

**Towards healthy public spaces in the Egyptian communities;
inclusion health in public spaces**

An applied study Egyptian open parks

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Abstract:

The place is integral to health. Our everyday environments play a fundamental role in shaping how healthy we are, as individuals and as communities. Where we live, work, and play has a lot to do with why some people are healthier than others and can have a key role in determining why some people are not as healthy as they otherwise could be. A wealth of research demonstrates that place matters when it comes to health.

Public places that promote health, trust, and inclusion are essential. Every community needs such places, where all feel welcome and where all can “enjoy being part of the great congress of humanity”. Good public spaces allow for healthy public life - for social interactions both planned and spontaneous on sidewalks or at bus stops, in parks, at street fairs, urban plazas, outdoor concerts, and art installations.

In Egypt and as in many developing countries, our most important shared places - our public spaces - continue to be planned and designed without considering all users or an entire range of well-being. It's almost as though people in the fields of public health and urban planning and design speak different languages.

It is argued that our public places can help to unite us, and they can provide everyone with opportunities for good health. That's what this research is about. It aims to bridge the fields of public health and community planning and design

in new ways, with a focus on supporting inclusive healthy public spaces. Such spaces don't just build themselves. They don't happen in a vacuum. They need to be planned, created, refreshed, and promoted, intentionally, with the involvement of an engaged community

This research aims to explore how new communities in Egyptian cities are designing and using their public spaces to improve the health and well-being of their citizens. In this context, this research attempts to develop a framework as a tool for evaluating and creating healthy, inclusive public places that support health equity. The Framework and supporting analysis presented in this report represent a synthesis of research and expertise in public health and urban planning and design, focusing on those social determinants of health that can be viewed clearly through the lens of public space to promote healthier public spaces in Egyptian cities.

Keywords: Healthy public spaces; Healthy communities; Public health and urban design; Egypt.

1. Introduction.

The world now faces unprecedented restrictions as many...The world's population remains at home to WHO recommendations The world has announced to the public its recommendations for quarantine and distancing social distancing, and self-isolation have become a strategy The basics to limit the spread of this epidemic around the world [1,2] These procedures It not only affects individuals' desire for social interaction, but it also affects cities, parks, squares, and subways Although common spaces and city streets are designed.[3] Interconnectedness between cities is a major source of social progress However, this may help in the spread of COVID-19.

Following these trends and the necessity of cutting the chain of infection through...To limit population movement, urban designers face many challenges and questions about the difference between the trend in design towards an Increase in social relationships between individuals [4], And the need to separate Population during the current situation [5] Cities are witnessing unprecedented measures in using public places around the world. Despite this Despite the restrictions, it is possible to consider the epidemic as an opportunity to reread the city and its urban spaces. In light of this epidemic, he must resort Designers need to give priority to designing public urban spaces pedestrians and cyclists, and designing healthy buildings that would change cities for the better. According to the World Health Organization Global, "Healthy Cities Process and Planning are background papers Supporting the work of the World Health Organization" [6]. So, it became of It is necessary to emphasize the importance of orientation toward city and environmental designs in urban areas in a way that

provides a healthy environment for individuals. The mutual relationship between City elements such as buildings, streets, public parks, and architectural City infrastructure greatly affects the quality and effectiveness of life for individuals in cities [7]. Therefore, this research aims to study the effect The epidemic has had on the design of cities and urban areas over time, And the challenges that cities face in the current crisis Derived from an individual health perspective. The search is directed by Designers and planners towards what is the relationship between urban design and health. And discuss these cities' strategies to help restore Designing cities when facing any upcoming crises.

2. An overview of the history of epidemics and their effects on space and the city

The analytical chronological order of epidemics throughout history reveals... Over the past 200 years, the number of epidemics has been increasing, as have cities The arena for the spread of diseases, and the Coronavirus is not the first pandemic in the world, other epidemics struck and ended the world lives of millions [8]; (Figure 1) and through organized statistics World Health This figure reveals that the number of epidemics has increased sharply During the past two centuries, this rapid spread of diseases has led to...Millions of deaths throughout history. When epidemics, especially diseases, appear Respiratory system, precautionary measures emphasize the necessity of isolation, and closing public places. It also transforms the image of cities and public spaces into empty environments, which requires a change in the shape of the city, on for example; The Black Death crisis affected urban design In European societies by calling for the opening of more squares Large public space that provides more space, to allow communicating with people Nature and reduce the feeling of isolation. also. The clearest effect of epidemics is What Europe was witnessing, which led to modernity moving towards Openness and housing in the suburbs, in the early nineteenth century When a series of cholera epidemics struck the world, it was time an unfortunate urbanite in London in 1850; According to WHO data Global [9,10] one of the main causes of cholera is mixing with water Clean drinking with sewage, disease played a major role on street waste management, And support the feeling of desire Ventilation, daylighting, outdoor mobility and enhancing spaces Through which people can move. On the other hand; My luck The field of infrastructure design has a great opportunity for development in a crisis of Cholera. When it was found that the infection resulted from a mixture of wastewater Sanitation and drinking water in the Thames, subsequently, between 1918 and 1918 -1919 The deadliest "Spanish influenza pandemic" occurred History that killed more than 50 million people throughout the world, a clear impact on slowing urban growth and reducing from public life for some time to slow the spread of the disease.

It greatly affected the nature of social life and interaction Environmental and urban growth, for example, have been replaced by methods of public transportation by walking on uncrowded streets, the sidewalks at night were often unusually clear.[11,12] Residents prefer to stay at home, which is similar to what is happening now in the Coronavirus crisis, COVID-19 has been added to the list long term for rapidly spreading infectious diseases in the current century, such as Tuberculosis in South Africa in 2006, and Ebola in West Africa in 2006 2014 ,presenting a new challenge for cities and it becomes necessary Transforming into healthy cities [6], so the need to take action arose Studies on epidemics and their impact on urban design and system creation Healthy and competent, he became Finally, as history always reminds us of the interrelationship between diseases Critical and future cities, where

they can leave marks In our cities, our communities, and ourselves, we must know that things will not Be as it was in the past.

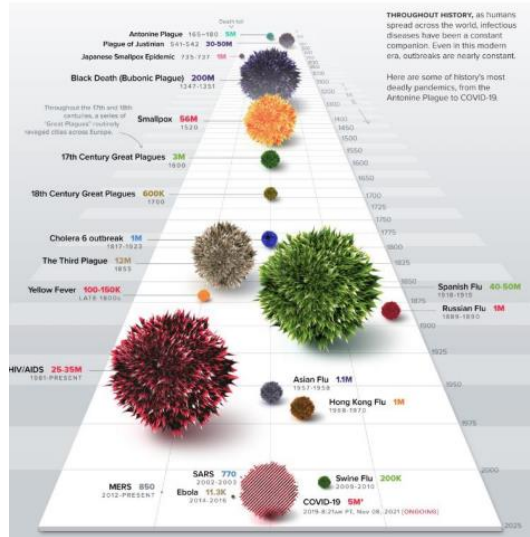


Figure (1): The deadliest epidemics throughout history Source

3. Research objective

Throughout history, cities have been affected by various epidemics. It is worth Noting that every epidemic has provided opportunities for urban designers to gain. New skills. In this regard, understanding the social consequences of the cultural and economic impact of the COVID-19 pandemic will also shed light on designing more efficient cities. “With the increasing number of positive cases Mortality is associated with the size of cities and the population density it faces “Population is a high risk.” [13] The COVID-19 pandemic may be an opportunity to improve cities by incorporating social behavior in the time of pandemic The health perspective as one of the pillars of urban space design social services in the city to confront global epidemics. Figure.(2) This helps urban designers prepare for Facing any other crises

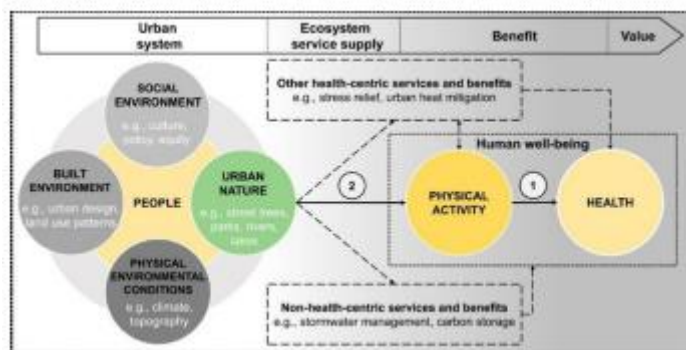


Fig (2): Integration of the health and social system into urban design to produce Ideal cities

4. Previous studies on the impact of the pandemic on the concept of urban space

Since the early days of the COVID-19 crisis, the global community has been striving continuously to shed light on different issues such as driving mechanisms The spread of the virus and its environmental, social, and economic impacts, and plans and policies for recovery and adaptation to the crisis. Due to the high-density Population and economic activities cities are often hotspots for COVID-19 infection (Accordingly, many researchers have sought...To understand the effects of the pandemic on cities and highlight lessons The main ones that can be learned for planning and designing Urban post-COVID-19, from these studies:(Sharifi, A., & Khavarian-Garmsir, A. - Research Paper) 1

(2020)discussed the effects of the COVID-19 pandemic on...Cities linked this impact mainly to four themes President, it is1) Environmental quality, (2) Social impacts and economics, (3) management and governance, and (4) transportation and design Urban. By a diverse research agenda, the paper covers Research issues related to air quality and meteorological standards Atmospheric conditions, prevailing water quality, and air and shed improvements Highlighting the important environmental impacts of human activities and concludes the study is a call to wake up and adopt development paths

Environmentally friendly and sustainable. [14] As shown in the figure Number 3.

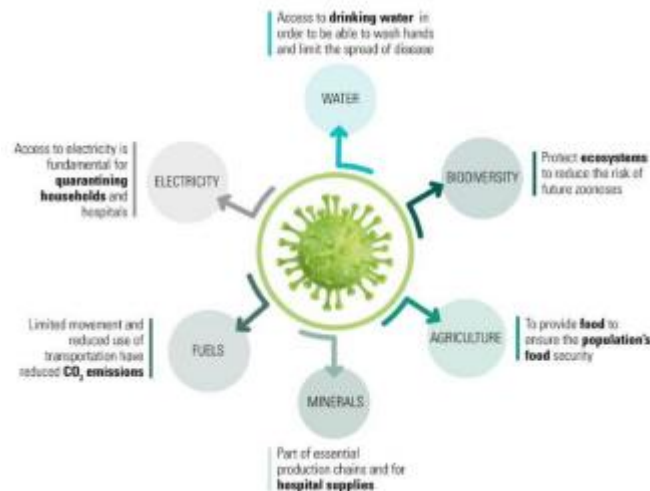


Figure (3): The impact of the pandemic on environmental, social and economic factors in Sharifi, A., & Khavarian-Garmsir, A. R., City Source: 2020

As for the study (15, Pisano, 2020C), it sought to provide a series of factors that must be taken into consideration in building A framework for identifying and evaluating strategies for post-cities CVID-19. Through the use of a mutual learning methodology ,this contribution is based on the concept of the prevention zone EPA epidemics proposed by a research team at the College of Engineering Mohammad, W. M., Al-Nuaimi, F. S., & AlHinkawi, W. S. (2021). Transformations of The Urban Space’s Concept Due to the Covid-19 Pandemic. Journal Port Science Research, 4(2), pp 96-110, <https://doi.org/10.36371/port.2021.2.61003> (Architecture, Southeastern University SEU in China with chair UNESCO in Cultural Resources

Management, as a System Urban response to the COVID-19 pandemic, and extracting its factors and compare it with two European strategies for a certain stage After the pandemic [16], the study concluded by identifying three important factors that can define the features of post-pandemic cities and confront them Future epidemiological events and these factors are: (1– Centralization of services, -2 Hierarchy of the transportation system And public services, 3- Redundancy in public and semi-public jobs the public.

The study (Nia, 2021) showed a strong difference between Epidemic disasters and other forms of disasters. Epidemic disasters Threaten users of public places while disasters may affect them others on infrastructure. Moreover, it is usually Disasters caused by the pandemic are long-term and have consequences with Huge economic impact, the study suggested several strategies for long and short-term interventions that promote tissue development in Urban areas that can withstand the pandemic. reveal results This study suggests that in the post-pandemic era, we must rethink Everything related to social, economic and environmental aspects The dimensions of functional urban spaces and suggest considerations Biology of epidemics in functional cities based on the urban approach Smart technologies are developing in a way that protects city residents from negative impacts for epidemics. As a use “Touchless technologies, control Voice, facial recognition technologies, smart cards, Smart devices, elevators or door motion sensors, Self-cleaning spaces, especially in commercial spaces. It is considered an important means of eliminating the virus[17] .

Based on previous and contemporary views, we conclude that: The pandemic may directly and strongly affect the lives of residents and the way they live They live in social spaces, so the concept of space has changed Urban social change from a space of social interaction to a space of isolation and distance, and through understanding the components of urban space that are most affected with the pandemic, the research problem will be addressed through the following dimensions:(City density, street design, public places, parks, green spaces, building design, smart city technologies (from as it relates to the health of the population during the epidemic and re-read it accordingly the urban system of the city.

2) Dimensions and factors

The research will discuss six of the factors and dimensions that were investigated and extracted from previous studies that were adopted to find measurement tools that contribute to solving the research problem under study as follows:

1) City density

Population density is one of the most basic factors that affects the spread of epidemics directly, in other words, as the density increases population, the risk of infection increases [18]. Therefore, cities need to Design reviews not only to achieve social justice but also to confront epidemics sustainably. It is worth mentioning that the first attempts at revising urban designs came to stop the spread Cholera epidemic in London in 1850, when useful measures were taken to reduce the epidemic and prevent its spread by reducing population density in Some cities and Expanding parks and streets and creating drainage systems sanitation and isolating it from the pure water system within the Corona pandemic The World Health Organization has set regulations to avoid crowding and closing gathering places, as is the case in many countries Cafes, restaurants, theatres, shopping malls and public spaces were closed Green and schools. In addition to precautionary measures for the use of Means of transportation, places, and hotspots where it can spread contain the virus Although closing public places was

a measure Effectively mentioned the orders to stop gatherings, isolation, and quarantine, it affected big cities that responded early [19], but especially in countries like Egypt; Complete closure is not possible for economic reasons Social, environmental...etc. Which required decision-makers to find Ways to push people to live in less dense places instead of Living in crowded cities. There was another planning proposal to address the problem of overcrowding in cities, it was proposed by the mayor of Paris (Anne Hidalgo) in her latest campaign that proposed a policy of Decentralization and dismantling of the city, which can reduce density Intensely, and enhances the concept of walking in every neighborhood, which contains Homes, jobs, facilities, stores, etc. [20], According to Birch's study[21]If neighborhoods were changed to become more accessible Its landmarks are on foot, providing services and jobs in those areas' communities; Cities may be able to mitigate Congestion in various systems such as public transportation. from the side of Anthropology, walking is not just human movement, but also culture and social exercise enables them to enhance physical activity and affect Population health as well as increasing the value of urban spaces[21] ".For example, incorporating walkability into inner neighborhoods As an environmental advantage, many other researches have shown the importance of incorporating...Walkability index in the urban environment and its beneficial effects on...Health, economics, and other aspects[22,23]

2)Street design

The most important challenge facing the world in the twenty-first century is the challenge of major epidemics, sparking calls to reconsider Approaches to dealing with and fighting disease everywhere the population is In tandem with him, a key part of the solution is redesigning the streets This procedure requires providing alternatives for other uses In addition to vehicle traffic, this includes pedestrians and cyclists Alleys, and this measure aims to create more sustainability Social tools for healthier cities in times of pandemic. [24]. from It is also necessary to highlight the use of sidewalks in rehabilitation Street design. The gist of this strategy is saving Appropriate spaces that enhance environmental enjoyment [25]. This one Street strategy will reduce the chances of pollution in the era post-pandemic, adding another lane for users like my rider Bicycles and pedestrians. Creating healthier and more socially sustainable cities affects the behavior of citizens in times of epidemics [26]. I have eaten the study conducted by Litman Healthy Urban Areas is Places where people live in a walkable community with Low-risk opportunities [27] to achieve social distancing Allowing the widest space between users, as part of the solution To limit epidemics and prevent them from spreading, it is possible to think about repeating Designing streets and also prohibiting the passage of cars on some streets Providing more spaces for pedestrians and cyclists who turn The city into a green, low-carbon city [28]. Some cities Such as the city of Barcelona directed to study street traffic And redirect it in a way that prevents crowding and reduces gatherings Humanity [29], several cities have begun to expand Streets in the city [30] such as the cities of Vienna, Boston, and Oakland In Philadelphia, some roads were closed to increase the space allocated for pedestrians And cyclists as a form of response to the epidemic is another example: The city of Bogota has expanded bike lanes and added more Temporary pedestrian walkways. Mexico City has a plan Similar to infrastructure development and addressing diverse issues e.g. Health, safety, economics, etc. [31,32] In addition, when Redesigning streets and taking into account increasing pedestrian and transportation spaces by being active, goals can be achieved and overall health maintained. It is worth noting when referring to the

street redesign point of view During the outbreak of the epidemic; What new standards should be taken into account? When using sidewalks. Such as moving away while queuing It requires providing the widest sidewalks and walkways while leaving a safe distance of About 1.5 m. Add more space to accommodate the waiting list Entrances to public facilities, providing fixed seats for the elderly, and discrimination The individual's destination with the entry sign. [28]

3) Public squares

The urban structure consists of a group of spaces and places with public facilities for social interaction including theaters and museums public libraries, sports facilities, etc., where possible People gather and engage in social activities. This is one of the most important measures The essential way to confront this epidemic is social distancing policies and limiting gatherings in public places, as part of those policies Governments have encouraged people to stay home and, or cancel or postpone large public occasions and events calling for gatherings Activities of theatres, museums, libraries, and assembly in establishments Sports, schools, universities, factories and markets and their closure. In addition to restricting presence in public places according to a parking plan and moving within calculated spaces to achieve social distancing at the time [33,34] With signs to enforce respect for distance Not less than one meter between space users with seating arrangement in public places, leave a seat between every two seats and stand Spaced at least two meters apart in corridors, organizing locations To park at shopping places and pay bills by applying adhesive tape On the ground or specify parking locations. The places used public facilities such as stadiums, conference centers, and hospitals Emergency because it can no longer accommodate the huge number of patients. And it was the quickest practical approach to adapting existing buildings. These temporary hospitals may seem primitive, but they are the best option currently. The scenario is the same all over the world, whether it is Closed and reopened hospitals, many hotels Vacant, or modernized stadiums for healthcare[35,36] However, the vast majority of those hospitals are not Designed in open areas described as courtyards. But the places the public has always been a destination for many individuals, many of whom were Religious and cultural centers for celebrations [37]. So, it could be Designers' attention is directed to rediscovering uses of Social and recreational facilities and redesigning according to the needs of Human design and design as follows: Flexible spaces and resistance to the epidemic [38] after the epidemic has passed and its effects have ended, may There is a need for new guidelines for describing public spaces, And the design in terms of distances and densities, or the presence of risks to Public Health [39] (Figure No. (5))



Figure (4): Social distancing distances in urban spaces

4) For gardens and green spaces

Green spaces are part of urban space and have shaped It has long been a human need to help reduce stress and improve Psychological, physical, and mental health. In the time of the pandemic, it has changed These areas were transformed into security isolation areas, and this was a challenge in terms of Controlling the transmission of Covid-19 in the outdoor environment[40] Naturally, the trend in sanitary design will be to Providing green spaces, as many studies have dealt with the importance of visual contact with nature enhances health The physical and psychological health of individuals [41]. Rezoning green spaces and parks inside cities. Designers may need to create more spaces and practices for individual use in planning green spaces, such as expanding running paths and paying attention to small neighborhood gardens, as one of the new solutions that provide for individuals to enjoy public parks, they do what is called circles social distance. This is already done in many parks like Brooklyn Park, Domino Park in New York, park Dolores in San Francisco [42] is a great idea suggested for green infrastructure, which improves public health. The system is more useful than scattered parks, so the parks are for residents, it facilitates communication with nature and ease of technology and movement [42,21] Like what happened in Singapore and the so-called network It is (PCN- park connected network) with the connected park It is a green network that can easily communicate between. Highly populated areas and natural areas, where Everyone can explore Singapore through green roads It depends on different rings on the island [43] See Figure (5)



Figure (5): The idea of the network connected to the park

Landscapes are often considered beneficial to human health. with the need to pay attention to increasing green spaces, they must be of good quality Landscape composition is also studied, as composition is not the proper type of tree used can lead to a range of Diseases. For example, researcher Thomas Leo Ogren studied the Effect of horticultural plants causing allergies [45]. you can add Minor improvements to enhance overall health, such as the inclusion of new items in landscapes, for example; Temporary hand washing stations It becomes a general culture. After the current crisis ends, you may need many more from cities to rethink unused spaces and build roofs and Homes [46] Many sites are in cities such as Brownfield Chicago, Barcelona, and many Egyptian cities. Finally, can gardens and green spaces encourage more people to Get out of their homes safely and stay safe at the same time Hence the importance of research is to take these considerations into account and apply them to Egyptian open gardens and achieve a readjustment by the variables of the Coronavirus.

5. The determinants of choosing case studies (Shagaret Al-Dor in Mansoura - Sana'a Park in Kafr El-Sheikh).

A-The two Parks are the largest in their two provinces, with the area of Shagaret Al-Dor Park being 20,000 acres and the area of Sanaa Park being 30,000 square meters.

B- The two Parks are the only recreation for the simple classes in the two provinces, and the locals from all the neighboring villages visit them on holidays and public occasions.

C-Both of them are accompanied by important public facilities. The Sana'a Garden is accompanied by an important zoo in the province, attracting many visitors, and the Shagaret Al-Dor Park is accompanied by an important nursery specific to the province.

D-Both are located within the campuses of the two provinces' universities.

E-Both are located on main and important streets in their provinces. Shagaret Al-Dor Park is located on Republic Street, which is one of the important and busy streets in Mansoura, extending across the city. The Sana'a Garden in Kafr El-Sheikh is located on Central Street, a main street in Kafr El-Sheikh, crossing the city.

F-The two Parks host many commercial shops, restaurants, cafes, and government institutions.

G-Both host many rare plants and flowers.

H-Both suffer from neglect and lack of development.

6. The design criteria employed in the research and applied to the case study (Shagret Al-Dor Park in Mansoura - Sana'a Park in Kafr El-Sheikh) to combat the spread of the coronavirus were as follows:

6.1. (Enhancing social distancing) was achieved by implementing the following measures:

a) The presence of open and sufficient spaces for visitors ensures the maintenance of safe distances between them, with no less than one meter between individuals, to minimize crowding and congestion.

b) The design of main and subsidiary pathways with widths that limit proximity between visitors, with no pathway width less than 4-5 meters.

c) Providing awareness signage and health instructions throughout the park to remind visitors of the importance of social distancing, in all park areas and on the ground.

d) Arranging seating in a manner that guarantees gaps between them to enhance social distancing, ensure necessary privacy, and establish safe distances between seats through floor markings.

6.2. Adopting design and planning strategies aimed at reducing the spread of the coronavirus:

A-Dividing the main seating areas into smaller and scattered areas to limit the spread of the coronavirus in case of an infected case in one of the areas.

B-Distributing seating areas in a way that controls the airflow dynamics, thereby reducing the chances of infection spread.

C-Designing spacious plazas and distribution areas in separate locations throughout the park to avoid overcrowding.

D-Adopting a vertical separation approach between different areas in the design to reduce crowding among visitors and using plant walls and vegetation to limit the spread of diseases and infections.

E-Avoiding shared areas such as group sports facilities and designing individual play areas that ensure social distancing between individuals.

O-Designing main pathways in a way that allows flexible visitor flow in multiple directions to ensure no congestion during movement.

P-Flexibility in design to adapt to public health requirements and integrating sustainability standards, such as minimal energy consumption, reliance on renewable energy, use of local materials with recycling potential, and using environmentally friendly materials to minimize environmental damage and utilizing irrigation systems that greatly reduce water usage and make use of rainwater while minimizing loss.

G-Providing open relaxation areas between different areas in the park for outdoor enjoyment without the need for medical masks.

F-Using materials that reduce the spread of viruses like the coronavirus, such as non-porous nanotechnology materials, when designing various park seating and finishing materials for buildings and pathways.

S-Encouraging wireless communication within the park to reduce physical contact, thus requiring an open Wi-Fi network within the park.

K-Clearly indicating the maximum capacity for each area within the park through signage placed in prominent locations, stating the appropriate number for each area, and monitoring it securely.

L-Utilizing artificial intelligence technology to reduce the spread of the coronavirus by providing screens in clear locations within the park that direct visitors to less crowded areas.

M-Encouraging electronic payments in stores and restaurants within the park to minimize contact and thus reduce the chances of infection spread.

N-Continuous evaluation and measurement of the effectiveness of the park's design in reducing the spread of the coronavirus and addressing any existing weaknesses.

Q- Encourage plant biodiversity in the design, such as using plant elements like trees and shrubs that are resistant to insect infestations, thereby reducing the spread of infections in the park, such as cypress trees, junipers, and neem trees.

Z-Considering the design of celebration and event spaces to be in open areas with appropriate spaces.

6.3. Implementing appropriate health measures to reduce the spread of the coronavirus:

A- Providing sterilization devices at various entrances and stations for hand sanitization in different places in the park.

B- Providing medical units and kits in suitable areas in the park for quarantine, providing healthcare for suspected cases, and ensuring proper handling in case of confirmed infection with the coronavirus.

C- Improving the park's health facilities and maintaining them regularly to reduce the spread of diseases and viruses in general.

D- Regular cleaning and sterilization of facilities and public devices such as public restrooms, playground equipment, and benches.

7. Farmwork used to design proposals for the two case studies:

Two Proposals have been made for each case study, so proposal (A-B) is for Shagaret Al-Dor Park, and proposal (A-B) is for Sana'a Park, and then the criteria used in the research applied to all proposals and then evaluated in terms of achieving the rates of benefit from those criteria in resisting the Coronavirus and choosing the best proposal for each case study.



Fig (6) Proposal (A) for Shagaret Al-Dor Park in Mansoura



Fig (7) Proposal (B) for Shagaret Al-Dor Park in Mansoura

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8.Evaluation of proposals (A-B) for Shagaret Al-Dor Park in Mansoura in terms of benefiting from the criteria used in the research on combating the Corona virus:

The categories of Criteria used in the research	criteria used in the research on combating the coronavirus	The attainment rates of standards							
		Proposal A				Proposal B			
		Excellent	Good	Fair	Week	Excellent	Good	Fair	Week
Enhancing social distancing	a) The presence of open and sufficient spaces for visitors		✓			✓			
	b) The design of main and subsidiary pathways with widths that limit proximity between visitors	✓				✓			
	c) Providing awareness signage and health instructions throughout the park	✓				✓			
	d) Arranging seating in a manner that guarantees gaps between them to enhance social distancing			✓		✓			
Adopting design and planning strategies aimed at reducing the spread of the coronavirus	A-Dividing the main seating areas into smaller and scattered areas to limit the spread of the coronavirus		✓			✓			
	B-Distributing seating areas in a way that controls the airflow dynamics				✓	✓			
	C-Designing spacious plazas and distribution areas in	✓					✓		

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	separate locations throughout the park								
	D-Adopting a vertical separation approach between different areas in the design to reduce crowding among visitors				✓	✓			
	E-Avoiding shared areas such as group sports facilities and designing individual play areas	✓				✓			
	O-Designing main pathways in a way that allows flexible visitor flow in multiple directions	✓				✓			
	P-Flexibility in design to adapt to public health requirements and integrating sustainability standards	✓				✓			
	G-Providing open relaxation areas between different areas in the park for outdoor enjoyment without the need for medical masks. F-Using materials that reduce the spread of viruses like the coronavirus, such as non-porous nanotechnology materials				✓		✓		
	S-Encouraging wireless communication	✓				✓			

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	within the park to reduce physical contact								
	K-Clearly indicating the maximum capacity for each area within the park through signage placed in prominent locations		✓			✓			
	L-Utilizing artificial intelligence technology to reduce the spread of the coronavirus by providing screens in clear locations			✓		✓			
	M-Encouraging electronic payments in stores and restaurants within the park to minimize contact	✓				✓			
	N-Continuous evaluation and measurement of the effectiveness of the park's design in reducing the spread of the coronavirus	✓				✓			
	Q-Encouraging plant biodiversity in the design, such as using plant elements like trees and shrubs that are resistant to insect infestations	✓				✓			
	Z-Considering the design of celebration and event spaces to be in open areas			✓			✓		

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	with appropriate spaces.								
Implementing appropriate health measures to reduce the spread of the coronavirus	A-Providing sterilization devices at various entrances and stations				✓		✓		
	B-Providing medical units and kits in suitable areas in the park for quarantine	✓				✓			
	C-Improving the park's health facilities and maintaining them regularly to reduce the spread of diseases	✓				✓			
	D-Regular cleaning and sterilization of facilities and public devices such as public restrooms, playground equipment, and benches.	✓				✓			

From the previous results, we find that proposal (B) is the best in terms of the availability of higher rates of the design criteria used in the research to resist the Coronavirus.

9. Evaluation of proposals (A-B) for SANAA Park in KAFR AL-SHEKH in terms of benefiting from the criteria used in the research on combating the coronavirus:



Fig(8)proposal (A) for SANAA Park in Kafr AL-Sheikh



Fig(9)Proposal (B) for SANAA Park in Kafr AL-Sheikh

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The categories of Criteria used in the research.	criteria used in the research on combating the Corona virus	The attainment rates of standards							
		Proposal A				Proposal B			
		Excellent	Good	Fair	Week	Excellent	Good	Fair	Week
Enhancing social distancing	a) The presence of open and sufficient spaces for visitors	✓						✓	
	b) The design of main and subsidiary pathways with widths that limit proximity between visitors	✓					✓		
	c) Providing awareness signage and health instructions throughout the park	✓				✓			
	d) Arranging seating in a manner that guarantees gaps between them to enhance social distancing				✓		✓		
Adopting design and planning strategies aimed at reducing the spread of the coronavirus	A-Dividing the main seating areas into smaller and scattered areas to limit the spread of the coronavirus	✓					✓		
	B-Distributing seating areas in a way that controls		✓				✓		

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	the airflow dynamics								
	C-Designing spacious plazas and distribution areas in separate locations throughout the park	✓					✓		
	D-Adopting a vertical separation approach between different areas in the design to reduce crowding among visitors	✓						✓	
	E-Avoiding shared areas such as group sports facilities and designing individual play areas	✓						✓	
	O-Designing main pathways in a way that allows flexible visitor flow in multiple directions	✓				✓			
	P-Flexibility in design to adapt to public health requirements and integrating sustainability standards		✓				✓		
	G-Providing open relaxation areas between different areas in	✓						✓	

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	the park for outdoor enjoyment without the need for medical masks.								
	F-Using materials that reduce the spread of viruses like the coronavirus, such as non-porous nanotechnology materials	✓				✓			
	S-Encouraging wireless communication within the park to reduce physical contact	✓				✓			
	K-Clearly indicating the maximum capacity for each area within the park through signage placed in prominent locations	✓				✓			
	L-Utilizing artificial intelligence technology to reduce the spread of the coronavirus by providing screens in clear locations	✓				✓			

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	M-Encouraging electronic payments in stores and restaurants within the park to minimize contact	✓					✓		
	N-Continuous evaluation and measurement of the effectiveness of the park's design in reducing the spread of the coronavirus	✓					✓		
	Q-Encouraging plant biodiversity in the design, such as using plant elements like trees and shrubs that are resistant to insect infestations	✓					✓		
	Z-Considering the design of celebration and event spaces to be in open areas with appropriate spaces.	✓					✓		
Implementing appropriate health measures to reduce the spread of the	A-Providing sterilization devices at various entrances and stations	✓					✓		
	B-Providing medical units and kits in suitable areas in	✓					✓		

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coronaviruses	the park for quarantine								
	C-Improving the park's health facilities and maintaining them regularly to reduce the spread of diseases	✓				✓			
	D-Regular cleaning and sterilization of facilities and public devices such as public restrooms, playground equipment, and benches.	✓				✓			

From the previous results, we find that proposal (A) is the best in terms of the availability of higher rates of the design criteria used in the research to resist the Coronavirus.

10. Conclusion:

- The applied strategy proposed in the research can be guided and circulated to open gardens to guide design during epidemics.
- The design strategy presented in the research was applied to two case studies: San'a Park in Kafr El-Sheikh and Shagret Al-dor Park in Mansoura. Through the research, it became clear that they both share many qualities and components, making them good choices for the study.
- Two alternative designs were proposed for each park, taking into consideration the application of the design strategy presented in the research to reduce the spread of the coronavirus in all the proposed alternatives. The alternatives for each park were evaluated based on design criteria, and the results ranged from excellent to weak.
- The best alternative was chosen, where the strategy could be implemented to a greater extent, and it was presented as an exemplary model for designing any public park in Egypt that works to reduce the spread of the coronavirus during a pandemic.

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