

# COVID-19 Severity Index comparison between Asia and Europe: A guide to Prevention from Pandemic

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## Abstract

This research is established to identify the COVID-19 Severity Index, according to which we can specify that how much Pandemic is severe. For this purpose, we study the two regions of the world, Asia and Europe, where the COVID-19 Distension was severe than the other regions of the World. We compare the severity of pandemic between Asia and Europe, and we determine the Country Count of COVID-19 severity for both regions. Country Count determines that for which region the pandemic is most severe. For this purpose we used the Pandemic Severity Index (PSI) established by the Centers for Disease Control and Prevention (CDC). We used case fatality ratio (CFR) to determine the severity levels for selected 40 countries from Asia and 40 from Europe. A Country Count is calculated for both regions. According to our study most of the countries of Europe are of Level 5 Severity index, and in Asia Country Count for Level 4 and Level 5 are almost equal.

**Keywords:** COVID-19, Pandemic severity index, CDC, CFR, Asia, Europe, Country Count

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## Introduction

Coronaviruses belongs to the family Coronaviridae. These are positive single-stranded RNA viruses enclosed in an envelope. Four viruses have been recognized the same reasons for respiratory tract diseases in humans on early detection of coronavirus in 1960, those are Alpha-, Beta-, Gamma-, and Deltacoronavirus. COVID-19 frequently spread as viral respiratory tract infection and many differential analyses associated to common pneumonia must be considered, such as influenza, respiratory virus infection, parainfluenza, adenovirus infection, metapneumovirus infection, and atypical pathogens, such as Chlamydia pneumonia infections and Mycoplasma pneumonia etc. [1]. Information about the spread of COVID-19 virus is gathering in every coming day. COVID-19 is firstly a respiratory disease and the range of infection from this virus can be spread out from people with very mild, non-respiratory symptoms to severe acute respiratory illness. Rather than that most of the deaths are noticed in older age people there is evidence that several young people with the virus can grow serious infection that would requires hospitalization. Some infected people have reported no indications at all. Human to human transmission through droplets is the main cause of spread inside the susceptible population. Additional indications appear with the clusters of outbreaks between family confirmed the prospect of person to person expansion [2-5].

## COVID-19 in Asia

First case of the COVID-19 in the Asia was reported in Wuhan, Hubei, China on November 2020. Current corona virus outbreak in China is the third epidemic caused by corona virus in the 21st century. Outbreak was identified in 44 patients from an unknown source from 31 December 2019 to 3 January 2020 [6-8].

WHO On 11 February 2020 termed the novel coronavirus as COVID-19 and declared as the infectious pandemic, after spreading out from China to other 24 countries then SARS-CoV-2 starts spread evenly through the whole continent. As of 8 June 2020, at least one case of COVID-19 had been reported in each country of Asia excluding North Korea and Turkmenistan [9].

## COVID-19 in Europe

The first case in Europe was confirmed on 24 January 2020 in Bordeaux (France). Two further confirmed cases were reported in Paris (France) by the end of the 24 January 2020, all of them are originated from China [10]. On 13 March 2020, when the figure of new cases turn out to be greater than those in China, the World Health Organization (WHO) commenced to consider the Europe as active center of the COVID-19 pandemic [11]. On

March 18 WHO evaluation of the risk of that virus remains high at the worldwide [12].

From the situation report of March 17, WHO observed that the risk of infection is not high for those people (i) who are not in the zone where COVID-19 is spreading, (ii) those who have not moved from an area where COVID-19 is spreading and those who have not been in contact with a diseased person [13].

### Pandemic Severity Index (PSI)

COVID-19 is an infectious respiratory disease that has the similar routes and ways of transmission as of influenza. It is found that the preventive measures carried by the Chinese government to control COVID-19 are also controlled the spread of influenza virus, because these two viruses part the same routes and ways of transmission [14].

The pandemic severity index (PSI) was a planned classification scale for determining the severity of influenza pandemics in the United States. The Pandemic Severity Index (PSI) was established by the Centers for Disease Control and Prevention (CDC) as an epidemic severity checklist tool, for usage by countries, societies and institutions [15], the PSI was designed to bear a resemblance to the Saffir-Simpson Hurricane Scale classification scheme. The index was replaced by the Pandemic Severity Assessment Framework in 2014. We can use PSI to check the severity of pandemic. As there were no premeditated plans prepared to be applied to a coronavirus epidemic. This epidemic is all new to handle. Endorsements made by WHO, the Centers for Disease Control and Prevention (CDC), the Brazilian Ministry of Health and other national and international organizations have recommended that contingencies plans of influenza should be applied because there are clinical and epidemiological resemblances among these respiratory diseases. These contingency strategies provided for different scenarios according to pandemic severity index [16].

To check the COVID-19 Severity between the regions of Asia and Europe we use the Pandemic Severity Index (PSI). Dimension-tool, the Pandemic Severity Index (PSI) has five categories or Levels; Level 1 represents least severity and Level 4-5 consider as the most severe Level 2 as minimum and Level 3 as moderate severity.

**Table 1** shows the Pandemic Severity Index (PSI), established by the Centers for Disease Control and Prevention (CDC) [17-22].

### Methodology

Following the Pandemic Severity Index (PSI), we compare the severity between the regions of Asia and Europe. We consider the 40 countries from Asia, and 40 from Europe, considering

those countries from which more than 500 cases were reported. Pandemic severity is determined by the case fatality ratio (CFR) [18], which is calculated by the following formula; and expressed as the percentage of infected people who died.

$$CFR = \frac{\text{Total number of deaths due to Covid -19}}{\text{Total number of Cases of Covid -19}} \times 100$$

Country having COVID-19 and with Level 1 PSI would be considered in the category of as severe as seasonal influenza. And a Country having COVID-19 and with Level 5 PSI would be considered in the category of as severe as of the 1918 flu pandemic.

### Data 1

Data 1 taken from Worldometer on 8 August 2020 [23]. All calculations for CFR and Country Count are done by using MS Excel.

**Table 2 and Figure 1** shows the number of Asian countries lies between PSI Levels (1-5). Which tells that there is equal ratio of Country Count of the selected countries for Level 4 and Level 5, such that 13 countries lies in the category of Level 4, and 13 countries lies in category of Level 5. While total of 14 countries lies between Level 1-3.

**Table 3 and Figure 2** shows the number of European countries lies between PSI Levels (1-5). This tells that none of the 40 countries lies in the Level 1 and Level 2, and 33 out of selected countries lies in Level 5 which shows that most of the countries lie in most severe category of PSI Levels.

### Data 2

Data 2 taken from Worldometer on 1 October 2020 [23]. All calculations for CFR and Country Count are done by using MS Excel.

**Table 4 and Figure 3** shows the number of Asian countries lies between PSI Levels (1-5). Which tells that there is equal ratio of Country Count of the selected countries for Level 4 and Level 5, such that 12 Countries lies in the category of Level 4, and 12 Countries lies in category of Level 5, 10 countries lies in Level 3, the moderate severity? While total of 6 countries lies between Level 1-2.

**Table 5 and Figure 4** it shows the number of European countries lies between PSI Levels (1- 5). This tells that none of the 40 countries lies in the Level 1. Only 2 countries are now in Level 2 and 26 out of selected countries lies in Level 5 category which is considered as most severe category, while 11 countries lies in Level 4.

### Preventive measures\ nonpharmaceutical measures

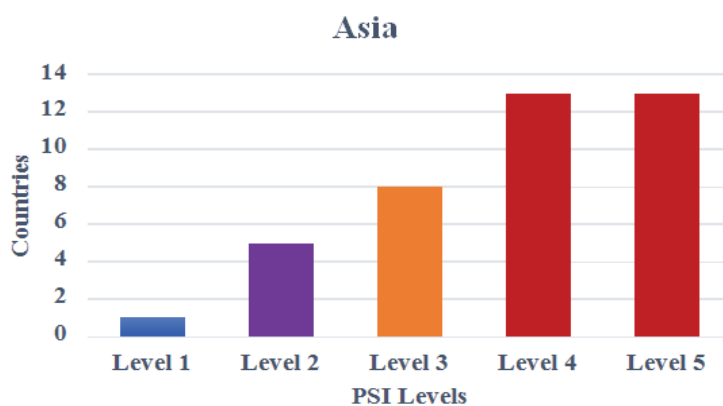
Since there are no ordinary treatments for COVID-19, it is important to avoid infection and more spreading. Pandemic

**Table 1:** CDC Pandemic Severity Index.

Category	Case fatality ratio	Example(s)
1	Less than 0.1%	Seasonal flu and 2009 swine flu [19]
2	0.1 – <0.5%	Asian flu and Hong Kong flu [19]
3	0.5 – <1%	pandemic H1N1 (2009) [20]
4	1.0 – <2.0%	Lassa fever [21]
5	2.0% or higher	1918 influenza pandemic [22]

**Table 2:** Number of Asian countries lies between PSI Levels (1-5).

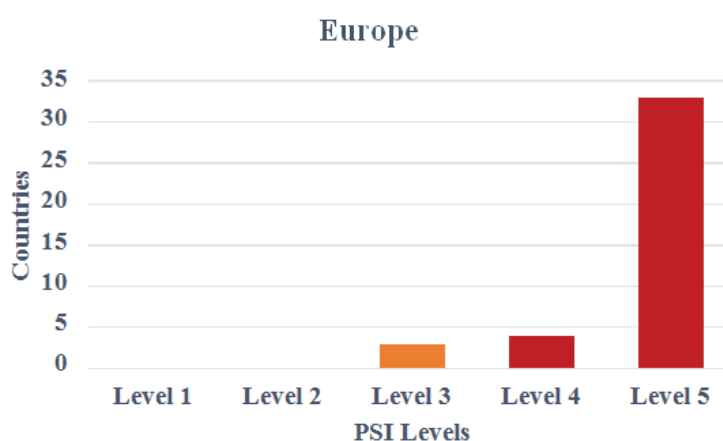
S. No.	CFR (%) Countries Count	CFR (%) Range by CDC	PSI Category
1	1 country	Less than 0.1%	Level 1
2	5 countries	0.1 – <0.5%	Level 2
3	8 countries	0.5 – <1%	Level 3
4	13 countries	1.0 – <2.0%	Level 4
5	13 countries	2.0% or higher	Level 5



**Figure 1** Number of Asian countries lies between PSI Levels (1-5).

**Table 3:** Number of European countries lies between PSI Levels (1-5).

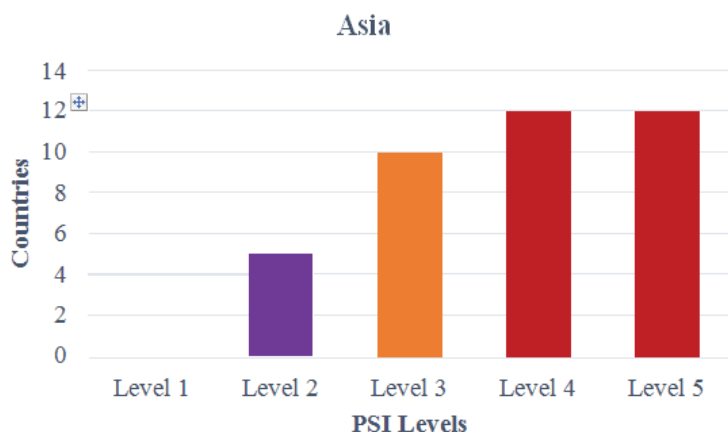
S. No.	CFR (%) Countries Count	CFR (%) Range by CDC	PSI Category
1	No Country	Less than 0.1%	Level 1
2	No Country	0.1 – <0.5%	Level 2
3	3 countries	0.5 – <1%	Level 3
4	4 countries	1.0 – <2.0%	Level 4
5	33 countries	2.0% or higher	Level 5



**Figure 2** Number of European countries lies between PSI Levels (1-5).

**Table 4:** Number of Asian countries lies between PSI Levels (1-5).

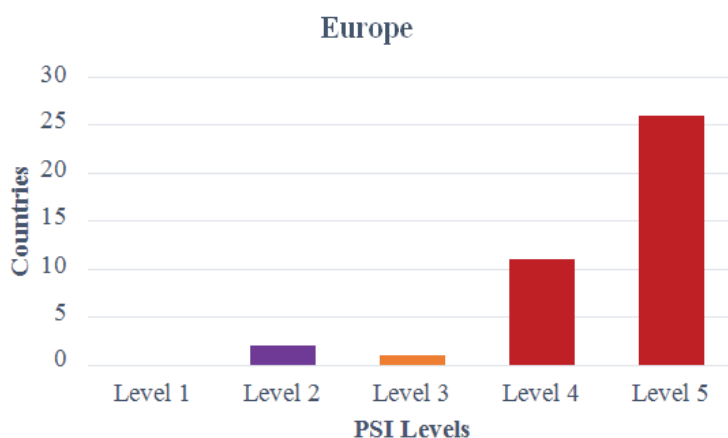
S. No.	CFR (%) Countries Count	CFR (%) Range by CDC	PSI Category
1	1 country	Less than 0.1%	Level 1
2	5 countries	0.1 – <0.5%	Level 2
3	10 countries	0.5 – <1%	Level 3
4	12 countries	1.0 – <2.0%	Level 4
5	12 countries	2.0% or higher	Level 5



**Figure 3** Number of Asian countries lies between PSI Levels (1-5).

**Table 5:** Number of European Countries lies between PSI Levels (1-5).

S. No.	CFR (%) Countries Count	CFR (%) Range by CDC	PSI Category
1	No Country	Less than 0.1%	Level 1
2	2 countries	0.1 – <0.5%	Level 2
3	1 country	0.5 – <1%	Level 3
4	11 countries	1.0 – <2.0%	Level 4
5	26 countries	2.0% or higher	Level 5



**Figure 4** Number of European Countries lies between PSI Levels (1-5).

severity index gives us a way to evade from the infection. Pandemic severity index should be measured in the early stage of the outbreak, according to which we can provide precise preventive measures and suggest numerous approaches to alleviate the chance of transmission and to control the pandemic.

Firstly, for Level 5, reducing the social distancing could perform a vital role whereas disinfection of cities and communities will not be effective as COVID-19 is not spread by the airborne path. Second, it is significant to wear N-95 masks and protective clothing foremost in hospitals where health-care staff is in direct contact with diseased patients. However, there is no evidence found that surgical masks can foil out the spread of COVID-19. Third, Study institutions should be closed unless the spread of the infection is under control, and child care centers are also closed. Fourth,

areas where most cases are reported should be under complete lockdown to avoid the spread of infection in other safe from infection areas. Fifth, Infected peoples are to stay at home and not to go for work until they are no longer infectious. For Level 1-4, in which severity of infection is not as much severe as in Level 5, Persons needs to follow the precautionary measures to stay safe from the infection. These are all called nonpharmaceutical measures, to slow down the spread of pandemic and to save lives when a vaccine possibly will be months away from the public availability [24].

Education about public health must be accordance with scientific affirmation to reduce the despair and anguish produced by fabrication. In practice, epidemiological results required to be reported in a timely and targeted way so that they can be

**Table 6:** Precautionary measures according to PSI Levels.

Precautions	Pandemic Severity Index		
	Level 1	Level 2-Level 3	Level 4-Level 5
<b>At Home</b>	Suggested	Suggested	Suggested
Isolation quarantine	Generally not suggested	Contemplate	Suggested
<b>At School</b>	Generally not suggested	Contemplate	Suggested
Childs social distancing Closure of schools Closure of child-care centers	Generally not suggested	Contemplate	Suggested
<b>At Working Place</b>	Generally not suggested	Contemplate	Suggested
Decrease social contact Increase social distancing Adjust or cancel public gathering to develop social distance	Generally not suggested	Contemplate	Suggested
	Generally not suggested	Contemplate	Suggested

evaluated and interpreted perfectly. Similarly, the progress of a vaccine is an urgent and prime concern for public health. We need to minimize social disruption and adverse economic affect by way of national and international cooperation. As well, it is also essential to handle the volatilities such as pandemic severity, degree of transmission and infection, treatment choices, and increasing the progress of diagnostics, curatives, and vaccines. There is a worldwide urgency for masks, hand sanitation products and other particular protective appliances. The virtual importance of non- pharmaceutical control measures including masks, hand hygiene, and social distancing require further research to quantify their impact [25].

Summary of these precautionary measures is given in the following **Table 6**.

## Results- Research Findings

In this research we find that the region of Asia on comparison with the region of Europe has least severity index. Pandemic severity index gives us a way to estimate the severity of a growing viral disease at early stages, according to that the precautionary measures should be followed to stay safe from the infection.

## References

- Huang C, Wang Y, Li X, Ren L, Zhao J, et al. (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet* 395: 497-506.
- Chan JFW, Yuan S, Kok KH, To KKW, Chu H, et al. (2020) A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *The Lancet* 395: 514-523.
- Chen N, Zhou M, Dong X, Qu J, Gong F, et al. (2020) Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet* 395: 507-513.
- Phan LT, Nguyen TV, Luong QC, Nguyen VT, Nguyen TH, et al. (2020) Importation and human-to-human transmission of a novel coronavirus in Vietnam. *N Engl J Med* 382: 872-874.
- Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, et al. (2020) Transmission of 2019-nCoV infection from an asymptomatic contact in Germany. *N Engl J Med* 382: 970-971.
- Sarkodie SA, Owusu PA (2020) Investigating the cases of novel coronavirus disease (COVID-19) in China using dynamic statistical techniques. *Heliyon* e03747.
- World Health Organization (Who) Novel Coronavirus Situation Report – 1 (2020). [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10\\_4](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10_4)
- World Health Organization (Who) Novel Coronavirus Situation Report – 22 (2020). [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200211-sitrep-22-ncov.pdf?sfvrsn=fb6d49b1\\_2](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200211-sitrep-22-ncov.pdf?sfvrsn=fb6d49b1_2).
- COVID-19 Pandemic in Asia (2020) [https://en.wikipedia.org/wiki/COVID-19\\_pandemic\\_in\\_Asia](https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Asia).
- Stoecklin SB, Rolland P, Silue Y, Mailles A, Campese C, et al. (2020) First cases of coronavirus disease 2019 (COVID-19) in France: surveillance, investigations and control measures, January 2020. *Euro Surveill* 25: 2000094.
- Cássaro FA, Pires LF (2020) Can we predict the occurrence of COVID-19 cases? Considerations using a simple model of growth. *Sci Total Environ* 728: 138834.
- World Health Organization (Who) Coronavirus disease 2019 (COVID-19) Situation Report 58 (2020). [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200318-sitrep-58-covid-19.pdf?sfvrsn=20876712\\_2](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200318-sitrep-58-covid-19.pdf?sfvrsn=20876712_2).
- World Health Organization (Who) Coronavirus disease 2019 (COVID-19) Situation Report- 57. [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200317-sitrep-57-covid-19.pdf?sfvrsn=a26922f2\\_4](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200317-sitrep-57-covid-19.pdf?sfvrsn=a26922f2_4).
- Wu D, Lu J, Liu Y, Zhang Z, Luo L (2020) Positive effects of COVID-19 control measures on influenza prevention, *International Journal of Infectious Diseases* (2020).
- Pandemic severity index. [https://en.wikipedia.org/wiki/Pandemic\\_severity\\_index](https://en.wikipedia.org/wiki/Pandemic_severity_index).
- Ribas Freitas A, Napimoga M, Donalisio M (2020) Assessing the severity of COVID-19, *Opinion Article. Epidemiol Serv Saúde* 29: 10.5123.
- Centres for disease control and Prevention. <https://www.cdc.gov/media/pdf/mitigation/slides.pdf%60>.
- CDC (2007) Interim pre-pandemic planning guidance: community strategy for pandemic influenza mitigation in the United States-early, targeted, layered use of nonpharmaceutical interventions.
- Panovska-Griffiths J, Grieco L, van Leeuwen E, Baguelin M, Pebody R, et al. (2019) Are we prepared for the next influenza pandemic? Lessons from modelling different preparedness policies against four pandemic scenarios. *J Theor Biol* 481: 223-232.

20. Mishra AC, Chadha MS, Choudhary ML, Potdar VA (2010) Pandemic influenza (H1N1) 2009 is associated with severe disease in India. PLoS One 5: e10540.
21. Wikipedia. [https://en.wikipedia.org/wiki/List\\_of\\_human\\_disease\\_case\\_fatality\\_rates](https://en.wikipedia.org/wiki/List_of_human_disease_case_fatality_rates).
22. Frost WH (1920) Statistics of influenza morbidity: with special reference to certain factors in case incidence and case fatality. Public Health Reports 35: 584-597.
23. Worldometer (2020) Coronavirus data. <https://www.worldometers.info/coronavirus/>.
24. Reed C, Biggerstaff M, Finelli L, Koonin LM, Beauvais D, et al. (2013) Novel framework for assessing epidemiologic effects of influenza epidemics and pandemics, Emerging infectious diseases 19: 85.
25. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19) (2020). <https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf>.