Introduction.
The situation of COVID-19 pandemic is becoming more complex. The research institutes should focus on the most important challenge related to this outbreak at the national level. We aim to realize this scoping review to map publications on COVID-19 in Vietnam in order to guide research priorities and policies in the country.

Methods.
This study was conducted at the Thai Binh University of Medicine and Pharmacy, from May to August 2020, according to the guidance for conducting systematic scoping review.

Results.
A total of 72 studies met the inclusion criteria. The most frequent publications were original articles (27.8%), followed by letter to editor/correspondence (26.4%). According to the research priorities for COVID-19 set by the WHO, 41.7% studies focused on control and prevention of COVID-19, but none of studies on personal protective equipment or protocol for healthcare workers’ safety were conducted. 12.5% studies carried out a thorough investigation into epidemiology of the COVID-19 pandemic in Vietnam. Virology and genomics, natural history of the virus and its transmission in Vietnam were described by 18.1% papers. Only one study was conducted in terms of development for candidate therapeutics.

Conclusion.
We call for national investigation on treatment against SARS-CoV-2 and protocol for medical staff protection. The government and academic institutions should work in collaboration with international stakeholders, including the WHO, to combat together the COVID-19.
We mapped the literature by 5 key steps: i) we identified the research question, then ii) we identified the literature relevant to COVID-19 in Vietnam and iii) We selected only those studies; iv) the data from the articles, including population type, participation of foreign experts, multinational study, hospital affiliation, studied topics and research priorities for COVID-19 set by the WHO were thereafter collected and summarized; v). Finally, we reported the results. The study was conducted at the Thai Binh University of Medicine and Pharmacy, from May to August 2020.

This scoping review was guided by the following questions: “What type of research on COVID-19 was carried out by Vietnamese institutions? What aspects of this pandemic and its impact were investigated in Vietnam?”

The following databases were investigated in all relevant studies published on: PubMed (http://www.ncbi.nlm.nih.gov/pubmed), Web of Science (http://webofknowledge.com) and Google Scholar (http://scholar.google.com/). The most recent search was conducted on July 31, 2020. The topic search terms used for searching the databases were the following:

#1: “COVID-19” OR “COVID19” OR “SARS-CoV-2” OR “nCoV”
#2: “Vietnam” OR “Viet Nam”
#3: #1 AND #2

No language, type of article or date of publication restrictions were applied. Search criteria were developed to capture articles relevant to research regarding COVID-19 pandemic from Vietnamese institutions. The studies which were not conducted in Vietnam and/or not related to COVID-19 were excluded.

Duplicate citations were initially removed in Zotero. All records were screened to identify studies that might have been missing from the research. After the abstracts had been screened, the full texts of the articles were assessed for eligibility by the same two researchers and selected or rejected for inclusion in the systematic review.

Included publications were abstracted and summarized in Microsoft Excel 2016 using the following items: title, authors, name of the Vietnamese institutions involved in the study, time of publication (month and year), type of study (Original article, review, short communication, letter to editor/correspondence, perspective, commentary, editorial, preprint), studied topics, national or collaborative international, name of the countries in case of multinational studies and funding.

Results

STUDY RESEARCH

The initial search provided 256 papers. Of which 161 duplicate were deleted. After being screened by authors, 23 records were excluded because they did not meet the eligibility following criteria: research not conducted in Vietnam (19) and research not related to COVID-19 but mentioned COVID-19 in their abstract or in the text (4). Finally, 72 studies met the inclusion criteria [6, 10-80]. Figure 1 shows the research strategy according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

CHARACTERISTICS OF INCLUDED STUDIES

Table I shows the characteristics of the included papers. The most frequent publications were original articles (20/72, 27.8%), followed by letter to editor/correspondence (19/72, 26.4%), preprints (12/72, 16.7%) and short communication (6/72, 8.3%). Two studies were published early February 2020 on the first cases of COVID-19 in Vietnam. Six, 18, 20, 22 and 4 papers were published from March to August 2020, respectively. The majority of the studies (43/72, 59.7%) were conducted in collaboration with scientists from other countries but only 4 (5.6%) were multinational research. A total of 13/72 (18.1%) studies were affiliated by the authors of hospitals. The funding was declared in 39 studies (54.2%) with 19 research (26.4%) were funded. Regarding the funding of selected studies, 11 studies were funded by non-government organizations and 8 received a governmental funding.

RESEARCH PRIORITIES

According to the research priorities for COVID-19 set by the WHO [81], a total of 30/72 (41.7%) studies focused on control and prevention of COVID-19 but no study on personal protective equipment or protocol for healthcare worker safe was conducted. Nine (12.5%) studies carried out a thorough investigation into epidemiology of the COVID-19 pandemic in Vietnam. Thirteen (18.1%) studied the virology and genomics, natural history of the virus and its transmission in Vietnam. The clinicopathological features of COVID-19 were described by 8 papers (11.1%). Two studies (one original article and one review) concentrated on the treatment of SARS-CoV-2 (Tab. II).

Discussion

Until now, Vietnam has reported three waves of COVID-19 outbreaks. After each wave, the pandemic is increasingly completed, and the new cases are on the increase [7]. Particularly, in the third outbreak which started on July 26, 2020, the rate of spread of this disease is higher than before. A total of 476 autochthonous cases within 3 weeks were recorded (50.1% of all cumulative
cases in the country from nearly 7 months), including medical staff. Furthermore, 23 deaths were recorded in this time [7]. Especially, the source of infection in the community has not been determined. Studies on epidemiology, transmission, preventive measures, and treatment strategies are essential to reduce morbidity and mortality of COVID-19. Especially in poor countries, with limited financial capacity, it is necessary to identify priority studies according to each period of pandemic in the national level.

Our review is useful in the actual context of COVID-19 in Vietnam for fund allocation from the government to support health care and related research. We identified 72 articles, including 12 preprints conducting on the COVID-19 pandemic in the country. Unfortunately, the current published research on COVID-19 in Vietnam seems to be discordant from the epidemic research priorities set by the WHO. This is possible that some of projects are still ongoing and have not been captured in this review, but the current publications do not provide a strong preparation for the country to neither adequately tackle the pandemic nor to accumulate experience for prevention of other outbreaks in the future. The research gap related to COVID-19 identified by the WHO are: i) natural history of SARS-CoV-2, its transmission and diagnosis; ii) animal and environmental research on the origin of the virus; iii) epidemiological studies; iv) clinical characterization and management of COVID-19; v) infection prevention and control, including health care workers protection; vi) research and development for candidate vaccines and treatment; vii) ethical considerations for research; and viii) integration of social sciences into the outbreak response [81]. These points should be utilized for focusing the topic and planning future research steps in Vietnam.

Most of the included studies in this scoping review were letter to editor and focused on control and prevention aspect. It is important because multiple effective measures have been applied to fight the COVID-19 pandemic in Vietnam such as: early lockdown, a strong political commitment and prompt actions with a multi-sectoral response plan, blanket media coverage of COVID-19 prevention, intensive surveillance, case management and large-scale health quarantine not only for patients, but also for persons in close contact with cases [10-24]. But these articles were narrative and described on experiences and reported views and experimental studies remain limited. Moreover, since the SARS-CoV-2 virus is highly contagious [2-4], safety for all healthcare workers must be ensured to protect themselves and to prevent nosocomial transmission. In fact, several medical staff in Vietnamese health facilities such as Bach Mai and Da Nang hospitals were infected by SARS-CoV-2 [7].

Isolation of infected health workers and colleagues
who have contact with them aggravates the overload of medical human resources. Therefore, research on personal protective equipment, protocol for its safety and the implementation of designated hospital units for COVID-19 patients are essential [82]. But in Vietnam, research on this field is scarce.

Thirteen included studies in this review investigated the COVID-19 epidemiology in Vietnam, but epidemiological studies focused on viral transmission or health resources utilization remained lacking. We also find that there is a lack of experimental studies and large multicentral, clinical trials inspecting treatment modalities of COVID-19. Only one original article focused on new treatment options. This can be explained by the poor participation of hospitals, especially central and provincial hospitals, in research.

The funding was declared in 39 studies. Of which, only 8 were Vietnamese government founders, while the remaining funding was raised by non-government organizations. Furthermore, despite the participation of foreign experts in 43 research, only 4 multinational studies were conducted. The government and academic institutions should work in collaboration with international stakeholders, including the WHO, to combat together the COVID-19.

This review has some limitations. We have screened the published papers only on PubMed, Web of Science and Google scholar. Ongoing research projects have not been captured. Finally, we have so far focused on only COVID-19-related studies in Vietnam. But this work shows the gap in research on COVID-19 of the country. It is the first step toward contributing to the development of a national research agenda. It helps government make decisions about prioritizing and allocating resources. We call for national investigation that takes emerging epidemics along with other public health priorities into consideration. In addition, we recommend establishing national capacity and encourage the investment in national companies for laboratory research materials. Furthermore, we strongly encourage hospitals and health facilities to get involved in therapeutic research strategies of SARS-CoV-2. Moreover, leading national universities must conduct projects to come up with solutions in the public health crisis, and provide guidance for the government based on the most scientific evidence. A COVID-19 national research framework with specific research projects should be thoroughly discussed to address critical gaps identified through this scoping review. This can be achieved through a partnership between the government, the Ministry of Health, and researchers in collaboration with WHO and international partners.

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### Tab. I. General characteristics of 72 included papers.

| Characteristics                  | Number of papers | Percentage |
|----------------------------------|------------------|------------|
| **Publication type**             |                  |            |
| Original article                 | 20               | 27.8       |
| Letter to editor/correspondence  | 19               | 26.4       |
| Short communication              | 6                | 8.5        |
| Review                           | 5                | 6.9        |
| Perspective                      | 3                | 4.2        |
| Case report                      | 1                | 1.4        |
| Commentary                       | 1                | 1.4        |
| Editorial                        | 1                | 1.4        |
| Viewpoints                       | 2                | 2.8        |
| Preprints                        | 12               | 16.7       |
| Other                            | 2                | 2.8        |
| Participation of foreign experts | 43               | 59.7       |
| Multinational study              | 4                | 5.6        |
| Hospital affiliation             | 13               | 18.1       |
| **Studied topics**               |                  |            |
| Clinicopathologic                | 8                | 11.1       |
| Control and prevention           | 30               | 41.7       |
| Economic impact                  | 7                | 9.7        |
| Epidemiology                     | 9                | 12.5       |
| Health impact                    | 3                | 4.2        |
| Medical management               | 5                | 6.9        |
| Social impact                    | 3                | 4.2        |
| Treatment                        | 2                | 2.8        |
| Virology and genome              | 11               | 15.3       |

### Tab. II. Research priorities for COVID-19 in Vietnam.

| Research priorities for COVID-19 set by the WHO | Number of included studies | Percentage |
|-----------------------------------------------|---------------------------|------------|
| Natural history of the virus, its transmission and diagnosis | 13 | 18.1 |
| Animal and environmental research on the origin of the virus, including management measures at the human-animal interface | 0 | 0 |
| Epidemiological studies | 9 | 12.5 |
| Clinical characterization and management of disease caused by the virus | 8 | 11.1 |
| Infection prevention and control, including best ways to protect health care workers | 30 | 41.7 |
| Research and development for candidate therapeutics and vaccines | 1 | 1.4 |
| Ethical considerations for research | 0 | 0 |
| Integration of social sciences into the outbreak response | 15 | 20.8 |
Conflict of interest statement

The authors declare that they have no conflict of interest.

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Authors’ contributions

Thi Loi Dao: Conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, writing – original draft. Minh Manh To: Validation, formal analysis, investigation, resources, data curation, writing – review and editing. The Diep Nguyen: Validation, formal analysis, investigation, resources, data curation, writing – review and editing. Van Thuan Hoang: Conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, writing – review and editing. Minh Manh To: Conceptualization, methodology, supervision, coordination.

References

[1] World Health Organization. Rolling updates on coronavirus disease (COVID-19). 2020. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen
[2] Ribas RM, de Campos PA, de Brito CS, Cavalcanti Dantas RC. 2021 Olympic Games Tokyo: Safety Issues and Protection against COVID-19 Transmission. J Glob Infect Dis 2020;12:114-5. https://doi.org/10.4103/jgid.jgid_88_20
[3] Musa SS, Zhao S, Wang MH, Habib AG, Mustapha UT, He D. Estimation of exponential growth rate and basic reproduction number of the coronavirus disease 2019 (COVID-19) in Africa. Infect Dis Poverty 2020;9:96. https://doi.org/10.1186/s40249-020-00718-y
[4] Nabil B, Sabrina B, Abdelhamid B. Transmission route and introduction of pandemic SARS-CoV-2 between China, Italy, and Spain. J Med Virol 2020;10.1002/jmv.26333. https://doi.org/10.1002/jmv.26333.
[5] Worldometer. COVID-19 Coronavirus Pandemic. https://www.worldometers.info/coronavirus/
[6] Phan LT, Nguyen TV, Luong QC, Nguyen HT, Le HQ, Nguyen TT, Cao TM, Pham QD. Importation and Hu-man-to-Human Transmission of a Novel Coronavirus in Vietnam. N Engl J Med 2020;382:872-4. https://doi.org/10.1056/NEJM2001272
[7] Ministry of Health. General information for quick response of national steering committee for epidemic COVID-19 prevention. Available at: https://ncov.vn/cdc.gov.vn/
[8] Peters MDJ, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews. JBI Evidence Implementation 2015;13:141-6. https://doi.org/10.1097/XEB.0000000000000050
[9] Tricco AC, Lillie E, Zarin W, O’Brien KK, Colquhoun H, Levac D, Moher D, Peters MDJ, Horsley T, Weeks L, Hempel S, Akl EA, Chang C, McGowan J, Stewart L, Hartling L, Aldcroft A, Wilson MG, Garrity C, Lewin S, Godfrey CM, MacDonald MT, Langlois EV, Soares-Weiser K, Moirarity J, Clifford T, Tuncalp O, Straus SE. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med 2018;169:467-3. https://doi.org/10.7326/M18-0850
[10] Duong DM, Le VT, Ha BTT. Controlling the COVID-19 Pandemic in Vietnam: Lessons From a Limited Resource Country. Asia Pac J Public Health 2020;32:161-2. https://doi.org/10.1177/1010539520927290
[11] Dinh L, Dinh P, Nguyen PDM, Nguyen DHN, Hoang T. Viet-nam’s response to COVID-19: prompt and proactive actions. J Travel Med 2020;27:taaa047. https://doi.org/10.1093/jtm/taaa047
[12] Ivic S. Vietnam’s Response to the COVID-19 Outbreak. Asian Bioeth Rev 2020;12: 341-7. https://doi.org/10.1007/s41649-020-00134-2
[13] Van Nguyen H, Van Hoang M, Dao ATM, Nguyen HL, Van Nguyen T, Van Nguyen PT, Khuong LQ, Le PM, Gilmour S. An adaptive model of health system organization and responses helped Vietnam to successfully halt the COVID-19 pandemic: What lessons can be learned from a resource-constrained country. Int J Health Plann Manage 2020;10.1002/hpm.3004. https://doi.org/10.1002/hpm.3004
[14] Ha BTT, Ngoc Quang L, Mizroz T, Tai NT, Thai PQ, Dinh PC. Combating the COVID-19 Epidemic: Experiences from Vietnam. Int J Environ Res Public Health 2020;17:3125. https://doi.org/10.3390/ijerph17093125
[15] Dao TL, Nguyen TD, Hoang VT. Controlling the COVID-19 pandemic: Useful lessons from Vietnam. Travel Med Infect Dis 2020;37:101822. https://doi.org/10.1016/j.tim.2020.101822
[16] Tran BX, Dang AK, Thai PK, Le HT, Le XTT, Do TTT, Nguyen TH, Pham HQ, Phan HT, Vu GT, Phung DT, Nghiem SH, Nguyen TH, Tran TD, Do KN, Tranq NV, Vu GV, Latkin CA, Ho CRCM, Ho CSH. Coverage of Health Information by Different Sources in Communities: Implication for COVID-19 Epidemic Response. Int J Environ Res Public Health 2020;17:3577. https://doi.org/10.3390/ijerph17103577
[17] Duc NM, Ha HD, Tuan TA, Bang MTL, Duc PH, Thong PM. From First COVID-19 Case to Current Outbreak: A Vietnamese Report. Electron J Gen Med 2020;17:em208. https://doi.org/10.29333/ejgm/7867
[18] Nguyen TA, Nguyen QC, Le ATK, Nguyen HN, Nguyen TTH. Modelling the impact of control measures against the COVID-19 pandemic in Viet nam. medRxiv 2020.04.24.20078030. https://doi.org/10.1101/2020.04.24.20078030
[19] La VP, Pham T-H, Ho M-T, Nguyen M-H, P Nguyen K-L, Vuong T-T, Nguyen HKT, Tran T, Khuo Q ; Ho MT, Vuong QH. Policy response, social media and science journalism for the sustainability of the public health system amid the COVID-19 outbreak: The vietnam lessons. Sustainability 2020;12:2931. https://doi.org/10.3390/su12072931
[20] Van Thang T, Nguyen NPT, Hoang TD, Tran VT, Vu CT, Sieve NJ, Colebunders, R Dunnef S. Preventive behavior of Vietnamese people in response to the COVID-19 pandemic. medRxiv 2020.05.14.20102418. https://doi.org/10.1101/2020.05.14.20102418
[21] Van Minh H. Proactive and Comprehensive Community Health Actions to Fight the COVID-19 Epidemic: Initial Lessons from Vietnam. J Rural Health 2020;10.1111/jrgh.12430. https://doi.org/10.1111/jrgh.12430
[22] Nguyen THD, Vu DC. Summary of the COVID-19 outbreak in Vietnam - Lessons and suggestions. Travel Med Infect Dis 2020;101651. https://doi.org/10.1016/j.tim.2020.101651
[23] Huynh TLD. The COVID-19 containment in Vietnam: Lessons From a Limited Resource Country. Asia Pac J Public Health 2020;32:161-2. https://doi.org/10.1177/1010539520927290
[24] Trisvan M, Le LC, Le AV. The COVID-19 Pandemic: A View From Vietnam. Am J Public Health 2020;110:1152-3. https://doi.org/10.2105/AJPH.2020.305751
[25] Nguyen TA, Cuong QN, Kim ALT, Huong TN, Nguyen HN, Fox GJ, Marks GB. Adapting a TB contact investigation strategy for COVID-19. The International Journal of Tuberculosis and Lung Disease 2020;24:548-50. https://doi.org/10.5588/ijtld.20.0169
COVID-19 RELATED RESEARCH IN VIETNAM

[26] Nguyen HG, Nguyen TV. An epidemiological profile of COVID-19 patients in Vietnam. medRxiv. 2020. doi: https://doi.org/10.1101/2020.04.10.20061226

[27] Tran DC. An open toolbox for generating map of actively confirmed SARS-CoV-2 or COVID-19 cases in Vietnam. Bulletin of Electrical Engineering and Informatics 2020;9:2396-3. https://doi.org/10.11591/eei.v9i6.2621

[28] Valencia C, Quang L, Handcock M, Nguyen D, Doan Q, Nguyen TV, Le NH, Truong TL, Do H, Otsu S, Le T, Pham QD, Nguyen TV, Lan PT, Le LV. Asymptomatic and Presymptomatic Transmission of 2019 Novel Coronavirus (COVID-19) Infection: An Estimation from a Cluster of Confirmed Cases in Ho Chi Minh City, Vietnam. 2020. Available at SSRN: https://ssrn.com/abstract=3630119

[29] Tran BX, Nguyen HT, Pham HQ, Le HT, Vu GT, Latkin CA, Ho CSH, Ho RCM. Capacity of local authority and community on epidemic response in Vietnam: Implication for COVID-19 preparedness. Safety Science 2020;130:104867. https://doi.org/10.1016/j.ssci.2020.104867

[30] Tran BX, Vu GT, Latkin CA, Pham HQ, Phan HT, Le HT, Ho RCM. Characterize health and economic vulnerabilities of workers to control the emergence of COVID-19 in an industrial zone in Vietnam. Safety Science 2020;104811. https://doi.org/10.1016/j.ssci.2020.104811

[31] Phan LT, Nguyen TV, Huynh LKT, Dao MH, Vo TAN, Vu NHP, Pham HTT, NGuyet HT, Nguyen TT, Le HQ, Nguyen TV, Nguyen QH, HuyNH, TP, Nguyen SN, Nguyen AH, Nguyen MT, Nguyen TTT, Luong QC, Cao TM, Pham QD. Clinical features, isolation, and complete genome sequence of severe acute respiratory syndrome coronavirus 2 from the first two patients in Vietnam. J Med Virol 2020:10.1002/jmv.26075. https://doi.org/10.1002/jmv.26075

[32] Acosta M, Nestore M. Comparing public policy implementation in Taiwan and Vietnam in the early stages of the COVID-19 outbreak: a review. SocArXiv 2020. https://doi.org/10.31235/osf.io/69qpx

[33] Ha TH, Ruano G, Lewis J. Comparison of epidemiological characteristics of COVID-19 patients in Vietnam. medRxiv 2020. https://doi.org/10.1102/2020.06.03.20121467

[34] Vo TS, Vo TTTN, Vo TTBC. Coronavirus Infection Prevention by Wearing Masks. Eurasian J Med 2020;5:197-1. https://doi.org/10.5152/eurasianjmed.2020.20056

[35] Tong PB, Lin LY, Tran TH. Coronavirus pandemics: Can neutralizing antibodies help? Life Sci 2020;255:117836. https://doi.org/10.1016/j.lfs.2020.117836

[36] Luong T. COVID-19 Dispatches from Ho Chi Minh City, Vietnam. Anthropology Now 2020;12:45-9. https://doi.org/10.1037/tra0000694

[37] Quach HL, Hoang NA. COVID-19 in Vietnam: A lesson of pre-preparation. J Clin Virol 2020;127:104379. https://doi.org/10.1016/j.jcv.2020.104379

[38] Truong, Quang-Thai and Nguyen, Duc Nguyen and Tran, QuyNh-Nhu and Al-Mohamad, Somar and Bakry, Walid, Valencia C, Quang L, Handcock M, Nguyen D, Doan Q, Nguyen TV, Lan PT, Le LV. Atomic-Resolution Docking Simulation. ChemistrySelect 2020;5:6312-20. https://doi.org/10.1002/slct.202000822

[39] Tran PB, Hensing G, Wingfield T, Atkins S, Sidney Annerstedt K, Kazibwe J, Tomeny E, Biermann O, Thorpe J, Forse R, Lönnroth K. Income security during public health emergencies: the COVID-19 poverty trap in Vietnam. BMJ Global Health 2020. https://doi.org/10.1136/bmjgh-2020-002504

[40] Tran DC. An open toolbox for generating map of actively confirmed SARS-CoV-2 in Vietnam. medRxiv 2020. https://doi.org/10.1101/2020.05.09.2005001

[41] Tran BX, Nguyen HT, Pham HQ, Le HT, Vu GT, Latkin CA, Ho CSH, Ho RCM. Demand for Health Information on COVID-19 among Vietnamese. Int J Environ Res Public Health 2020;17:4377. https://doi.org/10.29333/ejm-2020.03.28.20046136

[42] Le HT, Nguyen DN, Beydoun AS, Le XTT, Nguyen TT, Pham QT, Tu NTK, Nguyen QT, Nguyen AN, Hoang MT, Vu LG, Tran BX, Latkin CA, Ho CSH, Ho RCM. Demand for Health Information on COVID-19 among Vietnamese. Int J Environ Res Public Health 2020;17:4377. https://doi.org/10.29333/ejm-2020.03.28.20046136

[43] Hoang VM, Hoang HH, Khuong QL, La NQ, Tran TTH. Describing the pattern of the COVID-19 epidemic in Vietnam. Global Health Action 2020;13:1776526. https://doi.org/10.1080/16549716.2020.1776526

[44] Le VT, Nguyen NT, Tran NT, Dinh NMH, Nguyen TP, Tran TH, Nguyen GT, Guy T, Nguyen VVC. Duration of viral detection in throat and rectum of a patient with COVID-19. medRxiv 2020.03.07.20032052. https://doi.org/10.1101/2020.03.07.20032052

[45] Long Bui, Truong Nguyen Thanh, Ha Nguyen Ngoc. Early Estimation Of Reproduction Number Of COVID-19 in Vietnam. medRxiv 2020.03.28.20046136. https://doi.org/10.29333/ejm-2020.03.28.20046136

[46] Hoang VT, Pham TD, Dao TL, Nguyen DT, Dang VN, Dao TT, Nguyen VL, Dang QH, Do XC, Nguyen VT, Pham VD, Vu PT, Hoang NT, Gauthier P, Nguyen DC. Epidemiological Characteristics of COVID-19 Patients in Vietnam and a Description of Disease Control and Prevention Measures in Thai Binh Province. https://www.preprints.org/manuscript/202005.0197v1

[47] Tran PB, Hensing G, Wingfield T, Atkins S, Sidney Annerstedt K, Kazibwe J, Tomeny E, Biermann O, Thorpe J, Forse R, Lönnroth K. Income security during public health emergencies: the COVID-19 poverty trap in Vietnam. BMJ Global Health 2020. https://doi.org/10.1136/bmjgh-2020-002504

[48] My TTA, Loan HTP, Hai NTT, Hieu LT, Hoa TT, Thuy BTP, Quang QT, Triet NT, Anh TTV, Dieu NTX, Trung NT, Hue NV, Tat PV, Tung VT, Nhung NTA. Evaluation of the Inhibitory Activities of COVID-19 of Melaleuca cajuputi Oil Using Docking Simulation. ChemistrySelect 2020;5:6312-20. https://doi.org/10.1002/slct.202000822

[49] Thai PQ, Toan DTT, Sont D, Van HTTH, Minh LN, Hung LX, Toan NV, Hoat LN, Luong DH, Khuê Nh, Khoa NT, Huong LT. Factors associated with the duration of hospitalisation among COVID-19 patients in Vietnam: A survival analysis. Epidemiol Infect 2020;148:e114. https://doi.org/10.1017/S0950268820001259

[50] Nguyen HT, Do BN, Pham KM, Kim GB, Dam HTB, Nguyen TT, Nguyen TTP, Nguyen YH, Sørensen K, Pleasant A, Duong TV. Fear of COVID-19 Scale-Associations of Its Scores with Health Literacy and Health-Related Behaviors among Medical Students. Int J Environ Res Public Health 2020;17:4164. https://doi.org/10.3390/ijerph171114164

[51] Thoi PT, Ho Chi Minh City- the front line against COVID-19 in Vietnam. City Soc 2020. https://doi.org/10.1111/ciso.12284

[52] Nguyen THD, Vu DC. Impacts of the COVID-19 pandemic upon mental health: Perspectives from Vietnam. Psychol Trauma 2020;12:480-1. https://doi.org/10.1037/trt00000694

[53] Tran P, Bensinger G, Wingfield T, Atkins S, Sidney Annerstedt K, Kazibwe J, Tomeny E, Biermann O, Thorpe J, Forse R, Lönnroth K. Income security during public health emergencies: the COVID-19 poverty trap in Vietnam. BMJ Glob Health 2020;5:e002504. https://doi.org/10.1136/bmjgh-2020-002504

[54] Huynh G, Nguyen TNH, Vo KN, Vo VT, Pham LA. Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City, Asia Pacific Journal of Tropical Medicine 2020;13:260. https://doi.org/10.4103/1995-7645.280396

[55] Than HM, Nong VM, Nguyen CT, Thi Tran NH, Do CD, Pham TN. Management of mild cases of COVID-19 in low-resource countries: An experience in Vietnam. J Microbiol Immunol In-
fect 2020;S1684-1182(20)30106-7. https://doi.org/10.1016/j.jmii.2020.04.012

[56] Luong HT, Jardine M, Thomson N. Mobilizing the police from the top down as public health partners in combatting COVID-19: A perspective from Vietnam. Journal of Community Safety and Well-Being 2020;57-9. https://doi.org/10.35502/jcswb.132

[57] Hoang MP, Kanjanaumporn J, Aeumjaturapat S, Chusakul S, Seresirikachorn K, Snidvongs K. Olfactory and gustatory dysfunctions in COVID-19 patients: A systematic review and meta-analysis. Asian Pac J Allergy Immunol 2020;38:162-9. https://doi.org/10.12932/AP-210520-0853

[58] Nguyen HV, Tran HX, Huy LV, Nguyen NX, Thanh M, Nguyen N. Online Book Shopping in Vietnam: The Impact of the COVID-19 Pandemic Situation. Publ Res Q 2020. https://doi.org/10.1007/s12109-020-09732-2

[59] Thanh HN, Van TN, Thu HNT, Van BN, Thanh BD, Thu HPT, Kieu ANT, Viet NN, Marks GB, Fox GJ, Nguyen TA. Outbreak investigation for COVID-19 in northern Vietnam. Lancet Infect Dis 2020;20:535-6. https://doi.org/10.1016/S1473-3099(20)30159-6

[60] Nguyen HC, Nguyen MH, Do BN, Tran CQ, Nguyen TTP, Pham KM, Pham LV, Tran KV, Duong TT, Tran TV, Duong TH, Nguyen TT, Nguyen QH, Hoang TM, Nguyen KT, Pham TTM, Yang SH, Chao JC, Duong TV. People with Suspected COVID-19 Symptoms Were More Likely Depressed and Had Lower Health-Related Quality of Life: The Potential Benefit of Health Literacy. J Clin Med 2020;9:965. https://doi.org/10.3390/jcm90409695

[61] Pham VH, Gargiulo Isacco C, Nguyen KCD, Le SH, Tran DK, Nguyen QV, Pham HT, Aityan S, Pham ST, Cantore S, Inchingolo AM, Inchingolo AD, Dipalma G, Ballini A, Inchingolo F. Rapid and sensitive diagnostic procedure for multiple detection of pandemic Coronaviridae family members SARS-CoV-2, SARS-CoV, MERS-CoV and HCoV: a translational research and cooperation between the Phan Chau Trinh University in Vietnam and University of Bari “Aldo Moro” in Italy. Eur Rev Med Pharmacol Sci 2020;24:7173-91. https://doi.org/10.26355/eurev_202006_21713

[62] Tran BX, Phan HT, Nguyen TPT, Hoang MT, Vu GT, Thi LE H, Latkin CA, Ho CS, Ho RC. Reaching further by Village Health Collaborators: The informal health taskforce of Vietnam for COVID-19 responses. J Glob Health 2020;10:010354. https://doi.org/10.7189/jogh.10.010354

[63] Van TN, Thi Thuong N, My Nguyen T, Tran Van T, Tran Lam V, Anh Nguyen L, Nguyen Truc N, Huu L, Thi Ha N, Ngoc Quang Minh N, Nguyen Huy Man D, Thi Hy Van H, Nguyen Quoc Khanh P, Chanh Xuan T, Thanh Phong N, Nguyen Hoang Tu, Tinh Hien T, Manh Hung L, Thanh Truong N, Minh Yen L, Thanh Dung N, Thwaites G, Van Vinh Chau N, for OU-CRU COVID-19 research group. SARS-CoV-2 and co-infections detection in nasopharyngeal throat swabs of COVID-19 patients by metagenomics. J Infect 2020;81:e175-e177. https://doi.org/10.1016/j.jinf.2020.06.033

[64] Le TQM, Takeamura T, Moi ML, Nabeshima T, Nguyen LKH, Hoang VMP, Ung THT, Le TT, Nguyen VS, Pham HQA, Duong TN, Nguyen HT, Ng D, Nguyen CK, Morita K, Hasebe F, Dang DA. Severe Acute Respiratory Syndrome Coronavirus 2 Shedding by Travelers, Vietnam, 2020. Emerg Infect Dis 2020;26:1624-6. https://doi.org/10.3201/eid2607.200591

[65] Tung LT. Social Responses for Older People in COVID-19 Pandemic: Experience from Vietnam. Journal of Gerontological Social Work 2020;1-6. https://doi.org/10.1080/01634372.2020.1773596

[66] Tran BX, Ha GH, Nguyen LH, Vu GT, Hoang MT, Le HT, Latkin CA, Ho CSH, Ho CMC. Studies of Novel Coronavirus Disease 19 (COVID-19) Pandemic: A Global Analysis of Literature. Int J Environ Res Public Health 2020;17:4095. https://doi.org/10.3390/ijerph17114095

[67] Hoang MV, Nguyen PTN, Tran TTP, Khuong LQ, Dao ATM, Nguyen HV, Djalante R, Tran HTT. The COVID-19 pandemic in the ASEAN: A preliminary report on the spread, burden and medical capacities. Asian Pac J Trop Med 2020;13:247-51. https://doi.org/10.14195/journals.2020.07.0464

[68] Huynh TL. The COVID-19 risk perception: A survey on socioeconomics and media attention. Econ Bull. 2020;40:758-64. https://doi.org/10.17632/w9x5km9pm.3

[69] Le HT, Nguyen LV, Tran DM, Do HT, Tran HT, Le YT, Phan PH. The first infant case of COVID-19 acquired from a secondary transmission in Vietnam. Lancet Child Adolesc Health 2020;4:405-6. https://doi.org/10.1016/S2352-4642(20)30091-2

[70] Van Cuong L, Giang HTN, Linh LK, Shah J, Van Sy L, Hung TH, Reda A, Truong LN, Tien DX, Huy NT. The first Vietnamese case of COVID-19 acquired from China. Lancet Infect Dis 2020;20:408-9. https://doi.org/10.1016/S1473-3099(20)30111-0

[71] Van Le Q, Ngo DQ, Tran TD, Ngo QX. The impact of COVID-19 pandemic on thyroid surgery in Vietnam. Eur J Surg Oncol 2020;S0748-7983(20)30649-1. https://doi.org/10.1016/j.ejso.2020.07.022

[72] Nguyen THD, Vu DC. The largest epicenter of the coronavirus outbreak in Vietnam. Infect Control Hosp Epidemiol 2020;41:984-5. https://doi.org/10.1017/ice.2020.128

[73] Chau NNV, Thanh Lam V, Thanh Dung N, Yen LM, Minh NNQ, Hung LM, Ngoc NM, Dung NT, Man DNH, Nguyen LA, Nhat LTH, Nhu LNT, Ny NTH, Hong NTT, Kestelyn E, Dung NTP, Xuan TC, Hien TT, Thanh Phong N, Tu TNH, Ge-skus RB, Thanh TT, Thanh Truong N, Binh NT, Thuoang TC, Thwaites G, Tan LV; OUCRU COVID-19 research group. The natural history and transmission potential of asymptomatic SARS-CoV-2 infection. Clin Infect Dis 2020;ciaa711. https://doi.org/10.1093/cid/ciaa711

[74] Tran BX, Hoang MT, Pham HQ, Hoang CL, Le HT, Latkin CA, Ho CS, Ho RC. The operational readiness capacities of the grassroots health system in responses to epidemics: Implications for COVID-19 control in Vietnam. J Glob Health 2020;10:010006. https://doi.org/10.7189/jogh.10.010006

[75] Tran T, Hoang A-D, Nguyen Y-C, Nguyen L-C, Ta N-T, Pham Q-H, et al. Toward Sustainable Learning during School Suspension: Socioeconomic, Occupational Aspirations, and Learning Behavior of Vietnamese Students during COVID-19. Sustainability 2020;12:4195. https://doi.org/10.3390/su12104195

[76] Long KQ, Hanh HH, Hanh TTT, Quang LN, Van Minh H. Treatment for COVID-19 patients in Vietnam: Analysis of time-to-recovery. Asian Pacific Journal of Tropical Medicine 2020;13. https://doi.org/10.4103/1995-7645.289505

[77] Long KQ, Hanh HH, Hanh TTT, Quang LN, Van Minh H. Turning Vietnam’s COVID-19 Success into Economic Recovery: A Job-Focused Analysis of Individual Assessments on Their Finance and the Economy. GLO Discussion Paper, No. 566. http://hdl.handle.net/10419/218863

[78] Dreisbach JL. Vietnamese Public Health Practices in the Ad- vant of the COVID-19 Pandemic: Lessons for Developing Countries. Asia Pac J Public Health 2020;32:163-164. https://doi.org/10.1177/1010539520927268

[79] Le LT, Nguyen HT, Nguyen TH, Ho TT, Tran LH, Luu TT, Nguyen TTN, Huyh TKL, Pham DQ, Luong CQ, Cao MT, Nguyen VT, Hoang H, Chu HH, Phan TL, Truong NH. Whole-genome sequencing and de novo assembly of a 2019 novel coronavirus (sars-cov-2) strain isolated in Vietnam. BioRxiv 2020. https://doi.org/10.1101/2020.06.12.149377
[80] Lan F-Y, Wei C-F, Hsu Y-T, Christiani DC, Kales SN. Work-related COVID-19 transmission in six Asian countries/areas: A follow-up study. PloS one 2020;15:e0233588. https://doi.org/10.1371/journal.pone.0233588

[81] World Health Organization. World experts and funders set priorities for COVID-19 research. https://www.who.int/news-room/detail/12-02-2020-world-experts-and-funders-set-priorities-for-covid-19-research

[82] Zhan M, Anders RL, Lin B, Zhang M, Chen X. Lesson Learned from China Regarding Use of Personal Protective Equipment. Am J Infect Control 2020;S0196-6553(20)30771-9. https://doi.org/10.1016/j.ajic.2020.08.00