Policy Brief
SENATE ECONOMIC PLANNING OFFICE

May 2021 PB-21-01

COVID-19 Response: Strengthening Contact Tracing

A country's COVID-19 response is only as strong as its weakest link. Currently, the Philippines has the second highest number of COVID-19 cases in the ASEAN and this has wreaked havoc to the domestic economy.

Addressing the issues and challenges to contact tracing implementation would lead to more targeted testing and isolation, and help stop the ongoing transmission of the virus.

The SEPO Policy Brief, a publication of the Senate Economic Planning Office, provides analysis and discussion on important socio-economic issues as inputs to the work of Senators and Senate Officials. The SEPO Policy Brief is also available at www.senate.gov.ph.

1. Introduction

Contact tracing has been a primary response in addressing the coronavirus disease 2019 (COVID-19) by several Asian countries that led to successful reduction of COVID-19 cases (ECDC 2020, 1). By immediately identifying and managing the contacts of COVID-19 infected persons, these countries were able to rapidly identify secondary cases that would have resulted after transmission from the primary cases. As contact tracing interrupts the further transmission of the virus, it is widely regarded as an effective public health measure for the control of COVID-19, especially when combined with robust testing and surveillance systems.

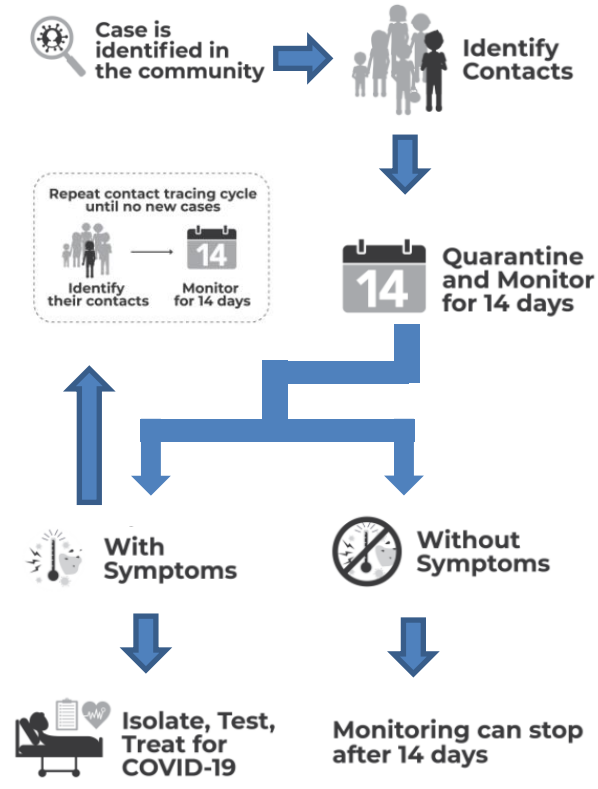
In the Philippines, much of the public health policy response to address COVID-19, specifically in the Bayanihan I and II laws, focused more on strengthening the capacities of health facilities nationwide to test, treat, and isolate COVID-19 infected persons. Contact tracing has lagged behind. Despite the provision of additional resources and the increase in the number of trained contact tracers, the government is still tracing too few individuals who have been exposed to COVID-19 infected persons, especially in Metro Manila. Contact tracing has been described and is still referred to as the weakest link in the Philippines' response to COVID-19 (David et al. 2020, 9; Roque in Salaverria 2021).

In advocating for a more effective and responsive public health policy to address COVID-19, this paper aims to: (1) emphasize the need to strengthen government's overall COVID-19 response by focusing on the improvement of its contact tracing efforts; (2) provide a brief background and discuss the issues and challenges of contact tracing in the Philippines; and (3) underscore the elements of a necessary public policy that would improve contact tracing in the country.

Figure 1. A Vector Illustration of Contacts

Source: Ani Ka via Getty Images

Figure 2. Steps in Contact Tracing



Source: NTF-CT

2. Contact Tracing Basics

In public health, contact tracing is the process of identifying persons who may have encountered an infected person, i.e., contacts; and collecting further information about these contacts (Anderson et al. 2020, 3). Specifically, a contact, as defined by the World Health Organization (WHO),[1] is a person who has had any one of the following exposures to a probable or confirmed case: (1) face-to-face contact with a probable or confirmed case within 1 meter and for at least 15 minutes; (2) direct physical contact with a probable or confirmed case; (3) direct care for a patient with probable or confirmed COVID-19 without the use of proper personal protective equipment (PPE); or (4) other situations as indicated by local risk assessments (WHO 2021).

The goals of contact tracing are to: (1) interrupt ongoing transmission and reduce the spread of infection; (2) alert contacts to the possibility of infection and offer preventive counseling or prophylactic care; (3) offer diagnosis, counseling and treatment to infected individuals; (4) help prevent reinfection of the originally infected patient, if the infection is treatable; and (5) learn about the epidemiology of a disease in a particular population (DOH 2020a; DOH in LGA 2020).

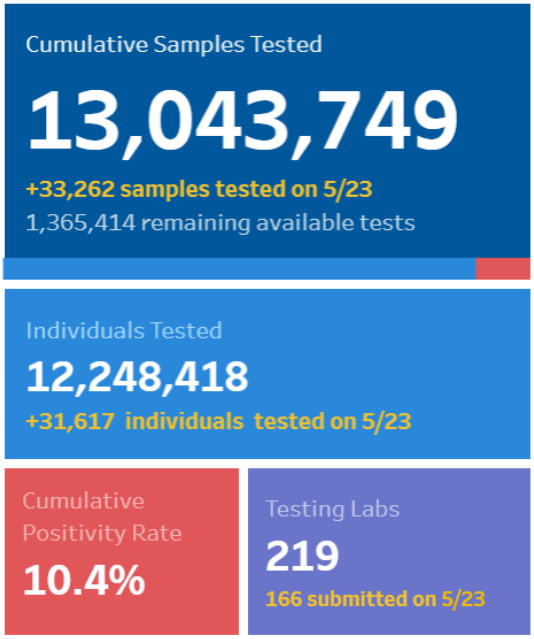
Contact tracing has been a pillar of communicable disease control in public health for decades. It is commonly performed for diseases such as tuberculosis, vaccine-preventable infections like measles, sexually transmitted infections (including HIV), blood-borne infections, some serious bacterial infections, and novel infections (e.g., SARS-CoV, H1N1, and COVID-19). Anderson et al. (2020, 3), for example, pointed out that the eradication of smallpox was achieved not only by universal immunization, but by: (1) exhaustive contact tracing to find all infected persons; and (2) isolation of infected individuals and immunization of the surrounding community and contacts at risk of contracting smallpox. Although contact tracing can be enhanced by letting patients provide information, medication, and referrals to their contacts, evidence demonstrates that direct public health involvement in notification is most effective (OPIDAC 2009).

3. A Case for a Stronger Contact Tracing

As of 24 May 2021, the Philippines has a total of 1,189,679 COVID-19 cases, the second highest in the ASEAN. Active cases are 48,917, while recorded mortalities are 19,983. Like most countries, the Philippine government's public health response to the COVID-19 pandemic can be summarized as follows: (1) mass testing; (2) contact tracing; and (3) treatment and isolation. Of these three critical steps, contact tracing appears to have lagged behind the most. In May 2020, experts from the University of the Philippines (UP) described contact tracing as the "weakest link" in the Philippines' response to COVID-19 (David

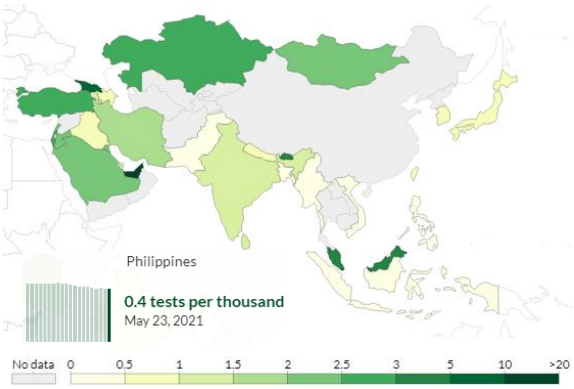
[1] Taking off from the definition of the WHO, the United States Centers for Disease Control and Prevention (CDC) defines "close contact" as someone who was within 2 meters of an infected person for at least 15 minutes within a 24-hour period starting from 2 days before illness onset (or, for asymptomatic cases 2 days prior to positive specimen collection) until the time the patient is isolated.

Figure 3. COVID-19 Testing Data



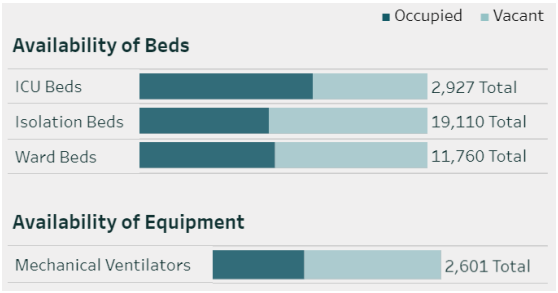
Source: DOH

Figure 4. Daily Tests Per Thousand People



Source: Our World in Data

Figure 5. Availability of Beds and Equipment



Source: DOH (as of 24 May 2021)

et al. 2020, 9). One year into the pandemic, the country's contact tracing czar, Baguio City Mayor Benjamin Magalong, and even Malacañang have confirmed that it is still the weakest part in the country's COVID-19 response (Roque in Salaverria 2021; Magalong in Galvez 2021).

There are several reasons why the government needs to improve on this weakness to strengthen its overall COVID-19 response:

3.1. Maximizing the impact of other pandemic strategies

According to the WHO, with more than a million COVID-19 cases, the country's testing capacity should at least be 130,000 per day. The UP COVID-19 Pandemic Response Team has similarly pointed out that Metro Manila's daily testing capacity alone should at least be 91,000. However, data from the Department of Health (DOH) show that on May 17 to 23, 2021, the average number of daily tests conducted is only 47,725.14. The average daily positivity rate (i.e., the percentage of all COVID-19 tests performed that are actually positive during the said period) is at 10.4 percent, way above the criteria set by the WHO, which is below 5 percent positivity rate to indicate that COVID-19 in the country is under control.

Clearly, expanding COVID-19 mass testing is necessary. However, even if a high proportion of those infected with COVID-19 are tested, it would not stop transmission if test results end up taking too long or infected contacts are not traced before they become infectious (Kucharski et al. 2020; Hochman 2020). To have maximum impact, mass testing and contact tracing in the Philippines will need to identify and isolate a large proportion of infected individuals and their contacts, in a manner that is quick enough to get ahead of the outbreak. Rapid contact tracing and targeting programs, for example, made it possible for countries such as South Korea, New Zealand, Taiwan, and Vietnam to maintain less than 4 percent testing positivity rates (Siddarth 2020).

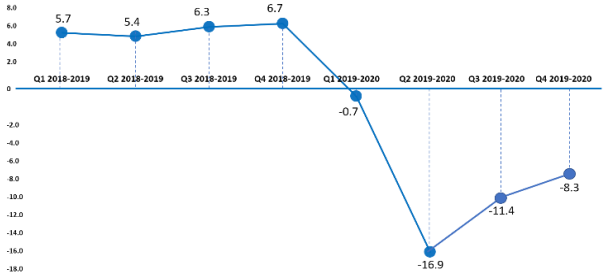
Similarly, even if the number of health care facilities and isolation centers around the country are increased, if community transmission is left unchecked due to poor contact tracing, it may lead to another surge and the treatment of COVID-19 patients would eventually be compromised. At present, the country has a total of 1,271 facilities, 33,797 beds, and 2,601 mechanical ventilators for COVID-19 cases. Medical workers have urged the government to speed up its contact tracing efforts, fearing that the country's healthcare system would be overwhelmed (CNN PH 2020).

3.2. The problem of asymptomatic cases

Infected people without symptoms can easily spread the disease because they carry just as much virus as those with symptoms (Lee et al. 2020). It is estimated that the asymptomatic transmission of the virus likely accounts for at least a third of all transmission globally (Greenhalgh et al. 2021). David et al. (2020), for example, cited

estimates that 50 to 75 percent of cases in Italy and in China as of April 2020 were asymptomatic. More recently, results from a study by Johansson et al. (2021) finds that 59 percent of COVID-19 cases stem from asymptomatic spread. In Vietnam, the high proportion of cases that never developed symptoms (43%) suggests that its comprehensive contact tracing approach has been a key contributor to limiting community transmission at an early stage (Pham et al. 2020).

Figure 6. Gross Domestic Product Growth Rates

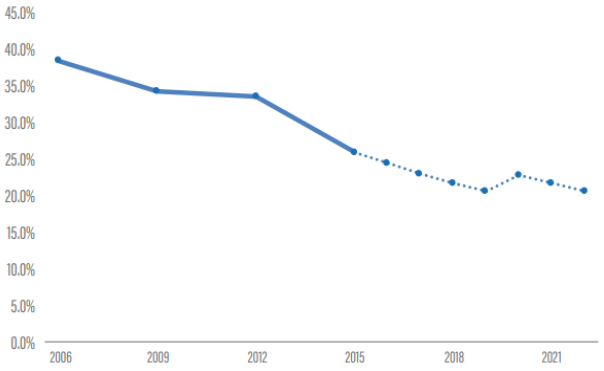


Source: PSA 2021

Based on the distribution of active COVID-19 cases in the Philippines, only 5 percent of the active cases are asymptomatic. Given the global trend in COVID-19 infections where there is a significant proportion of asymptomatic cases, there is a strong likelihood that undetected asymptomatic transmission is happening and that the prevalence of COVID-19 cases in the country is understated. This is why contact tracing is key. Exposure to infected people and their contacts should be sufficient basis for an individual's precautionary quarantine even before testing.

3.3. The high cost of community quarantines

Figure 7. Actual and Projected Poverty Rates



** USD3.20-a-day poverty rates*
Source: WB staff estimates in WB 2020, 44

Given the poor mass testing and the weak state of contact tracing in the country, everyone was subjected to varying levels of community quarantine since the start of the pandemic, the strictest being the enhanced community quarantine (ECQ). These quarantine measures come at a heavy cost. The country's domestic economy contracted by 9.5 percent in 2020, its worst performance in the post-war era. In the first quarter of 2021, the economy continued to shrink by 4.2 percent. The recession has led to record high joblessness and increase in hunger and poverty incidence. However, the stringent lockdown measures still failed to halt the spread of the virus, with the Philippines still having the second highest number of COVID-19 cases in the ASEAN. Improved contact tracing can help avoid another costly lockdown. The success of easing stay-at-home orders and social distancing policies depend on the government's ability to effectively carry out its contact tracing efforts on a larger scale.

3.4. Insufficiency of vaccines

As of 23 May 2021, a total of 4.1 million vaccine doses have already been administered out of the 8.2 million (5.5 million Sinovac, 2.5 million AstraZeneca, 30,000 Sputnik V and 193,050 doses of Pfizer's Covid-19 vaccine) which arrived in the country since the start of the vaccination program on 1 March 2021. The Philippine government initially aimed to reach herd immunity[2] by inoculating 50-70 million Filipinos by the end of 2021. However, citing the global supply crunch and the emergence of more contagious strains resistant to some vaccines, the government recently adjusted its target from herd immunity to "population protection", which means reducing the number of deaths and hospitalized patients through vaccination.

[2] According to the WHO, herd immunity is defined as the indirect protection from an infectious disease that happens when a population is immune either through vaccination or immunity developed through previous infection.

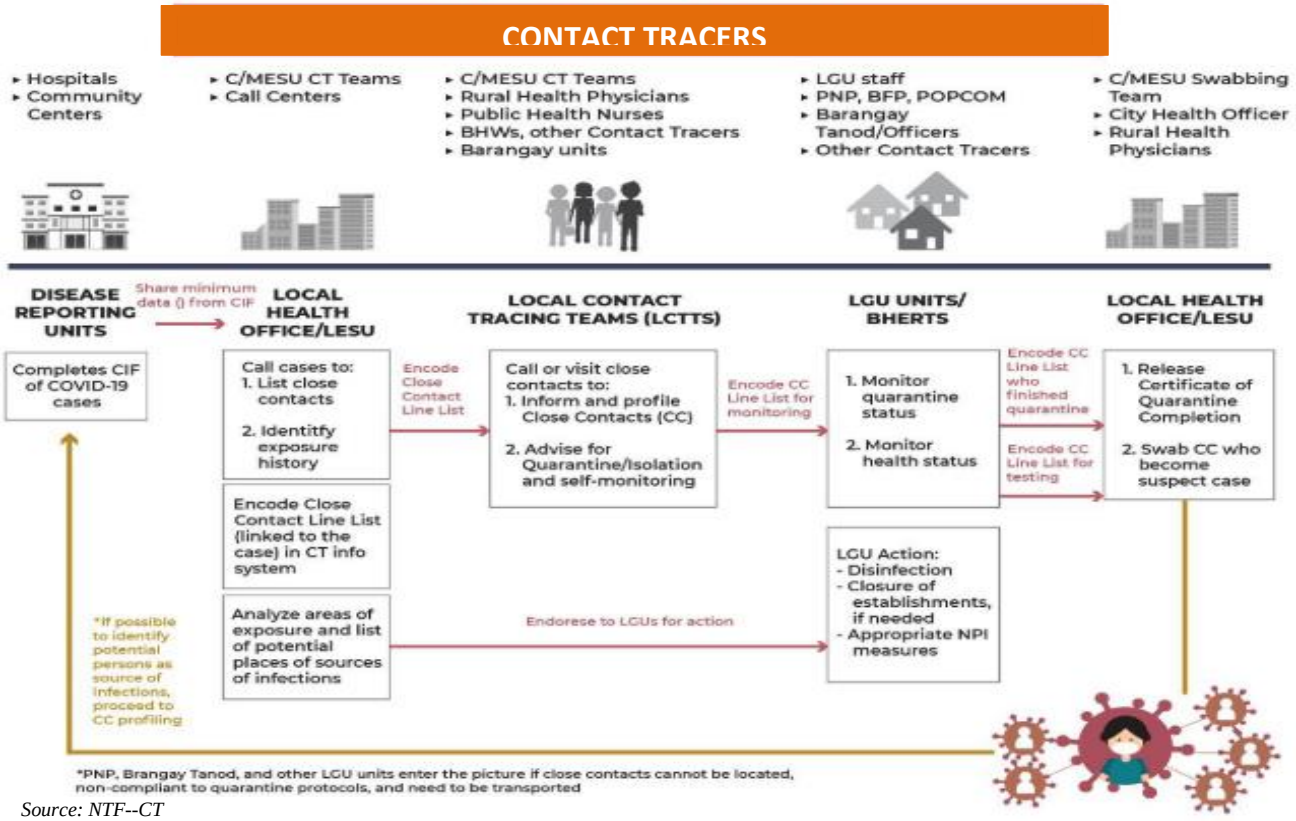
The government is now targeting to vaccinate 50-60 million Filipinos and will concentrate the inoculation coverage in Metro Manila and other regions that are economically critical and have high number of COVID-19 cases. With these considerations, contact tracing remains a vital component in any country's COVID-19 response, even with the presence of vaccines.

4. Overview of Contact Tracing in the Philippines: Issues and Challenges

Contact tracing in the Philippines is led by: (1) the DOH, as the lead implementing agency of the COVID-19 Surveillance System; and (2) the Department of the Interior and Local Government (DILG), as the lead agency that ensures all local government units (LGUs) fully assist and cooperate with the DOH in the conduct of response efforts against COVID-19, which includes contact tracing and expanded testing (NTF-CT 2020, 17-18). The DOH issued the following policies and guidelines on contact tracing for COVID-19: (1) Department Memorandum No. (DMN) 2020-0068 on 5 February 2020 for the reiteration of the interim guidelines on contact tracing for confirmed COVID-19 cases; (2) DMN 2020-0189 on 17 April 2020, which updated the guidelines on contact tracing of COVID-19 close contacts (i.e., contacts as defined by the WHO); and (3) DMN 2020-0227 on 08 May 2020, to intensify case investigation, contact tracing, reporting and deployment of COVID-19 special teams for urgent response to stop COVID-19 transmission. The DILG, on the other hand, issued Memorandum Circular No. 2020-073 mandating the creation of a local task force for COVID-19 in each LGU.

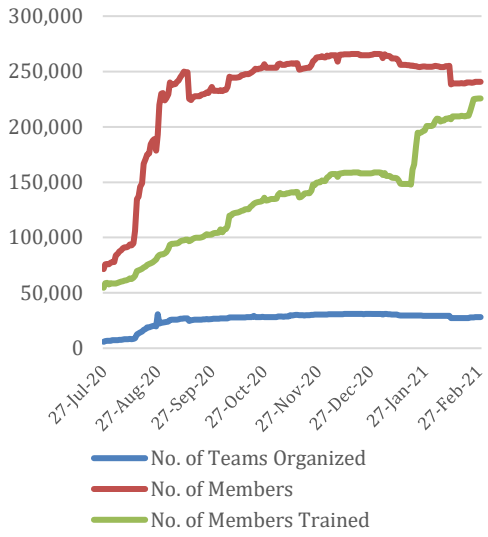
Contact tracing comes after case investigation of every suspect COVID-19 case identified and recorded in the DOH-provided COVID-19 Case Investigation Form (CIF). All Disease Reporting Units (DRUs), LGUs, Temporary Treatment and Monitoring Facilities (TTMFs), and public and private institutions that are providing testing for COVID-19 are mandated to complete the CIF and ensure that all information required are fully complied with. After getting the minimum data of suspect cases from the CIF, the information is then referred to the Local Epidemiology and Surveillance Units (LESUs) for profiling and referral to Local Contact Tracing Teams (LCTTs), which are responsible for the conduct of contact tracing in the LGUs. The Barangay Health Emergency Response Teams (BHERTs) are the ones who monitor and report the quarantine and health status of close contacts within an LGU's jurisdiction. Close contacts that have completed the 14-day quarantine shall then be given a Certificate of Quarantine Completion upon the recommendation of the LESUs. Figure 8 illustrates the key players in contact tracing and their functions (NTF-CT 2020, 35).

Figure 8. Key Players in Contact Tracing and Their Functions



Source: NTF--CT

Figure 9. Organization of Contact Tracing



Source of basic data: NTF-CT

Table 1. Contact Tracing of Confirmed Cases (as of March 9, 2021)

REGION	Cumulative No. of Confirmed Cases	Cumulative No. of Close Contacts Traced and Assessed	Case : Close Contact Ratio
Philippines	**461,325**	**2,535,576**	**1:6**
NCR	189,050	1,203,039	1:7
CAR	14,376	174,033	1:13
I	6,534	55,555	1:9
II	9,365	48,240	1:6
III	23,471	147,990	1:7
IV-A	80,447	310,772	1:4
IV-B	2,159	13,305	1:7
V	4,926	21,982	1:5
VI	22,713	56,962	1:3
VII	40,979	106,099	1:3
VIII	12,620	53,624	1:5
IX	6,706	74,678	1:12
X	10,270	34,439	1:4
XI	20,308	123,461	1:7
XII	5,628	32,497	1:7
CARAGA	7,651	64,856	1:9
BARMM	4,122	14,044	1:4

Source: DILG

As the country mounts its contact tracing efforts, implementation issues and challenges have been observed:

4.1. Lack of trained and dedicated contact tracers

Manual contact tracing is resource-intensive because it requires a substantial number of contact tracers, which are non-licensed public health professionals providing support to a health department in the fight against COVID-19. Case investigation and contact tracing is a specialized skill. To be done effectively, it requires people with the training, supervision, and access to social and medical support for patients and contacts (CDC 2020). Following the WHO's ideal contact tracer to population ratio of 1:800, the Philippines needs at least 135,000 dedicated contact tracers to cover its 110-million population.

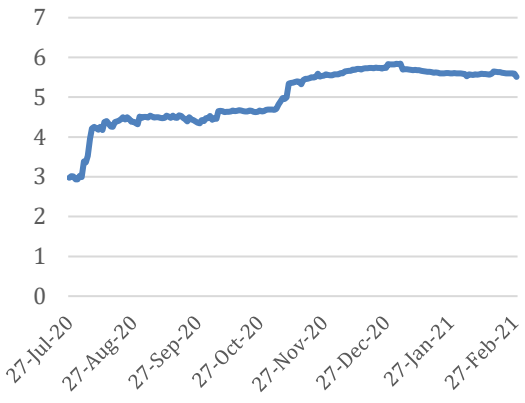
As of 9 March 2021, there were 228,225 contact tracers in the country. Note though that most of these are designated, i.e., composed mostly of government employees from LESUs, Philippine National Police (PNP), Bureau of Fire Protection (BFP), and barangay health workers (BHWs). It also includes other non-public health staff and volunteers (e.g., staff working in other areas of the public service, students, retired healthcare professionals, NGO workers, among others) which the government tapped after it abandoned DOH's proposal in June 2020 for an additional PhP11.7 billion funding to hire at least 135,000 dedicated contact tracers.

Republic Act No. 11494 or the Bayanihan II included a budget of PhP5 billion for contact tracing which enabled the DILG to hire around 50,000 dedicated contact tracers on 21 November 2020. The DILG itself said that these dedicated contact tracers were able to do "the job exclusively, unlike some from earlier batches" (Malaya in Abad 2020). Their contracts however were terminated on 31 December 2020.

While this is acceptable as a quick-response measure, it must be understood that volunteers are generally not expected to do full-time contact tracing work. Hence, even if it appears that there are already too many contact tracers, they may be doing less work than necessary. In addition, Figure 9 shows the gap in the number of contract tracers and those who have undergone training to do contact tracing work. While the gap is narrowing, it is uncertain if those who received training actually do or continue to do contact tracing work. It has been reported, for example, that designated contact tracers from the PNP only accompanied contact tracers (i.e., as security escorts), but did not apply their probing skills to search for cases and close contacts (Talabong and Ines 2021).

According to the DILG, as of 10 March 2021, only four out of the 13 cities in Metro Manila are compliant with contact tracing standards set by the national government. These cities include Manila, San Juan, Taguig and Pateros. The rest have not complied with the WHO-recommended ratio of one contact tracer per 800 people. Also, it has been reported that LGUs had the tendency of "concentrating on the number of contact tracers" just for compliance, even if the contact tracing team and the composition of its members are not properly established or organized (Magalong in Gonzales 2020).

Figure 10. Case : Close Contact Ratio



Source of basic data: NTF-CT

Table 2. Case : Close Contact Ratio Comparison

REGION	Case : Close Contact Ratio		
	18 August 2020	31 December 2020	9 March 2021
Philippines	**1:5**	**1:6**	**1:6**
NCR	1:5	1:7	1:7
CAR	1:19	1:13	1:13
I	1:12	1:9	1:9
II	1:10	1:8	1:6
III	1:8	1:7	1:7
IV-A	1:4	1:4	1:4
IV-B	1:21	1:7	1:7
V	1:6	1:5	1:5
VI	1:4	1:3	1:3
VII	1:3	1:4	1:3
VIII	1:4	1:6	1:5
IX	1:5	1:7	1:12
X	1:5	1:5	1:4
XI	1:7	1:7	1:7
XII	1:8	1:8	1:7
CARAGA	1:11	1:11	1:9
BARMM	1:5	1:4	1:4

Source: DILG

4.2. Low performance or contact tracing efficiency

Despite the seemingly large number of contact tracers, the government is still tracing too few individuals who have been exposed to COVID-19 infected persons. As of 9 March 2021, the Philippines only managed to trace 2,535,576 close contacts out of 461,325 confirmed cases (Table 1) or a case-to-close contact ratio of 1:6. Moreover, contact tracing in many areas in the country do not go beyond the household of the detected COVID-19 case (Talabong 2021). According to contact tracing czar Mayor Magalong, to cut the transmission of the disease, a 1:37 or at least 1:30 patient-to-close contacts ratio is recommended. He admitted that this ratio is difficult to achieve, hence the government now has decreased the target contact tracing ratio to 1:15 to be "more realistic" (Galvez 2021).

Among the regions in the country, only the Cordillera Administrative Region (CAR) and Region 9 managed to have an average case-to-contact ratio of at least 10, as of March 2021. This represents a decline in regional performance, given that five regions managed to trace more than 10 close contacts of a confirmed case in August 2020. During that period, CAR was able to reach 19 close contacts, while Region IV-B did even better at 21 contacts. By the end of 2020, only CAR and CARAGA sustained an average of case-to-contact ratio of at least 10. Currently, only Region 9 has an improving contact tracing performance (Table 2). The recent overwhelming increase in positive cases deteriorated the quality of contact tracing.

4.3. Lack of automation in digital contact tracing

Technology can support case investigation and contact tracing but cannot take the place of the staff who interview, counsel, and provide support for those impacted by COVID-19 (CDC 2020). There are two key types of technology that can contribute to the contact tracing process: (1) case management tools; and (2) proximity tracing/exposure notification tools.

In the Philippines, there are many online platforms and digital contact tracing applications. Some of the examples are: (1) StaySafe.ph, which is the official digital contact-tracing app of the Philippine government; (2) COVID Kaya, which is used by the DOH and health workers; (3) Traze, which is supported by the Department of Transportation (DOTr); (4) Tanod COVID, the online platform backed by the Department of Science and Technology (DOST); (5) Trace Together, which is preferred by the National Bureau of Investigation (NBI); and (6), Kontra COVID, which is used by the Light Rail Transit 1 (LRT-1) maintenance provider. LGUs have endorsed apps specific to their cities (Samaniego 2020).

After the Memorandum of Agreement signing and official turnover of the StaySafe.ph app to the government on 29 March 2021, the DILG asked LGUs to stop developing their own systems and use the StaySafe.ph application instead. According to the DILG, the StaySafe.ph app is currently being used by some 15 million individual users and

some 700 LGUs or about 43 percent of the total LGUs. The government aims to reach at least 50 million users and connect all 1,634 city and municipal LGUs (DILG 2021). While having a centralized or interlinked contact tracing database through the StaySafe.ph app is a step in the right direction, the current functionalities of StaySafe.ph, as well as the various applications mentioned earlier, are only geared to support case management. That is, they only provide a built-in digital logbook and quick response (QR) code scanning features to replace the manual logging of visitors' health check to establishments, thereby facilitating the manual labor involved in contact tracing (Ordoña 2020). These digital contact-tracing apps do not have automated COVID-19 exposure notification functionalities which would immediately inform close contacts that they have been exposed to a person infected with COVID-19 (Rahman 2021). While the app is not meant to replace the actual tracing on the ground, as the DOH has indicated (Esguerra 2020), simply digitizing logbooks seems to be a waste of ingenuity.

4.4. Misuse of contact-tracing data

Contact tracing is a form of public health surveillance. Though it has repeatedly proved to help limit the spread of the virus (WHO 2020), privacy advocates point out that contact tracing can be abused by companies or governments (O'Neill 2020). Several business establishments in the Philippines, in particular, have been the subject of reports from citizens over mishandling and misuse of contact-tracing data (e.g., improper use of logbooks, leaving filled-out contact tracing forms open to the eyes of the public, using personal data for purposes besides contact tracing, absence of a privacy note, and having a baseless retention period for customer data). Aside from the inconvenience of manually providing personal data to every establishment visited, these privacy concerns led to the lack of cooperation of the general public in providing accurate and reliable contact information.

These prompted privacy advocates and experts to call for strict guidelines on maintaining confidential information secure, anonymous, and protected from potential abuse by the state and other parties. Multisys Technologies Corp., the developer of StaySafe.ph, for example, removed the GPS (i.e., global positioning system) and Bluetooth features of its contact-tracing app to ensure "zero surveillance" (Balinbin 2021).

The National Privacy Commission (NPC) likewise took steps in checking the businesses' compliance with Republic Act No. 10173 or the Data Privacy Act (DPA) of 2012 and other government issuances (NPC 2020). The NPC, however, has clarified that the DPA is not a hindrance to contact tracing initiatives, saying that it seeks to protect individuals from discrimination, harassment, and acts of social vigilantism amid the COVID-19 pandemic.

The NPC emphasized that: (1) hospitals have the duty to disclose the necessary details of COVID-19 patients to LGU contact tracers following the DOH guidelines; and (2) COVID-19 patients should be truthful in providing accurate personal details, in accordance with Section 9 of Republic Act No. 11332 or the Mandatory Reporting of Notifiable Diseases and Health Events of Public Health Concern Act (NPC 2020). Despite this clarification, however, efforts to improve data collection efficacy (e.g., use of GPS and Bluetooth) have been thwarted by persisting data privacy concerns.

5. How to Make Contact Tracing Work

The COVID-19 response of the Philippine government is only as strong as its weakest link. Given the issues and challenges discussed in the previous section, the following are recommended to strengthen contact tracing in the country:

5.1. Hire many trained and dedicated contact tracers

The government needs to hire additional dedicated manual contact tracers; or at the very least, ensure that those it designates are doing full-time contact tracing work. If they are not working full time, then the government needs to ensure the number of contact tracers and the working hours they provide are still comparable to those provided by the ideal number of full-time tracers.

For 2021, the DILG said it can only rehire 15,000 of the recommended 50,000 personnel for six months. This is because the Department of Budget and Management (DBM) only approved PhP1.9 billion as budget for the hiring of contact tracers in 2021, PhP500 million of

which will come from the 2021 national budget while the bulk will be from the unreleased balance under the Bayanihan II. The DILG is considering to request more funds from Congress for contact tracers, as it may need an additional PhP1 billion in funding to sustain them until the end of the year (Malaya in Gonzales 2021). The DBM, however, has pointed out that the DILG can instead realign its budget to accommodate the hiring of up to 35,000 contact tracers.

5.2. Ensure that relevant personal health information is properly used and readily available to healthcare workers

Contact tracing will only work if people will fully and truthfully disclose the needed information to authorities (manually or digitally). They will only do this if they feel assured that the information they provide will be properly used for treatment, disease surveillance, and response; and that the data provided will be protected against any type of misuse. To protect the data privacy of the general public, the DILG in coordination with the NPC and the Department of Trade and Industry (DTI), should ensure that establishments do not collect information beyond what is required and necessary for contact tracing (i.e., first name and contact number should suffice).

To facilitate and ensure the provision of complete and accurate information to healthcare workers in their duty to observe, diagnose, and treat possibly COVID-19 infected persons, Senator Imee Marcos has filed Senate Bill No. 1446, which proposes to amend the DPA. The bill states that, upon declaration of national health emergency or pandemic, the DPA does not apply to "[…] personal information, including privileged and sensitive personal information, that are necessary to address the health crisis. Provided, the DOH shall first issue guidelines for its implementation, taking into consideration the safety and welfare of the data subject, including the circumstances when mandatory public disclosure of personal information shall be implemented." This amendment should settle any policy gaps or differences in interpretation between the DPA and other relevant laws such as the Mandatory Reporting of Notifiable Diseases and Health Events of Public Health Concern Act.

5.3. Use automation and big data analytics

The government can take advantage of the fact that more than 74 million Filipinos use a smartphone. This is the primary device that could provide: (1) automated exposure notification for its population, as well as (2) big mobility data for improved case management.

The digital contact-tracing mobile applications in the Philippines need to use the Google/Apple Exposure Notification (GAEN) system, or a similar framework and protocol specification. Once a person downloads a supported application and activates the GAEN, it will generate random identifications (IDs) on the device. These random IDs make it possible for smartphones to recognize each other. To help prevent tracking, the phone's random ID will change every 10-20 minutes. The phone then works in the background to share random IDs via Bluetooth with other phones around that also have Exposure Notifications on. When a phone detects a random ID from another device, it records and stores the ID on the device (i.e., no internet is required in this process; just Bluetooth). If someone reports having COVID-19 and his/her ID is stored on a person's phone, the app will notify him/her of the next steps to take.

Aside from improving contact tracing efficiency, the GAEN system prevents health authorities from gathering personal information about app users or their devices, thereby helping to address data privacy concerns. Nonetheless, to increase the uptake of such technology, the purpose and significance of sharing information for contact tracing should be communicated effectively to the public.

Moreover, the DOH and the DILG need to adopt and integrate technological advancements in case management. The Asian Development Bank (ADB), for example, has conducted a series of studies which explore ways to use big data, artificial intelligence, and machine learning to craft development solutions during the pandemic.

One of its studies (Sy et al. 2020) analyzed data from popular transit applications such as Waze and observed a positive relationship between increased mobility (e.g., number of reported traffic jams) and COVID-19 cases in Metro Manila. David et al. (2020) pointed out that big data is critical for decision support and recommended that the government partners with the academe and the private sector that are involved in model simulations, mobility tracking, geospatial analysis, and media content analysis. Nombres and Goh (2020), on the other hand, cited the advancements in Geographic Information Systems (GIS) tools that allow the spread of COVID-19 to be modelled through various spatial and temporal scales.

5.4. Replicate international best practices

For a successful COVID-19 contact-tracing operation, the WHO recommends tracing and isolating 80 percent of close contacts within three days of a case being confirmed. This is a goal few countries have achieved. A handful of countries, however, stand out as exemplars of successful contact-tracing. The Philippines can learn valuable lessons and replicate best practices from countries such as South Korea, Vietnam, and Taiwan.

South Korea: Lewis (2020) cited how government authorities in South Korea use data-surveillance techniques to get around the problem of people being unwilling to disclose (or unable to recall) close contacts. The study also pointed out how a law passed in response to an outbreak of Middle East Respiratory Syndrome (MERS) in 2015 allowed authorities to use data from credit cards, mobile phones, and closed-circuit television (CCTV) to trace a person's movements and identify others they might have exposed to the virus.

South Korea also avoided broad lockdowns by being transparent and kept on publishing information about cases online (Lewis 2020). However, in response to human rights concerns on the overly intrusive disclosure of personal information, the Korea Disease Control and Prevention Agency released new guidelines instructing local governments not to release information that could result in the identification of an individual (Kennedy 2020).

Vietnam: Mass testing has been the strategy for many countries in their response to combatting the pandemic. However, in Vietnam, the country has focused more on isolating infected people and comprehensive contact tracing (Nortajuddin 2020).

Vietnam's contact tracing strategy is based on tracing degrees of contact from F0 (the infected person) through F1 (those who have had close contact with F0 or are suspected of being infected) and F2 (close contact with F1), and all the way up to F5. All close contacts (F1), defined as people who have been within approximately 6 feet (2 meters) of or have prolonged contact of 30 or more minutes with a confirmed COVID-19 case, are identified and tested for the virus. Close contacts of the previously identified close contacts (F2s) are required to self-isolate at home for 14 days (see more in Pollack et al. 2021). The National Institute of Hygiene and Epidemiology in Hanoi has reported that as many as 200 contacts for each case are found and tested.

Taiwan: Lin et al. (2021) described contact tracing in Taiwan as a cross-departmental, human resource-intensive task. Central and regional CDC epidemiologists lead local health department teams in conducting interviews and compiling lists of locations that the infected persons have been 7-14 days prior to estimated disease onset and all identifiable contacts, sometimes hundreds per case. Teams work closely with local law enforcement and use data from multiple sources, including matching clinical records from the National Health Insurance with travel histories from the Customs and Immigration database. When needed, community security videos and individual cell phone GPS records or social media posts are utilized (with verbal consent) to assist recall, while maintaining confidentiality. Information regarding symptom progression, occupations and travel/contact histories of the infected and suspected, length and proximity of interactions, mask or other precautions employed, and specimen samples are collected to help triangulate the source of infection and determine the risk to contacts (Lin et al. 2021).

Lin et al. (2021) pointed out that the first round of case investigation in Taiwan is usually completed within 10 hours, accomplished by teams working extended hours to swiftly halt the spread of transmission to COVID-19. Every close contact is interviewed by phone or, preferably, in person and tested. If negative, they undergo a 14-day home-quarantine. All other contacts are communicated by telephone and instructed to self-monitor for two weeks. Local environmental departments disinfect identified locations and surrounding areas, as needed. If there is a potential exposure by the larger unidentifiable public, the Central Epidemic Command Center (CECC) publicizes the site and date through cell broadcast or regular media, to alert affected individuals to also self-monitor. Daily press conferences outlining case investigation results have educated the public about transmission routes and underscored the importance of vigilance and cooperation with response efforts.

6. Conclusion

Historically, contact tracing has quelled outbreaks of Ebola, allowed smallpox to be corralled before being vanquished by a vaccine, and helped turn HIV/AIDS into a survivable illness. Whenever a new infectious disease emerges, it has been public health's most powerful weapon for tracking transmission and figuring out how best to protect the population.

Like most countries, the Philippine government's overall public health response to the COVID-19 pandemic is to test, trace, and treat and isolate. Each of these elements is important and integral to control the pandemic. Strengthening contact tracing would enhance the overall COVID-19 response of the government, which again is only as strong or effective as its weakest link.

To have maximum impact, mass testing and contact tracing in the Philippines will need to identify and isolate a large proportion of COVID-19 infected cases and their contacts, in a manner that is quick enough to get ahead of the outbreak.

Strengthening contact tracing would: (1) address the limitations of mass testing, by immediately identifying, and therefore quickly isolating, infected contacts before they infect others; (2) address the problem of asymptomatic cases and super spreaders, all of whom can easily and unknowingly bypass even the strictest quarantine protocols; (3) help avoid another lockdown that can further strain the country's economic and social welfare; (4) ensure that the country's healthcare system is not overwhelmed and that medical professionals are not burned out; and (5) provide a greater sense of normalcy as the world waits for sufficient and widely available vaccines. Strengthening contact tracing essentially means employing targeted testing and targeted quarantine and isolation.

To make contact tracing work, the government needs to: (1) improve case-to-close contact ratio by hiring a substantial number of well-trained and dedicated manual tracers through agency budget realignments; (2) ensure proper use of personal health information for improved cooperation between contact tracers and close contacts; (3) use of automation to improve contact tracing efficiency, and big data analytics to improve case management; and (4) replicate international best practices (i.e., South Korea, Vietnam, and Taiwan).

These measures that would strengthen contract tracing can be included in the amendatory bill to the Mandatory Reporting of Notifiable Diseases and Health Events of Public Health Concern Act under Senate Bill No. 1528 filed by Senator Christopher Lawrence "Bong" Go. Otherwise, such measures can be integrated in the "Better Normal" bills under Senate Bill Nos. 1747 and 1792 filed by Senators Juan Edgardo "Sonny" Angara and Francis "Tol" Tolentino, respectively.

Strengthening the country's contact tracing capability is not only critical to halting the spread of COVID-19, it is also a preemptive step to build up the Philippines' pandemic preparedness and resilience to future outbreaks.

References

Abad, Michelle (2020): Philippines' contact tracing 'army' complete – DILG. Rappler. 21 November 2020.

Aguilar, Krissy (2020): Data privacy law among challenges in contact tracing, Año admits. The Philippine Daily Inquirer. 10 August 2020.

Anderson, Roy, Carolin Vegvari, Rosie Maddren, and Rebecca Baggaley (2020): SARS-CoV-2: Where do people acquire infection and 'who infects whom'? The Royal Society. 14 December 2020.

Centers for Disease Control and Prevention (2020): Contact Tracing for COVID-19. Centers for Disease Control and Prevention. 16 December 2020.

CNN Philippines Staff (2020): Pagod na pagod na kami': Frontliners appeal for two-week ECQ in Mega Manila amid surge in coronavirus cases. CNN Philippines. 1 August 2020.

Daphne Galvez (2021): Magalong: Contact tracing remains weakest link in PH COVID-19 response. INQUIRER.net. 4 May 2021.

David, Guido, Ranjit Singh Rye, and Ma. Patricia Agbulos (2020): COVID-19 Forecasts in the Philippines: NCR and Cebu as of 08 June 2020. UP Media and Public Relations Office (upd.edu.ph). 12 June 2020.

De Dios, Emmanuel S. (2020): And do bring us to the test — please lang. Introspective. Business World Online. 7 June 2020.

Department of Health (2020a): Department Memorandum No. 2020-0189: Updated Guidelines on Contact Tracing of Close Contacts of Confirmed Coronavirus Disease (COVID-19) Cases. DOH. 17 April 2020.

Department of Health (2020b): DOH explains COVID-testing protocol. Press Release. 14 April 2020.

Department of the Interior and Local Government (2021): DILG to LGUs, public: Use StaySafe.PH app to boost contact tracing. DILG Press Release. March 30, 2021.

Esguerra, Darryl John (2020): DOH: StafySafe.ph app only an aid for on-ground contact tracing. The Philippine Daily Inquirer. 11 June 2020.

European Centre for Disease Prevention and Control (April 2020): Contact tracing for COVID-19: Current evidence, options for scale-up and an assessment of resources needed. ECDC Technical Report. 05 May 2020.

Galvez, Daphne (2021): Magalong: Contact tracing remains weakest link in PH COVID-19 response. Inquirer.net.

Gonzales, Cathrine (2020): Less than 1% of 600 LGUs have 'relatively good' contact tracing system—Magalong. INQUIRER.net. 30 July 2020.

Gonzales, Cathrine (2021): DILG to ask more funds for contract tracers under proposed Bayanihan 3. Inquirer.net. 11 March 2021.

Greenhalgh, Trisha, Jose L Jimenez, Kimberly A Prather, Zeynep Tufekci, David Fisman, Robert Schooley (2021): Ten Scientific Reasons in Support of Airborne Transmission of Sars-Cov-2. Comment: Volume 397, Issue 10285, P1603-1605, May 01, 2021. The Lancet. April 15, 2021 DOI:https://doi.org/10.1016/S0140-6736(21)00869-2.

Hochman, Michael (2020): Testing everyone for COVID-19 doesn't make sense. We need to test smarter, not harder. StatNews. 15 May 2020.

Johansson, Michael A., Talia M. Quandelacy, Sarah Kada, Pragati Venkata Prasad, Molly Steele, John T. Brooks, Rachel B. Slayton, Matthew Biggerstaff, Jay C. Butler (2021): SARS-CoV-2 Transmission from people without COVID-19 symptoms. JAMA Network Open. 2021;4(1): e2035057. doi:10.1001/jamanetworkopen.2020.35057.

Kennedy, Jonathan. (2020): What can the UK learn from South Korea's response to COVID-19? Centre for Health and the Public Interest. 7 April 2020.

Kucharski, Adam, Petra Klepac, Andrew Conlan, Stephen Kissler, Maria Tang, Hannah Fry, Julia Gog, W John Edmunds, and CMMID COVID-19 working group (2020): Effectiveness of isolation, testing, contact tracing and physical distancing on reducing transmission of SARS-CoV-2 in different settings: A mathematical modelling study. The Lancet: Infectious Diseases. 16 June 2020.

Lee, Seungjae, Tark Kim, Eunjung Lee, Cheolgu Lee, Hojung Kim, Heejeong Rhee, Se Yoon Park, Hyo-Ju Son, Shinae Yu, Jung Wan Park, Eun Ju Choo, Suyeon Park, Mark Loeb, and Tae Hyong Kim (2020): Clinical course and molecular viral shedding among asymptomatic and symptomatic patients with SARS-CoV-2 infection in a community treatment center in the Republic of Korea. JAMA Intern Med. 2020;180(11):1447-1452. doi:10.1001/jamainternmed.2020.3862.

Lewis, Dyani (2020): Why many countries failed at COVID-19 contact-tracing—but some got it right. Nature.com. 17 December 2020.

Lin, Cheryl, Jewel Mullen, Wendy Braund, Pikuei Tu, and John Auerba (2021): Reopening safely—Lessons from Taiwan's COVID-19 response. Journey of Global Health. 2021.

Local Government Academy (2020): DILG, LGA capacitate local officials on COVID-19 contact tracing. Department of Interior and Local Government – Local Government Academy. 11 May 2020.

National Privacy Commission (2020): Developers of LGUs' contact-tracing apps enjoined to act as privacy watchers. National Privacy Commission. 20 November 2020.

National Task Force on Contact Tracing (2020): Contact tracing for COVID-19 basic course/Philippines fighting COVID-19: Contact Tracing.

Nombres, Albert and Yam Guan Goh (2020): Advanced analytics for coronavirus—trends, patterns, predictions. Teradata. 16 March 2020.

Nortajuddin, Athira (2020): Vietnam's exemplary response to COVID-19. The ASEAN Post. 9 April 2020.

O'Neill, Patrick Howell (2020): Five things we need to do to make contact tracing really work. MIT Technology Review. 28 April 2020.

Ontario Provincial Infectious Diseases Advisory Committee (2009): Sexually transmitted infections best practices and contact tracing best practice recommendations. Toronto, Canada: Ontario Ministry of Health and Long-Term Care. ISBN 978-1-42497946-2.

Ordoña, Athens (2020): StaySafe.ph launches QR code scanning, health check, digital logbook in companies. Multisys.

Rahman, Mishaal (2021): Here are the countries using Google and Apple's COVID-19 contact tracing API. XDA. 1 February 2021.

Salaverria, Leila B. (2021): Palace: Contact tracing 'weakest' point in PH response. Inquirer.net. 12 March 2021.

Samaniego, Art (2020): The country needs a unified contact tracing strategy. Manila Bulletin Opinion-Editorial. 28 November 2020.

Siddarth, Divya, Rebecca Katz, Ellie Graeden, Danielle Allen, and Thomas Tsai, (2020): Evidence Roundup: Why positive test rates need to fall below 3%. Harvard Global Health Institute. 29 May 2020.

Sy, Stephanie, Hanif Rahemtulla, and Bruno Carrasco (2020): Using urban mobility and big data to track the pandemic. Asian Development Blog. Asian Development Bank. 12 October 2020.

Talabong, Rambo (2021): Magalong: Contact tracing is worsening in PH. Rappler. 30 March 2021.

Talabong, Rambo and Jezreel Ines (2021): How Philippine contact tracers lost track of the virus. Rappler. 8 April 2021.

Thai, Pham Quang, Maia A Rabaa, Duong Huy Luong, Dang Quang Tan, Tran Dai Quang, Ha-Linh Quach, Ngoc-Anh Hoang Thi, Phung Cong Dinh, Ngu Duy Nghia, Tran Anh Tu (2021): The first 100 days of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) control in Vietnam. Clinical Infectious Diseases, Volume 72, Issue 9, 1 May 2021, Pages e334–e342, https://doi.org/10.1093/cid/ciaa1130. Oxford Academic. 1 August 2020.

World Health Organization (2021): Contact tracing in the context of COVID-19. COVID-19: Surveillance, case investigation and epidemiological protocols. WHO. 1 February 2021.

World Health Organization (2021): Draft landscape of COVID-19 candidate vaccines. WHO. 12 March 2021.

Yee, Jovic and Julie Aurelio (2020): Palace: PH privacy laws limit use of digital contact tracing. The Philippine Daily Inquirer. 12 August 2020.

This Policy Brief was principally prepared by Ms. Lilibeth Y. Santos and Mr. Rocky Howard D. Yap with inputs from Governance Sector Head Paolo Neil S. Navata and Social Development Sector OIC-Head David Alegre III under the supervision of SEPO's Directors and the overall guidance of its Director General.