

LETTER TO THE EDITOR

To trace or not to trace: Saving lives from COVID-19 at the cost of privacy breach in Bangladesh

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The World Health Organization declared the novel coronavirus disease 2019 (COVID-19) outbreak as a pandemic on March 12, 2020. Since the first official reported case of COVID-19 in Bangladesh on 08 March 2020,¹ Bangladesh is now ranked 17th among the countries in the world in terms of positive COVID-19 cases with more than 205,000 people testing positive for COVID-19 after diagnosis (as of 20 July, 2020).² Without any effective therapeutic measures to control COVID-19, like many other countries, Bangladesh adopted a nontherapeutic measure to control this pandemic; however, there is ongoing debate on the implementation and effectiveness of such measurements.¹

In the first week of March 2020, when the very first attempt at lockdown measures was about to end in Bangladesh, a large number of factory workers began to enter big industrial cities, such as Dhaka and Chittagong, due to concerns about their job security.³ On 16 March, 2020, Bangladesh imposed a 14-day mandatory quarantine for all travelers entering the country. This attempt was sharply criticized because of the lack of testing facilities at the entry points. Additionally, many expatriates from COVID-19 affected countries (e.g., Italy) were seen roaming around marketplaces without maintaining proper social distancing.⁴ These events, out of many, exposed not only the lack of coordination among authorities but also indicated the lack of awareness among common Bangladeshi people regarding the severity of COVID-19. Additionally, Bangladesh has a severe shortage of COVID-19 testing kits; it has no more than 100,000 testing kits in stock of which nearly 20% have been dispatched to multiple testing centers across the country to reduce the spread of

the virus.⁵ Thus, many positive cases might not be detected because of the insufficient testing facilities, which has already raised concerns about the accuracy of the official reported positive cases.⁴

Considering the above backdrop coupled with inadequate medical infrastructure (Bangladesh has 130,437 hospital beds of which there are only 1169 ICU beds¹) in a densely populated country of 164 million, contact tracing could be considered as a viable option to control the outbreak of COVID-19. Of course, given the significant shortage of COVID-19 kits, contact tracing will not be as effective as it could be. Nevertheless, at the least, it certainly promises to impose better control by restricting transmission from COVID-19 positive cases. This in turn helps, at least to some degree, to lower the need for more test kits.

One of the most successful countries in controlling the spread of COVID-19 is South Korea, where instead of deploying lockdown and immigration control, they adopted a "trace, test, and treat" strategy for controlling the spread of COVID-19.⁶ Interestingly, South Korea, instead of relying heavily on app-based contact tracing, employed an integrated system of multiple stakeholders with the support of advanced information technology infrastructure.⁶ In contrast to South Korea, many other countries have employed app-based contact tracing leveraging GPS and/or Bluetooth technologies.⁷

Contact tracing as an intervention has raised concerns in the context of personal privacy, and in particular, serious concerns have been raised in lower-middle-income countries, where citizens' privacies are not given due consideration and are often breached without notice. Maintaining digital privacy is not only a technical challenge but also depends on the mindset of the government. National authorities should be aware that personal data contains sensitive information about social activities and should be handled with utmost responsibility and discretion. People should be informed about the transparency of data processing, data storage, and data usage. Related to this, Amnesty International UK pointed out seven guiding principles⁸ regarding the UK government's plan to rollout a contact-tracing app (Table 1).

Bangladesh's government launched a contact-tracing mobile app named "Corona Tracer BD" on 05 June, 2020. Corona Tracer BD utilizes Bluetooth signals to

detect if the app's user is in close contact with infected individuals. However, only about 500,000 people (0.31% of the total population) have downloaded Corona Tracer BD since its launch (as of 20 July, 2020). This clearly exposes another dimension of the problem (apart from the privacy issue); i.e., the low percentage of smartphone users in Bangladesh where smartphone penetration is only 18.5%.⁹ A relevant and recently coined term is Digital Herd Immunity (DHI): even without making the population biologically immune (i.e., herd immunity), the population can be made immune to epidemic growth with the use of technology. DHI states that there is always a critical fraction (ϕ_c , where $0 \leq \phi_c < 1$) of contact-tracing apps usage such that adoption of apps by a fraction $\phi > \phi_c$ of the population would be sufficient to prevent the spreading of a disease.¹⁰ The proposed model suggests that to avert a COVID-19 epidemic, ϕ_c may need to be as high as 75%.¹⁰ An agent-based modeling study suggests that while city-wide lockdown is in place, $\phi > 60\%$ could be enough to bring an epidemic under control very quickly.¹⁰ While none of these models were conducted in the context of Bangladesh, their results certainly give some indication.

While the above results related to DHI seem interesting, they do not seem promising for low-income countries like Bangladesh, particularly if only smartphone-based apps are considered for facilitating DHI (perhaps an extended definition of DHI could be more meaningful in this context, where digital aspects other than smartphones are also included). So, for Bangladesh, non-app measures (like South Korea's) must also be implemented for effective contact tracing. To do that, the immediate proposal that comes to mind is to use data from the telecommunications industry in combination with other sources (like the South Korean case) as well as using smartphone-based contact tracing apps (when available). Telecommunications industry engagement could be particularly fruitful since according to the Bangladesh Telecommunication Regulatory Commission, which is the national regulatory watchdog for national telecommunication systems and infrastructure, as of June 2020, the number of mobile phone subscribers is a staggering ~ 161 million¹¹, and the number of internet subscribers has surpassed 103 million and among which more than 94 million utilize mobile data (e.g., through SIM-based modems or advanced feature phones with limited internet capabilities in the absence of a smartphone).¹²

Table 1. Seven guiding principles for the rollout of a contact-tracing app.⁸

No.	Principles
1	Consent and transparency
2	Limited purpose (restricted to only COVID-19)
3	Anonymity
4	Privacy and data protection by design
5	Independent expert oversight
6	Time limits (data deletion after serving the purpose)
7	Equality and nondiscrimination

This of course brings up the question of privacy again. Overriding the consent and privacy of people in the name of COVID-19 surveillance may fuel distrust and ultimately lead to poorer health outcomes in this pandemic. This could also have far-reaching effects on a post-COVID-19 scenario. Despite all these concerns, under the circumstances, it seems that "whether to trace" is not the right question, and "not to trace" is certainly not the acceptable answer.

Rather, Bangladesh needs to adopt and implement a tracing strategy that preserves privacy as much as possible by following an acceptable guideline such as that in Table 1 and gain the confidence of citizens to collectively fight and win this war against the COVID-19 pandemic.

Conflicts of Interest

None declared.

REFERENCES

- Monjur MR, Hassan MZ. Early phases of COVID-19 management in a low-income country: Bangladesh. *Infection Control & Hospital Epidemiology*. 2020;41(9):1116–1117.
- Dong E, Du H, Gardner L. An interactive web-based dashboard to track COVID-19 in real time. *The Lancet infectious diseases*. 2020;20(5):533–534.
- RMG workers returning Dhaka to save jobs amid virus fear. The Financial Express [Internet]. 2020 April 5. Available from: <https://thefinancialexpress.com.bd/national/rmg-workers-returning-dhaka-to-save-jobs-amid-virus-fear-1586003905>.
- Anwar S, Nasrullah M, Hosen MJ. COVID-19 and Bangladesh: Challenges and how to address them. *Frontiers in Public Health*. 2020;8: 154.
- Molla M A-M. Govt now scrambles for testing kits, PPE. The Daily Star [Internet]. 2020 March 19. (Accessed 20 June, 2020). Available from: <https://www.thedailystar.net/frontpage/news/govt-now-scrambles-testing-kits-ppe-1882633>.
- Park S, Choi GJ, Ko H. Information technology–based tracing strategy in response to COVID-19 in South Korea—privacy controversies. *JAMA*. 2020; 323(21): 2129–2130.
- Lalmuanawma S, Hussain J, Chhakchhuak L. Applications of Machine Learning and Artificial Intelligence for Covid-19 (SARS-CoV-2) pandemic: A review. *Chaos, Solitons & Fractals*. 2020;110059.
- Amnesty International UK. 7 principles that should be guiding roll-out of any COVID-19 contacting-tracing app. 2020 May 19. Available from: <https://www.amnesty.org.uk/coronavirus/7-principles-contact-tracing-app-rollout>.
- Kooistra J. Newzoo's 2018 Global Mobile Market Report: Insights into the World's 3 Billion Smartphone Users. Newzoo. 2018 Sept 11. (accessed on 3 January 2019). Available from: <https://newzoo.com/insights/articles/newzoos-2018-global-mobile-market-report-insights-into-the-worlds-3-billion-smart-phone-users/>.
- Shamil MS, Farheen F, Ibtehaaz N, Khan IM, Rahman MS. An Agent Based Modeling of COVID-19: Validation, Analysis, and Recommendations. *MedRxiv*; 2020. Doi: <https://doi.org/10.1101/2020.07.05.20146977>.
- BTRC. Mobile Phone subscribers in Bangladesh. Bangladesh Telecommunication Regulatory Commission (BTRC). (Accessed September 07, 2020, 2020) Available from: <http://www.btrc.gov.bd/content/mobile-phone-subscribers-bangladesh-june-2020>.
- BTRC. Internet Subscribers in Bangladesh. Bangladesh Telecommunication Regulatory Commission (BTRC). (Accessed September 07, 2020, 2020) Available from: <http://www.btrc.gov.bd/content/internet-subscribers-bangladesh-june-2020>.