How Vietnam is saving lives against Covid-19?

Dr. Jonas Gomes da Silva (jgsilva@ufam.edu.br or jonas.gomesdasilva@manchester.ac.uk)
Associate Professor at the Industrial Engineering Department of FT/UFAM – Eureka Laboratory
Manaus – Amazon – Brazil
Was Research Visitor at the MIOIR (Alliance Manchester Business School) in 2020
The University of Manchester – United Kingdom

Abstract

It complements Silva's (2020b) research, which showed that among 108 well–evaluated countries, the top benchmark nations against Covid–19 are Vietnam, Taiwan, and Thailand. For example, on April 16, 2021, around 3,011,574 lives were officially lost by Covid–19, while Taiwan, Vietnam, and Thailand reported respectively only 11, 35, and 97 fatal cases (WORLDOMETERS, 2021). This article's main aim is to investigate the Vietnam performance and management practices used to save lives against Covid-19. The research uses an online questionnaire, which is descriptive with documentary and bibliographic approaches to identify management practices, including Non-Pharmaceutical Interventions (NPIs) adopted against a pandemic. Also, the Fatality Total Index (SILVA, 2020b p. 563) was used to compare Vietnam's performance with 43 countries. Some results are 1) 210 NPIs were identified across the world against coronavirus; 2) Among the 44 countries, Vietnam was the second-best performer, after Taiwan; 3) among 107 respondents living in Vietnam, only 5.61% don´t believe that cultural practices are decisive for the low rate of Covid–19 death, while most (94.39%) believe in that. From those that believe, the most decisive cultural practices were: wear a mask, wash hands, not shake hands, not hug in public and few religious assemblies; 4) for 106 respondents living in Vietnam, the ten main policy measures adopted by the National Government that saved lives against the virus are international travel control, public information campaigns, schools closures, public event cancellations, integration with mass media, restriction on internal movement, effective public-private collaboration, increase the medical and personal equipment capacity, public transport reduction and combat fake news. At the final, ten golden lessons are provided, from 340 policies, measures, programs, projects, actions, innovative products/services identified, with the majority led by the Public Sector (71.2%), followed by Corporations (8.8%), Others (8.8%), Startups (6.2%), and Universities (5%).

Keywords: Covid–19; FTI; Innovation; Management practices; NPIs; Policy; Responses

1. Introduction

On 24th March 2021, Vietnam completed 426 days (1.17 year; 14 months) of intense battle against a virus called by the WHO (2020) Coronavirus disease, popular known as Covid–19.

Even though until 16th April 2021, around 878.92 million single doses of Covid–19 vaccines have been administered globally (OUR WORLD IN DATA, 2021), the world surpasses 3,011,574 fatal cases with no signs of pandemic control in most countries.

Table 1 shows that until 16th April 2021, the Covid-19 mortality is accelerating globally, since one million deaths are happening in less time, taking 267 days to kill the first 1,003,417 people, decreasing to 112 days to surpass 2,013,287 deaths and continuing decreasing to 93 days to surpass 3,011,574 fatal cases, with USA (579,942=19.3%), Brazil (369,024=12.2%), Mexico (211,213=7%), India (175,673=5.8%) and UK (127,225=4.2%) among the most critical countries in terms of total deaths, while Vietnam officially reported only a total of 35 fatal cases, situated in the 177th position when compared against 221 countries (WORLDOMETERS, 2021).

Table 1: World Total Covid-19 Deaths x Vietnam Total Covid-19 Deaths to each one million

World Total Deaths	Dates	Period among dates (Days)	Vietnam Total Deaths
1,003,417	D1=September 23, 2020	267 since December 31, 2020	35
2,013,287	D2= January 13, 2021	D2 – D1 = 112	35
3,011,574	D3 = April 16, 2021	D3 – D2 = 93	35 (177th place)

Source: Worldometers (2021)

In addition, the WHO Report number 39 on Covid-19 Situation in Vietnam (WHO, 2020c p. 7), published last April 29th reveals that: a) the country has passed 31 days from the last locally acquired cases found in Hai Duong province on 25 March 2021; b) among the 63 provinces: b1) there is no large scale community transmission (Stage 3); b2) there is no localized community transmission (Stage 2); b3) 27 provinces (42.8%) have imported transmission (Stage 1); b4) there is not transmission (Stage 0) in most provinces (36=57.2%), reason by which the main question of this research is "**How Vietnam is saving lives against the Covid-19?**"

Taking into consideration the total number of fatal cases of Covid–19 over time, the world surpassed the first one million reported deaths on 23rd September 2020, with the USA, Brazil, India, Mexico, UK, and Italy considered the most critical countries. In that time, Silva (2020b) developed a holistic methodology to identify 20 benchmark countries that are saving lives against Covid–19, and the 15 phases of the methodology showed that among 108 well–evaluated countries, the top six benchmark nations were Vietnam, Taiwan, Thailand, China, Malaysia, and Singapore. That research did not focus on the innovations, measures, policies, projects, or cultural aspects that were adopted by each country over time, **reason by which further research was recommended to identify, and disseminate them** (SILVA 2020b p. 568).

On November/20, an article (GOMES DA SILVA, 2020) was published focused on Thailand's performance and the best management practices adopted to save lives against Covid–19, during the first 180 days facing the pandemic. Another (Silva, 2021) was published on January/21 to investigate the performance and the best management practices adopted in Taiwan to save lives, during the first 300 days facing the pandemic.

In short, these studies are part of a research package that is investigating the performance and management practices adopted by each country considered as a benchmark by Silva (2020a, 2020b). To continue, this article aims to investigate the Vietnam performance and management practices used to save lives against Covid-19. The specific goals are: a) propose a new classification method for management practices (including Non-Pharmaceutical Interventions-NPIs) adopted against Covid-19; b) to present the first measures of Vietnam National Government and main partners against the Covid-19; c) to compare Vietnam´s performance with 43 semifinalist countries identified by Silva (2020b); d) to identify management practices (including NPIs) adopted in Vietnam, taking into consideration cultural practices, main policy measures, programs, projects, strategies, and innovative solutions.

The research is relevant for Presidents, Ministers, Managers, Policy Makers, WHO, and Centers for Disease Control and Prevention (CDC), since they will know management practices developed not only by the National Government of Vietnam but Corporations, Start-Up, and other stakeholders, before 2020 and during the first 14 months fighting the pandemic. Furthermore, it can be useful for benchmark studies or for the development of strategies to prevent or control similar pandemic episodes in the future.

Finally, it contributes to the teaching process and development of new research, especially related to NPIs on Covid–19. Although authors have published relevant information about Coronavirus (COWLING et al., 2020; CUI et al 2003; CHUANG et al, 2020; FLAXMAN et al., 2020; GOMES DA SILVA 2020; HA et al., 2020; LA et al., 2020; LE, VODDEN, and ATIWESH, 2021; JIAN et al 2017; JIAN et al 2020; NGUYEN, 2020; SILVA, 2020a; SILVA, 2020b; PANG 2003; ZAMBRANO–MONSERRATE, RUANO, AND SANCHEZ–ALCALDE, 2020**;** SVOBODA et al. 2004; VAN NGUYEN et al, 2020; YEH AND CHENG, 2020; YEN et al 2011; YEN et al 2014**;** WANG, NG, AND BROOK, 2020), there are needs to: a) better classify the responses/measures; b) to compare the performance evolution of a benchmark country against other well–evaluated nations, taking into consideration the real estimated number of Covid–19 fatal cases by one million population during the first 14 months facing the pandemic; c) to provide a more complete study on cultural aspects, policy measures, programs, projects, strategies, and innovative solutions adopted over time.

2. Endemic, Outbreak, Epidemic and Pandemic

According to Intermountain Healthcare (2020), an endemic is something that belongs to a particular area. An outbreak represents a greater number of endemic cases, if it's not quickly controlled, an outbreak can become an epidemic, which is a disease that affects a large number of people within a community, population, or region. A pandemic is an epidemic that's spread over multiple countries or continents.

Throughout history, as humans spread across the world, infectious diseases and pandemics have been a constant challenge, with at least 29 mortal pandemics recorded over time, with The Black Death, Smallpox, Spanish Flu, and Plague of Justinian (Table 2) among the most notorious cases.

According to Oswalia and Vasdev (2021), in the last 20 years, the world has seen the emergence and re-emergence of both bacterial, viral and vector transmitted diseases, such as Ebola, MERS–Cov, SARS, and Covid-19, due to the following factors: a) overpopulation with poor sanitation; b) movement of humans all over the globe; c) experimentation of some foods; d) destruction of the natural ecosystem, etc.

Table 2: Seven example of worst epidemics and pandemics in human history

Name	Period	Origin	Deaths toll	Cause
The Black Death	1347–1351	China	200 M	Yersinia Pestis
Smallpox	1492–1980	China	56 M	Pox Virus
Spanish Flu	1918–1920	Spain	40–50 M	Influenza virus/H1N1
Plague of Justinian	541–542	China/India/Ethiopia	30–50 M	Yersinia Pestis
Aids (HIV)	1981–Present	Congo	25–35 M	Chimpanze virus–HIV
Third Bubonic Plague	1885–1960	China/India	15 M	Yersinia Pestis
Cocoliztili	1545–1448	Mexico	15 M	VHF and Salmonella C

Source: Oswalia and Vasdev (2021).

In addition, Lepan (2020) presents a good visualization of a brief history of the pandemics since Antonine Plague (165–180) until Covid-19 (2019 – present) and argues that there is a trend over time concerning a gradual reduction in the death rate (Figure 1), from 51% of the population reported during the Black Death to less than 1% when compared with the most recent pandemics such as Covid-19 or HIV/Aids, probably because of healthcare improvements, reduction of vaccine development lead time, standardization of NPIs, measures, responses, international new rules created by WHO, development of global prevention network, surveillance system, and new technologies solutions such as apps, artificial intelligence, big data, IoT, telehealth, robots, autonomous cars, etc.

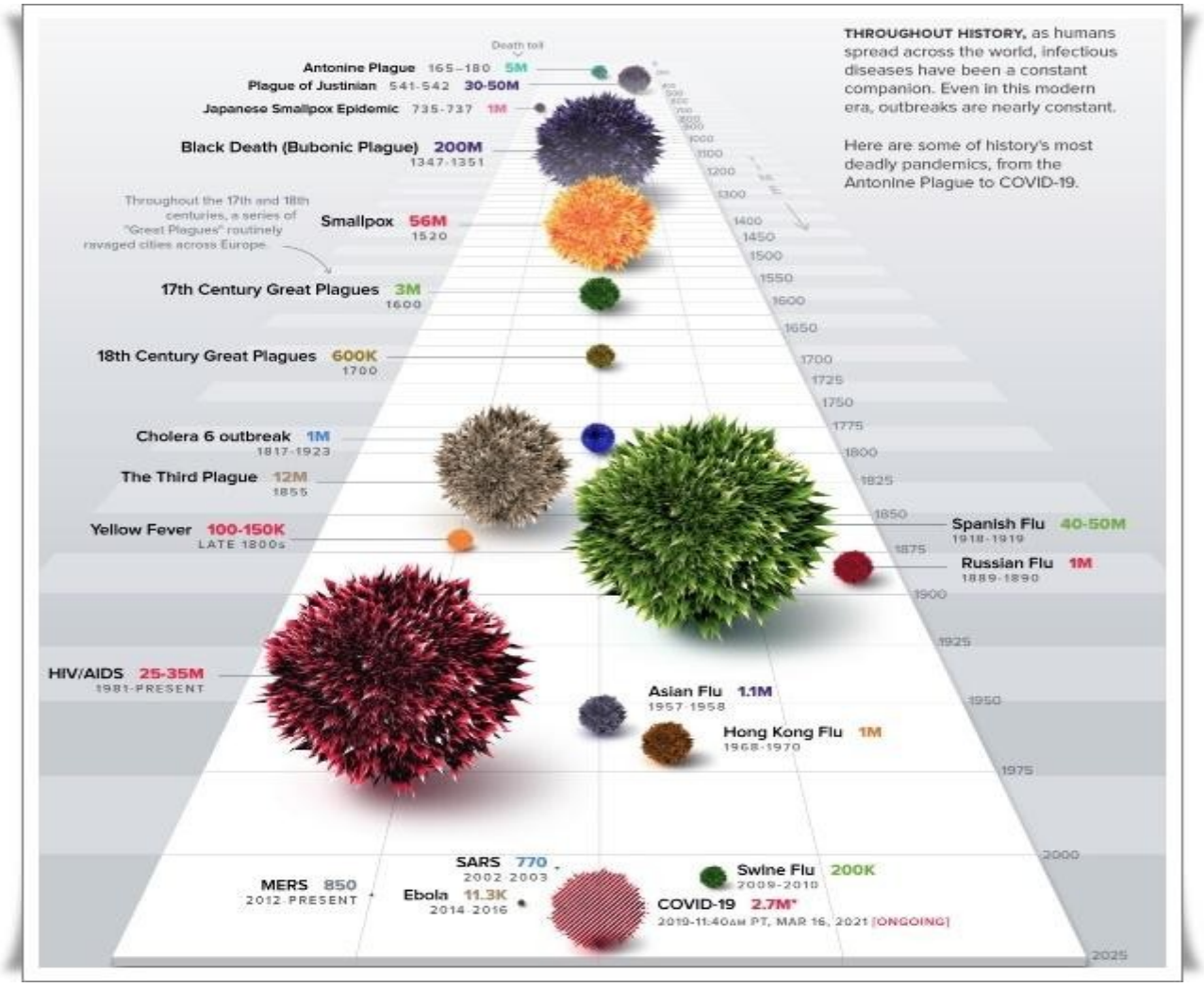

Figure 1: History of Pandemic
Source: Lepan (2020)

Concerning the last coronavirus pandemics, much progress have been made by organizations such as WHO (PACIFIC, 2020; WHO, 2019) and Centers for Disease Control and Prevention (CDC, 2019a) to provide guidance, standards to face them, with several authors and other organization (FLAXMAN et al, 2020; HOLMES, 2003; PANG, 2003; WATTS, 2003; BELL, 2004; INSTITUTE OF MEDICINE, 2004; YEN et al, 2011; YEN et al, 2014) also providing information or lessons about Non-Pharmaceutical interventions necessary to prevent, control, and respond to future global outbreaks.

3. Management Practices (MPs)

For this research, Management Practices (MPs) are defined as management instruments developed to achieve the goal(s). The instrument could be classified into 3 levels: International, National, and Regional/Local, as shown in Figure 2.

Figure 2: MP classification related to Health and/or Covid–19
Source: improved from Gomes da Silva (2020 p. 124)

According to Gomes da Silva (2020 p. 124), at the International level, there are international evaluation systems such as the Global Health Security Index (NTI, JHU, and EIU, 2019), Legatum Prosperity Index (LEGATUM INSTITUTE, 2019), The Sustainable Development Goals Index (GBD 2017 SDG Collaborators (2018), NUMBEO Health Care Index (NUMBEO 2020), Covid–19 Regional Safety Assessment (DEEP KNOWLEDGE GROUP, 2020), all related to Health or Covid–19. In addition, International Cooperation or networks can be considered at this level.

At the National level, there are Government or Legislative acts, laws, regulations, policies, measures, programs, projects. At the Regional/Local level, there are also active, law, regulations, policies, measures, programs, projects, campaign, a set of values, culture, methodology, method/technique, innovation or process, developed by Local Governments, Companies, Universities, Startups, Foundations, Institutes, and NGOs. In addition, at the National, Regional and Local Level, NPIs can be considered also Management Practices, as explained ahead.

4. NPIs and a New Classification Method

NPIs are all measures or actions, other than vaccination or medicines, that can be implemented to slow the spread of influenza in a population, playing an important role to combat the pandemic, while vaccines and drugs are developed, tested, and approved (WHO, 2019 p. 8).

To ECDC (2020), NPIs are public health measures that aim to prevent and/or control SARS–Cov2 transmission in the community. Until a safe and effective vaccine is available to all at risk, NPI will continue to be the main public health tool against SARS–Cov–2.

For this research, NPIs have a broad scope, means public, private and individual measures, projects, actions or responses aimed to support the prevention or control of a pandemic, while effective vaccine, drugs or medicines are not available to the population. Under this concept, NPIs are part of Management Practices, not limited only to public health, but also to other public and private areas necessaries to prevent and face the pandemic over the time.

After investigate several examples of measures, actions or responses mentioned by authors and organizations (ACAPS, 2020; ASKITIAS et al, 2021; BELL, 2004; BO et al, 2021; CDC, 2019a; FLAXMAN et al, 2020; GOMES DA SILVA, 2020; HA et al, 2020; IMF, 2020; IMF 2021; JONES, 2020; KANTOR and KANTOR, 2020; OCDE, 2020; OUR WORLD IN DATA, 2020; PANG, 2003; POLICY, 2020; SILVA, 2021; START UP BLINK (2020); SVOBODA et al, 2004; WHO, 2019; WHO, 2020b), it is possible to identify at least 210 NPIs and also propose a new method to classify them into eight categories as shown in Figure 3.

The Figure 3 shows that:

1) Economic/Fiscal/Support category is related to money and support program/projects/actions, it is the main category with 74 examples of NPIs (36.2%) measures such as allowance, bonus, costs, donations, funds, grants, income, tax, loan, employment, pension, purchase, relief, prices, rent, etc;

2) Health is related to Prevention, Diagnostic or Treatment program/projects/actions, it is the second category with 47 NPIs (22.4%) such as disinfection, distribution of freehand sanitizers, masks, gloves, gown, sample and testing, sanitary protocols for hotels, non–urgent surgery canceled, etc;

3) Movement Restrictions is concerning to reduce people movement, it is the third category with 21 NPIs (10%) such as border close, border check, curfews, suspend flights, etc.

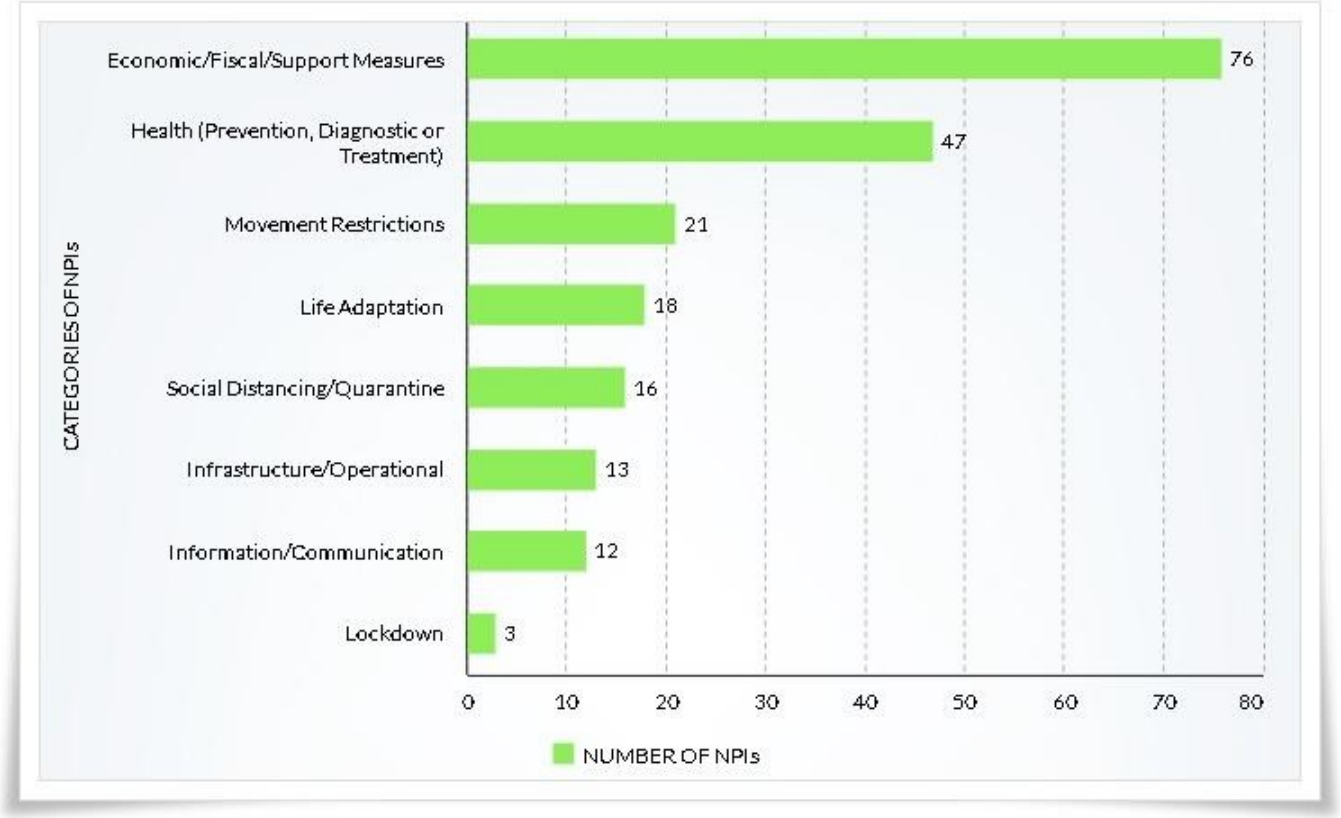

Figure 3: Number of NPIs types found around the world organized by Categories
Source: Author (2021)

4) Life Adaption focus on measures that change people routine lives to reduce the risk of infection of the virus, it is the fourth category with 18 NPIs (8.6%) such as act, law, regulation, application of fines/penalties, development of effective public-private partnership, flexible work hours, postponement local government elections, etc;

5) Infrastructure/Operation is a concern to provide the necessary infrastructure and operational support for other categories, it is the fifth category containing 17 NPIs (8.1%) such as construct field hospital, modular swab unit, set up national teams, strengthen smart labs, improve intensive care unit structures, increase ventilation, etc;

6) Social Distance/Quarantine is the category to keep people isolated, respecting social distance and quarantine actions, it is the sixth category with 16 NPIs (7.6%) such as isolation of sick persons, quarantine hotels, avoiding crowding, distance learning, school measures/closure, etc

7) Information/Communication helps the society to be correctly informed and develop correct behavior to support government and partners or other stakeholders actions, it is the seventh category containing 12 NPIs (5.7%) such as combat fake news, declare a state of emergency, mask map, general recommendations, public awareness campaigns, etc

8) Lockdown is the most severe way to isolate people, especially in an area where occurs many cases of infections. This category is the last with 3 types of NPIs (1.3%) such as full lockdown, partial lockdown, lockdown of refugees, camps, or other minorities.

It is important to notice that each NPI does not work alone, but together with others from the same category or not, depending on the pandemic level in the region. The proposed classification is not perfect, some NPIs could be classified in more than another category, but in general, it can help decision-makers to have a more broad, diverse, and organized view of potential NPIs solutions, which are in constant updating since more Management Practices are found over time.

Chart 1 to Chart 7 shows the 210 NPIs organized by categories and alphabetic order.

CATEGORY	NPIs	NPIs
Economic, Fiscal and Support Measures	1 Additional funding to strengthen the aged care system.	38 Grant for public health workers
	2 Asset purchase	39 Income tax amendment
	3 Banks to defer loan repayments for SME	40 Income tax exemption for SMEs
	4 Bonus for Start–up contract unemployed	41 Interest rate subsidies
	5 Bonus for affected education staff	42 Lay–off prohibition
	6 Budget plan for Covid-19	43 Low interest loans
	7 Campaign to raise donations	44 Payments by credit card or on line
	8 Care allowance to who can not work because they need to care children	45 Price cap on face masks, thermometers and hand sanitizer
	9 Cash and raise minimum pension 10 Cash transfers for low income families	46 Program to help people to find job; 47 Reduce import costs to facilitate access to critical goods
	11 Compensation scheme for the cancellation or postponement major events	48 Purchase emergency supply (mask, gloves, etc)
	12 Consumption coupons for the poor, emergency family care support, and support for business re–opening	49 Postponement of social security contributions and tax payment for companies.
	13 Compensation to quarantined individuals	50 Rescue package for the arts/culture sector
	14 Control of prices (food, medicine and critical equipment)	51 Relief with monthly payments, food and medicine

	NPIs	NPIs
Economic, Fiscal and Support Measures (Continuation)	15 Corporate solvency support	52 Reduction of electricity/gas/water fee
	16 Debit relief of hospitals	53 Reduce road tax rate for vehicles
	17 Economic package to support transport and travel adaptations	54 Research grant to support vaccine, drugs or test kit development
	18 Distribution of Donations	55 Rent payments suspended
	19 Economic support for sport clubs	56 Rent subsidy or reduction
	20 Emergency family allowance	57 Simplification of credit for companies
	21 Equity Injections	58 Subsidies for agricultural producers
	22 Financial aid for low income householders	59 Support to refugees and returnees
	23 Financial aid for unemployed 24 Financial aid for business re–opening	60 Subsidies and capital transfers to medical establishments
	25 Financial fund to help companies to grow the production of Covid-19 related supplies 26 Financial support for exporters	61 Subsidies for companies use digital technologies to grow their businesses and create jobs as part of economic recovery
	27 Financial fund to help companies to shift production toward Covid–related supplies	62 Suspension of toll collection 63 Tax payment deadline extended
	28 Financial support and liquidity measures for the agricultural sector	64 Tax cut; 65 Tax reliefs; 66 Tax system amendment
	29 Financial support for remote education	67 Tax breaks for trade centers and cinema
	30 Financial support for SMEs	68 Temporary suspension of all lotteries
	31 Fund to expand the number of hospital beds, medical staff & equipment	69 Temporary stop of loan payment 70 VAT reduction
	32 Financial grants for Startups 33 Fund to increase testing for Covid	71 Unemployed person do not need to pay gas, electricity or water bills
	34 Fund to increase tracing for Covid 35 Fund to support online training programs	72 Universities to cut prices on courses to help re–skill workers after coronavirus
	36 Fund to help new graduated students to find job	73 Wage incentives (bonus) for front line workers
	37 Grant for R&D to improve medical devices /serv.	74 Wage subsidies for workers

Chart 1: Examples of Economic/Fiscal/Support NPIs adopted by countries against a pandemic

CATEGORY	NPIs	NPIs
Health (Prevention, Diagnostic or Treatment)	1 Avoiding face touching 2 Avoiding handshakes 3 Conduct risk assessment;	27 Policy to ease access to testing; 28 Protection for front–line workers and service personal
	4 Disinfection of markets 5 Disinfection gateway; 6 Distribution of face masks	29 Psychological assistance 30 Pulse oximeter use and improvements
	7 Distribution of food packs to underprivileged	31 QR Code System implementation
	8 Distribution of free hand sanitizers	32 Reschedule non–urgent health or medical care
	9 Ensure availability of personal protective equipment	33 Robots to support medical actions
	10 Face shields with characters from cartoons, games and sci-fi movies; 11 Frequent hand hygiene	34 Sanitizing public spaces 35 Smart care system implementation 36 Smart Epidemic Prevention Door

	NPIs	NPIs
Health (Prevention, Diagnostic or Treatment) (Continuation)	12 Guidance for the reopening of Daycares and Pre–Schools;	37 Smart Temperature Measurement Systems
	13 Guideline for employers/employees in both public and private sector; 14 Guidelines for hair & beauty salons; 15 Guidelines to protect aged care residents 16 Hand sanitizers at any shop entrance	38 Students must bring a packed lunch 39 Surface and object cleaning 40 Temperature checks at shopping malls
	17 Health & Safety Protocols for The Tourism; 18 Health screenings in airports and borders	41 Temperature checks at airports, ports, stations, ferry terminals
	19 Home delivery of medicines to elderly persons; 20 Lung Care application; 21 Mass population testing; 22 Non-urgent surgery canceled	42 Use of Thermometers 43 Training of health safety measures for children in schools
	23 Obligatory medical tests not related to Covid–19; 24 Pharmacy Delivery Service; 25 Respiratory Etiquette (Tissue/Elbow Sneeze, etc); 26 Sanitary Protocols for Hotels;	44 Use of Negative Pressure Cabinets For Specimen Collection 45 Use of Covid–19 detection reagents 46 Village Health Volunteer Program 47 Wear mask, gloves or eye protection

Chart 2: Examples of Health NPIs developed around the world against a pandemic

CATEGORY	NPIs	NPIs
Movement Restrictions	1 Additional health documents requirements upon arrival	12 Public transport service to be limited to seated passengers only
	2 Border checks	13 Public transport reduction
	3 Border closure	14 Restrict visit to hospital
	4 Checkpoints within the country	15 Restriction on internal movement
	5 Complete Border closure	16 Surveillance and monitoring
	6 Curfews	17 Temporary ban of immigration services
	7 Domestic travel restrictions 8 International flights suspension	18 Temporary ban of international cruise ship from calling at ports
	9 International travel control	19 Temporary close of international airport
	10 Movement Control Order (MCO) 11 Public event cancellations	20 Temporary road block 21 Visa restrictions

Chart 3: Examples of Movement Restrictions NPIs developed around the world against a pandemic

CATEGORY	NPIs	NPIs
Infrastructure / Operational	1 CDC	10 Modular Swab Unit
	2 Close field hospital	11 Quarantine camps
	3 Construct field hospital	12 Set up National Teams
	4 Emergency administrative structures	13 Strengthen Central and Local Gov. Care Centers
	5 Improve Intensive Care unit Structure	14 Strength National Inf. Disease Statistic System
	6 Increase the medical personal equip	15 Strengthen SmartLabs
	7 Increase ventilation	16 Strengthening the Public Health System
	8 Laboratories 9 Mobile Test Station	17 Turns places into field hospital (Stadium, University, School, etc)

Chart 4: Examples of Infrastructure/Operational NPIs developed around the world against a pandemic

CATEGORY	NPIs	NPIs
Social Distancing / Quarantine	1 Avoiding crowding	9 Public workplace measures and/or close
	2 Business workplace measures and/or close	10 Quarantine
	3 Contact tracing	11 Quarantine hotels
	4 Distance learning	12 Schools measures and/or closure
	5 Isolation of sick individuals	13 Stay at Home
	6 Limit public gatherings	14 Suspend mass gathering
	7 Promote Telehealth	15 Teleconferences or Virtual meeting
	8 Promote teleworking from home	16 Universities measures and/or closure

Chart 5: Examples of Social Distance/Quarantine NPIs developed around the world against a pandemic

CATEGORY	NPIs	NPIs
Information / Communication	1 Combat fake news	7 Integration with Mass Media
	2 Declaring State of Emergency	8 Mask map
	3 Digital Fencing Tracking System	9 Public Awareness/Information campaigns
	4 Flu Forecast Map	10 Travel advice
	5 General recommendations	11 Use of chatbots to inform, combat fake news
	6 Installation of Hotlines or Call centers	12 Use of PTT Bulletin Board System
Lockdown	1 Full Lockdown	3 Partial Lockdown
	2 Lockdown of refugee/idp camps or other minorities	–

Chart 6: Example of Information/Communication or Lockdown NPIs applied during a pandemic

5. Methodology

The study uses a qualitative and quantitative approach, is descriptive, applied, based on bibliographic and documentary research, involving the study of articles, technical reports, official sites, guidelines, standards, manuals, collected from the internet.

To reach the specific objectives, the collection and data analysis were made in four mains phases:

Phase 1) propose a new classification method for Management practices

It was described in sections 3 and 4.

Phase 2) to present the first measures of Vietnam National Government and main partners

The investigation focus on the first measures adopted by Vietnam National Government and main partners to prepare, prevent, and control the Covid-19, before WHO declare it a pandemic on March 11, 2020. The WHO and Vietnam National Government sites, articles, technical reports, and others are the main sources used to collect data (ACAPS, 2020; HA et al 2020; IMF, 2020; IMF, 2021); LA et al 2020; LUATVIETNAM.VN, 2020; THE GOVERNMENT OF THE SOCIALIST REPUBLIC OF VIET NAM, 2020; THE GOVERNMENT OF THE SOCIALIST REPUBLIC OF VIET NAM MINISTRY OF HEALTH, 2020; TRAN et al 2020; VAN NGUYEN et al 2020; WHO, 2021).

Phase 3) to compare Vietnam´s performance against 43 semifinalist countries

Silva (2020b) developed a holistic methodology with 15 phases divided by rankings to identify the best 20 benchmark countries that are saving lives against Covid–19. In that research, Vietnam was the best country and the reason to make a new comparative analysis against the 43 semifinalists, is to check the performance evolution of this country over time when 426 days (14 months) are considered. The period of 426 days was chosen because it is the maximum number of days observed for each country until the conclusion of this article.

In addition, to reach that result, it was also used the Fatality Total Index (FTI; SILVA 2020b p. 563), an indicator that estimates the real number of fatal cases by one million population during the same period (example 426 days=FTI426) applied to each country facing the pandemic.

The data were collected daily from the worldometers site, from December 31, 2019, until April 30, 2021. For each country, the official date of the first case of Covid–19 was identified, and also the date when completed 426 days facing the pandemic (DTFC426). After that, The FTI Formula (SILVA 2020b p. 563) was applied for each country, and they are ranked in ascending order by using the FTI426.

Phase 4) to identify management practices adopted in Vietnam

In June/20, an on–line Survey <https://ufam.typeform.com/to/UL7R8M> was developed with 9 questions related to Q1) the country: with 15 benchmark countries (including Vietnam) listed, selected by the author in that time taking into consideration the FTI100; Q2) eleven cultural practices that the respondent believes were decisive for the low rate of death, with one option for those that don´t believe culture practice were decisive; Q3) how much (0–10) the respondent trust in official statistics released by the National Government about the number of deaths cases by Covid–19; Q4) what are the main policy measures (18 options, multiple choice) adopted by the National Government that saved lives against the Covid–19; Q5) an opened question to inform (if know) the name of the most innovative product or service that are protecting people against Covid–19. It aims to identify some tips for the researcher to intensify the search on the internet; Q6) the age; Q7) if the respondent is native or not; Q8) The time (years) living in the country; Q9) an open question for suggestions or to inform email, just in case the respondent is interested to receive the scientific article.

The questionnaire's main aim is to identify the perceptions of people living in Vietnam and the respondent must have more than 17 years old and living in the country for at least four months. The pilot test was from June 21st to July 21th, after that, some improvements were to make it easier to answer. The survey continues from the beginning of August until the 9th of November, 2020. Because the difficulty collecting data, it is worth noting that from 26/October to 09/November/20, another questionnaire was crated in the Vietnamese language to run together with the English version.

Facebook service “Bost a post” was contracted, invitations with the link of the questionnaire were written in English and Vietnamese, and send to the audience of Vietnam. Due to Covid–19 and cost limitations, it was tried to carry out sampling for convenience, where the researcher depends on the availability of the respondent to contribute in a volunteer way for the survey. As a result, a confidence interval or margin of error was not adopted, but it was hoped to get at least 100 correct answers.

Finally, from June 2020 until end April 2021, parallel to the online questionnaire, several searches on articles, sites of government, universities, journals, startups, associations, and companies located in Vietnam were realized to identify more responses (including innovative products and services) adopted to protect and save lives against the Covid–19.

6. Results

6.1 At least 86 MPs taken before the Covid–19 was declared a Pandemic by WHO

According to WHO Report number 24 on Covid-19 Situation in Vietnam (WHO, 2020c p.10), between January to 31 December 2020, Vietnam faced four waves of Covid-19 and around 33 Key public health interventions were implemented as shown in Figure 4.

Among the key interventions are: wear a mask, hand hygiene, respiratory etiquette, school closure, workplace closure, mass gathering ban, stay at home, restriction on internal movement, restrictions on international travel, communities/hospital lockdown, and quarantine.

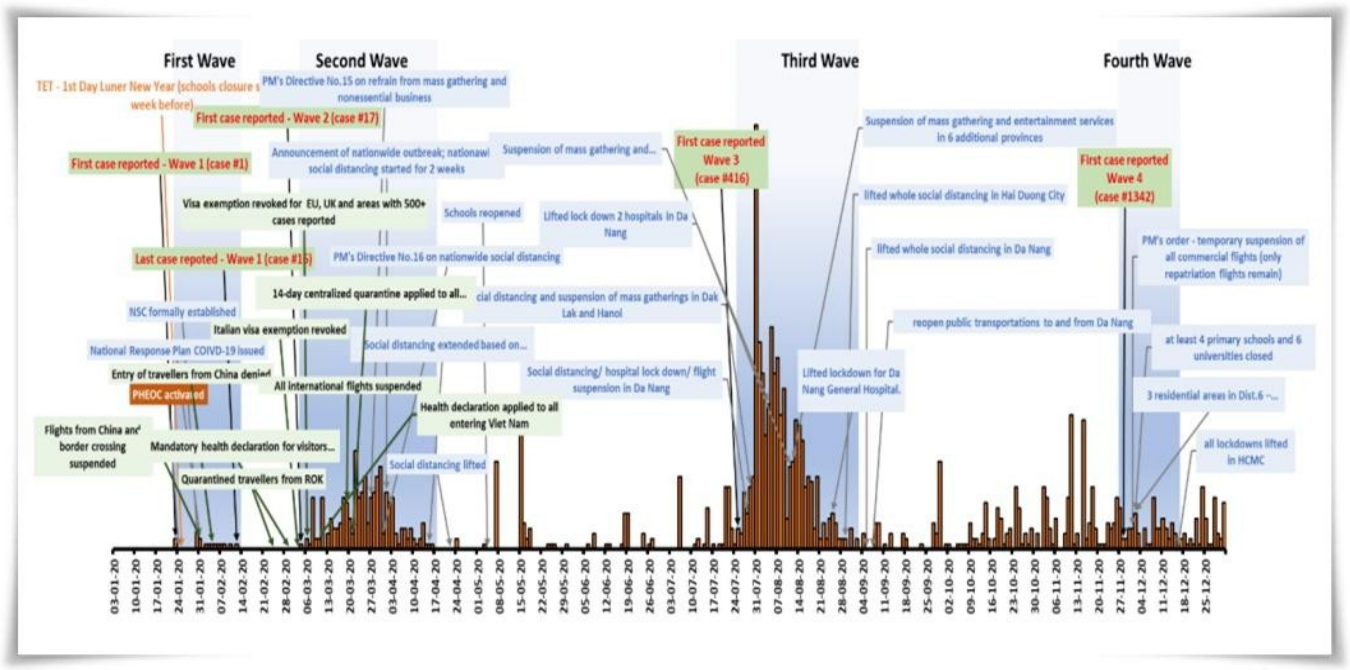

Figure 4: Key public health interventions adopted in Vietnam against Covid (January to Dec./2020)

However, when applying the concepts of sections 3 and 4 and search to Management Practices adopted by National, Local Government and main partners, the number of responses is much higher.

For instance, Chart 7 (from next page) shows that before March 11, 2020, when the Covid-19 was declared a pandemic by WHO, Vietnamese National Government leaders and main partners adopted at least 86 measures/solutions against the Covid-19. In general, among them, most (18=20.9%) is related to Life Adaptation category, followed by Health (15=17.5%), Information and Communication (16=18.7%), Infrastructure/Operation (10=11.6%), Social Distance/Quarantine (10=11.6%), Movement Restrictions (10=11.6%), Economic/Fiscal/Support (4=4.6%) and Lockdown (3.5%) categories.

It is worth noting that 13 (15.7%) measures/solutions were developed before 2020, most (7=54%) related to Legal measures such as law, decrees, circulars, and directives concerning Health issues that are valuable to prepare, prevent and control a pandemic.

In a country with few resources, another interesting case is the combination of new technologies (Apps, Lotus Platform, Zalo Platform, Facebook platform, mobiles, SMS, Youtube, etc) with the old Public LoudSpeaker System, available in every community across the country, focusing on how dangerous is Covid-19, how to mitigate the risks, the importance of participating in the Government efforts (DANG, 2020). The Public Loudspeaker System is an important technology for the older generation and those living in places without good internet access. According to Dang (2020), against the Covid-19, this system is low-cost, easy, and effective, normally operates twice a day during the early morning or in the late afternoon, depending on each community.

Finally, the two decisions taken by the Prime Minister and Ministry of Health, on 30 January 2020, to establish a National Steering Committee, as well as to set up 45 Mobile teams, seems to have contributed for the acceleration of measures necessary to guide, prevent and control the Covid-19 across the country.

FIRST MEASURES/SOLUTIONS USED	CATEGORY	WHEN
1 – Public LoudSpeaker System, Mini Cars and Motorbikes with loudspeakers	Inf/Com.	Before 2020
2 – Law 03/2007/QH12: Prevention and Control of Infectious Diseases	Life Adaptation	Before 2020
3 – CDC Vietnam's Global Health Security Program	Infra/Op	Before 2020
4 – Decree No. 101/2010/ND–CP: Medical examination & treatment in terms of implementation of isolation measures, etc	Life Adaptation	Before 2020
5 – Decree No: 75/2017 / ND–CP: Regulations on Functions, Duties, Powers and Organization Structure of the MoH	Infra/Op.	Before 2020
6 – Decree No. 176/2013/ND–CP: Penalties for Administrative violations against medical laws)	Life Adaptation	Before 2020
7 – Decree No. 89/2018/ND–CP: Implementation of the law on infectious disease prevention and control regarding border health quarantine	Life Adaptation	Before 2020
8 – Decree No. 107/2018/ND–CP: Simplify the rice export business)	Life Adaptation	Before 2020
9 – Decree No. 115/2018/ND–CP: Penalties for administrative violations against regulations on food safety	Life Adaptation	Before 2020
10 – Directive No. 12/CT–BYT: Intensifying the implementation of Non–cash payment for medical and health service	Ec/Fisc/Sup	Before 2020
11 – Circular No. 28/2019/TT–BYT: Guidelines for notification and reporting of medical quarantine activities at border	Inf/Com.	Before 2020
12 – National Network of Emergency Operations Centers (EOCs)	Infra/Op.	Before 2020
13 – Thong Tin Chinh Phu Facebook / MoH Zalo/MoH Lotus /SMS	Inf/Com.	Before 2020
14 – Public information warning about strange pneumonia	Inf/Com.	Jan/09/20
15 – Assess the epidemic situation, review response activities and propose appropriate disease prevention measures	Health	Jan/10/20
16 – Decision No: 125 / QD–BYT: Guideline for diagnosis & treatment of coronavirus infection	Health	Jan/16/20
17 – Decision No: 137 / QD–BYT: Issuing the plan for the prevention and control of the infectious epidemic in 2020	Life Adaptation	Jan/17/20
18 – Dispatch No: 62 / KCB–NV: Guidance for early detection and good preparation for disease prevention and control by nCoV	Inf/Com.	Jan/17/20
19 – Directive 03 / CT–BYT: Strengthening prevention and control of acute respiratory infections caused by a new strain of Coronavirus	Health	Jan/22/20
20 – Isolation of suspected passengers	Health	Jan/23/20
21 – Screening on passengers at airports, seaports, and land crossings	Health	Jan/23/20
22 – Suspend flight to Wuhan	Mov . Restriction	Jan/23/20
23 – Compulsory health declaration at all international ports	Inf/Com	Jan/25/20
24 – Directive 05 / CT–TTg: Prevention and Control of Covid-19	Mov . Restriction	Jan/28/20
25 – Clarifies responsibilities of ministries, agencies and localities	Infra/Op.	Jan/28/20
26 – Directive No. 05 / CT–TTg: Suspend flights from Vietnam to infected areas of China	Mov. Restriction	Jan/28/20
27 – Twenty two Hospital Hotlines free of charge to share information on Covid-19	Inf/Com.	Jan/29/20
28 – Refuse entrance of foreigners coming from China	Mov . Restriction	Jan/30/20
29 – Suspend visa issuance to Chinese tourists	Mov . Restriction	Jan/30/20
30 – Decision No. 170 / QD–Ttg: Establishment of a National Steering Committee	Infra/Op	Jan/30/20
31 – Decision No: 225 / QD–BYT: Set up 45 Mobile teams	Infra/Op	Jan/30/20

FIRST MEASURES/SOLUTIONS USED (CONTINUATION)	CATEGORY	WHEN
32 – Isolate suspected cases and Inspect the prevention actions in Nha Trang	Health	Jan/30/20
33 – Orientation to not travel to China	Inf/Com.	Jan/30/20
34 – Directive 06 / CT–TTg: Strengthening Prevention Measures	Health	Jan/31/20
35 – Regular information system with leaders of 63 departments of educ./training	Inf/Com.	Feb/ 01/2036
36 – Installation of Hotlines 19009095 and 19003228	Inf/Com.	Feb/01/20
37 – Suspend flight to China, HK, Macau, Taiwan	Mov . Restriction	Feb/01/20
38 – Decision No. 173/QD–Ttg: Declare nCoV as epidemic in Vietnam	Inf/Com	Feb/01/20
39 – Temporary School close (63 provinces)	SocDist/Quar	Feb/02/20
40 – PM/MoH alert of punishment to units that does not send report	Inf/Com	Feb/02/20
41 – Building two field hospitals with 500 beds in HCM province	Infra/Op	Feb/03/20
42 – Decree No. 15/20/ND–CP: Fake news penalties	Life Adaptation	Feb/03/20
43 – Mandatory 14 days quarantine to travelers from China	SocDist/Quar	Feb/03/20
44 – Dispatch No. 156/CD–Ttg: Restrictions of large gatherings and festivals	Mov . Restriction	Feb/03/20
45 – Official Telegraph No. 396/CD–BVHTTDL: Suspension of festivals and activities at historical monuments and sites	SocDist/Quar	Feb/03/20
46 – Building two field hospitals with 500 beds in HCM Province	Infra/Op	Feb/03/20
47 – All localities delay school reopening due to Covid-19 (until Feb 29 2020)	SocDist/Quar	Feb/05/20
48 – Preparation of 3 isolated zones in Lang Son Province	Health	Feb/06/20
49 – Decision No: 332 / QD–BYT: Update Diagnosis and treatment of acute respiratory infections caused by new Corona virus strain (2019–nCoV)	Health	Feb/06/20
50 – Directive to boost face mask production	Life Adaptation	Feb/06/20
51 – Decision No. 155/QD–BTC: List of goods eligible for import tax exemption	Ec/Fisc/Sup	Feb/07/20
52 – Exemption of Tax for medical suppliers	Ec/Fisc/Sup	Feb/07/20
53 – Decision No. 344/QD–BYT: Guidance on the health quarantine at quarantine establishments	SocDist/Quar	Feb/07/20
54 – Decision No. 345/QD–BYT: Guidance on medical isolation at home and places of residence	SocDist/Quar	Feb/07//20
55 – Launch Website <https://ncov.moh.gov.vn/> and App named 'Vietnam Health' to provide information on nCoV infection.	Inf/Com	Feb/08//20
56 – Disinfect villages at Vinh Long Province (sprayed within a radius of 300m from people infected)	Health	Feb/09/20
57 – Suspend and Fine pharmacies that increased prices in Nghe An DoH, Thua Thien Hue and Ha Long Provinces	Life Adaptation	Feb/11 to 13/20
58 – Representatives of supermarkets/distributors signed commitments to buy agricultural products that are piling up	Ec/Fisc/Sup	Feb/13/20
59 – Lockdown and quarantine in Vinh Phuc Province Son Loi Commune in Binh Xuyen District, where seven people have contracted the new coronavirus.	Lockdown	Feb/13/20
60 – Delay the end of the school year to prevent COVID–19	SocDist/Quar	Feb/14/20
61 – Extend the time of absence from students to the end of February/20	SocDist/Quar	Feb/15/20
62 – Orientation to not travel to South Korea	Inf/Com	Feb/15/20
63 – Lockdown and quarantine in Hai Phong Province	Lockdown	Feb/13/20

FIRST MEASURES/SOLUTIONS USED (CONTINUATION)	CATEGORY	WHEN
64 – Application of fines to people that were disseminating fake news in Quang Ninh, Hung Yen, Hanoi and Thanh Hoa Provinces	Life Adaptation	Feb/20 to 26/20
65 – Guidance on prevention and control of Covid–19 in medical examination and treatment establishments	Health	Feb/19/20
66 – The national intelligence management force checked and supervised 73 medical equipment manufacturing and trading establishments; handled 17 violating establishments with a fine of 16.8 million VND.	Health	Feb/22/20
67 – Directive No.10/CT-TT: Entry bans to people coming from SK	Mov . Restriction	Feb/25/20
68 – Disinfection and cleaning of buses and railways stations in Hanoi Province	Health	Feb/27/20
69 – Fine company for 30000 fake masks, detention of masks and machines in Nghe An Province	Life Adaptation	Feb/27/20
70 – Resolution No. 20 / NQ–CP of 2020: Application of export licensing regime for medical masks	Life Adaptation	Feb/28/20
71 – Mandatory 14d quarantine to travelers from SK	SocDist/Quar	Feb/29/20
72 – Suspend visa waiver program for SK people	Mov . Restriction	Feb/29/20
73 – Mandatory 14d quarantine to travelers from Italy & Iran	SocDist/Quar	Mar/01/20
74 – Fill Medical declaration upon arrival (China, Korea, Italy, Iran) in Vietnam	Health	Mar/01/20
75 – Partnership with IMPACT–MED Alliance to support the Vietnam MoH efforts in the prevention and management of Covid–19. In 2020, they trained 963 healthcare workers from 194 healthcare facilities, improved epidemic control performance of 30 hospitals across the country, and facilitated 12 online training sessions for 3400 health professional participants on COVID care and treatment	Health	Start Mar/01/20 Until Dec/31/20
76 – Fine more than 300 in Bac Giang Province for violating regulations	Life Adaptation	Mar/03/20
77 – In partnership with VMED Group the MoH launched the Vietnam Telemedicine Centre to use 4.0 digital healthcare solutions to combat Covid–19	Infra/Op.	Mar/05/20
78 – MoH launched On Line Management and Administration Center for diagnosis and treatment of COVID–19 infection	Infra/Op.	Mar/05/20
79 Lockdown in Truc Bach Street, Ha loi Village and Bach Mai hospital	Lockdown	Mar/06/20
80 – ASEAN Economic Ministers: Four days workshops to work together to deal the novel coronavirus	Life Adaptation	Mar/8 to 11/20
81 – In Partnership with Hanoi Radio and TV: The Hanoi DoE provide broadcast classes on TV for students in grades 9 and 12	Life Adaptation	Mar/09/20
82 – Suspend visa–waiver program for 8 European countries	Mov . Restriction	Mar/09/20
83 – Launch Vietnam health declaration app for foreigners	Inf/Com.	Mar/10/20
84 – MoCST & partners: Public Campaign Awareness “Joining hands to put back Covid-19”	Inf/Com.	Mar/10/20
85 – Suspend and Fine pharmacies that increased prices (Nghe An DoH Province)	Life Adaptation	Mar/11/20
86 – Fine pharmacy that increased prices in Thua Thien Hue	Life Adaptation	Mar/11/20
WHO announced Covid–19 as a pandemic	–	**Mar/11/20**

Chart 7: Example of first measures taken by Vietnam National Government and partners against the Covid–19 until March11, 2020

6.2 Vietnam is the second best performer against 43 semifinalist countries

Vietnam is a country with an intense flux of people coming from abroad. In 2019, Vietnam reported a record number of international arrival, 18 million, a rise of 16.2% when compared against 2018, with 5.8 million (32.2%) visitors coming from China (XINHUA, 2020). The proximity to China has made Vietnam (around 1357 Km from Hanoi to Wuhan, one of the first focus transmission of Covid-19), a popular destination for thousands of people traveling between these countries, especially during the Lunar New Year Holiday, celebrated on January 25, 2020, reason by which, it was a source of high concern and the adoption of rapid several measures taken by the Vietnam National Government, as shown in Chart 7.

It is worth noting that among the 44 semifinalist countries identified by Silva (2020b), Vietnam was among the first ten countries affected by Covid–19: 1) China (31th/Dec/19); 2) Thailand (13th/Jan); 3) Japan (16th/Jan); 4) SK (20th/Jan); 5 and 6) Taiwan and USA (21th/Jan); 7 and 8) Vietnam and Singapore (23th/Jan); 9) France (24th/Jan); 10 and 11) Malaysia and Australia (25th/Jan/2020).

In terms of the number of Total Fatal Cases (TFC) of Covid–19 officially reported by each 44 semifinalist countries, during 14 months (426 days), Vietnam is the fifth-best performer: 1st) Taiwan (TFC426=10); 2nd) New Zealand (26), 3rd) Iceland (29), 4th) Singapore (30), 5th) Vietnam (35). On the other hand, the USA (TFC=558321), UK (126764), Italy (109847), France (93912), and Germany (76468) are the most critical countries. However, the result changes when is used the concept of Fatality Total Index (FTI426) to estimate the real number of total fatal cases by the one million population during 426 (14 months) days facing the pandemic. Table 3 and 4 show the basic profile and performance (FTI426 in ascending order) of the 44 countries and the main results are:

a) Taiwan is the best country (Table 3), with FTI426 (last column) equal to 0.0020, followed by Vietnam (0.0025), Thailand (0.0037), China (0.0094), Singapore (0.0129), New Zealand (0.0220), Malaysia (0.0997), South Korea (0.1044), Australia (0.1134) and Hong Kong (0.1308), all considered the top ten benchmark nations, 80% from Asia and 20% from Oceania. It is important to note that a) all the ten countries reported at least one case of SARS2003; b) except New Zealand (0), South Korea (0), and Australia (0), the seven other countries reported at least two fatal cases of SARS2003, with the highest cases reported in China (349), Hong Kong (299 fatal cases), Taiwan (37), Singapore (33) and Vietnam (5), which indicate that they have learned lessons and are more prepared to face a pandemic.

Table 3: Twenty two best countries profile & performance in ascending order of FTI426

R	COUNTRIES	CONTINENT	SARS2003 TD/TC	START	P2020 (Mil)	PD20	AGE>65(20)	HBED/100K	DTFC366	TFC366	FTI366	DTFC396	TFC396	FTI396	DTFC426	TFC426	FTI426
1	TAIWAN	Asia	37 / 346 = 10,7%	21/01/20	23,82	673,00	14,00	6,98	21/01/21	7	0,0016	20/02/21	9	0,0019	22/03/21	10	0,0020
2	VIETNAM	Asia	5 / 63 = 7,93%	23/01/20	97,34	308,13	7,90	2,60	23/01/21	35	0,0029	22/02/21	35	0,0027	24/03/21	35	0,0025
3	THAILAND	Asia	2 / 9 = 22,2%	13/01/20	69,80	135,13	13,00	2,10	13/01/21	67	0,0034	12/02/21	80	0,0037	14/03/21	86	0,0037
4	CHINA	Asia	349 / 5327 = 6,55%	31/12/19	1439,32	147,67	12,00	4,34	31/12/20	4634	0,0109	30/01/21	4636	0,0101	01/03/21	4636	0,0094
5	SINGAPORE	Asia	33 / 238 = 13,87%	23/01/20	5,86	7915,73	13,40	2,40	23/01/21	29	0,0145	22/02/21	29	0,0134	24/03/21	30	0,0129
6	NEW ZEALAND	Oceania	0 / 1 = 0%	28/02/20	4,82	18,21	16,40	2,61	28/02/21	26	0,0256	30/03/21	26	0,0236	29/04/21	26	0,0220
7	MALAYSIA	Asia	2 / 5 = 40%	25/01/20	32,38	96,25	7,20	1,90	25/01/21	689	0,0640	24/02/21	1088	0,0935	26/03/21	1249	0,0997
8	SOUTH KOREA	Asia	0 / 3 = 0%	20/01/20	51,28	527,97	15,80	12,27	20/01/21	1300	0,0932	19/02/21	1550	0,1027	21/03/21	1696	0,1044
9	AUSTRALIA	Oceania	0 / 6 = 0%	25/01/20	25,50	3,20	16,20	3,84	25/01/21	909	0,1320	24/02/21	909	0,1220	26/03/21	909	0,1134
10	HK	Asia	299 / 1755 = 17,04%	23/02/20	7,50	7039,71	18,20	-	23/02/21	197	0,1435	25/03/21	204	0,1374	24/04/21	209	0,1308
11	ICELAND	Europe	NO CASE	28/02/20	0,34	3,40	15,60	2,91	28/02/21	29	0,2667	30/03/21	29	0,2465	29/04/21	29	0,2292
12	JAPAN	Asia	NO CASE	16/01/20	126,49	347,78	28,40	13,05	16/01/21	4380	0,1670	15/02/21	6952	0,2449	17/03/21	8678	0,2842
13	UAE	Asia	NO CASE	27/01/20	9,90	112,44	1,30	1,20	27/01/21	811	0,2375	26/02/21	1198	0,3243	28/03/21	1481	0,3727
14	QATAR	Asia	NO CASE	27/02/20	2,89	227,32	1,70	1,20	27/02/21	257	0,2821	29/03/21	286	0,2902	28/04/21	445	0,4197
15	NORWAY	Europe	NO CASE	26/02/20	5,42	14,46	17,50	3,60	26/02/21	622	0,4256	28/03/21	656	0,4149	27/04/21	736	0,4327
16	FINLAND	Europe	NO CASE	29/01/20	5,54	18,14	22,60	3,28	29/01/21	671	0,4765	28/02/21	742	0,4870	30/03/21	826	0,5040
17	CYPRUS	Asia	NO CASE	09/03/20	1,21	127,66	14,40	3,40	10/03/21	235	0,6661	09/04/21	268	0,7021	09/05/21	317	0,7719
18	DENMARK	Europe	NO CASE	27/02/20	5,79	136,52	20,20	2,50	27/02/21	2358	1,5727	29/03/21	2415	1,4887	28/04/21	2481	1,4217
19	ISRAEL	Asia	NO CASE	21/02/20	8,67	402,61	12,40	2,99	21/02/21	5577	2,1203	23/03/21	6122	2,1512	22/04/21	6346	2,0729
20	CANADA	North America	43 / 251 = 17,13%	27/01/20	37,74	4,04	18,10	2,50	27/01/21	19533	3,0159	26/02/21	21900	3,1252	28/03/21	22880	3,0351
21	GERMANY	Europe	0 / 9 = 0%	27/01/20	83,80	237,01	21,70	8,00	27/01/21	55358	2,8599	26/02/21	70421	3,3625	28/03/21	76468	3,3941
22	ESTONIA	Europe	NO CASE	27/02/20	1,33	31,03	20,40	4,69	27/02/21	584	2,2780	29/03/21	879	3,1689	28/04/21	1148	3,8472

Source: Author (2021)

b) On the other hand (Table 4), Spain (FTI426=34.5799), Hungary (28.1022), UK (17.1636), Italy (16.9561), Slovenia (12.6253), Czech (9.5023), Belgium (9.0280), Poland (8.5398), Lithuania (7.8307) and USA (7.8142) were the ten most critical countries with the highest number of FTI426. In this group, most (90%) is from Europe and only the USA (10%) is from North America. Besides, among these countries, 60% (Lithuania, Poland, Belgium, Czech, Slovenia, and Hungary) did not report any case of SARS2003, and all did not report any fatal case of that pandemic, indicating that they do not have experience in dealing with a high number of SARS2003 disease cases. As a result, the delay in taking appropriate measures to prepare, prevent and control the Covid-19 have contributed to the high number of fatal cases per million population over time;

c) The 44 countries' FTI426 average is 5.30656 (S=7.24; CV=136.49%), and the median equals 3.92903, with twenty–nine countries FTI426 average lower than the 5.30656. The 10 best countries´ FTI426 average is **0.0501** (S=0.0544; CV=108.45%), and the median equals 0.01743, with the five best performers countries FTI426 average equal to 0.0061.

It is worth to note that Taiwan (until Feb/15/20=no fatal cases; Jan/21/20 to March/22/21 = 0 to 10 fatal cases), Vietnam (until July/20 = no fatal cases; Jan/23/20 until Mar/24/21 = 0 to 35 fatal cases), Thailand (until Feb/29/20 = no fatal cases; Jan/13/20 until Mar/14/21 = 0 to 86 fatal cases), Singapore (until Mar/20 = 0 fatal case; Jan/23/20 until Mar/24/21 = 0 to 30 fatal cases) and New Zealand (until Mar/27/20 = 0 fatal case; Feb/02/20 until April/29/21= 0 to 26 fatal cases) can be considered the best to keep the number of total fatal cases very low during 426 days.

Table 4: 22 countries profile & performance in ascending order of FTI426 (Continuation of Table 3)

R	COUNTRIES	CONTINENT	SARS2003 TD/TC	START	P2020 (Mil)	PD20	AGE>65(20)	HBED/100K	DTFC366	TFC366	FTI366	DTFC396	TFC396	FTI396	DTFC426	TFC426	FTI426
23	AUSTRIA	Europe	NO CASE	25/02/20	9,00	106,75	19,20	7,37	25/02/21	8493	3,9264	27/03/21	9231	3,9443	26/04/21	10098	4,0109
24	NETHERLANDS	Europe	NO CASE	27/02/20	17,13	508,54	20,00	3,32	27/02/21	15543	4,3973	29/03/21	16473	4,3074	28/04/21	17104	4,1574
25	LUXEMBOURG	Europe	NO CASE	29/02/20	0,62	231,45	14,40	4,51	01/03/21	639	4,0162	31/03/21	746	4,3335	30/04/21	793	4,2821
26	MALTA	Europe	NO CASE	07/03/20	0,44	1454,04	21,30	4,49	08/03/21	334	4,1386	07/04/21	400	4,5810	07/05/21	421	4,4819
27	CHILE	South America	NO CASE	03/03/20	19,11	24,28	12,20	2,11	04/03/21	20838	4,1766	03/04/21	23524	4,3578	03/05/21	26588	4,5785
28	SWITZERLAND	Europe	0 / 1 = 0%	25/02/20	8,68	214,24	19,10	4,53	25/02/21	9954	5,3509	27/03/21	10299	5,1170	26/04/21	10584	4,8882
29	GREECE	Europe	NO CASE	26/02/20	10,43	83,48	22,30	4,21	26/02/21	6439	3,7670	28/03/21	7880	4,2607	27/04/21	10179	5,1162
30	LATVIA	Europe	NO CASE	02/03/20	1,89	31,21	20,70	5,57	03/03/21	1654	4,8468	02/04/21	1893	5,1269	02/05/21	2133	5,3701
31	PORTUGAL	Europe	NO CASE	02/03/20	10,20	112,37	22,80	3,39	03/03/21	16430	6,7941	02/04/21	16870	6,4475	02/05/21	16985	6,0343
32	SWEDEN	Europe	0 / 5 = 0%	31/01/20	10,10	24,72	20,30	2,22	31/01/21	12228	7,1514	02/03/21	13062	7,0604	01/04/21	13547	6,8069
33	IRELAND	Europe	0 / 1 = 0%	29/02/20	4,94	69,87	14,60	2,96	01/03/21	4319	7,0744	31/03/21	4687	7,0955	30/04/21	4908	6,9068
34	FRANCE	Europe	1 / 7 = 14,29%	24/01/20	65,30	122,58	20,80	5,98	24/01/21	73179	6,7360	23/02/21	85044	7,2352	25/03/21	93912	7,4270
35	USA	North America	0 / 27 = 0%	21/01/20	331,03	35,61	16,60	2,77	21/01/21	429952	7,0040	20/02/21	513602	7,7329	22/03/21	558321	7,8142
36	LITHUANIA	Europe	NO CASE	28/02/20	2,73	45,13	20,60	6,56	28/02/21	3246	7,5550	30/03/21	3567	7,6732	29/04/21	3916	7,8307
37	POLAND	Europe	NO CASE	04/03/20	37,85	124,03	18,70	6,62	05/03/21	44914	6,4556	04/04/21	54941	7,2986	04/05/21	69154	8,5398
38	BELGIUM	Europe	NO CASE	04/02/20	11,60	315,56	19,30	5,64	04/02/21	21216	9,6223	06/03/21	22215	9,3121	05/04/21	23169	9,0280
39	CZECH REP	Europe	NO CASE	01/03/20	10,71	137,18	20,10	6,63	02/03/21	21018	7,9240	01/04/21	26719	9,3102	01/05/21	29336	9,5023
40	SLOVENIA	Europe	NO CASE	04/03/20	2,09	102,62	20,70	4,50	05/03/21	3882	13,3161	04/04/21	4075	12,9192	04/05/21	4284	12,6253
41	ITALY	Europe	0 / 4 = 0%	31/01/20	60,48	205,86	23,30	3,18	31/01/21	88516	15,9033	02/03/21	98288	16,3212	01/04/21	109847	16,9561
42	UK	Europe	0 / 4 = 0%	31/01/20	67,90	272,90	18,70	2,54	31/01/21	106307	16,7534	02/03/21	123468	17,9838	01/04/21	126764	17,1636
43	HUNGARY	Europe	NO CASE	04/03/20	9,70	108,04	20,20	7,02	05/03/21	15619	18,0142	04/04/21	21775	23,2117	04/05/21	28360	28,1022
44	SPAIN	Europe	0 / 1 = 0%	31/01/20	46,76	93,10	20,00	2,97	31/01/21	58827	31,3434	02/03/21	69801	34,3730	01/04/21	75541	34,5799

Source: Author (2021)

d) The ten countries with the highest population density are: 1) Singapore (7915.73 people/Km^2), 2) HK (7039.71), 3) Malta (1454.04), 4) Taiwan (673), 5) SK (527.97), 6) Netherlands (508.54), 7) Israel (402.61), 8) Japan (347.78), 9) Belgium (315.56), and 10) Vietnam (308.13). When compared with the 10 best countries' FTI426 average (**0.0501),** special attention should be made to Taiwan (0.0020), Vietnam (0.0025), and Singapore (0.0129) because their FTI426 are lower than 0.0501, indicating that they are the best in facing the pandemic in areas with a high level of people living close to each other, confirming the findings of Silva (2021 p. 451).

6.3 At least 340 Management Practices adopted in Vietnam to save lives against the Covid–19

Between 21st June and 9th November 2020, three Boost Posts run for a total of 70 days with the invitation and link of the questionnaire. The Posts reached 109734 people living in Vietnam, from which 107 (0.097%) respondents accepted voluntarily to participate in the survey.

6.3.1 Basic profile of the respondent

a) 5min18s was the average time to answer the questions.

b) most (105=98.1%) informed the age, 57 years old is the average, the median age is 60 years old, the youngest respondent has 18 years old, and the oldest has 83 years old. This indicates that adult and old people are more motivated to participate in the survey.

c) most (59=55%) is foreigner, while 48 (45%) are native. Most foreigners (58=98.3%) accepted to inform the time living in Vietnam, with the average time being 6.21 years. Around 11 foreigners are living there for less than one year, with the lowest time living there being four months.

6.3.2 Cultural practices from the perception of 107 respondents

Only six respondents (5.6%) don´t believe that cultural practices were decisive to the low rate of Covid–19 in Vietnam, while most (101=94.4%) believe in that.

From the group that believe (Figure 5), the most decisive cultural practices were: first) wear a mask (84.2%), 2nd) wash hands (64.4%), 3rd) not shake hands (51.5), 4th) not hug in public (48.5%), and 5th) few religious assemblies (41.6%).

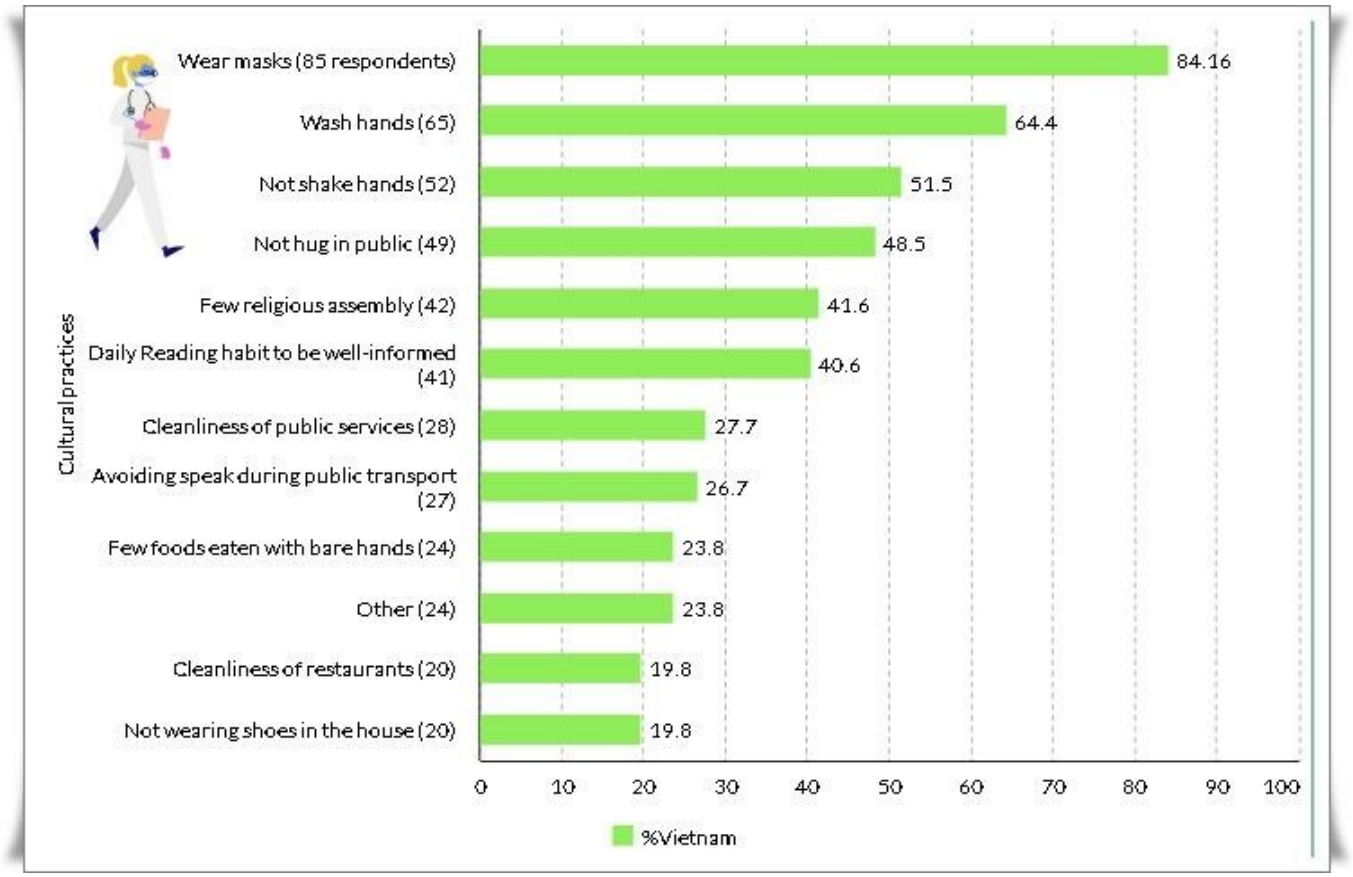

Figure 5: Perception of the 101 respondents that believes that cultural practices were decisive to reduce the rate of Covid–19 deaths in Vietnam

Source: Author (2021)

It is important to note that wear a mask, wash hands, not shake hands and not hug in public also appears among the five main cultural practices that saved lives against Covid–19 in Thailand and Taiwan, as shown respectively by Gomes da Silva (2020 p. 135) and Silva (2021 p. 453).

On the other hand, the less decisive were: 12th) not wearing shoes in the house (19.8%), 11th) cleanliness of restaurants (19.8%), 10th) Other (23.8%), 9th) few foods eaten with bare hands (23.8%), 8th) avoiding speak during public transport (26.7%), 7th) cleanliness of public services (27.7%). Here, not wearing shoes in the house, few foods eaten with bare hands, cleanliness of restaurants, and others also appear among the five less decisive cultural practices that saved lives against Covid–19, according to respondents living in Thailand and Taiwan, as shown respectively by Gomes da Silva (2020 p. 135) and Silva (2021 p. 453).

These results reveal to policy decision-makers the importance of developing programs that incorporate cultural practices during the development of an effective strategic plan to prepare, prevent and control pandemics.

For example, cultural practices of greeting such as shaking hands, hugging in public, or a kiss on the face are widely adopted greetings internationally, especially in western (USA, Brazil, Mexico, Italy, Spain) countries, which contributed to the spread of viruses and bacteria. Several countries have recommended against handshaking and other traditional forms of greeting such as kissing on the cheek and the "nose to nose" greeting. Encouraging the population to alter or adjust customary cultural practices as a form of primary prevention can be difficult, but a necessary tool to slow or alter the transmission of disease (adapted from BRUNS et al, 2020).

Finally, a good example to be followed comes from the Taiwan Ministry of Health and Welfare, where Good Etiquette of Citizen is part of the key success factor against the Covid-19 (SILVA, 2021 p. 446).

6.3.3 Trust in the National Government of Vietnam

All respondents rated from 0 to 10 the level of trust in official statistics released by the National Government of Vietnam about the number of death cases by Covid–19.

The average of trust is high (X=8.65; S=1.97; CV=22.73%) and the median is 9, with most (97=90.65%) giving a rate equal or over 7 points, while 9.35% rated lower than 7.

When the answers are compared by the foreigners and natives, only 8.5% of foreigners rated lower than 7, while 10.42% of natives did so, and the suspicion is slightly higher among old Vietnamese people.

6.3.4 The perception of the respondents on the main policy measures adopted that saved lives

Concerning the respondents' perception, most (106=99.06%) selected at least one (multiple choice) of 18 measures provided.

As a result, Figure 6 shows that for the 106 respondents, the ten main policy measures adopted by the National Government of Vietnam that saved lives against the Covid–19 are:

First) international travel control (87.7%), 2nd) public information campaigns (71.7%), 3rd) schools closures (68.8%), 4th) public event cancellations (66%), 5th) integration with mass media (54.7), 6th) restriction on internal movement (51.9%), 7th) effective public-private collaboration (50.9%), 8th) increase the medical and personal equipment capacity (45.28%), 9th) public transport reduction (44.3%), and 10th) combat fake news (46.79%).

Concerning the best policy, **international travel control**, it is possible to mention several early responses related with, shown in Chart 8 (Appendix A), such as suspend flight to Wuhan (Jan/23/20), isolation of suspected passengers (Jan/23/20), screening on passengers at airports, seaport and crossings

(Jan/23/20), compulsory health declaration at all international ports (Jan/25/20), suspend flight from Vietnam to infected areas of China (Jan/28/20), refuse entrance of foreigners coming from China (Jan/30/20), suspend visa issuance to Chinese tourists (Jan/30/20), etc.

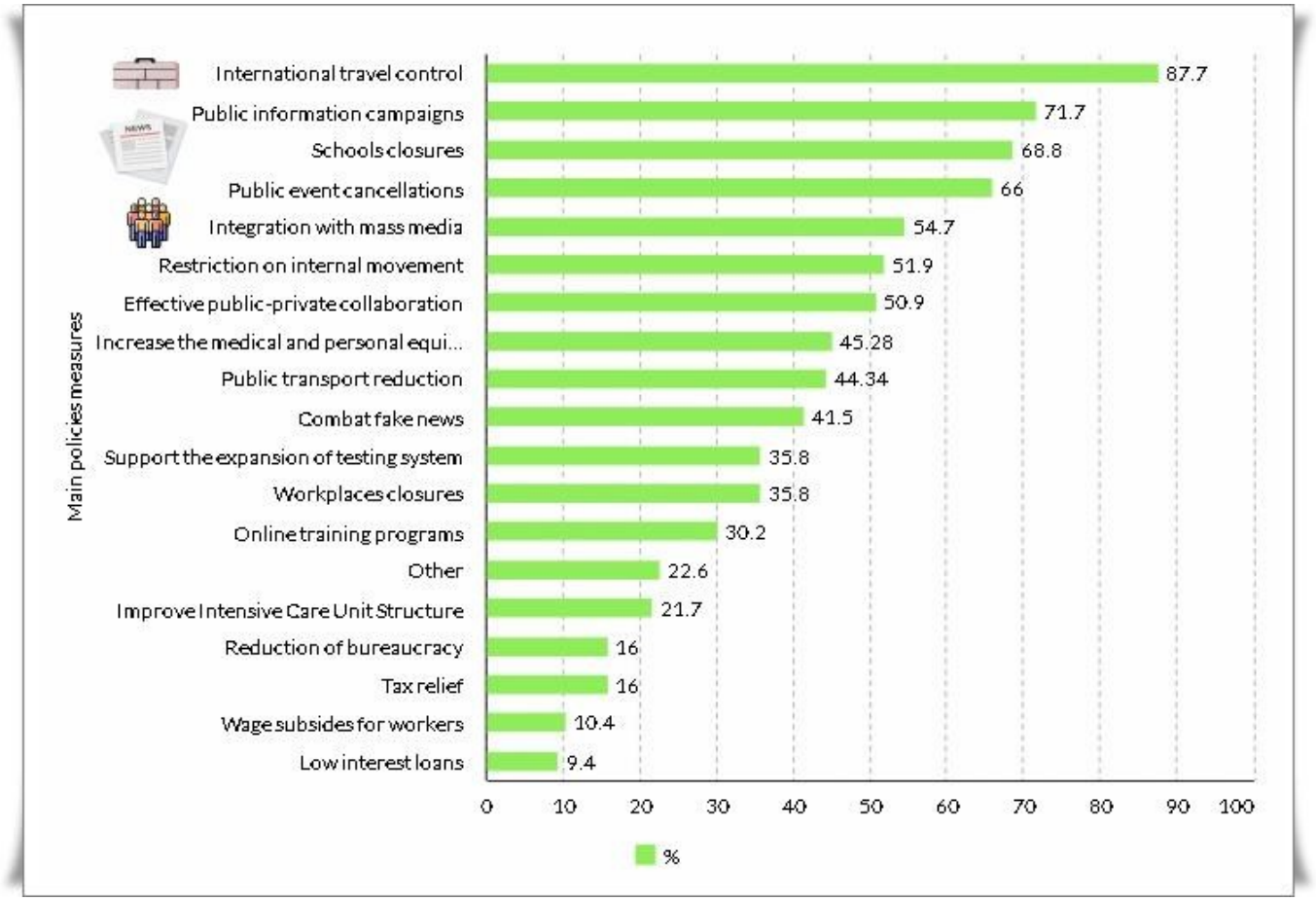

Figure 6: Perceptions of the 106 respondents on the main National Government policies that saved lives in Vietnam against Covid–19
Source: Author (2021)

Concerning **public information campaigns**, Kong Nguyen and Ho (2020) argues that a proactive communication strategy was in place in Vietnam since the beginning, using a) online media; b) social media; c) community loudspeakers, and d) pandemic awareness campaigns. For example, between March 10th to June 2020, these popular campaigns were deployed (example of sponsors: MoH or MIC) to raise public awareness and support to combat the virus: a) Joining hands to push back Covid-19 (contest); b) Every citizen, lets support fight against Covid-19 (SMS donation); c) Lets sing, Vietnam! (music challenge); d) Stay strong Vietnam in fighting Covid-19 (Community support program); e) Vietnam will win (Music collaboration); f) Farewell Covid (music collaboration); g) Proud of Vietnam (Music collaboration); h) Thank you, my Vietnam (Campaign on Facebook); i) Drawing Kindness, Covid-19 (Drawing contest).

Concerning temporary **school closures**, they were reported in Vietnam on the first day of February 2020. As of February 6th, around 63 provinces and cities reported to the Ministry of Education and Training the decision to leave school for students to prevent acute respiratory infections caused by a new strain of coronavirus (nCoV).

Concerning measures related to **public event cancellations**, they started from the beginning of February 2020, with dispatch No. 156/CD–Ttg (restrictions of large gatherings and festivals; February 3,

2020), official telegraph No. 396/CD–BVHTTDL (suspension of festivals and activities at historical monuments and sites; February 3, 2020), stopping religious activities in HCM province with more than 20 people (February 21, 2020), cancel religious festivals, entertainment activities and conferences that attract large people (March 27, 2020), the ban on the gathering of more than 10 people in outside (March 27, 2020), ban gathering of more than 20 people for 2 weeks (March 28, 2020), etc.

Concerning **integration with mass media**, Kong Nguyen and Ho (2020) informed that days before the first two Covid-19 cases were officially reported in Vietnam (January 23th 2020), local news outlets published around 295 articles about a "strange pneumonia" in China, with the earliest article dated from December 25, 2020, on the official website of Hanoi Department of Health.

To Ha et al (2020) that was a close media communication with the Ministry of Health (MoH) to disseminate information on the prevention and control of COVID–19 from the beginning. Official newspapers, the government's website, MOH's website, and open TV channels provided daily updates on positive cases globally and in Vietnam, and conveyed MoH health messages to prevent and control COVID–19, to large audiences. The broadcasting of specific new cases on national TV, and their related epidemiological information, allowed high-risk groups to be traced all over the country, especially between 7 to 20 March/20, when many citizens returned to Vietnam from Europe and the USA.

In addition, according to the Ministry of Health (2020), since February 9, 2020, the Prime Ministry signed Resolution 16/NQCP where reporters who come directly to the treatment site of COVID–19 are supported with VND 130,000 / day.

Other examples used to keep people informed are public information warning about strange pneumonia (Jan/09/20), use of old Loudspeaker system together with cars, motorbikes, TV, Radio and social media (Facebook, youtube, Zalo, Lotus, platform), daily press conferences (since Jan/01/20), directives to strengthen the prevention and control actions against the new strain of coronavirus (Jan/22/20; Jan/28/20; Jan/31/20), the installation of 22 hospitals hotlines free of charge to share information on Covid-19 (Jan/29/20), clarification of responsibilities of ministries, agencies, localities (Jan/28/30), orientation to not travel to China (Jan/31/20), development of information systems with leaders of 63 departments of education and training (Feb/01/20), development of Website <https://ncov.moh.gov.vn/> and App named 'Vietnam Health' to provide information on nCoV infection, etc.

On the other hand, the policy measures that respondents considered less decisive to save people lives are: 18th) low–interest loans (9.43%), 17th) wage subsidies for workers (10.4%), 16th) Tax relief (16%), and 15th) reduction of bureaucracy (16%).

Chart 8 (Appendix A) lists the policy measures adopted in Vietnam over time.

6.3.5 MPs identified in Vietnam against Covid–19 until April 25th, 2021

For question 5 of the questionnaire, the respondent was asked, if know, to write the name of the most innovative products or services that are protecting people in Vietnam against the Covid–19.

As a result, it was noted that most (65=60.8%) respondent tried to inform what they believed as innovative products or services, while 36 (33.6%) respondents did not answer the question, 4 (3.7%) respondents informed that they did not know, and only 2 (1.9%) informed that there was no innovative products or services.

Of 65 respondents that tried to explain the innovative solutions, fourteen (21.5%) informed the name of the products or services. It is worth noting that the main aim of the question was not to evaluate their ability in innovation issues but to find tips to search on the internet for details of the product/service name, organization, goal, period of implementation, and technologies adopted.

For the 65 respondents, the perceptions about the most innovative products or services are related to: Test Kit (19=29.2%), Public or Media information (14=21.5%), Apps (13=20%), Facemask (12=18.5%), Trace and Track (10=15.4%), Government immediate actions (10=15.4%), Webpages (7=11%), Quarantine (5=7.7%), Ventilators (3=4.6%), Telehealth (3=4.6%), Ingredients availability for vaccines (2=3%), Lockdown (2=3%), Temperature measures (2=3%), Facial recognition tech for contact tracing (2=3%), Isolation of positive cases (1=1.5%), Product for wash hand (1=1.5%), Ventilated houses (1=1.5%), Disinfection water (1=1.5%), and Sanitizer gel (1=1.5%).

With these tips, a spreadsheet was built to insert new data from the complementary research on the internet to identify the management practices, with the following fields: 1) organization and solution, which describes the name of the organization and the response developed; 2) type, divided into Corporation, Public Sector, Start-Up, University, and Other; 3) contact, informing the email or link for contact; 4) site; 5) city where it was developed/applied; 6) stage, divided into In Preparation, Pilot/Demo/ Trial, or Ready; 7) category, as described in section 4; 8) technology used; 9) resume, which describes the main information of the solution.

As a result, from June 2020 until April 24th, 2021, it was found 340 responses in Vietnam, with the majority led by Public Sector (242=71.2%), followed by Corporation (30=8.8%), Others (30=8.8%), Start-Up (21=6.2%), and University (17=5%). Regarding the stage of the responses, during the period of data collection, most (331=97.3%) are Ready, while nine (2.7%) are in Pilot/Demo/Trial.

Concerning to Category, most responses is located in Health (Prevention, Diagnostic and Treatment) category (107=31.5%), followed by Social Distance/Quarantine (62=18.2%), Information and Communication (44=12.9%), Life Adaptation (38=11.2%), Economic/Fiscal/Support (37=10.9%), Infrastructure/Operational (22=6.5%), Movement Restriction (21=6.2%), and Lockdown (9=2.6%).

Examples of Health (Prevention, Diagnostic and Treatment) responses are: a) Assess the epidemic situation, review response activities and propose appropriate disease prevention measures; b) Isolation of suspected passengers; c) Screening on passengers at airports, seaports, and land crossings; d) Disinfect villages (sprayed within a radius of 300m from people infected); e) Mobile disinfection chamber system; f) Temperature control and quick test at wholesale markets in Hanoi; g) RT-PCR COVID-19 Thai Duong (kit test); h) Ministry of Health 5K advisory message; i) Sample and Test people; j) Training on disease prevention & control to Private hospitals.

Examples of Social Distance/Quarantine responses are: a) Temporary school closure; b) Mandatory 14d quarantine to travelers from China; c) Suspend festivals and activities at historical monuments and sites; d) Decision No. 344/QD-BYT - Guidance on the health quarantine at quarantine establishments; e) Decision No. 345/QD-BYT - Guidance on medical isolation at home and places of residence; f) Mandatory 14d quarantine to travelers from SK; f) Isolation of 400 people coming from Thailand and Laos; g) Close of restaurants, barbershops; h) Directive No.16/CT-TTG (Strict social distancing rules); i) National wide 15-day social distance imposed; j) Quarantine for the whole city (Hi Duong).

Examples of Information and Communication responses are: a) Public information warning about strange pneumonia; b) 22 Hospital Hotlines free of charge to share information on Covid-19; c) Orientation to not travel to China; d) NCOVI site and app for Vietnamese; e) Public Campaign Awareness “Joining hands to pus back Covid-19”; f) Public Campaign Awareness “Every Citizen, let´s support the fight against Covid-19”; g) Travel Viet Nam Safety App; h) Circular No. 28/2019/TT-BYT - Guidelines for notification and reporting of medical quarantine activities at the border; i) thong tin Chinh Phu Facebook; j) LoudSpeaker System, Minicar and Motobike.

Examples of Life Adaptation measures are: a) Decision No: 137 / QD-BYT – Issuing the plan for

the prevention and control of the infectious epidemic in 2020; b) Decree No.15/20/ND-CP0Ttg (Fake news penalties); c) Directive to boost face mask production; d) Suspend and Fine pharmacies that increased prices; e) Broadcast classes on TV for students in grades 9 and 12; f) Stop rice export; g) Custom clearance in the Lang Son Province; h) Award certificate to officials, teachers, and staff; I) Decree No. 107/2018/ND-CP to simplify the rice export business; j) National mandatory use of masks in public places.

Examples of Economic/Fiscal/Support measures are: a) Exemption of Tax for medical suppliers; b) Representatives of supermarkets/distributors signed commitments to buy agricultural products that are piling up; c) Resolution 42/NQ-CP – Financial Assistance for People affected by covid-19; d) Donations of medical equipment to Laos and Camboja; e) Reduction of land and house rent; f) $2.6 billion fiscal packages; g) Reduce power bills for businesses and households in April, May and June 2020.

Examples of Infrastructure/Operational measures are: a) Clarifies responsibilities of ministries, agencies, and localities; b) Decision No: 225 / QD-BYT - Set up 45 Mobile teams to respond quickly to the epidemic; c) Decision No. 170 / QD-Ttg - Establishment of a National Steering Committee for the prevention and control of acute respiratory infections caused by a new strain of Coronavirus; d) Building two field hospitals with 500 beds; e) Mobile Covid-19 test stations; f) two Mobile lung X-ray vehicles; g) 169 laboratories capable of conducting RT-PCR tests nationwide; h) CDC Vietnam's Global Health Security Program.

Some example of innovative products or services are: a) Mobile disinfection chamber system developed by NIOEH, HCMC University of Technology and CSTDY; b) Isolation room sterilization robot developed by Eastern Military Medical Hospital; c) Robot BK-anti-Covid developed by Da Nang University of Science and Technology; d) Vibot Version 1a robot developed by Military Medical University; e) CD 1.0 disinfection robot (Covid Defender 1.0) developed by Ton Duc Thang University (TDTU); f) Rice ATM developed by the entrepreuner Hoang Tuan Anh, a 24/7 automatic dispensing machine providing free rice for people out of work following an ongoing nationwide lockdown to curb the spread of the novel coronavirus; g) Non-contact hand sanitizer sprayer developed by HCMC University of Technology; h) IoT devices from AIRIOT Start Up; I) Facial recognition system from VinAi Research; j) Testo 830-T2 (Infrared thermometer) and Thermal imager testo 890 Fever Detection Kit developed by Testo Company; l) Bluezone App developed by Bkav; m) Covid19 Check developed by GOT IT Start Up; n) COVID-19 Safe Living Map system (AntoanCovid.vn) developed by VNPT (Vietnam Post); o) RT-PCR COVID-19 Thai Duong a test Kit developed by NICVB; p) Corona RT-Lamp Rapid Test Kit developed by HUST & Innogenex Int. Tech. Science Co; q) LightPower iVA SARS-CoV-2 1st RT-rPCR test kit developed by Military Medical University; r) Ventilators VFS-410 and VFS-510 developed by Vingroup; s) DTU-Vent version 1.0 and 2.0 developed by Duy Tân University; t) Low-cost ventilator system from HCMC University of Technology & UTS; u) BK-Vent Supportive Respirator from HUST; v) Ventilator BAC385 1.0 and 2.0 from Bkav & National Hospital for Tropical Diseases; x) e-commerce solutions from On Point Start-Up; z) Doctor booking platform from Finizz Start-Up, etc

. Concerning to the technologies and methods used in Vietnam, it is important to notice that on line solutions are playing important role, together with Hotlines (toll-free line), Apps, Digital Guidelines or Handbooks, Temperature equipment and systems, Disinfection products, Donations, Campaigns, Youtube, E-learning, E-commerce, Database, Ventilator, Sample and Testing, Robots, Artificial Intelligence, Posters, Test Kit, QR Code, Music, Zalo Platform, Facebook, 3D Print, TV (including Broadcast classes), Radio, IoT, Digital Map, Contests, Camera Sensors, Award Certificates/Prizes, 5K Message, Tiktok, Telehealth, SMS, Smart Phones, Pharmacy Delivery, Face recognition, Custom

Clearance, Cloud Tech, Chat Bot, Big Data, Waste Management, Vehicles (with loud speakers, X ray, etc), UV Rays tech, Ultrasound, Turbine Technology, Traditional embryo egg tech, Telehealth, Storage System, Speech Recognition Technology, single PCRs, serological testing, targeted testing, ramdomic test, Silver nano, Reverse transcription loop-mediated isothermal amplification (RT-LAMP) technique, Remote system, Remote body temperature measurement, Real-time clinical data transmission software, Real time temperature measure, Real time pricing, Protein subunit, Photos, Training, PACs software, Open Source, One sprays electrolyzed water, On line conferences, On line community, News Paper, Management of antibiotic, Magnetic strip navigation technology, National Loudspeaker System, Lotus Platform, Inventory Management, Intelligent image processing system, Helm, GPS, Filters, ERP Software, Electronic Card, Documentary, Deep Learning Model, Computerized tomograpy, Chamber to disinfect, BlueTooth, Biodegradable polymers, B2B sourcing platform, Automatic Rice Dividing System, 4-5-1 nutritional formula, 360-degree ultrasonic spray system, Mini communication car, Motorbike communication..

Finally, all the 340 responses are shown in Chart 8 (Appendix A)

7. Conclusions and recommendations (Golden lessons)

To answer the main question "How Vietnam is saving people against Covid-19?", it was investigated the performance and the best practices adopted in Vietnam to save lives, during the first 426 days facing the pandemic.

From the data collection and analysis, it is possible to conclude and recommend:

1) **Partnership is crucial**. Throughout our history, infectious diseases, epidemics, and pandemics have been a constant challenge, a reason by which every nation should allocate resources, develop international and national partnerships to better prevent and respond to these threats. In this sense, it was found signs of several partnerships among Vietnam National Government and WHO, UNICEF, US CDC, and Defense Threat Reduction Agency, Media, Supermarket and Distributors representatives, Universities, Companies, Start-Ups, and Entrepreneurs. Future research should be done to identify key partnerships, the effectiveness, and the impact of their responses during the Covid-19 pandemic;

2) **Pandemic preparedness is not effective only adopting short-term measures**. Lessons from Taiwan (SILVA, 2021), Thailand (GOMES DA SILVA, 2020), and Vietnam against Covid-19 reveal that they were prepared with investments made before 2020. In the case of Vietnam Public National Sector, it was found 13 measures, most (6=46.15%) related to Life Adaptation, followed by Infrastructure/Operational (3=23.1%), Information/Communication (3=23.1%), and one (7.7%) Economic, Fiscal and Support categories. Further research should be done in Vietnam to investigate more deeply the nature and effectiveness of each preparedness investments developed over time;

3) **Virus is like a fire! Provide Fast Responses is very important.** Before WHO announce Covid-19 as a pandemic (March 11, 2020), at least 86 measures/solutions against the Covid-19 were adopted by Vietnam National Government and main partners. In general, among them, most (18=20.9%) is related to Life Adaptation category strongly related to legal issues, followed by Health (16=18.7%), Information and Communication (16=18.7%), Infrastructure/Operation (10=11.6%), Social Distance/Quarantine (10=11.6%), Movement Restrictions (10.5%), Economic/Fiscal/Support (4=4.6%) and Lockdown (3.5%) categories;

4) **Exemplar Leadership, Communication, and Transparency of Public Leaders generate trust and support.** Around 340 responses were identified in Vietnam, most led by Public Sector (242=71.2%), followed by Corporations (30=8.8%), Others (30=8.8%), Start-Up (21=6.2%), and

University (17=5%). Regarding the stage of the responses, during the period of data collection, most (331=97.3%) is Ready, while nine (2.7%) are in Pilot/Demo/Trial. In addition, for 107 respondents living in Vietnam, the average level of trust is considered high concerning the number of death cases by Covid–19 informed by the National Government. The main lesson is that National and Local Public Government leaders play an important role to inspire, educate, prepare and save lives against a pandemic. Further studies could be done to investigate the leadership style adopted by the Prime Minister and Ministries, as well as the directives, measures, and technologies used to provide transparency to citizens over time;

5) **The proposed new method to classify the measures can be helpful but needs to be improved.** Eight categories were proposed to classify Management Practices (including NPIs) adopted to prepare and combat the Covid-19 pandemic. Far from perfect, the new method helps policy and decision-makers to have a broad perspective of responses that could be taken before and during a pandemic. Further research can be done to criticize and improve the proposed method, and also to create indicators to measure the effectiveness of each category;

6) **Only public health interventions are not enough.** Among the 340 responses identified in Vietnam, most is located in Health (Prevention, Diagnostic and Treatment) category (107=31.5%), followed by Social Distance/Quarantine (62=18.2%), Information and Communication (44=12.9%), Life Adaptation (38=11.2%), Economic/Fiscal/Support (37=10.9%), Infrastructure/Operational (22=6.5%), Movement Restriction (21=6.2%), and Lockdown (9=2.6%) categories. There are many opportunities for further research in each category. One interesting focus for future research could be about how Vietnam was able to increase its laboratory capacity to test people (Infrastructures/Operation), growing from 51 laboratories (May 4th, 2020) to 169 laboratories nationwide (WHO, 2021) able of detecting Covid-19 by Realtime RT-PCR technique with 114 designated as confirmatory laboratories (April 24th, 2021);

7) **Cultural practices must be considered in any plan against a pandemic.** For 101 (94.4%) respondents living in Vietnam, the most decisive cultural practices were wearing a mask (84.2%), wash hands (64.4%), not shake hands (51.5), not hug in public (48.5%), and few religious assemblies (41.6%). Some good examples found in Vietnam to get public support with the adoption of correct behaviors are: at least eleven Public Awareness Campaign deployed over time with the support of UNICEF, WHO, UNDP, Gamuda Land Vietnam, Singers, Composers, Artists, etc. O the other hand, combat fake news, application of fines and detention to those that not follow the laws/rules are the most strict ways used in Vietnam to make people and companies adjust their behavior over time. These results reveal to policy decision-makers, the importance to develop programs that incorporate cultural practices and laws/regulations during the development of an effective strategic plan to prepare, prevent and control the pandemic. Another good example to be followed comes from the Taiwan Ministry of Health and Welfare, where Good Etiquette of Citizen is part of the key success factor against the Covid-19 (SILVA, 2021 p. 446);

8) **Public support is relevant.** For the 106 respondents living in Vietnam, the ten main policy measures adopted by the National Government that saved lives against the Covid–19 are international travel control, public information campaigns, schools closures, public event cancellations, integration with mass media, restriction on internal movement, effective public-private collaboration, increase the medical and personal equipment capacity, public transport reduction, and combat fake news. Additional research should be done to evaluate the most effective management practices (for example: Public Awareness Campaigns, Partnerships with Media or Technology Companies, Start Ups) adopted by the Government to keep the public well informed and get their support over time;

9) **Online solutions are in evidence. However, not only innovative products and services are playing an important role, but also well-known products or services**. It was found more than 100

technological solutions applied in Vietnam to prepare and combat the Covid-19. Some of them are quite new in Vietnam such as test kits, apps, 3D products, digital thermometers, disinfection robots, ventilators, rice ATMs, digital maps, intelligent helm, mobile disinfection machine, Tiktok platform, digital payment or transactions, etc. However, others are not, such as Telehealth services, Facebook, SMS, Youtube, TV, Radio, Delivery, LoudSpeaker used in cars, motors, posts, buildings and by hand (Example police´s borders), Soaps, Gel, Alcohol, Masks, Gloves, etc. In special, Public Loudspeaker System, integrated into Social Media is an example of cheap ways to fight the pandemic.

10) **Vietnam is the second-best performer, but still needs improvements.** Among the 44 semifinalist countries identified by Silva (2020b), when the concept of Fatality Total Index (FTI426) is used to estimate the real number of total fatal cases by the one million population during 426 (14 months) days facing the pandemic, Vietnam was the second-best performer behind Taiwan. However, there are areas for improvements, such as combat corruption (TRANSPARENCY INTERNATIONAL, 2020), economic support for quarantined citizens, quarantine timeline, criminal penalties for violating quarantine, economic sustainability, government surveillance technology for monitoring, level of technological advance, Covid-19 equipment availability and improve the sanitization methods (DEEP KNOWLEDGE GROUP, 2020 p. 155), reason by which new research should focus on these areas.

The research has limitations, it identified the responses considered as management practices, however, it did not evaluate their costs and effectiveness over time, which can open several opportunities for new research. Also, other research can be done with a higher number of participants to get more representative data. Further research should be done to investigate New Zealand and Singapore since these countries were also considered benchmark nations against the Covid-19 pandemic.

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j) all public managers, technical, nurses, doctors, professors, researchers, drivers, cookers, janitors, donors, public and private managers, volunteers that are bravely fighting the Covid–19, God Bless You.

9. Appendix A – Chart 8: 340 Management Practices adopted in Vietnam against Covid-19

Due to space limitation, the Chart 8 can be viewed as a spreadsheet by accessing the link <https://bit.ly/3gSJHUP>

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