Average Mortality Rate of COVID-19 in Iran

Sajjad Baber

Craniomaxillofacial research center, Department of Oral and Maxillofacial Surgery, School of Dentistry, Resident, International Campus, Shariati hospital, Tehran University of Medical Sciences, Tehran, Iran

Corresponding author:

Sajjad Baber

Craniomaxillofacial research center, Department of Oral and Maxillofacial Surgery, School of Dentistry, Resident, International Campus, Shariati hospital, Tehran University of Medical Sciences, Tehran, Iran

Email: drsaijad_khan@yahoo.com

Phone no: +98.09013243277
Abstract:

Background:

Corona virus disease was first reported in Wuhan City, Hubei province, China. Soon the corona virus disease has spread to many countries. World health organization has described the situation as Pandemic. By 12 March 2020, corona virus disease has affected 125 countries around the world. Corona virus was first confirmed in Iran on 19 February 2020.

Objective:

The aim of writing this small article is to determine the mortality rate of corona virus disease in different cities of Iran. This article will give readers an idea of different ways to control spread of corona virus disease in Iran.

Methods:

Author has collected the data of daily confirmed cases from different diagnostic centers and hospitals across the country from 19 February 2020 to 1 April 2020.

Results:

Mortality rate of corona virus disease is roughly 4%.

Conclusions:

Mortality rate could rise if COVID 19 infection is not controlled.

Key words: COVID 19; mortality; Iran; pandemic

INTRODUCTION:

A case of pneumonia with unknown pathogen was first reported on 8 December in Wuhan City, Hubei province, China. On December 31, China confirmed around 27 cases of pneumonia with unknown pathogen to World health organization. Chinese scientists discovered the pathogen on 7 January and named as novel corona virus, Corona virus disease [COVID-19](1),(2). World health organization on 30 January declared a ‘public health emergency of international concern’. Soon the COVID-19 has spread to many countries. Honorale Director -General of WHO, Tedros
Adhanom Ghebreyesus termed the situation as ‘Pandemic’ (3). By 12 March 2020, COVID-19 has affected 125 countries around the world (3, 4).

First two confirmed cases of Corona virus were emerged in Qom on 19 February 2020. Both cases were accurately detected before they died (5). It was a shock to Iranian officials as none of them travelled abroad or out of Qom. It was extremely challenging for the Iranian administration to start testing of corona virus on suspected cases due to economic sanctions of the United States on direct access to test kits (6).

Iran represents a country of about 83 million people. Initial findings suggest that a merchant may bring the virus from Wuhan to Qom. It is important to mention that both cases could have been sick weeks ago and infecting others for weeks (7).

More infectious cases had been reported in major cities after Qom. After that, the Iranian government had begun taking practical measures. Subways, cars and BRT buses were disinfected. Schools, universities and cultural centers were closed. The Iranian health ministry had politely advised locals to carefully avoid crowded areas and not shake hands. Citizens were also advised to limit the extensive use of bank notes. A lot of inmates in various prisons were released on a temporary basis. Short working hours were allowed in work places and public offices (7, 8).

Signs and symptoms of corona virus disease 19[COVID 19]: It usually starts with mild fever, cough, profound fatigue and mild pain in the body. A headache with or without moderate diarrhea or abdominal pain begins slowly. This can typically lead to respiratory distress in severe cases (9).

Epidemiology and quarantine: Corona virus disease-19 [COVID-19] infection typically spreads at a very fast pace and recently described as ‘Pandemic’ by world health organization. Quarantine is necessary for suspected patients. Quarantine is the reasonable restriction of movement of already infected or about to infect local people.

Suspected patients can quarantine in hospital. Mild cases with good immunity can self quarantine at home.

Generally, the incubation period of corona virus is approximately 14 days. China reported a case of 27 days incubation period in world health organization. It can typically transmit through air via coughing or blood contamination and faeces of infected persons. Mortality rate is higher in old age and patients with systemic diseases.(10, 11)

There are several advantages of small cities.
First, it requires low cost and improved communication as compare to big cities. Second, due to low population, there is less consumption of masks, face shields and gowns. Third, low manpower or active personnel are required in smaller cities.

**Methods to reduce spread of infection:** Remember an important proverb ‘Prevention is better than cure’.

1. Proper washing of hands with soap and water/hand sanitizer.
2. Maintaining clean and hygienic work places.
3. Hand shake and kiss should be forbidden.
4. No excursions in Nowruz should be permitted.
5. No in restaurant food.
7. Adequate use of herbs and in particular fruits, to improve immunity.
8. Periodic exercise.
9. Avoid touching nose, mouth and eyes. Remember T sign of face.
10. Quarantine areas where contamination is high.
11. Educate through electronic media.
12. No unprotective interaction with wild life.
13. No close contact with individuals having cold or flu like symptoms.
14. Infected persons should stay at home.
16. Infected individuals should wear face masks to keep the infection away from other people. (3, 10-12).

Materials and methods:

Data collection: There are numerous ways to collect the data of COVID-19 patients.

1. Household transmission data: We can ask the family members via telephone about symptoms of COVID-19. This method is unreliable. The family members can be false negative due to absence of symptoms or false positive like misdiagnosing with seasonal flu.

2. Questionnaire via mobile application software: These surveys are cost wise cheap and fast but again this method is not reliable.

3. Data collected from ministry of health: This ministry usually collects data from hospitals and laboratories electronically.

According to author, the standard method is hospital based or a laboratory based data.

Not a single method can tell us the pin point accuracy of mortality rate of COVID-19. Some patients might be in the incubation period. Ordinary villagers might consider this as an ordinary pneumonia due to lack of education and old customs and traditions. COVID-19 cases may be
missed due to lack of diagnostic kits. Rapid testing Polymerase chain reaction [RT PCT] was used to confirm COVID-19 in suspected cases.

Author has obtained data of daily series of confirmed cases from different diagnostic centers and hospitals across the country from 19 February 2020 to 1 April 2020. Iranian ministry of health and medical education confirmed 47,593 cases and 3,036 deaths and 3,871 critical cases till 1 April in Iran.

It is important to mention that no disparity of number of cases was found between the Iranian ministry of health and medical education and different diagnostic centers and hospitals.

RESULTS

There are 47,593 cases reported so far in Iran with 3,036 deaths and about 3,871 in intensive care unit till 1 April 2020. Author believes that mortality rate of COVID-19 is roughly 4% mostly elderly people i.e. approx 88% and young people with existing systemic diseases and poor immune system (10%). Around 2% of child deaths between age 12 to 14 years have been reported. It is important to mention that about 15,473 people have been recovered from infection.

Detailed numbers of COVID-19 infections from 1 March to 1 April 2020 is summarized in the form of Tables 1, 2 and 3.

<table>
<thead>
<tr>
<th>March</th>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number</td>
<td>978</td>
<td>1501</td>
<td>2336</td>
<td>2922</td>
<td>3513</td>
<td>4747</td>
<td>5823</td>
<td>6566</td>
<td>7161</td>
<td>8042</td>
<td>9000</td>
<td>10075</td>
<td></td>
</tr>
<tr>
<td>infected persons</td>
<td>394</td>
<td>523</td>
<td>835</td>
<td>586</td>
<td>591</td>
<td>1234</td>
<td>1076</td>
<td>743</td>
<td>595</td>
<td>881</td>
<td>958</td>
<td>1075</td>
<td></td>
</tr>
<tr>
<td>Total number</td>
<td>54</td>
<td>66</td>
<td>77</td>
<td>92</td>
<td>107</td>
<td>124</td>
<td>145</td>
<td>194</td>
<td>237</td>
<td>291</td>
<td>354</td>
<td>429</td>
<td></td>
</tr>
<tr>
<td>deceased persons</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>21</td>
<td>49</td>
<td>43</td>
<td>51</td>
<td>63</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Total number</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>913</td>
<td>1669</td>
<td>2134</td>
<td>2394</td>
<td>2731</td>
<td>2959</td>
<td>3276</td>
<td></td>
</tr>
<tr>
<td>recovered persons</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>913</td>
<td>753</td>
<td>465</td>
<td>260</td>
<td>337</td>
<td>228</td>
<td>317</td>
<td></td>
</tr>
</tbody>
</table>

| Recovered persons in past 24 hours | 0 | 0 | 0 | 0 | 0 | 913 | 753 | 465 | 260 | 337 | 228 | 317 |

| Recovered persons in past 24 hours | 0 | 0 | 0 | 0 | 0 | 913 | 753 | 465 | 260 | 337 | 228 | 317 |
### Table 1

<table>
<thead>
<tr>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Total number of infected persons**

<table>
<thead>
<tr>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>11364</td>
<td>12729</td>
<td>13938</td>
<td>14991</td>
<td>16169</td>
<td>17361</td>
<td>18407</td>
<td>19644</td>
<td>20610</td>
<td>21638</td>
<td>23049</td>
<td>24811</td>
</tr>
</tbody>
</table>

**Infected persons in past 24 hours**

| 1289 | 1365 | 1209 | 1053 | 1178 | 1192 | 1046 | 1237 | 966  | 1027 | 1411 | 1762 |

**Total number of deceased persons**

| 514  | 611  | 724  | 853  | 988  | 1135 | 1284 | 1433 | 1556 | 1685 | 1812 | 1934 |

**Deceased persons in past 24 hours**

| 85   | 97   | 113  | 129  | 125  | 147  | 149  | 149  | 123  | 129  | 127  | 122  |

**Total number of recovered persons**

| 3529 | 4339 | 4590 | 4996 | 5389 | 5710 | 5979 | 6745 | 7635 | 7913 | 8376 | 8913 |

**Recovered persons in past 24 hours**

| 253  | 810  | 251  | 406  | 393  | 321  | 269  | 766  | 890  | 278  | 463  | 537  |

### Table 2

<table>
<thead>
<tr>
<th>March</th>
<th>April</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>25</td>
</tr>
</tbody>
</table>

**Total number of infected persons**

| 27017 | 29406 | 32332 | 35408 | 38309 | 41495 | 44606 | 47593 |

**Infected persons in past 24 hours**

| 2206  | 2389  | 2926  | 3076  | 2901  | 3186  | 3111  | 2988  |

**Total number of deceased**

<p>| 2077  | 2234  | 2378  | 2517  | 2640  | 2757  | 2898  | 3036  |</p>
<table>
<thead>
<tr>
<th></th>
<th>15 April</th>
<th>16 April</th>
<th>17 April</th>
<th>18 April</th>
<th>19 April</th>
<th>20 April</th>
<th>21 April</th>
<th>22 April</th>
<th>23 April</th>
<th>24 April</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deceased persons in past 24 hours</td>
<td>143</td>
<td>157</td>
<td>144</td>
<td>139</td>
<td>123</td>
<td>117</td>
<td>141</td>
<td>138</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of recovered persons</td>
<td>9625</td>
<td>10457</td>
<td>11133</td>
<td>11679</td>
<td>12391</td>
<td>13911</td>
<td>14656</td>
<td>15473</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovered persons in past 24 hours</td>
<td>712</td>
<td>832</td>
<td>676</td>
<td>546</td>
<td>712</td>
<td>1520</td>
<td>745</td>
<td>817</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3

Table 1, 2 and 3 are showing COVID-19 data collection of diverse number of patients from 1 March to 1 April 2020 in Iran. Iran registered its initial case on 19 February 2020. Table 1, 2 and 3 showed that the total number of cases infected on March 1 was 978 which increased to 24,811 on 24 March, a total of 34 days. From 25th March to 1st April 2020, the overall number of active infections were 47,593 a figure nearly double in one week.

The infection has spread in all the 31 provinces with Tehran, Mazandaran and Qom province are mostly affected as shown in the graph.

Graph 1.
Graph 1 shows the mortality rate of various age groups till 1 April 2020. According to this graph, a total number of 3,036 persons died. There are approximately 2,671 deaths of Old people, 304 deaths of young individuals, and 61 deaths of children which consists of 88%, 10%, and 2% respectively.

Based on the research, I can assume that the average mortality rate in Iran would be around 4% to 5% but it could rise if COVID 19 infection is not effectively controlled. The mortality rate was initially estimated to 2% by the World Health Organization. On 3 March 2020, mortality rate was increased to 3.4%. It can increase to further more depending on the spread of infections in different countries.

Graph 2

This graph shows us COVID 19 data collection of total count of patients from 1 March to 12 March 2020.

According to this graph there are approximately 10,075 of the total figures of infected patients in which 1075 infections are detected in the past 24 hours. Total number of deceased individuals up to 12 March 2020 are 429 while the number of deceased individuals in past 24 hours are 75. It is important to mention that about 3276 people have been recovered from infection while from 1st to 5th March no recovered persons are noted.
This graph shows the COVID 19 data collected in different Provinces of Iran from 4 March to 12 March 2020. From 4th March, the number of infected cases in Tehran, Mazandaran, Qom, Isfahan, and Gilan province was 253, 9, 101, 0 and 35 respectively which has increased in 9 days to 2673, 997, 846, 792 and 613 respectively. The number of infected cases has increased in all five provinces particularly in the province of Tehran.

**Discussion:**

It is a great challenge for Iran to typically control COVID 19. In the past, we have seen the impact of other epidemics such as Severe acute respiratory syndrome [SARS] and Middle east respiratory syndrome [MERS] in some developed countries. Beyond Iran, COVID-19 has been reported in 125 other countries such as China, Italy, South Korea, Spain, France, Germany, United States of America, Switzerland, Norway and Japan e.t.c. The outbreak raised several research questions such as its origin, pathogenesis and treatment. There is currently no appropriate drug or effective vaccine. Chloroquine Sulphate and Anti retroviral have been used on COVID-19 patients on trial basis. Some countries such as China, the United States of America, UK, Israel and Iran claim to have been or nearly effective in vaccine development. The vaccine is incredibly difficult for large populations to manufacture in a shorter time frame (13, 14).

It is easier to quarantine small cities with small population than larger cities with large population. Improved manpower and numerous facilities are fundamental for managing
outbreaks in bigger cities and provinces. This large and complex outbreak of COVID 19 revealed problems in Iran's health care system. Such specific problems are lack of preparedness in potential emergency, prevention and control of diseases, lack of availability of test kits for accurate diagnosis of COVID 19, adequate masks and protective equipment. One major problem is the United States sanctions on Iran which normally include life saving drugs and diagnostic equipment.(13, 15, 16)

Some local and independent media outlets and local officials have tried to create panic by giving false information without providing substantial evidence. May be some of the cases have not been properly screened due to apparent lack of testing kits.

In my opinion, all the countries should help each other in order to contain COVID 19 outbreak. Information regarding COVID-19 should be shared on each and every platform.

In conclusion, to overcome such outbreak, Iran should improve its health systems. Extensive testing is the main key to stop covid 19 infection chain. United States should lift sanctions on humanitarian grounds so that Iran could be able to contain COVID 19.WHO and other international aid agencies should cooperate with Iran to control the spread of Corona virus infection. Media and newspaper should also pay a role to educate the general public about this disease. All countries affected with this epidemic should share their experience. General public should cooperate with the government to contain the disease.

In the author best knowledge, this is the first study to approximate the number of Corona virus cases in different cities and provinces of Iran. God bless us all!

REFERENCES:


