

Population change and quality of life in relation to urban development in north America, Europe and Asia

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Abstract

Quality of life (QoL) and happiness are increasingly prevalent topics in academic literature. This article explores city specific development and life satisfaction in relation to demographic change in Asia, north America and Europe. How did certain cities develop to be such heavens for good quality of life? Why do the regions differ in terms of their quality of urban living? It is suggested that the demographic transition and overall demographic trends have (had) consequences on city development, and thus have a measurable effect on the experienced quality of living. Population growth is therefore related to quality of life. In addition to being compact, green and sustainable, the cities whose population enjoys a high QoL and satisfaction tend to share trends in long term demographic development.

Keywords

Demography, development, happiness, quality of life, city ranking, urban

Introduction to some cities and their rankings

As the world's population is increasingly likely to live in cities, the importance of identifying ways to combine urban living with a high quality of life is rising in importance. In the Quality of Living worldwide city rankings by Mercer, European cities continue to dominate the top.¹ The index covers 221 (218 in 2008) cities worldwide and is based on 39 quality of living criteria for each city related to health, consumption, housing, education, public and private services, security, recreation and culture. Cities from Europe, Australia and New Zealand dominate the upper rankings, while American cities tend to be more average, and Asian ones generally fare worse. Vienna retains the top spot as the city with the world's best quality of living for the second year in a row.

The city with the highest measured quality of life level in the world in Mercers' rating – Vienna, had a population that was greater in 1900 (1.77 million) than in 2001 (1.61 million) although the area of settlement was smaller and people were more likely to live within the inner districts of today's city (Lutz et al. 2003). Number 2 on the list, Zurich saw its population decline from 445 000 individuals in 1962 to 359 000 by 1998 (Zurich Stadtinfo 2008). Based on the UN World Urbanization Prospects database (2007), since 1950, Vienna has had a negative population growth during the period 1960-1980, and an increasingly positive growth since the year 2000. Zurich has had a small positive population growth rate since 1990 (and a fluctuating one before that). Both nevertheless share the fact that their recent past is one of only mild fluctuations in population size, which may be an integral part of what allows them to perform so well in the rankings. For comparison, the less developed regions are expected to account for 95% of the world urban population increment of about 15 million annually in the course of the following decennia (Zlotnik 2004).

Figure 1 shows the rapid population change of an Asian city compared to Vienna. Mumbai, whose population has surged in the last half-century is shown together with Vienna that has a population that has fluctuated steadily around two million during the same period. Mumbai has witnessed heavy population growth since the 1940s with annual growth rates up to 5.2 per cent (MMRDA 1999). Having started as a city scattered over many islands, Mumbai has undergone many transitions in becoming the densely populated metropolis it is today. Most of the physical transformations, such as landfills joining the islands, or railroads connecting suburbs, were completed by independence in 1947. As shown in Figure 1, the heavy population growth started only around that time, and is still ongoing. This growth is a challenge not only to the city administrators, but the regular people competing for diminishing personal space and scarce resources for livelihoods.

This research suggests that the trends in urban population development play a role in the high appreciation and overall QoL of cities. At the same time, Asian cities differ considerably from the European or North-American cities in terms of QoL, population size, density as well as demographic transition schedule.

¹ The 10 highest rated cities in 2010 were Vienna, Zürich, Vancouver, Auckland, Düsseldorf, Frankfurt, München, Bern and Sydney, www.mercer.com.

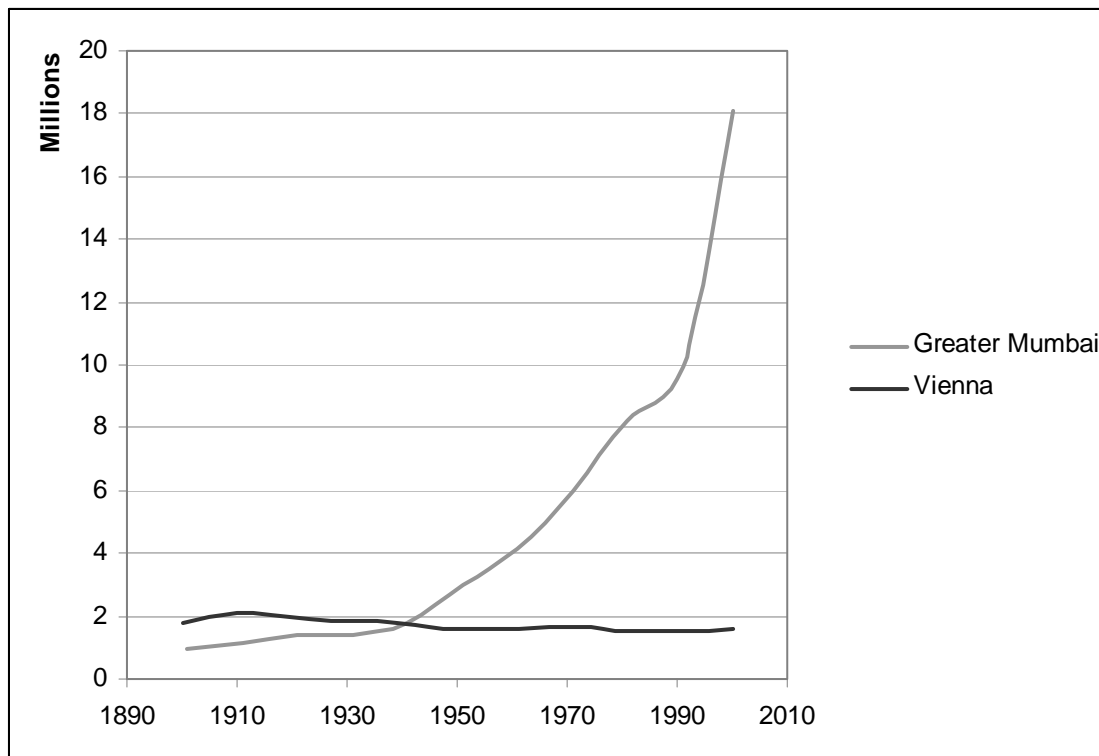


Figure 1. Population of Mumbai and Vienna. Data sources: MMRDA, Stadt Wien 2000.

Background

Quality of life in the urban context made its appearance in scientific literature in the 1970s. The approach was to link bundles of wages, rents and amenities to an index and then to compare the locations of the bundles (Blomquist et al. 1988 and references therein). In the 1988 study of counties of the US, it was found that the highest rank tended to be connected to small- and medium-sized cities, and that the bottom of the ranking was dominated by medium to large cities. This seems to be still valid today, as the highest ranking US entry in the Mercer (2010) survey is Honolulu. Also Coleman and Rowthorn (under preparation) conclude in their paper on population decline and societal impact assessment that smaller populations can have a positive effect on individual welfare.

The study of the relationships between media discourse and urban politics resonates with a more widespread attempt in urban studies to understand the power of discourse in the construction of urban economies (McCann 2004). Senlier (2009) points out that the concepts of livability and urban QoL, in other words, the basic units of urban sustainability, have priority in the planning and political agenda of today, and appear among the most important factors in the competition between cities. Rogerson (1999) explores the rating of cities and locations in terms of the QoL and focuses, in particular, on how QoL has been viewed as part of the profile of a 'competitive city', *i.e.* one that is successful in attracting the attention of capital. He further examines the ways in which quality of life factors have been identified as influential in patterns of urban growth and development. Rogerson points out how the use of

QoL as part of place promotion and city marketing has emphasized a rather narrow conception that is place-based rather than people-based.

Razin and Ben-Zion (1975) formulate an intergenerational model of population growth suggesting that, in economic terms, the utility of each generation is a function of the level of its consumption and the number and utility of the new generation, therefore resulting in an optimum population growth. This goes together with the evidence presented here on population growth: Extremes reduce happiness.

More people cause environmental degradation and damage through consumption of energy, among others. The number of people (P), multiplied by per capita affluence (A) or consumption, in turn multiplied by an index of the environmental damage caused by the technologies employed to service the consumption (T), gives a measure of the environmental impact (I) of a society. This is the basic $I = P \times A \times T$ identity (O'Neill et al. 2004), originally introduced in the form $I = P \times F(P)$ by Ehrlich and Holdren (1971), where $F(P)$ is the impact given as a function of population. In the modern form, $A \times T$ can be estimated through per capita energy consumption.

At the lowest levels of development, energy use probably underestimates environmental impact. For example, very poor people can cause serious environmental damage by cutting down trees for fuelwood and thus exacerbating erosion and depleting carbon sinks. On the other hand, at the highest development levels, energy use probably overestimates environmental impact because of greater efficiency and stricter environmental regulation. Despite the imperfections, for international or intertemporal comparisons, energy use seems to be *a priori* a reasonable measure that correlates with many types of environmental damage (Ehrlich and Ehrlich 1997).

Reductions in population growth lower resource use, and can lead to significant reductions in carbon-emissions and more stability in environmental development (O'Neill et al. 2010). Population growth fuels demand for food (Dyson 1999, FAO 2003) and raises the need for agricultural land and productivity (Harris and Kennedy 1999). Campbell et al. (2007) note the large unmet need for contraception in most high fertility regions and argue that lower regional population growth would decrease poverty, raise gender equality, decrease child mortality, improve maternal health, decrease the spread of diseases such as HIV and malaria, and increase environmental sustainability. UN (2003) shows that an increasing share of national governments express dissatisfaction with fertility levels (68% in 2001 versus 48% in 1976) – and most governments would prefer a decrease in childbearing levels.

The long term demographic determinants of a high quality of life

What are the long term determinants of differences in quality of life across world regions? One important cause is likely to be the very different population development, or the demographic transition, that these regions have undergone. One of the main underlying causes for the differences in urban population sizes in Asia and Europe is the regional variation in the

demographic transition multiplier. This is defined as the ratio of the post-transition population size to the pre-transition population size and is determined by the extent to which birth rates exceed death rates, as well as the duration of the transition period.

While the majority of European countries initiated the demographic transition in the late 19th century and replacement fertility levels were reached in the 1970s, the demographic transition, which characterises the period when the number of surviving offspring is above 2 (it was on average around 2 before the 1800s and is for Europe below 2 since the 1970s) has been slow to take effect in Asian countries as a whole. At the same time the most technologically advanced nations in Asia are in tune with the European transition rate to low fertility.

The slow mortality decline experienced by many European countries over the past century was accompanied by a gradual decline in gross fertility (from lower gross fertility levels than in other world regions; e.g, 4-5 children rather than 7-8 children, see Notestein 1953, Chesnais 1992, UN 2009). The decline in fertility in Europe resulted in only slight increases in net fertility before fertility eventually fell, causing in effect a relatively low increase in population size. The growth in Asia has been much greater than in Europe, even when factoring in the impact of outmigration, in particular to North America. While European populations grew by a factor of 3.75, Asian populations (for which there are data) are expected to grow by a factor of more than 14 (Cleland 2001). This implies that the vast majority of global population growth during the last two centuries took place outside of Europe.

Global population growth is thus unevenly distributed and is increasingly concentrated in the already dense cities in the urban regions of Asia (UN 2007b). As shown in Figure 2, the low European population growth implies that urban population size has stalled in Europe, and grows only at a slow pace in America. The urban population of Asia grew to match that of Europe by 1960 and was three times as large by 2000. Asian Development Bank sees urban population growth as one of the most fundamental challenges for sustainable development throughout Asia (ADB 2008).

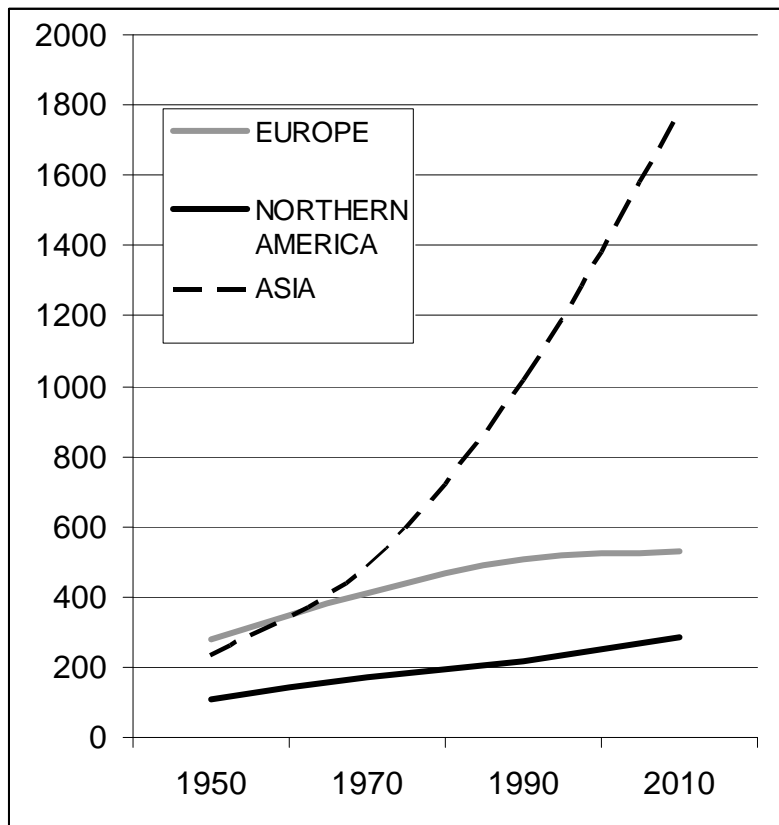


Figure 2. Urban population size by continent. Northern America, Europe and Asia.

Even while having less high rise city centres, European cities tend to be more dense than American cities (see Table 1). Figure 3 shows the relation between urban population density and quality of life as measured by Mercer. High urban density tends to correlate with low index in terms of QoL. New York City (NYC) is assigned the index value of 100, and anything below that value is considered a decrease in QoL compared to NYC. To get an idea of usual population densities, consider that in 1990 the urbanized areas in the USA had an average population density of 1,000 people per square kilometre, whereas in Fujian, China, even in rural towns or settlements it is common to reach population densities of the same order (Zhu 2004).

European cities constantly develop into less energy and resource demanding, and are less polluted than American cities because of not only geography, historic events and self-reinforcing political choices, but also due to the power of city administrators to curb and control spatial city growth, and the ability of governments to tax indirect costs such as pollution. Per capita fossil fuel use in the US is more than twice as great as that of Europe (OECD 2008). The ability of European governments to place high taxes on gasoline may have been an effective way to curb long commutes of private citizens, to lead to less urban sprawl and to encourage public transport use. In addition to a high level of centralized urban planning and restricted land availability, the low level of population growth in Europe is a necessary cause of the low levels of urban sprawl.

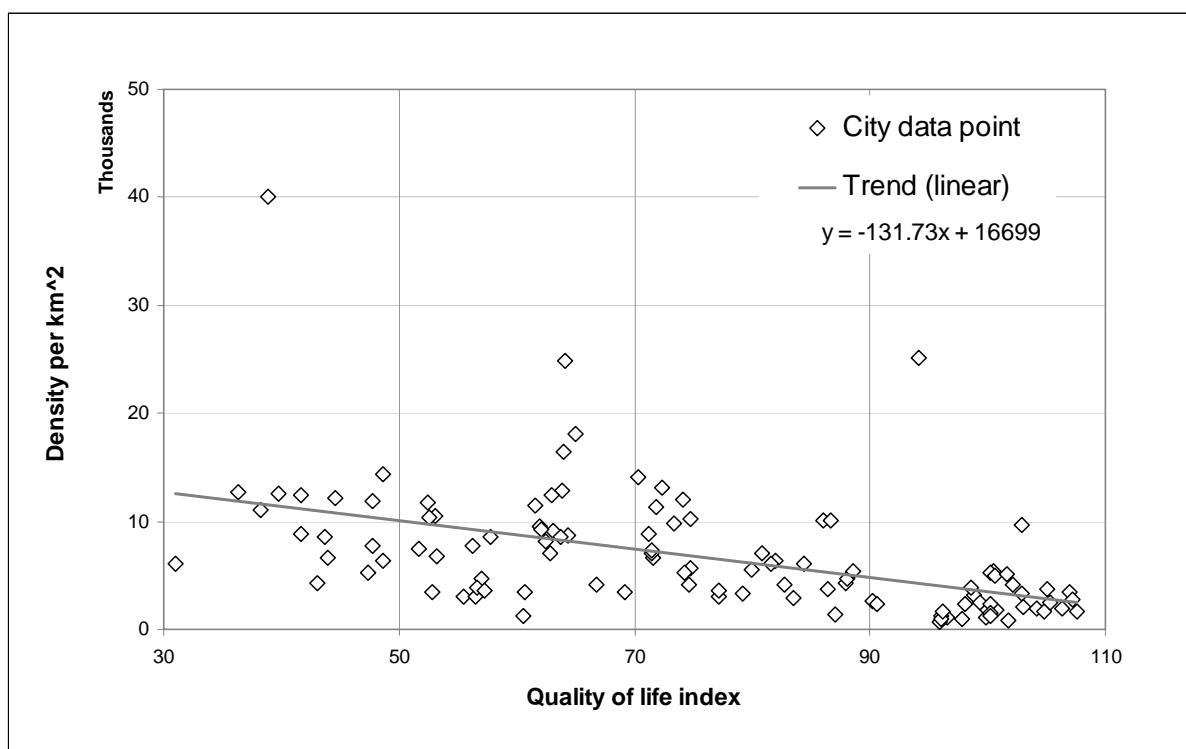


Figure 3. Quality of life in relation to urban population density (Mercer 2008, Demographia 2010).

Table 1. Urban population density in areas of more than 500 000 people.

	Number of cities	persons / km ²	Density Compared to United States	Density Compared to Hong Kong
EUROPE (high income)	63	3050	2.70	0.103
EUROPE (middle & low income, not Russia)	29	4750	4.20	0.161
USA	71	1150	1	0.038
ASIA (high income, not Japan, Hong Kong)	25	7600	6.75	0.164
CHINA (Hong Kong and Macao)	1	29400	26.12	1
LATIN AMERICA AND THE CARIBBEAN	94	6650	5.91	0.226
AFRICA	75	8200	7.26	0.278
High Income World: GDP US\$17,500+ (PIB) Purchasing Power Parity per Capita 2003				

Source: Demographia (2010).

Concluding remarks

Two central characteristics determine urban challenges: The growth and the settlement of urban populations. Relatively small cities with modest or no population growth in western Europe seem to be characterized by the highest quality of life. In an Asian-European-American comparison, European cities stand out as relatively compact and small, while US cities are more spread out and Asian population are both more spread out, and experience much more rapid growth than European cities.

The ultimate reason for the better quality of life in European cities could be the regions' relatively low population growth and dense populations. Slow population growth means that cities have time to adjust to changes in population size which increases the probability to create sufficient, affordable but high quality housing, good public transportation, as well as infrastructure that allows more effective city planning, more green space and lower pollution levels. Public participation, or the sense of community contrary to American individualism, is also a factor adding to the quality of city life, as stakeholders commit to ensuring that their living and business environment retains its high quality and standards. From an individual's point of view, low population growth may also be desirable, at least when coupled to steady (local) economic growth. In general, population in economically viable cities with low population growth would experience low unemployment, less pressure at the job market due to secure job situation, and consequently better job satisfaction. Although job satisfaction does not guarantee overall happiness, it is one cornerstone of the quality of life. Since long times commuting (alone) are generally viewed as undesirable and decrease satisfaction (Kahneman and Krueger 2006), living in a compact city within an easy commute has definite advantages. Most European cities fall into this category.

The long run historic determinants of population size and growth are central in determining the current challenges of cities. Fast population growth and rising urban shares, combined with weak governance/city planning can cause uncontrolled urban growth and poor quality of life in many Asian cities, while north American cities may suffer from the non-reversible effects of sprawl. European cities are often in a better situation, with more limited population growth, stronger governance and better city planning.

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Appendix

Table A1. Urbanised shares (in percent), world regions. 1970-2030. Source: UN (2005).

	1970	1990	2010	2030
EUROPE	62,6	70,6	72,9	78,3
NORTHERN AMERICA	73,8	75,4	82,1	86,7
ASIA	22,7	31,9	42,5	54,1
LATIN AMERICA AND THE CARIBBEAN	57,2	70,9	79,1	84,3
AFRICA	23,4	32,0	40,5	50,7
Highest variation between world regions	50,4	43,5	41,6	36,0

Table A2. Population Size (in millions). 1970-2030. Medium forecast. Source: UN (2007b).

	1970	1990	2010	2030
EUROPE	657	721	730	707
NORTHERN AMERICA	232	284	349	405
ASIA	2 138	3 181	4 166	4 930
LATIN AMERICA AND THE CARIBBEAN	288	444	594	713
AFRICA	364	637	866	1 308

Table A3. Urban population Size (in millions). 1970-2030. Medium forecast. Source: UN (2007b).

	1970	1990	2010	2030
EUROPE	411	509	532	554
NORTHERN AMERICA	171	214	287	351
ASIA	485	1015	1771	2667
LATIN AMERICA AND THE CARIBBEAN	165	315	470	601
AFRICA	85	204	351	663

