As the COVID-19 pandemic continues its deadly reign all over the world, devising and implementing effective strategy for detecting and controlling the infection has become ever more critical. While a number of developed countries have utilized mass community testing of suspected infection to effectively manage the spread and severity of the pandemic, less-developed nations struggle to implement similar measure due to various financial and human resource constrains faced by their health system. In this viewpoint, we discuss how by understanding health seeking behavior of a country’s population, developing countries can identify and set priorities to most resource-efficient disease management measures, which then would help them achieve successes in controlling COVID-19 in their countries.

The viewpoint concludes with an example of such success cases.

As of July 18, 2020, there have been over 13.8 million confirmed cases of SARS-COV-2 with death toll amounted to 593,087 [1]. A number of countries, mostly developed nations with long-considered advanced health care system have started rolling out mass community testing for the virus, alongside with restrictions on population mobility. Some experts have argued that population-wide testing is a more reliable and reasonable way of detecting and controlling the infection – as the economy and individual’s mental health suffer the side effects of quarantine and social distancing, while the uncertainty of when the disease will peak and what follows is still looming [2]. The situation is more complicated, though, for developing nations with frequently over-burdened health system and rather diverse health seeking behaviors, such that community-wide testing per se may not be the most appropriate and effective choice.

The lack of health professionals, limited financial resources for health care, and the under-developed health infrastructure may all be challenges in implementing mass testing of SARS-COV-2 in the community in developing countries. In a time of need for pandemic response, even mobilization of resources and support from donations may not help overcome these problems completely. Setting priorities to target interventions by identifying suspected cases in various geographical locations requires the understand-
As the common practice of many developing nations’ citizens is contacting local pharmacists and non-official health providers firstly when having health problems, these local health gatekeepers should be involved as first point of case detection, while accurate information regarding COVID-19 prevention and control can also be delivered through them in timely manner. Utilizing local health gatekeepers has indeed been at the core of current success story of Vietnam in COVID-19 management.

People with mild COVID-19 symptoms that in many cases are similar to a common or seasonal cold, do not thinking that they may have been infected with the virus, and may go to these non-official health facilities for medication, increasing the risk of exposure of others while limiting the chance of tracing back to first infection case (F0). They may be long gone before other positive cases infected by them are detected. In addition, people who believed they might have been infected based on their

Table 1. Examples of health seeking behaviors in countries with frequent local epidemics (Unit: %)

| Ref. | Countries     | District               | Health problem/ population          | Medical health providers | Pharmacy | Self-treatment | Others | Not seeking |
|------|---------------|------------------------|-------------------------------------|--------------------------|----------|----------------|--------|-------------|
| [5]  | Indonesia     | Papua                  | Malaria                            | Commune health station   | 32.2     | 37.8           | 6.1    | 24.0        |
| [6]  | Indonesia     | West Java              | Fatal illnesses in young children  | Hospital central         | 36.0     | 42.4           | 21.6   |             |
| [7]  | Indonesia     | Jogjakarta             | Tuberculosis                       | Private hospital         | 40.8     |                | 11.3   |             |
| [8]  | Uganda        | Kampala                | Chronic cough                      | Private clinics          | 59.6     | 25.0           | 13.5   | 1.3         |
| [9]  | Pakistan      | Islamabad              | Students                           | Traditional medicine worker | 26.6     | 73.4           |        |             |
| [10] | Pakistan      | Rawalpindi, Islamabad, Abbotabad, Peshawar | General problem | 18.4 | 26.2 | 39.1 | 23.5 |
| [11] | Indonesia     | West Java              | Rural population                   |                          |          |                |        |             |
| [12] | Pakistan      | Karachi                | Terminal child illness             |                          |          |                |        |             |
| [13] | Bangladesh    | Bangladesh             | Childhood acute respiratory tract infections |                      | 18.5 | 24.7 | 26.3 | 10.3 |
| [14] | Ethiopia      | Gambella               | Sexually transmitted infections     |                          |          |                |        |             |
| [15] | Indonesia     | South Sulawesi         | Elderly health problem             |                          | Rank 1   | Rank 3         | Rank 2 |             |
| [16] | South Africa  | Johannesburg           | Common infectious                  |                          | Rank 2   | Rank 3         | Rank 2 | Rank 4 |
| [17] | China         | Hong Kong              | Respiratory and gastrointestinal-related infections |              | Rank 3   | Rank 2         | Rank 1 |             |
| [18] | Guatemala     | Chimaltenango, Totonicapán, Suchitepequez Jalapa | Child illness |          | Rank 2   | Rank 3         | Rank 4 | Rank 1 |

Ref. – reference
*For publication where no indication of percentage (%) of participant using a provider is found, we ranked the providers in terms of time of contact (ie, first contact will be Rank 1)
Symptoms may also ask their families and friends to get their medication from health workers in the communities or from the pharmacies, rather than going to hospitals or testing centers. Such behavior is likely to be induced by the fear of stigma towards them, should they be tested positive, as well as fear of having their whole families transferred to quarantine location, or having to disclose their past activities for contact tracing. SARS-COV-2 associated stigma, which can undermine the testing and monitoring efforts, has been one of the major concerns of health experts and organizations globally [19]. The habit and ease of seeking health advice and medication from pharmacies, traditional health providers, and private/non-official clinics in developing countries is likely to exacerbate such problem.

To effectively detect and control the SAR-COV-2 infection in these resource-scarce settings, thus, would require the active and thorough involvement of health facilities other than hospitals and official health centers, especially in more remote regions where accessibility to official health care is limited. Pharmacies, traditional healers, village health collaborators, private clinics, or mobile independent health workers in the commune should be considered as gatekeepers in a closely connected network of COVID-19 surveillance. Ideally, a well-determined mechanism for timely information sharing between these first contact points and higher-level and specialized taskforces should be established. Staff at these facilities should be trained to detect signs and epidemiological history of suspected COVID-19 cases from or relating to their customers while being provided with sufficient equipment for their own disease protection. These local health gatekeepers can also be effective, community-based, and far-reaching channels in which accurate information regarding COVID-19 knowledge and response can be delivered to the individuals. For example, pharmacists can persuade disease-suspecting customers to visit hospital or testing centers. In addition, due to their proximity to the residency and familiarity with local residents, these facilities would also be points via which intervention packages being delivered to the community, in the unfortunate case of prolonged disease.

One of the examples of how understanding health seeking behavior of population can result in effective strategies for detecting and controlling SARS-COV-2 infections is the case of Vietnam. A low middle income country with health system facing numerous constrains, Vietnam has so far managed to keep the number of SARS-COV-2 confirmed infected cases at 382 and no mortality as of 18 July 2020, through effective utilization of the network of non-official, community-based health facilities and pharmacies, based on the knowledge that majority of the Vietnamese population would prefer going to these local, non-official health workforce when having health problems [20]. We believe that this current success story would further encourage similar resource-scarce settings all over the world to pay more attention to health seeking behaviors of their population and effects of such behaviors on disease management when developing and implementing COVID-19 surveillance and detection measures.

Photo: Rapid COVID-19 testing registration desk in Hanoi (from: Truyền Hình Phap Luật, via https://commons.wikimedia.org/wiki/File:Vietnamese_registered_for_rapid_testing_(COVID-19).png).

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Correspondence to: Bach Xuan Tran, PhD
Associate Professor, Vice Head, Department of Health Economics
Institute for Preventive Medicine and Public Health, Hanoi Medical University
No. 1 Ton That Tung street
Dong Da district
Hanoi 100000
Viet Nam
bach.ipmph2@gmail.com