

Lyttkens, Carl Hampus

**Working Paper**

## Health, Economics and Ancient Greek Medicine

Working Paper, No. 2011:7

**Provided in Cooperation with:**

Department of Economics, School of Economics and Management, Lund University

*Suggested Citation:* Lyttkens, Carl Hampus (2011) : Health, Economics and Ancient Greek Medicine, Working Paper, No. 2011:7, Lund University, School of Economics and Management, Department of Economics, Lund

This Version is available at:

<https://hdl.handle.net/10419/259998>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Health, Economics and Ancient Greek Medicine

**Carl Hampus Lyttkens\***

Department of Economics  
Lund University, Sweden

**January 2011**

## **Abstract**

A period of two and a half millennia separates us from the Classical period of ancient Greece. Nevertheless, looking at ancient Greek medicine from the perspective of modern health economics is an interesting endeavour in that it increases our understanding of the ancient world and provides insights into contemporary society. Ancient Greece is rightly famous for pioneering secular and scientific medicine, but equally noteworthy is the prominence of healing cults, such as that of Asklepios. In this paper, the market for secular physicians is illuminated with tools from modern economics, for example the concern for the physician's reputation. The simultaneous emergence in ancient Greece of a scientific and rational approach to medicine and the proliferation of religious medicine provides an interesting vantage point for a study of the current market for alternative medicine. Similar circumstances arguably lie behind the dual nature of the health market that was present then and is still present now. The underlying mechanism in both periods is hypothesised to be increased uncertainty in everyday life.

**Keywords:** health; economics; medicine; ancient Greece; alternative

**JEL classification:** I11; N33

---

\* Corresponding author: Carl Hampus Lyttkens, Professor of Economics, Department of Economics, Lund University, P.O. Box 7082, SE-220 07 Lund, Sweden. [carl\\_hampus.lyttkens@nek.lu.se](mailto:carl_hampus.lyttkens@nek.lu.se)

# 1. Introduction

More than 2000 years separate us from ancient Greece of the Classical period. There are perhaps few areas where the apparent differences between our societies are as striking as in medicine. The great advances in medicine during the last century range from our understanding of the mechanisms involved at the molecular level to high-tech interventions and documentation of the importance of life-style factors. Nevertheless, current economic theory can shed light on the market for medical services in classical Greece. Furthermore, I hypothesize that similar factors account for the double-sided nature of the health market in both ancient Greece and the industrialised world, where religious and alternative medicine coexists with secular and scientific approaches.

## 1.1 Then and now – the setting for the provision of medical services

The intellectual heritage of ancient Greece has been extremely influential in shaping our perceptions of the world. This influence encompasses, for example, politics, literature, art, science and economic life. The Classical period of Ancient Greece (c. 500-323 B.C.) shares many features with modern society, and this is particularly true of ancient Athens.<sup>1</sup>

On the political side, classical Greece witnessed the first formalized democratic institutions (and the first use of the word “demokratia”). The Athenians developed a far-reaching direct democracy, which notably gave rights only to male citizens (excluding foreigners and slaves). It was a remarkable transformation of a traditional oligarchic society. The democratic institutions exhibited remarkable tenacity, and survived in Athens for some 150 years, despite, for example, the defeat in the Peloponnesian war.

The achievements in art and literature are even better known, but will not concern us here.<sup>2</sup> More important for our purpose is the birth of natural science. From Thales and onwards, the Greeks speculated about their natural environment, and made empirical observations in order to enhance their understanding of the world. At the same time, Greece in general, and (yet again) Athens in particular witnessed an increased reliance on market relationships during the Classical period, especially in the fourth century.

---

<sup>1</sup> In this essay, “Greece” is used as shorthand for the areas settled by Greeks in antiquity, i.e. including the coast of Asia Minor, southern Italy etc.

<sup>2</sup> A pity, but there it is. The Apollo statue from the west pediment of the Zeus temple in Olympia – a superb example of the severe style – as well as the archaic Peplos Kore from the Acropolis of Athens are both among my all-time favourite pieces of art.

## 1.2 Then and now – the double-sided market for health and health care

All of this means that ancient Greek society had much in common with the modern world that has evolved since the 19<sup>th</sup> century. At the cross-roads between medicine and economics, several interesting issues present themselves.

In fifth-century Greece, illness was no longer necessarily viewed as bad luck or the influence of evil spirits. Instead, it came to be believed that physicians could diagnose the cause of ill health, and, with the help of empirical observation, suggest a remedy – one that did not necessarily involve an appeal to the Gods. The private practitioner was a common feature in ancient Greek society.

Another similarity across the millennia is the simultaneous presence of secular and religious medicine. A conspicuous phenomenon in classical Greece was that the birth of secular medicine in no way caused the demise of religious medicine. On the contrary, it appears that religious medicine (healing cults) took an upswing around this time. At least, this is the period when several healing sanctuaries, such as the Asklepieion in Epidauros, were established or expanded. To the modern reader this may seem like a paradox at first sight, mainly because we are so used to the successes of scientific medicine (and its disregard for traditional or alternative healing methods).

Closer scrutiny, however, quickly brings the realisation that we have a similar situation in our society today. The fact that we spend some 10-15% of GDP on scientific medicine in the rich OECD countries does not stop the population from making extensive use of so called complementary or alternative medicine.

Furthermore, we who belong to the scientific tribe sometimes forget how widespread religious beliefs are today. In a recent World Values Survey, people in different countries were asked if they believed in a life after death. Arguably somebody who answers yes to that question has a belief that is at least unsupported by modern science. It turns out that such a belief is widespread all over the globe. In the highly secularised Nordic countries around 40% of the population believe in a life after death, and many industrialised countries have shares well above 50% (e.g., the USA 81%, Italy 73%, and the UK 58%).<sup>3</sup>

---

<sup>3</sup> Some Catholic countries come out unexpectedly (?) low, e.g., France 45% and Portugal 47%). Results reported in the daily Swedish newspaper *Sydsvenskan* 2008-11-02.

We note in particular that healing cults have not disappeared from the scene, not even in the western and more secularised society. Visiting a place like Lourdes in southern France is indeed an unforgettable experience.<sup>4</sup> Seemingly endless rows of the sick – in wheel-chairs or on stretchers or on crutches – approach the holy place, light candles, etc., in the hope of being cured. In 1999, the 66<sup>th</sup> miracle in Lourdes was officially acknowledged (400 physicians had failed to find any other explanation for the fact that a man suffering from disseminated sclerosis suddenly became healthy).

In short, the successes and great resources of modern scientific medicine have not eliminated non-scientific medicine nor in particular religious medicine. How should we understand the co-existence (indeed simultaneous thriving) of secular medicine and healing cults in Classical Greece, which is mirrored by the simultaneous presence of scientific, alternative and religious medicine today? We will return to this question in section 6 below.

## 2. The economic background of ancient Greek medicine

In Classical Greece, many people became dependent on the market for their supply of necessary goods. “Extensive specialization of labour made it inevitable that the average Athenian [...] would have dealings with those outside the restricted circle of family, neighbours, and friends. When he bought and sold, he thus had to enter the world of market relations” (Harris, 2002, p. 76). “In bad years most and in normal years many Athenians had to buy their cereals. Aristophanes tells us about a peasant who carries his wine to the market to sell it and buy flour instead” (Hansen, 1987, p. 12). Athens and several other city-states were notorious importers of grain from, for example, the Black Sea region and Egypt (Hansen, 2006).

It is obvious that prices fluctuated with demand and supply, and that people were aware of this. This is clear from several remarks in the comedies of Aristophanes (e.g., people rushing to buy cheap sardines in *Knights* 640ff). Loomis (1998, p. 254) shows that “economic forces of supply and demand are a [...] likely explanation for differences in wage rates across occupations and over time in Athens in the fifth and fourth centuries.”<sup>5</sup>

---

<sup>4</sup> The author witnessed this a summer evening in 1997.

<sup>5</sup> Even Sir Moses Finley found it necessary to point out that Aristotle “knew perfectly well that prices sometimes responded to variations in supply and demand” (Finley, 1970, pp. 13-14). Otherwise, the position associated with Finley is that the ancient economy was “embedded” in other relationships, and that market forces essentially played no independent role (Finley 1999[1973]). There are two problems with this position. Many economic transactions are also embedded in the modern world, so the difference is one of degrees (Lyttkens, 2010a). Secondly, the position is

The growing importance of the market is illustrated by an innovation in language; the word “agora” originally signified public meeting place, but by the middle of the fifth century a new verb, “agorazo”, that is “I buy”, had appeared (Davies, 2007, p. 335).<sup>6</sup>

It is hard to escape the conclusion that the increasing reliance on market relationships gradually changed the behaviour of individual citizens, so that behaviour became more and more economically rational (Lyttkens, 2010a). The Athenians, in particular, are likely to have become more and more like “economic man”. This change in behaviour was mirrored in a change in attitudes towards economic activities. By the fourth century, many prominent citizens had become deeply involved in commercial enterprises. Bitros and Karayiannis (2008) argue that the development towards a market economy was encouraged both by a value system conducive to entrepreneurship and by measures that facilitated private contracting.

### 3. Secular medicine and healing cults in Classical Greece

#### 3.1 Secular medicine

Classical Greece pioneered the development of secular medicine.<sup>7</sup> The two most famous schools were those of Kos and Knidos, the former associated with the most famous physician of all times – Hippocrates. Much of our knowledge of secular medicine in the Classical period comes from the so-called Hippocratic Corpus, which contains material from different schools, authors and periods. Hippocrates himself was probably a contemporary of Socrates (469-399).

While the physicians belonged to different schools, with different theories about illness, they had in common the belief that illness was not connected to the supernatural. Their theories about illness were at the same time often widely off the mark, partly because mortems were not practised on humans at the time. The Hippocratic physicians were famous for prognosis and excelled in clinical observation. Dietetics was used to cure internal disorders but also as preventive medicine. According to the medical doctrine, the whole of the patient should be

---

increasingly being challenged by scholars who do in fact find market forces and market relationships in ancient Greece in the fifth and fourth centuries.

<sup>6</sup>Herodotos, writing after the middle of the fifth century tells us how Cyrus (Persian ruler c. 557-530) replied to a Spartan embassy, “I never yet feared men who have a place set apart in the midst of their city where they perjure themselves and deceive each other,” by which he meant the Greek market place (Herodotos I. 152-53).

<sup>7</sup> I will not discuss whether their practices should be described as truly scientific, or whether that epithet has to wait until the school of Alexandria in the Hellenistic period. Cf. Horstmanshoff (1990).

treated.<sup>8</sup> An important source of medical knowledge was the gymnasium, but that will not be discussed here.

The typical physician in the classical period was like an itinerant craftsman (Edelstein (1987) [1967], pp. 87ff). He travelled from city-state to city-state and offered his services (just like the sophists, who appear in the fifth century as itinerant men of higher education and taught various subjects, most famously perhaps methods of persuasion). The physician received his training through apprenticeship, which he may have had to pay for. A few became body physicians of powerful men. Finally, some cities paid a physician to be their “public physician”.

Particularly famous is the career of the sixth century physician Demokedes: troubled with a harsh-tempered father at Croton, with whom he was unable to live, he left and went to Aegina. Settled there he excelled over all the other physicians. In his second year, the Aeginetans paid him a talent to be their public physician; in the next the Athenians hired him for a hundred minae; and Polykrates (tyrant in Samos) in the next again for two talents.<sup>9</sup> While serving under Polykrates, he was captured and enslaved by the Persians, and later came to be used by the Emperor Darius as his body physician. He managed to escape from the Persians and returned to Croton, but had to leave again towards the end of his life because of political difficulties (Herodotus III: 125-131). In other words, Demokedes experienced all three ways of earning a living mentioned above, as well as being enslaved.

Demokedes was of course exceptional. Some additional wealthy physicians are known (Cohn-Haft, 1956, p. 20 with n. 58) but we have very little information about what the income of an average physician would have been.

### 3.2 Healing cults

To the modern mind, a natural assumption is that there must be a sharp divide between the scientific accomplishments of the ancient Greeks and their religious beliefs, just as we tend to draw such a line between modern scientific medicine and alternative medicine. However such a distinction would have seemed strange to the inhabitants of the ancient world. The physicians in

---

<sup>8</sup> In the third century B.C., the centre of medicine, like so many other sciences, shifted to Alexandria. Great advances were made by scientists such as Herophilus and Erasistratos. They contributed to anatomy, physiology, surgery etc., described the nervous system, and almost discovered the circulation of blood. This development, however, is beyond the scope of this paper.

<sup>9</sup> According to the Attic standard, 1 talent = 60 minae, 1 mina = 100 drachmas, 1 drachma = 6 obols. Towards the end of the fifth century, an ordinary craftsman earned about 1 drachma per day (traditional view).

Classical Greece rejected magic and superstition, but there is no indication they were hostile to religious medicine. They regarded Asklepios as their patron deity and made sacrifices to him. Illness and disease had natural causes but this did not exclude the possibility that divine intervention could cure the disease. Dreams were important at the sanctuaries (cf. below) and the physicians also used dreams in setting diagnosis, just as dreams were used in a variety of situations in the ancient world (Edelstein, 1987 [1967], pp. 241ff; Nielsen, 2003).

Whether or not they believed in Asklepios and other deities, the ancient Greeks had to acknowledge the reports on successful cures that came from the sanctuaries. It cannot be disputed that many people believed that they had been cured by Asklepios.<sup>10</sup>

In many parts of the world today, scientific medicine is not available, so the demand for health care is directed towards traditional healers of various kinds. We can safely assume that in ancient Greece, as in any pre-modern society, a significant portion of the health care needs of the population was taken care of by traditional healers, the wise old woman in the village etc. What is special about ancient Greece is the existence of a highly institutionalised form of religious medicine, and it is only this form that we will deal with in this paper.

The healing cults became a significant feature of ancient Greek society. As noted above, the expansion of the healing cults was preceded by the emergence of rational thought about the universe, beginning with Thales of Miletos. The outstanding representative of religious medicine in ancient Greece was the sanctuary of Asklepios – the Asklepieion. Asklepios gradually replaced Apollo as the God of healing, his cult expanded rapidly in the second half of the fifth century, and in the Hellenistic period he was “universally” recognized (Burford, 1969).

Epidauros and Kos became famous centres for the Asklepios cult in the fifth century. These establishments expanded in the fourth century and many more sanctuaries came into being in the following centuries.<sup>11</sup> The sanctuary in Epidauros dates back to the end of the sixth century (when Asklepios’ recognition as a God began to take off) and was expanded considerably after 370. The Asklepios temple in Epidauros was built around 370, but would have been built earlier if it had not been for shortage of skilled craftsmen.<sup>12</sup> The building cost of this temple was between 23 and 24 talents. The total building activity in Epidauros between c. 370 B.C. and 250 B.C. ran to some 240-290 talents (Burford, 1965). Presumably it was financed partly by public

---

<sup>10</sup> In this study, the possibility that Asklepios existed is not explored. If this is an erroneous assumption, it would be an example of a “No-Good No-God assumption” (Lyttkens, 2009).

<sup>11</sup> Cf., for example, Pausanias guide to ancient Greece.

<sup>12</sup> Burford (1972).



revenue and partly by private donations (Burford, 1969, pp. 81ff). Public revenue in Athens was 400 talents per year in the 340s, and the revenue in Epidauros must have been considerably less.

The cult of Asklepios was established in Athens in 420 and that of the healing God Amphiaraos in Oropos around the same time (Nielsen, 2003). This means that the expansion of healing cults also took place at a time when reliance on market relationships had become an important feature in Athens. The expansion of the healing cults was contemporary with Plato (429-374) and Aristotle (384-322). The proliferation of healing cults was also contemporaneous with the emergence of secular medicine.

Large numbers of patients congregated at the sanctuaries, sometimes staying on for several years. The larger shrines could be equipped with baths and libraries. The treatment usually included the so-called incubation: after some religious preliminaries, the patient was laid to sleep in a special building; either the patient was cured by the morning, or received instructions for the cure in a dream.<sup>13</sup> The cases cured at the shrines range from comparatively trivial matters (migraine) to “hopeless” cases (blind without any eyes). Grateful patients informed other visitors of their good fortune and the successful cures by paying for inscriptions, votive gifts etc (Aleshire, 1992).

## 4 The market for secular medicine

### 4.1 An economic attitude in medicine

For being a pre-modern society, Classical Greece was a rapidly changing one. The archaic and classical periods witnessed institutional changes, including the introduction of written law, formalised political institutions etc. Furthermore, as we saw above, economic life changed and market relationships came to play an important role. Correspondingly, an economic way of thinking must have become more common, in the sense that the common citizen found it natural to seek out economically advantageous transactions, and to expect economically rational behaviour from his fellow citizens (Lyttkens, 2010a).

We see this rational attitude perhaps most clearly in how the Athenians set up their government bureaucracy. It was characterised by extensive audits of anybody who handled public money. The overarching principle behind the extensive rules and regulations was “that absolutely nobody is to be trusted” (Davies, 1994, p. 204, who attributes this characterisation to David Lewis). Similarly,

---

<sup>13</sup> It was also possible to approach Asklepios privately in prayer. The most popular method, however, appears to have been incubation at the temples (Edelstein, 1945, p. 148)

“The Athenians had the characteristic of being honest with themselves about themselves. [...] they went on the basis that, given the chance, every one of them would have his hand in the till and make a profit out of political activity, and they took every possible means to limit the chances” (Hansen 1991, p. 310).

It seems natural to assume that the economically rational attitude carried over to the medical market. Accordingly, when we turn to the ancient testimonies regarding physician practices, we are justified in looking for evidence that the market for medicine was influenced by economically rational behaviour and that it may be useful to apply our economic paradigm.

In general, it is obvious that physicians affect their patients demand for health care – the question is *how* they exert their influence. A substantial literature in health economics is devoted to demonstrating that it would be rational for patients to expect a doctor to be influenced by his own self-interest. Put another way, it is *not* the case that the treatment given to a patient is only a function of the health needs of the patient.

Economists have been preoccupied with showing that physicians change their treatment of patients when the ‘economic environment’ changes, for example when the physician/population density varies. The most well-known issue is whether there exists physician-induced demand (PID), which, in the words of Thomas McGuire (2000, p. 504), can be defined to occur when “the physician influences a patient’s demand for care against the physician’s interpretation of the best interest of the patient.” PID has been notoriously difficult to prove. One of the most convincing cases is the Gruber & Owings (1996) study of caesarean sections in the US, where a 10% reduction in fertility rate in a state was associated with a 0.6% increase in the caesarean section rate. Studies of price changes and ‘natural experiments’ have been relatively more successful in documenting the fact that physician behaviour changes with changing economic incentives (McGuire 2000). Hence the treatment provided to patients by physicians is not purely determined by the health problem of the patient.

## **4.2 Private physicians**

### *Market power and price discrimination*

Let us now apply the modern health-economic tool-kit to the market for physician services in ancient Greece. Secular medicine was mainly practiced by private physicians, typically in the role of itinerant craftsmen, travelling between cities in search of demand for their services. The

travelling physician had to make a living and hence show an interest in money. It has been said that "...physicians wanted to make money and were not ashamed of admitting it" (Edelstein, 1945, p. 175). The medical ethics ordained that he should not be preoccupied by money, but not that he should be *indifferent* to money (Edelstein 1956).

This setting has several implications. Firstly it allowed the physician to serve a larger market than a single city-state (*polis*). Secondly, it reduced the probability that the physician and a particular patient would meet again and, thirdly, a physician would often have had a local monopoly when he came to a city. Even with other physicians present, his situation would have been one of monopolistic competition rather than perfect competition, since patients were unlikely to see different physicians as perfect substitutes and there would have been costs involved in switching between physicians (McGuire, 2000). The same situation – a downward sloping demand curve – would arguably apply if the physician faced competition from healing cults. A physician would presumably have planned to stay in a community until he came to a point when it seemed more lucrative to move to another place (the marginal revenue of extending the volume of his services locally would have been too low).

The features noted above regarding the market for physician services (downward sloping demand curve, potentially no long-term relationship with patients) had several implications for the contract between the patient and the physician. Firstly, there was no price regulation, and with a local monopoly the physician could be free to set the price for his services. In fact, since it is normally not possible to re-sell medical care, the physician could potentially use price discrimination, i.e., charge different prices to different patients. This would have maximised the physician's income for a given level of production. Since the rich would likely have been the ones with the higher willingness to pay, such a strategy could be advertised as charity – "look how benevolent I am – I only charge a small fee to the poor."

This feature of "charitable" behaviour has been noted in connection with the claim by US doctors that they were being charitable when they charged income-related fees (in the pre-insurance days), a proposition that has been challenged but also received some support (Kessel, 1958; Ruffin & Leigh, 1973). In this perspective, it comes as no surprise that we find in the Hippocratic writings a recommendation to the physician that he should adjust his fee to the means of the patient and that it is presented as charitable behaviour:

”I urge you not to be too unkind, but to consider carefully your patient’s superabundance or means. Sometimes you give your services for nothing, calling to mind a previous benefaction or your present reputation.” (Hippocrates, Precepts VI)

The fact that prices fluctuate with demand and supply is obviously common sense and requires no ‘economic theory’, just some powers of empirical observation. The same is true, I would argue, of the insight that you can increase your profits by adjusting your fees to the patient’s ability to pay. Remember that the Hippocratic physicians were famous for their powers of empirical observation.

### *The principal-agent relationship and the importance of reputation*

In any economic transaction there is an element of trust (Arrow, 1972), and so called relational contracts depend on the trust that can be created when parties have repeated dealings with each other. However, there are also elements of rational calculation present, which means that some contracts are unlikely to be efficient or even exist.

We know from the principal-agent literature that important issues in contracting are whether the payment from the principal to the agent depends on the agent’s effort or only on the outcome (the effect of treatment is typically also influenced by factors other than the effort of the agent – “Nature”). Whether the level of payment should be decided before or after the agent has performed his task (cf. below) is also an issue.

Suppose quality of treatment can be enhanced by the physician by expending effort. Effort is costly for the physician though, and never contractible (not verifiable in a court). Assume additionally that patients infer (imperfectly) the physician’s effort from the outcome. Effort is not directly observable because, as noted by Weisbrod (1978), it is not just that it is difficult for the patient to judge the quality of the treatment before the purchase, but also that it is very difficult after the purchase. Ever since the seminal article by Arrow (1963), the asymmetry of information that exists between the physician and his patient is seen by economists as possibly the most salient feature of the health-care market.<sup>14</sup>

---

<sup>14</sup> It is acknowledged that similar conditions exist in many other markets as well, e.g., the market for legal advice, or plumbing. In health care, this asymmetry is regarded as a major factor behind spontaneous solutions such as licensing of physicians, medical ethics, the importance of not-for-profit organisations, etc.

Consider now the possibility that the patient should pay before receiving treatment. Suppose, furthermore, that it is a one-shot game. The latter is a reasonable assumption for many of the contacts between physicians and patients, especially when the physician moves around constantly. If the physician is paid in advance he has no reason to supply any effort (he will betray the implicit trust shown by the patient). The patient, being rational, anticipates this, and backward induction suggests that the patient will not accept paying in advance.

The physician is more likely to supply effort if he has (or expects), for example, repeated dealings with the same patient. Alternatively, the physician may have a reputation to think of, which may lead him to supply more than minimum effort. The Greek city-states were usually small and in close contact with each other; they obviously learned from each other when it came to institutional design. Movement of goods, traders and artisans provided information channels. Hence, it could be useful for the physician to invest in a good reputation by providing effort. The reputation mechanism was more likely to induce effort in communities sufficiently large so that the physician did not have to move to another place. With a stationary physician a prospective patient is likely to be aware of the physician's reputation. Conversely, if he moves around constantly, the benefit from a good reputation would be smaller.

If we make the reasonable assumption that physicians are heterogeneous in their levels of skill, not being known in a community would be relatively advantageous for a low-skill physician. Staying in the same locality can then function as a signal of having great skills.

Instead, suppose now that the payment is decided after the treatment.<sup>15</sup> We can think of this as an implicit contract set up before the treatment. The level of payment can then depend on the effort of the physician, or on the outcome, i.e., the patient's health. If the agreed payment depends on the effort of the physician, the problem is again that this is not verifiable (and not necessarily observable). So if it is a one-shot game, and if the physician has made a great effort, the patient will rationally defect (betray the trust) and only pay a low-effort fee (or nothing at all). The physician – realising this – will again not supply any effort. If the patient instead expects that

---

<sup>15</sup> Postponing payment until after the treatment facilitates price discrimination, as it allows the physician time to get to know the patient and his household. Again it can be given a charitable interpretation:

“For should you begin by discussing fees, you will suggest to the patient either that you will go away and leave him if no agreement be reached, or that you will neglect him and not prescribe any immediate treatment. So one must not be anxious about fixing a fee. For I consider such a worry to be harmful to a troubled patient, particularly if the disease be acute. For the quickness of the disease, offering no opportunity for turning back, spurs on the good physician not to seek his profit but rather to lay hold on reputation. Therefore it is better to reproach a patient you have saved than to extort money from those who are at death's door” (Hippocrates Precepts IV).

he will have repeated dealings with the physician (the latter stays in the community) he may however honour the implicit contract and pay a high-effort fee. Similar problems easily arise if payment depends on the health outcome instead, because it will often be the patient that decides whether there has been any positive effect, again with the “true” effect not being verifiable in court.

Consequently, we would expect the market to be characterised by physicians expending low levels of effort, unless they stayed in the same place for a longer time and/or found it valuable to have a good reputation. The latter was a likely situation, but building a reputation was not necessarily easy in ancient Greece (cf. below).

The outcome may also entail high levels of effort if physicians are altruistic in the sense of caring about the health or utility of their patients. In many health economic models, an argument is included in the physician’s utility function to reflect such preferences. For example, it is frequently assumed that the physician experience disutility from using his discretionary power to manipulate the patient’s demand (Evans, 1974; McGuire, 2000). Finally, the nature of the doctor-patient relationship itself may be conducive to high levels of trust and trustworthiness.

#### *Building a reputation without necessarily curing patients*

Given the level of medical knowledge, it was no easy thing to build a good reputation in ancient times: there were many conditions that the physician could not treat with any hope of success. In that situation, an important possibility was that a physician could build a reputation by being able to diagnose an illness and correctly predict the outcome. Prognosis – emphasised by the Hippocratic School – was a way to signal skill. It essentially served the physician’s concerns rather than the patients’ (Horstmanshoff, 1990). And it would be natural if such a reputation carried over to high-quality care and trustworthiness. The ability to diagnose hopeless cases entailed a double benefit for the physician’s reputation – he showed his own knowledge and avoided giving a treatment that was unsuccessful. Viz.:

”I hold that it is an excellent thing for a physician to practice forecasting. For if he discover and declare unaided by the side of his patients the present, the past and the future, and fill in the gaps in the account given by the sick, he will be the more believed to understand the case, so that men will confidently entrust themselves to him for treatment.” (Hippocrates, Prognostic I)

This seems like good advice in view of the analysis above. It is also more likely that a physician who was regarded as skilful because of his powers of prognosis had greater success with his treatment. This follows because the placebo effect (cf. section 6.2) is apparently affected by “ceremony” and by the doctor’s own beliefs about the usefulness of his cure.

The uncertainty regarding expected efforts and degree of benevolence of the travelling physician means that the famous Hippocratic Oath is naturally interpreted as a signalling and commitment device:

“into whatsoever house I enter, I will enter to help the sick, and I will abstain from all intentional wrong-doing and harm, especially from abusing the bodies of man or woman, bond or free” (Hippocrates, *Oath*).

The physician swears by the Oath that he will not take undue advantage of the patient’s trust. As we noted above, the individual was increasingly involved in market relationships in classical Greece. This entailed, perhaps most importantly, a change in the individual’s your view of fellow citizens. Given the Greek propensity for rationality, there is no reason why this sober view of fellow citizens should not include the physicians. In practice, it seems that it did:

”Just as physicians, you know, by way of building a towering reputation, are want to diagnose insignificant troubles as greater ones and to exaggerate real dangers” (Menander, *Phanium*).

This quote reflects the insight that there are two different ways for the physician to convince the patient that he has made great efforts: either by actually doing so or by convincing the patient that the outcome without the physician’s services would have been very bad.

In summary, both the ancient physicians and their patients seem to have shown considerable interest in the physician’s reputation and this concern makes perfect economic sense.

### **4.3 Public physicians**

Turning finally to the public interventions in secular health care, there was no quality regulation as we invariably have today. The ancients themselves marvelled at (and sometimes deplored) the degree of freedom they had granted to physicians; nothing prevented a person with only

rudimentary training from acting as a physician.<sup>16</sup> Instead, the market had to self-regulate, and the famous Oath may have been part of this as it took a strong stand against certain behaviours which certainly were practised, such as euthanasia and abortion (Edelstein 1987 [1967], pp. 12-13). It helped define just which school of medical thought the physician subscribed to and to bolster his reputation, as noted above.<sup>17</sup>

An intervention that did take place, however, was that occasionally a physician was paid to reside in a particular city (such as Demokedes above). Eventually, payment to a so-called public physician (*demosios iatros*) became a widely spread practice in the Hellenistic period (Cohn- Haft, 1956, p. 7). When this practice was first discovered by modern scholars, it was thought that it had been part of an ancient “welfare state,” and that the public physicians had provided services free of charge to everybody. However, it has since been recognized that there is no evidence that they practiced free of charge, and in fact there is evidence to the contrary.<sup>18</sup> Hiring a public physician was rather like establishing a social health insurance with considerable co-payments.

So the purpose was most probably to persuade the physician to be present in the city, which means that the objective must have been either to secure a supply of medical care or to ensure that the supply came from a highly skilled physician. Cohn-Haft (1956) argues that the most usual reason for hiring a public physician was simply to ensure the residence of a physician in the community. With physicians moving around there was no guarantee that you could get hold of one when you needed him (just as lack of skilled sculptors, masons etc delayed the building of the Asklepios temple in Epidauros for two generations (Burford, 1972)). However evidence also shows that city-states occasionally strove to enlist a highly skilled physician.

In fact, it is likely that hiring a public physician both ensured his presence *and* served to increase the quality of his services. As mentioned above, a good reputation is likely to have been of considerably greater value for a physician who stayed in the same city for a longer period, compared to one who moved around. Thus a contract with a physician to stay in a city made it more profitable for him to invest in a good reputation. In other words, the quality of his services was likely improved by the contract, even if it only stipulated that he was to remain in the city.

At the same time, there is an important difference between availability and quantity supplied. It is not to be taken for granted that paying a physician to stay in a city meant that the *quantity* he

---

<sup>16</sup> Edelstein (1966), Kudlien (1970). Cohn-Haft (1956) argues that the system was sufficiently self-regulating through the apprentice system.

<sup>17</sup> Horstmanshoff (1990). The famous Oath probably reflects the position of physicians associated with Pythagorean ethics (Edelstein, 1987 [1967], pp. 3ff; Phillips (1987) [1973], pp. 114ff.)

<sup>18</sup> Cohn-Haft (1956), Ch. 3, Hands (1968), pp. 134-138, Horstmanshoff (1990).



*supplied* to the citizens increased. He now only produced for his city of residence, which tended to increase the amount of services he provided in the city. Still, a fixed income that did not depend on the quantity of services supplied made the physician better off, and so more able to afford leisure (an income effect). This effect unequivocally reduced his supply of services. Finally, the overall demand for his services would have increased, because his reputation for being highly skilled would have increased (as argued above), which suggests that he could charge higher fees (a substitution and an income effect).

By now it should be obvious that using public revenue to hire a public physician was not necessarily to the benefit of everybody in the community. He would have become more expensive to consult and the quantity supplied may have decreased. This suggests that it would primarily have been the more affluent in the population who would have benefited from his presence, whereas everybody would have felt the opportunity cost of using public funds to pay his salary.<sup>19</sup> This was hardly seen as a problem by the ruling elite in *poleis* ruled by oligarchies (and note that Demokedes moved to Athens when it was ruled by the sons of Peisistratos, i.e., by tyranny). Phrases commending public physicians for treating all who came to him are common in the inscriptions (Cohn-Haft, 1956, p. 37), suggesting that such a practice could not be taken for granted.

In general, the ancient Greek avoided direct taxation of citizens as it was seen as socially degrading. Hence it is noteworthy to find a special “doctors’ tax”, the *iatrikon* (Andreades 1979[1933]). It is usually surmised that this was a head-tax used to finance the services of a public physician.<sup>20</sup>

## 5 The market for healing cults

Usually, the healing cult centres did not charge an entrance fee (Oropos being an exception). However, sacrifices, dedications etc were expected, with the expenditure expected to reflect the affluence of the suppliant. This, again, suggests either price discrimination or charity. In Oropos,

---

<sup>19</sup> In the area of health one could for example point at alternatives such as the construction of water facilities.

<sup>20</sup> Andreades (1979[1933]), pp. 249-250 n. 10, provides an analogous example: in Dubois in Wyoming, a poll tax was used in the 1920s to pay the only physician to stay put. However, it seems that so little is known about the *iatrikon* that it could even have been a tax on doctors instead, just as there were taxes on resident foreigners, freedmen, and prostitutes. One of the few places where we have evidence of this tax is the island of Kos, well-known for its great sanctuary to Asklepios and for being the birthplace of Hippocrates. So one wonders if it was designed to subsidise the services of the physicians or to tax the competitors of the cult of Asklepios.

the thankful patient was expected to throw silver and gold coins into the holy spring (Pausanias I, 34).

Payment after treatment was the norm. This practice may have been facilitated by the fact that organised religion may have been able to achieve a higher success rate than a physician could because the placebo effect was probably stronger, cf. section 6.2 below. Ex post payment would also have been facilitated to the extent that those who came to the sanctuary feared retributions from an angry God if they defaulted on payment. I have assumed that the Gods in question did not exist, but that does not mean that Asklepios did not exist in the patients' view of the world. Edelstein & Edelstein (1945, T. 423: 22) report the following testimony: "Hermon of Thasus. His blindness was cured by Asclepius. But, since afterwards he did not bring the thank-offerings, the god made him blind again."<sup>21</sup>

A high success rate could also help explain that the healing cults achieved a considerable market share despite the disadvantage – compared to the itinerant physician – of patients having to travel to the sanctuary (whereas the doctor would appear on the patient's doorstep). That travel costs were important can be seen in a quote from Plato (Republic): "A carpenter,' said I. 'when he is sick he expects his physician to give him a drug which will operate as an emetic on the disease, or to get rid of it by purging or the use of cautery or the knife. But if anyone prescribes for him a long course of treatment [...] he hastily says that he has no leisure to be sick [...] he bids farewell to that kind of physician, enters upon his customary way of life, regains his health [...] or [...] he dies and is freed from all his troubles."

One should not forget that the sanctuaries were efficient at enhancing their reputations, by votives, inscriptions from satisfied patients etc. A quote from Attic comedy shows that the Greeks were aware that those who administered the organised religion might have had objectives of their own:

”Then to the precincts of the God we went  
There on the altar honey-cakes and bakemeats  
Were offered ...  
There laid we Wealth as custom bids ...  
soon the Temple servitor  
Put out the lights, and bade us fall asleep

---

<sup>21</sup> Asklepios seems to have understood moral hazard effects: "Hush, he [Asklepios] gives to those who desire it, but you do things that irritate and aggravate your disease, for you give yourself up to luxury" (Edelstein & Edelstein, 1945, T. 397).

... And I could catch no slumber ...  
Then, glancing upwards, I behold the priest  
Whipping the cheese-cakes and the figs from off  
The holy table; thence he coasted around  
To every altar, spying what was left.  
And everything he found he consecrated  
Into a sort of sack”  
(Aristophanes, *Ploutos* 659-683)

## 6 The dual nature of the medical market

It is time to look more deeply into the most intriguing aspect of the market for health in Classical Greece – the simultaneous thriving and expansion of religious and secular medicine. This duality still exists in the intellectual descendant of ancient Greece – the western world today.

To clear the ground, it was *not* the case that the healing sanctuaries *solely* represented a convenient dumping-place for ancient physicians so that they could get rid of particularly difficult cases they did not want to treat. We find both trivial cases and complicated ones at the sanctuaries.

In general, there are of course many and complex social, economic, political, psychological etc. factors involved when a religious cult spreads across countries and population groups. For example, in the early days of the *polis*, a function of sanctuaries was that they helped to mark the boundaries of *poleis* and establish territorial rights (Osborne, 1996, 102; Polignac, 1994). In sixth-century Athens, the tyrant Peisistratos fostered public cults probably to reduce the influence of the traditional aristocracy.

Furthermore, sanctuaries had complex relationships with the *polis* economy – they could have public revenue allocated to them, they served as banks in the sense of safe-keeping valuables for governments and individuals, they provided employment, they attracted visitors, the building activities required import of skilled labour, etc.

However, I will focus on the demand side, i.e., what brought the scores of visitors that made healing sanctuaries such prominent features of the ancient Greek society?

### 6.1 A question of income?

Following, for example, the Grossman (1972) model, we would expect individual investments in health and prevention to increase if income from work increases. With increasing wage levels it becomes more profitable to be able to work, and there is also a consumption motive to invest in your health (health directly increases your utility). So one explanation for the expansion could be that living standards improved so that people could afford more of these goods and/or found it more advantageous to make such investments.

That the standards of living have increased tremendously in the last 100 years goes without saying. To take a concrete example, the consumption of living space has increased in Sweden from one room per person in the 1950s to two rooms today (with an average space per person of 44 square meters).<sup>22</sup>

For ancient Greece, Morris (2004, 2005) has estimated that living standards rose by at least 50-100% over the period 800-300. A typical Greek house increased in size by 350%. Furthermore, it seems likely that living standards improved significantly in the fourth century. Scheidel (2010) estimates that the real daily wage in Athens increased from 8-9 litres of wheat in the late fifth century to 13-16 litres in the late fourth century, i.e., by some 50-100%. Even in the absence of major technological progress, productivity could increase as a result of trade, specialisation, better organisation etc.<sup>23</sup>

So incomes increased both then and now, but it seems doubtful that this alone has produced the upsurge in non-secular or alternative medicine in recent years. In Sweden, the number of people who report that they have used herbal remedies or similar products in the previous two weeks increased by more than a factor of 4 from 1980 to 2005, and the proportion who reported that they had gone to see a practitioner of alternative or complementary medicine in the previous twelve months increased by a factor of 5 (cf. table 1). GDP per capita, on the other hand, also increased, but only by a factor of 1.7 (over the same period).

Similarly, temple building was no cheap activity. For example, the great temple in the Asklepieion in Epidauros cost 23-24 talents in the 370s (Burford, 1965), which corresponds to, for example, 500-600 yearly wages, or one sixteenth of the public revenue of the Athenians in the 340s and probably more than 50% of the public revenue of Epidauros itself. The temple was built in a few years and the running costs of the sanctuary remain to be accounted for.

---

<sup>22</sup> *Housing statistics in the European Union 2004* & Persson (2007).

<sup>23</sup> On specialization, cf. Harris (2002). Note in particular that productivity could increase even in the absence of technological advances. It seems that an increased real wage is often ignored as a possibility in the literature, possibly due to the long-lasting influence of Finley (1999[1973]), cf. Lyttkens (2010b).

<b>Table 1: Consumption of herbal remedies and visits to alternative or complementary medicine</b>				
	1980/1981	1988/1989	1996/1997	2004/2005
Have used herbal remedies the last two weeks (%)	4	8	11	17
Have visited a practitioner of alternative medicine the last twelve months (%)	2	8	7	10

Source: Data from *The Swedish Survey of Living Conditions* (ULF)

## 6.2 A question of placebo?

One potential explanation for the success of the healing cults, which should not be overlooked, is the possibility that the “treatment” did in fact make people feel significantly better because of placebo effects (Egense, 1996).

In fact, both the ancient physicians and the healing cults may have had more success with their patients than one would spontaneously assume, given the crude nature of medical knowledge. The placebo effect is powerful. One third of patients will often improve on the basis of placebo alone, and in some cases the proportion with symptom relief can be 75% (Guyatt et al., 1986). It has been found that in gastric ulcer treatments that two sugar pills are less effective than four sugar pills (Goldacre, 2009, 66-67).

A reason why sugar pills work is that there is also what Goldacre calls ‘ceremony’ involved (a nice choice of terminology in view of our theme). It is not just taking pills; it is how they are taken, how often, what colour they are etc. For example, it has been shown that pink pills are better than blue pills in maintaining concentration (op. cit., 68). The value of ceremony is nicely demonstrated when it is shown that injections with salt water are better than sugar pills for, e.g., blood pressure and headaches (op. cit., 69). Note that neither of these two interventions has any physical effect related to blood pressure or head aches. Nor is placebo only a psychological reaction: patients with Parkinson’s disease who receive a placebo treatment show increased release of dopamine in the brain.

Hence a possible interpretation of the success of the healing cults in Classical Greece is that the Greeks inadvertently discovered and made systematic use of the placebo effect and its properties.<sup>24</sup> Among the conditions cured were migraines, ulcers, paralyses, which may all have had a considerable psychosomatic component. So the sanctuaries should perhaps more aptly be denoted Spas with placebo facilities. The pure Spa-effect should not be ignored – it may have been good for people to go to a sanctuary to rest, drink water, read, breathe the air etc. But the placebo effects are by far the most likely candidate for the majority of reported recoveries (under the no-God assumption). Since ceremony seems to be an important part of the placebo effect, it seems likely that treatments at an Asklepieion would have had a greater likelihood of success than treatments administered by a physician. There was clearly more ceremony involved in travelling to a sanctuary, preparing, lying down to sleep in the hall for the incubation etc.

Another aspect of the success of the Asklepios sanctuaries comes from economic psychology. To go to a sanctuary for incubation etc would presumably have been more costly than seeing a physician. The former probably entailed travelling a considerable distance, the cost of sacrifices, votives, etc, and likely exceeded the physician's fee. Furthermore, going to an Asklepieion was not something that could be done without other people knowing about it. This meant that fear of cognitive dissonance would have made people inclined to report to their neighbours and friends that they had been cured by Asklepios. We like to think of ourselves as smart people and admitting to ourselves (and others) that we have made an unwise choice would conflict with that mental image (hence lead to cognitive dissonance).<sup>25</sup> In other words, people who went to an Asklepios sanctuary were unlikely to tell others that it did not help. They were more likely to manifest the smartness of their action by paying for a votive at the sanctuary.<sup>26</sup> These aspects of human behaviour probably gave the healing cults a better reputation than doctors, because seeing a doctor was less costly.

Furthermore, what the doctor says and what the doctor believes have an effect on healing. The patients of doctors who believe they are administering a useful treatment get better than patients of doctors who do not believe so (Goldacre, 2009, 74). This implies, for example, that doctors who acquire confidence by being able to make correct diagnoses are perhaps also more likely to have (placebo) success with their treatments.

---

<sup>24</sup> This means that religious medicine as practiced in ancient Greece could have been an exception to the general result (Bhagwati & Srinivasan, 1986) that organized religious activity (priests, temples, etc) is a waste of resources if it cannot influence heavenly welfare.

<sup>25</sup> On the economics of cognitive dissonance, cf. Akerlof & Dickens (1982).

<sup>26</sup> How many of your friends come back from an expensive vacation and tell you that they had a lousy time?

### 6.3 A question of uncertainty?

A possible factor behind the proliferation of healing cults is that it – at least partly – was a reaction due to a perceived increased uncertainty in the lives of ordinary people. Human beings dislike uncertainty.<sup>27</sup> By this I do not simply mean risk aversion or ambiguity aversion, but a much more fundamental trait. We dislike it when we do not understand the world or what is happening to us and around us. We also dislike it when life is subject to random shocks beyond our control.

A striking similarity between Classical Greece and the 20<sup>th</sup> and 21<sup>st</sup> centuries A.D. is the comparatively high pace of social change. Both are periods of great changes in the lives of ordinary people.

Douglass North famously has noted that “institutions are the rules of the game in a society [...] the humanly devised constraints that shape human interaction” (North 1990 p. 3). If we are lucky, our institutions promote efficient economic behaviour. Less often noted is his observation that the “deep underlying force driving the human endeavour [is] the ubiquitous effort of humans to render their environment intelligible – to reduce the uncertainties of that environment” (North, 2005, p. 4). Over time, North observes, humans have conquered the physical environment. We understand and control Nature. We are (better) able to stop floods (though sometimes our actions cause them), drought no longer leads to famine in certain parts of the world, and so on. At the same time, however, the uncertainty that is generated by human interaction has grown in importance.

*Then*

In ancient Greece, significant advances were made in understanding and controlling nature. Together with the notion and experience that democracy is a Good Thing, this is perhaps the most important part of the intellectual heritage handed to us from this period.

Another important aspect of ancient Greek society is that it seems indisputable that the uncertainty stemming from human interaction increased rapidly. Firstly, there was an increasing reliance on market relationships, coinage replaced barter and coins were struck in small

---

<sup>27</sup> Uncertainty adds to the fundamental existential anxiety that is there in all of us. See also the psychometric literature on risks, which shows that the dread of risks is influenced by several factors other than the probability and size of loss (Slovic, 1987)

denominations useful for everyday use already in the sixth century (Kim 2002). This provided new opportunities, but also new responsibilities. It was no longer satisfactory to farm the land in the same way as previous generations. Furthermore, reliance on the market for necessities meant depending on people you did not know, and market forces that you were unaccustomed to (and perhaps understood poorly).

It is common today to talk about the effects of globalisation, and the ancient Greeks must have experienced something similar. Many came to depend on imports of grain (and sales of their own products). The growing importance of long distance trade was part of an exchange of goods and ideas across the eastern Mediterranean, which increased steadily from the low ebb in political and economic contacts after the fall of the Mycenaean societies around 1200 BC. The political situation was changed by the expansion of the Persian Empire in the sixth century, and the Persians became a power in Greek politics for many years to come. In the middle of the fourth century, Macedon took on the role of an imperialistic aggressor. Economically, with increasing trade across the Aegean and the Mediterranean and up to the Black sea, events in many different parts of the world could suddenly affect living conditions in Greece.

In brief, the world became more uncertain in the domain of human interaction. Important factors were less and less under your control. The ordinary farmer probably also found it more difficult to comprehend what was going on.

When you are rapidly being deprived of the possibility of acting in an unreflective and traditional way, and increasingly have to take responsibility for choosing your line of work, for choosing a trading partner etc, you experience escalating demands on your capacity for rational choice. In addition to being unpleasant, such a situation with high demands and low level of control causes harmful stress, as social epidemiology has shown.

In such a situation, we would expect individuals to try and find ways to self-insure (reduce the probability of loss) and self-protect (reduce the size of loss) (Ehrlich & Becker, 1972), but also to find ways to make life less demanding and increase their control over the situation.

An obvious way to mitigate the increase in uncertainty is through religion, because religion usually offers both an explanation of the world and also ways of affecting your own situation and prospects (prayers, sacrifices etc.). In this perspective, it comes as no surprise that there was an increased interest in individualised religions (often imported) in Classical Greece and the healing cults were a part of that development. The healing cult entailed a direct relationship between the



suppliant and the God, and seemed more likely to provide comfort and mitigate the increased uncertainty compared to the traditional Olympian cults.

There were also secular solutions being marketed. In the fourth century, the cynics, such as Diogenes, taught that you should strive for independence and self-restraint, and that you would achieve freedom by learning to make do with little. Later stoicism is a particularly conspicuous example (if somewhat outside our period) of the search for ways of handling the increased uncertainty and associated anxiety.

### *Now*

Looking at our own time through the lens provided by the ancient Greek experience, we note that one of the most important trends of the 20<sup>th</sup> century was the individualisation of society (Beck, 1994). In many ways, the individual came to be expected to take responsibility for her future, for her education, occupation, pension, health, lifestyle, habits, marriage, children, children's education etc. For large groups in society, this was a marked change compared to the previous situation when most individuals expected to work in the same occupation as their fathers, live in the same community, eat the same kind of food etc. If the pace of change was unprecedentedly high in classical Greece, it was still nothing compared to the present. To this we must add the rapid technological development, which represents new opportunities, but also new demands on your abilities. If you cannot use a computer, you will likely be out of a job; if you do not have the latest software you lose in social standing etc.

This process has entailed a change in emphasis away from unreflective habits as a decision process to more consciously calculated decisions. This increasing emphasis on explicit decision making is relatively well suited to those with ample resources, but it is an uncomfortable phenomenon for those less fortunate.<sup>28</sup>

Another important current trend, as mentioned above, is globalisation in economic, political and social terms. While this seems to have several beneficial effects overall (Bergh and Nilsson, 2010), it also means that we are now affected by wars in regions of the world our grandfathers had never heard of, by poor banking practices in the USA, by crop failures in the coffee plantations in Brazil, etc. Not only has the pace of change quickened, but, due to the new ways of spreading information, we are also aware of the changes to a much larger extent than before. Information

---

<sup>28</sup> Lindbladh & Lyttkens (2002). Obviously everybody uses habits to a great extent; otherwise life becomes unmanageable (Hodgson, 1997).

of all kinds is nowadays only an iPhone away (and there is sure to be an App for it). We are continuously being made aware of how much we depend on factors totally beyond our control.

For the affluent, these changes may be construed as improvements. It frees the individual from the constraints associated with upbringing and tradition, and enables her to freely choose a life career. It could equally be seen as a burden, as a source of anxiety, and as a loss of control over the situation. This is particularly the case for all those who do not have sufficient resources to engage themselves in explicit calculated decision making. Without sufficient resources, they have to accept that they no longer have the comfort of habitual behaviour as a sufficient and acceptable guide in life. The multitude of choices merely cause stress (high demand – low control) and manifest their lack of control over their lives.

Faced with these changes, the individual will seek comfort and ways to reduce the associated uncertainty. One strategy is to cling to old habits even if they have become dysfunctional. Acting in accordance with a habit is an important way to feel comfort (Lindbladh & Lyttkens, 2002), and probably the only way remaining for those with few resources, who feel that it is a waste of resources to engage in explicit decision making.

Another strategy is to try to turn new behaviours into habits: “I try to make a habit out of it, so it feels nice” as an interviewee said when asked how he dealt with the current demands of choosing a healthier life-style (Lindbladh & Lyttkens, 2002). One coping strategy is alcohol consumption. A very clear example of what increased freedom of choice may do to a population that lacks the means to take advantage of this freedom is the post-iron curtain experience in the former communist countries. In several cases, mortality has escalated, supposedly because of the stress and accompanying use of alcohol (Ajus, 2010). Obviously there are several contributing reasons for this trend in mortality; for example, many have lost their jobs, but I would argue that the overall anxiety in the new ‘free market’ is an important contributory reason for the development of mortality.

Incidentally, on a speculative note it is not unlikely, given that many people find comfort in eating, that the search for comfort is a major factor behind the “epidemic” in obesity that is present across the industrialised world; obesity is increasing in all countries albeit at different levels. Similarly, Offer et al. (2010) suggest that “market liberal countries have an environment of greater economic insecurity” which leads to stress (social or financial), which then leads to overeating and obesity.

Just as in antiquity, however, religion in various forms offers control and comfort. The traditional religions maintain a strong following in many countries, and less traditional groups of various kinds seem to find new disciples. The different creeds usually have in common the fact that they offer an explanation of what is going on in society, and more importantly provide a way to influence the future of the believers.

The modern world has not been very successful in dealing with the kind of uncertainty that has been increasing steadily. In Sweden we provide more and more legislation to ensure that everybody is treated equally, and a great many ‘dangerous’ activities are being prohibited, but that probably only makes individuals badly equipped to deal with any kind of failure or setback in life (Eberhard , 2009[2006]). The impression one gets from the ancient evidence is that the Greeks of the Classical period were more to the point than we are, when they helped establish comfort centres in the form of sanctuaries for healing cults.

#### **6.4 The view of the world?**

There is one final observation from the New Institutional Economics that suggests itself in this context. We have already touched upon the importance of the individual’s view of the world, namely with respect to how the increased reliance on market relationships likely influenced not only the individual’s own behaviour but also what kind of behaviour he expected from others. We may assume that the individual is self-interested and rational, but how that attitude translates into behaviour depends on how the individual believes the world to function.

In contemporary society, the possibilities of controlling ”nature” and the advances in scientific medicine may have produced a view of the world that is overly optimistic. It seems to me that the tremendous progress in modern medical technology has fostered an expectation among the citizens that *any* illness can be cured. This is obviously an erroneous belief – an incorrect view of the world. Nevertheless, a belief that any illness ought to be “curable” may easily make people turn to alternative medicine in some situations when they are dissatisfied with the prospects offered by scientific medicine. It seems less obvious that this was a factor behind the medical market in ancient Greece; something similar may conceivably have occurred though as a function of the de-mystification of nature.

If I am right, this would not be the only situation where technological advances make people believe that anything can be accomplished. What springs to mind is the Swedish minister Ines

Uusman, who commented upon the unsuccessful attempts to drill a railway tunnel through a mountain ridge in southern Sweden. She expressed confidence that the tunnel would soon be ready – after all, she said, if we can put man on the moon we ought to be able to build a tunnel. This was said in the early 1990s, when the estimated costs were SEK 1.2 billion and the job was planned to be finished by 1995. Today (winter 2010) the tunnel is expected to be ready in 2015, and the estimated costs now exceed SEK 10 billion.<sup>29</sup>

## 7. Concluding remarks

Market relationships and, with them, economically rational behaviour gradually became more important in ancient Greece in the Classical period. Consequently, it comes as no surprise that modern health economics and principal-agent theory help us understand the functioning of the medical market in antiquity, such as the importance of reputation and the usefulness of paying a doctor to stay permanently in your city.

The similarities between then and now include the concomitant development of secular and scientific medicine on the one hand, and a proliferation of healing cults and alternative medicine on the other. In economic terms, secular medicine and healing cults seem to have been complements rather than substitutes. There are many factors involved in this development, but a common and important theme – despite the 2500 years that separates us – is our need to feel that the world is comprehensible and predictable. Both Classical Greece and modern society have witnessed a considerable growth of uncertainty in people's everyday lives, an uncertainty that stems from human interaction. Individuals are trying to find ways to mitigate this uncertainty. Science helps us conquer nature, but has not helped with uncertainty from other sources.

Looking at the ancient world from the vantage point of health economics is useful, as is looking at contemporary trends through the lens provided by the ancient societies.

## Acknowledgement

Helpful comments from the participants in the conference *Economics, Politics and Ethics in the light of intellectual inheritance of Ancient Athens* (Delphi, September 2010) are gratefully acknowledged. I am

---

<sup>29</sup> So far the project has killed fish, drained wells, poisoned construction workers and agricultural land, etc. It seems that the ancient Greeks were more successful, *vide* Polykrates' tunnel project on Samos in the 6<sup>th</sup> century B.C.

grateful to Lina-Maria Ellegård for providing the data for Table 1. This research has received financial support from the Gyllenstiernska Krapperup Foundation.

## References

- Ajus, F. (2010). Alcoholics and workaholics. Premature male mortality as a reaction to economic crisis. Master's thesis. Department of Economic History, Lund University.
- Akerlof, G.A., & Dickens, W. T. (1982). The economic consequences of cognitive dissonance. *The American Economic Review* 72, 307-319.
- Aleshire, S. B. (1992). The economics of dedication at the Athenian Asklepieion. In: Linders, T., Alroth, B. (eds.), *Economics of cult in the ancient Greek world*. Uppsala: Acta Universitatis Upsaliensis.
- Andreades, A. M. 1979 [1933]. *A History of Greek Public Finance*, New York: Arno Press.
- Arrow, K. (1963). Uncertainty and the welfare economics of medical care. *The American Economic Review* 53, 941-73.
- Arrow K. (1972). Gifts and exchanges. *Philosophy and Public Affairs* 1, 343–62.
- Bhagwati, J. N. & Srinivasan, T. N. (1986). Religion as DUP activity. *Public Choice* 48, 49-54.
- Beck, U. (1994). *Risk society. Towards a new modernity*. London: Sage Publications.
- Bitros, G. C. & Karayiannis, A. D. (2008). Values and institutions as determinants of entrepreneurship in ancient Athens. *Journal of Institutional Economics* 4, 205-230.
- Bergh, A & Nilsson, T. (2010). Worth living for? On the relationship between globalization and life expectancy. Forthcoming in *World Development*.
- Burford, A. M. (1965). The economics of Greek temple building, *Proceedings of the Cambridge Philological Society*, 21-34.
- Burford, A. (1969). *The Greek temple builders at Epidaurous*. Liverpool: Liverpool UP.
- Burford, A. (1972). *Craftsmen in Greek and Roman society*. London: Thames and Hudson.
- Cohn-Haft, L. (1956). The public physicians of ancient Greece. *Smith College Studies in History*, Vol. 42. Northampton MA.
- Davies, J. K. (1994). Accounts and accountability in ancient Athens. In: Osborne, R., Hornblower, S. (eds.), *Ritual, finance, politics*. Oxford: Clarendon Press, 201-212.
- Davies, J. K. (2007). Classical Greece: production. In: W. Scheidel, M. Morris, & R. Saller (eds.), *The Cambridge Economic History of the Greco-Roman World*, pp. 333-361.
- Eberhard, D. (2009[2006]). *I trygghetsnarkomanernas land*. Mån-pocket.
- Edelstein E. J. & Edelstein, L. (1945). *Asclepius Vol. I, Collection of the testimonies*. Baltimore: Johns Hopkins University Press.

- Edelstein, L. (1956). The professional ethics of the Greek physician. *Bulletin of the History of Medicine* 30. Reprinted in Edelstein (1987) [1967], 319-348.
- Edelstein, L. (1966). The distinctive Hellenism of Greek medicine. *Bulletin of the History of Medicine* 40. Reprinted in Edelstein (1987) [1967], 367-397.
- Edelstein, L. (1987) [1967]. *Ancient Medicine, Selected papers by Ludvig Edelstein*, Tomkin, O. & Tomkin, C. L. (eds.). Baltimore: Johns Hopkins University Press.
- Edelstein, L. (1945). *Asclepius Vol. II. Interpretation of the testimonies*. Baltimore: Johns Hopkins University Press.
- Egense, E. (1996). Miraklerne i Epidaurus – en naturlig förklaring? *Sfinx* 3, 118-121.
- Ehrlich, I., Becker, G. (1972). Market insurance, self-insurance, and self-protection. *Journal of Political Economy* 80, 623-648.
- Evans, R.G. (1974). Supplier-induced demand: some evidence and implications. In: Perlman, M. (ed.), *The Economics of Health and Medical Care*. Macmillan.
- Finley, M. I. (1970). Aristotle and economic analysis. *Past and Present*, No. 47, 3-25.
- Finley, M. I. (1999) [1973]. *The Ancient Economy*. London: Chatto & Windus.
- Goldacre, B. (2009). *Bad science*. London: Fourth Estate.
- Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy* 80, 223-255.
- Gruber, J. & M. Owings (1996). Physician financial incentives and Cesarean section delivery. *RAND Journal of Economics* 27, 99-123.
- Guyatt, G. et al. (1986). Guidelines for the clinical and economic evaluation of health care technologies. *Social Science and Medicine* 22, 393-408.
- Hands, A. R. (1968). *Charities and social aid in Greece and Rome*. London: Thames and Hudson.
- Hansen, M. H. (1987). *The Athenian Assembly*. Oxford: Basil Blackwell.
- Hansen, M. H. (1991). *The Athenian Democracy in the Age of Demosthenes*. Oxford: Basil Blackwell.
- Hansen, M.H. (2006). *The shotgun method. The demography of the ancient Greek city-state culture*. Columbia: University of Missouri Press.
- Harris, E. M. (2002). Workshop, marketplace and household. In P. Cartledge, E. E. Cohen, and L. Foxhall (eds.), *Money, Labour and Land*. Abingdon: Routledge, 67-99.
- Hodgson, G.M. (1997). The ubiquity of habits and rules. *Cambridge Journal of Economics* 21, 663-84.
- Horstmanshoff, H. F. J. (1990), The ancient physician: craftsman of scientist? *The Journal of the History of Medicine and Allied Sciences* 45, 176-197.

- Housing statistics in the European Union 2004* (2005). National Board of Housing, Building and Planning, Sweden, and Ministry for Regional Development of the Czech Republic. Karlskrona: Boverket.
- Kessel, R. (1958). Price discrimination in medicine. *Journal of Law and Economics* 1, 20-53.
- Kim, H. S. (2002). Small change and the moneyed economy. In P. Cartledge, E. E. Cohen, and L. Foxhall (eds.), *Money, Labour and Land*. Abingdon: Routledge, 44-51.
- Kudlien, F. (1970). Medical ethics and popular ethics in Greece and Rome. *Clio Medica* 5, 91-121.
- Lindbladh, E. & C. H. Lyttkens (2002). Habit versus choice: the process of decision-making in health-related behaviour. *Social Science & Medicine* 55, 451-465.
- Loomis, W. T. (1998). *Wages, Welfare Costs and Inflation in Classical Athens*. Ann Arbor: The University of Michigan Press.
- Lyttkens, C. H. (2009). Why the econometrician is in good spirits - a workshop through the looking glass. *The European Journal of Health Economics*, 10, 239-242.
- Lyttkens, C. H. (2010a). Institutions, taxation, and market relationships in ancient Athens. *Journal of Institutional Economics* 6, 505-527.
- Lyttkens, C. H. (2010b). Tankemönster som inspirationskälla. In: Faegersten, F., Wallensten, J., Östenberg, I. (eds.), *Tankemönster. En festskrift till Eva Rystedt*. Kristianstad, 133-136.
- McGuire, T. G. (2000), *Physician agency*. In Culyer, A. J. & J. P. Newhouse (eds.), *Handbook of Health Economics Vol. 1A*. Elsevier: Amsterdam, 462-536.
- Morris, I. (2004). Economic growth in ancient Greece. *Journal of Institutional and Theoretical Economics* 160, 709-742.
- Morris, I. (2005). Archaeology, standards of living and Greek economic history. In: J. G. Manning & I. Morris (eds.), *The Ancient Economy. Evidence and Models*. Stanford: Stanford UP, 91-126.
- Nielsen, L. E. (2003). *Helbredelse i Amphiareion Oropos. Speciale*, University of Southern Denmark, Odense.
- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. New York: Cambridge UP.
- North, D. C. (2005). *Understanding the Process of Economic Change*. Princeton: Princeton UP.
- Offer, A., Pechey, R., Ulijaszek, S. (2010). Obesity under affluence varies by welfare regimes: The effect of fast food, insecurity and inequality, *Economics and Human Biology* 8, 297-308.
- Osborne R. (1996). *Greece in the Making 1200-479 BC*. London: Routledge.
- Persson, M. (2007). Bostadspolitiken. In Hultkrantz, L. & H. T. Söderström (eds.), *Marknad och politik*. Stockholm: SNS Förlag, 276–303.



- Phillips, E.D. (1987) [1973]. *Aspects of Greek medicine*. Beckenham: Croom Helm.
- Polignac, F. de (1994). Mediation, Competition, and Sovereignty: The Evolution of Rural Sanctuaries in Geometric Greece. In: Alcock, S. E. and R. Osborne (eds.) *Placing the Gods. Sanctuaries and Sacred Space in Ancient Greece*, pp. 3-18. Oxford: Clarendon Press.
- Ruffin, R. J. & Leigh, D. E. (1973), Charity, competition, and the pricing of doctors' services. *Journal of Human Resources* 12, 482-502.
- Scheidel, W. (2010). Real wages in early economies. *Journal of the Economic and Social History of the Orient* 53. 425-462.
- Slovic, P. (1987). Perception of risk. *Science* 235, 280-285.
- Weisbrod, B. A. (1978). 'Comment on M. V. Pauly', in Greenberg, W. (ed.), *Competition in the health care sector*, Federal Trade Commission, Germanstown.

### **Ancient sources**

- Aristophanes, *Knights, Ploutos*, in Aristophanes, Vols. I-II. The Loeb Classical Library. London: Harvard UP, 1992, 1991.
- Herodotos I, III, in Herodotus Vol. I-II, The Loeb Classical Library. London: Harvard UP, 1990, 1982.
- Hippocrates, Vols. I-II, *Precepts, Oath, Prognostics*, The Loeb Classical Library. London: Harvard UP, 1974, 1981.
- Menander, *Phanium* (fragment). The Loeb Classical Library. London: William Heineman Ltd, 1959.
- Pausanias, *Guide to Greece* Vol 1-2. Harmondsworth: Penguin Classics, 1979.
- Plato, *Republic Vol. I*. The Loeb Classical Library. London: William Heineman Ltd, 1946.