

HEALTH AND NUTRITION IN MEXICO CITY

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SUMMARY México City, considered today as the most populated city in America, was founded almost 700 years ago in a fertile and already well populated valley. The religious, political and military capital of an extensive empire, Mexico was already one of the biggest cities in the World at the time of the Conquest. Completely destroyed and rebuilt by the Spaniards according to revolutionary urbanistic concepts, during the following 300 years Mexico City was the proud capital of the wealthy vicekingdom of the New Spain and the largest metropolis on the continent. Keeping its status as national hub until the present day, during the last 50 years the city has received a strong migratory flow, partly originated in urban/rural disparities, which has reduced its average standard of life and has generated new and complex social, sanitary and nutritional problems. Understanding and solving those problems require an interdisciplinary approach.

INTRODUCTION

This is the final presentation of the first part of the workshop whose purpose has been to describe briefly the characteristics of eight of the largest urban centres in Latin America, and the problems each one of them faces regarding nutrition and health. The Organising Committee decided that Mexico City should be the final city to be described, as it is the site of the workshop. It is also the final destination on this imaginary trip from the southern end of the continent northwards.

Describing a whole city in a few paragraphs requires a summarising capacity which I do not possess and requires solid information which is not available.

I was born in Mexico City. When I was a child, it had a population of 3 million; its sky was blue and clear; it was surrounded by mountains, forests and some lakes, and most of the year the impressive view of the eternal snow of its two volcanoes was a feast for the eyes. Gradually I learned its history and learned its magic; both reasons for sincere pride.

During the last few decades I have seen the city deteriorate. Its own attractive, uncontrolled socioeconomic characteristic, the foolishness of an alienated society and the lack of responsibility of all (people, and both private and public authorities) have led to its explosive growth, the destruction of its resources and environment, the pollution of its air and the rise of violence- an example of what never should have occurred.

Despite these troubles, Mexico City is extremely vital. Beyond planning, its inhabitants have a notable capacity for adjustment and response to the problems which they solve as they appear with intuitive, creative solutions. Reason should advise us to abandon it; however perhaps without understanding why, 16 million people stay.

Since these lines are descriptive, particular analyses or methodological discussion of the few available studies will be avoided; these studies are not comparable and contain a mass of data without structure from which I intend to pick out a few in order to develop a theme for the purpose of the workshop.

Most of what can be said about Mexico City is similar to what has been presented for the other seven metropolises of the continent, but aside from numerous similarities, there are several differences with those other metropolises, the main and more general being:

- Mexico City is unfortunately the most populated urban centre on the continent, and the one that has grown most in the last decade.
- Mexico City is by far the oldest among the cities analysed.
- For Mexico City, overpopulation is not a recent problem.

Since nutrition is an interdisciplinary science, a few words about the history, geography, demography and socioeconomic characteristics of Mexico City are in order.

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WHAT IS MEXICO?

We Mexicans use the term "Mexico" for our country, for its capital city and for the valley where it is located and also for one of the 31 states composing the federation. None of these applications is sufficient. The official name of the country is the "Mexican United States", and the City is really composed of the urban area of the Federal District along with 27 counties in the State of Mexico.

During the 19th century, there were long and bloody fights between those proposing a centralist regime and those who wanted to imitate the political organisation of the USA. The centralist position was unjust, but it had Precolombian roots which were accentuated during the colonial period, since the capital of the Aztec empire became the capital of the extensive viceroyalty of New Spain. The federal position finally prevailed but it was artificial, a naive imitation of a model of a completely different country which even now has not been consolidated. The adoption of a federal system required the creation of a Federal District as a site of the federal government which was located exactly in the old centre of Precolombian and colonial power. This Federal District was divided into districts one of which was called Mexico City, but 20 years ago this district was further divided, and the name Mexico disappeared from the administrative language, but not from the mind of the population who still refer to the country and to the city as Mexico.

PRECOLOMBIAN MEXICO

Mexico, where "x" should sound like "sh", is part of the name of the Aztec capital, Mexico Tenochtitlan founded in 1325, and means "the place in the centre of the maguey (agave) or the moon"; with this name the Aztecs placed its capital in the centre of the universe, since "maguey" is a holy symbol. The history of Mexico is, however, much older.

It seems indisputable that the American continent was populated by Asian migrants who crossed the Bering Strait. When they reached the central valley of what is today Mexico, many settled and developed agriculture. One of the sites for the domestication of corn (one of the three most important foods of mankind) is in a valley neighbouring Mexico City. One of the oldest human remains on the continent (Tepexpan Man) was found in the valley of Mexico.

Once within the historical context, attention must be directed to the region known as "Mesoamerica" which includes the Centre and Southeast of Mexico today and most of Central America. Mesoamerica was the site of magnificent cultures and civilisations which during the peak of splendour had no rival on the planet; when Europe was submerged in the darkness of the Middle Ages and Eurasia was being destroyed by the barbarians, arts and sciences flourished in Mesoamerica and the Andean region.

The mother culture in Mesoamerica was the Olmec one situated on the coast of the Gulf of Mexico from which developed the Mayan culture (from Honduras to Yucatan), the Teotihuacan culture (a few miles north of the present Mexico City) and the Zapotec and Mixtec cultures in Oaxaca, to mention only some among many.

Teotihuacan was undoubtedly the peak of civilisation on the Mexican plateau. It is unknown who lived there, what they looked like and which language they spoke; the name Teotihuacan (the place where Gods were born, or where man became God) was bestowed by the Aztecs hundreds of years after the first collapse of the City as they admired the magnificent ruins, the same ones which can still be admired today. Teotihuacan flourished from before the Christian age until several centuries after Christ's birth. The centre of the city is still preserved, boasting not only impressive buildings, but also a complex network of water supply and sewage works. Its influence is apparent thousands of kilometres away to the south; since no military structures have ever been found, it is supposed that the power of the city was due to its artistic, technological and scientific creativity.

After the unexplained decline of this culture, many others appeared on the Mexican plateau. The Nahuas, from the North-West of the country gradually settled, specially in the valley of Mexico. The last tribe to arrive in the valley was the Aztecs, a violent and barbaric people who were not accepted by the settlers of the valley, but who were brave warriors and had very capable leaders who finally established themselves on a small island in the centre of Lake Texcoco where they saw the "divine signal" of an eagle standing on a "nopal" cactus while eating a serpent. They carried building materials from the shore to the island, and gradually they built Mexico Tenochtitlan.

The small island was located in what today is the "Centro Historico" of Mexico City, and the "divine signal" observed by the Aztecs became the symbol of the whole country, present on our flag, on our coins and on all official documents.

Hard work made the city grow, and war increased its power until a gigantic empire developed from 200 kilometres North of Mexico City down to Panama.

The city, artificially built on the shallowwaters of the lake, was crossed by numerous channels which facilitated transportation. In the centre there were magnificent palaces and temples, markets, schools and housing for myriads of citizens. Its splendour was praised as eternal by the poets of the time. A political genius, Tlacaetl, was the real power behind the first four or five emperors, and he achieved expansion of that bloody empire which justly deserved the hatred of the rest of the people.

As with any other group at the peak of imperial power, the Aztecs considered themselves the elected people, owners of absolute truth and masters of the World. This privileged posi-

tion, however, conferred on them a heavy responsibility of saving the World whatever the sacrifice; therefore, every 52 years they were responsible for creating the new sun and the new age through sacrifice and prayer. That universal ceremony took place on the "Mount of the Star" (a parallel to Mount Sinai), today sadly affected by urban chaos.

When the Spaniards arrived, (about which Emperor Moctezuma already knew a great deal, since relay runners, who normally brought seafood from the Gulf coast to his table, also brought detailed descriptions of strange visitors over more than 400 kilometres of rough mountain land) the Empire was at its climax. The city as seen by Cortes, was larger and better organised than any European city, and along with other cities in the valley of Mexico, made the region one of the most populated in the 16th century. A network of roads and bridges connected the city with the shore of the lake, also acting as effective defences against possible attack. At the Southeastern end of the valley was Xochimilco, "The Place of Flowers", established in a fresh water lake on which hundreds of "chinampas" were constructed. The "Chinampa" is one of the most productive agricultural techniques ever developed, and it made it possible to feed the overpopulated valley without affecting its ecology. According to Spanish chronicles, Moctezuma was presented every day with more than 100 different dishes, from which he selected two or three, and the rest were given away to members of the court.

Bernal Diaz del Castillo, one of Cortes' soldiers left a detailed account of what he saw (1):

"One day.....we reached the wide road.....we saw so many cities and villages both on water and on land and that road so straight, we became astonished and we said it was a thing of enchantment as described in the book of Amadis, because the five towers and buildings they had in water, all of them built on stone. Some of our soldiers thought that it was a dream and I am trying to describe this, but I do not know how".

Francisco Lopez de Gomara notes(2):

"when Cortes arrived, the city had 60,000 houses. Those belonging to the king and members of the court were big and well built. Those belonging to the people were small, without doors nor windows but usually sheltering two, three and even ten dwellers; so there are many people. It is founded on water like Venice. The body of the city lies on top of water".

This estimate of 60,000 houses with several inhabitants in each one of them places the population of the Aztec capital between 200,000 and 500,000 thousand people, and even in the case of a gross overestimation, the city had at least 100,000 inhabitants, a notable number for that time. As there were many other cities in the valley, it is clear that it was an important population nucleus. That extensive ostentatious and seemingly

eternal empire was however condemned. Cortes found numerous allies in the subjugated people who hated the empire. Furthermore Moctezuma was rather a weak leader and he remembered well the prophecy of "the return of Quetzalcoatl" to end the glory of the empire. This belief facilitated the conquest although it was still not easy. The fight was long and ferocious, and victory could have smiled at either side. Virtually defeated and on the verge of death, Cortes managed to win the last battle; he was an able warrior, a natural politician but a specially tenacious and fearless man.

The surrender of Tenochtitlan in 1521 meant the conquest of all Mesoamerica. Cortes gained for Charles V of Spain a land larger than Spain itself, and for the church millions of potential Catholics.

COLONIAL MEXICO

Having defeated the empire, Cortes acquired a potential power above that of Charles V of Spain, but he did not take advantage of this.

With a mixture of avarice and religious fanaticism Cortes proceeded to erase the city from the map. Everything was destroyed and the stone was used to build a new city, wisely established in the same place as the imperial capital. Before falling into disgrace with Charles V, Cortes showed his capacity as a revolutionary urban planner; he wanted the new city to be exemplary, so using the main square as a central pivot, he developed a great grid of wide straight streets, some of them partially occupied by canals.

The destruction of the Aztec city meant the destruction of architectural wealth and also of all external signs of the former culture, its paintings and the books containing philosophy, rites, language, poetry, medicine etc. It is worth mentioning that nothing in Mexico commemorates Cortes, not a single statue, not a single street, as if after 450 years a Mestizo population was unable to forgive the conquest and the destruction.

The military conflict ending with the surrender of Mexico-Tenochtitlan was long and violent, but was only the beginning of another conflict, a lot longer and a more violent one between two civilisations: the process of colonisation.

The colonisation of Mexico was very different from the colonisation of today's Canada and the USA, and the colonisation of South America outside the Inca empire. In all these places, the indigenous population was scarce, and not organised into states each with their own strength; the colonisers were mainly European farmers, socially well organised and eager to live on their own work. The latter displaced the native Indians in a relatively peaceful way but without mixing with them. It was a colonisation without conquest, or almost without it.

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In the case of the Aztec and Inca empires, the colonisers were soldiers eager to take over the mining treasures of the New World after having fought powerful well-established states; the process was therefore different. The surviving people were not displaced or exterminated, but converted into slaves to work the mines and the land. They were made to accept the religion, the language, the dress and eating habits of the Spanish, and a mixing of races and cultures emerged. After the conquest, Mexico was no longer indigenous, nor Spanish, but something different and new.

The racial mixing did not occur under ideal conditions. It was usually forced by the male Spanish conqueror on submissive Indian women, and this trauma is still present as a source of a variety of social and personal complexes of the Mexican population, clearly expressed today in attitudes, behaviour and language.

Cultural mixing also took place. The Spanish culture was partially established. Castillian became the national language without totally displacing most of the several dozen tongues which are still spoken today, and was enriched by numerous local expressions. The Catholic religion was established, incorporating many Indian beliefs, and without the disappearance of many of Precolombian components. Perhaps the richest example of mixing took place in relation to food; without losing Indian components, European ingredients were incorporated into new dishes which presently make up one of the richest, most diverse and distinct culinary traditions in the world. Colonial architecture followed European rules, but Indian hands gave it a special interpretation that can still be admired in many Baroque and Churrigueresque buildings.

The new capital of the extensive vice royalty of New Spain which spread over more than 4 million square kilometres from Canada to Central America, was born with this background. The new city was born in 1521 as the centre of political, religious, military and economic power. The Mexican silver peso was used for a long time as the standard currency in many parts of the world. Within a few years the city proudly boasted many palaces, hospitals, convents, a printing house (1539) and a University (1552). To Cervantes de Salazar (1554), Mexico was the most impressive capital on the American Continent, and to many its magnificence, spaciousness and modern design distinguished it above European cities.

When the Pilgrims landed in Plymouth, thus initiating the English colony in North America, colonial Mexico City was already 200 years old, Tenochtitlan, 400, and the valley of Mexico had witnessed a full thousand years of civilisation.

This Viceroyalty, several-fold larger and richer than Spain, could have been a hub of world importance, but the immense wealth extracted from its soil and sent to Spain or the Vatican, was intercepted by English pirates or was lost at the bottom of the ocean. Furthermore those were the darkest years of Spanish

Inquisition which killed human creativity and expression despite the exceptional cases of Sor Juana Ines de la Cruz and Juan Ruiz de la Cruz.

The colonial period lasted 300 years, a period longer than that of the Aztec Empire and than that of independent Mexico, and much longer than the cycles of rise and fall of modern empires. During those 300 years, Mexico City was by far the most important urban centre this side of the Atlantic Ocean, and in 1815 Simon Bolivar proposed Mexico as the "capital of America" (as it was the only city on the continent with internal force, without which there are no metropolises).

INDEPENDENT MEXICO

At the end of the 18th century and the beginning of the 19th century, Europe enters a critical period. England loses the USA, France gives up Canada and the Spanish Crown weakens. The ideas of the French Revolution thrive in America, and between 1810 and 1821 Latin America is liberated. To Mexico, independence means 11 years of war, which destroys its economy and decimates its population, and causes its intellectuals to flee.

Born with the worst prospects in 1821, the country enters a 100 years of chaos and civil war in which it loses more than half its territory to the USA, and has to bear a short-lived French invasion. The capital city of the Maximilian Empire adopted French forms and customs in its development which can still be found today.

After the crucial intervention of Benito Juarez, one of the most important political figures of the 19th century, who defeats the French, separates the Church and the State, and creates the bases of modern Mexico the country goes through a long period of dictatorship which tries to stabilise and develop the country. In practice, such a load of injustice was created that in 1910 the first social revolution of the present century broke out. This revolution finally gave birth to the new country around 1920-1930 which is no longer the Aztec Empire nor the Viceroyalty of New Spain, neither Indian nor Spanish, and whose geographical boundaries are different from the former ones. Mexico today is a very young country with scarcely half a century of stable life, but with millenary roots, not only Mesoamerican but also Iberic and Arabic; a young country born by a painful and slow delivery, which conditions national life.

For many centuries, Mexico City has been the centre of the country. As the symbolic centre of the Church's Hierarchy, the hub of several subsequent empires, as well as the political, religious, economic, intellectual and military centre of the region, the City inevitably attracts many Mexicans who visit it and settle here.

MEXICO TODAY

According to the last census, the Mexican United States in 1990 had a population of 81.1 millions with a density of 40.5 individuals per Sq.Km.(3). The Gross National Product (GNP) that year reached 185,000 million dollars giving a per capita income of 2270 dollars per year.

The income distribution is unfortunately quite uneven. In 1984, 50 percent of the households earned only 18 percent of the total income, while the most privileged 10 percent of society acquired 34 percent of the income (4). Known unemployment is 20 percent and the mean size of a family is 5.

MEXICO CITY TODAY

The evolution of the city's population since 1900 to date appears in Table 1.

TABLE 1
POPULATION OF MEXICO CITY
(thousands)

Year	Population	
1900	345	
1930	1029	} Highest rate at annual 5%
1950	3136	
1970	9045	
1980	13000	
1990	15785	

Source (5)

As may be seen, by 1900 the city had a small population not much greater than that of the Aztec capital 400 years before. The population only multiplied two fold in the following 30 years, probably due to the effects of the revolution.

Since 1930, when the country was already in a period of political and economic stability, the city grew 871 percent until 1970, when, with 9 million inhabitants it already figured among the largest cities in the world. Such growth (more than 5 percent per year) was of course due to the natural reproduction of the people, but specially to the migration of rural dwellers. As with many other developing countries, Mexico established at that time an industrialisation policy based on protectionist strategies, and sacrifice of rural areas in favour of the cities. While the traditionally poor rural areas were exposed to increased exploitation, the cities were given all types of subsidies and services. It was only natural that rural dwellers decided to leave the hard miserable life of the countryside and try their luck in the cities.

For comparison purposes, Tables 2 and 3 present the demographic data on Mexico. The birth rate (6) during the last

TABLE 2
BIRTH AND MORTALITY RATES AND
DEMOGRAPHIC GROWTH IN THE MEXICAN
UNITED STATES
(per 1000 inhabitants)

Year	Birth	Mortality	Growth
1985	49	38	11
1905	49	38	11
1915	46	39	7
1925	49	32	17
1935	46	26	20
1945	44	18	26
1955	45	13	32
1965	45	10	35
1975	38	9	29
1985	32	7	25

Source (6)

TABLE 3
TOTAL POPULATION AND CHILDREN LESS
THAN 15 YEARS AND LIFE EXPECTANCY IN THE
MEXICAN UNITED STATES

Year	Total (millions)	Population less than 15 years (%)	Life expectancy (years)
1895	1.5	40.5	29.8
1900	13.6	40.6	29.8
1910	15.1	41.3	25.4
1920	14.2	39.0	31.5
1930	16.6	39.4	36.7
1940	19.8	42.2	45.7
1950	25.8	42.8	53.7
1960	35.0	44.4	59.5
1970	48.9	46.1	63.6
1980	67.0	43.5	69.0
1990	81.6	—	69.1

Source (6)

100 years has been extremely high, and only started to decrease in 1975. The general mortality was very high until 1915, but notably decreased between 1935 and 1955. Population growth reached a peak of 3.5 percent per year in 1965, due to improvements in sanitation and general living conditions, without parallel changes in reproductive behaviour.

As shown in Table 3, the national population has increased 7 fold in 90 years (6), placing Mexico among the 15 most populated countries in the world and the third in the continent. The fraction of the population younger than 15 years has

always been high, reaching 46 percent in 1970, implying a heavy load on the economically productive population, although also giving the country very interesting prospects for rapid change. Life expectancy has risen from the dramatic value of 30 years in 1895 to 69 years in 1990, indicating a decrease in infant mortality.

Comparison of Tables 1 and 3 reveals that the population growth in Mexico City was faster than that of the country as a whole. While the national population grew 294 percent between 1930 and 1970, the metropolitan population increased 879 percent in the same period,

During the seventies, city development crept into the State of Mexico (5,7) so that the figures from 1970 onwards really represent the metropolitan area and not only the Federal District. In 1980, 79 percent of the metropolitan population lived in the Federal District and 21 percent in the State of Mexico, but in 1990 the proportions changed to 62 percent in the Federal District and 38 percent in the State of Mexico.

It is estimated that in 1992 the metropolitan population numbers 16.1 million (19.7 percent of all Mexicans) and that grows 2 percent per year. Even though there is no official geographical definition of the metropolitan area, it is usually considered as the urban part of the Federal District and 27 counties in the State of Mexico, with an area of 4451.2 Sq. Km. and a density of 3617 persons per Sq.Km.(5). The population of the urban part of the Federal District (1480 Sq.Km.) is about 10.16 million with a density of 6871 persons per Sq.Km., contrasting with a rather low national demographic density of 40.5. Other important urban centres in the country are Guadalajara in the West with 3.16 million inhabitants, Monterrey in the Northeast with 2.77 million, and Puebla to the East of Mexico City with 1.6 million (5); it is worth mentioning that several million Mexicans live in California, and that Los Angeles could well be included in the former list.

THE RAPID URBANISATION PHENOMENON

From the previous section it is clear that the country has rapid accelerated urbanisation fundamentally due to migration of rural dwellers. Rural migration to cities is not a new nor infrequent phenomenon; it occurs in all parts of the world and has characterised the present century (8). It is important however to distinguish two basic models of rural migration:

- a) That seen in Europe and North America with the Industrial Revolution in which the prosperity and labour demand in cities attracted peasants with clear prospects of economic improvement, availability of services and personal development opportunities. Due to this type of migration, agriculture became a highly technical activity utilising a small fraction of the national labour force.
- b) The model presented in Mexico and many other developing countries during the last 15 years in which the process is not

due to urban prosperity but to rural misery. In this model, migrants desperately run away from the countryside to cities which have not enough employment nor services to receive them, and which will not offer great prospects of personal and economic development; by comparison cities offer better conditions than the countryside, but they are not really satisfactory, more of an illusion than reality. In this model, agriculture is not technical, thus generating a crisis of agricultural production. Moreover, quite often the migrants settled on lands surrounding the city which was formerly agriculturally productive, and this makes the city dependent on the supply of many products from distant places.

Of course a small fraction of migration in underdeveloped countries follows the first model, but in most cases it follows the second one.

According to some estimates based on current trends, by the year 2015, 82 percent (555 million people) of the Latin American population will be urban, while only 75 percent of the European and Anglo-American population and 50 percent of the African population will fit into this category (8).

Rural migration due to rural poverty overpopulates only specific cities which then suffer an economic, social, sanitary and nutritional polarisation; the usual contrasts deepen, and the mean indicators of wellbeing are reduced.

Illegal urban settlements are called "ciudades perdidas" in Mexico, "pueblos nuevos" in Peru, "favelas" in Brazil or "villas miseria" in Chile and Argentina. All are the same: virtual invasions in which rural groups more or less largely establish themselves around the city where there is no service at all and often not even reasonable topographic conditions (dry beds of rivers or lakes, steep slopes on mountains, ravines etc.). Rudimentary "houses" are built in a hurry on those sites using cardboard, pieces of wood or similar materials, which from the beginning are crammed into a narrow space. These houses lack any floor except the soil; they also lack tap water, sewage and electricity. In some cases, after some time, these houses will be rebuilt in better condition, but usually they will be finally destroyed when the former water course is flooded or when the edge of the ravine breaks.

Legal ownership of these constructions does not exist, and this generates problems and conflict with the original owners of the land. Sometimes the city administration regularises the properties, but not without cases of exploitation and corruption.

In these unhealthy, crowded, unsafe and uncomfortable neighbourhoods, there is no employment, making it necessary to travel to the centre of the city. Transportation, however, is not adequate. In Mexico City the inhabitants of such nuclei may spend 5 to 7 hours travelling to and from centres of employment.

Since employment is not sufficient in any of the big cities suffering this phenomenon, there is widespread unemployment or underemployment, generating high crime rates.

Family stability is weak. Overcrowding in the home and the need to earn income cause dwellers to be absent from home.

Pollution is outstanding in these places because of accumulations of rubbish and excreta; there is a notable lack of schools, health centres and recreational facilities.

The phenomenon of "street inhabitants" develops, specially children walking around the central streets of the city. These people look for income through both legitimate and illegitimate means, and are exposed to city aggression and to sophisticated systems of exploitation.

Whatever their extraction and rural origin, migrants suffer extreme cultural and environmental shock. Instead of the natural environment in which they used to live, they are now confronted with a mixture of bizarre walls and ceilings in filthy surroundings quite different from their original communities.

Cultural shock is even more intense. Most customs have to be changed. Values, activities, beliefs, relationships and behavioural habits are different, as are the needs and the availability of time and resources. On top of these deep changes, publicity and quacks impose the consumption of expensive and unnecessary products.

The migrant faces the transculturation process with self devaluation, an inferiority complex which makes him leave behind his original patterns of life and acquire those which he observes in his new environment. In this process there are gains and losses, but the latter are specially undesirable since they imply losing survival techniques gradually generated as solutions to chronic limitations.

The migrants gain wider availability and sometimes better prices for food than those in their original town, but lose healthier and more economical food habits.

Among the main food changes (9) observed in the case of Mexico City are lower consumption of tortillas and beans, and higher consumption of white bread, pasta, rice, sugar, fats and oils, salt, sweets, bottled soft drinks and fast foods. Thus the diet loses fibre and starch and is more abundant in sodium, sucrose cholesterol, and total and saturated fatty acids; in other words this change is the opposite to the one promoted by health authorities and, when reaching large enough proportions, favours a higher incidence of atherosclerosis, obesity and other chronic diseases which are increasing as causes of death in adults (10).

The search for illusive prestige through imitation of urban and foreign consumption patterns, the need to eat in the street, and the easy access to snacks and junk food favour the negative changes already mentioned and mean higher expenses than with the traditional patterns. Specially important is the decline

in breast feeding in the urban area (11). This change, in combination with poor hygiene and sanitary facilities, is accompanied by high morbidity from undernutrition and infections and, consequently, by high infant mortality.

INDICATORS IN METROPOLITAN MEXICO CITY

Both in the Federal District and in the State of Mexico, the mortality rate in 1987 (26.3/1000) is lower than the national rate (32/1000). The respective fertility rates (per 1000 women at reproductive age) were 96.1 for the Federal District, 98.1 for the State of Mexico and 136.4 for the whole country (10).

The mortality rate in 1987 was 7/1000 for the country, 4.3/1000 for the Federal District and 4.1/1000 for the State of Mexico. Infant mortality was 22.6 for the Federal District, 35.9 for the State of Mexico and 23.0 for the country (10).

TABLE 4
SOCIO-ECONOMIC INDICATORS IN THE
METROPOLITAN AREA OF MEXICO CITY (1988)
(% of mexican households)

Radio and TV	96
Refrigerator	76
Telephone	36
Car	35
Earthen floor	9
Running water	98
Drainage system	80
Illiteracy	14

Source (12)

Life expectancy in 1987 was 68.8 years for the country and for the State of Mexico and 72.4 years for the Federal District, with slightly more than 2 years more for women and almost three years less for men (10). In general the sanitary pattern revealed by these figures is reasonably good.

Table 4 shows selected socioeconomic indexes for Metropolitan Mexico City obtained in the National Nutrition Survey done by the Ministry of Health in 1988 (12).

The figures are self explanatory. Even though illiteracy is still high, most homes have radio and television sets. The number of telephones and cars is low, and not all homes have proper drains although most of them have tap water.

Metropolitan Mexico City would need at least 6.3 million jobs, but there are only about 6.1 million, so that there are at least 200,000 unemployed people. Since 175,000 additional new jobs are needed every year, there is a considerable gap. Among employed people, 1.1 million earn less than the minimum wage, equivalent to 4.20 US dollars per day.

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Since there exists the possibility of a North American Free Trade Agreement, it is interesting to compare some indicators of the three signing countries.

While the per capita income reaches 18,530 US dollars in the USA and 15,160 US dollars in Canada, it is only 2,200 US dollars in Mexico. There is an eight fold gap between Mexico and the USA which is complicated by the extreme asymmetry of the distribution of income in Mexico and the demographic growth which is 2.2 percent a year in Mexico against 1 percent in Canada and the USA (13).

The economically active population is 29.3 million in Mexico, 13.5 million in Canada and 123.4 million in the USA, with an annual growth of 3.4 percent in Mexico and 1.7 percent in the other two countries; the type of employment is also quite different. The primary sector represents 23 percent in Mexico, against 3 and 5 percent in the USA and Canada respectively; the secondary sector is basically similar in the three countries (25-27 percent) and the tertiary sector is only 52 percent in Mexico, as against 70 percent in Canada and the USA (13).

The minimum wage in Mexico is 4.2 US dollars per day, as against 32 US dollars in the USA. The monthly minimum wage for the manufacturing sector is 282 US dollars in Mexico, 1985 US dollars in the USA, and 2055 US dollars in Canada (13).

Data on the urban diet in Mexico are very limited. Table 5 shows data obtained in the National Nutrition Survey in 1979 for Mexico City.

TABLE 5
COMPOSITION OF AN URBAN
FAMILY DIET(1979)
(per person per day)

Energy	2180	kcal
Protein	78	g
Triglycerides	103	g
Carbohydrates	255	g
Iron	21	mg
Calcium	980	mg
Cholesterol	385	mg
Retinol	580	µg
Vit. C	62	mg

Source (9)

Average energy intake is almost 2200 kcal per person per day, with a high contribution of fat (42 percent) and protein (14.3 percent), some excess of cholesterol, enough iron, vitamin C and calcium, and little retinol (9).

Table 6 presents some anthropometric data in preschool children and non-pregnant women in the metropolitan area of Mexico City obtained in the National Nutrition Survey of 1988 (12).

TABLE 6
ANTHROPOMETRIC INDICATORS IN
CHILDREN LESS THAN 5 YEARS OLD AND
IN NON-PREGNANT WOMEN, 1988
(% of cases)

Indicator		Deficient		Excess
		Normal Total	Serious	
Wt/Age	31.1	0.1	52.3	12.9
Ht/Age	24.7	1.1	71.1	—
Wt/Ht	13.0	0.6	68.5	13.6
BMI women	22.1	—	24.1	25.2(43.5)

Source (12): Encuesta Nacional de Nutrición 1988.

The best indicator of active undernutrition, Wt/Ht, indicates there were 13 percent undernourished children (0.6 percent severe cases) and 13.6 percent overweight children. Nearly 25.5 percent of the children had short stature and the Quetelet index in non-pregnant women was low in 22 percent, normal in 24 percent and high in 25 percent of the cases (12).

MEXICO CITY IN THE WORLD

In 1990, the Population Crisis Committee published an interesting analysis of living conditions in the 100 most populated cities in the world. These results are pertinent to this workshop (8). From the rich and abundant material of these analyses, a few figures are commented on in the following paragraphs.

The first cities appeared about 6,000 years ago, but the "urban explosion" started only in the last 50 years. In 1900 only 10 percent of the world population lived in cities, and in 1950 this proportion reached only 30 percent with only 26 cities over 2 million inhabitants and 10 cities over 5 million inhabitants. In 1990, however, there were 33 cities with more than 5 million, 15 reaching more than 10 million and 6 with over 15 million inhabitants.

Table 7 lists the 10 largest urban conglomerations and their population in 1990 and 1965 according to the Committee.

Three of these conglomerations are Latin American cities, and the three have been analysed in this workshop: Mexico, Sao Paulo and Buenos Aires. In 1965 only three cities in the world had more than 10 million inhabitants, and the largest in Latin America was Buenos Aires (8 million), closely followed by Mexico and Sao Paulo. In 1990, however, Mexico ranks second in the world and first in the continent, while Buenos Aires ranks 10th. From 1965 to 1990 Seoul was a rapidly growing city, while New York and Moscow virtually did not grow.

TABLE 7
WORLD URBAN CONGLOMERATES
AND THEIR POPULATION
(millions of inhabitants)

1965	
Conglomerate	Population
Tokyo Yokohama	18.1
New York	16.5
Osaka Kobe Kyoto	11.4
Moscow	8.9
Calcutta	8.1
Buenos Aires, La Plata	8.1
Mexico	7.0
Sao Paulo	6.0
Bombay	5.4
Seoul	4.4
1990	
Conglomerate	Population
Tokyo Yokohama	29.0
Mexico	20.1
Sao Paulo	17.9
New York	17.5
Osaka Kobe Kyoto	16.9
Seoul	16.4
Moscow	13.3
Bombay	13.3
Calcutta	13.0
Buenos Aires, La Plata	12.6
(London)	(11.0)
(Paris)	(10.0)

Source (8)

At the end of Table 7, London and Paris are included as important references, since for the last 200 years they were prototypes of large cities, and today, they occupy quite a secondary place population-wise.

According to the Committee, the annual growth of Mexico City, Buenos Aires and New York during the Eighties was 3.8 percent, 1.78 percent and 0.32 percent respectively. During the same period Tehran grew 4.7 percent, Djakarta 4.4 percent, Madras 4.2 percent, Belo Horizonte 3.85 percent, Guadalajara 3.4 percent, Los Angeles 1.83 percent, Boston 0.32 percent and Rome 0.29 percent.

According to the 1990 National Census, Mexico City only has a population of 16 million and not 20 million as the Committee points out, which establishes uncertainty about reliability of other figures in the study. Even though the data used by the Committee may not be strictly comparable between cities and countries since their origin is different, often subjective (opinions) and without uniform criteria, nevertheless, the study is extremely interesting and deserves analysis.

The study took 2.5 years to complete. The Committee sent 167 questionnaires to 200 experts in 45 countries and data was received about 98 cities. The questionnaire established 12 indicators, but the analysis of unemployment and of nutritional status was eliminated in the end, since the answers lacked consistency and were incomplete. No questions were made on purpose about culture or recreation, since national bias in this respect was likely. In the end only the following 10 indicators were used:

1. Safety: murders per 100,000 inhabitants per year according to police estimates.
2. Food costs: proportion of the family income spent on food (Metropolitan average).
3. Living: number of persons per room based on city estimates of the number of homes and the average number of rooms per home.
4. Quality of homes: number of homes with tap water and electricity (average of both indicators).
5. Communications: number of telephones per 100 inhabitants according to local companies adjusted for the number of incomplete calls.
6. Education: proportion of 14 to 17 year olds attending secondary school.
7. Public Health: infant mortality per 1000 live births per year.
8. Quiet and Silence: score of environmental noise from 1 to 10 estimated by those answering the questionnaire.
9. Traffic speed: estimate of the time needed to go from the commercial centre of the city to the airport at the peak hour in the morning.
10. Air quality: The lowest value for ozone particles or SO₂.

Each indicator was scored from 1 to 10, and a grand total was obtained with a theoretical maximum score of 100 points. Table 8 shows the marks obtained by Mexico City, Guadalajara, Monterrey, and other cities selected in each case as interesting for comparison purposes. We have eliminated the extremely subjective indicator of quiet and silence, but the proportion of the population estimated as living in depressed areas of the city is included.

The numbers speak for themselves, and it is clear that Mexico City does not rank well and is included in the "bad" category; Guadalajara and Monterrey showed better marks but they are quite far behind Melbourne, Montreal and Seattle Takoma with 86 points. Boston had 71 points, Tijuana 63, Buenos Aires 55, Santiago 50, Calcutta 34 and Lagos 19.

Besides the probable uncertainty of many of the data used in this exercise, it is also difficult to interpret them because of the use of averages.

TABLE 8
POINTS OBTAINED BY MEXICO CITY, GUADALAJARA, MONTERREY AND OTHER SELECTED CITIES IN THE INDICATORS
STUDIED BY THE POPULATION CRISIS COMMITTEE (1990).

Indicator	México City	Guadalajara	Monterrey	Other cities	Criteria*	
					1 point	10points
Murders/year/100 000 inhab.	27.6	8.4	9.5	Cairo 56.0, Washington 14.8	>30.0	<1.5
Food expenditure (%)	41.0	40.0	45.0	Lima 70.0, Paris 21.0	>60.0	<16.0
Persons per room	1.9	1.6	1.9	Bombay 4.2, N.York 0.5	>2.4	<0.5
Household with water and electricity (%)	94.0	82.0	97.0	Lagos 50.0, Kmshasa 33.3	<50.0	>99.0
Telephones per 100 persons	6.0	12.0	12.0	London 50.0, Lima 2.0	<10.0	>69.0
Young people in secondary school.	62.0	67.0	74.0	Moscow 100.0, B.Aires 51.0	<40.0	>94.0
Infant mortality/1000 live births	22.0	26.0	19.0	Tokyo 5.0, Karachi 97.0	>97.0	<10.0
Traffic Speed	13.0	36.0	45.0	Atlanta 64.0, N.York 14.0	<17.0	>64.0
Cleanliness of air (ppm O3)	0.41	0.19	---	Los Angeles 0.35, N.York 0.28, Santiago 0.40, Sidney and Taipei 0.00	—	—
Population in deprived areas (%)	42.0	—	—	Kinshasa 60.0, Bogota 60.0, Calcutta 67.0, Casablanca 70.0	—	—
FINAL COUNT (points)**	38	53	51	Melbourne and Montreal 86.0, Lagos 19		

* The worst value is one point, and the best is 10 points which is considered the ideal.

** >75 "Very good", 60 to 74 points "good", 45 to 59 points "average" and <44 points "bad".

Source (8)

The proportion of the income spent on food depends on the local cost of the products and on the local cost of other expenditure items (transportation, housing, education, recreation, health etc). Thus a figure of 50 percent in New York would represent a much more critical situation than in cities where transportation is extremely cheap, and education and health services are virtually free.

The traffic speed as it was investigated is not probably a good indicator of the real traffic speed for the rest of the day, and it depends on the size of the city and how far the airport is from the centre.

According to the Committee's report, some cities would be virtually uninhabitable due to traffic paralysis or violence. Usually misleading averages are even more misleading when used to describe variables which do not distribute normally. Even though those indicators may reveal undesirable situations in general, such situations take place in specific parts of the city and therefore the situation may be even worse in those zones but much better in others.

EPILOGUE

These pages have tried to sketch Mexico City, with its old splendour and importance, and its alarming present situation. Due to its size and complexity, Mexico City's problems often have no precedent. The study of these problems and moreover their solution is a gigantic task which obviously demands a multidisciplinary approach and a united effort.

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