

# **TURKEY’S RESPONSE TO COVID-19: FIRST IMPRESSIONS**

**Ankara, TURKEY**

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# CONTENTS

<b>ACRONYMS AND ABBREVIATIONS .....</b>	<b>2</b>
<b>I. INTRODUCTION .....</b>	<b>3</b>
<b>II. PREVENTION AND PREPAREDNESS .....</b>	<b>3</b>
A. HEALTH SYSTEMS REFORMS .....	3
B. STRONG CULTURE OF HEALTH EMERGENCIES AND DISASTER MANAGEMENT .....	4
C. PANDEMIC INFLUENZA PREPAREDNESS .....	5
D. WHO AND THE INTERNATIONAL HEALTH REGULATIONS (IHR 2005) .....	5
E. PROGRESSIVE POLICIES AND HISTORICAL MEASURES .....	5
F. HEALTH SECURITY: AN INTERSECTORAL, ALL-HAZARDS APPROACH .....	6
<b>III. READINESS OF TURKEY: ONSET OF THE SARS-COV-2 OUTBREAK IN THE WORLD .....</b>	<b>6</b>
A. ACTIVATION OF EWRS – EMERGENCY OPERATIONS CENTRE .....	7
B. CONVENING OF THE CORONAVIRUS SCIENTIFIC ADVISORY BOARD .....	7
C. RELEASE OF THE <i>2019-nCoV DISEASE GUIDELINES</i> .....	7
D. DEVELOPMENT OF A PCR DIAGNOSTIC TEST FOR SARS-CoV-2 .....	8
E. INITIAL STEPS TO PREVENT IMPORTATION OF DISEASE .....	8
F. SARS-CoV-2 REFERRAL HOSPITALS .....	8
G. TRAVEL RESTRICTIONS .....	8
H. RISK COMMUNICATION AND INFOGRAPHICS .....	9
I. CONTROLLED AIRLIFTING OF TURKISH CITIZENS FROM ABROAD .....	9
J. ACTIVATION OF PROVINCIAL EMERGENCY OPERATIONS CENTRES AND HEALTH PROTECTION BOARDS .....	9
K. PUBLIC ENGAGEMENT AND RISK COMMUNICATION .....	9
L. STRATEGIC PRE-POSITIONING OF CRITICAL PERSONAL PROTECTIVE EQUIPMENT AND THERAPEUTIC AGENTS .....	9
<b>IV. ARRIVAL OF SARS-COV-2 IN TURKEY: PUBLIC HEALTH MEASURES AND MULTISECTORAL ACTIVITIES BASED ON A WHOLE-OF-GOVERNMENT APPROACH .....</b>	<b>10</b>
A. THE FIRST SARS-CoV-2 CASE .....	10
B. MITIGATION MEASURES .....	10
<b>V. PANDEMIC COURSE IN TURKEY AND CONTAINMENT MEASURES .....</b>	<b>13</b>
A. THE COURSE OF THE PANDEMIC IN TURKEY .....	13
B. TESTING, CONTACT TRACING AND CASE-FINDING .....	15
<b>VI. LEAVING NO ONE BEHIND – VULNERABLE POPULATIONS .....</b>	<b>16</b>
<b>VII. TURKEY’S CONTRIBUTION TO INTERNATIONAL SOLIDARITY .....</b>	<b>17</b>
<b>VIII. TOWARDS THE NEW NORMAL; CONTROLLED SOCIAL LIFE .....</b>	<b>18</b>
<b>IX. CONCLUSIONS .....</b>	<b>19</b>
<b>X. THE WAY FORWARD .....</b>	<b>20</b>
<b>REFERENCES .....</b>	<b>21</b>

## Acronyms and abbreviations

AFAD	Disaster and Emergency Management Presidency of Turkey
COVID-19	coronavirus disease
CSAB	Coronavirus Scientific Advisory Board
ECDC	European Centre for Disease Prevention and Control
EOC	Emergency Operations Centre
EU	European Union
EUL	emergency use listing
EWRS	Early Warning and Response System
FITAS	Filiation, Isolation and Tracing System
FP	family physician
GDO	geographically dispersed office
GDP	gross domestic product
GSM	Global System for Mobile Communications
HCW	health-care worker
IHR	International Health Regulations (2005)
IPC	infection prevention and control
IT	information technology
MoH	Ministry of Health
PCR	polymerase chain reaction
PHC	primary health care
PHEIC	public health emergency of international concern
PIP	pandemic influenza preparedness
PPE	personal protective equipment
PPP	purchasing power parity
SARS-CoV-2	severe acute respiratory syndrome coronavirus-2
SuTP	Syrians under Temporary Protection
TIKA	Turkish Coordination and Cooperation Agency
TL	Turkish lira
UN	United Nations
USHAS	International Health Services Corporation (of Turkey)
WHE	WHO Health Emergencies Programme
WHE	WHO Health Emergency
WHO	World Health Organization

# TURKEY'S RESPONSE TO COVID-19: FIRST IMPRESSIONS

## I. Introduction

Turkey's response to and experience thus far with the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) pandemic affords the world and the region a unique opportunity for and distinctive insights into combating this novel virus. On the one hand, Turkey has one of the lowest case fatality ratios (2.8%; and 52.5 infections/million population), particularly among the elderly aged 65 years and older (the high-risk group). It has also risen to the occasion and shouldered its role as a longstanding propagator of global solidarity and provider of humanitarian support. Turkey's success in scaling up local manufacturing of personal protective equipment (PPE), a globally scarce commodity, and dispatching supplies on humanitarian grounds to many countries in their time of desperate need to fight against the pandemic, while still able to meet critical domestic needs, offers key lessons in manufacturing and adjusting supply chains. This paper aims to highlight key policies and practices, and partnerships behind Turkey's effective and successful fight against the SARS-CoV-2 pandemic. These have enabled the country to significantly lower the case load, and to expand upon the elements behind this success.

## II. PREVENTION AND PREPAREDNESS

### a. Health systems reforms

Turkey, though geographically located between Europe and Asia, is also a Mediterranean country with a Mediterranean heritage and culture. Close contact and conviviality is part of its longstanding rich tradition. Spending time together and congregating during social events and hugging and cheek-to-cheek contact are common greeting gestures in daily life. Such physical contact-based cultural factors become particularly important when considering infection prevention and control (IPC) measures at the population level for an affliction that is inherently spread by droplet and close contact.

Turkey has been implementing a health reforms initiative called the Health Transformation Program since 2002 (1). This program has covered and strengthened nearly all of the building blocks of health systems in Turkey – from governance to health financing to health service delivery, with heavy investments in health infrastructure, redefining the roles of all key relevant stakeholders for the better (2).

Three key macro-level features of this health system transformation that seem to have played critical enabling roles during the pandemic are as follows:

1. Strengthening of primary health care (PHC) services. With accessibility and equity as foundational principles, staff in PHC facilities links people and communities through a network of nearly 8000 hubs with 25 000 family medicine units. Each serves, free of charge, a surrounding catchment unit of 3000 persons, thus traversing the geographical and social extent of the country. Every person in the 3000 catchment population unit thus has an assigned family physician in charge of their health, facilitated by electronic

health records for each, including street address records of all. This comprehensive PHC network with improved access to and up-to-date health and geographical information on each person made community outreach and engagement for the SARS-CoV-2 response efficient, effective and timely – from risk communication to testing to contact tracing.

2. Turkey built large “Healthy Cities”, harnessing a public–private partnership model that boosted its health infrastructure manifold, especially intensive care bed capacity (3),<sup>a</sup> with some hospitals specifically equipped with negative pressure rooms – assets and capacities that proved decisive in saving lives among those severely ill with SARS-CoV-2 without seriously straining critical care systems and capacities.
3. The population was extensively covered with a reliable information technology (IT) infrastructure that enabled and supported critical response elements. These ranged from timely reporting of surveillance and early warning to telemedicine for the elderly and those with chronic diseases, as well as those with mental health problems and home-/facility-bound persons. It also connected those who were “healthy but worried” with a health-care provider, precluding crowding of health facilities and possibly excessive health-care worker (HCW) infections.

Before the pandemic, Turkey had one of the most comprehensive universal health coverage schemes (accessible by 99% of all inhabitants, including over 3.6 million externally displaced Syrians seeking refuge in Turkey – Syrians under Temporary Protection (SuTP) (4).

#### **b. Strong culture of health emergencies and disaster management**

Supported by the Health Transformation Program, the country also has a longstanding strong and resilient health system, tested and retested by many natural and human-induced disasters and emergencies. A World Health Organization (WHO) publication of 2011 entitled *Assessment of health systems' crisis preparedness: Turkey* concluded that “With its broad experience in disaster situations and its advanced disaster and emergency management system, Turkey could play a leading role in training and research related to disaster risk reduction at global level” (5). It is this realization and appreciation of Turkey’s expertise in health emergencies and disaster management that has made it appropriate for the WHO Regional Office for Europe to house its new regional centre of excellence on Preparedness for Humanitarian and Health Emergencies in Turkey. This centre is part of a system of the Regional Office’s outposts (centres) also called geographically dispersed offices (GDOs) (6),<sup>b</sup> with each working on and offering expertise in thematic areas. The GDO in Istanbul will support Member States with capacity development and operationalization for emergency preparedness and selected core capacities of the International Health Regulations (IHR, 2005) (7).

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<sup>a</sup> The number of ICU beds was 2214 in 2002, 869 of which were in public hospitals. As of 2019, the total number of total ICU beds in Turkey is 39 279, including 16 887 in public hospitals.

<sup>b</sup> GDOs are defined as entities that constitute a fully integrated part of the WHO Regional Office for Europe and its programmes but which are physically located outside Copenhagen.

### c. Pandemic influenza preparedness

Another supporting WHO health emergency initiative has been the implementation of an intersectoral approach-based, multidimensional process entitled the Pandemic Influenza Preparedness (PIP) Framework to help Member States prepare for and be ready to respond to pandemic influenza.

After the publication of the National Pandemic Influenza Preparedness Plan with a Presidential decree, members were selected and assigned to the PIP Scientific Consultancy Board (8). Provincial pandemic plans were prepared by provincial health directorates, and the Ministry of Health (MoH) organized a workshop for evaluation of the developed provincial plans. The MoH also organized training of trainers for implementation of PIP and training of health-care workers and the public.

### d. WHO and the International Health Regulations (IHR 2005)

After restructuring and escalating execution of its mandate about health emergencies, together with the United Nations (UN) system, WHO established the WHO Health Emergencies Programme (WHE) in 2016 (9). The IHR (2005) have also defined the core capacities of a strong and resilient health system and emphasized all-hazards and intersectoral coordination approaches to manage any public health emergency. Guided by the IHR (2005) and together with operational partners, the WHE has been leading and coordinating the coronavirus disease (COVID-19) pandemic and has been ready to respond to other public health emergencies by strengthening preparedness and readiness capacities at country and sub-country levels.

### e. Progressive policies and historical measures

Turkey has had a long history of prevention and control of communicable diseases, starting from the early Ottoman Empire era with its quarantine regulations. Since the early stages of the foundation of the Republic of Turkey, relevant public health and public safety laws and regulations have been consistently updated, improved and published on public health and communicable diseases.<sup>c</sup> Generations of Turkish citizens have also inherited a culture of civic responsibility, embracing rules, regulations and expert guidance from the State. These citizenry attributes have enhanced the efficiency and effectiveness of the prevention and containment measures instituted against pandemics at the national and provincial levels.

The foundation of the current policies of Turkey on outbreaks and pandemics emanates from the notification system established in 2004.<sup>c</sup> This was followed by the creation of an Early Warning and Response System (EWRS) in 2007 for the surveillance and control of communicable diseases.<sup>d</sup> In addition, pandemic preparedness plans have also been regularly updated and published.

Turkey's long and incremental experience with prevention of outbreaks accumulated over the years, the EWRS system and continuous learning with updated pandemic preparedness plans

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<sup>c</sup> Communiqué on Notification and Reporting System of Communicable Diseases (6 November 2004). Official Gazette No: 25635. (In Turkish)

<sup>d</sup> Regulation on Surveillance and Control of Communicable Diseases (30 May 2007). Official Gazette No: 26537. Updated with Regulation Changing the Regulation on Surveillance and Control of Communicable Diseases (4 May 2019). Official Gazette No: 30764. (In Turkish)

have helped prevent and control influenza pandemics and other outbreaks on its territory. Turkey's past experiences with the swine flu (H1N1), avian influenza (H5N1) and SARS outbreaks only attest to the effectiveness and efficiency of Turkey's policies (10).

#### f. Health security: an intersectoral, all-hazards approach

In a globally interconnected world coupled with Turkey's geopolitical importance in the Region, the country has increasingly recognized the critical need to comply with its global (IHR, 2005) (7) and regional (EC 1082/2006) obligations (11), appreciating how national and global health security are intertwined and interdependent. For the past 15 years, a series of projects on strengthening surveillance and control of communicable diseases, strengthening and expansion of the EWRS and laboratory sector, linking laboratory surveillance with disease surveillance and building field epidemiology training have been implemented in collaboration with WHO and the European Union (EU).<sup>e</sup> These projects have cemented and expanded the health security capacities of Turkey and helped prioritize health threats, including those due to emerging and re-emerging diseases, and refined and improved EWRS. The country has also updated technical guidelines in alignment with global and regional standards, and best practices of the EU and WHO on a regular basis.

Under these health security-focused projects, coordination mechanisms have also been strengthened for EWRS between the MoH and other line ministries across relevant sectors, and protocols prepared and signed to establish/strengthen inter-ministerial collaboration between and across sectors.

Establishment of a national reference laboratory was also a key achievement of these projects. Within the scope of the currently ongoing Health Security Project, the fourth in the series, a national laboratory assessment tool was updated, and a capacity assessment study completed in 2019 that included on-site evaluations of selected laboratories to monitor and evaluate the application of national standards and compliance therewith at the provincial levels. This strengthened and expanded EWRS and the laboratory sector but, more importantly, the strengthened linkages between the two have been instrumental in combating this pandemic.

### III. READINESS OF TURKEY: ONSET OF THE SARS-CoV-2 OUTBREAK IN THE WORLD

On 31 December 2019, the WHO Country Office in China picked up a media statement on cases of pneumonia of unknown etiology detected in Wuhan City, Hubei Province of China. The Country Office notified the IHR (2005) regional contact point for the WHO Regional Office for the Western Pacific about the Wuhan Municipal Health Commission's media statement of the cases and provided a translation of it.

WHO declared a "public health emergency of international concern" (PHEIC) on 30 January 2020 regarding the outbreak of the novel coronavirus. The disease was later named COVID-

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<sup>e</sup> Turkey has conducted consecutive projects, which were funded by European Union's Instrument for Pre-Accession Assistance within the scope of alignment with the EU Acquis on communicable diseases and health security. These projects focused on strengthening surveillance and control of communicable diseases as well as laboratory capacity, in addition to the development of a field epidemiology training programme.



19 in February 2020. Due to the rapid increase in the number of cases and affected countries, WHO declared the COVID-19 outbreak a global pandemic on 11 March 2020 (12).

#### a. Activation of EWRS – Emergency Operations Centre

On 6 January 2020, the WHE/Europe shared with all countries in the European Region and European Centre for Disease Prevention and Control (ECDC) an initial WHO rapid risk assessment (RRA) on the cluster of atypical pneumonia cases, in order to facilitate sharing of information and accelerate readiness actions.

Indeed, Turkey activated its preparedness/contingency plans and began readiness activities on that day. The EWRS Emergency Operations Centre (EOC) in Ankara, Turkey was activated and situational monitoring of the outbreak from this novel coronavirus in China started with updates from China and through WHO resources. Starting from early February, with cases increasing, the EOC started to work on a 24/7 basis with technical staff manning key/priority areas such as surveillance, logistics, IHR requirements and communications. This operations centre remains operational and continues with a similar configuration.

#### b. Convening of the Coronavirus Scientific Advisory Board

On 10 January 2020, just before the announcement of the first fatality by China, the MoH convened the Coronavirus Scientific Advisory Board (CSAB), bringing together experts from different medical disciplines. The CSAB is composed of 26 members, all senior and high-level specialists and academicians in various relevant fields, e.g. public health and epidemiology, pulmonology, infectious diseases, clinical microbiology, among others. The CSAB has been a critical technical support and decision-guiding body since then and has guided not only the leadership and staff from the MoH but also from other relevant line ministries and other stakeholders. Though formally convened twice a week, in practice, board members spent most of their time at the MoH discussing emerging pandemic-related issues thoroughly and in real time, generating discussions and garnering consensus on critical and emerging issues. One of the important and critical outputs, especially at the beginning, was drafting of the *National 2019-nCoV disease guidelines* that set the stage for prevention, mitigation and containment. The first guideline was replaced with multiple new guidelines, which were prepared considering the latest scientific evidence (13). CSAB meetings were later moved to a video conference platform as social distancing regulations were promulgated. Realizing the importance of risk communication, an online messaging platform was also established to ensure a constant communication channel between the Board and stakeholders. With evolution of the pandemic, as the needs grew and priorities got added, more experts/scientists were added to the Board, allowing additional technical subgroups to work on emerging priority areas and concerns.

#### c. Release of the 2019-nCoV disease guidelines

The first version of the *2019-nCoV disease guidelines* was published on the MoH website on 14 January 2020 and served as a dynamic, living document (13). As new information and knowledge trickled in, these guidelines were updated to incorporate new knowledge and emerging evidence. Training of health-care workers continued to be conducted at the provincial

levels,<sup>f,g</sup> in line with the updated national guidance and to ensure that the latest global and regional knowledge trickled down and was applied at provincial/municipal levels, the first line of contact between health staff and the community.<sup>h</sup>

#### d. Development of a PCR diagnostic test for SARS-CoV-2

Laboratory diagnosis with polymerase chain reaction (PCR) testing for SARS-CoV-2 was initiated at the National Microbiology Reference Laboratory; however, it was a time- and resource-intensive effort initially. In particular, a research protocol was initiated to develop and produce a rapid laboratory PCR test kit for domestic use as well as for export to other countries. With the help of the WHO Country Office, WHO's emergency use listing (EUL) was readily secured for the newly developed test, which also extended to the test the necessary quality cover for national use and for international marketing (14). As of date, there are 115 laboratories strategically spread across the country capable of performing a PCR test for SARS-CoV-2, providing accessibility to and testing coverage for the diagnosis of active SARS-CoV-2 infections.

#### e. Initial steps to prevent importation of disease

Anticipating a high risk of imported cases, temperature screening with thermal scanners was initiated of passengers arriving on flights originating from infection-reporting countries from 24 January at all involved airports. No symptomatic passenger was admitted on Turkish Airlines planes at points of departure and all incoming passengers were asked to fill a passenger contact information form to ensure efficient and effective contact tracing if any exposure was later suspected on board. Passengers demonstrating any symptom related to SARS-CoV-2 were quarantined. These passenger screenings were later expanded to include all countries that reported a large number of confirmed cases. Later, all arriving international passengers were subjected to 14 days' quarantine at designated places.

#### f. SARS-CoV-2 referral hospitals

A total of 563 hospitals with the necessary infrastructure and staff were selected to serve as reference hospitals for cases with COVID-19, of which 175 were public, 63 university and 325 private hospitals. All elective procedures and surgeries were put on hold indefinitely in these hospitals. Hospital admissions were minimized and allowed only through a centralized health-care appointment system reachable through a hotline, website or an online app.

#### g. Travel restrictions

Turkey cancelled all flights from China as early as 3 February 2020, followed by flights from Iran effective 23 February 2020. Turkey also temporarily closed its border land crossings with Iran for 4 days to mount field hospitals at eight border land crossings and then reopened land border crossings with the necessary health screenings.

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<sup>f</sup> Ministry of Health Correspondence dated 04 .02.2020 with 125 reference number (In Turkish)

<sup>g</sup> Ministry of Health Correspondence dated 24 .02.2020 with 190 reference number (In Turkish)

<sup>h</sup> Ministry of Health Correspondence dated 13.03.2020 with 279 reference number and signature of Deputy Health Minister (In Turkish)

#### h. Risk communication and infographics

On 29 January, brochures, banners and posters prepared in Turkish, English and Arabic were distributed to inform the public, highlighting precautions and actions to stop virus transmission. Starting from February, TV spots and social media communication campaigns were broadcast widely on the media. Risk communication campaigns continue and their scope is expanded in line with the latest national and global developments (15).

#### i. Controlled airlifting of Turkish citizens from abroad

Turkey also evacuated its citizens stranded in disease-prone areas/countries as international travel shrank. The first flight brought stranded citizens from Wuhan on 31 January and the second from Tehran on 23 February. Airlifting continued from several countries since then and so far over 70 000 citizens have been brought back home from across the world under controlled and risk-mitigation strategies. All arriving citizens were subjected to 14 days of quarantine at dedicated locations.

#### j. Activation of provincial emergency operations centres and health protection boards

Provincial operation centres were activated and provincial health protection boards established under the leadership of governors. They started working to manage the pandemic at the provincial level to guarantee effective management.

#### k. Public engagement and risk communication

Showing leadership from the front, the Minister of Health, Fahrettin Koca, regularly held press conferences, especially after scientific board meetings, to inform the public about the latest developments as related to the management of the pandemic, emerging knowledge and best practices. The “mis/dis information campaigns/infodemic” was countered by the leadership. Risk communication meetings and events (with social distancing observed) were organized to share information and get feedback from all relevant stakeholders and other governmental ministries and entities.

#### l. Strategic pre-positioning of critical personal protective equipment and therapeutic agents

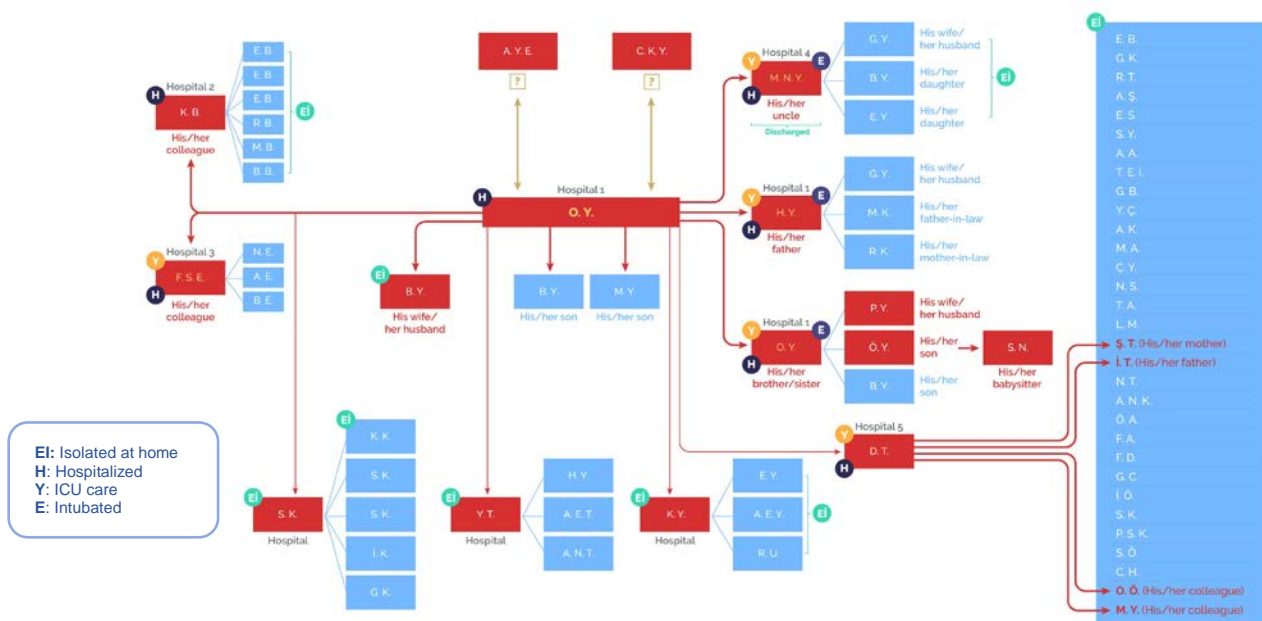
In line with the recommendations made by the CSAB, the MoH ensured provision of appropriate and adequate amounts of therapeutic drugs such as hydroxychloroquine, the antiviral favipiravir and other drugs for use in hospitals, and PPE for health-care workers in health-care settings. Enough stockpiles were ensured of these critical case management and treatment drugs before the start of pandemic in the country.

## IV. ARRIVAL OF SARS-CoV-2 IN TURKEY: PUBLIC HEALTH MEASURES AND MULTISECTORAL ACTIVITIES BASED ON A WHOLE-OF-GOVERNMENT APPROACH

### a. The first SARS-CoV-2 case

Turkey announced the first confirmed case on 11 March, incidentally the same day that WHO announced that the SARS-CoV-2 outbreak was a pandemic (16). Minister Koca later shared a graph showing how contact tracing of the first case was performed (Fig. 1).

The day after the first case was reported, President Erdoğan led a ministerial cabinet meeting to initiate implementation of the response road map of the Turkish Government.



**Fig. 1. Contact tracing scheme of the first case in Turkey**

Source: Daily reporting from the Directorate General for Health Information Systems, Ministry of Health, Turkey ([https://covid19.saglik.gov.tr/?\\_Dil=2](https://covid19.saglik.gov.tr/?_Dil=2))

### b. Mitigation measures

#### (i). Closure of on-site instruction in education institutions across the country

All primary, middle and high schools and universities in Turkey were closed, effective the following Monday, 16 March 2020 and online and TV broadcasting-supported education started for primary, middle and high schools after a one-week mid-term break (17).

#### (ii). Banning of mass gathering events

A large number of measures to prevent mass gatherings were put into practice as of 16 March 2020 (18). All sports, games, scientific, cultural or artistic meetings, conferences and

congresses were postponed until further notice. Mosques and all places of worship, libraries, cafes, gyms, movie theatres, were closed. Public banks started delivering pensions to retirees above the age of 76 years to their homes to help them stay at home.

### (iii). Restrictive measures for public officials

Public officials over the age of 60 years and those suffering from chronic conditions (presumed to be at high risk for SARS-CoV-2 based on global evidence) were granted administrative leave as of 22 March 2020 (19,20). Public institutions and organizations were asked to allow alternating and flexible working schedules and enforce remote/teleworking if and where possible.

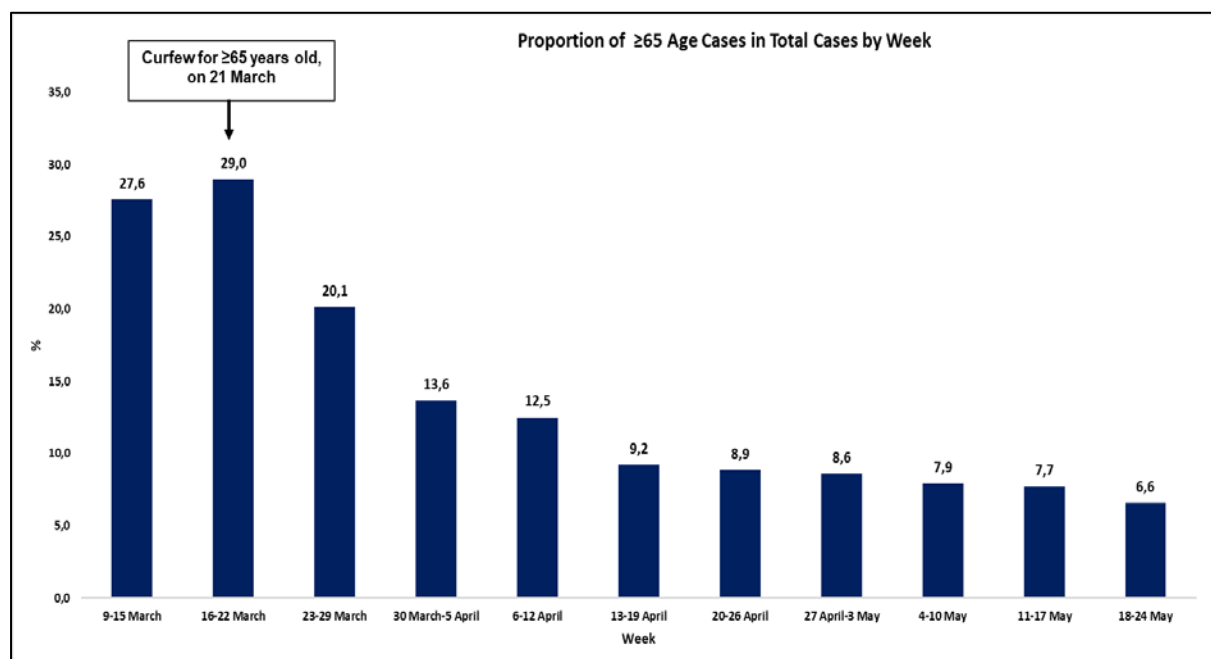
### (iv). Additional travel restrictions

Flight bans were later extended to include most of the European countries as of 14 March 2020 (17).

### (v). Curfews and lockdowns

#### 1. Selective curfew for the elderly over 65 years and establishment of “Vefa (fidelity) Social Support Groups” (20)

Effective from 22 March, a curfew was imposed for those over 65 years of age while their daily needs were met through newly established special teams called “Vefa (fidelity) Social Support Groups”. These curfew measures for the elderly seem to have played a major role in reducing the incidence of new cases of SARS-CoV-2 in the elderly (Fig. 2).



**Fig. 2. The incidence of new cases of SARS-CoV-2 in the elderly**

Source: Daily reporting from the Directorate General for Health Information Systems, Ministry of Health, Turkey ([https://covid19.saglik.gov.tr/?\\_Dil=2](https://covid19.saglik.gov.tr/?_Dil=2))

#### 2. Curfew for those under 20 years

Ten days after imposing the curfew for the elderly over 65 years of age, curfew was extended to those under 20 years of age.

(vi). Weekend total lockdowns

Curfew for the whole population was first imposed on the weekend of 11 April and continued till June in selected cities. It was extended to cover public holidays adjoining weekends.

(vii). In-country travel restrictions

On 3 April, an entrance ban to 30 metropolitan municipalities and provinces was announced by the President. All these measures were implemented with a whole-of-government approach, with active participation and contribution of all relevant authorities.

(viii). Economic relief

An economic relief package of 100 billion Turkish lira (TL) (roughly US\$ 15 billion) was announced by President Erdoğan on 18 March 2020 to address the immediate financial woes of companies and costs in low-income households (17). With this package, the government also agreed to postpone tax liabilities, social security premium payments and credit debts of employers in sectors worst affected by the crisis. The government also coordinated cash-raising campaigns and transferred 11.5 billion TL to families in need (2 billion TL was raised through an aid campaign called “We Are Enough For Each Other Turkey”), among other measures.

(ix). Incentives for health-care workers

Special economic incentives for HCWs were provided by the government. Additional remuneration was granted to HCWs with a Regulation published on 14 March 2020 (21). Operators of the Global System for Mobile Communications (GSM) in the country also provided 15 GB Internet packages for HCWs free of charge to facilitate continued contact of HCWs with their patients under isolation/quarantine, and contact of HCWs with their own as well as patients’ families and loved ones. Similarly, for those HCWs who could not commute or did not want to go back home after their shifts for fear of transmitting the virus to family members/loved ones, alternate accommodation was provided free of charge.

(x). Free health coverage for SARS-CoV-2 for all

With a Presidential Decree published on 14 April 2020, all costs related to the diagnosis and provision of medical treatment of persons with SARS-CoV-2 were made free of charge for all citizens and residents of Turkey (22).

(xi). Mental and psychosocial health

Some health professionals working in healthy living centres and in some hospitals were trained and organized to provide psychosocial and mental health support to the community by placing at least once such staff in one health-care facility in each province.

(xii). Smart phone apps/IT usage

A specific software module for COVID-19 was added to the Public Health Management System software to ease surveillance of the disease and contact tracing.

A mobile application called Mental Health Support System was developed by the MoH to provide a direct channel between mental health professionals and HCWs to protect the mental

health of HCWs and support their well-being while providing health care under challenging circumstances.

Another mobile application called “Hayat Eve Sığar” (Life Fits in Home) was also developed by the MoH to inform, guide and protect the public about areas with high exposure risk and by alerting them about high-risk behaviours. Residents could obtain a code through this application if that individual’s travel between provinces was not restricted (not during the isolation period or recovery phase). Ten million residents have downloaded and availed of this application thus far.

Special arrangements were also made to reduce the need for visits to health-care facilities for purposes other than medical consultation, to reduce potential exposure risks for visitors as well as HCWs. Such measures included prescription refills for chronic diseases directly from pharmacies without a fresh prescription from a clinician.

#### (xiii). Role of family physicians

Family physicians (FPs) have played a critical role in this response. FPs shouldered the provision of medical care in hospitals on the one hand and provided follow up for vulnerable groups, such as the elderly, pregnant women and children, refugees, on the other. FPs provided daily health checks of such vulnerable members of the community who were confined/isolated in their respective homes because of known close contact with confirmed SARS-CoV-2 patients but were asymptomatic and thus not hospitalized.

#### (xiv). Research and development

##### *a. Clinical trials for vaccine development*

The MoH has organized a committee to synchronize and coordinate all clinical trials related to SARS-CoV-2. Data from multicentric scientific trials are about to be submitted for peer-review and publication in various journals. Multiple institutions have also initiated research on vaccine development, therapeutics and plasma convalescent therapy.

##### *b. Transfer and sharing of global/regional knowledge*

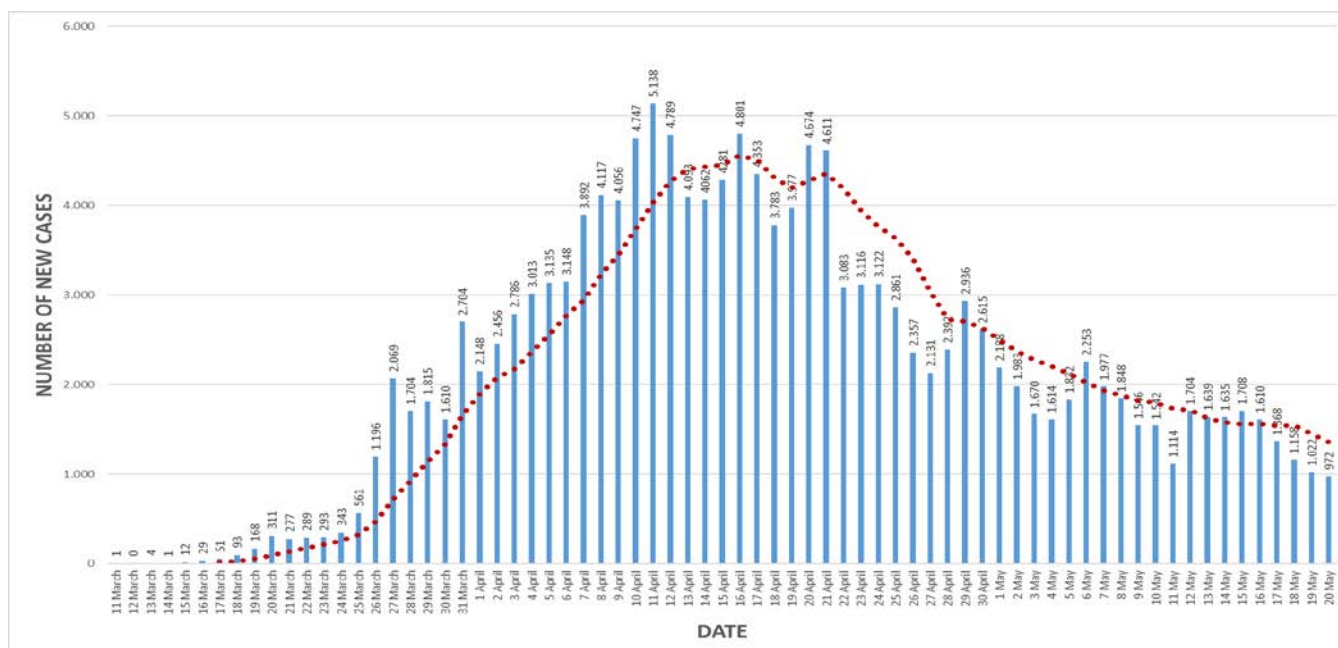
MoH officials organized several videoconferences with many countries and with three levels of WHO and other international organizations to acquire/share/transfer knowledge, emerging best practices and experience gained.

## V. PANDEMIC COURSE IN TURKEY AND CONTAINMENT MEASURES

### *a. The course of the pandemic in Turkey*

**Containment measures** in Turkey basically comprised four essential strategies; testing, (contact) tracing, treatment and quarantine/isolation. The epidemiological curve of cases with SARS-CoV-2 reported in Turkey is displayed in Fig. 3.





**Fig. 3. The epidemiological curve of new cases of SARS-CoV-2 reported in Turkey**

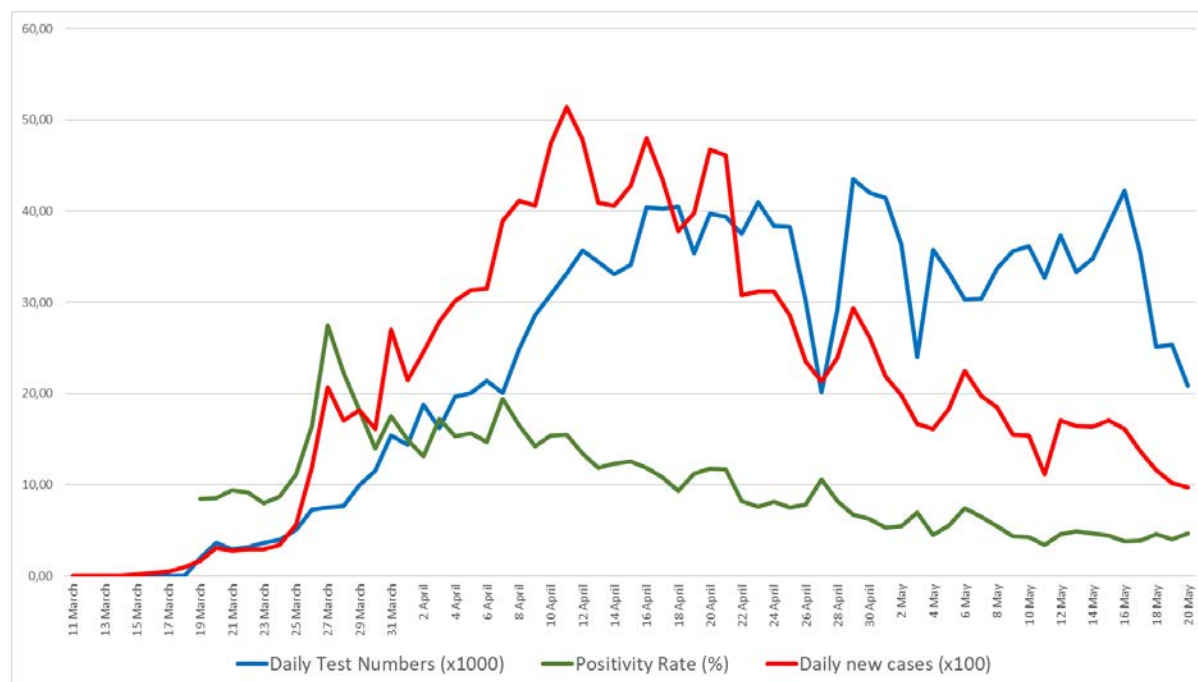
Source: Daily reporting from the Directorate General for Health Information Systems, Ministry of Health, Turkey ([https://covid19.saglik.gov.tr/?\\_Dil=2](https://covid19.saglik.gov.tr/?_Dil=2))

The highest number of daily new cases was reported on 11 April with 5138 cases, the peak of the pandemic in the current wave. The peak tapered to a daily new case load of only 972 cases by 20 May 2020 (Fig. 3). Another key attribute responsible for Turkey's successful course is its strong testing capacity; Turkey rapidly increased its daily testing capacity. It reached up to 40 097 per million as of 30 June 2020, one of the best in the Region while many other developed economies continued to face the testing glut (Table 1 and Fig. 4) (23,24). With its high testing capacity, Turkey was able to test for cases and rapidly trace and test close contacts early. It was also able to isolate/quarantine and/or treat them and thus interrupt transmission chains early and effectively, preventing the spread of the virus to new susceptible individuals.

**Table 1. Comparison of cases, tests and case fatality ratio among some countries of the European Region (data as of 30 June 2020)**

COUNTRY	Total cases (per million)	Total tests (per million)	Case fatality ratio
ROMANIA	1441	38 220	6.11
SPAIN	6338	116 544	9.57
ITALY	3979	89 149	14.45
NETHERLANDS	2938	35 972	12.16
TURKEY	2370	40 097	2.57
FRANCE	2525	21 213	18.11





**Fig. 4. Testing capacity, positivity rate and case numbers per 1000 population starting from 11 March to 20 May**

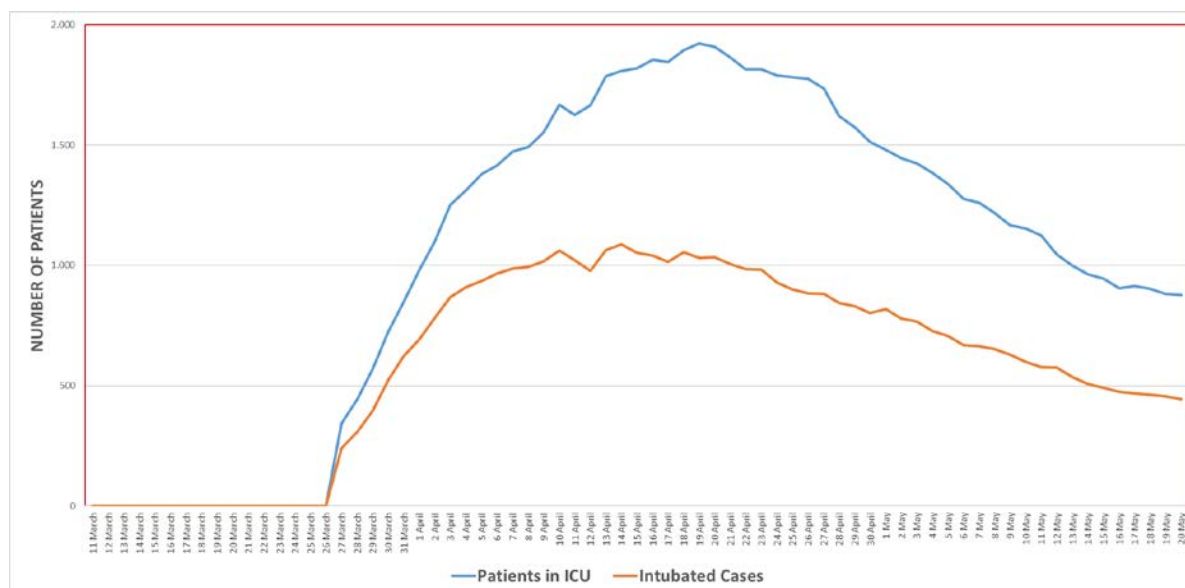
Source: Daily reporting from the Directorate General for Health Information Systems, Ministry of Health, Turkey ([https://covid19.saglik.gov.tr/?\\_Dil=2](https://covid19.saglik.gov.tr/?_Dil=2))

All confirmed cases can access case management and treatment easily and free of charge. Treatment recommendations are given in the COVID-19 guidelines developed by the CSAB and are updated regularly in line with new evidence and information.

#### b. Testing, contact tracing and case-finding

Turkey has implemented a comprehensive contact-tracing strategy. More than 6000 field teams composed of three staff each, were organized all around the country for contact tracing and epidemiological investigation of cases that had had interactions with confirmed cases. A special software called FITAS (Filiation, Isolation and Tracing System) has been prepared and is used to monitor all tracking activities, and reach all contacts, relatives, colleagues at work and others. This application is also used for monitoring individuals isolated at their homes. FPs regularly check their health status and refer them to hospital at the earliest stage if any symptom arises. Through this process, Turkey has been able to reach 99.6% of all contacts, that is, approximately 792 000 people (more than 5 persons per one confirmed case) and each contact was detected within a timeframe of less than 32 hours.

While the testing capacity has averaged on or around 25 000/day or so, the yield of positive tests gradually fell from a high of 15% in mid-April to single digits (5–6%) by mid-May. This sustained lower yield, despite the large number of tests, underscores the fact that the country is now ready to implement cascading, controlled relaxation of lockdowns. Both the number of patients needing ICU care and those needing to be intubated have decreased over time (Fig. 5).



**Fig. 5. The number of patients in intensive care and those who are intubated**

Source: Daily reporting from the Directorate General for Health Information Systems, Ministry of Health, Turkey ([https://covid19.saglik.gov.tr/?\\_Dil=2](https://covid19.saglik.gov.tr/?_Dil=2))

This could be attributed to the introduction of specific successful treatment protocols, as recommended by the CSAB. The MoH had recommended starting hydroxychloroquine and/or azithromycin treatment if the likelihood of pneumonia was high. The large number of cases with only mild pneumonia in hospital admissions also lowered the need for intensive care and intubation. The full efficacy and safety of such treatment regimens still remain to be ascertained after compilation and analysis of observational data supplanted with retrospective chart reviews of patients. Initial therapy with hydroxychloroquine was elaborated on recently by the CSAB and advised to be given to only hospitalized patients.

It may also be useful to compile additional evidence to document the benefits of early treatment with favipiravir. Additionally, the accumulated clinical evidence on what is beneficial ranges from high-flow oxygenation, nursing in the prone position, late intubation, use of immunomodulators (such as anakinra and tocilizumab) and anticoagulants as supportive therapies for case management, with improved health outcomes in severe cases. Early diagnosis, contact tracing and case management have helped greatly by lowering new infections, improving prognosis and reducing the strain on the health-care system. The proportion of intubated patients compared to those in intensive care has remained stable (approximately 50%) over time, also a proxy validation of effective case management practices (Fig. 5).

## VI. LEAVING NO ONE BEHIND – VULNERABLE POPULATIONS

Turkey hosts 3.6 million Syrians and nearly 1.5 million regular and irregular migrants within its borders. Only 60 000 Syrians are living in the camps while the rest live within host communities scattered across various provinces. Although it would be relatively easier to

provide health services to displaced populations living in camp settings, since >97% of Syrians in Turkey reside in host communities, Turkey established a network of migrant health centres for provision of health services and built these centres especially in provinces heavily inhabited by Syrians. In 2019, more than 17 million visits were recorded to these health facilities. Relevant health education and communication materials, including those for the pandemic, were developed in Arabic and English to facilitate linguistic and cultural acceptability by the refugee/migrant community. These migrant health centres helped to educate and train populations about the disease and the health protection measures they should take, and facilitated contact-tracing activities, especially for migrants. All related diagnostics and treatment procedures for SARS-CoV-2 during the pandemic are considered as emergencies and accordingly, under this emergency approach, all services related to pandemic prevention and treatment were provided free of charge for both regular and irregular migrants as is the case with citizens (4).

Special arrangements were also made to prevent virus transmission in prisons and care homes for the elderly. Fixed staff teams, pre-screened and determined to be non-infected, were arranged to work for longer hours in these facilities. Cases in prisons and care homes were isolated immediately in hospitals, and contacts of these cases were also screened and quarantined/isolated as needed. Meetings, visits and transfers of prisoners were also postponed, minimizing exposures.

## VII. TURKEY'S CONTRIBUTION TO INTERNATIONAL SOLIDARITY

As an eminent and dutiful member of the international community, Turkey has been determined to fight an effective battle against SARS-CoV-2 at the national, regional and global levels. Turkey's holistic approach, its deep-rooted State traditions, strong organizational structure, solidarity between the strong State and the nation, and effective leadership with political will – all elements came to the fore, arming the nation in this fight.

Since the beginning of the outbreak, 136 countries and eight international organizations have requested Turkey's cooperation as a part of their COVID-19 response efforts.

These cooperation requests entailed the following:

- sharing of scientific and technical knowledge and experiences
- donation of medication, medical supplies and medical devices
- provision of sales and export licenses for medication, medical supplies and medical devices.

Under the auspices and coordination of the Presidency, the MoH, Ministry of National Defense, Ministry of Foreign Affairs, Turkish Red Crescent, Turkish Coordination and Cooperation Agency (TIKA), Disaster and Emergency Management Presidency of Turkey (AFAD), as well as many professional organizations, civil society organizations, and international foundations and associations took part in these aid efforts.

Turkey has supported more than 80 countries with PPE, SARS-CoV-2 diagnostic kits, medical devices and medication, and issued exceptional export licenses to 65 different countries and

international organizations to allow export of medication, PPE and medical devices from Turkey to these end-beneficiaries.

In terms of scientific and technical knowledge and exchange of experiences, the Minister of Health, Dr Fahrettin Koca, has conducted bilateral meetings with the Director-General of WHO, Regional Director of the WHO European Region, and the ministers of health of Azerbaijan, Bulgaria, Iran, Kazakhstan, Libya, Pakistan, Romania, Russia, Spain, Tunisia, the UK, and the USA, as well as multilateral meetings at the World Health Assembly and the Turkic Council. In addition, the Scientific Committee of the MoH also held bilateral meetings with its counterparts, the scientific committees of many countries.

Videoconferences have also been held on a regular basis to exchange experiences on COVID-19 response efforts to support other countries and strengthen their capacities. Turkey has also tried to fulfil requests for PPE and ventilators from outside as much as possible while taking into consideration priority domestic needs. Turkey has continued to support cross-border surveillance, monitoring and provision of health-care services at the border with northern Syria during this period.

Regular videoconferences have been held with the three levels of WHO – ministerial-level meetings organized by WHO headquarters and the Regional Office for Europe were attended, good practices and experiences of other countries shared, and global and regional developments closely followed.

Turkey also became a co-sponsor of the draft resolution on fair access to COVID-19 therapeutics, diagnostics, vaccines and drugs at the UN.

By selling diagnostic kits and PPE to 11 countries and four international organizations, the International Health Services Corporation (USHAS) of Turkey, which was established as an affiliate to the MoH, has effectively carried out its assigned role, successfully demonstrating the capabilities and capacity of the health-care sector of Turkey on the one hand while contributing to the economy on the other.

For Turkey, global cooperation and solidarity are part and parcel of COVID-19 response efforts. Accordingly, Dr Fahrettin Koca's recommendations on the establishment of a "Supply Chain Group", "Health Scientific Board" and "Health Business Forum" were unanimously accepted by Member States of the Turkic Council, again setting an example among international platforms.

The words of Mevlana Celaleddin-i Rumi (famous Anatolian mystic philosopher), displayed on the boxes of supplies sent to other countries, constitute the essence of Turkey's efforts:

*"There is hope after despair and many suns after darkness."*

Through the act of global solidarity exhibited in the COVID-19 response efforts, Turkey has once again demonstrated that it may not be the wealthiest but it is one of the most generous of countries.

## VIII. TOWARDS THE NEW NORMAL; CONTROLLED SOCIAL LIFE

President Erdoğan announced a road map for normalization on 3 May. It is called "a new normal", meaning some public health measures will be implemented permanently even after

all facilities have reopened. The CSAB provides advice on this normalization plan and prepares guidelines for various sectors. A research study is planned to determine the immunity level of the community at the provincial level. One hundred fifty thousand samples will be collected for testing during the study.

Turkey's normalization is a dynamic process. Depending on up-to-date developments, some measures may be relaxed earlier or later. The future of normalization will be decided by not only the impact of measures, but also by public behaviour. Therefore, public engagement plays a vital role. That is why the public is informed on a daily basis and communities are engaged efficiently throughout the process with a whole-of-society approach.

As echoed by WHO, countries need to ensure that they have the capacities in place to detect and manage any upsurge in the number of cases once the transition period to a new normal is initiated. Despite the low levels of intensive care and hospital bed occupancy ratios, construction of some additional pandemic hospitals and development of health system capacity is ongoing in Turkey.

## IX. CONCLUSIONS

Turkey has successfully turned the corner in the current wave of the pandemic and stands among the countries with lower mortality rates generally but remarkably low mortality rates in the elderly. A multitude of factors seem to have worked in tandem and may hold the answers to these results:

1. Political commitment and leadership, multisectoral engagement, whole-of-government approaches are all pillars of any public health struggle, as emphasized by WHO and demonstrated by Turkey's experience.
2. The proportion of the elderly (>65 years) in the overall population of Turkey is smaller compared to countries with higher deaths rates (e.g. 6.5%, as compared to >14% in Italy). Specific preventive and testing measures were instituted early to protect the elderly and prevent the spread of infection.
3. Early imposition of selective curfew for the elderly and people with chronic conditions protected them from being exposed to the circulating virus.
4. Turkey was an avid observer and quickly learnt to adopt selective containment and mitigation measures, closely observing the experiences of other countries and applying these nationally. It also adapted national guidelines according to the latest knowledge and best practices – *think globally and apply locally*.
5. The Turkish SARS-CoV-2 guidelines were prepared with clear evidence-based recommendations, providing standardized therapeutic algorithms to all stakeholders around the country.
6. Strategic stockpiles, local production and pre-positioning allowed Turkey to avoid any critical shortages of PPEs, drugs and medical equipment.
7. Pre-pandemic high ICU bed/population ratios allowed dilution of the strain on critical care systems even at the peak of the pandemic, the highest occupancy of ICU beds did not exceed 60%.

8. Turkey has been active and flexible in extending the use of all possible treatment options to clinicians, ranging from antivirals to even some regimens from traditional Chinese medicine, and updated its guidelines according to clinical experiences.
9. Hydroxychloroquine is given to all positive and suspected cases as soon as a diagnosis of SARS-CoV-2 is made. Early medication, particularly with antivirals and high-flow oxygen seems to play some protective role, precluding the need for the use of mechanical ventilators in the ICU.
10. Late intubation and a prone position seem to have contributed to improved health outcomes in patients in the ICU.

Turkey is not among the richest of countries. In fact, Turkey is the 17th country by virtue of population size and the 19th largest economy. Its gross domestic product (GDP)/capita scale (as measured by the purchasing power parity [PPP]) is around 75th in the world. The total expenditure on health is not more than 5% of the GDP and that means a little more than \$1000 is spent on health per capita (on a PPP scale). Despite this, Turkey has been the most generous country as measured by its GDP. Turkey continued to support global solidarity and unity by sending lifesaving PPE and other supplies to countries in need without creating any critical shortages of these much-needed products at home.

Turkey's experience with its therapeutic algorithms, political and policy decisions, and public health measures have kept mortality rates from COVID-19 low, particularly among the elderly. With technical backstopping from WHO and other stakeholders, Turkey offers lessons and best practices that could be useful in contributing to the global health arsenal against the pandemic.

## X. THE WAY FORWARD

With all critical indicators of the severity of the pandemic tapering consistently and continually for over 4 weeks now, Turkey is preparing for a measured exit into a socially controlled life. Nonetheless, it will be extremely critical for communities to ensure compliance with social distancing, personal hygiene and personal responsibilities to keep the infection rates low and spread of the disease in check to ensure that there is no second peak in the initial wave that the country has successfully tamed. A critical marker is the looming autumn (fall) season, which is the flu season. Social distancing, personal hygiene coupled with compliance with flu vaccination are the interventions that can see Turkey safely through the fall.

Turkey will also continue to work with WHO to ensure that containment, mitigation, and therapeutic and case management measures that have worked to its unique advantage in turning the corner and best practices are shared and applied in a timely manner for the ultimate benefit of humanity.



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## **The WHO Regional Office for Europe**

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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