



Review Article

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Screening all incoming travellers for COVID-19, What the world could learn from Qatar?

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Abstract

Background: There is a global spread of Corona Virus Disease (COVID-19) with Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) being identified as the causative organism. This pandemic has infected over 53 million people globally causing over 1.3 million deaths resulting in lockdowns being implemented across many countries in the world. Global travel has been severely restricted especially in the early phase with far reaching social, economic and emotional implications. In addition to local measures undertaken by each country to curtail the spread of the disease, many countries implemented entry restriction on flights to reduce the risk of importing the disease by potentially infected incoming travellers. The State of Qatar eased travel restrictions from 1st of September 2020 (Phase IV of re-opening of pandemic restrictions) [1]. Incoming travellers from high risk countries had to have a mandatory COVID-19 Naso-Oropharyngeal swab negative result before boarding their flight to Qatar. Then they had to commit to two weeks of compulsory quarantine. Travellers from low risk countries had to be swabbed at Hamad international airport on arrival, followed by a week's mandatory home quarantine. All travellers had to have COVID-19 RT-PCR naso-oropharyngeal swab on day 6 after arrival in Qatar. **Method:** We looked at the data provided by Ministry of Public Health (MOPH), Qatar from 1st of September to 30th of November. This was retrospective observational study looking at the prevalence of COVID positivity of return travellers as compared to the total positive cases in the country [1]. **Results:** In our review, out of a total of 19,909 COVID-19 positive cases, 2692 were incoming travellers which amounts to about 14 % of total COVID positive cases in Qatar. It was also noted that with each passing day, the ratio of incoming traveller's in comparison to the total cases have been increasing, with figures of 9% in September 2020 as compared to 21% in November 2020. **Conclusion:** This figure clearly shows how important it is to screen all return travellers for COVID-19 as travellers are generally asymptomatic and could potentially spread the disease in the local community. All countries should consider implementing similar policies to reduce the risks of importing COVID-19.

Keywords: COVID-19, Return travellers, Incoming travellers, Screening, Asymptomatic, RT-PCR.

INTRODUCTION

On 31st December 2019, China reported the presence of a cluster of cases of atypical pneumonia in the Wuhan province, which was later identified to be due to the novel corona virus later named – Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-Cov-2). The terminology used for this disease was Corona Virus Disease-2019 (COVID-19). Ever since, this virus spread to 195 countries in the world infecting over 63 million people and causing over 1.4 million deaths (as of 30/11/2020, 22:03 GMT) [2].

It has been estimated that 40-45% of patients infected with SARS-CoV-2 are likely to be asymptomatic with a high infectivity rate of 75%, wherein these patients can silently infect other people [3]. Local strict disease controlling measures, are unlikely to suffice unless travellers are screened for presence of COVID-19 disease. Majority of countries have a much informal approach to home quarantine measures for incoming travellers which is unlikely to completely limit the spread of the disease.

MATERIALS AND METHODS

Patient population and data collection:

The data was collected from Ministry of Public health, Qatar's website which is readily accessible to the public.

A retrospective observational data review was conducted analysing the relative frequency of COVID positive patients amongst returning travellers in Qatar. The data of asymptomatic travellers, who travelled to Qatar and had a screening Reverse-Transcription-Polymerase-Chain-Reaction (RT-PCR) on arrival or on the 6th day of entry into Doha, was reviewed, from the period of 1st September to 14th November 2020. A total of 2692 incoming travellers were found to be positive for COVID-19 RT-PCR out of a total of 19901 positive cases recorded in the country during this period.

Literature search was done using PubMed tool and standard citation (Vancouver style) is available in the reference section.

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RESULT

The Ministry of Public Health, Qatar implemented a comprehensive incoming travel policy in phase IV of easing restrictions from 1st September 2020. All incoming travellers from high-risk countries were required to do RT-PCR test for COVID-19 from their origin countries, followed by two weeks mandatory quarantine period (one week in designated quarantine hotels listed by the MOPH followed by a week at home quarantine, provided day-6 COVID-19 RT-PCR was negative). Incoming travellers from low-risk countries had to have COVID-19 PCR test on arrival at Hamad International Airport, followed by a one-week mandatory home quarantine as well as COVID-19 RT-PCR swab test to be negative on day 6 after arrival [1].

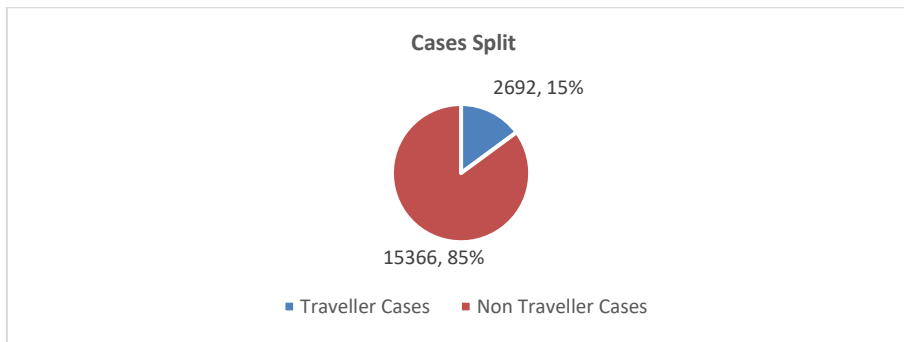
During the study period, 2692 incoming travellers were found to have COVID-19 out of a total of 19901 COVID-19 positive patients in the state of Qatar. The ratio was 15% Travellers Versus 85% local positives.

These COVID-19 positive patients had to undergo further assessment by MOPH or designated COVID centres in Qatar, as per protocol for further management of their condition. After the assessment, these patients would either be isolated at home after been accepted by Mobile Health Services (MHS) team (if they met the criteria for home quarantine), had to be transferred to designated quarantine facility (equipped with 24 hours medical staff) or referred to the hospital, depending on their clinical condition and the severity of the illness.

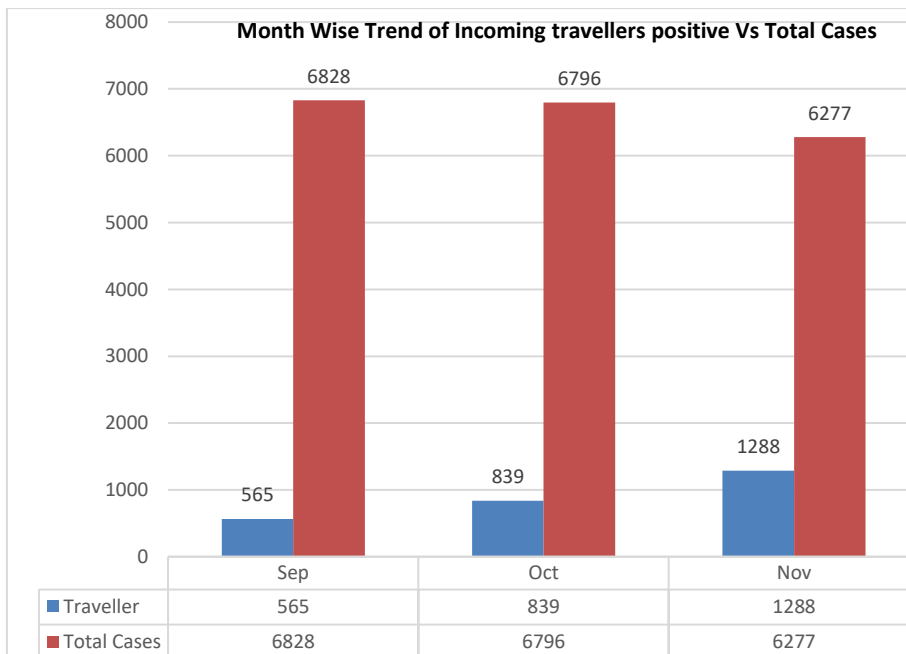
We noted from the data that the percentage of COVID positive return-travellers to the total number of COVID positives has increased over time. This ratio was 9% in September, 12% in October and 21% in November probably due to increased number of return travellers from different countries, as lockdown was eased across countries and thereby open their borders for international travel.

Table 1: Details of monthly figures of total Vs incoming travellers COVID-19 cases

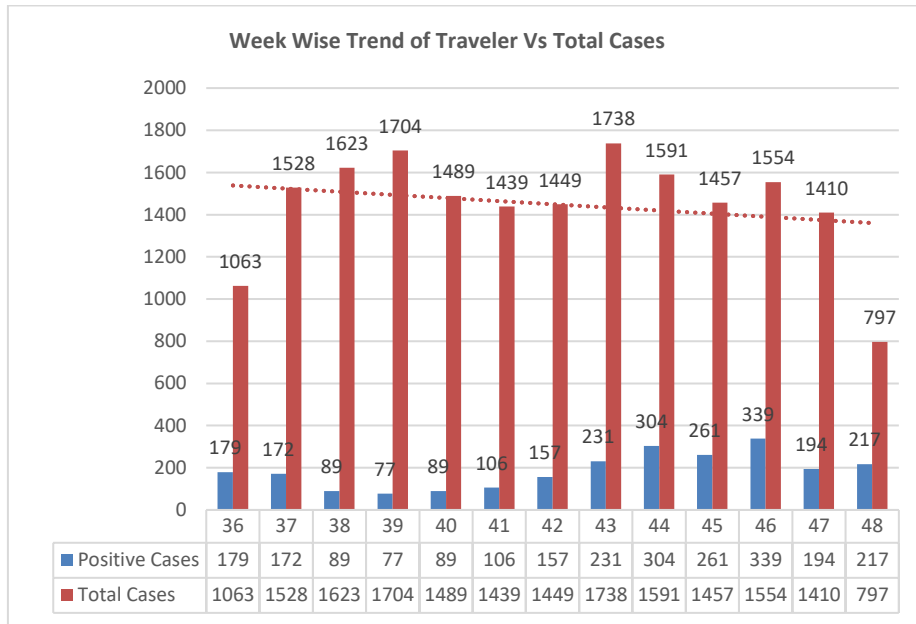
Month	Incoming travellers Positives	Total Cases	%
September 2020	565	6828	9
October 2020	839	6796	12
November 2020	1288	6277	21
Total	2692	19901	14%



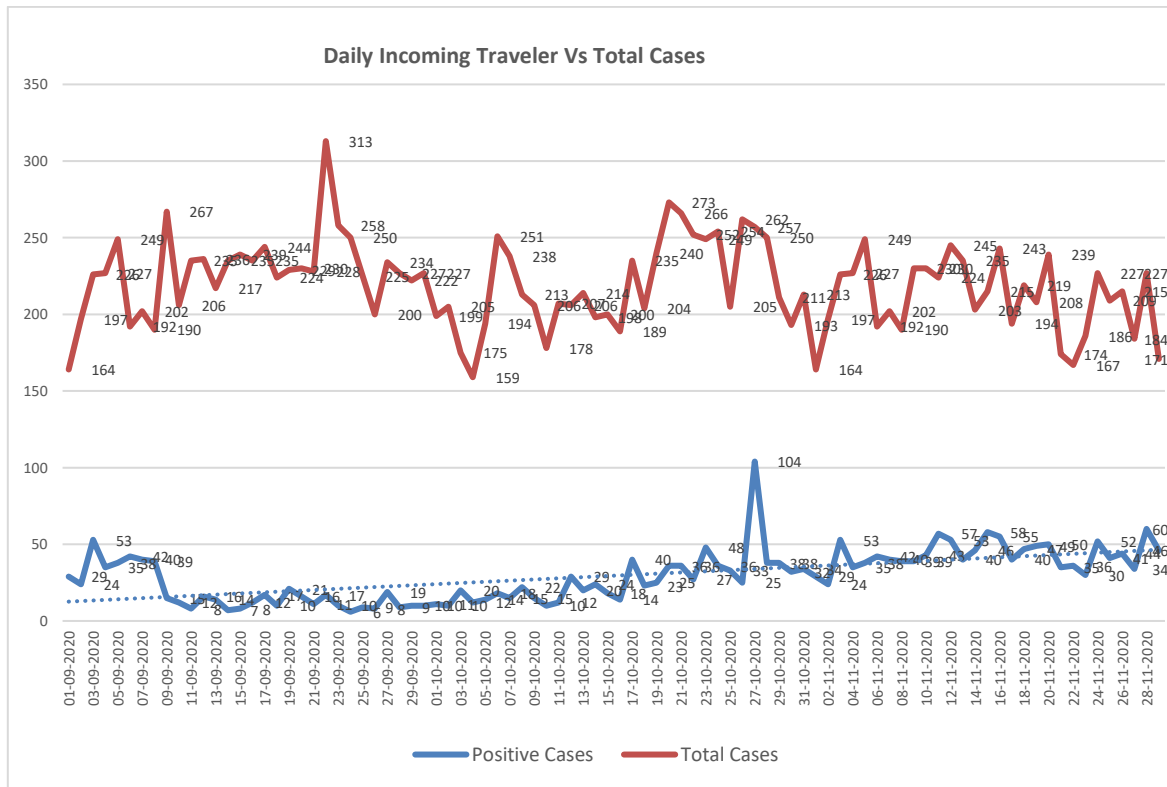
Graph 1: Incoming Travellers Vs local positive cases



Graph 2: Monthly trend incoming travellers positive cases Vs total cases from 1st September to 30th November 2020



Graph 3: Weekly trend of incoming travellers' positives Vs total cases from 1st September to 29th November 2020



Graph 4: Daily incoming travellers positive Vs Total positive cases from 1st September to 30th November 2020

DISCUSSION

WHO had declared COVID-19 as a public health emergency of international concern on the 30th January 2020. Shortly afterwards, reports of COVID-19 started to emerge from all corners of the globe. This resulted in severe restrictions on international travel which included complete travel ban in certain countries with mandatory quarantine requirements. Ever since the first peak of COVID-19, lots of countries in the world have been opening up with easing lockdown restrictions, which has provided some relief to the travellers, but also has increased the risk of international spread of the disease. There are

mandatory travel regulations in almost all the countries with the aim to curtail the spread of the disease.

One of these measures introduced in first half of 2020 was thermal screening of arriving travellers. However, fever measurement alone was not considered an adequate tool to screening return travellers [4]. Absence of fever could be as a result of an antipyretic medication intake or just an asymptomatic case [3]. Thermal scanning alone could give a sense of false reassurance to the travellers as well as authorities but could miss many asymptomatic cases resulting in further outbreaks of the disease.

Table 2: Following table shows daily crude data

Date	Incoming Traveler +ve cases count	Total cases Count	% of total	10/10/2020	10	178	6%	19/11/2020	49	208	24%
9/1/2020	29	164	18%	10/11/2020	12	207	6%	20/11/2020	50	239	21%
9/2/2020	24	197	12%	10/12/2020	29	206	14%	21/11/2020	35	174	20%
9/3/2020	53	226	23%	10/13/2020	20	214	9%	22/11/2020	36	167	22%
9/4/2020	35	227	15%	10/14/2020	24	198	12%	23/11/2020	30	186	16%
9/5/2020	38	249	15%	10/15/2020	18	200	9%	24/11/2020	52	227	23%
9/6/2020	42	192	22%	10/16/2020	14	189	7%	25/11/2020	41	209	20%
9/7/2020	40	202	20%	10/17/2020	40	235	17%	26/11/2020	44	215	20%
9/8/2020	39	190	21%	10/18/2020	23	204	11%	27/11/2020	34	184	18%
9/9/2020	15	267	6%	10/19/2020	25	240	10%	28/11/2020	60	227	26%
9/10/2020	12	206	6%	10/20/2020	36	273	13%	29/11/2020	46	171	27%
9/11/2020	8	235	3%	10/21/2020	36	266	14%	30/11/2020	33	185	18%
9/12/2020	16	236	7%	10/22/2020	27	252	11%	Totals	2692	19901	14%
9/13/2020	14	217	6%	10/23/2020	48	249	19%				
9/14/2020	7	235	3%	10/24/2020	36	254	14%				
TTab9/15/2020	8	239	3%	10/25/2020	33	205	16%				
9/16/2020	12	235	5%	10/26/2020	25	262	10%				
9/17/2020	17	244	7%	10/27/2020	104	257	40%				
9/18/2020	10	224	4%	10/28/2020	38	250	15%				
9/19/2020	21	229	9%	10/29/2020	38	211	18%				
9/20/2020	16	230	7%	10/30/2020	32	193	17%				
9/21/2020	11	228	5%	10/31/2020	34	213	16%				
9/22/2020	17	313	5%	11/1/2020	29	164	18%				
9/23/2020	10	258	4%	11/2/2020	24	197	12%				
9/24/2020	6	250	2%	11/3/2020	53	226	23%				
9/25/2020	9	225	4%	11/4/2020	35	227	15%				
9/26/2020	8	200	4%	11/5/2020	38	249	15%				
9/27/2020	19	234	8%	11/6/2020	42	192	22%				
9/28/2020	9	227	4%	11/7/2020	40	202	20%				
9/29/2020	10	222	5%	11/8/2020	39	190	21%				
9/30/2020	10	227	4%	11/9/2020	39	230	17%				
10/1/2020	11	199	6%	11/10/2020	43	230	19%				
10/2/2020	10	205	5%	11/11/2020	57	224	25%				
10/3/2020	20	175	11%	12/11/2020	53	245	22%				

10/4/2020	12	159	8%	13/11/2020	40	235	17%
10/5/2020	14	194	7%	14/11/2020	46	203	23%
10/6/2020	18	251	7%	15/11/2020	58	215	27%
10/7/2020	15	238	6%	16/11/2020	55	243	23%
10/8/2020	22	213	10%	17/11/2020	40	194	21%
10/9/2020	15	206	7%	18/11/2020	47	219	22%

There have also been efforts to manufacture a vaccine against this rapidly transmitting disease [5]. There are early reports of vaccine trials in different countries with over 90% success rates in phase 3 trials and it is encouraging to see the launch of vaccine in United Kingdom but more time would be needed to assess its long-term efficacy as well as its availability to all of the population globally [6]. Availability of an effective vaccine worldwide could pave the way towards normalising life including international travel. However, until this time, all countries must work collectively to deal with this potentially deadly disease with highly significant morbidity and mortality. As a remarkable proportion of patients with COVID-19 can be asymptomatic or have only mild symptoms, all measures need to be in place to detect this early so as to minimise the spread of this disease and ensure that the world doesn't face a 3rd or a 4th wave. Systems should be in place to carry out timely RT-PCR testing which is the most effective method to diagnose COVID-19 in different settings including return travellers [7]. In this study, it has been shown that a significant number of return travellers were diagnosed to have COVID-19 when tested by the RT-PCR test on arrival in Qatar or on day 6, although they were asymptomatic well individuals, having travelled on an international flight.

A similar study in Taiwan published in May 2020, showed that there were 321 imported cases that were identified from 21st January to 6th April 2020. Half of these travellers developed symptoms before arrival whereas the remainder developed symptoms 1-13 days (mean 4.0 days) after arrival into Taiwan with 3.4% staying asymptomatic. Body temperature and symptom screening at airports identified 32.7% of the cases [8].

To date RT-PCR COVID testing remains the gold standard testing tool in a variety of settings [7]. Therefore, it is suggested to have a mandatory RT-PCR COVID screening for all return travellers in addition to quarantine requirements, considering the above risks involved [4].

Limitations

Although RT-PCR COVID testing is the most important tool to diagnose COVID 19 [9], but has limitations of its own.

RT-PCR at initial presentation in patients with suspected COVID-19 can miss infected patients, with false negative rates of up to 10% [10]. 1 in 25 patients with RT-PCR-positive COVID-19 do not develop antibodies detectable with frequently employed and commercially available immunoassays. However due to the invasive nature of immunoassays and inability to develop detectable antibodies in 4% of people, it is generally reserved for academic purposes[10].

This study is based on publicly accessible data from MOPH Qatar website and did not include demographic details of the returning travellers who were tested positive, neither were details of the origin country disclosed. Therefore, prevalence of COVID-19 positivity in returning travellers from certain countries which could otherwise be identified as red zones or having inadequate screening checks could not be ascertained in this study.

CONCLUSION

SARS-Cov-2 Virus has a RO value of 2-3 which is much higher than any other viruses depicting high infectivity and hence the potential for it to spread very quickly. Hence, it is vital to implement all measures to limit the spread of virus so as to reduce the case fatality [11]. This reflects as one COVID-19 positive patient could potentially spread the disease to roughly 406 people [12]. If the population in this cohort were not identified and quarantined effectively, the total number of people potentially infected as a result could equate to 1,092,952 people with disastrous consequences for the healthcare system as well as the local population. Some countries such as Australia and New Zealand have implemented strictest measures to control import of the disease which has resulted in great success as new cases are zero or near zero in these places [13].

As things stand, it is important to implement screening programs as well as infection prevention and control measures to tackle COVID-19. Hence, in the author's view, identification of infected individuals is very important to prevent the spread of disease. Therefore, combination of screening of incoming travellers at the arrival ports along with robust local measures to deal with COVID-19 is needed to ensure that disease burden remain within manageable range and social life could be restored as normal as possible. The authors suggest the consideration of screening all arriving travellers at the port of entry in addition to local quarantine procedures to be implemented as a worldwide policy to be adopted by all countries and monitored by the WHO, to ensure this is executed in an efficient manner, to rid the world of COVID-19.

Conflicts of interest

The authors declared no conflict of interest.

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