# The Historian and Quantitative Approaches: Demographic Studies of Islamic Cities Hypotheses and Questions[1]

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This study introduces the stages of the development of quantitative history through its main scholars and schools, then presents some statistical innovations and methods to estimate the inhabitants and populations of some Islamic cities throughout history, using a number of Arab and Western studies. This research has relied on quantitative approaches, demographic theories, and sought to utilize old texts and the statistical inferences found throughout these texts. The study also employs mathematical inferences that can be drawn from the spacial dimensions of these cities and the number of their public facilities, in as much as these inferences provide indicators of the dynamics of population size and growth in these cities. These quantitative approaches are certainly an important addition to the study of the history of Islamic societies. However, their systemic gaps reveal their limits and their relative nature. The utilization of these kinds of quantitative approaches can be risky if they are not historically and cognitively situated. This caution is in no way an attempt to dismiss these quantitative approaches, but rather a call to strengthen them using a more cautious and controlled approach.

**Islamic Cities  Islamic Societies  Demography  Demographic Theories  Quantitative History**

The historian attempting to comprehensively establish the living conditions of a particular society, or to determine rises and falls in population, is setting out on a difficult path. The sources and documents are typically lacking and he is thus forced to 'invent' new sources or use methods borrowed from elsewhere to make the existing sources speak. Indeed, when examining a document, he may be compelled to adopt the approaches of other disciplines such as social anthropology, ethnographic enquiry, or quantitative methodologies.

In this study – after tracing the development of quantitative history through its various pioneers and schools of thought – I will look in depth at methods by which the population of various historical Islamic cities can be measured. These methods draw on demographic theories, ways of teasing out the demographic clues scattered throughout classical texts, and mathematical extrapolations based on the area of and number of public buildings in these cities that can be used as indicators of population dynamics.

The temporal depth employed in determining the periods studied from the beginning of Islam to the modern period is based practically on the information available in classical sources and modern studies. From the methodological standpoint it is also based on my conviction that it is crucial to move between the antecedents and consequents of phenomena to understand them clearly, because issues are understood through their causes and their results. An extended chronological framework is appropriate to the slow rhythm of major population changes. Finally, and no less importantly, it is appropriate to the specificity of the periodization of Islamic societies, whose structures only came under outside influence in the modern era.

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1    This study was originally presented at ACRPS' Seventh Conference on Social Sciences and Humanities, which was held in March, 2019. The theme of the conference was «Research Methodologies in the Social Sciences and Humanities ». The study was translated by Chris Huw Hitchcock.

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# Historical demography: Long efforts, limited ambitions

The discourse of the historian is formed each time according to the context of his time and his openness to the topics and methodologies of other disciplines. In recent years this openness has moved from the logic of mere 'supporting disciplines' to the concept of 'interdisciplinarity' in the sense of mutual influence of different academic fields on one another both epistemologically and methodologically.

Epistemologically speaking, the successive academic revolutions within the 'hard' sciences have had a great influence on humanity's conception of itself. Ideas have fluctuated between a reduction of man to an animal or to the concept of a mechanism, his reification, or his re-imagination as a mere collection of organs.[3] These reductions have served as a framework for many of the conceptualizations and methodologies of those who work in the humanities and social sciences.

Methodologically, mixed-methods (the use of various overlapping methodologies) has made only limited advances, not necessarily because of the practical difficulties involved but because of the rigidity of the positions and conceptions of many of those working in these fields. Each specialization continues to clash with itself and make war on its own ghosts and idols.

The historian, as François Simiand (1873-1935) stated in his famous article,[4] has never ceased to be confronted by three 'idols': 'the individual', 'politics' and 'chronology'. Historians' openness to other disciplines, meanwhile, is still vacillating between advancement and hesitation. Having reviewed their priorities and broadened their ideas of what constitutes and how to read a document, they have now begun to open their minds – albeit cautiously – to the approaches of other disciplines, including quantitative, mathematical and statistical methodologies.

The founding years of quantitative history fell between the 1930s and 1950s, following the use of mathematical models or systems by the pioneers of economic history.[5] This trend first appeared in the United States with Simon Kusnets' studies in political economy, and within the International Association for Research in Income and Wealth.[6] In France, the work of the French sociologist and economist Simiand, which combined statistics and social analysis,[7] was the starting-point for this period. He was followed by C.E. Labrousse, whose academic contributions, inspired by the work of his predecessors, became a model of discussion between history, economics and statistics.[8]

Numerical data, which had previously been used only in exceptional cases and in isolation, was now organized by the partisans of this new trend in economic history into consistent collections of statistics, and used to study historical problems. The enthusiasm for quantitative approaches and attempts to represent historical phenomena numerically developed further between 1950 and 1980, contributing to historiography's shift away from pure narrative and simultaneously affirming the discipline's scientific nature.[9]

With time, the quantitative approach came to be supported by digital processing of data. Its use expanded beyond economic history to new fields, especially demographic history. The reframing and reconstruction of historical data allowed great development in the understanding of demographic behaviors.

After 1960, the quantitative method and the new historical approach known as *l'histoire sérielle* (history read through regular and consistent collections of statistics) sought to expand into the cultural sphere. This trend attempted to establish

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**3**   See the summary of these four approaches in: Jean-Claude Guillebaud, Le principe d'humanité (Paris, éditions Seuil, 2001), pp. 43 - 158.

**4**   François Simiand, « Méthode historique et science sociale », *Annales, Economies, Société, Civilisations*, n°1, (1960), pp. 83 - 119.

**5**   Maria-Novella Borghetti, « Histoire quantitative, histoire sérielle », in *Historiographies, I, Concepts et débats*, dir. C. de la croix et autres, (Paris, Édition Gallimard, 2010), p. 412.

**6**   Jean Marczewski, *Introduction à l'histoire quantitative*, (Genève, Droz ; 1965), p. 185.

**7**   François Simiand, *Statistique et expérience, remarques de méthode* (Paris, Éditions M. Rivière, 1922), p. 79.

**8**   Ernest Labrousse, *Esquisse du mouvement des prix et des revenus en France au 18e siècle*, (Paris, Montreux. Coll. Réimpression, Éditions des Archives contemporaines, 1984), p. 697.

**9**   Bernard Lepetit, « L'histoire quantitative: deux ou trois choses que je sais d'elle », *Histoire & Mesure*, IV 3-4, (1989), pp. 191 - 199.

relationships between the quantitative and the study of mentalities and social representations (the third level according to Pierre Chaunu).[10] They showed a new interest in fields that had typically only been analyzed qualitatively, such as written culture and approaches on death.[11]

This attraction to the quantitative method reached its apogee in the 1980s. At the same time, however, researchers reconsidered their blind faith in the meanings of numbers, since quantitative measures do not have the same soundness or scientific objectivity in the social sciences and humanities as they do in the 'hard' sciences. Historians remain convinced of the importance and legitimacy of numerical data, but this is based today on a less ambitious academic project, which considers quantitative data a methodological tool and a relative indicator – and not a new scientific philosophy or history. These more modest ambitions focus fundamentally on economic and demographic studies.[12]

The field of historical demography has opened up new horizons for research, despite the fact that extrapolation and hypothetical calculations are something of an exceptional tool, one that the historian is compelled to make use of because – in most cases – he has no sources in his possession that allow conceptualization and understanding of the quantitative development of a given society.

A few fundamental questions may leap to mind at this point. Why risk building a house on such shaky foundations? Why rely on such imprecise methodologies? Where did the quantitative fever that seems to have beset historians come from? And what is the end-point of such approaches?

We can answer these questions from two perspectives:

1. Because to determine population numbers and trends is to trace the first and most important agent in the making of history: man. Likewise, it means drawing closer to the 'primary datum' that drives events, determines demand, creates conflict and generates different forms of civilization.

2. Having accepted this general premise, why attempt to be precise with regards to population numbers and their growth over specific periods? The answer is that population increase is not a mere quantitative accumulation but also a qualitative transformation correlated directly with pure numbers. There is variation between small and large numbers in the laws of sedentary life. There are numerical thresholds (*seuils critiques*) and critical limits. In the wake of a population boom the structure of society changes and becomes more complicated (socially, economically and politically). Historical scenarios shift and new phenomena and social by-products appear: those who benefit and those who are marginalized; tribal affiliation to urban affiliation; the breaking-up of a single structure into different groups; the retreat of one hegemonic set of behaviors and values in the face of another. Any society whose population has grown numerically also changes qualitatively in accordance with its constituents and its possibilities and its individual and collective options.

Ibn Khaldun, for example, believed that population numbers determined a tribe's prestige and success. Discussing the Hawwara, whose power disappeared along with their numbers, he says that "Barqa was one of the bases of these Hawwara... When Zuweila (one of the cities of Barqa) came out, they [left it] and moved across the Sahara to Fezzan, where they settled. There they had power and authority [*mulk wa-dawla*]... Many peoples in the Maghreb come from the Hawwara... But the strength and power they had had in the days of the conquests thanks to their numbers disappeared, and they became scattered among the valleys because they were so few."[13]

It should of course be noted that this sort of social transition plays out according to circumstances and mechanisms produced by a balance of various phenomena: from economic prosperity to the decline of living standards and poor nutrition; from specialized professional organization to limited work opportunities disproportionate to the working population; from land reclamation and wasteland development to rural out-migration.

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10  Maria-Novella Borghetti, p. 415.

11  Pierre Chaunu, *Histoire quantitative, histoire sérielle* (Paris, éditions Armand Golin, 1978), p. 304.

12  Maria-Novella Borghetti, p. 417.

13  ʻAbdurrahman bin Khaldun, *Tarikh al-ʻAllama ibn Khaldun* (Beirut: Dar al-Kitab al-Lubnani, 1983), p. 6, pp. 291 - 292.

The main constant is that knowing population numbers helps us to understand social structure and composition with all its organization, contradictions, and ability to integrate later arrivals with the original settled society. It is data that contributes to a more solid base of information with which to explain the causes and contexts of historical events and phenomena and estimate the rate, extent and direction of change.

## Major questions and theses on the demographic history of the Islamic World

A grasp of the population data helps us to assess the seriousness, or tenuousness, of various "general" historical theses or *modèles* that attempt to trace the effects of fluctuations in population growth across broad swathes of the Islamic World.

Henri Pirenne (1862-1935) connected the spread of Muslims, and the growth in their numbers within a relatively short period, to the military and economic consequences of this growth in the Mediterranean. He suggests that this caused a decisive break in the unity of the Mediterranean: Spain (al-Andalus) and North Africa were separated from urban society, and this culturally new population makeup was to limit exchange within the Mediterranean basin, dividing east and west and making it a "Muslim lake".[14]

Marshall Hodgson asserts that the Islamic world remained central to humanity until the 16th century, to the point that neither the genius of the European Renaissance nor the discovery of the New World was able to shake it.[15] The French academic Gabriel Martinez-Gros has explored this question further, suggesting that we look into demographic sources on the world of the fifteenth century in order to understand these phenomena.[16] He finds support for Hodgson's assertion in demographic historian Jean-Noël Biraben's[17] statistics for the population of the Islamic World as compared to the rest of the world. Having confirmed these data, Martinez-Gros attempts to explain the high figures for the Islamic World (which are similar to Hodgson's estimates). After a small decline between the 11th and 13th centuries, the population of the Islamic World rose to dominate the global stage between 1400CE and 1700CE. The Asian and African worlds played a major role in this – more so than the Arab World.

**Table 1: Estimates of the world's population in millions in several regions across different time frames based on Jean-Noël Biraben, p. 23.**

| Area | Years | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 400BC | 200BC | 0 | 200 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
| China | 19 | 40 | 70 | 60 | 25 | 32 | 49 | 44 | 56 | 48 | 56 | 83 | 124 |
| | | | | | | | | | | | | | |
| India, Pakistan, Bangladesh | 30 | 55 | 46 | 45 | 32 | 33 | 37 | 50 | 43 | 38 | 40 | 48 | 69 |
| Southwest Asia | 42 | 52 | 47 | 46 | 45 | 41 | 32 | 25 | 29 | 33 | 33 | 28 | 27 |
| Japan | 0.1 | 0.2 | 0.3 | 0.5 | 1.5 | 2 | 4 | 5 | 6 | 7 | 7 | 7 | 6 |

**14** Henri Pirenne, *Mahomet et Charlemagne,* (Paris, Quadrige PUF, 1970) ; Maurice Lombard, « Mahomet et Charlemagne: le problème économique », chap. II, *Espaces et réseau du Moyen Age*, (Paris, Éditions. Mouton, 1972).

**15** Marshall Hodgson, *The Venture of Islam, Conscience and History in a World Civilization, vol II, The expansion of Islam in the Middle Periods*, (Chicago and London, The University of Chicago Press, 1974).

**16** Gabriel Martinez-Gros, « La seconde islamisation du monde », in *Histoire du monde au XV siècle, 2. Temps et devenirs du monde*, (Paris, Édition pluriel, 2017), T. II, p. 416.

**17** Jean-Noël Biraben, « L'histoire du peuplement humain des origines à nos jours » , chapter 66 of *L'Histoire du peuplement et prévision*, 5th volume of Traité *Démographie: Analyse et synthèse*, under the direction of G. Caselli, J. Vallin et G. Wunsch, (Paris, Edition de l'INED, 2004), pp. 9 - 31.

| Area | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remainder of Asia (Soviet Union not included) | 3 | 4 | 5 | 5 | 7 | 8 | 11 | 12 | 14 | 16 | 19 | 24 | 31 |
| Europe (without Soviet Union) | 19 | 25 | 31 | 44 | 36 | 30 | 22 | 22 | 25 | 28 | 30 | 35 | 49 |
| Soviet Union | 13 | 14 | 12 | 13 | 12 | 11 | 11 | 10 | 10 | 11 | 13 | 15 | 17 |
| North Africa | 10 | 13 | 13 | 16 | 13 | 12 | 11 | 9 | 10 | 10 | 10 | 8 | 8 |
| Remainder of Africa | 7 | 9 | 12 | 14 | 18 | 20 | 17 | 15 | 16 | 20 | 30 | 30 | 40 |
| South America | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| Central and North America | 7 | 8 | 10 | 9 | 11 | 13 | 14 | 15 | 15 | 13 | 16 | 19 | 23 |
| Oceania | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| **Global total** | **152** | **223** | **250** | **255** | **204** | **205** | **211** | **210** | **227** | **227** | **257** | **301** | **399** |

| Area | 1250 | 1300 | 1340 | 1400 | 1500 | 1600 | 1700 | 1750 | 1800 | 1850 | 1900 | 1950 | 1970 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| China | 112 | 83 | 70 | 70 | 84 | 110 | 150 | 220 | 330 | 435 | 415 | 558 | 774 |
| India, Pakistan, Bangladesh | 83 | 100 | 107 | 74 | 95 | 145 | 175 | 165 | 190 | 216 | 290 | 431 | 667 |
| Southwest Asia | 22 | 21 | 22 | 19 | 23 | 30 | 30 | 28 | 28 | 31 | 38 | 75 | 118 |
| Japan | 6 | 7 | 7 | 8 | 8 | 12 | 28 | 30 | 30 | 31 | 44 | 83 | 104 |
| Remainder of Asia (Soviet Union not included) | 31 | 29 | 29 | 29 | 33 | 42 | 53 | 61 | 68 | 78 | 115 | 245 | 386 |
| Europe (without Soviet Union) | 57 | 70 | 74 | 52 | 67 | 89 | 95 | 111 | 146 | 209 | 295 | 395 | 462 |
| Soviet Union | 14 | 16 | 16 | 13 | 17 | 22 | 30 | 35 | 49 | 79 | 127 | 180 | 243 |
| North Africa | 8 | 9 | 9 | 8 | 8 | 10 | 9 | 10 | 9 | 13 | 23 | 44 | 70 |
| Remainder of Africa | 49 | 60 | 71 | 60 | 78 | 104 | 97 | 94 | 92 | 90 | 95 | 167 | 266 |
| South America | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 5 | 25 | 90 | 166 | 283 |
| Central and North America | 26 | 29 | 29 | 36 | 39 | 10 | 10 | 15 | 19 | 34 | 75 | 164 | 283 |
| Oceania | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 6 | 13 | 19 |
| **Global total** | **413** | **429** | **439** | **374** | **458** | **580** | **682** | **775** | **968** | **1243** | **1613** | **2521** | **3620** |

André Miquel, in his *L'islam et sa civilisation*, raises various demographic questions about the Islamic World, asking for example what the population dynamics of the region might have been like prior to the well-known demographic explosion of the 20th century if this explosion was indeed caused by falling death rates and rising birthrates.[18] Based on studies by Ömer Lütfi Barkan[19] and JC Russell,[20] and drawing on historical data from the West with suggestions of new interpretations of established texts and events, Miquel summarizes the general demographic trend in Islamic countries as a lasting shortage of men and,

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**18** André Miquel, *L'Islam et sa civilisation*, (Paris, A. Colin, coll. « Destins du monde », 1968), p. 572.

**19** Ömer Lütfi Barkan, « Essai sur les données statistiques des registres de recensement dans l'Empire Ottoman au XVe et XVIe siècles », *Journal of Economic and Social History of the Orient*, vol. 1, N°1, (Aug. 1957), pp. 9 - 36.

**20** J. C. Russell, *Late Ancient and Medieval Population*, Transactions of the American Philosophical Society, Vol. 43, n°3, (Philadelphia, The Society, 1958).

moreover, bad distribution of population; a subsequent decrease in rural population in favor of the cities and subsequent high urban population density, resulting in great sensitivity to demographic catastrophes such as plagues and famines.

Ibn Khaldun describes the destructive demographic effects of the Black Death, which spread across the Islamic World in the fourteenth century:

'However, at the present time – that is, at the end of the eighth [fourteenth] century – the situation in the Maghrib, as we can observe, has taken a turn and changed entirely... This was the situation until, in the middle of the eighth [fourteenth] century, civilization both in the East and the West was visited by a destructive plague which devastated nations and caused populations to vanish. It swallowed up many of the good things of civilization and wiped them out. It overtook the dynasties at the time of their senility, when they had reached the limit of their duration. It lessened their power and curtailed their influence. It weakened their authority. Their situation approached the point of annihilation and dissolution. Civilization decreased with the decrease of mankind. Cities and buildings were laid waste, roads and way signs were obliterated, settlements and mansions became empty, dynasties and tribes grew weak. The entire inhabited world changed. The East, it seems, was similarly visited, though in accordance with and in proportion to [the East's more affluent] civilization. It was as if the voice of existence in the world had called out for oblivion and restriction, and the world had responded to its call. God inherits the earth and whomever is upon it. When there is a general change of conditions, it is as if the entire creation had changed and the whole world been altered, as if it were a new and repeated creation, a world brought into existence anew.'[21]

After the Black Death, in the 15th and 16th centuries, the population of the Islamic World experienced lively growth. Thereafter, however, the data for Muslim countries was to deviate from that in European countries: "Unlike the growth in Europe, the demographic makeup of Muslims remained

entirely subject to the laws of hunger and illness. Between 1600 and 1800, Islam extended across the map less than it might have if the same sanitary conditions had been available as in Europe." Miquel adds that Muslims had to wait until the end of the 19th century for their own demographic resurgence – with its previous demographic atrophy cited to explain the current backwardness of the Islamic World.[22]

In terms of social structure and population, we should note Pierre Guichard's thesis on 'eastern' and 'western' social structure in al-Andalus,[23] which contends that the anthropological peculiarities of Andalusian Arab and Berber society – segmented social structure, cousin marriage, and honor values – produced a demographic composition that had a clear effect on the character of Andalusian society socially, economically, and in terms of use of space. Many French and Spanish researchers have lauded this analytical vision, to the extent that his thesis has become an analytical model for historical interpretation of the particularity of "Islamic Spain".

As an example of a more negative view charged with anti-"Oriental" prejudices, let us consider the thesis, first elaborated by the traveler Constantin-François Volney,[24] that under Ottoman rule there was a decrease in the population of the Levant. This thesis was subsequently adopted and reinforced by a number of later historical studies very much under the sway of the idea of "oriental despotism" so widespread in classical studies on the "splendor of the Orient".[25] According to the thesis, between 1600 and 1800 – when Europe's population was growing rapidly – the Levant experienced a demographic dark age. This depopulation could be attributed, naturally, to the despotism and collective punishment practiced by the Ottoman administration in the Levantine cities, and the Levant was surrendered to western forces almost empty.

This thesis has been countered by several specialist rebuttals based on the Ottoman archive, motivated in particular by the fact that the idea of the shrinking Ottoman city in the 18th century does not correspond

21    Ibn Khaldun, *The Muqaddimah*, trans. Franz Rosenthal (New York: Princeton University Press, 1967), p. 80.

22    André Miquel, *L'Islam et sa civilisation*, (Paris, A. Colin, coll. « Destins du monde », 1968).

23    Pierre Guichard, *Structures sociales orientales et occidentales dans l'Espagne musulmane*, (Paris, Editions. Mouton, 1977).

24    Constantin-François Volney, *Voyages en Syrie en Egypte pendant les années 1873 - 18*75 (Paris, 1959).

25    Antoine Abdel Nour, "as-Sukkan wa-Dimughrafiyyat al-Madina: Mudun Bilad ash-Sham fi'l-'Asr al-'Uthmani," trans Marie France Janabizi, *al-Fikr al-'Arabi*, 29 :4 (1982), p. 267.

to what we know about the general development of the global population in modern history.
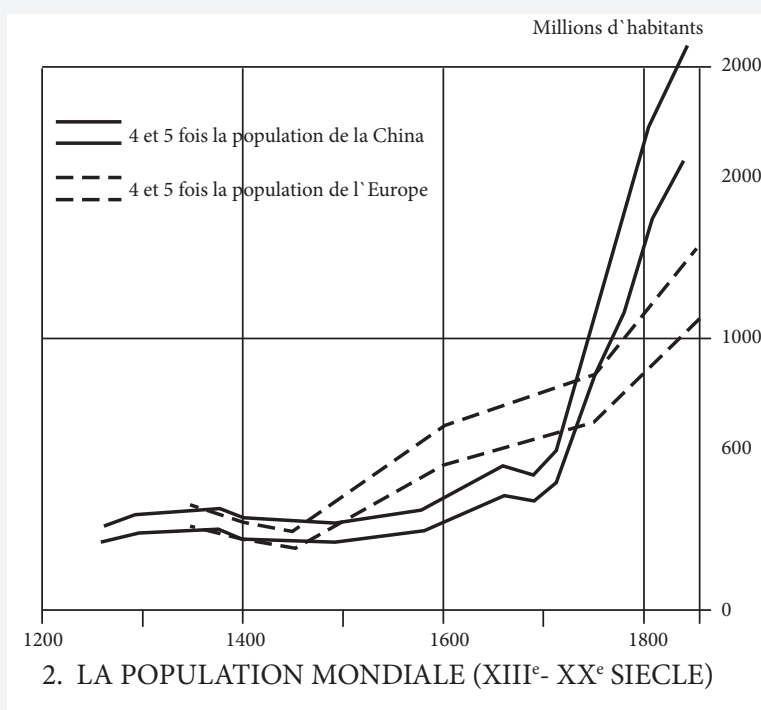
This brings us to a discussion of theoretical methods and general comparative approaches, or what is referred to as 'simultaneous correlation' or 'demographic self-regulation'.

## Theory of population readjustment: A preliminary theoretical approach

Ernest Wageman and Fernand Braudel[26] contend that it is possible to observe correlations and dynamics common to medieval cities at a continental scale. Braudel describes – in general terms – an increase in the 16th century, a reduction and shrinkage in the 17th century, and growth again in the 18th century.

In his view this is driven by two large areas (China and Europe) whose populations the historian has a broad conception of, considering them a unit of comparison representing some quarter or fifth of the world's population.

**Graph 1:**
**Global population (13th-20th centuries)[27]**



Millions d`habitants

— 4 et 5 fois la population de la China

- - - 4 et 5 fois la population de l`Europe

2. LA POPULATION MONDIALE (XIIIᵉ- XXᵉ SIECLE)

____ **Inhabitants of China (14/ or 1 / 5 of global population)**
------ **Inhabitants of Europe (14/ or 1 / 5 of global population)**

Based on this unit of measurement and by tracking the rate of population growth, it is possible to observe a simultaneous readjustment between the different

continents. In this schema population developments (resulting from commercial growth, plagues, etc) take the form of aftershocks which can be traced

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26   Fernand Braudel, *Les structures du quotidien: le possible et l'impossible, Civilisation matérielle, économie et capitalisme, XV-XVIII siècle*, T. 1, (Paris, Armand Colin, 1979), p. 18.

27   Braudel, p. 24.

and observed concurrently in different regions of the world. This concurrence is clear in the 18th century, relatively clear in the 17th century, and may well be observable in the 13th century.

The demographer Ernest Wageman believes that this readjustment or autocorrection, which cannot be explained by the international economy, is evidence that demographic development depends fundamentally on factors unrelated to the economy or medical development. Indeed, the economic factor may itself sometimes be a consequence rather than a cause of demographic developments.

Generally speaking, these near-simultaneous fluctuations throughout the world help us to imagine and understand how it can be that different agglomerations of humans managed to maintain a fixed numerical ratio between their populations (one quarter, one third, one half), in a manner that allows us to draw conclusions and analogies. These generalized figures, despite their imprecision, help to trace the "biological growth of humanity" as a single "stock" (as statisticians refer to it).

The correlation between two different geographical spaces may be inverse, as shown by the Tunisian historian Mohamed Talbi in his study of demographic changes in the Maghreb between the 11th and 15th centuries.[28] This study attempts to overcome the paucity of numerical data in the Arabic sources, drawing out indicative remarks made by Arab geographers to demonstrate the dense and intensive use of urban space in the 9th century Maghreb during a period when Merovingian and Carolingian Europe had no cities with a population greater than 10,000 people. At the end of the 12th century, these cities saw a demographic decline – while the population of Milan rose to 200,000 people, with a concurrent growth in its economic and architectural sophistication.[29] According to Talbi, this retreat began quietly in the 10th century, becoming marked with the arrival of famine and plague particularly in 1005, when it became clear that the demographic weight of the area was falling. The 'bottom of the [demographic] trough' came in the mid-14th century with the Black Death and other successive crises in the 15/16th centuries. Talbi's conclusion is that to explain the curve of medieval population decline, an approach is needed that encompasses political, socioeconomic and sanitary conditions, and perhaps links them to natural data (weather and forestation), without forgetting wars, technological decline, natural crises, tax policy and developments in the social structure.[30]

## History of the Islamic World: Particularity of the Sources and Exploring Family Background

Alongside more general approaches, historians depend on unusually informative sources that allow – to a significant extent – the development of demographic-statistical approaches to many aspects of the history of Islamic peoples. Since the 1970s there has been broad interest in classical biographical collections (*at-tarajim wa't-tabaqat*) because of the diverse topics that they cover. With these studies has come a period of real recognition of such sources' importance. Academics have begun to pay attention to their statistical aspects and what the hints they contain can tell us about microdemography, particularly given classical biographers' interest in the lives of people from a wide range of social classes (jurisprudential and religious scholars, doctors, poets…) over time and in particular Islamic cities (Baghdad, Damascus, Fez, Marrakesh).

Charles Pellat, in an enquiry into the possibility of establishing a birth rate for the Prophetic period,[31] draws on various sources such as Ibn Sa'd's *Tabaqat*, az-Zubairi's *Nisab Quraysh*, and Ibn Hajar's *Isaba*. Focusing on Mecca and Medina in the first third of the 7th century AD and using the expressions 'he

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**28**  Mohamed Talbi, « Effondrement démographique au Maghreb du XI au XV siècle », *Cahiers de Tunisie*, T. XXV, n° 97-97, 1 et 2 trim.,( 1977), pp. 51 - 60.

**29**  Ibid, p. 54.

**30**  Ibid, pp. 59 - 60.

**31**  Charles Pellat , « Peut-on connaître le taux de natalité au temps du Prophète ? A la recherche d'une méthode », *Journal of the Economic and Social History of the Orient*, Vol. 14, n° 2, (Aug 1971), pp. 107 - 135.

begat' and 'the child of', he compiles a list of some 700 women with a total of 1,726 children (1,327 boys and 399 girls) from *Nisab Quraysh*. He thus calculates a birth rate of 2.46 (1.89 boys and 0.57 girls). Of course, even if we consider this imprecise estimate of fertility to be something important that can be used as a model in later studies, these numbers are still very general, and the ratio of girls to boys should be investigated further.

Pellat then makes another calculation, beginning from 50 women whose children are mentioned (340 children: 233 boys and 117 girls), i.e. with a fertility rate of 6.8 (4.46 boys and 2.36 girls), and a new ratio of boys to girls (190 boys to every 100 girls). In a more specific sample of women who married more than once, he notes 27 detailed cases with 102 children (67 boys and 35 girls), i.e. a ratio of 177 boys to every 100 girls. After reviewing the different samples and producing a group of precise calculations and statistical tables, he sets the fertility rate for that period at 2.5 per woman.

But these results only acquire their real importance as a model, or in understanding the rate at which new generations were produced through family fertility, when we consider them alongside various related issues. These issues pertain on the one hand to the specificity of the sources and on the other hand to the sociological givens constituting the general environment. Many of the sample cases studied date to the pre-Islamic period, when it was common for a son and a father to marry the same woman, for a woman to become the wife of two brothers through inheritance, and for widowed and divorced women to marry more than once.

Another of Pellat's studies[32] is based on Ibn 'Imad's eight-volume *Shadharat adh-Dhahab* (1623-1679), which covers a thousand years of Islamic history and allows us to trace several problems as well as make comparisons between different centuries. The book includes some 3,311 biographies indicating age and 1,573 giving precise indication of the years of birth and death. This quantity of data allows us to make a number of conclusions regarding the average lifespan of prominent figures over nine centuries:

**Table 2: Average lifespan of prominent figures over 9 centuries according to Shadharat adh-Dhahab**
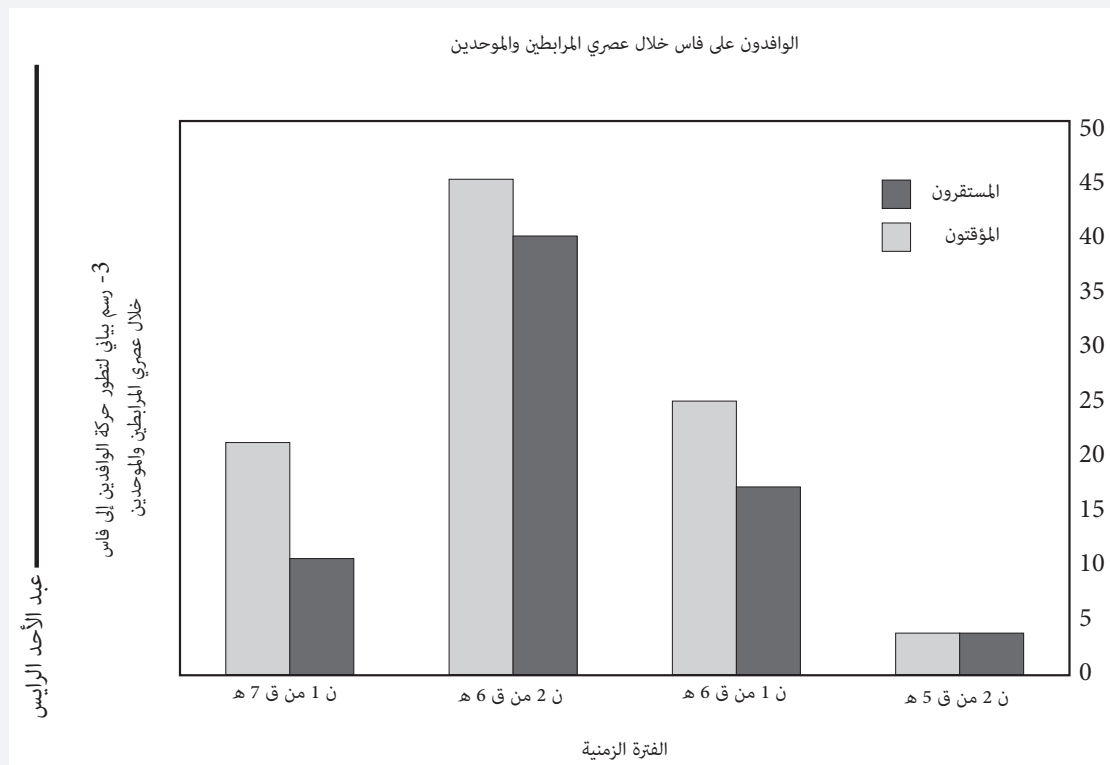
| Time period | Average lifespan (according to biographies in Shadharat adh-Dhahab) |
| --- | --- |
| 2nd century AH | 81 |
| 3rd century AH | 85 |
| 4th century AH | 86 |
| 5th century AH | 82 |
| 6th century AH | 78 |
| 7th century AH | 75 |
| 8th century AH | 72 |
| 9th century AH | 67 |
| 10th century AH | 71 |

He ultimately concludes a general average lifespan of 73 - 74 solar years (75 years and 8 months in lunar years) while recognizing that this remains a simplified and limited methodological approach, but one perhaps capable of opening up new horizons if compared with questions regarding the movements of these prominent figures and the circumstances of their deaths (illness, killing or otherwise).

Abdelahad El-Rayes uses a similar approach in his study of the population demographics of medieval Fes.[33] This study is based on al-Tamimi's *al-Mustafad*, and attempts to reveal population growth mechanisms pertaining to in-migration and translate them into graphs and tables, showing that population movement to Fes rose steadily from the turn of the 6th century AH, with a relative rise during the Almohad era. Despite the incomplete and imprecise source data they are based on, these results may allow us to answer new questions if they are connected to economic structures and their transformation during the medieval period, located cartographically in urban space, and read alongside new archaeological data.

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32    Charles Pellat, « Quelques chiffres sur la vie moyenne d'une catégorie de musulmans », in *Mémorial Alfred Bel*, (Leyde, 1974), pp. 233 - 246.

33    Abdelahed El-Rayes, "Harakat as-Sukkan bi-Fas Khilal 'Asr al-Murabitin wa'l-Muwahhidin: Harakat al-Wafidin Mithalan," *Kananish* 4 (2002), pp. 9 - 34.

**Graph 2: Migration to Fes from the turn of the 6th century to the Almohad era[34]**



الوافدون على فاس خلال عصري المرابطين والموحدين

3- رسم بياني لتطور حركة الوافدين والموحدين إلى فاس
خلال عصري المرابطين والموحدين

عبد الأحد الرايس

المستقرون
المؤقتون

ن 1 من ق 7 ه    ن 2 من ق 6 ه    ن 1 من ق 6 ه    ن 2 من ق 5 ه

الفترة الزمنية

**Note: The graph is only available in Arabic.**
**Please see the footnote for a translation of the graph.[35]**

Other notable sources include the Ottoman census records, which go as far back as the 15th and 16th centuries. Each record – especially under Suleiman the Magnificent (1520-1566) – includes precise numerical data regarding population and taxes paid, by month or by forty-year period, according to Ottoman administrative tradition.[36]

This information allows us to draw a lively historical portrait of Ottoman Turkey (and some Arab cities which were part of the Ottoman Empire) as regards the population of the cities and the rural areas, notables and Janissaries, migratory tribes and religious confessions, economic makeup and careers, markets and taxes. These rich documents have allowed Ömer Lütfi Barkan to produce accurate tables of rural property owners, the social and administrative structure of the Ottoman Empire, and notables' religious affiliations. Through three censuses taken between 1451 and 1575 he has been able to trace the population of Ottoman cities and confirm that they grew during the 16th century, as well as comparing them to their European and Asian counterparts.

Barkan draws a number of conclusions regarding other demographic fluctuations, taking into account a collection of data and methodological caveats concerning:

- The non-inclusion of single men in tax censuses.

- The cautious use of a fixed multiplier of 5 for every family, depending on the class under study, the social group or the families' jobs.

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**34**  Ibid, p. 34.

**35**  The title of the graph is "Migrants to Fez during Almohad and Almoravid eras". The Y axis is the number of migrants while the x axis is time frame. The time frame read from right-to-left is as follows "2nd half of the 5th Hijri Century", "1st half of the 6th Hijri Century", "2nd half of the 6th Hijri Century" and "1st half of the 7th Hijri Century". The blue bars denote settled migrants, while the red bars denote temporary migrants.

**36**  Barkan, p. 11.

- The absence of slaves in Ottoman records despite the fact that they represented between approximately 5 and 10 per cent of the urban population at the time.

- The assumption that foreign merchants and *madrasa* students were present despite the absence of supporting evidence and statistical indications in the records under study.

**Table 3: The populations of different Ottoman cities at different times according to Ottoman records (37)**

| City | Before 1520 | 1520-1530 | 1571-1580 | After 1580 |
|---|---|---|---|---|
| Istanbul | 97,956 (in 1478) | 400,000 ? | 700,000 ? | |
| Aleppo | 67,344 | 56,881 | 45,331 | 46,365 |
| Damascus | - | 57,326 | - | 42,779 (in 1595) |
| Bursa | - | 34,930 | 70,686 | - |
| Edirne | | 22,335 | 30,140 | - |
| Diyarbekir | - | 18,942 (in 1541) | 31,443 | - |
| Ankara | - | 14,872 | 29,007 | - |
| Athens | | 12,633 | 17,616 | - |
| Tokat | 17,328 (in 1455) | 8,354 | 13,282 | 21,219 (in 1646) |
| Sivas | 3,396 | 5,560 | 16,846 | - |
| Sarajevo | - | 5,632 | 23,485 | - |
| Monastir | 2,645 | 4,647 | 5,918 | - |
| Skopje (Macedonia) | 4,974 | 4,631 | 9,867 | - |
| Sofia | - | 3,899 | 7,848 | - |
| **Total of all 12 cities** | | **142,562** | **271,494** | |

## Architectural indicators and their demographic implications in certain Islamic cities

In the absence of precise written sources that might help demographic historians to trace the development of Islamic cities' population, a school has emerged that makes inventive and methodical use of both ruins and buildings that are still standing to answer many historical-demographic questions. Particularly relevant here is Alexandre Lézine's method of making relative estimates of medieval Tunisian cities by tracing the expansion of their central mosques, using the number of worshipers they could hold at Friday prayers as a sample indicative of population growth. Lézine first applied this method to the Great Mosque of Sousse, following an architectural-archaeological approach by which he was able to follow the development of the number of worshipers over time, and using a fixed multiplier to determine the broader population.[38] He has since used the same method to study the demographics of other Tunisian

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**37** Barkan, p. 27.

**38** Lézine estimates the average space necessary for a single worshipper as a rectangle 0.6 metres by 1.35 metres.

cities, such as Kairouan, through their own central mosques.

In a similar approach, confronted by the relatively sparse documentary record and demographic data on Arab cities in the Ottoman period between the 16th and 19th centuries, André Raymond has used the distribution of public amenities such as bathhouses [39] and fountains [40] as indicators of population numbers. One bathhouse, in his view, is generally equivalent to a population of somewhere between 3,000 and 5,000 people – that is, there is an average of 4,000 inhabitants for each bathhouse. On the basis of numerical indications taken from sources regarding public amenities, particularly in Ottoman Cairo (15th-18th century), Raymond has refuted the idea that there was a population decline in the Ottoman era – and indeed, has shown that there was growth (from 150,000 in 1420 to 260,000 in 1798). [41]

Through a selection of examples of this sort of study, I will now attempt to show the wide range of methodologies, the great number of historical questions pertaining to population numbers, and the necessity of serious academic depth in any attempt to understand the structures and changes of Arab society over time.

## Damascus

Thiery Bianquis believes that it is fairly easy to quantify the area of medieval Damascus, drawing on contemporary maps allowing us to understand the past development of the city. [42] In his view Damascus – like Jerusalem or Aleppo, but unlike Cairo or Baghdad – is organized around an old city centre (dating to the 2nd millennium CE), and develops with the growth or destruction of the areas surrounding this centre.

Bianquis sets the area of medieval Damascus at 115 hectares, not including 150 hectares of surrounding neighborhoods. He then takes the intramural area of Damascus (115 hectares) and deducts 1/3, the area taken up by streets and public buildings, leaving us with 70 hectares of residential space. A residential unit, according to him, covered on average 100 square meters and housed 3 - 7 individuals. With a general average of 100 housing units per hectare, each hectare represents between 300 and 700 individuals. If we assume that the city had 80 hectares of residential space, the number of residents was somewhere between 24,000 and 56,000 people.

Bianquis makes use of another approach based on the classical source Ibn al-Qalanisi, who attests that in the 11th century there were 240 bread-ovens in Damascus. Each oven, according to his estimate, would meet the needs of a maximum of fifty families, each one made up of five individuals – i.e. 12,000 families, or 60,000 individuals maximum.

Alongside daily nutrition, Bianquis bases another calculation on data concerning the water supply, which he considers likewise fundamental to daily life. By comparing archaeological studies on medieval Damascus' water supply to its early-20th century counterpart, he concludes that Damascus' population throughout its history would have reached 200,000-300,000 people. [43] This is a large number.

## Baghdad

Historians and archaeologists have suggested various theoretical estimates for the population of Baghdad during the Islamic period, ranging from the hundreds of thousands to nearly two million people. These estimates have not in general been based on precise calculations but on assumptions based on the number of bathhouses mentioned in historical sources or the area of the city. [44]

The chronicler al-Khatib al-Baghdadi (d. 1071) presents several different accounts regarding Baghdad's bathhouses. The first is from Muhammad bin Yahya al-Suli (d. 946), which gives an exaggerated figure of 60,000. Two other narratives, from different time periods, give different figures: more than 10,000

39    André Raymond, « Les bains publics au Caire à la fin du XVIII siècle », *Annales Islamologiques*, VIII, (1969), pp. 129 - 150.

40    André Raymond, « Signes urbains et études de la population des grandes villes arabes à l'époque ottomane », *B. E. O, XXVII*, (1974), pp. 183 - 1*93*.

41    André Raymond, "La population du Caire de Maqrizi à la Description de l'Egypte », *B. E. O* ; XXVIII, 1975, p. 209.

42    Thiery Bianquis, « Damas », in *Grandes villes méditerranéennes du monde musulman médiéval*, Jean-Claude Garcin (dir.), (Rome, Collection de l'Ecole Française de Rome, 269, 2000), p. 41.

43    Ibid, p. 42.

44    Françoise Micheau, « Bagdad », in *Grandes villes méditerranéennes du monde musulman médiéval*, Jean-Claude Garcin (dir.), (Rome, Collection de l'Ecole Française de Rome, 269, 2000), p. 93.

according to al-Mihbali, the vizier of the first Buyid Emir in Baghdad (c. 945), and 27,000 during the time of Caliph al-Muqtadir (908-932). Al-Baghdadi adds a fourth narrative placing the number of bathhouses at some 50,000 under 'Adud al-Dawla, who seized Baghdad in 979.[45] The wide variation between these numbers within a fairly restricted time period of course calls for a certain skepticism, and makes them somewhat suspicious.

The contemporary historian Abdelaziz Duri prefers to begin from the figure given by Hilal as-Sabi in the late 10th century (1,500 bathhouses). Assuming that each bathhouse was sufficient to meet the needs of 200 houses, and that every family had an average of 5 members, he estimates the population of medieval Baghdad at its height at some 1.5 million people.[46]

Other studies have attempted to estimate the population of Baghdad by first establishing its area. This method has its own difficulties both methodological and pertaining to the information available, since it assumes that we begin with knowledge of both the area and the population density. Nonetheless, various contemporary historians have chosen to apply it.

Lassner suggests 40 inhabitants per hectare in the 5th century AH, suggesting that the density should be estimated at one fifth of that of Constantinople (200/hectare) given Baghdad's expansive parks and palaces. He thus estimates the area of Baghdad at 7,000 hectares and its population at 280,000 inhabitants.[47] Elsewhere, J.C. Russell has concluded that the population density of medieval Baghdad can be estimated at some 100 people per hectare and its area at 3,000 hectares, for a population of 300,000 Baghdadis.[48]

It is difficult to come down decisively in favor of any one of these varying estimates, but they all confirm Baghdad's great size compared to its medieval counterparts, as is affirmed by classical sources. The geographer al-Ya'qubi in his *Kitab al-Buldan* mentions some 10,000 alleyways or roads (*zuqaq*), while at-Tabari notes 7,000 houses that were destroyed in the Karkh neighbourhood by the floods of 883. Ibn al-Qufti, the historian of intellectuals, says that there were 860 doctors in Baghdad in 931.[49]

## Cairo

Estimates of Cairo's population are typically both rough and inflated – 500 or 600 thousand according to the studies of Clerget and Abu Lughod,[50] for example, while M. Dols puts it as 450,000 before the plague of 1349.[51] There are also some very conservative estimates (50-60,000) based on mathematical calculations derived incorrectly from historical sources.[52] In any case, André Raymond's figures remain the most convincing. He suggests a figure of less than 200,000 at the beginning of the 16th century and less than 250,000 in the 14th for the area of the city, not including Bulaq and Fustat.[53]

## Aleppo

The chronicles attest to an important growth in the urban development of Aleppo between the 12th and 13th centuries, which according to Sourdel extended outside the walls of the city.[54] In terms of architectural data, Ibn Shaddad's description of Aleppo before the Mongol invasions of 1260 gives figures for certain types of public buildings (208 mosques, 70 bathhouses) within the walls of the city.[55]

While the development of the city between the mid-12th century and the mid-13th century is undisputed, establishing exact population numbers for this period is not so easy. The Arabic historical

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**45**   Ibid.

**46**   Abdelaziz Duri, « Bagdad » in *Encyclopédie de l'Islam*, 2 éditions ; vol. 1, (Leyde & Paris, Maisonneuve & Larose, 1960), p. 925.

**47**   Jacob Lassner, *The Topography of Baghdad in The Early Middle Ages*, (Detroit, Wayne State University, 1970), p. 159 - 160.

**48**   J.C. Russell, *Late Ancient*, p. 89.

**49**   Françoise Micheau, p. 93.

**50**   Doris Behrens-Abouseif & *alii*, « Le Caire», in *Grandes villes méditerranéennes du monde musulman médiéval*, Jean-Claude Garcin (dir.), (Rome, Collection de l'Ecole Française de Rome, 269, 2000), p. 179 - 180.

**51**   Ibid.

**52**   J. C. Russel, *Late Ancient,* p. 131.

**53**   André Raymond, « La population Du Caire», p. 201 - 215.

**54**   Dominique Sourdel, « Esquisse topographique d'Alep intra-muros à l'époque ayyoubide », *Annales Archéologiques de Syrie*, II, (1952), pp. 109 - 133.

**55**   Anne-Marie Eddé, « Alep », in *Grandes villes méditerranéennes du monde musulman médiéval*, Jean-Claude Garcin (dir.), (Collection de l'Ecole Française de Rome, 269, Rome, 2000), p. 159 - 160.

sources give various numbers that are difficult to understand for the period after the Mongol invasions (50,000 people who fled from these massacres, a quarter of the population according to some sources, and 100,000 sold as slaves).[56]

Attempts to quantify and calculate the population using the area of the city or its public amenities have proven disappointing. Calculations based on area face two fundamental problems: the difficulty of establishing the area of the extramural neighborhoods, and historians' lack of knowledge regarding the extent of unbuilt-upon land within the city walls (roads, gardens, public buildings etc), which means any attempt to estimate the density of construction within the city can only enjoy relative success.

Russell arrives at an estimate of 14,000 people for the population of Aleppo in 1200, based on the intramural area of the city. But he does this by assuming 125 inhabitants per hectare without concerning himself with the inhabitants of those neighborhoods outside the walls whatsoever, meaning his estimates end up far from the historical reality.[57]

Methodologically speaking, the estimates offered by André Raymond – known for his use of public amenities in the Ottoman period as an indicator of population dynamics and growth – based on an assumption of between 3,000 and 3,500 residents per bathhouse, seem refutable and inappropriate in the case of Aleppo. In the 13th century Aleppo had some 163 public and 30 private bathhouses, producing a greatly inflated figure.

The same applies to Gaube and Wirth's thesis based on the number of mosques, which produces an estimate of 200,000 residents for Aleppo.[58] It is in fact difficult to establish a ratio between residents and mosques, because places of worship took different forms – independent buildings or rooms inside public amenities (hostels and towers) – while new mosques were more often constructed for religious or personal reasons than because of demographic need.

Anne-Marie Eddé believes that it is possible to estimate the density of Aleppo before the Mongol invasions of 1260 at between 200 and 350 residents per hectare,[59] with an area estimated at 112 hectares plus four hectares given over to fortifications and thus less densely populated.

Intramural Aleppo was home to at least 23,000 people, to whom must be added the numerous inhabitants of the extramural neighborhoods (between 25,000 and 30,000 people). With a density of 350 residents per hectare, the population can be estimated at 40,000 people, with perhaps another 45,000 in the outer neighborhoods, for a total of somewhere between 50,000 and 85,000 residents.

Given the paucity of secondary sources on the population of Aleppo during the Mamluk era, we should remember the effect of the Mongol invasions in 1260, the great plague of 1348-1349, the destruction inflicted by Tamerlane in 1400, and the plagues that swept through the city in the mid-15th century as indicative of stagnation and reversal of population growth in northern Syria, even if it is not possible to establish precise numbers until the beginning of the 16th century.[60]

In the absence of precise written sources and clear architectural data, the researcher has no choice but to make comparisons with data from other Islamic cities in order to establish the number of Aleppans in the Middle Ages. For this purpose it is possible to make use of data concerning the (minimum and maximum) population density of the cities of the Islamic West, including those in al-Andalus, in order to produce a rough estimate.

### Tunis

In the Islamic West, and particularly in Tunis, Alexandre Lézine's approach remains the most methodical, even if it begins from premises that are not necessarily true or unquestionable. For Lézine, an engineer and historian, the assumed (necessary) area for a given worshiper in a city's central mosque is 0.60 by 1.35 meters. He begins

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**56** Ibid.

**57** J. C. Russell, "The population of the Crusader States", in *A History of the Crusaders*, *Volume V: The Impact of the Crusades on the Near East*, edited by Norman P. Zacour and Harry W. Hazard. (Madison, Wisconsin, University of Wisconsin Press, 1985), p. 295 - 314.

**58** Anne-Marie Eddé, p. 160.

**59** Ibid, p. 161.

**60** For the 16th century, studies drawing on Ottoman administrative and tax sources confirm that Aleppo's population had declined from 67,000 individuals in 1519 to about 45,000 in 1580. C.f. Ömer Lütfi Barkan, pp. 9 - 36.

his study with the Zeytouniyya Mosque's renovation in 864, when Tunis was the second city of the Aghlabid state and an important port in North Africa. He uses the details of this renovation, after which the mosque was large enough for 9,000 worshippers, to produce the following estimates: in 732 Tunis had some 6,500 inhabitants, while in 864 the population was 9,000. The population density according to his conclusions must have ranged between 140 and 200 residents per hectare, given that the city was 500 meters from east to west and between 1,000 and 1,300 from north to south (and noting the observation by the traveler al-'Abdari, who visited Tunis at the beginning of the 13th century, that the suburbs of the city were as large as the city itself).

One useful piece of information provided by the historical sources is Ibn al-Shamma's comment that there were 7,000 houses in Tunis in 1370[61] – that is, according to Lézine's approach, approximately 35,000 people, or some 120 residents per hectare. Ibrahim Jadla multiplies this figure by ten to account for polygamy, concubines, servants and slaves in a given household, giving a final total of around 70,000 people.[62] This population (whether 35,000 or 70,000) was spread throughout a built-up area estimated by these researchers at 293 hectares, defined by the ruins of the old walls dating from between 1317 and 1350.[63]

According to Abdelaziz Dawlati, meanwhile, in the 15th century Tunis covered more than 250 hectares, and the density was thus approximately 200 residents per hectare within the walls. The outskirts, which maintained a village-style population distribution, had a lower density.[64]

In the sixteenth century, according to Liyun al-Afriqi (al-Hasan al-Wazan), Tunis came to encompass some 10,000 kanuns (hearths, i.e. families). If we accept that the average family had five members, this represents some 50,000 residents, giving a population density of 160 people per hectare.[65]

Ibrahim Jadla's reading is again unusual, suggesting an interpretation of the information given by al-Afriqi that places the population of Tunis at 80,000 residents. Al-Afriqi in fact cites 10,000 kanuns within the city, 300 in Bab al-Menara, more than 1,000 in Sweiqa, and more than 300 in Bab al-Bahr, i.e. approximately 11,600 kanuns, producing between 58,000 and 116,000 residents depending on how these figures are interpreted.

Alongside this summary, studies by Ahmad Sa'dawi and Ibrahim Jadla regarding the plagues and disasters that struck Tunis complement the picture of population growth in the city. Sa'dawi notes a periodicity to crises (drought, famine, plague) of 19 years between 1206 and 1494, which is affirmed by al-Afriqi, who says that crises took place every 10 or 15 years.

From another perspective, Mounira Remadi states that Tunis experienced 11 plagues between 1348 and 1494. She argues that the situation could be much clarified by use of the Italian and Spanish archives, which will undoubtedly provide many new insights and details.[66]

## Kairouan

Mundhir Saqli notes that it is difficult to precisely determine the population of medieval Kairouan. Mohamed Talbi suggests that its population never exceeded 50,000 people, while Lézine – relying on his well-established method of establishing a relationship between the size of the central mosque and its development – places its population at 9,250 in the last quarter of the 8th century. While Talbi believes that Kairouan's 9th-century population rose continuously during the Aghlabid period, Lézine states that the city had no standing walls at the time and that its area was constantly growing, which is reflected in the movement and growth of the population.

61    Ibn ash-Shamma', *al-Adilla al-Bayyina an-Nawraniyya fi Mafajir ad-Dawla al-Hafsiyya*, Tahir bin Mohammed al-Ma'muri ed. (Tunis: ad-Dar al-'Arabiyya li'l-Kitab, 1984), p. 105.

62    Ibrahim Jadla, "as-Sukkan al-Hudur bi-Ifriqiyya min al-Qarn ath-Thalith 'Ashar M. Ila al-Qarn as-Sadis 'Ashar M", *ad-Dimughrafiyya at-Tarikhiyya wa'l-'Alam al-'Arabi,* Silsilat Maraji' (Tunis: Dar Saras li'n-Nashr al-Ma'had al-'Ali li't-Tarbiya wa't-Takwin al-Mustamirr, 1993), p. 97.

63    Mounira Chapoutot-Remadi, « Tunis », in *Grandes villes méditerranéennes du monde musulman médiéval*, Jean-Claude Garcin (dir.), (Rome, Collection de l'Ecole Française de Rome, 269, 2000), p. 237.

64    Abdulaziz Dawlati, *Madinat Tunis fi al-'Ahd al-Hafsi*, tr. Mohammed al-Shabi and Abdulaziz Dawlati (Tunis: Dar Saras li'n-Nashr, 1987), p. 107.

65    Mounira Chapoutot-Remadi, p. 237.

66    Ibid, p. 238.

In the 10th century Kairouan's built-up area expanded, with, according to Talbi, a population density estimated by Lézine at 35,000 to 36,000 inhabitants. Talbi also states that during the turn towards population decline in modern-day Tunisia, which lasted from the mid-10th to the mid-11th century, Kairouan saw a major fall in its population because of the famine and plague of 1005.

**Fez**

The demographic information available for Fez remains limited, with the exception of certain details scattered throughout the sources, which may allow us – if verified – to extrapolate rough estimates of population. Historically, the core of the city was founded on the right bank of Wadi Fas in 789. A few years later, Idris II founded another settlement on the left side of the Wadi. These two clusters of buildings (the Kairouan side and the Andalus side) developed quickly, each within its own walls, separated by Wadi al-Jawahir.[67] The subsequent waves of migration to Fes from Cordoba (818) and Kairouan (825) provided new human resources which allowed Fez to leave behind its embryonic state and set out on its path to being a major city.

The two sides did not grow according to the same rhythm, however. The Kairouan bank quickly began to develop and expand, while construction on the other bank remained limited for a fairly long period of time, with scattered buildings separated by broad empty spaces that became agricultural areas.

The geographer al-Ya'qubi (d. 891) states that in his time the Fez River boasted 'three thousand mills... and impressive buildings'.[68] The number of mills ascribed here to the Kairouan bank is certainly exaggerated and must be taken with a pinch of salt, but this description is nonetheless expressive. In a less exaggerated fashion, the geographer al-Bakri (1014-1094) states that the Fez of his time had some 300 mills, 20 public bathhouses, and green areas that produced significant revenues.[69]

We can add to this an Almohad document that confirms the growth in the built-up area through numerical data.[70] These figures, collected by the overseer 'Ali bin 'Umar al-Awsi from a manuscript left by his predecessors during the era of the Almohad Sultan al-Mansur (1184-1198), indicate that during the Almohad era Fez had:

**Table 4: Public amenities in Fez under the Almohad al-Mansur (1184-1198)**

| Amenities | Number |
|---|---|
| Shops | 9082 |
| Roofed marketplaces | 2 |
| Small marketplaces equipped for weaving | 3064 |
| Soap factories | 47 |
| Places for conducting ablutions | 42 |
| Places for prayer | 19041 |
| Mills | 472 |
| Copper-beating workshops | 12 |
| Pottery workshops | 188 |
| Lime-making workshops | 135 |
| Mosques | 782 |

**67**   Ibn Zar' ('Ali), *al-Anis al-Mutrib bi-Rawd al-Qurtas fi Akhbar Muluk al-Maghrib wa-Tarikh Muluk Fas* (Rabat, Dar al-Mansur li't-Tiba'a wa'l-Wiraqa, 1972), p. 39.

**68**   Al-Ya'qubi, *Kitab al-Buldan*, ed. Mohammed Amin Dannawi (Beirut: Dar al-Kutub al-'Ilmiyya, [N. D.]), p. 198.

**69**   Al-Bakri (Abu 'Ubayd), *Kitab al-Masalik wa'l-Mamalik*, ed. Adrian Van Leufen and Andre Ferry (Tunis: Bayt al-Hikma, 1992), p. 795.

**70**   Ibn Abi Zir' ('Ali'), pp. 48 - 49.

| | |
|---|---|
| Drinking fountains | 80 |
| Tanneries | 116 |
| Bathhouses | 73 |
| Bread ovens | 1170 |
| Houses | 89236 |
| Glassmakers' workshops | 11 |
| Hostels | 467 |

Again, even if some of these figures are inflated, either in order to demonstrate the glory of the city or because of scribal error, they still reflect something of the historical truth and reveal the scope and diversity of Fez's public amenities. Analysis of the data pertaining to the 12th century may contribute to a conceptualization of the population making use of these buildings and the extent of the city's economic development after only a few centuries of existence. The main constant in looking at these source data, in light of architectural data, is that the city of Fez had a population of some 100,000 people.

In a later period, Liyun al-Afriqi's *Wasf Ifriqiya* gives us some important numerical data: 20,000 people employed in the weaving sector and 20,000 others in the city's many mills. He also adds that a single neighbourhood of the city might encompass some 500 *kanun*s.[71]

The Arabist and traveler Nicolas Clenardus (1493-1542) claims that the population of Fez in 1540 was some 40,000 families, i.e. between 100,000 and 240,000 people.[72]

Assessing and verifying all these data and estimates historically and numerically will only be possible if we use all of the source data available in works of history and geography and biographical collections and the detailed maps produced recently of neighborhoods and residences, as well as numeric methods. We can then assess theories and draw conclusions.

**Al-Andalus**

The Spanish academic Torres Balbás's studies of the demography and architecture of the cities of al-Andalus were seminal works in their field. Having noticed the neglect shown by the western demography of the 1950s to these urban centers despite the great role they played in 10th-century European history, Balbás set out to correct this error despite the absence of precise numerical data.

While Balbás was aware of the inflation of data in both Arab or Christian sources[73] – whether as a celebration of these cities or for political propaganda – he nonetheless lauded some of them for their useful and unusual content. The Christian records calculating the property of the Moriscos expelled from Islamic cities such as Mallorca, Malaga and Murcia in order to redistribute it to Christians (*repartimientos* or redistribution records), for example, give precise data for the number, types and area of residences.

Architectural data taken from the remains of Andalusian houses in Malaga and Granada likewise allowed Balbás to calculate the average area of Andalusian residences (172 meters squared) and the average size of the Andalusian family (assumed to be 5 or 6 people). In parallel with this information, Balbás relies on intramural city area, which he identifies using the metric of large and durable buildings.

With these mathematical statistics, which Balbás claims have only limited problems,[74] he was able to leave behind assumptions unsupported by quantitative analysis and present a group of results that have become a source for many studies of al-Andalus. Some of these results are given in the table below:

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71   We should note here the importance of further study into the meaning of the word *kanun* ('hearth') in al-Afriqi's writings, and whether it means the same thing in Fes as it does in Cairo and elsewhere.

72   Halima Ferhat, « Fès », in *Grandes villes méditerranéennes du monde musulman médiéval*, Jean-Claude Garcin (dir.), (Rome, Collection de l'Ecole Française de Rome, 269, 2000), p. 219.

73   Leopoldo Torres Balbás, « Extension y demografía de las Cuidades hispano-musulmanas », *Studia-islamica*, n° 3, (1955), p. 41.

74   Leopoldo Torres Balbás, p. 32.

**Table 5: Balbás's most important conclusions on the population and area of Andalusian cities in the 11th and 12th centuries**

| City | Population | City area | Time period |
|---|---|---|---|
| Malaga | 15 to 20,000 | 37 hectares | 11th century |
| Grenada | 26,000 | 75 hectares | 11th century |
| Toledo | 37,000 | 106 hectares | 11th and 12th century |
| Mallorca | - | 90 hectares | 11th and 12th century |
| Valencia | 15,500 | 44 hectares | 11th and 12th century |
| Zaragoza | 17,000 | 47 hectares | 11th and 12th century |

Balbás concludes that by the end of the 11th century there were at least six Andalusian cities (Cordoba, Toledo, Almeria, Grenada, Mallorca, Malaga and Valencia) that could be categorized as major population centers, whose intramural area exceeded 40 hectares, and whose population was more than 15,000 people.

Both classical and modern sources affirm the importance of Cordoba, which was one of the 10th century's most important cities.[75] Among the important data provided by medieval sources is the census of houses ordered by the Chamberlain (*hajib*) Abu 'Amir al-Mansur at the end of the 10th century. This census, transmitted to us by the geographer al-Bakri, covered 213,077 normal houses and 60,300 large houses (of the notability or *khassa*). Cordoba also had 300 public bathhouses, 13 graveyards and between 471 and 1,600 mosques according to the sources,[76] and more than twenty additional neighborhoods on its outskirts. Based on this data, historians have put Islamic Cordoba's population between 100,000 and 500,000 people in Balbás and Lévi-Provençal's estimates.[77]

## Conclusions

Although these approaches (i.e. attempts at quantitative analysis) may represent a real addition to the study of Arab Islamic societies over time, their methodological holes reveal their limits. Hypothetical inferences based on a connection between the area of a city's central mosque and its population are not always well-founded. In modern-day Tunisia, for example, as Faouzi Mahfoudh notes, the construction of mosques was typically driven by political figures' desire to give themselves legitimacy, show their power, and secure their legacy, and thus had more to do with politics than demographics. Likewise, the fixed ratio of 5 individuals for every worshipper –

forgetting the extended nature of Muslim families and the high density of communal housing – remains speculative and without historical roots as far as the societies of the first centuries of Islam are concerned.

These objections – presented in detail by Antoine Abdel Nour[78] and by Faouzi Mahfoudh in a detailed study of Sfax[79] to refute many of Lézine's premises – are all useful, not to negate this methodological vision but to strengthen it through these sorts of caveats and notes.

One such important caveat is that Lézine's studies of the population of Tunisian cities came after his

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**75** Leopoldo Torres Balbás, p. 32.

**76** Manuel Acién Almansa & Antonio Vallejo Triano, « Cordoue », in *Grandes villes méditerranéennes du monde musulman médiéval*, Jean-Claude Garcin (dir.), (Rome, Collection de l'Ecole Française de Rome, 269, 2000), p. 121.

**77** Ibid.

**78** Antoine Abdel Nour, pp. 270 - 271.

**79** Faouzi Mahfoudh, « Aspects de la démographie de la ville de Sfax au Moyen Âge (IX-XII siècles) », in La démographie historique, en Tunisie et dans le monde arab*e*, coll. Sources, (Tunis, Céres, 1993), pp. 73 - 82.

various works on Roman cities in the same region. The classical and medieval periods differ in more than one way, and it is thus unreasonable to simply reproduce borrowed models and adopt the same numerical approach to study population in these two periods.

Lézine relies on a series of premises that have no historical backing in the medieval period. He begins from the principle that in the 9th century Tunisian cities had only one mosque in which to hold Friday prayers, and that adult male (16 years and older) attendance on Friday was absolutely compulsory. With this calculation, which leaves out women and children and assumes every worshipper to be the head of a household, Lézine believes that it is possible to establish the capacity of the grand mosque at any given point if we use an area of 1.35 by 0.60 meters for every worshipper, and can thus come up with a number of heads of household, which we can then multiply by the coefficient typically used in studies of Mediterranean cities. Even if we cannot contradict Lézine as regards the existence of one mosque for Friday prayers in each city, his other premises are not universally agreed upon: the characteristics of mosque attendees (sex and age) and the coefficient used to establish the members of the medieval family in these cities are hypothetical and not based on precise historical studies.

It likewise seems that although graveyards can sometimes be used by historians to measure demographic changes, Islamic burial customs – distinguished by extreme simplicity and in some cases the complete absence of names on grave markers – does not allow important numerical conclusions to be drawn. Likewise, the existence of multiple layers of burials in a single place, as noted by Khaled Mawdoud in his study of the Quraysh graveyard in Kairouan (where there are seven separate layers), adds further archaeological complications to such approaches.[80]

It would not be unreasonable to say that what is troubling about these approaches is the mechanistic connection between public amenities – without any thought for their nature, their area, their location within the urban fabric or their connection to the water supply – and the population, and likewise the

dependence on inflated numbers taken from Arab chronicles without any discussion or consistent skepticism, and without creating a theoretical means by which we might sharpen our analysis by drawing on studies of the context.

These methodological approaches place the researcher between, on the one hand, more speculative numerical estimates of the maximum and minimum urban population and, on the other, more qualitative theories in touch with the sources, whose historical vision of Islamic societies is produced by placing them in conversation with political and economic data, the urban framework, and the structure and dynamics of its population. These latter are a crucial means by which the major gap in the sources can be overcome. A critical and wary approach towards these quantitative efforts to avoid arbitrary oversimplification should be accompanied by a base of knowledge connecting models, inspired by numerical estimates and demographic studies, to a political and cultural history linked to the rate at which generations, families, and social behaviors are renewed.

Connecting the qualitative and the quantitative and establishing a creative balance between them would produce a mental framework that would contribute to an explanation of historical phenomena without deluding us into fantasies of perfect accuracy. It is not enough for us to measure or quantify phenomena to see them, just as numbers do not necessarily have any greater intuitive validity or effective capacity to reveal things than anything else. Nonetheless, the historian should review his fixed certainties towards quantitative methodologies, and make use of the fundamentals and methodologies of fuzzy logic,[81] according to the nature of human and social phenomena, which are beset by vagueness and complexity, and difficult to quantify and express in terms of pure value.

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80  Faouzi Mahfoudh, p. 74.

81  Shahira Sharaf, *Mantiq ad-Dababiyya wa'l-'Ulum al-Ijtima'iyya: Muqaraba Nazariyya-Tatbiqiyya* (Beirut, ACRPS, 2016).

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