



Cities Can Seriously Damage Your Health!

If you live in an urban area the chances are that your life expectancy will be shorter. The UK is a good example of this trend in the developed world; see **Table 1**.

Table 1 Life expectancy in the United Kingdom

	Females	Males
UK	83.0	79.1
Urban Areas	82.6	78.6
Rural Areas	83.7	80.2

Source: O.N.S.

In developing countries, the rapid growth of poorly planned urban centres has led to the development of underserved settlements characterised by:

- inadequate sanitation and waste removal.
- unsafe drinking water.
- poor housing conditions.
- poverty and malnutrition.

While there are many differences between cities in the developed and less developed parts of the world, they do share one common feature. It tends to be the urban poor who are more vulnerable to prolonged ill health (morbidity) and premature death.

A recent study made in Sheffield, United Kingdom, showed that the gap in life expectancy between the most and least deprived parts of Sheffield is 10 years for men and 7 years for women. In both cases this is lower than the U.K. average (Source: *Director of Public Health Report 2016*).

Table 2 Female Life Expectancy across Sheffield

Most deprived	Female healthy life expectancy	Least deprived	Female healthy life expectancy
Firth Park	50–55 yrs	Eccleshall	75+ yrs
Southey	55 yrs	Fulwood	70–75 yrs
Burngreave	50–55 yrs	Dore and Totley	70–75 yrs
Manor Castle	50–55 yrs	Graves Park	65–70 yrs
Arbourthorne	50–55 yrs	Crookes	70–75 yrs

When looking at how many years of healthy life Sheffield residents can expect (relates to morbidity) the figures are even more stark:

- Low income households can expect just 50 years of healthy life or to put it another way (assuming a life span of over 75 years) 25 years of long-term limiting illness.
- In comparison higher income households can expect over 70 years of healthy life.

The situation is similar in developing countries. In most countries, slum children have much poorer health outcomes and childhood illnesses and malnutrition are higher among children living in slum communities compared to those living elsewhere.

What is it that makes cities unhealthy?

The health of a city population is determined by a range of factors:

1. The presence and spread of infectious disease.
2. Air quality.
3. Water quality, sanitation and personal hygiene.
4. Garbage and waste disposal.
5. Crime and safety..

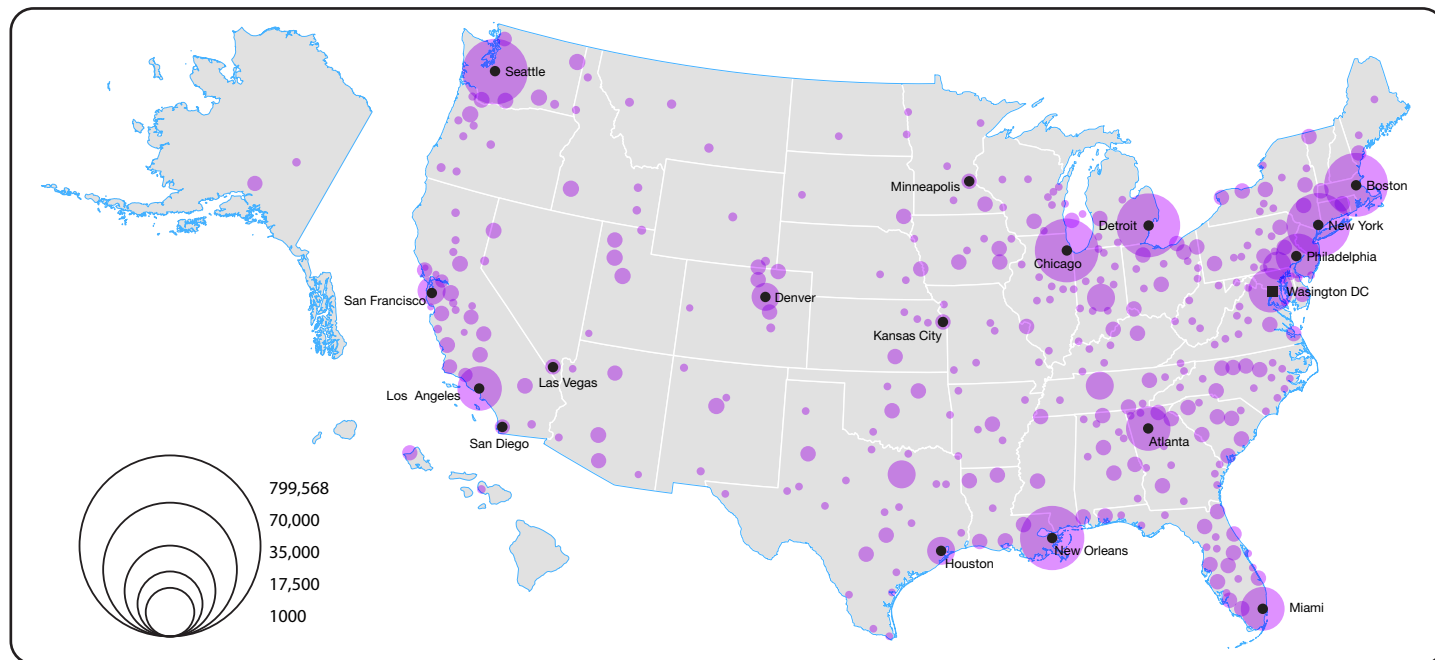
1. Infectious disease

Diseases such as hepatitis, tuberculosis, malaria and HIV Aids are major global killers and flourish in cities. Tuberculosis is fast becoming an urban health issue. High rates of TB have been reported in large cities throughout the world prompting concerns of possible urban TB epidemics in the future as more people migrate into cities. In addition, viral diseases like dengue fever, diarrhoea, whilst less likely to cause death are endemic in many cities in the tropics and are responsible for high levels of morbidity. This is because:

- Cities concentrate large populations into high density neighbourhoods, which facilitates the rapid transmission of infectious disease.
- Vulnerable populations tend to concentrate in cities, e.g. children, the old, those with mobility issues, and people with long term limiting illnesses.
- Parts of cities also concentrate higher levels of poverty and deprivation which can lead via malnutrition poor housing conditions and inadequate water supply to a lowering of the immunity of the population.

When people live travel and work in high concentrations, disease agents and vectors multiply and can lead to the rapid spread of infection. This was the case with the rapid onset and spread of COVID 19 not just in the London, but also metropolitan areas of the USA (see **Figure 1**), Sao Paulo in Brazil and most of Northern Italy.

Figure 1 COVID-19 cases in the USA as of April 2020



Source: Brookings.edu

The recent COVID-19 outbreak showed clusters of cases in many cities because of the high density of populations and therefore high level of contacts, for example, on public transport. The larger circles on **Figure 1** sit over the main metropolitan areas of New York and the Eastern Seaboard cities, Chicago, New Orleans, Miami, San Francisco and Los Angeles.

- One pollutant PM2.5 is estimated to be the cause of 1 in 19 deaths in the UK’s largest towns and cities (116 in the South East).
- The proportion of deaths from pollution is highest in the South-East, and particularly in London, Slough and Luton where an estimated 1 in 16 people die from exposure to PM2.5. In the UK air quality is worse in urban areas:

2. Air Quality

Poor air quality is an almost universal problem in cities. Los Angeles is (in)famous for its photochemical smog; see **Figure 2**.

Definition: PM2.5 refers to atmospheric particulate matter (PM) that has a diameter of less than 2.5 micrometers.

Figure 2 Smog haze Los Angeles



However, in nearly all major cities air pollution from a number of sources exceeds recommended limits. Perhaps, the absolute worst example is New Delhi, India. Check out this YouTube link: https://www.youtube.com/watch?v=p0_str5bPIQ

Example: The United Kingdom. Air quality is worse in urban areas. Source: *Cities Outlook 2020; Holding our breath. Centre for Cities.*

The main sources of pollution are as follows:

- Cars and trucks emit nitrous oxide, carbon monoxide, ozone, hydrocarbons and small particulate matter (SPM).
- Manufacturing industry contributes significant amounts of sulphur dioxide, carbon dioxide, lead mercury and SPM.
- Incinerators also emit a range of greenhouse gases together with traces of metal and organic compounds and SPM.

The result is a toxic mix of compounds which can promote respiratory diseases amongst the urban population such as chronic obstructive lung disease and asthma and lung cancer.

Globally, seven million deaths are attributable to the joint effects of household and ambient air pollution, annually.

The people most affected are those with chronic lung disease, lung cancer and asthma. But it is also being increasingly associated with cardiocerebral vascular disease, heart disease and even adverse effects on nervous system.

Air quality in cities needs to improve rapidly in order to reduce the negative impacts on health, and the rapid improvement in air quality in many large cities during the lockdowns imposed by governments during the COVID 19 crisis only serve to remind city populations of what their air should be like.

However, cleaning up air pollution will take a concerted effort to reduce the source of those pollutants; vehicles, manufacturing industry and effluent from domestic coal and wood burners.

On the positive side several cities across Europe in particular, have taken the view that reducing the number of vehicles in cities is a good place to start. London, with its congestion charging and low emission zone is one example. The question is do they work?

Case Study: Traffic Management Madrid Central

Over the past decade, there have been increasing attempts in many European cities to improve air quality. As a result, there has been noted a clear snowball effect in the rising trend of air quality policies, introduced to target the reduction of emissions. One such example is Madrid.

Located within the ‘geographical heart’ of Spain (Figure 3), Madrid has estimated population five million inhabitants residing in the area Metropolitan Area of Madrid (MAM), an area of approximately 2000km². Despite low levels of industry, the area has seen increasingly levels of greenhouse gas emissions (GHG), in particular pollutants such as NO_x (nitrogen oxides) and PM (particulate matter). Throughout most of the early 21st century, NO_x levels in Madrid were recorded at ‘70’, significantly above the recommended levels of 0–50. This is attributed to the following:

- Increasing size of the conurbation due to suburbanization of both housing and employment.
- Car ownership rates in the region have increased and are higher (690/1000 inhabitants) than the Spanish average (500/1000 inhabitants).
- High levels of congestion in MAM due to an approximate 2 million commuters into the area each day.

- Vast highways and road networks in MAM connect the central area to the suburbs and surrounding areas.

What did the government do?

In response to the increasing concerns with regards air quality, the Madrid government devised ‘Plan A’, part of a larger ‘Air Quality and Climate Change plan’ in 2017. This particular TPAQ (Transport Policy for improving Air Quality) involved the creation of a Low-Emission Zone (LEZ) in the centre of the city. Madrid is one of over 250 cities in the EU to have introduced such measures and features the following:

Restrictions on access and parking rights depending on the emission class of vehicles – this involved 472 hectares of the city centre being made off limits to traffic, detailed by signs and zoning (see Figure 4) This included banning some of the oldest and highest pollutant vehicles.

- **Specialised authorization** through permits or ‘*sticker Distintivo Ambiental*’ – this enables certain vehicles to circulate and park in the MAM. These are reserved for residents, those with parking spaces and those with formal employment.
- **Upgrading and subsidising public transport** – strong public investment in expanding infrastructure, including the underground networks which have increased by 139% in size since 1995. In addition, a ‘flat’ fare of €20 for residents under 26 years old.
- **Fines and penalties** – monitored by cameras that ensure the zones remain car-free (except for those with ‘stickers’, the LEZ is enforced through €90 fines.

Figure 3 Case Study Area: (a) Madrid city location in Central Spain (b) Location of Madrid Central LEZ (Low-Emission Zone)

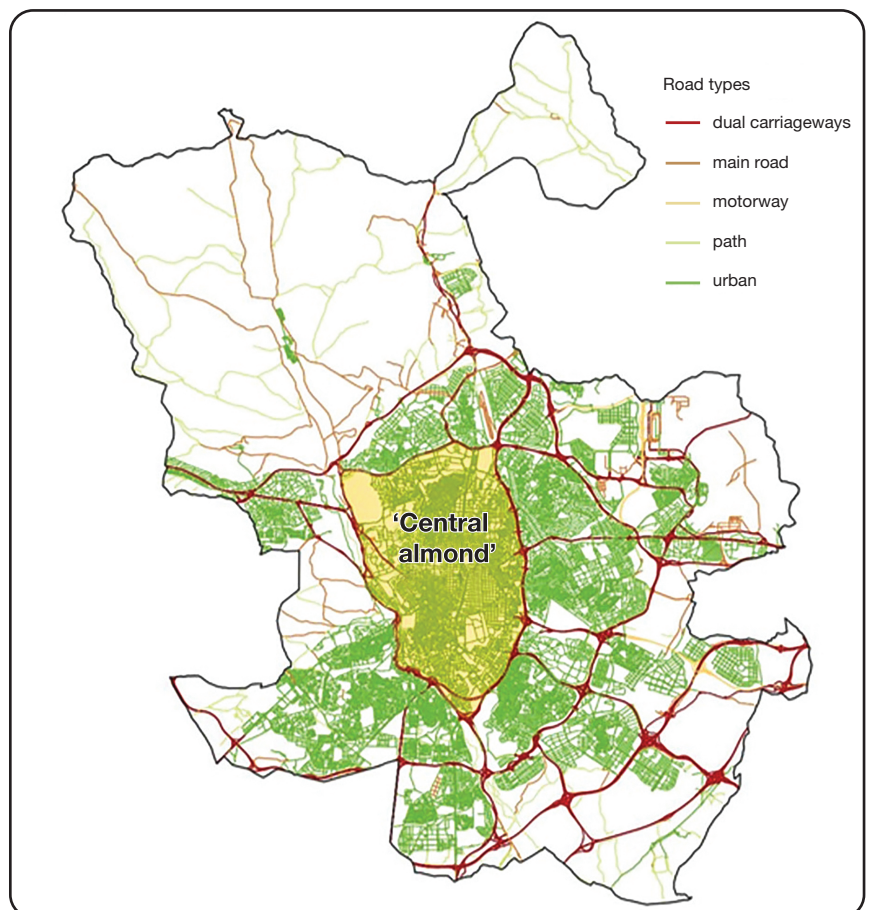


Figure 4 Zoning sign in Madrid**Is it effective?**

“The data proves it: Madrid Central has a positive effect on the air quality of all the city”

(Mayor Manuela Carmena).

In the case of Madrid, there is evidence to suggest that it is one of the most successful Low-Emission Zones in Europe. Here, the highest reductions in NO₂ (Nitrogen Dioxide) were recorded, with a Transport & Environment reporting a decrease by 32% (2019:1). This claim was furthered in a report from Ecologists in Action (2020), a grassroots confederation of 300 Spanish ecological groups, who suggested the LEZ had led to ‘historic lows’ in air pollution. The Madrid based newspaper *El Pais* reported varying levels of traffic reductions with major highways receiving 31.8% less.

The pioneering LEZ in the case of Madrid was the first of its kind in Spain. Perhaps in the case of MAM its biggest success was in the replication across other Spanish cities. Soon after its implementation, Pontevedra effectively created a pedestrianised version of Madrid Central with Barcelona commencing its own LEZ at the start of 2020.

3. Water Quality and Sanitation

Note: Sustainable Development Goal 6 calls for nations to “Ensure availability and sustainable management of water and sanitation for all”. However:

1. Poor sanitation kills 775,000 people every year.
2. 5% of deaths in developing countries result from unsafe sanitation.
3. 2.4 billion people worldwide lack access to improved sanitation.
4. 4.5 billion people do not have access to safely managed sanitation.
5. One Third of the world’s population does not have access to safe drinking water.
6. 40% of the world does not have access to basic handwashing facilities.

Access to a clean, safe water supply and the efficient disposal of human and industrial waste is essential to the maintenance of a healthy city. Without it, cities cease to be sustainable. By and large, in cities in the developed world safe systems are already in place. However, for cities in developing countries and particularly for the urban poor, living in underserved settlements, this remains a major problem area.

The rapid and often unplanned growth of cities in developing world has seen an increase in the percentage of population not served by domestic sewerage systems, safe piped water and the treatment of industrial waste products.

This has led to range of water borne disease, including diarrhoea, trachoma, intestinal worms and bilharzia. All of these are major sources of mortality and morbidity.

Inadequate sewage disposal and contaminated water supply can lead to outbreaks of cholera and typhoid. Cholera outbreaks, for example, have been reported in urban slums in various parts of the world, ranging from Kolkata, India, and Jakarta, Indonesia, to Nairobi, Kenya, and Kampala, Uganda.

4. Garbage Collection and Disposal

All cities generate thousands of tonnes of garbage daily. The problem is how to dispose of it. Cities in the developing world suffer from inefficient, disorganised and poorly funded municipal refuse collection services. The result is that household garbage is simply burned or dumped on the street and in waterways where it becomes a health hazard for the population (see **Figure 5**).

Figure 5 Street garbage Kathmandu

Untended garbage:

- Becomes the ideal breeding ground for mosquitos which are the carriers of malaria, dengue fever, Zika virus, West Nile fever and Japanese encephalitis.
- Attracts vermin which can be carriers of disease and leachates from dumps contain highly dangerous toxins which can contaminate groundwater.

Rapid population growth, and lack of sufficient funds have led to poorly run MSWM (Municipal Solid Waste Management) that is both inadequate in coverage and unreliable. It is reported that only 50-80% of waste generated in cities in the developing world is collected.

However, many researchers suggest that to simply establish new formal waste and recycling systems would be counterproductive. Instead, it would be better to take into account informal systems that already exist and are very much a part of everyday life. Many thousands of people living in urban areas of developing countries rely on the recycling of waste materials for their primary livelihoods. In these urban areas, poverty reduction and the improvement of waste strategies and recycling rates are at the forefront of policy making agendas. These next two short case studies outline how the two strands above can come together to improve urban waste processing.

Two short case studies: The Role of the Informal Sector in Recycling & Waste Management in Developing Countries

Case Study 1 Abidjan, Côte D'Ivoire (Informal Collectors)

Figure 6 Abidjan location



The metropolis of Abidjan is the Côte D'Ivoire's capital city in West Africa. The UN predicts that by 2025 the country's urban population will grow by approximately 60% (UN, 2009), with a significant proportion in the capital city, which already houses 20% of the population.

Such rapid urbanisation has significantly increased the quantity of waste generated, which in turn has led to widespread disease. Poor waste management is estimated to be responsible for 60% of malaria, diarrhoea and pneumonia cases in children (Fersko, 2018) in Abidjan.

As a result of the lack of organised solid waste collection an informal sector Private Waste Pre-Collectors (WPC) emerged in 2007. They currently collect 70% of the city's domestic waste, whereas previously only 30–40% of waste was collected (Parrot *et al*, 2009: 988).

In addition to the health benefits associated, it is suggested that this WPC service is not only the preferred service for household waste collection, but also, the activity could also have important economic impacts by reducing unemployment. Not only this, the WCP service is 10% higher than the minimum wage (Andrianisa *et al*, 2015). However, despite this, every day the rapidly growing metropolis of Abidjan produces 288 tonnes of plastic waste (Fersko, 2018), but only approximately only 5% is recycled. The next case study suggests how this may be addressed.

Case Study 2 Lahore, Pakistan (Scavengers)

The formal recycling of waste throughout Pakistan does not exist. Even in Lahore, the country's second largest city, there is no private sector or formalised government involvement in the sorting of waste for the city's 10 million inhabitants. Instead scavengers, or *korreywalas* are the major stakeholders in MSWM, combatting the 5000 tons of waste per day generated in Lahore City (Hafeeze *et al*, 3026: 954).

Figure 7 Korreywalas



Korreywalas currently recycle 21.2% of waste, amounting to 15.30 tons per day (Kamran *et al*, 2015: 542) making important socio-economic and environmental contributions:

According to Syed Ayub Qutub (2019), "scavengers collect almost all the metal and glass, 95 per cent of paper and about 60 per cent of plastic", thus saving the developing nations SWM (solid waste management) expenses.

417, 852, 000 tonnes of recyclables are processed per year (Batoool *et al*, 2007: 297), saving 9bn GJ of energy per year.

Valuable landfill space is saved, which is needed to replace the 'street side' disposal which is both hazardous and aesthetically poor.

There is a potential revenue of US \$8.8million per year if recycling were to be adopted as a formal industry (Batoool *et al*, 2007: 297).

However, despite the positives, there is a need to reshape the industry, in order to address health hazards that result from the non-regulated nature of the industry. Households across Lahore rarely separate waste and as such, recyclable waste is often contaminated, putting workers at risk. Equally, attitudes towards *korreywalas* are often negative, regarding them unhygienic and 'backward' and despite their key function, they remain one most marginalised social economic groups in Pakistan.

A developing world problem?

Garbage disposal is not only a problem in the less developed world. The city of New York generates over 14 million tonnes of garbage every year and spends \$2.3 million disposing of it.

An efficient municipal collection service removes garbage to transfer stations which then send it to landfill sites over 600 miles from the city.

The problem here is that:

- Trucking garbage to these sites is expensive.
- It adds to the city's carbon footprint.
- Existing sites are beginning to fill up.
- Authorities encounter fierce local opposition when they attempt to develop new sites.

So, it becomes obvious that cities like New York (and all the other global metropolitan centres) have to find alternative ways to deal with its garbage problem. If they don't, cities will simply choke on their own refuse. Yet New York's throwaway culture seems to work against the development of an efficient recycling system.

5. Crime and Safety

Crime, the fear of crime and public perceptions of safety are key factors in helping to form public perceptions of a city's 'health'. The organisation Crime+ carried out a survey of 2000 people recently which generated alarming results.

- 31% felt unsafe in their homes at some point.
- 25% were aware of break-ins and violent attacks in their neighbourhood.
- Nearly 50% knew a victim of crime.
- 33% knew someone who had been the of victim of car theft.
- 25% knew a victim of mugging.
- 25% were the victims of some form of crime.
- 33% felt less safe now than 10 years ago.

According to The Office of National Statistics average crime rates in the U.K. are lower in rural areas than urban areas (see **Table 3**).

Table 3 Crime rates in the UK 2018/19

Type of crime	Urban crime/1000	Rural crime/1000
Violence	29.5	17.7
Sexual offences	2.8	2.2
Burglary	16.2	5.9
Vehicle theft	11.5	3.6

Source: ONS; 2018/19

The same is true for the USA. Violent and property crime rates in the largest cities (Metropolitan Statistical Areas, or MSAs) are three to four times as high as the rates in rural communities.

What this means is that instead of people being drawn to live in a city they become increasingly drawn to what they perceive to be the relative safety of suburban and rural fringe areas. This, in turn is bound to affect the long-term sustainability of the city.

In developing countries, the rapid growth of cities has put a strain on the ability of governments to cope. According to an article published by The World Economic Forum:

“there is growing evidence that overcrowded and sprawling cities are more likely to be afflicted by protracted violence and this has a negative impact on the development potential of cities.”

Making Cities Healthier

Although the notion of 'Healthy Cities' emerged in the 1980s, overall, there has been a lack of progress towards improving the both the health of the urban population and the underlying environmental quality in cities. This is becoming even more crucial, given that by the year 2050, the number of people living in cities is expected to grow exponentially.

The case studies presented in this **Geo Factsheet** are evidence that governments and communities are beginning to address some of the issues, but there is a long way to go before cities become healthy places in which to live and work.

Perhaps the most important issue to address is poverty and deprivation and its links to mortality and morbidity as data from Sheffield shows.

In the developing world upgrading under-served settlements should be a matter of priority for those governments, and whilst there are some examples of upgrading, it is arguable that sufficient is being done or at a fast enough pace.

Whilst in cities across the developed world the general quality of housing may be higher, there are high density urban neighbourhoods where poverty and poor environmental quality go hand in hand and contribute to poor health and a reduced sense of well-being in the population.

The connections between crime and deprivation are also well documented elsewhere whether in the favelas of Sao Paolo or the projects (high rise estates) in Chicago. Many argue that to solve the problems caused by criminal gangs, violence, drug abuse and theft the underlying causes of poverty, deprivation and social exclusion need to be addressed.

Although the case studies suggest that governments and communities are beginning to address some of the issues, there is a long way to go before cities become healthier places in which to live and work.

Further Reading and Research

- Director of Health Report 2016; Sheffield.
- Cities Outlook 2020; Holding our breath: <https://www.centreforcities.org/publication/cities-outlook-2020/>
- <https://ourworldindata.org/>
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- 'This is how megacities are being held back by violence'; Antonio Sampaio; 2015 World economic forum.

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