THE TRANSFORMATION OF HEALTH POLICIES IN TURKEY AS PART OF THE EUROPEAN INTEGRATION: THE CASE OF CAUSE OF DEATH STATISTICS

THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

EMRAH SÜMER

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF SOCIOLOGY

DECEMBER 2007

Approval of the Graduate School of Social Sciences

_____

Prof. Dr. Sencer Ayata

Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science

_____

Prof. Dr. Kayhan Mutlu

Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

_____

Assist. Prof. Dr. Aykan Erdemir

Supervisor

Examining Committee Members

Assist. Prof. Dr. Aykan Erdemir (METU, SOC) _____

Dr. Mustafa Şen (METU, SOC) _____

Dr.Kezban Çelik (Dr. Sami Ulus Hospital) _____

I hereby declare that all the information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original in this work.

Name, Last Name: Emrah Sümer

Signature:

ABSTRACT

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Sümer, Emrah
M.S., Department of Sociology
Supervisor: Assist. Prof. Dr. Aykan Erdemir

December, 2007, 111 pages

The thesis builds up on the significance of the social aspect of the statistics giving direct reference to the standards of the European Union (EU) on statistics. The study concentrates on the modernization, reformation and transformation process of the Turkish Statistical System, particularly the health statistics on the basis of a specific Programme called "Upgrading the Statistical System of Turkey" funded by the EU and the Law on Turkish Statistics (No: 5429) within the process of the harmonization of the Turkish Statistical System, which aims the integration of the current system to the international one via the EU *acquis communautaire*. This thesis presents the causes of the death statistics as one of the most significant dimensions of statistics since it is the most extensive and the oldest public health surveillance system in the world. The reformation in the certification process, the classification stage and the analysis of the cause of the death statistics (COD) are examined in detail hereby. Improvement of the coverage, introduction of the International Classification of Diseases-10th Revision (ICD-10), development of institutional coordination and a new formation of the causes of death statistics in line with the EU requirements are analyzed in depth.

Based on the findings of this study, it is proposed that the introduction of ICD-10 and improvement of the coverage of the COD statistics are not sufficient to ameliorate the shortcomings of the current death certificate system rested upon on the two documents including the “COD forms” and the “burial licence” in Turkey. The study also suggests that solutions to be proposed should be radical and effective since the problems encountered in the death certificate system are deep-rooted. Consequently, with regard to the issues of increasing the coverage of physical autopsy and providing training for the COD forms and with the aim of reducing diversified and complex chain of bureaucratic transactions, it is essential to bring an encompassing new legal base for the current death certificate system.

Key words: Cause of Death Statistics, ICD 10, European Integration, Health Policies

ÖZ

AVRUPA ENTEGRASYONU SÜRECİNDE
TÜRKİYE'DE SAĞLIK POLİTİKALARININ DÖNÜŞÜMÜ:
ÖLÜM NEDENİ İSTATİSTİKLERİ ÖRNEĞİ

Sümer, Emrah
M.S., Department of Sociology
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Bu tez, istatistiğe ilişkin Avrupa Birliği'nin (AB) standartlarına doğrudan gönderme yaparak istatistiğin sosyal boyutunun öneminden hareket etmektedir. Çalışma, Türk İstatistik Sisteminin AB ve uluslararası sistemle bütünleşmesine yönelik sürdürülen ve AB müktesebat uyumu sürecinde AB fonlarından yararlanılarak oluşturulmuş "Türk İstatistik Sisteminin Geliştirilmesi Programı" ve bu kapsamda yürürlüğe koyulmuş 5429 Sayılı Türk İstatistik Kanunu çerçevesinde özellikle sağlık istatistikleri alanında yaşanan modernizasyon, reformasyon ve dönüşüm sürecine odaklanmaktadır. Tezde, istatistik kavramının bir boyutu olan ölüm nedeni istatistiklerinin en kapsamlı ve en eski halk sağlığı sürveyans sistemi olması nedeniyle, bu istatistiklerin belgelendirilmesi, sınıflandırılması ve analizine ilişkin reform çalışmalarına yönelik bir çerçeve oluşturulmaya çalışılmaktadır. AB gereklilikleri temelinde ölüm nedenlerine ilişkin kapsamın iyileştirilmesi, Uluslararası Hastalık Sınıflaması Onuncu Versiyonunun (ICD-10) kullanılması ve ölüm nedeni istatistiklerine ilişkin yeni bir formun oluşturulması ile kurumsal koordinasyonun geliştirilmesi kapsamlı bir şekilde analiz edilmektedir.

Bu çalışma neticesinde, Türkiye'deki "ölüm formu" ve "ölü gömme izin kağıdı" belgelerinden oluşan ölü defin belgesi düzenlenmesi üzerine kurulu mevcut sistemin sorunlarını çözme noktasında, ölüm nedeni istatistiklerinin kapsamının iyileştirilmesinin ve ICD-10'un kullanılmasının yeterli olmayacağı savunulmaktadır. Ayrıca, bu tez, ölüm belgeleme sisteminin köklü sorunlarının ancak radikal ve etkili reformlar aracılığı ile çözülebileceği savının altını çizmektedir. Bu bağlamda, tezde bürokratik işlemler zincirinin kırılması ereğine yönelik olarak, ölüm nedeni formlarına dair eğitimlerin ve fiziksel otopsi kapsamının artırılmasının yanı sıra ölüm belgeleme sistemine ilişkin kavrayıcı ve yeni bir bakış açısını ortaya koyan yasal dayanağın oluşturulmasının zorunlu olduğunu vurgulanmaktadır.

Anahtar Sözcükler: Ölüm Nedeni İstatistikleri, ICD 10, Avrupa Bütünleşmesi, Sağlık Politikaları

To The Memory of My Beloved Father

ACKNOWLEDGEMENTS

This thesis is a result of a research that took more than two years. During this period, many people contributed very much to my study. Firstly, I would like to express my appreciation to my supervisor, Assist. Prof. Dr. Aykan Erdemir, for his encouragement and amiable personality. He guided me in a very constructive way to write an original thesis on the cause of death statistics. I would like to thank the thesis committee members, Dr. Mustafa Şen and Dr. Kezban Çelik, for their careful readings and guidance. They contributed to the development of my academic capability.

I also would like to thank the EU Expert Nilüfer Avcı Işık who provided me not only material resources but also emotional support. I owe thanks to my friends, EU Deputy Expert İmdat Karakoç Betül Gündüz, Büşra Karaduman and EU Deputy Expert Ahmet Miraç Sönmez, who have shown utmost support for my study. My last but not at least thanks to my mother, who encouraged me every moment of the work.

I dedicated this work to the memory of my beloved father.

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LIST OF ABBREVIATIONS

COD	Causes of Death
EU	European Union
EUROSTAT	Statistical Office of the European Commission
GDS	General Directorate of Statistics
ICD	International Classification of Diseases
MoH	Ministry of Health
NUTS	Nomenclature Territorial Units for Statistics
NPAA	The National Plan for Adoption of the Acquis
SIS	State Institute of Statistics
TURKSTAT	Turkish Statistical Institute
TSS	Turkish Statistical System
USST	Upgrading the Statistical System of Turkey
VA	Verbal Autopsy
WHO	World Health Organization

CHAPTER I
INTRODUCTION

1.1. The Research Question:

Statistics can be most easily defined as the mathematics of the collection, organization, interpretation and presentation of some numerical data, especially the analysis of population characteristics by inference from sampling.[1] People collect, organize and explain numerical data for testing some assumptions and sometimes in order to control and steer phenomena. Henceforth, statistics is also widely and inclusively used by various sciences ranging from physical sciences to social sciences. Hacking argues that Europe is under the "fetishism and avalanche of numbers"[2]. He also underlines that there is an increasing enthusiasm for statistics. In that manner, on the basis of the rising importance of statistics, public and private sectors have been collecting more comprehensive and detailed statistics in order to make informed and rational decisions. Consequently, from the point of view of governments, statistics is a significant vehicle to develop reasonable policies. Through realistic statistics, the state apparatus can accurately determine its social, political and economic situation and can also test the degree of success of their policies.[3] This point is also very momentous for the European Union (EU) because thanks to statistics, it is possible to manage and develop common policies in the EU, which has a highly complex structure. Statistics is not just an independent chapter in the *acquis communautaire* but it is also an input for other chapters as well. That point entrenches statistics in a very important place within the common policies of the EU. Therefore, statistics is a crucial input in terms of not only agricultural and fiscal issues but also in the fields of health and fishery in the process of negotiations.

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[1]Haber, Audrey and Runyon R. Richard (1969). *General Statistics.* Addison-Wesley Publishing Company, 5.

[2] Hacking, Ian (2005). *Şansın Terbiye Edilişi*. Mehmet Moralı, trns. İstanbul: Metis Yayıncılık.

[3] İktisadi Kalkınma Vakfı (2005). *Avrupa Birliği İle Katılım Müzakereleri Rehberi*. İstanbul: İktisadi Kalkınma Vakfı Yayınları, 257.

Health statistics, playing a crucial role for any analysis of the status of health of Turkish population, is one of the most momentous components of statistics. Data collection is the first and the most important step for the analysis of health statistics, which has key importance in order to develop health policies. Consequently, accurate and realistic health statistics is important in terms of determining health policies. Nevertheless, in Turkey, health statistics obtained from official registrations and questionnaires have problems with respect to coverage, quality, validity and reliability. Furthermore, there are problems with regard to the definition, classification and coordination of health statistics, which would further result in internationally incomparable health statistical data. Nonetheless, in order to make reformation and transformation on health statistics, Ministry of Health of Turkey (MoH) has been working to reach the standards of the Statistical Office of the European Commission (EUROSTAT). On the basis of the specific programme called "Upgrading Statistical System of Turkey" and the Law on Turkish Statistics No: 5429, MoH has been trying to solve above mentioned problems concerning health statistics.

In this thesis, I am going to concentrate on the reformation, modernization and transformation movements in the health statistics in the light of the causes of death (COD) statistics, which form the basis for the epidemiologic studies that highlights the fundamental death causes. In parallel, I am also going to try to present some suggestions in terms of the improved implementation and the best-practice of the current death certificate system. Furthermore, this thesis will briefly explore the role of statistics in the Turkish nation-building and modernization project. In other words, it seeks to determine the probable relationship between construction of nation state and the statistical development in the Republic of Turkey. Henceforth, Kemalist nation building process and importance of culture of statistics will be evaluated.

1.2. Theoretical Background

The COD statistics is a significant tool in the process of emergence of statistical thinking, which cannot be considered without evaluating social and political context

of a certain country or a region. Theodore M. Porter in his book named *The Rise of Statistical Thinking 1820-1900* and Ian Hacking *The Taming of Chance* emphasizes the importance of collection of the COD data in the statistical thinking particularly in the light of John Graunt's treatise *Natural and Political Observations Made upon the Bills of Mortality (1662).* Although his attempt more specifically grows out of practical reasons, this treatise was a response to a plague outbreak. He contributed to justify the idea of the "natural theology", which assumes that everything in the world is regular so that nothing is haphazard. This way of thinking -as it is seen below- is parallel with the way of statistical thinking of the 18th and 19th centuries and it is also important in terms of humans' demand to control and change the natural phenomena. In that manner, the COD statistics is one of the first attempts in justifying natural theology and probably the introduction of Foucault's concept of bio- power.

The idea of law of death and attempts to demonstrate this law was the one of the first precursors of Michel Foucault's concept of "bio-politics" so that the whole social order was subject to statistical evaluations. In order to better understand Foucault's concept of bio-power, it would be beneficial to consider the views of Foucault on power. Foucault, in the first volume of *History of Sexuality: Will to Knowledge*, explains the concept of modern power by putting the emphasis on separating the Hobbesian tradition of power from his own new mechanism. He labels the former as *juridico-discursive theory*, which derives from Hobbes' model of power in the *Leviathan.* The *juridico-discursive* theory depends on the sovereignty of the state, the forms of law, and prohibition.[4] Nevertheless, at the beginning of the eighteenth century, with the effect of the industrial revolution, this model could not accomplish to cover the new power structures that extend beyond the limits of the juridical model of power. According to Foucault, power is exercised not only through the monopoly or domination of a state, a group, an elite, an individual and the forces of the economic relations from above, but also it is exercised in the disciplinary

[4] Foucault, Michel (1997). *Truth and Power. Essential Works. III: Power*. J.D. Faubion, ed. The New Press, 12.

techniques, strategies, and discourses from below.[5] The conceptualization of power in the Foucauldian sense does not refer to a negative force such as exploitation, and repression as is the case in the Marxism. For him, power not only comes from everywhere but it is also a productive force, which produces reality, discourses, and knowledge.

The exercise of this new form of power is presented as a characteristic of the western modern society. The task of this new power is to "administer life". This new form is concerned with managing the processes of the life itself in both anatomical and social levels. Foucault calls this new form of power mechanism 'bio-power' and he argues that it has a twofold dynamics: *anatomo-politics of the human body and bio-politics of the population.*[6] *Anatomo-politics* of the human body aims to discipline the body, optimize its capabilities, and implement its forces. It increases body's usefulness, effectiveness and its docility, and therefore makes the system operate more economically. On the other hand, *bio-politics* of the population focuses on the body, which serves as the basis of the biological processes such as birth, mortality, the level of health, life expectancy and longevity. The supervision of these conditions was actualized through a series of interventions and regulatory controls and therefore *a bio-politics of population* was formed.[7] With the development of such diverse techniques, subjugation of bodies and the control of populations indicate the beginning of the era of bio-power, which makes "power over life" possible.

According to Foucault, bio-power is an indispensable element in the development of capitalism. It inserts the body into the machinery of production and adjusts the phenomena of population to economic process.[8] In order to allow capitalism to function better, *anatomo politics of the human body and bio-politics of the*

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[5] Foucault, Michel (1990). *History of Sexuality Vol.1: Will to Knowledge*. London: Penguin, 92-93.

[6] Ibid., p.139.

[7] Ibid., p.139.

[8] Ibid., p.140-141.

population have been created to operate in the sphere of economic processes. Therefore, bio-power as a power technique, which intensely gets in touch with every aspects of individual life, are utilized by diverse institutions such as family, army, schools, police, medicine, and administration of collective bodies. In addition, as a concluding remark, Foucault regards sex as a political issue, which influences the entire political technology of life.[9] On the one hand, it was tied to the disciplines of the body through adjustment and economy of its energy; on the other hand, it was applied to the regulation of population through the wide-ranging effects of its activities. When Foucault describes bio-power as "power over life" or "administer the life", he implies that this process is the historical outcome of a technology of power centred on life.

Human's biological processes like birth, reproduction, life expectancy and death is under the domination of statistical regularities and statistical laws as a way of executing power for governments. In that sense, the COD statistics was an ideological tool and a vehicle for "bio-politics" because as we will see these statistics were used to "administer life". In that manner, in order to give probable early attempts for Foucault's concept of "bio-politics" and 'administer life', I am going to take into consideration the ideas of Susmilch and Malthus as well.

Johann Peter Sussmilch (1707-1767), assumed as the father of German demography, tried to explain the regularity of mortality statistics through giving direct reference to the theological order and divine wisdom. Sussmilch is inspired from Graunt's arguments. Through analysing church registers and mortality statistics, he asserted that there are high proportions of deaths in cities when they are compared to rural areas. According to him, this difference was stemming from the sin, which is committed more frequently in the cities.

Another illustration for "bio-politics" belongs to Thomas Robert Malthus (1766-1834). In his book *An Essay on the Principle of Population*, Malthus explained his

[9] Ibid., p.145.

principles on population. He asserted that population increases at a geometric rate but food supply increases at an arithmetic rate; hence, according to him, increases in the population should be checked and this check should be made on poor people, who are responsible for such a rapid population increase.

Both Malthus and Sussmilch presented their subjective ideas as objective data through the help of statistics. As it is seen in the subsequent chapters, these thinkers were also the first harbingers for "avalanche of numbers". Therefore, they are important figures resulting in the "spill over effect" in terms of statistical evaluations. Namely, spill over effect on statistical evaluations were practiced as such: at the beginning statistics were used in biological issues such as the COD statistics and political issues like taxation and conscription for military service. Subsequently, the science of statistics was begun to be applied to issues such as crimes and suicides.

1.3. Methodology and Research Techniques

This thesis is a descriptive study of the causes of death statistics in Turkey. In an attempt to contextualize and historicize the development and transformation of the causes of death statistics, the thesis presents both a historical overview as well as an examination of the current developments. The historical study focuses on the institutional development and transformation of the COD statistics through a study of various secondary sources on Ottoman statistics. This historical analysis is situated within a theoretical and critical debate on statistics in general. The descriptive part of the thesis utilizes various research techniques, namely, observation, documentary and archival research, and review of secondary literature. The author is a Turkish civil servant who was employed at the MoH as a deputy European Union expert for the duration of the thesis research. He, therefore, had the opportunity to observe the developments concerning the reform of the COD statistics in Turkey as part of its EU accession process. He not only had a chance to observe the details of the process from within the Turkish bureaucracy, an opportunity which outsiders would not have, but also had easy access to a wide range of archival material and documents available at the Ministry as well as related state institutions. This thesis draws a

substantial amount of data from these sources and provides them through the interpretative lens of the author.

Similar studies concerning the accuracy of COD data and reformation of the COD system has been carried out in the European countries. I will briefly mention two cases, which are Sweden and Greece. In Sweden, there were studies on historical development of the COD data. Furthermore, there is a doctoral dissertation on infant and child mortality in Linköping which is a town in Sweden. This study is done by Magdalena Bengtsson, who also concentrated on changes on the COD information.[10]

In Sweden, during the eighteenth and nineteenth centuries, studies on the COD data mainly focuses on the clergy's medical competence.[11] To illustrate, Artur Imhof and Bengt Lindskog claimed that although clergy knew the basic principles of medicine, they did not have sufficient information on the COD data. Carl von Linné and Abraham Bäck suggested introducing reforms to clergy's medical education so as to improve reporting of mortality statistics.[12] Nevertheless, the historian Britt-Inger Puranen stressed that clergy is local doctors for Sweden so that they played a crucial role for medical treatment. He also underlined the practical experience of clergy.

Studies on the COD information in Sweden are important to indicate changes in the patterns of the COD. In addition, these studies provide significant clues for the alteration of practice of medical science and health policies. Consequently, the history of causes of death analyses in Sweden is beneficial to understand mortality patterns and changes of them.

In Greece, there were studies concerning the accuracy of the COD data. In rural Crete, between 1994 and 1999, death certificates were reviewed in order to

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[10] Bengtsson, Magdalena (1996). "The Interpretation of Cause of Death Among Infants" http://www.ep.liu.se/ej/hygiea/ra/012/paperb.pdf [accessed on 10-09-2007].

[11] Ibid.

[12] Ibid.

investigate the stated accuracy of causes of death. Henceforth, 765 death certificates were examined in the study.[13] It was found out that the most frequently used ill-defined cause of death included cardiac arrest and cardio respiratory insufficiency which are classified in the category of the diseases of the circulatory system.[14] It means that there is an over-reporting for the cardiovascular diseases in Crete.

These two studies provide important comparative cases to consider in my thesis because they concentrate on significance and accuracy of causes of death statistics with their peculiar historical background. Henceforth, the thesis has utilized to the studies with regard to evaluating the COD statistics.

[13] Lapidakis G.M and A.I Stathopoulos (2000). "Investigation of Accuracy of Death Certificate Completion and Implications on Mortality Statistics in Greece" *European Journal of Epidemiology* 16(11):1081.

[14] Ibid.

CHAPTER II
BACKGROUND

2.1 Statistics in General

Statistics as a social phenomenon can be defined in different ways. To define exactly statistics is a rather difficult task. In everyday usage, statistics is usually used for two broad senses. The first one is numerical records of anything and the second one is a branch of knowledge and scientific discipline. In the thesis, I will concentrate on the second sense of the statistics.

If they were to ask the "man on the street" what statistics means to him, it is possible that people would define "statistics" is "hocus pocus" with numbers. By manipulating these numbers according to certain secret and well-guarded rules, we can prove anything we have a mind to.[15] Or, "statistics is the refuge of the uninformed. When we can not prove our point through the use of sound reasoning, we fall back upon statistical 'mumbo-jumbo' to confuse and demoralize our opponents".[16]

The Random House College Dictionary defines statistics as "the science that deals with the collection, classification, analysis, and interpretation of information or data." Statistics can be also defined as a method of dealing with data.[17] Data is numbers or measurements which are collected as a result of observations.[18] "Statistics is a framework for decision making" because decision making or evaluation most of the time necessitates data, which is related the decision or

[15] Haber, Audrey and Runyon R. Richard (1969). G*eneral Statistics.* Addison-Wesley Publishing Company, 5.

[16] Ibid., p.5.

[17] Ibid., p.6.

[18] Ibid., p.6.

problem in question. Statistics can also be defined as "prolongation of inductive reasoning'. Induction and deduction are within the sphere of philosophy which is known as epistemology or the theory of knowledge. Consequently, "statistics, if it is a prolongation of inductive reasoning, would naturally be an outgrowth of epistemology"[19]. His definition encounters criticism because it is thought to be rather narrow and disregards deduction, which is also widely used in the statistical analysis. Another criticism towards this definition is that if statistics is just inductive logic and reasoning, then it is related to epistemology, which does not deal with value-judgments. Nevertheless, statistics is related to value- judgments because statistics generally concentrates on data in order make a decision as opposed to other decisions. This process of selection among other alternatives necessitates value-judgment. On the basis of the explanation, it is possible to reach another definition of statistics. "Statistics is a logic and methodology for measurement of uncertainty and for an examination of the consequences of that uncertainty in the planning and interpretation of experimentation and observation". This measurement of uncertainty cannot be isolated from decision making because to measure uncertainty is *sine qua non* for decision making.

Statistics as a science is also an important input for other sciences. It acquires methodology and techniques for not only physical sciences but also for social sciences. Therefore, there is a dynamic and reciprocal relationship between statistics and other branches of sciences as statistics is an invaluable tool for decision making under uncertainty. Furthermore, since "randomness is inherit in all sciences"[20], unpredictable or random part of all sciences is to some extent related to statistics.

Statistics is generally related to two distinctive processes: i) describing sets of data ii) drawing conclusions. On the basis of the two basic differentiations, statistics is divided into two branches: descriptive statistics and inferential statistics. Descriptive

[19] Ramsey, B. James (2002). *The Elements of Statistics with Application to Economics and the Social Sciences.* Duxbury Thomson Learning, 2.

[20] Ibid., p.2.

statistics uses numerical and graphical methods to look for patterns in a data set, to summarize the information revealed in a data set, and to present that information in a convenient form.[21] On the other hand, inferential statistics uses sample data to make estimates, decisions, predictions, or other generalizations.

2.1.1 The Social History of Statistics

Following the definition of statistics, the historical development of statistics as a social phenomenon will be mentioned herein after. At this point, it should be kept in the mind that our understanding of history rest upon our viewpoint of the present, which shapes or colours the history. Thus, we are inclined to recreate and reconstruct the history. History of statistics and statistical thought are generally viewed as a single structure in the realm created by the human mind.[22] However, the history of statistics is not compact; there are many fissures so that it is not uni-linear process. Consequently, in this part, I am going to concentrate on a short history of statistical thought in the light of the reconstruction of history.

2.1.2 The First Medical Statistical Treatise

Statistics and statistical thought cannot be isolated from social developments. In that sense, on the one hand, statistics influences on social and political developments but on the other hand, it is affected by social and political issues. Theodore M. Porter in his book named *The Rise of Statistical Thinking 1820-1900* and Ian Hacking *The Taming of Chance* stress the importance of social aspect of statistics. They are inclined to assert that statistics grows out of as a study of society. Therefore, through statistics, like natural laws, a new version of law on society emerged and society has become statistical. They also underline the dynamic and reciprocal relationship between natural sciences and social sciences and they add that statistics is

[21] McClave, T. James and Terry Sincich (2002).*Statistics*, Pearson Education International, 5.

[22] Chatterjee, Shoutir Kishore (2003). *Statistical Thought: A Perspective and History*. Oxford: Oxford University Press, 3.

intertwiningly interconnected with other social and natural sciences. On the basis of these two arguments, they claim that statistics and statistical thought have played a significant role in the development of modern thought.

In the developments of statistical thought, the COD statistics played an important role. Therefore, in order to reveal the importance of the COD statistics, John Graunt's treatise (1662), which is one of the first statistical treatises, will be mentioned hereinafter. His treatise was the pioneering work in giving importance to numbers in the medical sciences. Furthermore, he deduced that even though the underlying causes of death vary, death is subject to the stable laws.

During the 1600s, there emerged eagerness in human demography and this eagerness was related to the Old Testament. The Genesis 5 and 6 asserts that early descants of Adam lived over 500 years but that was decreased to 120 years and finally that was reduced to 70 years[23]. Parallel to these statements, a French Jesuit theologian, Denis Petau (1583-1652) debated this issue in his widely reprinted work, "*Opus de doctrina temporum"* (1627). This work is the first book on human demography.

After Denis Petau, John Graunt is one of the early leading figures in human demography. Graunt is one of the first persons, who used demographic statistics for administrative and medical purpose, which attracted much attention throughout the Europe. London published weekly its number of deaths and their probable causes. He used the COD statistics in his book *Natural and Political Observations Made upon the Bills of Mortaliyt*. Graunt in the preface of the treatise argued that his work was multifunctional so that it did not just concentrate on plague outbreak. Concerning the treatise, Sir William Petty (1623- 1687) asserted that London data has problems with regard to accuracy and standardized terminology. Nonetheless, this treatise played a considerable role in the development of statistics because it discovered the regularity of phenomena and the importance of data collection.

[23] Egerton, N. Frank (2005). "A History of the Ecological Sciences, Part15: The Precocious Origins of Human and Animal Demography and Statistics in the 1600s" http://esapubs.org/bulletin/current/history_list/history_part15.pdf, [accessed on 18.08.2007]

In the treatise, Graunt discovered that the numbers of deaths for each particular cause is relatively same in a series of years. Henceforth, John Graunt's treatise was the first attempt to discover or invent the idea of law of death. Moreover, this law also tried to be demonstrated by J.H Lambert, who used mathematical formulas for the COD statistics in order to justify divine wisdom.

Graunt also noticed that more boys were born than girls but the sex ratio remained nearly equal and that showed balance of nature. He indicated that life expectancy is in the city is greater than in village. Furthermore, on the basis of the statistical data of London, he tried to calculate the population of London. However, his method for determining the population of London is difficult to understand and problematic from the point of view of modern statisticians. He argues:

> … the number of Child-bearing women might be about double to the Births: forasmuch as such women, with another, have scarce more than one Childe in two years. The number of births I found, by those years, wherein the registers were well kept, to have been somewhat less than the Burials. The burials in these late years at a Medium are about 13000, and consequently the Christening not above 12000. I therefore esteemed the number of Teeming women to be 24000: then I imagined, that there might be twice as many Families, as of such women; for that there might be twice as many women Aged between 16 and 76, as between 16 and 40, or between 20 and 44; and there were about eight Persons in a Family, one with another, viz. The Man, and his Wife, three Children, and three Servants, or Lodgers: now 8 times 48000 makes 384000.[24]

The procedure explained above was highly complex and problematic so that it is not used by modern demographers. John Graunt's book in 1662 *Observation upon Bills of Mortality* contained many wise inferences based on his data, but its primary contemporary influence was more in its development in its demonstration of the value of data gathering than on the development of modes of analysis.[25] Consequently, his treatise was crucial for indicating significance of data collection, demonstrating harmony of nature and introducing concept of "Political arithmetic", which will be explained later in depth.

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[24]Egerton, N. Frank (2005). "A History of the Ecological Sciences, Part15: The Precocious Origins of Human and Animal Demography and Statistics in the 1600s" http://esapubs.org/bulletin/current/history_list/history_part15.pdf, [accessed on 18.08.2007]

[25] Stigler, M. Stephen (1983). *The History of Statistics: The Measurements of Uncertainty before 1900,* The Belknap Press of Harvard University Press,4.

2.1.3 Statistics and the Concept of Political Arithmetic

The word "statistics" has a German genealogic tree.[26] Idea of statistics is related to reflection of power of states.[27] The term statistics was firstly used by Gottfried Achenwall in 1749. He defines statistics as "noteworthy facts concerning state" and adds that "history is ongoing statistics and statistics is stable history". The anglicized form of statistics was introduced by John Sinclair in his 21 volume compilation, the *Statistical Account of Scotland.* He defined statistics as collection of facts for reaching results. In France, statistics was identified with numerical information about society.[28]

In France, beginning of 1821, official compilation of population and mortality figures for Paris and Seine was published under the name *Recherches stattistiques.* The statistical initiative in France was taken chiefly by advocates of public health, especially by army surgeons released from service at the conclusion of the Napoleonic wars. Consequently, particularly on the basis of French and German case, it can be concluded that until about 1800s, statistics was related to state affairs or in other words statistics was science of state and main purpose of statistical activity was promotion of bureaucratic efficiency.[29] Consequently, statistics was a vehicle for reinforcing administrative power of states. It was a way for rationalizing of state power. Furthermore, since statistics was able to provide comparative data, states could not only measure but also evaluate their power and this comparison was related to initial purpose of statistics of which based on well functioning of state.

In order to understand statistics within the context of a new branch of social science, it is necessary to consider the concept of "political arithmetic", which is related to

[26] Hacking, Ian (2005). *Şansın Terbiye Edilişi*. Mehmet Moralı, trns. İstanbul: Metis Yayıncılık,42.

[27] Ibid.,p.37.

[28] Porter, M. Theodore (1986). *The Rise of Statistical Thinking 1820-1900*, Princeton University Press,24.

[29] Ibid., p.24.

well-informed state policy. The concept of political arithmetic was invented by William Petty and was used by John Graunt. According to Petty, political arithmetic was the application of Baconian principles to the art of government.[30] Bacon argues "a judicious Parallel …between the Body Natural and Body Politick" and it was evident "that to practice upon Politick, without knowing the Symmetry, Fabrick, Proportion of it, is as causal as the practice Old-women and Empyricks"[31] Therefore, political arithmetic is inclined to claim that official policy should be based upon an understanding of the land and its inhabitant. The power of state was grounded on the number and characteristics of its subjects. Therefore, political arithmetic was especially related to tax collection and conscription for the military. The political arithmetic was also later related to population records and particularly to the accurate life tables for the purpose of calculating insurance an annuity rates.[32]

Political arithmetic was used to determine whether the population size of the given country was expanding or diminishing. It was believed that the degree of prosperity of the given country is directly related to the degree of increase in the population. This principle was parallel to God's first commandment "be fruitful and multiply" (Genesis 1). Since, at that time, a reliable method for measuring population was non-existent, the ratios of total population to annual births were the one of the most important indicators for the degree of prosperity of that given state. Therefore, it was thought that power of a given country can be measured by the size of its population. In the light of this idea, in the 17th century, Prussia established a statistical office and this office was in line with the convictions of Leibniz, who argued that the best indicator of power of the state is population and its growth. Henceforth, Leibniz formed a statistical office, which had 56 evaluation categories such as sexes of people, the number of males who can perform their military service, the number of

[30] Ibid., p.19.

[31] Ibid., p:19.

[32] Ibid., p.20.

women at the age of marriage, population density, prevalence of diseases, causes of death statistics, population density and age pattern.[33]

Prussian statistical office, inspired from the ideas of William Petty for England, is a significant step for the idea of "avalanche of numbers" and "political arithmetic". Prussia collected and compiled different kinds of statistical information so that statistics started to accompany and affect human life entirely in Prussia. Once an infant was born, the state started to collect information until its death. Henceforth, statistics played an important role even after people die with effect to the causes of death statistics had to be complied in Prussia regularly. It means that statistics follows humans even after death. All these developments including number of deaths were also related to political arithmetic because the state was able to develop informed policies in the light of relatively comprehensive statistical data.

In the eighteen century, one of most significant figures in the political arithmetic was Johann Peter Süssmilch, who wrote treatise on the "divine order" in the demographic issues. Parallel with the God's first commandment, he supported to maximize the population growth. Concerning Sussmilch, Theodare Porter says:

> Susmilch, like most political arithmeticians, advocated expansion of the government apparatus for collecting population numbers and, more important, for acting on them Continental political arithmetic was an offspring not only of the scientific ambition of the Enlightenment, but also of enlightened despotism, and even in Great Britain this knowledge was to be put at the service of king and Parliament. To advocate the use of extensive statistical information was to favour centralization and bureaucratization and hence, as French progressives such as Turgot and Condorcet most earnestly hoped, to bypass conservative and particularistic interests like church and nobility. The ultimate beneficiaries of this rationalization ought to include the mass of private citizens, but its immediate effect was to be the consolidation of state power.[34]

Early active members of the statistical society were interested in politics rather than natural sciences and mathematics. According to Porter, although statistics were under

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[33] Hacking, Ian (2005). *Şansın Terbiye Edilişi*. Mehmet Moralı, trns. İstanbul: Metis Yayıncılık,35.

[34] Porter, M. Theodore (1986). *The Rise of Statistical Thinking 1820-1900*, Princeton University Press, 23-24.

the service of the state and bureaucracy through political arithmetic, there was not an uni-linear relationship. He argues:

> Needless to say royal absolutism was not always the beneficiary of these changes; perhaps bureaucratic centralism was, but its victory was an ambiguous one. If statistics provided bureaucracies with some of the knowledge that is indispensable to power, they also suggested certain limitations to this power. The limitations in question are not constitutional ones, but constraints that now seemed to exist independently of any particular formal arrangements of government. For expansion in the scope of numerical investigations was accompanied by an important change in the conception of their object.[35]

Concerning constraints of statistics, two significant thinkers are worth to consider, Sussmilch and Thomas Robert Malthus. Sussmilch supported the growth of population. In contrast, Malthus argued that population growth is the source of social illnesses. Although, they did not share similar ideas concerning population growth, both of them endorsed that population is not something flexible rather population is product of the natural laws and customs. Therefore, population increase or decrease is not just within the scope of state politics. Parallel with the statement, they argued that government could not dominate society, for it was itself constrained by society.

The political arithmetic offered a package to be followed by the legislator or governor, also provided a vehicle for the rational governing. Through resorting to the political arithmetic, a legislator could know more about their subjects. It was pragmatic and practical. For example, a king or governor could know how many people could be levied in a certain region. At this point, it can also be asserted that the political arithmetic had some unintended consequences because in time these numbers for rational governing became independent from their initial particular aim and became truth by themselves. Through the development of the political arithmetic, ruler became under the service of numbers. Consequently, like natural laws, a new version of law on society emerged under the leadership of political arithmetic. In the new version of law on society, Adolphe Quetelet (1796-1874) played a crucial role so that I will shortly consider his views.

[35] Ibid.,p.41.

2.1.4 Social Physics and Average Man

Quetelet, as one of the most prominent social statisticians, stressed the significance of statistics in social sciences. According to Ian Hacking, Quetelet is the key character of the statistical movement. Quetelet saw society as a dynamic entity and can not be radically changed by the political leaders. He believed that a single method is suitable for every science. Henceforth, according to him, astronomy, mathematics, statistics and social sciences can use the same method. In order to underline the similarity among different branches of sciences, Quetelet stressed the importance of astronomy and mathematics in the foundation of the statistics. He says: "It is not doctors that we owe the first tables of mortality, they were calculated by the celebrated astronomer Halley"[36] Consequently, according to him, astronomer's interest to discover natural order is real foundation of the statistics. He adds: "The laws that concern man, and those that govern social development, have always had a special attraction for the philosopher, and perhaps most especially for those who have directed their attention to the system of universe."[37] Therefore, statistics resembles other sciences particularly with respect to understanding the basic principles of the universe.

"Social physics" was Quetelet's leading concept, which was an attempt to underline the similarity between social sciences and physical sciences. This concept argues that society can be evaluated like physical facts. The social physics offers a package of laws like physical laws. Moral laws are analogous like natural laws. Therefore, in the social realm, it is possible to reach a high degree of certainty. According to Quetelet, the social realm can not be an outcome of irregular and haphazard acts of the will, so that under the leadership of social physics, social improvement and rational governing is possible through understanding the social regularities and laws. In that manner, the social physics is a guide for the legislator.

[36] Ibid.,p.44.

[37] Ibid.,p.44.

Another prominent concept of Quetelet is "average man" *(l'homme moyen)*, which is related to numerical regularities of the society. Thus, this concept, which is articulated in the *A Treatise on Man* (1842) on the one hand, is concerned with the belief that everything can be expressed numerically. On the other hand, this concept stresses to the regularity of social events. Ouetelet argued that this abstract man, elaborated with regard to the average of the whole human attributes in a given country, could be treated as the "type" of the nation, which is the representative of a society in social sciences comparable to the term of "gravity" in physics.[38] The average man is in line with the mean results, which are provided for a particular society. The average man is a middle value between deficiency and excess. According to Quetelet, to measure quantifiable characteristics of average man is simple and related to collecting measurements of height and weight. However, to measure moral features of the average man such as crime, courage or anger is a rather difficult task. In order to solve this problem, he proposes that social physicists should carefully record the numbers of criminal or courageous acts for the whole society. In this way, the inclination of average man for criminal acts can be calculated through dividing the number of criminal acts to the whole population. Furthermore, according to Quetelet, the average man has rational, temperate habits, more regulated passions and foresight.

The average man was a useful metaphor, so that in the nineteenth century it was widely considered in political, economical, cultural and social issues. On the basis of the Quetelet's concept, Charles Morgan asserted that legislation should be rested upon the average man rather than sum of individuals' ideas. George Cornwall Lewis suggested that the law of averages could be utilized to determine the "prevailing character" of a government, the "medium state between opposite extremes"[39]. He says:

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[38] Ibid.,p.52.

[39]Porter, M. Theodore (1986). *The Rise of Statistical Thinking 1820-1900*, Princeton University Press, 66.

> We may be unable to predicate any invariable and universal tendency of a form of government, just as we unable to say that all men live a certain number of years. But as we can say of men that the average duration of their life is a certain number of years- so we may say of a form of government, that it has ascertain prevailing average character.[40]

Karl Marx stated that Quetelet's concept of the average man can be employed to define a uniform standard of labour so that it is possible to reach exact and standard definition of the labour theory of value.[41] M.L. Wolowski claimed that the statistical laws provide a useful tool for economics.

Quetelet contributed to the quantification of sociology by his two significant metaphors the "average man" and "social physics". He asserted that everything can be numerically expressed and measured. He also claimed that there is no chance in life because all of things regarding life are subject to the unchangeable statistical laws, which are independent from the other laws. To illustrate, according to him, even though the underlying causes of death vary, death is subject to the stable laws. It is valid for actions of the free will such as crime and suicide. From the point of view of Quetelet, free actions are small causes for obtaining big regularities. Therefore, his views can be regarded as deterministic.

According to Quetelet, human actions like other natural events are determined by the universal laws. Therefore, like regularity in the natural world, there is a numerical regularity in the human world. In that manner, everything can numerically be explained and this explanation follows a regular path. Even though, marriages, suicides, crimes and births even to a certain extent deaths are products of human free will, it is not the case in reality because he noticed that the number of crimes, marriages and births are relatively regular throughout the years. In that sense, according to Quetelet, although humans think that they follow their own free will, they follow the natural order. Particularly the ratio of crimes is the same throughout

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[40] G.C. Lewis (1852). *A Treatise on the Methods of Observation and Reasoning in Politics* vol. 2, London, Arno Press, 84-85.

[41] Porter, M. Theodore (1986).*The Rise of Statistical Thinking 1820-1900*, Princeton University Press, 66.

the years so that Quetelet argues that no individual is free from the society and there are laws, which shapes the behaviours of individuals.

Quetelet used the statistical regularities for explaining social phenomena. All these regularities caused to proclaim the "law of large numbers", which asserts that nothing in the social life is the outcome of accidental and arbitrary actions of individuals so that general effects in the society are always produced by general causes. In addition, the concept states the principle: If the numbers of individuals increases, freedom of individuals diminishes because this situation creates transcendental laws, which are free from any individual in the society. All these deterministic arguments tend to state that everything in the social life is under the control of statistics. Nonetheless, according to Hacking, Quetelet also asserts that statistics can change human behaviours and statistics also includes laws about changes. At this point, he establishes a reciprocal link between power and information. Statistical information is the first step for acquiring and discovering the statistical laws. Consequently, through getting statistical information, we are able to manage to use power in a certain direction so that by this way, it is possible to change the social laws.

Quetelet established a direct relationship between information, control and the statistical laws, which caused to a new situation called "statistical fatalism". Contrary to Hacking's argument, statistical fatalism is a concept, which is situated against the human's capacity to change the social laws. According to Quetelet, society creates the conditions for committing crimes. Criminals are just vehicles thus society is responsible for crimes, not the individuals. This view can be called as fatalistic because there is no place for the individual free will. Although crime can be regarded as an irrational action and outcome of individual actions, Quetelet is inclined to regard the ratio of crime as the product of consistent social laws, which cannot be broken like natural laws.

In fact, Quetelet's assertion concerning statistical regularity in the social and moral world is not innovative. The idea of natural theology on the basis of demographic

regularities was developed by John Arbuthnot (1667-1735). According to Arbuthnot, everything in the world is under the service of natural harmony. He noticed the regularity of death, birth and marriage. They are strong evidences for the Creator's "perfect order". He found that in London, the ratio of female births is 12 while the number of males is 13.[42] Mortality of the male is more than the mortality of the female so at the age of marriage, balance of two sexes can be reached. These developments are signs for the natural harmony. The same situation is also valid for the stability of death tables. In a series of years, the numbers of deaths within a specific territory is regular. Arbuthnot claims that regularity on social phenomena can be extended to many social issues.

Pierre Simon Marquis de Laplace in the *Philosophical Essay on Probabilities* argued that the number of dead letters in the Paris postal system was constant in a series of years. These regularities were also sought to the number of suicides, thefts and other moral issues in order to indicate the theological and teleological order. Consequently, causes of death statistics, ratio of female and male births and moral statistics were used to justify the divine wisdom in the world. Statistics was used as the vehicle for that purpose.

It should be stated that until the nineteenth century, as opposed to modern usage of the COD statistics, these statistics was not very important for developing rational health policy. However, the COD statistics were used for the religious justifications particularly to demonstrate the divine wisdom in the world. In that sense, statistics especially the COD statistics were utilized as an ideological tool to justify religious and political doctrines.

2.1.5 The Erosion of Statistical Determinism

Quetelet was a significant figure for the statistical determinism and fatalism. His views also contributed to classify human nature on the basis of numerical

[42] Hacking, Ian (2005). *Şansın Terbiye Edilişi*. Mehmet Moralı, trns. İstanbul: Metis Yayıncılık, 63.

classifications so that numbers are isolated from humans and their characteristics. Numbers were indifferent to humans. Instead of real human beings, there were numbers, which were representing human beings. Henceforth, with the help of numbers, human's unchanging nature could be discovered and classified.

The statistical regularity was considered a sign to reveal natural power on human beings. Humans were subject to natural and social laws. Nevertheless, at this point, it should not be deduced that contemporaries of Quetelet do not have the same or very similar ideas concerning the nature of statistics, but they argued that their discipline composed of the application of the tried and true method of natural science to a social object[43]. According to Porter, this argument can be called "statistical determinism".

The statistical determinism encountered diversified and distinctive resistance. It was argued that statistics has little scientific worth because statistics concentrates on mean values rather than variation. In addition, Henry Thomas Buckle asserted that the statistical method is inherently imperfect one, because remoteness or intrinsic variability of the constituent objects rendered exact deterministic knowledge inaccessible.[44] Ian Hacking calls these developments as the "erosion of determinism".

Until the mid-nineteenth century, determinism was regarded as a theory, which repudiates human free will and freedom.[45] According to Porter, particularly during 1850s and 1860s under the statistical determinism, it was argued that the future of the world is determined by its present configuration. He also asserts that determinism differs from fatalism, which depends upon the natural laws of cause and effect rather than on some transcendental forces. Porter states that "indeterminism" asserts that

[43] Porter, M. Theodore (1986). *The Rise of Statistical Thinking 1820-1900*, Princeton University Press,8.

[44] Ibid.,p.8.

[45] Ibid.,p.12.

the world is not completely determined by natural causes. Alternatively, indeterminism is inclined to claim that the world can be reduced to random events.

Under these definitional elaborations, indeterminism and chance in contrast to the statistical determinism, teleology and fatalism gained power because statistics were everywhere so that people were fed up with statistics. For instance, statisticians were calculating the number of married men and women for per kilometre square. Statistics were penetrating and covering nearly the whole areas of the life, which questioned the existence of free will. Under such an atmosphere, a well known statement attributed to Benjamin Disraeli was widely used in political discussions. There were three lies: lies, damned lies and statistics. This phrase (whether it was said by Disraeli or not) was important for showing the reactions of avalanche of numbers and idea of statistical laws.

Auguste Comte was also against the statistical laws and explanations particularly in the field of sociology. He was arguing that statistics was endorsing the dogma of unchanging character of the laws. He was also against the probabilistic calculations of statisticians. According to him, these calculations are more futile than the discussions of the Middle Age academicians.

The reactions to statistics were also seen in medicine. Speakers of these reactions were Georges Canguilhem, William Coleman and Claude Bernard. Bernard was arguing that the basic function of doctors was to determine the causes of illnesses and to cure them. From the point of view of Bernard, a statistician is only able to predict that 80 % of people from a particular disease manages to survive. However, the thing the patient wants to know is his or her situation and statistics says nothing concerning that particular person's chance to survive his/her disesase. Therefore, statistics put barriers for reaching the reality. Statistics was concentrating on the averages and mean values, which was an impediment for the real situations. Thus, supporters of anti-statistical movement in the medicine were in favour of real individuals, who could form a good model for further analyses.

According to Ian Hacking; Charles Dickens, Auguste Comte, Fyodor Dostoyevsky, Frederic Le Play, Bernard and Augène Labiche were against the avalanche of numbers and averages. All of them asserted that humans were isolated from humanity. They repudiated that human's social life moves towards the statistical stability. For example, Dostoyevsky argues that statistics neglects humans' capacity to unconstraint imaginative power, free will and even caprices.

Another prominent resistance towards statistics was related to resurgence and re-emergence of the "pure chance". As it was stated earlier, Ouetelet tried to establish independent statistical laws and by this way, it was possible to control human lives in a more consistent way. According to Quetelet, everything was subject to the statistical laws. Through the resurgence of pure chance, these encompassing statistical laws were criticized. Hacking calls this resistance as "statistical nihilism" which stands against Newtonians of rational Enlightenment. The statistical nihilism was endorsed by Nietzsche and Romantic thinkers. Nietzsche asserted that humans' birth is a consequence of chance. Humans become individuals through birth. Thus, rationality in the world was an outcome of irrationality. According to Nietzsche, order in the world was a result of chance. Henceforth, from the point of view of Nietzsche, essentialism and fatalism is not related to repealing the chance rather they are combination of the chance.[46] In that sense, the chance and determinism were the twins and in order to explain, one of them, we need the other one. It resembles heads or tails. Bad players live through the probabilistic calculations so that they are subject to the law of large numbers but good players know that life is chance. Nietzsche argues that if there is purpose, chance is meaningful. In that manner, regularities in the world by itself are outcome of chance. Thus, humans ought to accept the unexplainable chance.

Another reaction to the dominance of statistical thought in the humans' lives is related to lack of cultural perspective of statistics. Particularly after publication of Henry Thomas Buckle's book *History of Civilization in England* this resistance

[46] Deleuze, Gilles (1983). *"Nietzsche and Philosophy"*, New York, Part II. "Dicethrow"

increased. Buckle in the book mentioned the laws that shape the very nature of human progress. He also stressed importance of the method of averages in his book. Even though, Wilhelm Wundt was a quantitative psychologist, he asserted that Buckle mixed human natural history with that of social history.

In the 18th and 19th centuries, it was argued that regularities in the world are the indicators for the statistical laws. However, supporters of anti- statistical movement argued that regularities in the world were not laws even rule. Thus, humans were marrying, reproducing, divorcing and committing suicide with their free will. In order to reveal the existence of the statistical laws, it was necessary to know the causal relationships among these phenomena but it was nearly impossible to know exactly the relationships among these phonemena. Thus, it was not probable to talk about any statistical laws like the law of suicide.

At this point, it is worth to mention Georg Friedrich Knapp's ideas. He was critical to statistical laws and against the view that society is subject to the fixed laws. According to him, these views see human beings as "homogeneous mass" so that they ignore autonomy and indeterminable character of human beings. In his first book, there is a chapter on demographic models. The name of the chapter is "Are There Laws of Mortality". He asserted that unless death was a fixed function of age, independent of time and place, which it was not, it could not be justified to speak of laws of mortality in this regard. He also claimed that there was no reason to be astonished by the regularities of statistics.[47]

From the point of view of Knapp, Quetelet was mixing up social sciences with "antropologie", (human science) which was rested upon individuals so that antropologie was atomist. In contrast, social science was a science of culture. He also says that Quetelet was establishing an erroneous relationship between the social determinism of physics and the atomistic individualism of anthropology. According

[47] Porter, M. Theodore (1986). *The Rise of Statistical Thinking 1820-1900*, Princeton University Press, 188.

to Knapp, Quetelet has an "astronomical conception of society". Knapp says: "forces act on society which, as we recognize from regularity of their effects, seem to be independent of those affecting individual events and actions, and that therefore must be conceived as external forces"[48]

Knapp asserted that it was misleading to try to understand culture through the statistical regularities, which regard society as the sum of similar individuals. In that sense, he criticized Quetelet's arguments on crime. He stated that society is very complex so that there can be a close correlation between crime and the level of education in one culture but in another culture this relationship cannot be shown in a definitive way. Therefore, to make encompassing assertions on society is misleading. In addition, according to him, belonging to a particular culture is not related to constraints on individuals' freedom. Since human nature do not exist, human become human in specific cultures. Therefore, society by itself imposes on laws for itself and social phenomena as the cultural products were historical.

On the basis of Knapp's views, it can be deduced that there can be regularities in the number of suicides, deaths and births but these numbers cannot be evaluated without giving direct reference to cultural traits, which creates these numeric regularities. Thus, statistics was independent variable rather than being independent law.

2.1.6 "Statistics and the Hegemony of Normal"

Until Joseph Broussais, pathologic and normal situations are two different phenomena but he argued that being healthy and ill fundamentally is the same situation. The difference between them lays their density. On the basis of the Broussais' ideas, Auguste Comte in his book *Système de politique positive* (1851) claimed that collective organisms are open to more serious and diversified problems. Comte says that he applied the method of Broussais to sociology.

[48] Ibid.,p.186.

Arguments of Broussais and Comte are important to invent the dichotomous model (pathologic and normal). Comte argues that pathologic is not radically different from normal. This invention was developed by Broussais within the scope of medicine and widely used in social sciences. Human behaviours were called either normal or abnormal and pathologic. The normal was not a value- free concept although it presented as an objective phenomena. The normal was associated with righteousness and accurateness. According to Comte, normal was centre as gravity in physics and progress is a movement towards normal.

Normal is average and average is Quetelet's *I'homme moyen.* Furthermore, according to Hacking, determinism and normal are interdependent concepts and the erosion of determinism is simultaneously related to invention of the concept of normal.

Hacking claims that instead of human nature, which is one of the most leading concepts of the Enlightenment, in the nineteenth century, the concept of normal was invented. According to him, human nature was an vehicle for creating a new morality. The concept of normal is defined and elaborated for the similar purpose so that thinkers started to talk about "normal man", who brought objectivity on human behaviours. There is an "idealized normal" and deviation or variation from the normality was regarded as error. As the "law of average", the "law of normality" was tried to be discovered. In order to determine the idealized normal and law of normality, statistics has undertaken an active role with the help of mod and median. Statistics as science of pure facts were not accepting any sort of speculations or vague information and data, so that it had to help to discover objective normal. Therefore, by this way, the scope of statistics has widened, statistics have a saying about not only political but also moral issues. Statistics has provided sufficient evidence to support the normal as the purified form of life.

Emile Durkheim was one of the most outspoken defender of the sharp dichotomy between pathologic and normal. In the *Rules of Sociological Method* (1895), instead of the average man, he used the concept of normal and pathologic. Durkheim

claimed that normal is lack of illnesses or problems. Durkheim also argued that statistics was supporting means in order to escape from extremes of particular groups. He was eager to use statistical data in order to show what is normal and pathologic. Thus, he used many statistical data in case of suicide. According to Hacking, this dichotomy is related to the difference between what exists and what ought to be. None of the concepts of Durkheim has encountered reactions and resistance as his concept of normal because this concept is one of the most powerful ideological vehicles in the 20th century.

Although the concept of normal is one of the most leading concepts for shaping the social structure, there was not a full consensus on the concept. At this point, it is possible to talk about two major ideas on the concept. In the first case, normal is used to reinforce and support statue-quo. This idea comes from Durkheim. According to this view, normal is a conservative concept so that the normal is related to sticking and obeying the socially accepted norms. According to the second view, the normal is average so that it can be developed. The supporters of this view Galton and Comte. According to Galton, the normal is important to go beyond it. For Comte, the normal is ideal for revolutionary positivism.

III CHAPTER

HISTORY OF STATISTICS IN OTTOMAN EMPIRE AND TURKEY

3.1 Statistics in the Ottoman Empire

After stressing the significance of the social part of statistics, I will concentrate on statistics in the Ottoman Empire. As it is stated earlier, statistics is the outcome of practical and pragmatic needs. In a broad context, statistics grows out of determining human and material resources of the given state[49]. Thus, any state can develop applicable and rational policies on the basis of realistic data and statistics. From the perspective of states, statistics is a significant vehicle for rational and systematic ruling. Furthermore, according to Halil İnalcık, the best way to access to unknown is to move from the known. In other words, the most suitable way to know unknown is to know very well known.

States have reflected and determined their power through using numbers and statistics. These developments have given way to the spread of numbers. Consequently, in that manner, statistics play a crucial role in the lives of states not only in industrial period but also for pre-industrial and agricultural period.

Ottoman Empire as a "central, bureaucratic and patrimonial" state developed peculiar and complex methods for data collection, book keeping and statistics. While performing administrative and financial functions, the Ottoman Empire collected regular, systematic and detailed quantitative data. İnalcık argues that J. Dupaquier' studies on the history of statistics from Chine to the Europe cannot be understood completely without considering and evaluating the Ottoman statistical history. According to Halil İnalcık and Şevket Pamuk, Ottoman Empire collected and maintained information about a large part of the tax-paying population, particularly

[49] İnalcık, Halil (2000). "Osmanlı'da İstatistik Metodu Kullanıldı mı?"*Osmanlı Devleti'nde Bilgi ve İstatistik- Data and Statistics in the Otoman Empire,* Halil Inalcik and Şevket Pamuk (edit) Ankara, State Institute of Statistics Prime Ministry Republic of Turkey,3.

agricultural population in order to keep their large empire under close central control.[50] Moreover, İnalcık argues that statistical defters of the Ottoman Empire is the indispensable component of the central administrative structure of the Ottomans, which created a rich legacy for the Republic of Turkey with respect to statistical data. Consequently, in the light of İnalcık's classification of the Ottoman statistical data, in this part of the thesis, the Ottoman data collection will be examined through dividing into two distinctive time periods: a) The Ottoman statistics and data collection during the classic period (15 and 16th century). b) Under the effects of modernization, new statistical methods and censuses in the Ottoman Empire that was started from the 19th century.

3.1.1 The Ottoman Statistics and Data Collection during the Classic Period

3.1.1.1 Tahrir Defters in the Ottoman Empire as the Fundamental Bases of Statistical Data

In order to determine the potentials of tax and tax population, many states and empires based on agricultural products made censuses in the pre-industrial period. The same situation is also valid for the Ottoman Empire. In that sense, in order to provide central control, the Ottoman Empire developed peculiar methods of censuses. Thus, it was a crucial necessity to get information concerning agricultural, human and commercial potential of the Empire so that the Ottomans was carried out censuses.

In the classical period of the Ottoman Empire, data collection and statistics was mainly based upon tax collection and conscription for the military. In that sense, *Tahrir Defters* (tax register) is the major source of the Ottoman statistics in the 16th and 17th centuries. The *Tahrir Defters* as a source of financial census was applied in the villages and town quarters mainly in the fifteenth and sixteenth centuries. The first known tax register in the Ottoman Empire on the basis of İnalcık's studies is the

[50] Ibid.,p:3.

1431 dated *Arvanid Sanjak Tahrir Defters*. Nevertheless, according to Mehmet Öz, there are significant clues that these defters are also used in the fourteenth century in the Ottoman Empire.

The *Tahrir Defters* is directly related to the system of fief *(tımar)* (Byzantine Empire "Pronija"). It means that the basic purpose of the *Tahrir Defters* is to collect tax from the agricultural population. In order to understand the basic tenets and aims of the *Tahrir Defters*, it is necessary to explain briefly the fief system of the Ottoman Empire. As it is known, Ottoman administrative structure is based on the *Eyalet* (province) system, which is divided into the *Sanjaks* (subdivision of a province) and *Kazas*. The *Kazas* are the ruled by judged by the *Cadıs*. *Eyalets* are ruled by the *Kanunname* (statute book). The Ottoman land system grows out of Islamic Principles succeed from Seljukids and Sasanian Empire. Old Turkish customs and traditions are also integrated into the system.[51] This system is inspired from *Ikta* system in which certain lands are given as a fief to definite officials in lieu of public and military service. This system was called as *Miri* land system or *Dirlik* (fief) systems and *Tımar* system in the Ottoman era.[52] According to İnalcık, the main purposes of the *Miri* land system are to guarantee to meet the necessities of Ottoman army (particularly barley and wheat) and to take precautions in order to be prevented from famine. Through well functioning *Tımar* system, the Ottoman Empire was able to escape from establishing a sophisticated system for the financial office.

From the perspective of central Ottoman bureaucrats, regular and rational running of *Tımar* lands were directly related to knowing the real revenues through estimating potential of taxation of the lands. Consequently, the Ottoman Empire needed census and survey, *(tahrir)* which was key importance not only for taxation potentials of the

[51] Bıyık, Cemal and Yavuz Ayşe (2003). "The Importance of Property Ownership and Management System in the Ottoman Empire in the Point of Today", Marrakech, Morocca,2nd FIG Regional Conference, December 2-5.
http://www.fig.net/pub/morocco/proceedings/TS10/TS10_4_biyik_yavuz.pdf [accessed on 11-06-2007]

[52] Ibid., p.3.

definite regions but also its population that is subject to these taxes. In the "classical period", Ottomans was carried out censuses or surveys every thirty to forty years. If there exists big changes in the taxation or population potential of a certain region, interim censuses could also be done.

Especially just after conquests, general censuses and surveys were carried out. (like Istanbul 1453, Budapest 1526) For that purpose, the Ottoman Sultans sent a Commission, which was composed of the *Emin* (writer), *Cadı* (local judge), the *Tımar* soldiers and sometimes fief holders. They as responsible persons for census and survey always come together and pay attention not to miss any potential source of taxation[53]. Henceforth, the Commission was writing the whole population that bears importance for the taxation and revenue resources. Among the *Reaya* (non-Muslim population), the Commission was registering only male grown ups, who are subject to levy. Thus, women and children were excluded from the censuses. While conducting census, the Commission also keeps the prior tax and population registration in order to update the *Tahrir Defters*. In addition, classifications in the *Tahrir defters* were generally based upon type of ownership of land, marital status and religion. In that sense, the *Tahrir Defters* acquire invaluable source for the population potential, religions of the population, occupational structure, numbers of grown up male and land structure of the Empire.

On the basis of the surveys and censuses, two kinds of registers are seen. The first one is the "detailed register" *(defter-i mufassal)* that includes the names of all the taxpayers, which means the whole adult males from villages or town quarters are covered in the register. Moreover, father name of taxpayer, occupation, marital status, obligations and privileges, extent of land held quantity of production and price of the production were available in the detailed registers. The *Defter-i Mufassal* is like a tax register in order to determine the revenue source. A provincial law book *(kanunname)* is the legal base of the tax surveys. These law books are consensus

[53] In the Prime Ministry Ottoman Archive, from 1302- 1883, there are 1094 defters.

documents between the local land elites and central state on the share and distribution of revenues[54]. Henceforth, they are flexible documents.

The second sort of register is the "summary register" *(defter-i icmal)* that includes the distribution of revenue sources by the local fief- holders. It also contains the name of the fief holders and identifies the total amount of the assessed tax, the number of taxpayers in the tax unit. Consequently, on the basis of revenue share, the summary registers are also tax registers. Furthermore, there were complementary registers: book of changes *(defter-i derdest)* and daybook *(defter-i ruzname)*. They regularly updated the detailed registers by recording. [55]

3.1.1.2 Avarız and Cizye Defters

As it was stated, the *Tahrir Defters* are widely used in the fifteenth and sixteenth centuries in the *Tımar* System of the Ottoman Empire. However, in the seventeenth century, although the usage of *Tahrir Defters* diminished, there were several examples of the *Tahrir Defters* in taxable regions of the Ottoman Empire. Ömer Lütfi Barkan argues that the latest *Tahrir Defters* (taxation census) was arranged by III.Murad in the late 16th century.

According to Cem Behar, the seventeenth and eighteenth centuries can be evaluated as the "dark period" with respect to the Ottoman demography because in these centuries due to farming out tax revenues and disappearing of the *Tımar* System, the Ottoman taxation system was decentralized so that the Ottomans collected and compiled less statistical data when it is compared to the fifteenth and sixteenth centuries. Parallel with disappearing of the *Tahrir Defters* and farming out the Ottoman lands, in the seventeenth century, tribute, which became one of the most significant incomes of the Ottoman Empire, has continued its existence until 1855

[54]Terzibasoglu, Yucel(2006). "Review of Dariusz Kolodziejczyk; Foreword by Victor Ostapchuk, The Ottoman Survey Register of Podolia (ca. 1681): Defter-i Mufassal-i Eyalet-i Kamanice" http://www.h-net.org/reviews/showrev.cgi?path=192971141141258 [accessed on 01-09-2007].

[55] Ibid.,p.2

with some changes in the 19th century. In that sense, tribute registries are important records in the Ottoman archives in terms of reflecting periodical and regional information.[56] Consequently, the *Cizye* and *Avarız* tax registries will be covered as a source of the demographic data particularly in the seventeenth century in the Ottoman Empire.

Ottoman law system, as other Islamic Turk states consists primarily of Islamic law.[57] In line with the Islamic law, *Cizye* (head tax) is collected from the non-Muslim population of the Ottoman Empire. The *Avarız* was taken from subjects *(tebaa)* of the Ottoman Empire in extraordinary circumstances in the first half of the seventeenth century. Later, it became regular and common. Since they are crucial sources of the Ottoman financial system especially in the seventeenth and eighteenth centuries, Ottomans kept *defters* for rational and systematic collection of these taxes.

At beginning of sixteenth century, the *Tımar* System was dissolved and farming out of lands became a general trend. These developments gave way to decrease importance of the *Tahrir Defters* and created a new registration office *(muhasebe-i cizye kalemi)*. According to Oktay Özel, it indicates that the *Defterhane* (the office of registration) did not lose its mission rather it was adapted to new conditions and circumstances. In line with this adaptation capacity, separate and independent *Cizye defters* were arranged. The arrangement mainly addresses to determine the persons that are levied.

The *Cizye* can be collected either on the basis of grown up individuals or a village or community as a whole. In some cases, the burden of the *Cizye* is also determined according to the land ownership. In 1691, important reforms were carried out on the

[56] Özcoşar, İbrahim and Güneş, Hüseyin Haşimi (2006). "Tribute in 19th Century Ottoman Empire and A Tribute Registry from 19th Century: The tribute Registry of Cızre's Sanjak" (The Tribute Registry Number:375), Elektronik Sosyal Bilimler Dergisi.
http://www.e-sosder.com/dergi/15159-179.pdf [accessed on 2-10-2007]

[57] Aydın, M. A. (1999). "Osmanlıda Hukuk" in *Osmanli Devleti Tarihi Cilt I* Ekmeleddin İhsanoğlu, ed., İstanbul: İKV.

basis of mandate *(firman)* of Sultan. In line with the mandate, the *Cizye* was collected not on the basis of households but it covered the whole grown up non Muslim population of the Ottoman Empire. In 1841, exemptions on the *Cizye* were repealed. Furthermore, the *Cizye* was collected annually in a regular manner.

Any significant change caused to update the lists of people, who are liable to pay the *Cizye* and *Avarız*. Therefore, the *Cizye* and *Avarız* censuses and registrations were made on the basis of up to date changes. Until the mid 17th century, these censuses were carried out by the local judges *(Cadıs)*. Nonetheless, after that period, these censuses were made by centrally assigned public officers.[58] Since the censuses were not made on regular basis, for each three years the registration of the *Cizye* and *Avarız* were updated on the basis of mandate of the central administration.

3.1.1.3 Temettüat Defters

Tanzimat period in the Ottoman Empire is an attempt to obtain social and administrative unity. In that sense, according to Tevfik Güran, Ottoman bureaucrats thought that the administrative unity rests largely on financial reforms. Parallel with these considerations, in the Ottoman Empire, tax reforms had been launched before the *Tanzimat* period. The basic reformation was to repeal many complex and random taxes. Instead, on the basis of economic power of households, solely one tax was levied. In order to facilitate financial reform, a new organization *"Muhassıllık"* was formed and the purpose of the *Muhassıllık* organization was to realistically determine the taxable population of the definite regions and economic power of the households. Parallel with these reforms, in 1845, comprehensive censuses were carried out and the results were sent to the Ottoman central administration. As a result, *Temettüat Defters* were created and these defters were kept in the Prime Ministry Ottoman Archives.

[58] Erkal, Mehmet "Cizye", TDVİA, 43.

The *Temettüat Tahrirs* is official registers of which content and purpose are determined by central Ottoman bureaucracy. The *Temettüat Tahrirs* were based upon the same systematic. It means that in every part of Empire the same method were applied and these censuses were simultaneously carried out nearly the whole part of the Empire by the people who were appointed by central administration.

According to Güran, as other registers, *(tahrirs)* the *Temettüat Tahrirs* was functional and related to the financial reform, which was key importance to ensure social and administrative unity. Güran also asserts that the *Temettüat Tahrirs* are the by-product of the Ottoman administrative elites' efforts for centralization and effectiveness, which were one of the basic tenets of *Tanzimat* period.[59] In that manner, the *Temettüat Tahrirs*, which covered large areas of the Empire, is the reflection of the centralization movement that can deeply be felt in the sphere of taxation arrangements.

As it is stated before, in the Ottoman Empire, censuses are realized in order to measure actual tax potential of the subjects. On the basis of the realistic tax potentials to make legal arrangements is the fundamental purpose of the tax registers. Parallel with the statement, the *Temetttüat Tahrirs* were carried out with the same systematic methods in the 19th century. In the *Temettüat Tahrirs*, taxation, wealth and income of households were tried to be determined by the central Ottoman bureaucracy. It is estimated that 1.1 million households were included in the censuses.[60] Consequently, the *Temettüat Tahrirs* were rich sources for historians with regard to taxation, structure and amount of agricultural production and wealth of households. Güran in the *Data and Statistics in the Ottoman Empire* claims that the *Temettüat Tahrirs* are also rich resources for sociological studies. He argues that these *tahrirs* give important clues for economic and social structure of the Ottoman society, social differentiations including ethnic, rural and urban differentiations. In that respect, the

[59]İnalcık, Halil (2000). "Osmanlı'da İstatistik Metodu Kullanıldı mı?"*Osmanlı Devleti'nde Bilgi ve İstatistik- Data and Statistics in the Otoman Empire,* Halil Inalcik and Şevket Pamuk (edit) Ankara, State Institute of Statistics Prime Ministry Republic of Turkey,73-78.

[60] Ibid.,p.79.

Temettüat Tahrirs can offer distinctive tools for economic activities of the Empire. It also obtains sociological modelling in order to understand the then-Ottoman social structure. Güran also asserts that in the period, one of the most momentous indicators of social status was wealth differentiations. Therefore, the *Tahrir* was revealing not only incomes of households but also basic constituent parts of wealth such as houses and possessions.

3.1.1.4 Shortcomings of Tahrir, Avarız, Cizye and Temettüat Defters

The *Tahrir Defters* were generally accepted as the starting point for data collection and statistics in the Ottoman Empire by the historians[61]. These *defters* were also used in order to get reliable information about the population of the Ottoman Empire. Nonetheless, this approach was criticized because the purpose of the *Tahrir Defters* was related to tax collection so that significant parts of the population (military personnel, children and women) were exempted from the censuses. Even though, some formulas have been developed for estimating the population of the Ottomon Empire, none of them except Lütfi Barkan's formula has been appreciated.[62]

The *Tahrir Defters* were also used for determining agricultural production data of the Empire. Nevertheless, such a data has also raised some difficulties. Firstly, there was not standardization for evaluating the *Tahrir Defters* among historians and researchers. The records of the *Tahrir Defters* were not standardized procedure and there were different registration procedures. Secondly, there are terminological problems and different units of measurement. This leads to calculating imprecise and inexact numbers for finding out the real agricultural production data of the Empire. Consequently, historians generally refrain from making rigid and definite argumentations concerning the demographical and agricultural data and their reciprocal relationship between the *Tahrir Defters* and the Ottoman Population structure.

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[61] Ibid.,p.3-7.

[62] Ibid.,p.21.

The *Avarız and Cizye Defters* like the *Tahrir Defters* should be evaluated in the light of specific social context and their peculiar purposes. To illustrate, the 16th century the *Cizye Defters* were distinctive from the 17th century *Cizye Defters* in terms of their arrangement, terminology and systematic.[63] It is also observed that the defters of 17th and 18th centuries differ from one region to another and one year to another. Furthermore, while in the 16th century, the classical unit for the *Cizye Defters* was households, in the 17th century, it was changed and the unit for the *Cizye Defters* became grown up male *(nefer)*. Like the *Cizye Defters*, the *Avarız Defters* changes from one region to another. It causes to differentiate the format and application of the *Avarız* and *Cizye* censuses. In addition, the Ottoman Empire granted exemptions certain groups so that they were not enumerated. To illustrate, these *defters* excludes to military personnel, women and children. Since whenever there is tax, there is escape from tax, it is possible that there were people who were able to escape from the censuses. Henceforth, the *Avarız* and *Cizye Defters* should be evaluated their own social and political conditions.

Concerning the *Avarız* and *Cizye Defters*, there are also terminological, methodological and categorical problems. For instance, there are discussions concerning number of household members and even the concept of household itself. According to Oktay Özel, the fundamental problem is the difference between classical definition of household *(hane)* and the *Avarız* household *(Avarız hane)*.[64] R. Jennings and M. Todorova claims that before 1691, the concept of household covers not only grown up males but also single males for the summary *Cizye Defters*. In addition, there are also debates regarding the ratio or numbers of household members.

Statistical and sociological values of the *Tahrir Defters* were mentioned above. According to Tevfik Güran, the shortcomings can basically be divided into two

[63] Ibid., p.41.

[64] Ibid., p.42.

groups.[65] Firstly, shortcomings related to the data covered in the *Temettüat Tahrirs*. For example, since the difference between income and wealth was not noticed in that period, the questions raised regarding reliability of the data. Secondly, Güran argues that there were shortcomings on the applications of censuses. One of the meanings of the statement is that there exists lack of verification sources for the data covered by these *defters*. Thus, data in the *Temettüat Tahrirs* cannot be controlled by the other data so that the degree of accuracy of these data is debatable. There were not also centralized method, procedure and standard. There was not a pressure to reach such standards from the central bureaucracy. As far as known, there were not homogenous regularity statutes.[66] Furthermore, the *Temettüat Tahrirs* were carried out only one particular period of time in the 19th century so that solely static analyses can be made on the basis of the data, which cannot give comprehensive picture of social and political life of the 19th century.

3.2 The Second Period in the Ottoman Statistics

As it was mentioned, the Ottoman data collection and statistics are divided into two periods on the basis of the Halil İnalcık's classification. Like İnalcık, Cem Behar divides the Ottoman statistics on population censuses into two periods. The first one called the "early period" starts from 15th century and ends up with the 19th century and the second period called the "pre-modern period" take up in 1830s. The fundamental distinction between the two periods rests upon difference in the change of nature of demographic data.[67] It denotes that the basic difference between two periods lies in the purpose of collection and conduction of data. Therefore, the primary reason for collecting data in the first period related to tax collection, central control and conscription for the military. Nonetheless, in the second period, the basic motive was overwhelmingly to get information from the subjects. At this point, Cem Behar asserts that the second is characterized to get information for its own sake

[65] Ibid., p.79.

[66] Ibid., p.65.

[67] Ibid., p.63 .

rather than the central control and tax collection.[68] Consequently, in the 19th century, although censuses for tax collection go on like the *Temettüat Defters*, it seems that there exists a mentality change in the Ottoman bureaucracy in line with the arguments of Cem Behar. Nonetheless, albeit this change and practical utility of this method, it can be argued that the distinction between two periods can blur and these periods can overlap each other. As we will see in the first population census that was a military oriented census, the two periods in the Ottoman Empire can overlap.

3.2.1 Census Population in the Ottoman Empire

The census of population in the 1831 is indispensable component of Mahmud II's reformation movements. This date is turning point for the Ottoman statistics and data collection because this census is regarded as the forerunner and pioneer for modern census of population in the Ottoman history.[69] According to Enver Ziya Karal that is the first population census for the Ottomans[70]. The census is carried out on the basis of individuals not households.

After the destruction of the Ottoman military unit Janissary corps in 1826 (this event is called *vaka-i hayriye* in the Ottoman history), the first thing to do is to establish a new army. Consequently, it was essential to know the number of subjects within the territory of the Ottoman Empire. In line with the arrangement purpose, only males are numbered. Non- Muslim populations are not subject to military services, since they pay to be exempted from their military services. Thus, in the census, they are classified as the Armenians, Jewish, etc. In addition, at that time, male populations of Istanbul are not subject to military services so that they are not numbered.

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[68] Ibid., p.63.

[69] Ibid., p.68.

[70] Karal, Enver Ziya (1997). *Osmanlı İmparatorluğunda İlk Nüfus Sayımı*-1831, İkinci baskı: Ankara; Devlet İstatistik Enstitüsü.

According to Behar, in the census, there were regional discrepancies with respect to method and classification.[71] Consequently, in order to number the whole male population in the Empire, there were lack of homogenous and definite categories. The male populations were classified as eligible to the military service (*mutluba muvafık*) and ineligible to the military service (*mutluba gayrı muvafık*). Nonetheless, as it is seen in the Muslim male population, there is not homogeneity with regard to classification of the Christian male population.

Parallel with the developments of census population, in the 1830s the Ottoman government founded the Office of Population Registers (*Ceride-i Nüfus Nezareti*) fund under the Ministry of Interior. In addition, by 1839, the census responsibilities were decentralized and different officials, who works in the field of population census were sent to the provinces. These officials are responsible for recording births and deaths in order to find out the total number of people in each region through the compilation of lists.

After the census population of 1831, next census was done in 1844 but the results of the census were not published by the Ottoman government. Another population census which can be regarded as the first genuine modern population census in terms of its methodology and data quality in the *Tanzimat* period is carried out in 1866 by governor Midhat Pasha in *Tuna* province *(Danube)* which was consisted of *Ruscuk, Vidin, Sofia, Tirnova and Varna*.[72] Main purpose of the census was conscription for military and tax collection.

Midhat Pasha thought that good governing was related to getting information from the population characteristics of the Empire. Therefore, this census included detailed information on the demographical characteristics of the Empire.[73] Nevertheless, according Behar, this effort was individually oriented.

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[71] Ibid., p.68.

[72] Ibid., p.69.

[73] Ibid., p.69.

After these censuses, significant developments in the Ottoman statistical system occurred. In 1867, the Council of State *(Şuray-i Devlet)* was founded. The Council brought new precautions for arranging a census and registration system. In 1874, the Ottoman Empire founded the General Population Directorate *(Tahrir-i Nüfus Umum Müdürlüğü)*. In 1881, administrative regulation on population *(Sicill-i Nüfus Nizamnamesi)* was published so that in order to establish population register, necessary steps were taken. On the basis of the *Sicil-i Nüfus Nizamnamesi*, two censuses were carried out in 1885 and 1907 in the Ottoman Empire. These censuses are comprehensive and detailed censuses and they are not military and tax oriented censuses rather they were overwhelmingly demography oriented censuses. These censuses are basic outcomes of the *Tanzimat* reforms and administrative restructuring.[74] Henceforth, on the basis of these two censuses, it is possible to calculate the rate of fertility, death or the total number of marriages. These censuses form the basis of modern Turkish population registers.[75]

3.2.2 The Spread of Enumeration in the Ottoman Empire

Introductory information concerning the rising significance of statistics like forming the General Population Directorate and administrative regulation on population was briefly covered above. In addition, it was also stated that as a part of the Ottoman reformation movement, many units and departments within the state apparatus established their own statistical office. Parallel with these reformation attempts and diversification of statistical data collected in Ottoman Empire, in this part of the thesis, it will very shortly be concentrated on distinctive kinds of statistical data like the agricultural, educational and industrial statistics which are compiled during the second half of the19th century.

In the second half of the 19th century, it was witnessed the spread of enumeration in the Ottoman Empire. Henceforth, in the Ottoman Empire, “spill over effect” on the

[74] Ibid., p.70.

[75] Shaw, J. Stanford (1978). “The Ottoman Census System and Population, 1831-1914”, *International Journal of Middle Eastern Studies,* 323-338.

statistics can be observed. It denotes that military and tax oriented data collection are replaced by more diversified and variegated statistics. This variegation is also related to undertaking of distinctive social services within the Empire such as education, health, communication, and transportation.

In the Ottoman Empire, compilation of agricultural statistics was begun in 1889. Since the Ottoman Empire had an extensive territory, the Ottoman bureaucrats preferred to benefit from local officials instead of sending officials from the central administration.[76] For that purpose, the Ottoman Empire formed temporary commission and the agricultural statistics were complied under the surveillance of agricultural inspectorates and these data were promulgated in 1893.[77]

Just after compilation of the agricultural statistics, the Ottoman administration started to collect industrial statistics in 1893. The Ottoman bureaucracy considered that industrial statistics would increase the efficiency of the Ottoman industry. Hence, comprehensive statistical data on industry was collected such as number of industrial establishments, qualifications of workers, the rate of export and import of industrial products, vehicles used for industrial production. During the *Meshrutiyet II*., industrial statistics were successfully collected. The industrial censuses were made by industrial inspectors and for the census, charts were sent to provinces. Since it was the first attempt to compile industrial statistics, at the beginning of the charts, there were definitions such as the concept of factory and counter. According to Zafer Toprak, these definitions and charts were protected and used in the compiling of the industrial statistics that were carried out in 1913 and 1915.[78]

After the census, it was found that the most important industrial establishments were in Istanbul and Izmir. Approximately 55 % of industrial establishments were in

[76] Toprak, Zafer (2000). "Osmanlı Devleti'nde Sayısallaşma yada Çağdaş İstatistiğin Doğuşu" *Osmanlı Devleti'nde Bilgi ve İstatistik- Data and Statistics in the Otoman Empire,* Halil Inalcik and Şevket Pamuk (edit) Ankara, State Institute of Statistics Prime Ministry Republic of Turkey,98.

[77] Ibid., p.98.

[78] Ibid.,p.99.

Istanbul.[79] Nonetheless, since factory owners were afraid of a new tax, they were tried to be convinced that it is not related to the implementation of a new tax. Henceforth, they were in hesitation to give correct numbers. Other shortcomings concerning the census stem from irregular registration in the industrial establishments and differentiations between the *Gregorian* and *Julian* calendar. Due to this differentiation, balance sheets were arranged in distinctive periods of time that brought significant difficulty for collecting industrial statistical data. Even though, these difficulties affected the accuracy of statistical data, this crucial attempt was able to depict the general picture of industrial establishments in the Ottoman Empire. Furthermore, these statistics were published under the name of *1329 and 1331 Years Industrial Statistics*.

In the Ottoman Empire, increasing diversification on statistical data in the 19th century can also be seen in the educational and foreign trade statistics. When it is compared to agricultural and industrial statistics, educational statistics are relatively easy to compile, since training inspectors had to notify the kinds and numbers of schools to the Ministry of Education. In the Empire, an unit for the educational statistics were established during the Abdülhamit II. In addition, modernization in education can be seen through following up numerical evolution of educational institutions.[80]

The Ottomans published foreign trade statistics starting from 1878. Before that period, there is no clue or information that foreign trade statistics were comprehensively and regularly collected.[81] The content and details of these statistics were developed year by year. For instance, in 1884, the book included foreign trade statistics were 32 pages, but in 1908 it was 200 pages and in 1913 it was 256 pages. In these books, the concept of general, transit and private trade were defined. The books also include the quantity of exports and imports in alphabetic order and lists of

[79] Ibid.,p.103.

[80] Ibid.,p.130.

[81] Ibid.,p.117.

goods. Furthermore, the value of export and import goods and total amount of customs duty were registered.

Former General Directorate of State Institute of Statistics Celal Aybar in the book named *Osmanlı İmparatorluğunun Ticaret Muvazenesi 1878-1913*, mentions three basic shortcomings concerning statistics on foreign trade. Since there was not made a distinction between private and general trade, there was accuracy problem with respect to foreign trade numbers. To illustrate, a transit trade between European countries and Iran can be registered as the Ottoman foreign trade due to unclear distinction between these two concepts. Consequently, it causes to raise the amount of exports and imports of the Ottoman Empire. The second shortcoming stems from the application of the Public Debtor *(Düyun-u Umumiye*). As the trades of tobacco, salt and wine were left to the administration of Public Debtor, these products were not registered in the foreign trade of the Ottomans. The third shortcoming was related to the difference between the prices used in foreign trade statistics and those products of real marketing prices. It denotes that the Ottoman Empire was inclined to raise the values of the export products while reducing the values of import products.[82]

During *Meshrutiyet* II, another significant attempt was related to compiling the pattern of household consumption expenditure. The basic purpose of this statistical data was to follow up the decreasing pattern of purchasing power of the Ottoman subjects due to wars.[83] Consequently, in İstanbul, in order to establish the cost of living index, retail prices were collected. This statistical data was also benefited from Turkey during early years of the Republic.

Starting from the last quarter of the 19th century the concept of statistics gained popularity in the Ottoman Empire. Thus, statistics were being widely used in the Ottoman literature and several authors wrote books on statistics in that period.

[82] Ibid.,p.121.

[83] Ibid., p.105.

Mehmed Ali Ayni wrote his book *Nazari and Ameli İstatistik* (Practical and Theoretical Statistics). Recai wrote 143 paged book named *İstatistik-i Umumi* (General Statistics) in 1876. Abdurrahman Şeref wrote a book intended for lesson book concerning statistics *İstatistik ve Coğrafya-i Umumi* (General Geography and Statistics). In the preamble of the book he defined statistics as the "science of state". In addition, Namık Zeki Aral's book *İhsaiyyat* (Statistics) was thought as a separate course in the *Mülkiye*.[84]

Member of Party of the Union and Progress *(İttihat ve Terakki Partisi)* Mehmed Cevdet Bey in this book *İhsaiyyat* criticized statistics in the period of Abdülhamit II. He argues that statistics collected and compiled in the period of Abdülhamit II aimed to imitate west and to manipulate the public opinion. Instead of manipulative statistics, he suggests that scientific statistics should be compiled and disseminated. He also argues that a separate organization should be established within the Empire.[85]

So far distinctive kinds of statistical data particularly during the second half of the 19th century are mentioned. Now, I will very concisely mention the first and the sole 1897 dated yearbook. One of the most significant outcomes of reformation movements of the Ottoman Empire in the nineteenth century is this yearbook. This statistical document is prepared by an expert committee. In the yearbook, there is different sorts of economic and social indicators and detailed data concerning the administrative structure, population, education, health, judiciary, transportation, finance, agriculture, mining, communication and forestry of the Empire. Consequently, this year book bears importance for establishing the bases of modern Turkish statistical mentality and application.

[84] Ibid.,p.112.

[85] Ibid., p.101.

3.3 Statistics in the Republic of Turkey

The Ottoman Empire left a rich legacy to the Republic of Turkey with respect to statistics. Henceforth, Turkish administrative elites knew the importance of timely, comparative, coherent, accurate and relevant statistical data for developing rational and informed politics. In Turkey, modern statistical service started with the foundation of "the Central Statistical Department" in 1926 after short period of time of the proclamation of Turkish Republic.

In the light of this information, it can be asserted that there is a dynamic and reciprocal relationship between establishments of modern statistical service in the Republic of Turkey and building of the nation state. As it was stated, statistics portrays and control both nationals and non-nationals within the territory of nation state. In this context, statistics has created a base for rational, informed and enlightened policies of the Republic of Turkey thereby it has ensured the authority and legitimacy of the government.

Although, statistics is crucial for providing legitimacy and authority of the nation states, it may also show the diversity within the nation state, which might against the fundamental principles of nation states. As it is known, Turkish nation state as other nation states grows out homogeneity, which are either old- rooted or constructed by the Kemalist state elites that adopted wide-ranging social, legal, and political reforms. On the other hand, statistics concentrates on masses and deviation in the masses. Although, statistics is inclined to indicate regularity in the social phenomena, it has also potential to reveal the diversity within the Turkish nation state, which is developed on the basis of the multi-cultural and ethnic Ottoman Empire. This point may create a tension between independent and powerful statistical department and policies of state elites. Consequently, modern Turkish state elites did not establish an independent statistical department.

As we will see in the following paragraph, the semi central statistical department was centralized in 1930 so that the department was exposed to more direct political

intervention. In other words, even though statistics seems to be objective and value-free discipline, it has included cultural representation and practices in Turkish case. In that sense, it is possible to talk about the role of culture of statistics in the nation building process.

The logical outcome of these developments in the early modern Turkey is to have statistical institutions, which are politically oriented so that statistical departments could not establish their independence from policies of state elites. Consequently, as opposed to independent statistical institutions, in Turkish case statistical institutions were under the service of political elites. To illustrate, starting from 1965 census, the question "what is your mother tongue" was left out because this question had the potential to reveal ethnic identity, which was perceived to be threatening to Turkish nationalism.

After giving brief information on the possible relationship between statistics and building of the Turkish nation state, I will concentrate on the developments in the Turkish statistical system. The Central Statistical Department founded in 1926 was responsible for compiling, evaluating and disseminating statistics used to examine and portray the changes and developments in the economic, social and cultural structure of the Turkish Republic. In addition, the department functioned as a partially-centralized system until 1930, as the date of change the name to "the General Directorate of Statistics (GDS)" and semi-centralized to a fully centralized one.[86]

In earlier years, statistical sources were relatively simple and data collection was confined to activities related to some of the relevant functions of the government like population censuses in every five years starting from 1927 population censuses, and

[86] Demir, Ömer and Toprak Ömer (2004). "Turkish Statistical System: Current Situation and New Challanges" http://209.85.135.104/search?q=cache:P76FZONxBDYJ:www.unescap.org/stat/sos1/sos1_turkey.pdf+%C3%B6mer+toprak+Turkish+Statistical+system:Current+situation+and+new+challanges&hl=tr&ct=clnk&cd=1&gl=tr [accesed on 10-07-2007]

economic and agricultural censuses in very ten years.[87] On the basis the rising needs for additional statistical information for well informed state politics, the activities of the GDS steadily widened.

Particularly with the adoption of development plans, which launched in 1963 and ended in 1967 in the economy, the Turkish Republic demanded more comprehensive and detailed data. Consequently, this development caused to change organization of the GDS and instead of the GDS, the State Institute of Statistics (SIS) was established. The idea behind this reorganization was to give the SIS had more responsibility, autonomy and authority. For this aim and intention, Law No. 53 was enacted in 1962 to establish the SIS under the Office of the Prime Minister. With the growth and rising complexity of the Turkish economy and the resulting social changes, there has been increasing interest in statistics as a means of monitoring many aspects of the country's development, including the functioning of government at all levels[88]. Henceforth, the SIS and its mission was regulated by the legal decree in 1984, 1989 and 1990 in order to reach well- functioning statistical office on the basis of newly emerging needs of the Republic of Turkey.

Although 1984, 1989 and 1990 legal decrees were aimed at well functioning of the SIS, these decrees far from creating autonomous statistical office. In addition, in the Turkish Statistical System, the position of the SIS was relatively weak and this weakness mainly stemmed from legal infrastructure, which does not meet requirements of the EUROSTAT.

Another important point concerning the SIS and Turkish Statistical System is insufficiency in the coordination in the public institutions, which are the main providers of statistical data and information. Thus, similar or the same statistical data were collected and compiled by different statistical institutions on the basis of the distinctive classifications, definitions and methodologies. These developments

[87] Ibid.

[88] Ibid.

caused statistical pollution. In that manner, most of the Turkish statistical data were internationally incomparable and reliable.

In order to solve these problems and meet international and national requirements, in 2005, the Turkish Law on Statistics numbered 5429 was adopted. Through the law, the SIS under the name of Turkish Statistical Institute (TURKSTAT) reorganized. The coordination role of the TURKSTAT within the Law on Turkish Statistics strengthened and scientific and technical autonomy of the TURKSTAT were provided. In addition, a revision in the classification system and improvement of the principles of statistical confidentially is provided. In that manner, the Turkish Statistical Law numbered 5429 is a turning point in the history of Turkish Statistical System. The law numbered 5429 will be covered more comprehensively under the title of the reformation and transformation in the Turkish health statistics.

3.3.1. Reform of Statistics as Part of the EU Accession

So far, I have given rather theoretical information about the social history of statistics, statistics in the Ottoman Empire and the Republic of Turkey, now I will focus on more practical issues. Therefore, I will mention the reformation and transformation in the health statistics. Before going into the details of these changes, it would be beneficial to analyse the problems of health statistics, which is one of the best indicators for revealing basic problems of the Turkish Statistical System.

3.3.2 Problems of Health Statistics in Turkey

Data used in health information is compiled through the administrative registration, questionnaire and research. While collecting data, the usage of questionnaire and research are very restricted so that most of data are obtained from administrative registrations. On the basis of the report of the TURKSTAT then named State Institute of Statistics current situation of the statistics can meet neither the national

needs nor international requirements.[89] Before elaborating and immersing general problems of statistics of Ministry of Health, firstly, I will give the whole statistical picture of Ministry of Health that is provided by the administrative registration. In that field, on the basis of administrative registration, statistical data of the Ministry of Health can be classified as follows:

- Morbidity Statistics
- Mortality Statistics
- Hospital Statistics (number of beds, number of operating room
- Health Personnel Statistics (age, sex and expertise field)
- Equipment Statistics
- Nursery- The Long Termed Health Care Statistics
- Inpatient Statistics (age, sex, permanent residence etc)
- Policlinics Statistics
- National Health Expenditure Statistics (budget and revenue)
- Daily Case Statistics

In Turkey, many and distinctive institutions and establishments work in the health sector so that the coverage of health field is extensive. In addition to institutional diversification in the health sector, in Turkey, there are insufficiencies in the field of legislative arrangements, which cause to compile the health statistics in an inaccurate, non- standardized and inefficient way.[90] In the Turkish health statistical system, the problems encountered in health statistics can be formulated as follows:

- lack of coverage,
- poor quality, lack of confidence and data inconsistency of statistical information,
- insufficiency of the definitions- classifications and incomparability in international level,

[89] State Institute of Statistics, "Health Statistics of Turkey: Current Situation, Problems and Solution Suggestions" 27.12.2004.

[90] Ibid.,p:2

- compilation of statistical data that serves the same purpose which is collected by different units of Ministry of Health and other public institutions,
- information saved on the basis of archives,
- insufficient coordination within the units of Ministry and different ministries, units, and institutions,
- Insufficiency of education in statistical meaning[91]

In Turkey, some information such as morbidity and mortality statistics cannot be collected at the nationwide. Therefore, policy makers in the health sector cannot accurately get sufficient information, which covers Turkey. This situation causes problems to develop efficient health policies.

In many city and county centres, there is insufficient number of personnel in the field of statistics.[92] Many statistical data comes to the TURKSTAT with lacking information. Sometimes forms used to collect statistical data filled inaccurately by unauthorized persons. Furthermore, different institutions and/or different units within the same institutions may collect the same statistical information through distinctive methods and classifications. Therefore, these factors contribute to provide inconsistent, poor quality and unreliable statistical data to the Turkish Statistical System.

The definitions and concepts that are used by public institutions are not uniform. Moreover, there is a lack of internationally comparable definitions and classifications so that there is not a standardized and acceptable criterion for the collecting reliable statistical data. Parallel with the disparity in the classifications and definitions, there is no data standardization. To illustrate, within the MoH, there are different numbers for the same factual data. The number of general practitioner is different for General Directorate of Primary Health Care and General Directorate of Health Training due

[91] Ibid.,p:2

[92] Ibid:p:3

to distinctiveness in the definition of general practitioner. Therefore, statistical data collected meet neither national needs nor international requirements.

Since the statistical data, which serves the same purpose, collected by distinctive public institutions or different units within the Ministry, there are various kinds of forms. This situation causes to data pollution, waste of time due to slow data flow. Therefore, more time is spent for evaluating statistical data.

In the registration system of units and departments of MoH, information based on archive is not turned into statistical data, so that information based on archive does not meet national requirements on health statistics.

Several institutions involve in the collecting and compiling health statistics and there is no legal arrangement for determining the missions of these actors. In the MoH, many departments have statistical units but there is no focal point for the statistical information. Henceforth, there is problem with regard to flow of the health data.

Except for big city centres, there are insufficient numbers of trained personnel in the field of statistics. In addition, personnel in the MoH do not generally give importance to the statistical data and their value in the developing health policy, which is key importance for future health planning.

3.3.3. Legal Basis of Statistics in the European Union

After articulating the fundamental problems of health statistics, I will pay attention the reformation movements in the Turkish Statistical System (TSS). Since the Helsinki Summit (1999), which declared Turkey as a candidate country, the Turkish Statistical Office (TURKSTAT) was included in EUROSTAT's pre-accession programmes. The Accession Partnership concerning Turkey was adopted in March 2001. Statistics (Chapter 12) is covered in that document. The National Plan for Adoption of the Acquits (NPAA) has been prepared by the government and presented to the European Commission. The TURKSTAT is committed to make all

efforts to harmonize the TSS with that of the EU, which is among the short-term priorities of the NPAA.[93] Therefore, since reformations in the TSS are linked to the EU process, it is important to mention legal basis of statistics in the EU.

The turning point for statistics in the EU is adoption of three major acts, which are the legal bases of Community statistics in the first time. These acts are crucial not only for guaranteeing the independence of the EUROSTAT but also for providing separation between political administration and Community statistics. Furthermore, these acts stress reliability, objectivity, cost-effectiveness and subsidiarity, which strengthen the partnership between the EUROSTAT and the statistical authorities of Member States.[94] The first major act regarding statistics in the EU is adoption of the Regulation on statistics known as the Statistics Law in February 1997 by the Council of the European Union. This Regulation defines the division of responsibility between national and Community statistical authorities. It also defines the basic conditions, procedures and general provisions governing official statistics at the EU level. Secondly, a Commission Decision in 1997 clarified the role of the Community Statistical Authority - EUROSTAT - defined in the Council Regulation. Thirdly, it reaffirmed the need for those involved in Community statistics to follow fundamental principles in ensuring that statistics are scientifically independent, transparent, impartial, reliable, pertinent and cost-effective.

Another step for statistics is the "Subsidiary Principle", which was adopted in Maastricht Treaty. In parallel with the principle, data collection and classification in accordance with the standards determined by the EUROSTAT is under the responsibility of Member States. However, the EUROSTAT itself controls the data forwarded and processes and presents them. The most fundamental provisions concerning statistics in the European Union is in the Amsterdam Treaty. According to Amsterdam Treaty Article 285, it is declared:

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[93] Standard Summary Project Fiche, Project number: TR 05 03.16 "Upgrading of Turkish Statistical System".

[94] EUROSTAT (2007). "Your Key to European Statistics" http://epp.eurostat.cec.eu.int/portal/page?_pageid=1153,47169267,1153_47183201&_dad=portal&_schema=PORTAL [accessed on 12-08-2007]

1. … the Council, … shall adopt measures for the production of statistics where necessary for the performance of the activities of the Community.

2. The production of Community Statistics shall conform to impartiality, reliability, objectivity, scientific independence, cost-effectiveness and statistical confidentiality; it shall not entail excessive burdens on economic operators.

Article 285 was a key step for the EU statistics. The article states that more and more statistics have to be collected at the Community level because of the development of the Union and it is no longer possible to ensure the availability of EU statistics on the basis of agreements alone. In addition, all these developments are crucial steps for ensuring the autonomy of EUROSTAT and bringing a legal basis for statistics at the EU level.

Regarding composition and bases of statistics, it should also be stated that in the EU the *acquis* in statistics composes of the exclusive legislation, which is directly applicable in the Member States such as the European Parliament and Council Regulation. These do not require any transposition in national legislation; the statistical *acquis* includes a wide range of methodological handbooks and manuals in the various statistical domains such as agriculture, economic and monetary policy, demographic and social statistics. International agreements also obtain a further base for the statistical production.[95]

3.3.4. Reformation and Transformation of the Health Statistics

After briefly explaining the general framework of the EU legislation concerning statistics, now development of statistics in Turkey and particularly reformation and transformation attempts concerning the causes of death statistics will be covered.

Parallel with the objective of NPAA, Turkey has taken momentous steps in order to approximate and harmonize its statistical system with the EU standards. At this point, it should be articulated that MoH does not have any direct responsibility for

[95] Screening Report Turkey, Chapter 18- Statistics

harmonizing the acquis in statistics. In addition, concerning statistics, screening process was held on 17 and 18 July 2006 in Brussels. Turkey expressed that it can accept *acquis* concerning statistics. Thus, Turkey does not predict difficulties to implement the statistical acquis on accession. In that sense, Turkey does not request any derogation or transitional period for the implementation. In the view of the above, Turkey proposes that the negotiations in statistics can be started without encountering any difficulty[96].

3.3.4.1 The Law on Turkish Statistics (No. 5429)

In the light of the views of above, in Turkey, the most significant development for the preparation for a fundamental reform of statistics is the adoption of the Law on Turkish Statistics (No.5429) as the basic legal code, which covers and regulates the whole statistical system of Turkey. This new statistical law is one of the most promising attempts for the reconstructing Turkish Statistical System in line with the EU. In that sense, the general objectives of the Law (No.5429) are to make an active collaboration and cooperation among distinctive institutions and to bring all official statistics under one umbrella and to form the basic framework related to production of the official statistics to be needed at the national and international level.

The new law takes the statistical production issue from a system approach.[97] It forms a decentralized system under the fully control and surveillance of the TURKSTAT[98]. Consequently, the law brings a new system in the sphere of statistics. Through the law, the establishment, function and authority of the TURKSTAT were arranged to deal with new challenges. It means that instead of the SIS, the TURKSTAT has founded and the autonomy of the new institution has acquired. The Law on Turkish Statistics (article 4) has provisions in order to ensure professional independence,

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[96] Ibid.

[97] Demir, Ömer and Toprak Ömer (2004). "Turkish Statistical System: Current Situation and New Challanges" http://209.85.135.104/search?q=cache:P76FZONxBDYJ:www.unescap.org/stat/sos1/sos1_turkey.pdf+%C3%B6mer+toprak+Turkish+Statistical+system:Current+situation+and+new+challanges&hl=tr&ct=clnk&cd=1&gl=tr [accessed on 10-07-2007]

[98] Ibid.

equal and easy access to statistical data, reliability, consistency, impartiality, confidentiality, timeliness, and transparency.

The Law No. 5429 also elaborates basic statistical concepts, definitions and standards used in the international platform. To reach such principles, on the basis of needed national statistical data, the Law on Turkish Statistics determines basic standards and strands concerning production, organization, evaluation and promulgation of official statistical data. The Law (No 5429) also defines undoubtedly the role of the TURKSTAT, which has a monopoly power to coordinate and produce official statistics among all the institutions, which provides statistical data. The TURKSTAT also collects statistical information from the statistical units, standardize national registration system, and decide on national statistical classification systems.

It should be also added that apart from the TURKSTAT, there are a number of governmental organizations, which provide either raw or processed data for the Statistical System of Turkey. In accordance with the Law No. 5429, the TURKSTAT aimed to integrate these providers in the statistical system of Turkey in order to reach the EU statistical standards.

On the basis of the Law (article 3), through five (5) year Official Statistics Program, the Turkish Statistical System is organized, coordinated and monitored. The Official Statistics Program is a new system based on Programmed statistics in the production of statistical data. In order to ensure scientific and technical autonomy of the Official Statistical Program, Article 17 stipulates that in the application of the Program, concerning statistical method, data resources, selection of the processes, timing of distribution and ensuring of confidentiality, no instruction can be given to implementing institution and personnel.

The Official Statistical Program addresses the following questions: Which statistical data will be collected? Which institution will collect that data? What sort of classification will be employed? Frequency of the publication of the data and geographical coverage of statistical data are the basic questions that are addressed by

the Official Statistical Program. In addition, the Law (No:5429) article 6 stipulates that in case of publication and announcement of the statistical researches, natural persons and private law legal entities, who are out of scope of the Program, should explain the coverage, method of sampling, volume of sample, method of compilation and application time of the research.

The first Official Program (2007-11) was adopted by the Decision of Council of Ministers numbered 2006/11446. This Program includes official statistical tasks of all institutions, division of labour among actors, time specifications, classifications used in the production of official statistics, and underlying standards on dissemination of the statistical data. The TURKSTAT monitors and controls the Official Statistics Program through annual reports and performance programs. Furthermore, two significant legal entities, the Data Quality Control Board and the Data Dissemination Board were established. Main function of the Data Quality Control Board (Article 41) is to control and supervise the statistical system particularly Official Statistics Programs with respect to scientific and international standards. The Data Dissemination Board (Article 42) concentrates on determining the fundamental principles, policies and standards regarding publication and dissemination of statistical data included in the Official Statistical Program.

The Law No. 5429 created the Statistics Council, which performs an advisory function for preparation, implementation and development of the Official Statistics Program through bringing all the relevant key persons in the public sector and relevant non governmental organizations, which study on statistics. The Council also gives advises on the problems, which are encountered in the field of statistics. The Council is consisted of the President and Vice Presidents of the TURKSTAT, Undersecretaries of the Ministries, the Undersecretary of State Planning Organization, the Undersecretary of Turkish Treasury, the Undersecretary of Customs, the Undersecretary of Maritime, the President of State Personnel, the President of the Central Bank of the Republic of Turkey, the representative of Council of Higher Education of the Republic of Turkey, the President of the Union of Chambers of Commodity Exchanges of Turkey, two representatives of non governmental organization of which employ most member of university in the field

of statistics. If the members of Council can not participate the meeting, instead of the members, authorized representatives can be charged with that of duty. (The first meeting of the Statistics Council was held on 29 November 2006)

3.3.4.2 A Specific Program: "Upgrading the Statistical System in Turkey"

After focusing on the very general problems of the health statistics and the general framework of reformation attempts on the basic of Law on Turkish Statistics No:5429, now I will mention a specific program called "Upgrading the Statistical System in Turkey" (USST) which has aimed to help Turkey in the implementation of its pre-accession strategy in the field of statistics. The Program has also intended to support the Turkish government to substantially approximate the statistical standards of the EU and to make available to the public and private institutions, to researchers and to the EU and international organizations timely and reliable statistical information.[99]

This project is focused on a limited group of providers of the statistical data: Ministry of Agriculture and Rural Affairs, Ministry of Finance, Ministry of Industry and Commerce, Ministry of Labour and Social Security and Ministry of Health.

Under them resides the main provider of the present health statistic, MoH. With the project 2005/101022 "Assessment of 5 (Five) Main Data Providers of the Turkish Statistical System", which was conducted two years ago, the data situation in the MoH had been assessed, the present and future distribution to the TSS had been clarified and the needs in the harmonization process with regard to the EU standards had been determined. On the basis of the results of this project three topics were selected, which are especially important for the statistical development and improvement: Hospital Statistic, Causes of Death Statistics and System of Health Accounts. The specific objective of the project as follows:

- analyse in depth the current situation of the provider to the TSS
- determine the problems and deficiencies in the current system

[99] Standard Summary Project Fiche, Project number: TR 05 03.16 "Upgrading of Turkish Statistical System".

- analyse and evaluate methodologies used to elaborate health statistics
- set priorities in producing hospital statistics, causes of death statistics and system of health accounts for provider, considering the harmonization process of the TURKSTAT with EU statistical norms
- determine the coordination role of the TURKSTAT and the task distribution between the provider and the Turkish Statistical Institute
- outline the methodological and processing changes in order to harmonize the respective statistics
- receive information on planned re-organisations of the provider in the area of hospital statistic, causes of death statistics and system of health accounts,
- draft an outline of the steps/phases necessary to reach EU statistical standards on the provider side
- outline the software, training and technical assistance requirements and provide training, to support the harmonization process
- participate in round table discussion to evaluate the findings with the concerned parties.[100]

This project is developed on the basis of needs of the Turkish Statistical System. From the point of view of MoH, this project aimed to evaluate the existing data situation of the Ministry and clearly determine the role and contribution of the Ministry in line with the EU requirements and standards through addressing classifications and methodologies used to produce health statistics. This program runs since the end of 2002 and foresees the provision of technical assistance equipment, training and data collection. The implementation of this programme for adoption of the *acquis communautaire* in statistics has been structured as three multi-annual Phases. Phase I started from the end of 2002 and runs with one year prolonged until 31.12.2006. Phase II will start with the beginning of 2007 until

[100] "Hoffmann Ulrich, "Improvement of the Hospital Statistics", Final Report, Project: FWS Request 2006/116623.

31.12.2008 and Phase III will probably start from 2009 onwards. Nonetheless, in the practice, the Phase of the Program is completed at the end of 2006.

Under the guidance of the Project, significant developments have been achieved in the selected sectors such as social demographic statistics, business statistics, tourism statistics, agricultural statistics and environmental statistics capacity including health statistics. In line with the EU standards, the quality, coverage and administration of the Statistical System have improved through the revision of Classification System and Classification Server, development of Multi Domain Statistical System and Statistical Analysis and increasing the information and communication technology capacity.

In case of health statistics, the project has upgraded the health statistics by improving the administrative system of health statistics, improving the knowledge and technical capacity of staff of MoH. Under the guidance and coordination of the SIS, a Committee composing of relevant public institutions and universities were set up in order to examine notification forms that are used by MoH. The EU Experts have trained this Committee concerning methodology to reach standardized notification forms. MoH close collaboration with the TURKSTAT has applied a pilot study in order to test new statistical forms and the data collection system.

CHAPTER IV
CASE STUDY

4.1. Reform of the Causes of Death Statistics

The COD statistics are collected and compiled by the health institutions in order to plan health services and combat morbidity and mortality leading to death. Mortality statistics are based on death certificates which are completed by the attending physicians and surgeons on the basis of converging clinical evidence.[101]

The COD statistics is widely used in international comparisons among different geographical regions. In the analyses of causes of death, two sets of statistics often used that of "underlying cause of death" and "multiple causes of death".[102] The underlying cause of death statistics are mainly summary statistics, in which, all the causes of death are reduced to one cause of death, "the one that started the chain of events leading to the death". In addition, the quality and accuracy of COD rests mainly on the underlying causes of death. Multiple causes of death statistics concentrates on not only the underlying cause of death but also other contributing factors that plays important role in the death.

Even though, the COD statistics is crucial input for developing health policy and epidemiological studies, in Turkey, the COD statistics is not reliable. This unreliability has multi- dimensional effects on not only at the national level but also international level. For instance, due to this unreliability, there are problems that are related to taking measures preventive and curative health services, steering epidemiological and demographical studies. Furthermore, the COD statistics is also important at the international level because due to this unreliability, there are

[101] Modelmog Dieter, Rahlenbeck Sibylle and Trichopoulos Dimitrios (1992). "Accuracy of Death Certificates: Population Based, Complete- Coverage One-Year Autopsy Study in East Germany" *Cancer Causes & Control*, Vol. 3, No. 6 (Nov., 1992), pp. 541-546.
[102] Bah, Sulaiman, (2003). "Multiple Causes of Death Statistics in South Africa: Their Utility and Changing Profile over the period 1997 to 2001" www.ssc.uwo.ca/sociology/popstudies/dp/dp03-02.pdf [accessed on 29-08-2007]

problems to compare health characteristics of Turkey with that of other European countries.

In Turkey, there are fundamentally two problems concerning COD. The first problem is related to lack of coverage of death statistics. Mortality statistics only covered city and town centres (on the basis EUROSTAT experts, it is estimated even 40% of mortality statistics of town centres is missing) but these statistics are not compiled from districts and villages. In other words, Turkey has been collecting the COD statistics at NUTS-3 level[103], that covers only city and town centres so that there is incomplete and discontinuous data on the COD. The second problem is more sophisticated. In Turkey, the COD statistics is poor quality. Many factors contribute to the low level quality of the COD. In municipal areas, cemetery officials are responsible of the burial records but in villages this duty is under the responsibility of *muhtar* (village headman). In the "National Maternal Mortality Study"[104], it was observed that there are negative approaches towards maintaining of burial records particularly among *muhtars,* who are the key personnel in Turkish death registration system.[105] Furthermore, they are also generally the lack of pre-service training, low level of education and lack of regular application of burial permits and registration system of cemeteries.[106] Henceforth, they are indifferent to the COD registration. They either do not notify many deaths in the villages or inaccurately fill out the COD forms.

Another major problem is related to the underlying causes of death. In Turkey, instead of writing the underlying cause of death, physicians generally writes the last condition or situation leading to death like cardio vascular arrest and respiratory failure, which are not considered as the underlying causes of death according to the

[103] NUTS (Nomenclature Territorial Units for Statistics) is a statistical region cataloguing that is used by member countries of EU so that in line with EU reformation, TURKSTAT developed the three levels of NUTS region classification on the basis of decree numbered 2002/4720.

[104] The Turkey National Maternal is a study of MoH. This study is conducted under the "Reproductive Health Program" from October 2004 to December 2006. In this study, qualitative research techniques are used so that in-depth interviews and focus group discussions are widely utilized.

[105]Reproductive Health Programme (2005). Turkey, "National Maternal Mortality Study", Main Report p:89.

[106] İbid: p:90.

World Health Organization (WHO) and EUROSTAT manual. In addition, the cause of death statistics are compiled according to the Eight Revision of International Classification of Diseases (ICD 8)[107] currently, but it required to compile the COD statistics according to the ICD 10 that is currently used in the European Countries.

Considering these fundamental problems related to the COD statistics, Turkey started to modernize its COD system in 2005 under the above-mentioned specific programme "Upgrading the Statistical System in Turkey". Under this programme, Turkey launched pilot studies on the COD including verbal autopsy.[108] Thus, Turkey has been reviewing the notification, certification and analysis of the COD statistics in line with the WHO and EUROSTAT requirements. Furthermore, in the Screening Report of Statistics (Chapter 18), it is stated that Turkey will use ICD 10 in 2009.

4.2 History of the Causes of Death Statistics

After giving introductory information concerning the basic problems encountered in the COD system and reformation attempts to renovate the COD system, I will concentrate on the history of the causes of death statistics. If the role of the systematic model in chemistry was centred on the problem of nomenclature, its influence in medicine was most clearly perceptible in questions of definition, description and classification of diseases and death.[109] In line with the statement, early studies regarding classification of diseases and deaths can trace back its origin to the writings of John Graunt (1620-1674), who is the one of the first demographers.

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[107] ICD is defined by WHO as follows: "ICD is the international standard diagnostic classification for all general epidemiological and many health management purposes. These include the analysis of the general health situation of population groups and monitoring of the incidence and prevalence of circumstances of the individuals affected." (http://www.who.int/classifications/icd/en/ (accessed on 10-10-2007)

[108] Verbal Autopsy concentrates on interviewing with families or community members, where medical certification of causes of death is not available. This is generally used in rural areas.
For more information: http://www.who.int/reproductive-health/publications/maternal_mortality_2005/mme_2005.pdf (accessed on 19-08-2007)

[109] Lesch, E.John (1990). "Systematics and the Geometrical Spirit" Frangsmyr, Tore, J. L. Heilbron, and Robin E. Rider editors. *The Quantifying Spirit in the Eighteenth Century.* Berkeley: University of California Press.

His book *Natural and Political Observations Made upon the Bills of Mortality* (1662) is an attempt to form a system to fight against the spread of plague in London through using mortality rolls of London. His book is about health statistics which grows out of practical reasons of that time. He also tried to estimate the proportion of live born children who died before reaching the age of six years and classify all deaths. Nevertheless, his works are generally faced with suspicion due to difficulty for classifying and compilation of statistics of diseases and causes of death. To illustrate, Major Greenwood as an eminent epidemiologist and statistician says: "The scientific purist, who will wait for medical statistics until they are nosologically exact, is no wiser then Horace's rustic waiting for the river to flow away".[110]

Another important early figure within the classification of the diseases is an English physician Thomas Sydenham. In the late 17th century, he supported "a natural description of all diseases". He claims that like species of plants, there were species of diseases. He denotes that diseases are distinct entities so that they should be classified systematically and separately. Therefore, he differentiates smallpox, cholera, plague and other diseases.

After Graunt and Sydenham, according to Sir George Knibbs treatise, François Bossier de Lacroix (1706-1777) known as Sauvages attempts to classify diseases. His book *Nosologia Methodica* was published in 1763. Another important figure in the classification of diseases is William Cullen (1710-1790), who tried to simplify the system of classification of diseases for general use in his book *Synopsis Nosologiae Methodicae*. William Farr (1807-1883), who founded the General Register Office of England and Wales, tried to obtain international standardization in the statistical classification of diseases. In the first Annual report of the Register he stressed importance of standard international classification of diseases:

> The advantages of a uniform statistical nomenclature, however imperfect, are so obvious, that is surprising no attention has been paid to its enforcement in Bill of Mortality. Each disease has, in many instances, been

[110] Greenwood M. (1948) *Medical Statistics from Graunt to Farr* Cambridge, Cambridge University Press.

> denoted by three or four terms, and each term has been applied to as many different diseases: vague, inconvenient names have been employed, or complications have been registered instead of primary diseases. The nomenclature is of much importance in this department of inquiry as weights and measures in the physical sciences, and should be settled without delay. [111]

The usefulness of a standard classification of the causes of death was strongly accepted at the first International Statistical Congress, held in Brussels in 1853 that the Congress requested William Farr and Marc d'Espine, of Geneva, to prepare an internationally applicable, uniform classification of the causes of death.[112] At the next Congress, in Paris in 1855, Farr and d'Espine brought two distinctive lists. Farr's classification was rested upon five categories: epidemic diseases, general diseases, local diseases, developmental diseases and diseases that are result of violence. In contrast, d'Espine classified diseases on the basis of their nature. (gouty, herpetic, haematic etc)[113] The Congress accepted a composition of the two lists. In 1864, this classification was rearranged in line with Farr's categorization and formed the basic principles of the International List of Causes of Death.

Jacques Bertillon (1851-1922) Chief of Statistical Services of City of Paris, worked on a list for the causes of death. His classification rested upon the distinction between general diseases and local diseases. His classification was accepted by several countries. Furthermore, in 1898, through suggesting the adoption of classification of Bertillon, the American Public Health Association stated that classification should be adjusted every ten years.[114] After this development, the International Statistical Institute accepted the following statement:

> The International Statistical Institute convinced of the necessity of using in the different countries comparable nomenclatures. …Insists vigorously that this system of nomenclature be adopted in principle and without revision,

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[111] First Annual Report .(1839)London, Register General of England and Wales:99

[112] History of the Development of the ICD
http://www.who.int/classifications/icd/en/HistoryOfICD.pdf [accessed on 01-09-2007]

[113] Ibid.

[114] Ibid.

> by all the statistical institutions of Europe; Approves at least in its lines, the system of decennial revision proposed by the American Public Health Association at its Ottawa session (1898): Urges the statistical offices who have yet adhered, to do so without delay, and to contribute to the comparability of the cause of death[115].

In the light of the statement, the first International Conference for the revision International Causes of Death met in 1900. In the conference, it was proclaimed that decennial revisions are necessary. In these classifications, Bertillon was active and revisions for the list were made in 1900, 1910 and 1920. After Bertillon's death, the Health Organization of the League of Nations took initiative in the causes of death statistics and appointed a Commission of Statistical Experts in order to work on the classification of the causes of death. With the help of International Statistical Institute, Health Organization of the League of Nations drafted the proposals for the Fourth (1929) and the Fifth (1938) revisions of the International List of Causes of Death.[116] In 1948, the Sixth Decennial revision for the causes of death statistics was supported by the First World Health Assembly, which suggested inclusive programme of international cooperation in mortality statistics.

So far, I concentrated on the classification of diseases related to death. However, Farr argued that this classification should be done for diseases that are not fatal. Consequently, the International Conference for the Seventh Revision of the International Classification of Diseases was organized in Paris under the leadership of the WHO in 1955. On the basis of suggestions of the WHO Expert Committee on Health Statistics, the revision was constrained to necessary changes of errors and inconsistencies.[117] Under the leadership of WHO, the Eight Revision of the International Classification of Diseases met in Geneva in 1965. The revision was

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[115] *Bulletin of the Institute of International Statistics,(* 1900)12,280.

[116] "History of the Development of ICD" http://www.who.int/classifications/icd/en/HistoryOfICD.pdf [accessed on 12-06-2007]

[117] Third Report of the Expert Committee on Health Statistics. Geneva, World Health Organization, 1952 (WHO Technical Report Series, No.53).

more radical that of the Seventh, however it protected basic structure and mentality of classification of diseases.[118]

In 1975, The International Conference for the Ninth Revision of the International Classification of Diseases, convened by the WHO, met in Geneva.[119] In the Ninth Revision, basic structure of ICD 8 protected and but it detailed. Work for preparation of the ICD 10 took up in 1983. The WHO thought that there is a necessity to reconsidered ICD that should be relatively stable during the series of years. Consequently, meetings were arranged in 1984 and 1987. In 1989, the Tenth Revision was completed.

4.3 The History of the Causes of Death Statistics in Turkey

The COD statistics is one of the most important inputs for developing suitable health policies in the future. Therefore, data on death occurring in province and most of the district centres were collected and compiled in Turkey. Statistical data on the death have been collected and compiled by the SIS from 1931 to 1949 for the most populous 25 provincial centres, for all provincial and district centres since 1957, using the international classification of diseases.[120] Moreover, these data have been compiled and publicized by the SIS and TURKSTAT.

In order to obtain the COD statistics, death statistics form is filled out for each death in the provincial and district centres by the municipality officers responsible issuing burial permits. Data are compiled on deaths from these forms sent to the SIS by health directorates in the province and by health centres in the districts.[121] In

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[118] "History of the Development of ICD"
http://www.who.int/classifications/icd/en/HistoryOfICD.pdf 12-06-2007

[119] Manual of the International Statistical Classification of Diseases (1977). Injuries, and Causes of Death, Volume 1. Geneva, World Health Organization.

[120] State Institute of Statistics (2000). *Death Statistics From Provincial and District Centers,* State Institute of Statistics Prime Ministry Republic of Turkey.

[121] Ibid.,p.1.

addition, collecting statistical data on deaths at the sub-districts and village level took up in 1982; they are still incomplete so that they are published. However, the mortality statistics as of 1986 only covered city and town centres and that because the statistics compiled from districts and villages in 1982 were not reliable, collecting data from these places were terminated.[122] Death statistics collected from provincial and district centres are classified in compliance with the International Disease Categories (ICD-8) containing 50 and 150 diseases as required by the World Health Organization. Under a specific programme called "Upgrading the Statistical System in Turkey", there has been reformation in the COD, which will be mentioned latter in depth.

4.4 The Current Death Certificate System in Turkey

Before focusing on the COD statistics previous to EU reforms, it is necessary to mention importance and legal basis of burial licence, which gave way to understand the situation of the COD statistics.

4.4.1 Importance of Mortality Data

In order to evaluate, health level of certain region or country, there are some health criteria. Through these health criteria, it is possible make comparisons not only at the regional and national level but also at the international level. Among these health criteria, one of the most significant indicators of health status of the certain population is the causes of death statistics such as the infant mortality rate and maternal mortality which is widely used multidimensional development indicator. In addition to development indicators, the causes of death statistics are the most important data for planning and rearranging health policies.[123] If the cause of death

[122] Reproductive Health Programme in Turkey, National Maternal Mortality Study (2005) Main Report p.102.

[123] Sümbüloğlu, Kadir, Sümbüloğlu, Vildan and Gören Ali, "Ölüm Raporu Yazım Kılavuzu" (Guidance for Writing of Death Report) (1995). Ankara, Health Information System Training Series Ministry of Health.

statistics is known well then planning and implementation of health policies can be more efficient.

The Medical Certificate of Cause of Death is the source of mortality statistics that set up the basis of the oldest and most extensive public health surveillance systems.[124] In the mortality data, there are two fundamental information:

1. Socio-economic-cultural characteristics of deceased person such as age, sex, educational level, occupation and residence of the dead person. By the help of these information, information collected concerning personnel features of the deceased person.
2. The causes of death of the deceased person. Through this data, the disease, condition or situation leading to death, is analysed. Particularly to combat the causes of mortality and morbidity, these statistics are inclusively used.

In the light of the two data, death certificates provide information on the characteristics of the people who die and the important information on the causes of death. As it was stated, the causes of death are the most significant statistical research item on the death certificate because they provide the basis for describing trends in human health and mortality and for analysing the conditions leading to death. Mortality statistics provide a basis for the epidemiological studies that focus on the leading causes of death by age, sex or other demographic variables. They also provide a basis for research in disease etymology and the evaluation of diagnostic techniques, which in turn lead to improvements in patient care.[125] To illustrate, if the causes of death stems from cancer increases in an certain city or region, then through knowing these causes accurately, governments can take measurements to cope with this situation like opening new cancer hospitals and assigning more expert practitioners or funding cancer research more. Hence, the causes of death statistics are the major input for improving health services.

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[124] Project "Preparation of an EU Traning Package on Certification of Causes of Death", EUROSTAT- ISAT Contract N 20023510007, Manual on the Certification of Causes of Death in Europe,9.

[125] Ibid.,p.9.

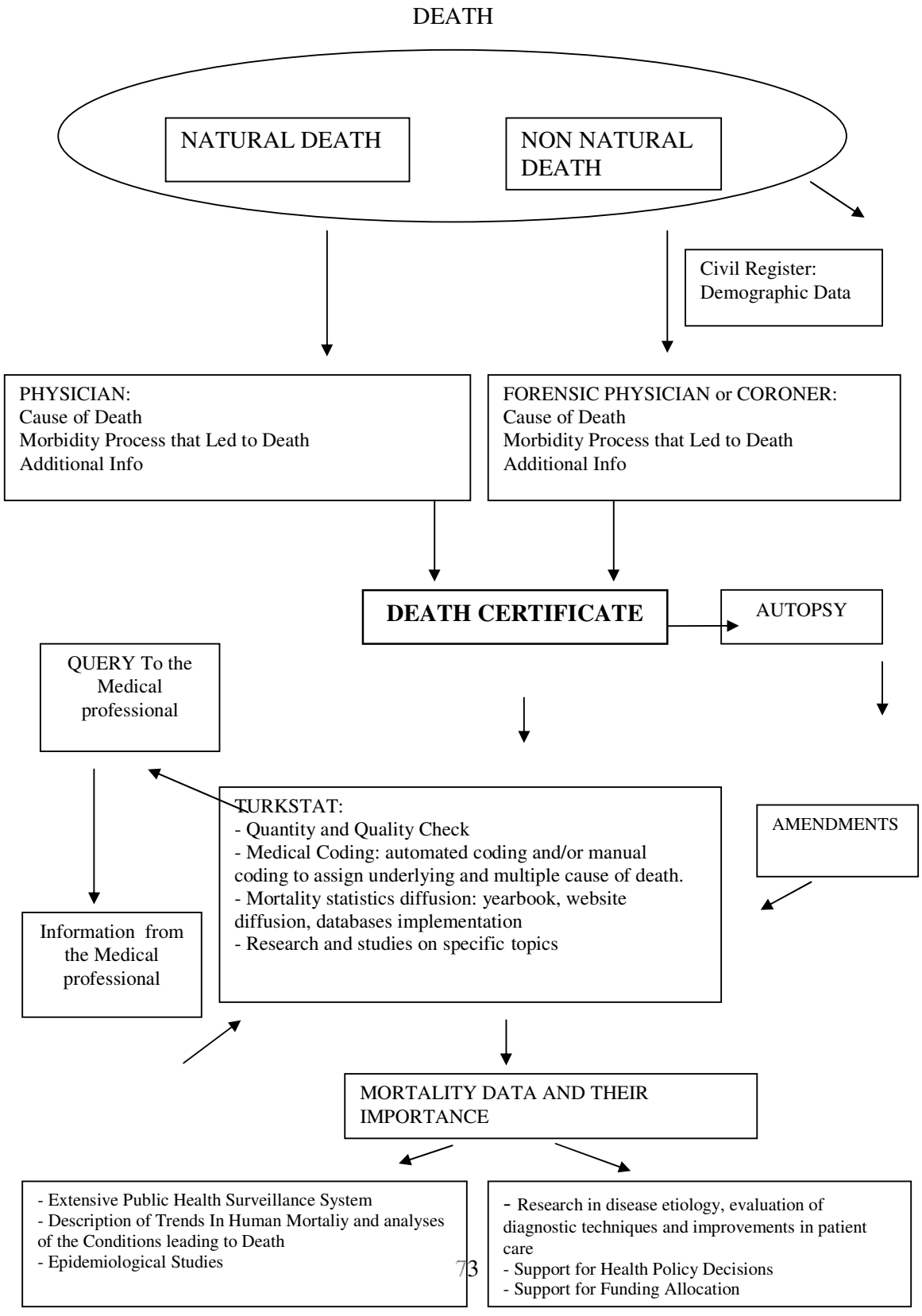
Since statistical data derived from death certificates cannot be more accurate than the information reported on the certificate, it is very important that all the people concerned in the registration of the deaths provide accurate, complete, reliable and prompt information. Mortality statistics focus on the underlying cause of death (the condition or disease starting the chain of events leading to death) for historical reasons as well as because public health interventions try to break the sequence of causally related medical conditions as early as possible.[126]

The causes of death data are used by the national and regional governments to set public health policies and goals. This data is also used by researchers and clinicians, educational institutions, and many others for many purposes. Consequently, mortality data are important indicator to measure and compare health status at the local, national and international levels because they are regularly and extensively collected in every developed country and in the most of the developing ones. In that sense, on the basis above-mentioned importance of the causes of death statistics, the importance of these data can be summarized or formulized as follows:

- To assess the population mortality pattern and determine its changes over time.
- To identify regional difference in death rates and investigates reasons for these differences.
- To monitor trends in public health issues such as infant and maternal mortality, infectious diseases, accidents and suicides
- To identify health risk related to environmental, occupational factors and lifestyle.
- To determine health research and health priorities and resource allocation.
- To plan health facilities, services and human resources.
- To develop health promotion programs and evaluates their results.

[126] Ibid.,p.9.

Table 1 - A generalized scheme from death to statistical data



4.4.2 Legal Basis of the Death Certificate System:

Death certificate is a legislative documentation and it is the last document of deceased person, which provides invaluable information for inheritance and insurance. Death certificate is composed of three pieces of paper, which are counterfoil, the COD form and burial licence. Counterfoil is kept by the health institution, which arranges the death certificate. The second part of the death certificate is the COD form in where the cause of death is written down and is sent to the TURKSTAT and the third part is burial licence that is given relative of the deceased person in order to perform necessary transactions for the burial.

The collection of data on the COD statistics is intertwined with the burial license and further regulated by specific rules of the MoH and also of the TURKSTAT. In fact, the burial license and the information on the COD statistics for the TURKSTAT are combined in one single form, known as the COD form (see Appendix 1).

Before mentioning the legal infrastructure of the COD, it should be stated that data collection for the COD statistics is a rather complex system because it is intertwined with registration of deaths for all kinds of administrative purposes, with issuing of burial certificates and with the reporting of COD from different health care providers. The system is steered by different laws and regulations. This results in practice in a complex system of forms, transfers of forms and data, records, an involvement of many national, regional and local government officers with different responsibilities and duties.

In Turkey, there are eight basic legal codes for issuing burial licence. These legal codes as follows: “The General Hygiene Law of 1930”, (article 211-234,282) the “Code of Criminal Procedure” numbered 1412 (Article:19), “Municipal Law” numbered 1580 dated 1930 (Article 15/5), “Village Law” numbered 442 dated 1593 (Article 13/2,14/4), “Amending Law on the Decree Law on the Administration of Metropolitan Municipalities” numbered 3030 Article 6/i) dated 1984, “Law of Population Service” numbered 26153 dated 2006 and “International Agreement on

the Transportation of Mortuary" numbered 3584. Apart from these laws, there are also regulations and circulars which refer these laws.

According to these laws, regulations and circulars, it is stated that without having burial licence, no mortuary can be transferred and buried. Traditional arrangements suggest that each rural settlement has one (sometimes two) cemeteries where the deceased are buried.[127] Village headmen *(muhtar)* are required to keep records all deaths in villages.

It is forbidden to bury the corpses in all areas except from cemeteries (the Law of General Hygiene Article 211). The areas having sanitary and technical properties are chosen as a cemetery (Article 214). None of the corpses are buried without death certificate. On the death certificate, identification, address, cause of death and burial permit of the dead person is determined clearly (Article 215). In addition, as a rule, delivering this document is under the responsibility of physicians.

On the basis of the General Hygiene Law, there is a sequence for delivering the burial document. The law, which is primarily concentrating on not only the burial license and but also to a certain extent on the COD statistics state that burial license is firstly delivered by municipal physicians. Moreover, in municipalities the form is completed by the municipal physicians for persons dying at home. If there is no municipal physician in certain province, then according to the law, local doctors are authorized to give the document. When there are no local doctors, it is given by government doctors after the examination of dead person (today, by the doctor of health centres). At the time of illness, which causes to death, the certificate which is given by the doctor who examines the dead person is valid only when it is validated by the official doctors (Article 216).

Governmental or local doctors may demand report from the doctor who examine the patient to determine the cause of death. When this is demanded, the doctor, who

[127] "Reproductive Health Programme" Turkey, National Maternal Mortality Study, 2005, Main Report,83.

examines the patient, is under the obligation to give the report (Article 217). At the hospitals and other official health institutions, the death certificate is given by the director or head physician and it is validated by the official doctors (Article 218). When there is no doctor, the examination of deaths is made by health officers and the other officers who are brought up for this job and death certificate is given by these. When these are also unavailable, it is given by gendarmerie headquarters and village headman *(muhtar)* (Article 219). The authorities, who give death certificate, keep books to record for this job. On this registration, name and address of dead person, date of death, disease that causes to death should be available. This information is reported to the closest office of a government doctor and health directorates until 15th of following month by collecting at the end of each month.

In case of a "doubtful death" (non-natural death) the burial license has to be filled out by the judicial physician. Moreover, in the case of death of patient, who undergoes an emergency treatment and surgical operation, the death must be notified to the chief public prosecutor's office because of forensic fact. Notifications concerned to crimes are given to the chief public prosecutor's office, judiciary police and the minions of the law and justice of the piece (verbal or written). These notices may be given to the governor and official charged with governing a provincial district for transmitting to the legal authorities. For verbal notices, a report is drawn up (the Code of Criminal Legal Procedure 151).

In the event that requires judicial inquiry, the burying without investigation and autopsy is included in the Code of Criminal Legal Procedure (Article 297). The people who hide and have the body of victim (dead) hidden or who bury or have it buried without reporting to government or investigations are punished with a fine and imprisonment.

4.4.3 Practice and Problems of the Death Certificate System

Before giving detailed information concerning current situation in the death certification system in Turkey, it would be a good idea to consider the actual application on the system. The current practice can be formulated as follows:

In Case of Natural Death:

Deaths in where physicians available: If the death occurs in the health institution, the counterfoil, the COD form and burial licence are filled out by the physicians, who see the deceased person. The health institution, where the death occurs, approves these forms. Counterfoil is kept by the health institution, the COD form is sent to the Health Directorate of Province, which sends these forms to the TURKSTAT. Burial licence is given to the relatives of deceased person in order to make necessary transactions for burial.

At this point, it should be articulated that apart from the death certification of MoH, there is another death form, which collected and evaluated by the Ministry of Interior. This death form is called the "Central Population Administration System" (MERNIS)[128] death form. For this death form, in the current practice, birth certificate of the deceased person is taken by the health institution. In addition, the MERNIS death form is filled out and sent to the District Population Directorate.

Death occurring outside the health institutions: If the death occurs within the borders of municipality, counterfoil, the COD form and burial licence were filled out by the municipal physicians. If there is no municipality in the place where death occurs, then through examining thoroughly the deceased person, physician of the village clinics gives the death certificate. Counterfoil is kept by the health institution, the COD form is sent to the Health Directorate of Province, which sends these forms to the TURKSTAT. Burial licence is given to the relatives of deceased person, who takes the licence to the municipality in order to make transactions of the mortuary.

[128] MERNİS is an e-state project and through the project, the whole transaction concerning citizenship population information is done in electronic form.

Institutional copy of birth certificate of deceased person is taken by either *muhtar* or municipality and in the current system the "MERNIS death form" is filled out. The MERNIS death form and the birth certificate are sent to District Population Directorate.

Deaths in where certifying physician is not available: For the deaths where certifying physician is not available, authorized personnel (nurse, health officer or midwife) in the health institution give the death certificate. If there is not nurse, health officer or midwife in the place where death occurs, then either *muhtar* or gendarmerie are authorized to give death certificate. These personnel are tasked with that issue by the governor or head official district of a district *(kaymakam).*

In Case of Non- Natural Death:

In the current system, if a suspicious death (accident, homicide, trauma, homeless, death with unknown cause, declared as non-natural death, faceless) occurs, on the basis of the Criminal Procedure Code (Article 86-89), Office of the Director of the Republic Prosecutions performs necessary transactions. If the cause of death is determined in venue, death certificate is given to relatives of deceased person. If the cause of death cannot be determined or decided in venue, physical autopsy is done. On the basis of the autopsy, death certificate is filled out and given to the relatives of the deceased. Moreover, according to the results of autopsy, if it is needed to further 'examination', examination is written in the part of the cause of death and death certificate is given to relatives of deceased.

After explaining actual practice of the death certification system, I will concentrate on problems of the COD statistics. In Turkey, concerning the problems of the COD statistics, it is possible to talk about two basic problems. The first one is lack of coverage. In Turkey, the COD statistics is collected at city and town centres but they are not collected and compiled in rural areas and villages. In addition, the flow of information in the town centres is slow and significant proportions of deaths in the town centres are not notified. Henceforth, the COD statistics does not reflect the whole country. It solely shows the picture of city and town centres.

The second problem is concerned to poor quality of the COD statistics which is much more sophisticated problem. In Turkey, the COD statistics are compiled on the basis of the ICD-8 in which there is just underlying causes of death but according to the ICD-10 not only the underlying causes of death but also other significant conditions contributing to death, but not related to diseases or condition causing it, is recorded.

In the practice of filling out the COD form, instead of writing the underlying causes of death, generally the last condition of death (immediate cause) is written in the COD forms so that there is accumulation of some causes like cardio vascular arrest and respiratory failure, which are not regarded as the underlying causes of death according to the WHO and EUROSTAT. To illustrate, in the COD form, practitioners may write cerebral haemorrhage but cerebral haemorrhage is not the underlying cause of death because it is an outcome of other causes. It can be a result of hypertension. Henceforth, in practice, in Turkey, generally the last situation instead of the underlying causes of death, which starts the chain of mortality are recorded. Moreover, it was also witnessed in the COD forms particularly coming from rural areas filled out by *muhtars*, 'old age', 'dispensation of providence' and 'fate' are written down as a cause of death. These causes indicate that accuracy of the COD forms vary on the basis of persons, who fill out the forms so that there is no standardization on the issue.

In Turkey, the system of burial licence is rather complex. Many institutions involve in this procedure such as municipalities, the Ministry of Interior (the General Directorate of Population and Citizenship), MoH, the TURKSTAT and for doubtful deaths Institution of Forensic Medicine. Since many institutions were responsible for the burial licence, in reality in some cases, no institution is responsible for the process. In addition, there is a coordination problem not only within the units of MoH but also among the concerned institutions. Since the statistical data on the COD statistics cannot be collected in the places where these data are produced, the coordination problem is inclined to increases. Parallel with this insufficiency in the coordination, even though the COD forms from province health directorates were compiled monthly, sometimes separate forms from hospitals arrived at the

TURKSTAT. Even though it is legally compulsory to notify deaths within ten days, in some cases, it is seen that institutions in question either make a late reporting or do not notify the case of death at all. Before regional directorates were founded, the forms sent from provinces arrived collectively. In the in-depth interview of the Turkey National Maternal Study (2005), a TURKSTAT expert says: "Let's say the number of forms in January coming from the town of Ceyhan in Adana, we can say that in Adana there are there are 10 hospitals, let's say 7 of them sent some and 3 did not, how do we determine this? We cannot determine this."[129] (Expert, TURKSTAT, Ankara) Moreover, in the MoH, eleven departments and units has been collecting statistical information including the COD data. In contrast, there was not one definite unit, which is responsible for the coordination in statistical information.

In the filling out the COD forms, the key personnel are medical doctors. Nevertheless, not only most of medical doctors do not have sufficient information for filling out form in an accurate way, more importantly but also they regard this duty as a secondary work. Medical doctors were under heavy workload so that from of the point of view of them this task is burden and bureaucratic transaction. In addition, medical doctors avoid filling out the COD forms due to probable forensic responsibility of the death.

In villages, *muhtars* are in charge of burial records. *Muhtars* fills out burial licences except for medical part of the licence. Nevertheless, *muhtars* as an elected person engage in problems related to road, water, electricity or security issues. According to *muhtars,* serving the villagers in visible and concrete manner is significant so that recording death is not admired by villagers. Therefore, for *muhtars*, filling out the COD forms is burden and has no practical value so that they have a negative approach towards these forms.[130] Furthermore, *muhtars* low level of education, the lack of pre-service training, and the lack of a regular application of burial permits and a registration system of cemeteries, all contributes the indifference of the

[129] Reproductive Health Programme in Turkey, National Maternal Mortality Study (2005). Main Report:102.

[130] Ibid.,p.89.

muhtars towards the issue of recording.[131] Thus, *muhtars* regard filling out these forms as a secondary work so that either they do not accurately fill out the death form or they do not send it related department on time.

As it is known, in villages everyone knows each other very well so that *muhtars* see no need for the burial permit except for doubtful situations. Henceforth, *muhtars* gave permission for burial without permits. For example, in the interview of *muhtars* under the National Maternal Mortality Study, one *muhtar* from Kayseri says: "The buried citizen is someone we all know, no there is no need to register no we have no such thing anyway, the state keeps record, when the registration office is notified, they cancel the registration."[132] (*Muhtar*, Kayseri)

Muhtars refrains from asking information for the death certificate from the relatives of the deceased person, who suffers from the dead. Thus, *muhtars* feel that they need time to get information for the COD form. In the National Maternal Mortality Study, during the interviews, two *muhtars* views on the issue as follows:

> We issue that, but going there suddenly, it is a bit strange, when there is a death, before I think the dead, going there straight away, they may say 'did he come for work', it can happen like that, it is possible. I mean this humanity…after he is buried one day later; we ask for his/her identification card." (Muhtar, Kayseri) "If the death occurred at home, the relative of deceased may or may not notify the death. He ignores it, why bother. He dies anyway. Why should I bother myself? Will I go and investigate why he/she died? Should I go and question him. The man will not tell me anyway. He died anyway. (*Muhtar*, Diyarbakır)[133]

Muhtars also do not regard themselves as civil servant. They generally do not know their own duties and responsibilities. Most *muhtars* learn their duties during the practice. Even though district governors sometimes organize meetings for the duties of *muhtars*, they are not regular. Moreover, from the point of view of Ministry of Health staff, sanctions for the *muhtars* were not enough.[134]

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[131] Ibid.,p.90.

[132] Ibid.,p.93.

[133] Ibid., p.94.

[134] Ibid., p.97.

So far, I mainly mentioned the problems of villages for filling out death certificates, now I will pay attention province, town and city centres. Concerning the problems of death certificates of these centres, it should be stated that there is no homogeneity with respect to accurately filling out the death certificates within distinctive regions in Turkey. It can be deduced that people who live in the Aegean and Marmara Sea regions are more sensitive towards the importance of burial licence than people who live in the East and Southeast Anatolian regions.

In Turkey, people's different approaches towards death certificate among distinctive regions mainly stems from the practice of 'night burials' in which cultural elements play a significant role. Particularly in East and Southern Anatolian regions, corpses can be buried without notifying the *muhtar* or the municipality officials. In these regions, people are generally member of *Shafi* religious sect. The dominant view of the sect is that burying the corpse straight away leads to less pain being felt.[135] Therefore, in practice, in some cases, the cemetery directors of the municipalities have given permission for night burials in order to respect people's religious views. In addition, climate conditions of these regions also influence on the situation because in hot weather, a corpse can more quickly deteriorate. In the National Maternal Mortality Study (2005), in the in depth interview of the cemetery directorates, one director says:

> I mean, well the cultural reason, some say, well, it is better for your dead to be buried as soon as possible, it is better not to trouble the people around, it is better to alleviate the pain as soon as possible. In general, I mean the reason is this. I mean for example a man has had a traffic accident, or I do not know he might be young, a sudden death, people want to remove the dead of especially people who die young earlier. I mean, because after the burial ends, the pain is a bit more relieved. But the most important thing, but the hot weather, the most influential factor might be the hot weather. Well, we especially say, if we establish our morgues we will definitely have these rules enforced. If it is for the good of our people too, if the system is better in this way, it should be in that way in my opinion."[136] (Cemetery director, Diyarbakır)

In the Southeast and East Anatolian regions, night burials have been done in places where *Shafiism* was widespread. Night burials are peculiar to these regions. In

[135] Ibid., p.101.

[136] Ibid., p.101.

contrast, night burials were banned in *Hanefi* religious sect. In the National Maternal Mortality Study (2005), in the in depth interview of the cemetery directorates, one director from Kayseri says:

> And perhaps here because of people's religious sect thing, because there is the Hanefi religious sect in Central Anatolia the evening prayer burial is considered as a sin. For this reason, there are no burials done in the afternoon. Even in the afternoon, even at the afternoon prayer, few generally the dead are buried after midday prayer; it is frequent then, not even in the afternoon time. Never is there in the evening and at night. For instance, I worked in the east, my real job is a teacher, I worked in Sarıkamış. Well someone's relative died and was buried; I said can a burial occur at this hour. Well they said, it is the Shafi religious sect. I mean I was shocked. But burial do not occur after working hours in our place here. It is as such in our regulations anyway. I mean it is done until the working hours end, if not it is not done.[137] (Cemetery Chief Officer, Kayseri)

4.5 Reformation in the Death Certificate System

Current practice in the death certificate system is explained above, the same formulization and procedure will also be followed for the explaining renovation in the death certificate system.

In Case of Natural Death:

Planned arrangement for deaths in where physicians available:

After the pass away of one person, medical doctor, who examines the death, fulfils for sheet of death certificate and this certificate is approved by the chief administrative officer. In addition, the chief administrative officer follows the procedure explained below:

- The death certificate form is prepared four (4) copies. The first copy is given to the relatives of deceased person. Through approving the death certificate, burial transactions are carried out by the municipality that health care service provider is under. If burial is carried out in the village clinic, which is out of

[137] Ibid.,p.102

the borders of municipality, burial transactions will be done by muhtar through approving death certificate.

- The second copy is sent to District Population Directorate, in which death occurred, within ten (10) days following the death. This document will be base to the MERNIS death form, which is used in current system and the MERNIS death form will be filled out by concerned the District Population Directorate.
- The third copy is sent to the Provincial Health Directorate to be delivered to the TURKSTAT Regional Directorate within the first five days of the following month. The Provincial Health Directorate sends the form to the TURKSTAT Regional Directorate at the latest within the last five days of next month.
- Finally, the fourth copy is kept by the health institution, which arranges the death certificate.

If the death certificate is fulfilled in electronic form, then above mentioned process should be followed by signing four copies.

Planned arrangements for death occurring outside the health institutions:

Death certificate is filled out as four copies by the medical doctor, who examines the death. This certificate is approved by the chief administrative officer of the health care service provider institution, in which the medical doctor works. (If the death certificate is given by the medical doctors, who work for private health institution, it is required to be given approval by Directorate of Health Group or Provincial Health Directorate.) The chief administrative officer follows the procedure explained below:

- The first copy is given to the relatives of deceased person. Burial transactions are carried out by the municipality that health care service provider is under. If the burial is carried out in a settlement place, which is out of the borders of municipality, burial transactions will be done by *muhtar*.
- The second copy is sent to the District Population Directorate, in which death occurred, at the latest within ten (10) days following the death. This

document will be base to the MERNIS death form, which is used in current system and the MERNIS death form will be filled out by concerned District Population Directorate.

- The third copy is sent to Provincial Health Directorate to be delivered to TURKSTAT Regional Directorate within the first five days of the following month. Provincial Health Directorate sends the form to TURKSTAT Regional Directorate at the latest within the last five days of next month.
- Finally, the fourth copy is kept by the health institution, which arranges the death certificate.

If the death certificate is fulfilled in electronic form, then above mentioned process should be followed by signing four copies.

Planned arrangement for deaths in where certifying physician is not available:

In the case of deaths in where certifying physicians is not available, Parts A and B of the death certificate are filled out as four copies in the presence of two witnesses by health institution competent officials (health officer, nurse, midwife). If these personnel are not available, people, (gendarmerie station commander, *muhtar*) who are charged with by governor or *kaymakam*, fills out the death certificate. (In the provinces that has been brought a new system called "Family Practitioner System", Family Health Centres and Public Health Centres are responsible for this process. In this process, Public Hygiene Law Article 216 will be applied)

- The first copy is given to the relatives of deceased person in order to be used for the 'burial licence'. The Burial transactions are carried out by the muhtar.
- The second copy is sent to the District Population Directorate, in which death occurred, at the latest within ten (10) days following the death. This document will be base to the MERNIS death form, which is used in current system and the MERNIS death form will be filled out by concerned District Population Directorate.

- The third copy is sent to the Directorate of Health Group to be delivered to the TURKSTAT Regional Directorate within the first five days of the following month. The Directorate of Health Group sends the form to the Provincial Health Directorate within the first ten days of next month, Provincial Health Directorate sends to the TURKSTAT Regional Directorate at the latest within the last five days of next month.
- In order to be filled out the 'Verbal Autopsy Form', the fourth copy is sent to the Directorate of District Health Group. This institution keeps the form in its archive.

For the cases of deaths, where there certifying physician is not available, health officer, nurse or midwife charged with filling out verbal autopsy form will go to the permanent residence of deceased person. They will fill out the verbal autopsy form and "C", "D", "E" and "F" parts of the death certificate with the information taken from relatives of deceased person and they will deliver responsible medical doctor. After that, medical doctor fills out the part "G" through examining death certificate and verbal autopsy form. Completed death certificate is sent to the TURKSTAT Regional Directorate within the first five days of following the second month. Cause of death in this form is 'estimated causes of death' based upon evaluation of restructured form. It does not incur liability in accordance with Law No: 5429 Article 13, paragraph 3. At that point, it should be articulated that if permanent residence mentioned in the death certificate is not responsibility area of concerned Directorate of Health Group, the fourth copy is sent to responsible Directorate of Health Group and at the same time the TURKSTAT Regional Directorate is informed. The Directorate of Health Group, which fourth copy is sent to, is liable for completing of the remaining part of verbal autopsy form and death certificate.

Non- Natural Death

Planned Arrangement:

In the planned system, if a suspicious death (accident, homicide, trauma, homeless, suspicion for communicable disease, death with unknown cause, faceless, declared as

non natural death) occurs, on the basis of the Criminal Procedure Code (Article 86-89), Office of the Director of the Republic Prosecutions performs necessary transactions.

- If the cause of death is determined on the basis of examination of the deceased person, the death certificate is filled out as four copies by the Republic Prosecutor and at least one of the medical doctors, who examine the deceased person.
- If the autopsy is carried out in order to determine the cause of death; the death certificate is filled out as four copies by the Republic Prosecutor and at least one of the medical doctors, who carry out autopsy.
- If it is needed further examination as a result of the autopsy, examination is written in the part of cause of death and the death certificate is filled out as four copies by the Republic Prosecutor and at least one of the medical doctors, who carry out autopsy.

- The first copy of the death certificate is given to the relatives of deceased in order to be used as a 'burial licence'.
- The second copy of the death certificate is sent to District Population Directorate, where the death occurs, by Office of the Director of Republic Prosecutions.
- The third copy of the death certificate is sent to the TURKSTAT Regional Directorate by Office of the Director of Republic Prosecutions.
- The fourth copy of the death certificate is kept in the investigation file.

Where "examination" is indicated as the cause of death in the "death certificate", a single copy of new death certificate shall be prepared and forwarded to the TURKSTAT by the Chief Republic Prosecutor's Office within the following month after the decision on the cause of death is made.

After giving planned practice of the death certificate system, I will focus on reformation attempts on the COD system. In the system of health statistics of Turkey,

the COD statistics play a key role because these statistics are the backbone for any analysis of the status of health of the population. Nevertheless, the COD statistics in Turkey are incomplete and require complete review of the notification, certification, classification and analysis in order to comply with standards of the WHO and EUROSTAT. In that manner, at the national level, there is a need to upgrade the COD statistics fundamentally for preparing, monitoring and evaluating of national and health programmes. Consequently, it was decided to modernise the COD statistics in Turkey, because Turkey is a candidate country of the EU and therefore should prepare its statistics according to the EU standards.

From the national perspective the need for the renovation of the COD concentrates on improvement of coverage, introduction of the ICD-10 and introduction of a new certification form. These central objectives are considered as the highest priority for reporting adequate data to the EUROSTAT.

In Turkey, the reformation and renovation attempts of the COD statistics were launched in 2005. Since then, the reformation of the COD in Turkey is implemented on the basis of a stepwise approach. It means that the different stages of the project are evaluated after the completion of each stage and the next step is adapted when and where necessary. This allows for optimal flexibility in order to include also new findings, methods and instruments mainly developed at international level such as the WHO and at the European Union level (EUROSTAT). In addition, this method has been applied for the explorations on the renovation of the COD statistics and the pilots with a revised form for the COD, certification and coding according to the ICD 10 which is gradually introduced for the COD statistics.

Under the specific programme USST, MoH and TURKSTAT have been working to reach the EUROSTAT and WHO standards in the COD statistics. This programme was implemented under the coordination of TURKSTAT. However, renovation of the COD statistics was implemented under the cooperation with MoH and TURKSTAT. In addition, expert of EUROSTAT Jacques Bontè prepared a report for analysis of the current situation of the COD statistics. In line with the report for the modernization of the COD statistics, a Committee was established with the

participation of concerned personnel from public institutions and this Committee was renovated the COD forms.

In order to improve coding of the COD forms, another EUROSTAT expert Monica Pace has taken an active role. Since evaluation of coding as a prerequisite for the evaluation of certification, this significant task has been performed by another EUROSTAT expert. Her evaluation on the certification focuses in principal on two key components: completeness and correct filling in of the forms, for medical and non medical variables.

The correct filling of the medical box of the forms can only be evaluated properly by analysing whether the sequence of events that led to death has been reported in the correct way in line with ICD-10. This evaluation has been better done by the surveillance of the expert particularly during the following phase of the pilot evaluation, the coding step. She stated that first the forms have to be coded before an evaluation on the correct filling of the forms can take place. Therefore, she warned that the evaluation of the coding conducted by the coders should be done first. Part of this evaluation process has provided directly the standard elements for the adequate evaluation of the certification with contributions of Mrs. Pace.

In Turkey, current health system will be replaced by a new system under the framework of "Health Transformation Programme". One of the most important tenets of the Programme is restructuring of MoH and introducing Family Practitioner System.

In the restructuring process of MoH, Strategy Development Presidency was set up. This unit became the responsible body to provide coordination in the statistics. Therefore, in order to solve scatteredness within the field of health statistics including the COD statistics, this unit has been charged with the duty of obtaining active collaboration within the units of MoH and other concerned institutions in statistics. Parallel with the Transformation Programme, MoH has been making pilot study in order to introduce Family Practitioner System in Düzce, Eskişehir, Bolu, Edirne, Denizli, Gümüşhane, Isparta, Elazığ, Adıyaman, Samsun and İzmir.

Therefore, considerations to adapt the reformation of COD forms to the family medicine have been going on. It is possible that family physicians will fill out the COD forms.

In order to renovate the COD statistics, training sessions were held for certifying physicians, who will work in the pilot study, trainers, and *muhtars*. It was witnessed that physicians were enthusiastic to learn how a death form can be filled out in an accurate way. Training sessions were arranged for training for trainers in the TURKSTAT so that these trainers have learnt the latest developments and techniques in the COD statistics. In addition, *muhtars*, who are key personnel in the process, encouraged to attend the training sessions. Nonetheless, even though most *muhtars* attended in training sessions, some *muhtars* rejected to attend in training sessions. Most *muhtars* have problems to understand the issues covered in the training sessions mainly due to their low level of education, their old age and ignorance.

One of the crucial problems in the renovation of the COD statistics is the underreporting on the COD. In order to solve this main problem, it is planned to apply the method of Verbal Autopsy (VA) in areas where there is no medical doctor available. The initially explored method was the method of VA used in previous studies such as the National Maternal Mortality Study in Turkey (2005).

As it was stated in Turkey, the COD statistics has been collected and disseminated on the basis of the ICD-8. Nonetheless, EU countries has been collecting and disseminating the COD statistics according to the ICD-10, in which there four causes with three steps. It means that in the ICD-8, there is only underlying cause of death, which can be defined as "the disease or injury which initiated the train of morbid events leading directly or indirectly to death or the circumstances of the accident or violence which produced the fatal injury"[138]. Consequently, the causes of death mentioned in the death certificate are reduced to one cause of death, 'the one that

[138] Prof. Sümbüloğlu, Kadir, Sümbüloğlu, Vildan and Gören Ali, "Ölüm Raporu Yazım Kılavuzu" (Guidance for Writing of Death Report) (1995). Ankara, Health Information System Training Series Ministry of Health.

started the chain of events leading to death'.[139] Therefore, the underlying cause of death is sometimes called as summary statistics, which is easy to compare with other countries. Even though the underlying cause of death concept is easy to understand, it sometimes fails adequately convey the complexity of reported medical conditions at the time of death.[140]

In addition to the underlying cause of death, in the ICD-10, there are contributing causes of death in the death certificate. Therefore, in the death certificate based on ICD-10, more information is available to be considered by health policy makers. In situations when there are more than one cause of the death, in the underlying cause of death just one cause is recorded in the death certificate but the ICD-10 rested upon multiple causes of death, it is possible to write down all the factors or conditions contributes death. In that sense, as opposed to one-dimensional underlying cause of death, the ICD-10 provides multidimensional analysis concerning the causes of death. This multidimensional analysis covers not only initiating condition but also intervening and immediate causes so that multiple cause of death statistics can acquire information concerning the interaction of diseases leading to death which otherwise be lacking. This analysis also obtains information on the nature of injury in the accidents. For instance, according to the underlying cause of death, it is possible to learn how many people dies in Turkish roads due to traffic accidents but it is not possible to learn how many people dies because of fracture, sprain or cerebral haemorrhage.

In the light of the reasons explained above, a change from the ICD-8 to ICD-10 is a revolutionary change in the COD statistics of Turkey. This process will contribute to acquire the accuracy of COD forms. In the Negotiation Paper on statistics, Turkey announced that in 2009 Turkey will apply ICD-10, which is important for obtaining timely and comprehensive the COD statistics. In the following parts of the thesis, I will mention pilot studies for renovation of the COD statistics and give more specific

[139]Bah, Sulaiman, (2003). "Multiple Causes of Death Statistics in South Africa: Their Utility and Changing Profile over the period 1997 to 2001" www.ssc.uwo.ca/sociology/popstudies/dp/dp03-02.pdf 29-08-2007

[140] Israel, R.A, Rosenberg H. M. and Curtin L.R. (1986), Analytical Potential for Multiple Cause of Death Data, *American Journal of Epidemiology*, Vol. 124 (2), 161-179.

information on reforms of the COD statistics in line with the EUROSTAT and WHO standards.

4.5.1 In the Light of the Pilot Study: Reformation in the COD statistics

In the framework of the project for the renovation of the COD statistics the key component is a pilot on the introduction of the new form for the certification of causes of death. Therefore, in 2005 the TURKSTAT made the first steps for improvement of the COD statistics. The appropriate chapter from the EUROSTAT "Manual on Certification and Coding of COD for Filling in the COD Form by Certifying Physicians" was translated in Turkish. Parallel with the key component of the project, in the Atatürk hospital, one physician volunteered to do a small pilot with a draft for a new form in October 2005. Thus, it was deduced that the new form is very promising because more and better statistical information was collected. After this study, MoH and the TURKSTAT defined and agreed the following aims for the pilot study:

1.getting familiar with the new COD form
2.getting familiar with the "medical box" of the COD form which is according to the WHO and EU recommendations
3.getting familiar with filling in the form properly according to the rules for certification
4.getting familiar with the available training material in order to be able to assist colleagues in the hospitals with filling in the forms

Based on the results of a small pilot in 2005 with a first draft of a revised form a second version of a new COD form was designed for implementation in a new larger pilot. The first test with this new COD form was conducted in October 2006 in several hospitals and health centres in Ankara and Kırıkkale. For each of the hospital a "reference physician" was appointed to act as focal point for the doctors in the hospitals. The reference physician had to distribute the new COD forms and the training material to the colleagues in the hospital, introduce the purposes of the pilot

and assist the colleagues with filling in the new COD form. Next to these physicians, nurses and staff responsible for the verbal autopsy attended the training. The primary aim was to train certifying hospital physicians for filling in the new COD form. For the pilot with the COD form in hospitals, which is the first step, it was decided to organise trainings both on certification of cause of death and on coding of the new form. This training is based on the ICD10.

A third pilot is on reporting on the COD for deaths which are not seen by a doctor. This method is called Verbal Autopsy (VA). The form for the VA which was used in a former study of MoH, called "Burden of Disease Study" has been simplified by the MoH. A modest pilot with the simplified forms was conducted in October 2006. In Kırıkkale, health centres without doctors were assigned for the pilot with the VA forms.

In the light of this information, the basic objectives of the modernization and reformation in the COD statistics for the pilot study can be classified under 10 headings:

1. to revise the draft form.
2. training of certifying physicians for filling in the forms and evaluation of filling in the forms by certifying physicians.
3. developing a method for filling the forms by means of verbal autopsy
4. training of personal for filling the forms by means verbal autopsy and evaluation of filling in the forms by means of verbal autopsy
5. testing of data entry by staff of provincial health offices of forms filled in by physicians and by means of verbal autopsy
6. testing of data transmission from MoH to TURKSTAT.
7. evaluation of the quality of the data results including comparison of data provided by physicians and by means of verbal autopsy
8. making draft tables on COD, including an overview of requirements for calculation of COD rates.
9. evaluation of quality of non-medical items on COD forms.

10. proposals for further steps for the introduction of the new COD form including burial licence and counterfoil.

The first objective objective concentrates on revising the draft form. As it was mentioned one of the most important components of COD registration reforms is related to bringing a new COD form in line with ICD-10. Instead of one dimensional underlying causes of death, in the new form, immediate cause, other contributing causes that lead to death and finally underlying causes of death is available. Since this change can be regarded as a radical one, it is necessary to find out whether new COD forms is working or not in the light of pilot study, which can also cause to revise or change new draft COD form. In addition, it was witnessed that draft form is functioning well.

The second objective is training of certifying physicians. However, before mentioning training of certifying physicians, it is necessary to mention the Death Certificate, which is composed of three components: Causes of Death Form, Counterfoil and Burial Licence. The Counterfoil stays in the institutions or unit, which arranges the death certificate. Causes of Death form are sent to TURKSTAT and finally burial licence is delivered by in the first remove.

Concerning instruction in Turkish on three parts of the form is finished. Furthermore, translation of the manual on COD was made and approved by Ministry of Health.

On the basis of the past experience, training of certifying physicians is done by national experts, who are trained in classification, coding and analysis of the COD. The reasons for training by national experts are self evident. Language, national medical culture, and national forms, rules and regulations for certification are the basic reasons. Henceforth, national trainers trained the certifying physicians, who will take part in the pilot.

The basic aim of the training was to make selected staff of the MoH and TURKSTAT familiar with the rules and basic principles for classification and coding

of causes of death. ICD-10 first edition, Turkish translation, was available via internet on the MoH website, with the exception of vol.3 Section 2 and 3 dealing with external causes of death and classification of chemicals. This was a first training course to make staff familiar with the most common situations in coding of the underlying cause of death in accordance with ICD-10 provisions. The trained staff should be able to code the forms collected in the pilot during October 2006

The third obejective is related to the methods for VA. As it was stated, VA is related to deaths, which are not seen by doctors. Concerning verbal autopsy, it is possible that verbal autopsy will not be able to cover the whole deaths, which are not seen by doctors because there is too much wok involved and supervision and management will be very difficult and cumbersome. Nonetheless, gaining more experience with the methods is significant.

The fourth objective focuses on training for verbal method. Henceforth, training sessions were organized by Başkent University with approval of MoH. In addition, evaluation of this method is twofold:
- the completed form on the basis of the information of the family can be evaluated by physicians in the health centre.
- the evaluation of the information on the forms for coding should be done by the trainers.

The fifth objective is the data entry. The data entry is separated for hospitals, health centres and verbal method. The data entry programme exists for the old form, but not for the new form. Therefore, the data entry for new form will be provided within the project.
Data entry of the new form is done by the trainers on the basis of manual coding. Coding for hospitals and health centres is done by means of the same procedure. The form from the verbal autopsy is treated differently.

The sixth objective is the data tranmission. The EUROSTAT experts articulated that data transmission does not seem to be suitable for testing in the pilot project.

The seventh objective is the evaluation of the quality of the results. Quality evaluation was made by the EUROSTAT expert Monica Pace. It was founded out that pilot study was successful.

The eight obejective focuses on tables and this objective will be defined and agreed in 2009.

The ninth objective is the Evaluation of the quality of non-medical items on the COD forms. This objective mainly covers everything except for cause of death part in the COD form. The quality of non-medical item is guaranteed through following up the implementations of the EU countries.

The tenth and final objective concentrates on the proposals for further steps for the introduction of the new COD form including burial licence and counterfoil. On the basis of the pilot study, it was founded out that in the current system, just changing the COD form and introduction of ICD-10 is not sufficient. It was also realized by the personnel of concerned institutions that the problems stemmed from the previous COD registration system cannot be sorted out by changing COD form. Consequently, it was believed that the pilot study should be applied to other cities such as Samsun, Adıyaman and Denizli. The selections of these cities are meaningful because each city represents heterogeneity in the practice COD system in Turkey. Consequently, these cities will be base for further proposals for the death certificate system.

CHAPTER V
SUGGESTIONS FOR IMPROVED IMPLEMENTATION

During the implementation of pilot study for the renovation and modernization of the COD statistics, it is encountered some problems. During the implementation for pilot study, one of the basic problems is related to the difference between legal rules and actual practice. As it was stated, in Turkey, the collection on the data for COD and burial licence in Turkey is based on eight laws so that there are many legal bases for COD data. The basic legal base of COD data is 1930 dated General Hygiene Law, which states that no corpse can be buried without burial licence. Nevertheless, in implementing the pilot study, TURKSTAT and MoH personnel encountered that corpses can be buried without having burial licence. Without having burial licence, punishments to bury deceased person necessitates legal punishment, but in reality these punishments are not applicable. In other words, in the system, it is observed that applications have become rule. Furthermore, according to the law (article 216), the basic responsibility for giving burial licence belongs to certifying practitioners, but in actual situation, since there is lack of certifying practitioners particularly rural areas, this responsibility were shared with other civil servants and particularly *muhtars* play an important role for this task.

It was witnessed that most *muhtars* are only primary school graduates. In the rural areas, *muhtars* make notification for the concerned institutions. Furthermore, it was a difficult job to teach them how a death form can be filled out accurately. Particularly, *muhtars* perception towards collecting COD forms is negative and for them to fill out COD form is meaningless so that they regard this task as drudgery. Furthermore, it is noticed that there are low number of personnel employed at cemeteries. The education level of the cemetery personnel is low, which one of the reasons of not keeping regular records.

In urban areas, there are also important problems for death registration system. Poor hospital archives are a widespread problem. In addition, from the point of view physicians, apart from filling out the COD forms, there are important tasks needed to

be performed. They think that they cannot adequately be interested in alive persons, who need medical care, so that according to them to examine the deceased person is not their primary task. It is not just only related to their heavy work load to try to escape from filling out the COD forms but also medical doctors also have a fear of supervision due to the case of death. Consequently, for medical doctors, filling out the COD form is a dangerous task.

After very briefly summarizing basic problems encountered during the implementation of the pilot study in order to improve the COD statistics, now I will concentrate on suggestions for upgrading COD system in Turkey.

Causes of death statistics are collected, compiled and evaluated very mainly for two reasons. The first reason is to make sure that death is natural so that there is no crime. Secondly, to get the COD information for developing health policies, COD data is one of the most momentous inputs for checking and changing for health policies. In order to have best information on the COD statistics the key personnel is last treating medical doctor of the deceased person. It means that COD form should be filled out by last treating doctor, who probably have best about the causes of death of the deceased person. In addition, to determine exactly cause of death is very difficult task.

In order to show the difficulty for exactly determining causes of death, I will consider two examples. One of them is the 'Goerlitz Autopsy Study' in former East Germany. Goerlitz is a municipality with 78.484 populations in East Germany. This study is unique because 1060 people died during the study in the district and 1023 of deceased people were examined by full autopsy. On the basis of ICD-9, the underlying cause of death tried to be determined by applying the same procedure. Assignment of causes of death was performed independently by the attending clinician and the pathology team who do the autopsy. The data were analyzed through cross-classification of deaths by death certificate diagnosis and autopsy

based diagnosis.[141] Sensitivity and positive predictive values were calculated for the death certificate diagnoses, assuming that autopsy findings represent the correct reference set. Overall, 47 percent of diagnoses on death certificates differed from those based on autopsy and, for 30 percent of the subjects; the difference crossed a major disease category.[142]

The second illustration is a study, which concentrates on the accuracy of death certificates conducted at *Cumhuriyet* University in Sivas in Turkey. The basic purpose of the study is to explore and check inaccurate death reports through examining the deaths occurred at the *Cumhuriyet* University Hospital in 2004. The study utilized the ICD-10 for classification of the mortality cases. The death certificates of 319 deaths events occurred at the university hospital were investigated on the basis of age, sex, accepted clinic, and reported death causes from death certificates and causes written in the hospital files.[143] In addition, according to the study, most of deaths were occurred at 60 years of age or above (53.0 %). According to the study, 17,3 % of deaths occurred in the Central Intensive Unit and the most frequent reported cause of death was cardiopulmonary arrest (52.0 %). The rate of forensic cases was 3.8 %.[144] The fundamental finding of the study is that 52 % of the deaths were reported inaccurately.[145]

In the light of the two illustrations, since inaccuracy is widespread phenomenon for the practice of writing underlying cause of death in COD forms not only just for our country but also for all over the world, autopsy can widely be used for accurately determining underlying cause of death which will probably give important clues to

[141] Dieter Modelmog, Sibylle Rahlenbeck, Dimitrios Trichopoulos *Cancer Causes & Control*, Vol. 3, No. 6 (Nov., 1992), pp. 541-546.

[142] Ibid.,p.541.

[143] Bütün, Celal, Beyaztaş Yücel Fatma, Çelik Muharrem and Kılıççıoğlu Barış (2006) "Defin Ruhsatlarında Belirtilen Ölüm Nedenlerinin İncelenmesi" (The Evaluation of Death Causes in Death Certificates) *Cumhuriyet Üniversitesi Tıp Fakültesi Dergisi* 28 (3):79-83.

[144] Ibid.

[145] Ibid.

determine first event that started chain of the death. Nonetheless, in formal procedure, to make autopsy is not easy work. Even though, autopsy necessitates financial cost and time and in some cases, autopsy gives emotional harm to relatives of deceased person, this option should be considered. Alternatively, it is also reasonable to select samples from deaths, who can represent a good sample with the help statistical calculations to do autopsy to develop health policies in an effective way.

On the basis of new Family Practitioner System, in-service training for medical doctors is crucial to have sufficient information about COD forms and particularly WHO ICD-10 terminology. Parallel with the in service training for medical doctors, basic information about COD data should be taught at medical school. It is also possible to bring a must course in order to introduce basic tenets for accurately filling out COD forms. Moreover, through decreasing the turn-over of medical doctors, it is possible to reach high quality of the COD forms because this decrease will contribute sustainability with regard to high quality record keeping. Even though medical staff particularly physicians are key personnel in death registration system, to increase awareness on the significance of death registration system among public can be beneficial to obtain the best COD forms.

As a rule, the COD forms should be filled out by people, who have a medical background. Nonetheless, it is known that this is not possible particularly for rural areas when the peculiar conditions of Turkey are considered. Henceforth, in rural areas, *muhtars* are the basic source for notification form. It was articulated that concerning the duty of *muhtars* in the death registration system is problematic. They are ignorant and insufficiently trained for filling out the COD forms. Instead of muhtars as an elected (political) person, imams or teachers can be authorized to fill out the COD forms. In the General Hygiene Law (article 219), it is stated that governor or head official of district *(kaymakam)* can authorize a civil servant to give death certificate so that for such a application, there is no need to change legislative procedure of the COD registration system.

It is seen that MoH is determined to improve the COD statistics, so that it has been trying to introduce ICD-10 and a new death certification on the basis of international standards. It is conceivable that in the new Family Practitioner System, family physicians will take an active role in the COD registration system. Family physicians through getting sufficient information about causes of death will fill out the COD forms. It is expected that this new system will also increase the effectiveness of causes of death system in Turkey.

Parallel with these renovations like introducing Family Practitioner System and new COD form, MoH or governorships can establish a unit for deaths occurring outside the hospitals. This unit aimed at determining cause of death should be composed of general physicians with low level of turn over of the physicians. In fact, such a establishment was set up by municipalities under the name of "Hallo Mortuary Service" (*Alo Cenaze Servisi* of which telephone number of the service is 188). If it is considered that most citizens do not know the procedures of mortuary, this service is beneficial. Furthermore, a stable phone number can be assigned for this unit. Thus, when a notification is made to the phone number, the members of unit can go the address stated and try to determine causes of death. After determining cause of death, members of the unit can fill out three- piece death certification form.

Even though these suggestions are important for improving current death certificate system, probably the most radical recommendation is to reduce diversified chain of bureaucratic transactions through changing current scattered legal bases of death certificate system. In other words, a new legislation might be put into force in order to reduce bureaucratic transactions, which brings burden to the relatives of deceased person. Therefore, the whole mortuary transactions such as determining cause of death, transfer of deceased person, burial licence, deleting of birth registers might be done by one responsible institution by filling out one form for name of efficient bureaucracy. On this issue, the current responsible institutions are the Ministry of Interior, MoH, TURKSTAT and municipalities. On the basis of new legislative arrangements, through reaching a consensus on responsible institutions in question, a

new institutional structure can be formed or alternatively municipalities might take a pioneering role in the system.

CHAPTER VI
CONCLUSION:

Taken as a whole, statistics is a response to needs of state. In that manner, at the beginning, parallel with the concept of political arithmetic that aims rational state administration, statistics concentrates on tax collection and conscription for the military. Statistical thought also cannot be evaluated without giving direct reference to social concepts and contexts, which shaped very idea of statistics. Consequently, on the basis of social context and needs of state, statistics has been used unfailing ground for decisions from medical and physical procedures to mathematical and social issues.

Statistics were regarded an invaluable resource for linking seemingly unrelated phenomena in a consistent way. Therefore, statistics focused on the causal relations, which cannot be noticed at the first sight. In that manner, statistics discovered large scale order and regularity in the world. This regularity is seen not only the biological events such as births and deaths but also voluntary and moral issues like crime and suicide. Regularity in the biological processes was used as an ideological tool for shaping society. To illustrate, in the first medical treatise *Natural and Political Observations Made upon the Bills of Mortality (1662)* John Graunt argued that regularity in the death phenomena is a proof for "divine wisdom" in the world. On the basis of the regularity in the moral issues, Adolph Quetelet developed idea of the "statistical law", which assumes these regularities would go on in the future because these regularities grow out of nature of the society, which created the concept of "average man". The average man is significant concept for explaining the universality of the rule of numbers.

Statistics in the Ottoman Empire can be divided into periods, classical period and modern period. In the classical period, the Ottoman Empire collected information for tax collection and conscription for the military. In the modern era, the Ottoman Empire collected information on different areas such as agriculture, industry, education, justice and foreign trade through using modern statistical methods.

Furthermore, the Ottomans held population censuses and issued the statistical yearbook in 1897. Henceforth, the Ottomans left a rich legacy to the Republic of Turkey, which founded "the Central Statistical Department" in 1926. This department is crucial in the nation building process of state elites because this department can be considered as an important step for providing rationalization and legitimization of the polices of the state elites in Turkey.

The State Institute of Statistics collected, complied and analyzed the COD statistics for twenty five (25) the most densely inhabited provincial centres starting from 1931. Since 1957, Turkey has been using the International Classification of Diseases. Currently, cause of death statistics were collected, complied and analysed according to ICD-8.

In the system of health statistics of Turkey, the COD statistics performs a crucial mission because these statistics are the fundamental indicator for status of health of the population. However, the COD statistics are incomplete and poor quality. In Turkey, the COD statistics are compiled and analyzed according to the NUTS 3 so that the COD statistics are not collected from rural areas mainly villages. Many factors contribute to the poor quality of the COD statistics. In rural areas, *muhtars* play key role in the filling out death certificates. Since they do not have any medical background, they cannot accurately fill out the COD forms. They also see this task as a secondary work. In urban areas, COD forms were generally filled out by medical doctors. Nevertheless, medical doctors do not want to be mortuary physician because from the point of view of them, this task is not only burden for them but also dangerous due to legal liabilities. There is also accumulation of some causes of death like cardiopulmonary arrest and respiratory arrest (restrictive pulmonary syndrome). In addition, the COD statistics are collected, compiled and evaluated according to ICD-8 in which there is only underlying causes of death so that contributing factors to death can not collected in Turkey in line with ICD-10.

The COD statistics in Turkey necessitates renovation with regard to notification, certification, classification and analysis. Consequently, Turkey has been

implementing a specific programme called “Upgrading the Statistical System in Turkey”. This programme has provided technical assistance, equipment and training for reaching reliable and timely statistical data. Under the programme, Turkey has been concentrating on the improvement of coverage of the COD statistics, introduction of a new certification form and introduction of ICD-10 by 2009.

This study can be considered beneficial in three fundamental ways. Firstly, this study provides a descriptive understanding for background of the COD statistics through analyzing the literature on the COD statistics. Secondly, this study portrays current practice and deficiencies of death certificate system, which might give important clues for improving current system. Thirdly, probably more significantly, this study recommends that there is an urgent need for better practice on the COD statistics through increasing in-service training for the COD statistics and increasing physical autopsy, which are crucial for getting more accurate COD data.

As a result of this study, even though, introduction of ICD-10 and improvement of the coverage of the COD statistics is vital for upgrading the current death certificate system in Turkey, it is also suggested that they are not sufficient to sort out the current problems of the death certificate system, which mainly stems from legal infrastructure. Consequently, from the point of view of the study, the most appropriate solution for the reaching a well functioning system in the COD statistics is a new legislative arrangement, which might aim to reduce bureaucratic transactions. In that sense, it is conceivable to strengthen the legal power of municipalities, which may play a leading role to reduce red tape in the current death certificate system. Furthermore, it is also recommended that a special unit for the COD data can be established like “Hallo Mortuary Service” (Alo Cenaze Servisi), in which permanent medical doctors might be employed for examining and filling out the COD forms. This system might also provide cost efficiency and reduce time loss. This system might also reach more rapidly to mortuaries through mobile team, in which physicians play a key role.

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APPENDICES

APPENDIX A-CURRENT DEATH CERTIFICATE

REPUBLIC OF TURKEY
PRIME MINISTRY
TURKISH STATISTICAL INSTITUTE

REPUBLIC OF TURKEY
MINISTRY OF HEALTH

COUNTERFOIL

Note: To be retained in responsible organization.

No: **.....**

I-Place where the form is filled out:

a)Province:

.....

b)District:

.....

II-Deceased:

ID Number : ……..

a)Name: .....

b)Surname:

.....

c)Father's name:

.....

d)Mother's name:

.....

e)Age (Completed):

.....

f)Sex:

.....

g)Home address:

.....

.....

.....

h)Cause of death (the main cause):

.....

ı)Date of Death: ..../..../20.....

To be sent to the Turkish Statistical Institute through Health Directorates in the province centers, Health Clinics in the district centers.

I-Place of death:

a)Name of province: .....

b)Name of district: .....

II-Deceased:

ID Number : ……..

a)Name and surname: .....

b)Age (Completed): ....years old

c)Under one year old: ..... months old

d)Under one month old: ..... days old

e)Sex:

☐ Male ☐ Female

f)Permanent residence: ..... Province

☐ Province center ☐ District center ☐ Sub-distrcit or village

g)Marital status

☐ Never married ☐ Married ☐ Widowed ☐ Divorced

h)Education level: **(Ask for 6 years of age and over)**

☐ Illiterate ☐ Literate without a diploma ☐ Primary school ☐ Primary education ☐ Junior high school and equivalent ☐ High school and equivalent ☐ Higher education or university

(Ask for 12 years of age and over)

i) 1: If employed, occupation: .....

2:If not employed, status: **(Mark related box)**

☐ Housewife ☐ Retired ☐ Student ☐ Income recipient ☐ Other

k) Month of death:

01 ☐ January 02 ☐ February 03 ☐ March 04 ☐ April

05 ☐ May 06 ☐ June 07 ☐ July 08 ☐ August

09 ☐ September 10 ☐ October 11 ☐ November 12 ☐ December

l)The main cause of death (write the main cause directly responsible for death) .....

m)To verify death, autopsy:

Is done Is not done

III-Death verified by:

☐ Hospital or Health Directorate ☐ Health Clinic Physician ☐ Municipal Physician

Name of the office permitting the burial of deceased:

ATTENTION: Please, fill out this form after reading explanatory notes on the back.

Official sead and signature

...../...../20.....

To be given to the next of kin.

No. of counterfoil: .....

I-Place where the form is filled out:

a)Province: .....

b)District: .....

II-Deceased:

a)Name: .....

b)Surname: .....

c)Father's name: .....

d)Mother's name: .....

e)Age (Completed): .....

f)Sex: .....

g)Home address:.. .....

.....

.....

h)Cause of death (the main cause):

.....

ı)Date of death: ...../...../20.....

III-Doctor verifying death:

a)Name: .....

b)Surname: .....

Burial of the deceased, name and identity written above, is permitted.

Official seal and signature

...../...../20....

APPENDİX B- GENERAL EXPLANATION OF THE PREVİOUS COD FORM

GENERAL EXPLANATION

The "Death Statistics Form" which is prepared by Turkish Statistical Institute (TURKSTAT) is sent to the Health Organization in the provinces and districts and filled out by municipal officers responsible for issuing burial permits for every death event in provincial and district centers and are sent to TURKSTAT Regional Offices by Health Directorates monthly within the first week of the following month.

Data compiled by this form are only used for statistical purposes and can not be used for any investigation. Those who fill out this form are obliged to give correct answers to the questions.

EXPLANATORY NOTES FOR THE DEATH STATISTICS FORM

I-Write in capital letters name of the province and district where death has occured.

II-Deceased:
ID Number: Write ID number of deceased person.
a-Name and surname:
Write in capital letters.

b-Age:
Write completed age of the deceased in years.

c-Under one year old:
Write age of the deceased in months at the time of death.

d-Under one month old:
Write age of the deceased in days at the time of death.

e-Sex:
For males mark the first box, for females mark the second box.

f-Permanent residence:
It is the place of permanent settlement. Mark appropriate box. Write name of the province of permanent residence. If permanent residence is in another country, write name of the country.

g-Marital status:
Mark appropriate box. **(Ask this question for deceased person 12 years of age over)**

h-Education level:
For those who died illiterate mark the first box, literate without a diploma mark the second box, literate with a diploma mark appropriate box. **(Ask this question for deceased person 6 years of age over)**

(Ask the employed question for deceased person 12 years of age over)

i-1)If employed, occupation:
Write last week's occupation. For example: Physician, dentist, mechanical engineer, shoe seller, yogurt maker, etc. For those who died in military service, write their occupation before military service.

i-2)If not employed, status:
For those who did not have an occupation at the time of death e.g. housewife, income recipient, retired and student, mark appropriate box.

k-Month of death:
Mark appropriate box.

l-Main cause of death:
Write the main cause directly responsible for death.

m-For verifying death, autopsy:
Mark appropriate box.

III-Name of the institution:
Mark appropriate box. Verifying cause of death.