and Compatible with all 3 major platforms (PC, Android and iOS), finger/ stylus functionality on any device with MS apps.

This app is ideal for having business as usual meetings, stand-ups and check-ins with your work team. It is an instant messaging app that facilitates teamwork and collaboration during social distancing.

2) *Google classroom*: A study by [24] shows that Google Classroom has the following strengths: Admin-led mass student registration; Easy access to submissions via app or browser; Variety of 3rd party associated apps (rubrics, appending peer/ instructor feedback to assignments); and Assignment filename auto-renamed with students' name

3) *Google Duo/ Hangouts*: Google Hangouts is an instant messaging and video chat platform by unified replacement for Google Talk, Google+ Messenger, and Hangouts, the video chat system present within Google+ [25]. It is primarily a text, voice and video app. It is available on Android as well as iOS. Google have raised the limit on video group calls from 8 to 12 people in light of the coronavirus. One nice feature is its "Knock knock" facility, where you can get a video preview of who is calling before answering.

#### B. SOCIAL VIDEO CHATS

1) *Facebook Messenger*: Facebook allows users to chat among themselves on a mobile app called Facebook Messenger [26]. Facebook Messenger can be considered as one of the widely used messaging apps in the world. According to Facebook F8 conference, Messenger has around 1.2 billion users [27]. Messenger is Facebook's messaging and video calling app. It is easy to use and you can video group chat with up to 50 people with no time limit. You do not need to have a Facebook account to use it.

2) *WhatsApp*: WhatsApp is a cross-platform instant messaging application available for Symbian, Asha, Windows Mobile, Android, iOS and Blackberry operating systems [28]. It facilitates the exchange of instant messages, pictures, videos and voice calls via an Internet connection [29]. WhatsApp has started calling feature to the contacts using WhatsApp application. WhatsApp Web is launched to give user device flexibility for running WhatsApp from desktop PC using internet browser [28]. This is a good option for group video calls because of its popularity.

3) *Viber*: Viber is a cross-platform instant messaging application available for Symbian, Asha, Windows Mobile, Android, iOS and Blackberry operating systems [28]. Viber is one of the widely used mobile chat application which has over 606 million users on its platform [30]. It is used for making phone calls and send text messages to contacts using Viber application [28].

4) *WeChat*: WeChat had 549 million monthly active users (MAUs) among over one billion registered users, almost all of them in Asia [31]. As suggested by [31] WeChat users in China can access services to hail a taxi, order food delivery, buy movie tickets, play casual games, check in for a flight, send money to friends, access fitness tracker data, book a doctor appointment, get banking statements, pay the water bill, find geo-targeted coupons, recognize music, search for a book at the local library, meet strangers around you, follow celebrity news, read magazine articles, and even donate to charity, all in a single, integrated app.

5) *FaceTime*: FaceTime may be used on any Apple products including iPhone, iPad, iPod Touch, and MacBook; enables phone and video call communication, either one-on-one or in groups between Apple product users [32]. FaceTime allows the person who is vision impaired to connect to an assistant of their choice [33]. With FaceTime you can video group chat with up to 32 people, it is easy to use and you do not need internet connection.

6) *Skype*: Skype is a popular Instant Messaging (IM) and Voice over Internet Protocol (VoIP) application that provides free IM services, audio and video calls between computers and other mobile devices [34]. May be used on mobile devices and computers; allows for communication between Skype users via one-on-one or group phone or video calls [32]. Skype allows users to share free video calls with anyone who has Skype and a webcam or compatible smartphone [34]. Skype is good for big groups – up to 50. It is on all platforms and can be downloaded to Xbox and Alexa devices.

7) *Bandsintown*: Bandsintown is an application for concerts. It is available as an Android, iOS, web and Facebook application. It recommends concerts based on the user's profile [35]. It is a live concert discovery app which helps fans to track their favorite artists of the music world. The app counts now more than 19 million registered users and it is available in 210 countries [36]. BandsInTown provides a listing of music events for a given area. It focuses on regional and national touring bands and generally has sparse coverage of events outside of large metropolitan areas [37]. Concerts are off the agenda for the time being. Bandsintown notifies users about livestreams being hosted by musicians, whether that is on Twitch, Twitter, or wherever. It is almost as good as actually being there.

8) *Daily Burn*: According to [38] DailyBurn is an application that allows the user to track calories through their food intake and workouts. Food tracking can be completed using a simple search through the food database provided by DailyBurn, and doesn't need a picture to determine calories.

DailyBurn provides a slew of expert - led video and audio-guided workouts to get you into shape. You can mix and match classes to suit your needs.

9) *Discord*: Discord is an application specifically built to enhance communication among video game players. The platform allows its users to communicate via voice, video, and text chat features. These affordances give users the ability to post pictures, videos, images, and links, either through specific community servers, private messages, or group messages. The application is available on PC, Mac, mobile devices, and even has a browser version [39]. Its ease of use has transformed it to a modern IRC alternative, hosting channels for many online communities [40]. For many, Discord is almost as good as meeting up face-to-face.

10) *DoorDash*: As suggested by [41] DoorDash is an app-based food delivery service. It supports thousands of restaurants across thousands of cities. The app offers the option of contact-free delivery.

11) *Uber Eats*: According to [42] Uber Eats allows viewing the surrounding restaurants and following the order in real time through the cell phone, with an average delivery time of 30 minutes. For the restaurant owners, it offers advice on how to organize all the delivery in the shortest possible time for the client.

Customer can browse menus at nearby restaurants and track order as it is being prepared in real time.

12) *Zoom*: Zoom has boomed with lots of people now working from home. Its uses include: register, schedule a meeting, send a link to others. Some cool features include the ability to share screens and record sessions. The desktop app is available for Windows and macOS, while the mobile app is available for Android and iOS.

13) *Houseparty*: This app is perfect for group video calls. You receive notifications when your friends and family are online and available to video chat. This video calling app is supposed to be like going to a real party, with people chatting in different rooms. The screen splits into sections so that everyone can see each other. You can spontaneously drop in and out of different group chats (up to 8 people) and lock the door of a group so no one else can enter. It allows from 2-8 people to connect via video. Can be made up of friends, but also random people. It is free, available for iOS, Android, macOS, and you can use it on PCs with Google Chrome.

14) *Netflix Party*: Netflix Party is allowing users to watch movies or television shows online at the same time as your friends. In addition to synchronizing video playback, it adds a group chat to the screen so you and your friends can react instantly to every plot twist unfolding on your screens.

15) *RAVE*: Rave app allows friends to watch the same content together, with the ability to send text and voice chats. The app supports Netflix, YouTube, Vimeo, Reddit, Dropbox and more. In addition to showing your friends the latest video, you can join public raves and meet people from around the world. Rave participants can even vote on which video they want to watch next. The app is available for free on both Android and iOS.

### C. MEDICAL APPS

1) *Teladoc*: Connects patients to a board-certified doctor 24/7 through phone visits. If needed, a prescription can be sent to the patient's pharmacy [32].

2) *K Health*: Provides digital primary care for patients and free risk assessments for COVID-19 [32].

3) *Doctor on Demand*: Provides face-to-face digital connection with a doctor, psychiatrist or psychologist through video on people's iPhone or iPad; provides urgent care, behavioral health, preventive health, and chronic care management; provides services in many languages when appointment is scheduled [32].

4) *GoodRx- Save on Prescriptions*: An online app that finds prescription discounts and offers medication coupons [32].

5) *Medisafe Medication Management (Medisafe)*: Provides personalized medication reminders for each medication; provides vital drug interaction warnings; keeps users connected with caregivers through real-time missed medication alerts [32].

### D. ENTERTAINMENT

All your favourite musicians are also on self-quarantine and bored out of their minds at home and having living room concerts. Musicians are keeping their fans as well as themselves occupied during these trying times. Below is a list of entertainment apps.

1) *YouTube*: YouTube is the most popular service in the Internet and is increasingly consumed on mobile devices [43]. It is the largest community for sharing video content online. It has no genre constraints or time limits and provides billions of public, searchable videos [44]. More than 1 billion users visit YouTube each month and watch over 6 billion hours of video content during this period [43]. YouTube categorizes its videos into several main categories such as "Auto & Vehicles," "Education," "Entertainment," "How-To & Style," "Music," "Travel," and so on [45]. Should all else fail, head to YouTube.

2) *Instagram live*: Instagram's uses are mainly educational/ informational and motivational/ supportive. The app has great potential to serve as a social networking platform in visually rich disciplines [46]. Catch your favorite artists or celebrities in real-time on Instagram Live to keep entertained. Instagram also has video call functionality that enables group video calls. You can start your own live and have chats with your followers.

3) *Snapchat*: Snapchat is a popular social media application that allows users to send and receive photos and videos. Users of the app can also post videos and pictures to their "MyStory" which can be viewed by all of their friends on the app [47]. If the user sends a video, he or she has the option to edit the time, the filter, and incorporate different stickers and emoji's [47]. Snapchat has recently been gaining in popularity. Among 18–34 year olds, it is now the third most popular app after Facebook and Instagram. [48].

4) *Minecraft*: Minecraft, a Massively Multiplayer Online Game (MMOG), has reportedly millions of players from different age groups worldwide [49]. Since its full-version release in 2011, Minecraft has sold 122 million copies making it one of the most successful video games of all time. This popularity attracted the attention of Microsoft, which purchased the game, and its publisher Mojang, for \$2.5 billion in 2014 [50]. Minecraft, an open world and survival game where players build and move through a world of cubes, breaking them up as they work their way through the landscape. In survival mode, players gather resources to kill monsters and to mine minerals and use tools for the main purpose of protection. In creative mode, players use an unlimited number of blocks and tools to create and build constructions as they design worlds. In all modes, players can build houses, towers, landscapes, usable items, and other objects [51].

### E. HEALTH & FITNESS

1) *Calm*: App for mindfulness and meditation to lower stress and improve sleep [32].

2) *Headspace: Meditation & Sleep*: Relaxation app with guided meditation and mindfulness techniques to lower stress and improve sleep [32].

3) *Yoga: Down Dog*: Allows users to practice yoga in their homes with over 60,000 configurations to create a new workout daily. Includes beginner and tailored Older Adults classes [32].

4) *MyFitnessPal*: Online calorie counter and diet plan. Users can log exercise and step count [32].

#### F. FOOD & DRINK APPS

1) *DoorDash- Food Delivery*: Food delivery service. Allows users to order food from participating restaurants and cafes [32].

2) *Instacart*: Same-day grocery delivery that allows users to request specific items from grocery stores [32].

#### G. APPS FOR VISUAL & HEARING IMPAIRMENT

1) *Be My Eyes- Helping the Blind*: Connects blind and visually impaired people with sighted people who assist them with tasks [32].

2) *Glide - Live Video Messenger*: Allows you to send “lightning-fast” video messages, enabling on demand communication using sign language and visuals [32].

### CONCLUSION

Smartphone installed with relevant app brings people together even when this coronavirus (COVID-19) pandemic forces us apart. Life has to go on. Students need education, people need food and medication, and economy has to be stable. Social distancing should not be complicated. These apps make your loved ones, team members and favorites accessible. It makes people not feeling as if they are jailed, but take social distancing as a social responsibility.

The article comes up with various apps that might be installed on smartphones to support social distancing. The apps are categorized into video conferencing, social video chats, medical, entertainment, health & fitness, food & drinks, and apps for visual & hearing impairments.

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