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**THE POSITION OF HOSPITALS
IN THE FINNISH HEALTH CARE SYSTEM:
AN HISTORICAL APPROACH**

TONI SAARIVIRTA & DAVIDE CONSOLI & PIETER DHONDT

University of Tampere
Research Unit for Urban and Regional Development Studies

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The position of hospitals in the Finnish health care system: An historical approach

Toni Saarivirta^a & Davide Consoli^b & Pieter Dhondt^c

Abstract. The purpose of the paper is twofold. First, it seeks to appreciate key events in the development of the Finnish health system and in particular those of the hospital system over the last two centuries. In doing so, the paper analyses the mutual influence of the emergence of new organisational and clinical routines underpinning the delivery of health care, the evolution of a body of medical scientific knowledge, and the training of medical doctors. The second objective of the paper is to recount one aspect of this evolutionary process by focusing on university hospitals, a specific type of organisation which emerged in the post-war period.

Keywords: evolution of Finnish health care system, emergence of organisational and clinical routines, training of medical doctors, university hospitals

INTRODUCTION

The transition from pre-modern to modern medicine started in the first half of the nineteenth century. The dominant approach to health care before 1850, at least in Finland, was less interventionist in the face of grave illness, and the popular ethos was very much ‘God gives and God takes’. Startling discoveries in chemistry and laboratory techniques and equipment during the nineteenth and twentieth centuries – Pasteur’s theory of micro-organisms, Koch’s breakthroughs in bacteriology, Röntgen’s invention of the X-ray and the electrocardiograph, to name but a few – contributed to the replacement of old notions and approaches in the field

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- a Research Unit for Urban and Regional Development Studies (Sente), University of Tampere, Finland
 - b Manchester Institute of Innovation Research (MIOIR), Manchester Business School (UK) and Institute of Innovation and Knowledge Management (INGENIO, CSIC-UPV), Valencia (Spain)
 - c Department of Foundations of Education, Ghent University (Belgium) and Department of History, University of Helsinki (Finland)

of medicine. Such advances also point to a narrowing between medicine as a body of science and an area of professional practice. In this fundamental sense the emergence of bacteriology and virology represented a dramatic transformation of the knowledge base, not only in terms of scientific novelty, but also in terms of the pressure exerted on the way in which health care is understood, organised, applied and transferred over time and across areas of medical practice.

The purpose of the paper is twofold. First, it seeks to appreciate key events in the development of the Finnish health system and in particular the hospital system over the last two centuries. In doing so the paper analyses the mutual influence of the emergence of new organisational and clinical routines underpinning the delivery of healthcare, the evolution of a body of medical scientific knowledge, and the training of medical doctors. A staple of our argument is that these independent, yet highly complementary, dimensions are strongly interwoven in the long-term trajectory of medical know-how. Against this background we analyse the functional role of hospitals, their origins and the reasons behind their transformations in the service of a changing Finnish health care system (HCS). The second objective of the paper is to recount one aspect of this evolutionary process by focusing on university hospitals, a specific type of organisation which emerged in the post-war period. In particular we aim at elucidating the origins of their emergence vis-à-vis the changing background of health science and health care delivery in the context of the Finnish HCS.

The paper begins with an historical background of health care needs and setting in Finland during the nineteenth and twentieth centuries. The next two sections concentrate on the origins of the national hospital infrastructure and the final section looks at the current health challenges with which the Finnish system is confronted, and brings us to our conclusion.

THE ESTABLISHMENT OF CLINICS AND HOSPITALS IN REPLY TO CHANGING ATTITUDES IN MEDICAL TREATMENT AND TRAINING

When the Royal Academy of Turku was founded in 1640 by Queen Christina of Sweden its main function was the training of priests and civil servants. Indeed, a faculty of medicine was included from the start and expectations ran high at its inauguration. It was intended that ‘the medical faculty would become equal to Padua, Freiburg, Strasbourg and Paris’.¹ In practice, however, only one chair was established, offering theoretical lectures on medical treatises from the classics. It took more than a century before the first Doctor of Medicine graduated from the Turku Academy. Until 1750 the only academically trained physician in Finland was the professor of medicine at the university.

Very late from a European perspective, medicine became one of the crucial interests of the university. Decisive were the low social status of physicians and the lack of prestige of medicine in general.² The change of power in 1809, when Finland became a (autonomous) part of the Russian empire, did not directly result in a different policy in this respect. From the introduction of the civil service examinations in 1817, the Academy of Turku became an institution almost exclusively in the service of the national (Finnish) state, with the training of civil servants as its main duty. Certainly, with the move of the university from Turku to the

1 Tommila and Korppi-Tommola (eds) 2006, p. 304.

2 von Bonsdorff 1975, p. 266.

capital of Helsinki in 1828, building up the nation became even more explicitly the task of the university. The location of the new Imperial Alexander University on Senate Square was significant, with the government residing on the opposite side of the square, whilst next to it stood the imposing cathedral. Supported by the Russian government, the university had to explore the indigenous Finnish culture in its broadest sense, to the disadvantage of the study of medicine.³

Revealing in this respect is the development of the number of professorial chairs. Until the end of the 1860s, a clear dominance of human sciences prevailed (see Figure 1). Gradually the balance between the number of lecturers at the different faculties and departments improved, but the humanities continued to outnumber the other disciplines after independence in 1917. At that time, only eight permanent professors were attached to the faculty of medicine in Helsinki. Two years later, Finland established its second university, but it took until 1943 before a medical faculty completed this institution. Priorities were on quite a different level. It became a major task of the university in Helsinki, and of history and jurisprudence faculties in particular, to answer the question of how Finland had matured to the unexpected situation of independence. In medicine, extensive resources were devoted to the study of the origins of Finns.⁴

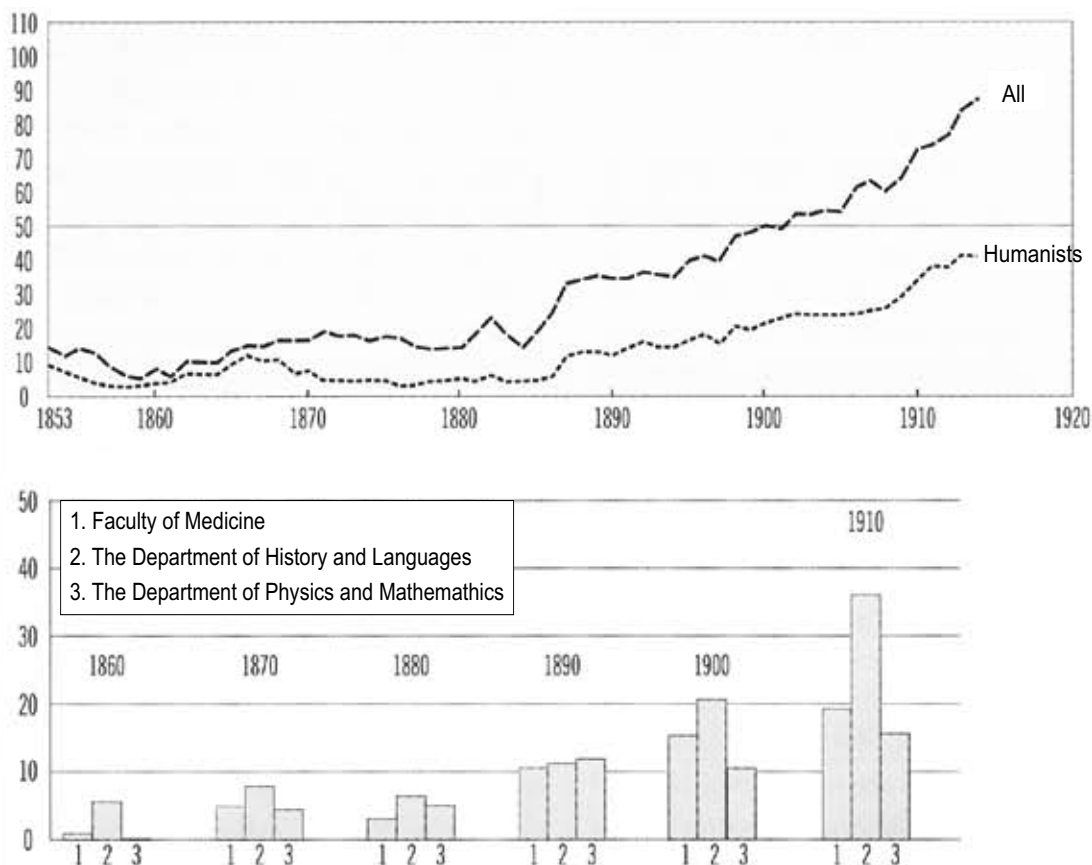


Fig 1. The development of the number of lecturers and professors at the University of Helsinki between 1853 and 1914 and the ten-yearly development of their numbers in the largest faculties.⁵

3 Dhondt 2008, pp. 99-126.

4 Tommila and Korppi-Tommola (eds) 2006, p. 74 and 309.

5 Tommila (eds) 2002, p. 62.

The lack of physicians was marked. At the end of the eighteenth century, Josef Pipping, professor of gynecology, argued that it was difficult to find a civilised country that lacked physicians as much as Finland.⁶ In 1776 there was only one doctor of medicine per 51.000 people. This number improved slowly to one academically trained physician per 41.000 people in 1800, but by the end of the nineteenth century, only five to ten students were graduating every year in medicine.⁷ From the beginning of the twentieth century the ratio of physicians to the general population improved steadily.

A crucial factor in this process of attempting to attract more medical students was the growing awareness around 1800 of the exceptionally high death rates in Finland in comparison with neighbouring countries.⁸ The main cause was the lower level of hygiene in Finland.⁹ The assumption that 'God gives and God takes' was extremely common. The attitude towards health was very different from today's, and patients were somewhat fatalist about such matters. Infections were believed to spread only through the air and not through touching.¹⁰ In consequence, surgeon's clothing was not cleaned or washed between operations on different patients. The legendary cutting dress of Jakob Estlander, professor of surgery, could even 'stand by itself' because of old, dried blood and tissue fluids which had made the dress like a harness.¹¹

Therefore it is not surprising that infectious diseases were the most common causes of death in Finland in the first half of the nineteenth century, especially cholera and typhoid fever around 1800, and tuberculosis and dysentery around 1850 (see Table 1). Certainly, the high mortality of babies and children worried the authorities, and resulted in increasing attention to the training of midwives (in a special school which was founded in Turku in 1816) and in the early introduction of gynecology and obstetrics at the university (in 1784).¹²

6 Pesonen 1980, p. 667.

7 Pesonen 1980, p. 7.

8 Figures are available for 1880 when the mortality in Sweden and Norway was about 16.6 and 17.8 per mille, against 22 per mille in Finland.

9 Harjula 2007, pp. 16-18.

10 Harjula 2007, p. 16.

11 Ignatius 2000, p. 510.

12 Pesonen 1980, p. 7.

Table 1. The commonest causes of death in Finland in the 1850s¹³

Cause of death	Mortality
Infectious diseases	20 000
- tuberculosis	4 300
- dysentery	4 300
- typhoid	2 600
- whooping-cough	2 400
- measles	1 300
- scarlet fever	1 200
- smallpox	1 100
- diphtheria	700
debility	4 100
accidents	1 200
drowning	600
sudden infant death	570
other diseases	14 000
others, not diagnosed	6 700
Total	47 000

Other medical fields, viz. surgery and pharmacy, were taught to university level in Finland much earlier than elsewhere in Europe. By the end of the eighteenth century, the training of physicians and surgeons was clearly separate in Finland, as in the rest of Europe. Surgeons were considered as craftsmen. They were trained at the (vocational) *Collegium Medicum* and formed their own guild, whereas physicians received a much more theoretical education focusing on internal diseases.¹⁴ Largely because of the growing awareness that internal and external medicine could no longer be divided completely, the so-called minor medical schools for surgeons gradually disappeared during the first decades of the nineteenth century. Only in France and in countries within France's range of influence, such as the Low Countries, did the distinction between these classes of medical practitioners survive a little longer, until around 1850.

The University of Helsinki had taken the same initiative almost ten years earlier, viz. in 1840, but in fact the integrated doctoral degree in medicine and surgery was already in existence by the middle of the 1820s. At that time the Finnish *Collegium Medicum* had abolished the examination to obtain the degree of 'master in surgery', which they organised themselves. In consequence, all medical practitioners were educated at the university, receiving a medical training with considerable emphasis on surgery.¹⁵ This re-orientation of training draws attention to the fact that professional practice is not static but rather evolutionary in

¹³ Ignatius 2000, p. 508; These statistics should be interpreted with caution, because the cause of death was determined by priests until 1936. Still, they do show a certain trend.

¹⁴ The Association for Doctors of Medicine was founded in Sweden in 1663 and functioned simultaneously as an educational institution, a professional association and a government body to monitor health care; Bonner 1995.

¹⁵ Klinge and Knapas and Leikola and Strömberg 1989, p. 377.

the sense of being forced to adapt to the emergence of new needs.¹⁶ In this specific instance we begin to notice the first steps in the trajectory that led to the coordinated management of training and practice that is at the heart of university hospitals.

The reason for the early introduction of the integrated doctoral degree in medicine lay in the vastness of a sparsely populated country, which made it impossible in many cases to consult a specialist, so that general practitioners were supposed to have a good knowledge of all medical fields: medicine as such, surgery, obstetrics and pharmacy. As a result, in Finland and the other Nordic countries, the three last disciplines were much elevated much earlier to university level than in most other European countries. The drawback of this extensive medical training, however, was the extremely long period of study, being on average eleven years: three years for the preparatory studies, the so-called preliminary medical examination (*medikofili*), two and a half years for the candidature in medicine and five and a half years to obtain the licentiate. Many students were put off by this long study period, resulting in the aforementioned lack of physicians.¹⁷

One way in which the Russian authorities attempted to improve health care and the training of physicians was by forcing practitioners to register officially, in order to get rid of the (still large number of) quack doctors. The underlying idea consisted of improving the attractiveness of the medical profession by recognising well-trained physicians and so meeting the lack of physicians, at least to some extent. In 1811, a *Collegium Medicum* was established for this purpose in place of the former Swedish Association for Doctors of Medicine. The members of the new *Collegium*, the three professors from the medical faculty and the professors of biology and chemistry from the arts faculty, were appointed to supervise and monitor the field of health care and medical practice, e.g. by registering all those who wanted to practice medicine, be it as physician, surgeon or pharmacist. If only on a small scale, gradually health care was withdrawn from the purely private sphere and became a public concern. One other government action in this respect was that all seven hospitals operating in the country at that moment became government trusts. Simultaneously, the number of county doctors increased from eleven to twenty.¹⁸

Because of these and similar measures, after a while the lack of physicians was not such a concern in Helsinki (and other cities), but it appeared to be particularly difficult to convince young doctors (who were already undervalued and underpaid) to set up a practice in the remote interior. Once they had studied at the (Swedish-speaking) university, former farmer's sons, who had now climbed the social ladder, were not immediately inclined to return to their home city, far away from the political and cultural life of the capital. To tackle this problem, which Finland shared with the other Nordic countries, the political and university authorities encouraged local priests to obtain basic medical training or even to study for a full degree at the university.¹⁹ This policy had some success, but opening the doors to female students

16 Langlois and Savage 2001.

17 Dhondt 2009.

18 The first county doctor started to operate in Vaasa in 1749 and by the end of the nineteenth century 53 of them were active in Finland. Soon afterwards the county doctor system was replaced by the provincial doctor system; Vauhkonen 1992, pp. 207-10; Pesonen 1980, pp. 53-86; Joutsivuo and Laakso 2008, pp. 14-15.

19 Klinge and Knapas and Leikola and Strömberg 1989, p. 371.

from the 1870s proved to be much more effective. The general restrictive Russian policy in this regard also had repercussions in Finland, so that it was only in 1902 that women were freely admitted to study at the university. In the field of medicine, however, female students were enrolled on a fairly regular basis from the 1870s to increase the number of physicians, *inter alia*.

The increasing attention to health care in general, the policy of conferring official recognition on well-educated medical practitioners and the (early) introduction of the integrated doctoral degree also had an effect on the content of the medical training which was characterised increasingly by a clinical approach. The Finnish university resembled its German counterparts in this respect. The University of Helsinki differed, however, in two important respects from universities such as Göttingen and Berlin, which were often referred to within the scope of the reform of the Finnish university statutes in 1811. First, the requirements with regard to surgical knowledge were clearly much stricter in Finland than in Germany (precisely because of the impossibility of guaranteeing the availability of a specialist surgeon when needed). Second, pharmacy at university level was introduced in Finland earlier and also integrated in the general curriculum of the doctoral degree.

The almost exclusively theoretical training at the end of the eighteenth century was thus gradually replaced by a combination of theoretical lectures with practical training at the bedside. One of the reasons for the building of the province hospital in Turku in 1759 was so that young, recently graduated doctors from the Academy could practice their clinical skills there. The basic conditions at the hospital did not, however, provide good opportunities for this. The new clinical institute which was built immediately after the move of the university to Helsinki in 1828 met expectations much better in this respect.²⁰

This predecessor of a university hospital was enthusiastically welcomed as a supplement to the few existing hospitals in terms of both medical training and medical treatment. By the end of the eighteenth century, only 20 hospitals existed in Sweden and six in Finland. Most of them were no more than shelters for sick and wounded people, run by the church or other private initiatives, and dependent on donations, voluntary fees and fines.²¹ Owing to the belief that disease was spread through the air, at least from the beginning of the nineteenth century many of these hospitals were built outside the city, on a hill or at the seaside where the pure air could aid the recovery process.

Only in the 1870s did things start to change in this regard. In the 1840s, the Hungarian professor Ignac Semmelweis was one of the first to document the risk of spreading diseases by touching and the need for clean hands in medical praxis, more particularly in the prevention of puerperal fever. His ideas did not reach Finland, however, until 30 years later. Josef A.J. Pippingsköld was struck by the huge difference in mortality rate between deliveries in the countryside, in the (clean environment of the) sauna with a lot of boiled water, and those on the maternity ward. After the introduction of some simple measures, such as forcing his personnel to wear clean dresses, paying great attention to blankets and cushions, heating instruments

²⁰ From the start, the clinical institute had a separate delivery section, which proves again the early introduction of obstetrics at the university level (Klinge and Knapas and Leikola and Strömberg 1989, pp. 255-58).

²¹ Pesonen 1980, p. 192.

before use, etc., the results were immediately visible. When the new lying-in hospital was opened in 1878, Pippingsköld got the opportunity to realise his intentions to the full.²²

The breakthrough of bacteriology in the same period was probably the main explanation for the abandonment of the theory of ‘miasma’, viz. the idea that diseases and infections were caused by bad air. The discovery by the German Robert Koch that anthrax and tuberculosis were caused by a bacterium turned the prevailing ideas upside down. Slowly but steadily the new approach, characterised by all kinds of hygienic measures, found general support.²³ German researchers and universities took the lead in this field and succeeded in promoting the new, scientific approach abroad. Also, Finnish professors of medicine increasingly had the opportunity to make study trips to German and other foreign universities between 1880 and 1910, the ‘golden age’ of Finnish medicine, and to adopt these characteristics of the foreign institutions which were suitable for the Finnish system.²⁴

For instance, the introduction of many specialist fields followed foreign models, be it Germany, Sweden, Russia or elsewhere: cell pathology, ophthalmology, syphilidology and dermatology, hygienics, forensic medicine, odontology, psychiatry, bacteriology, etc. In combination with increasingly professionalised clinical training this led to the establishment of many new clinics and hospitals from the 1880s, almost all of them run by the government (see Table 1). Only from the end of the nineteenth century did the municipalities also start to build their own hospitals because they were not satisfied with the current situation and with the government policy in this regard. The first of these hospitals was built in Ruovesi in 1881 and their number increased enormously. By the 1920s there were already 236 hospitals, of which 142 were run by local municipalities and 60 privately.²⁵ Also, the number of beds grew spectacularly: from 373 places in 1820 (for a population of 1.2 million) to 26225 in 1939 (for a population of 3.7 million).²⁶

Table 2. The number of hospitals between 1820 and 1920.²⁷

Year	general hospitals	mental hospitals	tuberculosis hospitals	sum
1820	9	2		11
1850	16	2		18
1880	28	2		30
1900	90	8		98
1920	205	15	16	236

22 Monos and Faragó and Hänninen 2002, pp. 43-56.

23 Harjula 2007, p. 16; Ignatius 2000, p. 511.

24 Ignatius, 2000, pp. 515-29; Dhondt 2009; The orientation towards Germany was also apparent in the language of the dissertations, which were written mostly in German. After the Second World War, however, English became the main language of communication in medicine, which had the unexpected effect that some innovations dating from before the War, yet published in German, had to be ‘re-invented’ because of the language gap (Ignatius and Nuorteva 1999, pp. 58-82).

25 Kaarninen and Kiuasmaa 1988, pp. 7-9.

26 Vauhkonen 1992, p. 239.

27 Vauhkonen 1992, p. 239.

Although the hospital network started to expand from the early twentieth century, being treated in a hospital was still quite rare. The largest hospitals in the 1920s were the state-owned provincial hospitals located in the big cities.²⁸ The municipal hospitals in the countryside often had fewer than 20 beds and many municipalities lacked hospitals altogether because of lack of resources. They were dependent on government-owned general hospitals in bigger localities, even though the distance to the hospital was sometimes very long. In the late 1920s, the Federation of Rural Municipalities together with the Common Association of Finnish Doctors of Medicine made a declaration to increase, first, government funding for municipally-run hospitals and, second, the total number of hospitals.²⁹

BUILDING UP A NETWORK OF CENTRAL AND UNIVERSITY HOSPITALS: THE NEED FOR A MORE ORGANISED HEALTHCARE SYSTEM

In 1929, the government set up a committee to canvass how to develop the fragmented system of hospitals in the country. The committee compared the Finnish situation with other Nordic countries, and noticed that the hospital services in Finland were unbalanced across the country. The rural areas were in a totally different situation from the urban ones. According to the committee's comparison, there was only one patient place for every 838 inhabitants in Finland, whereas the ratios in Sweden and Norway were 1 to 356 and 1 to 260.³⁰

The committee suggested that federations of municipalities should join forces and establish hospital districts to allow them to run larger hospitals in the regions. Besides, 30 to 60% of the costs of building and running these new hospitals should be covered by the state. In addition, the committee put forward the idea of dividing the country into several hospital districts, in which the municipalities could benefit from each other. In their opinion, the proposed actions should be fully implemented within the next fifteen years. Even though the committee's report was widely supported, it was rejected by the doctors' association from the state-run general hospitals. According to Kaarninen and Kiuasmaa, this also explained why the report had only marginal effect on immediate legal actions.³¹ Consequently, it is not really surprising that the medical staff of the state-run hospitals resisted the building of new hospitals, because they feared the loss of their highly valued status. As elsewhere, this phenomenon occurred in Finland several times, for example, when the university network was created in the 1960s.³² Professions tend to defend themselves and keep the number of specific professionals small in order to gain more status, money, etc.

The seed for developing the hospital system had, however, been planted, and another committee was set up in 1933 to see how central hospitals and faculties of medicine operated in different countries and how the governance of the hospitals was divided between the

28 Turku, Kuopio, Vaasa, Mikkeli, Oulu, Viipuri and Helsinki (the hospital in Helsinki was transferred later on to Hämeenlinna) (Väänänen 2005).

29 Pesonen 1980, pp. 589-94; Vauhkonen 1992, pp. 239-240; Kaarninen and Kiuasmaa 1988, pp.7-9; Sorvettula 1998.

30 Kaarninen and Kiuasmaa 1988, pp. 8-9.

31 Kaarninen and Kiuasmaa 1988, pp. 7-8.

32 Saarivirta 2003, pp. 62-63.

state and the municipalities. The examples were taken from Sweden, Germany and Latvia. Before the report of the 1933 committee was published, the National Board of Medicine had already suggested that the state-owned general hospitals should be enlarged to become central hospitals, where all special medical fields should be covered.³³

Altogether, the year 1933 was epoch-making with regard to the future hospital network. Especially remarkable in that period was the growing role of the municipalities. As mentioned before, in the early 1900s government initiatives were often supplemented by the municipalities, certainly with respect to the building of new hospitals for the treatment of people suffering from tuberculosis and mental problems. In the 1930s, however, the municipalities increasingly made the first move, as Pesonen has shown, for instance, on the basis of the discussions about the future of the state-owned province hospital in Turku.³⁴ The hospital was suffering from old facilities and desperately in need of refurbishment, but since the government was not willing to invest in it, the municipalities belonging to the province of Turku made an offer to share the refurbishment costs as well as the operation costs of the hospital afterwards. The Finnish parliament accepted the offer and this action can be seen as the starting-point for the characteristic role of the municipalities in health care in Finland, in comparison to the other Nordic countries.

The ideas presented by the early 1930s committees started to be introduced step by step and the National Board of Medicine too gradually adopted the view that the current state-owned provincial hospitals should be altered to more focus central hospitals where specialised treatment could be concentrated. The Second World War, however, delayed the plans for the individual central hospital projects for a while. On the other hand, according to Kaarninen and Kiuasmaa, the war, terrible as it was, actually boosted the overall development of the central hospital system: during the war against the Soviet Union the need for special health care (i.e. taking care of serious war injuries) increased hugely, and speeded up the planning process of the central hospitals.³⁵ In 1941, the National Board of Medicine submitted a proposal to the government to establish central hospitals. The law was passed by parliament in 1943 and it obliged the municipalities to share the costs caused by the establishment of central hospitals to the tune of 50%, even though the hospitals were still owned by the government. The 1943 law had to be renewed in 1948, however, because of the changed policy with regard to the treatment of epidemics.³⁶ Whereas previously the treatment of patients suffering from epidemic diseases was taken care of by the municipalities (and usually quite badly organised), after the war it became one of many responsibilities of the new central hospitals and special wards for the treatment of epidemics had to be built.³⁷

After the introduction of the law on central hospitals, the country was divided into 20 hospital districts with a central hospital in the middle of each. This allocation exists even today. The building of the hospitals took place mainly in the 1950s and 1960s, starting with

33 Pesonen 1980, p. 596; Kaarninen and Kiuasmaa 1988, pp. 8-9; Joutsivuo and Laakso 2008, pp. 15-16.

34 Pesonen 1980, p. 596.

35 Kaarninen and Kiuasmaa 1988, p. 21.

36 Joutsivuo and Laakso 2008, p.16.

37 Pesonen 1980, pp. 598-601.

the regions where the hospital situation was most deficient. In practice, this meant the regions in the eastern part of Finland. The first central hospital was completed in 1953 in North Karelia (Joensuu) and the second one in 1954 in Jyväskylä. In line with the aforementioned increasing role of the municipalities the whole system of central hospitals was transferred in 1957 to the rule and ownership of the municipalities, and in 1965 all the other state hospitals were subjected to the same measure.³⁸

In the hospital districts where there was a university, the central hospitals were called university hospitals. Indeed, Turku received a university of its own again in 1920, but it was not until 1943 that a faculty of medicine completed the new institution. Therefore, immediately after the war, only Helsinki and Turku had a medical faculty and a hospital connected to it. Both hospitals, the state-owned general hospital in Helsinki and the state-owned province hospital in Turku, were thus changed into central/university hospitals at the beginning of the 1950s. In the same period the country's university network started to expand, from the previous domination of Southern Finland to different parts of the country: universities were established in Oulu (the northern part of the country), Kuopio, Joensuu, Lappeenranta (all in the eastern part), Vaasa (the western part) and Tampere (the middle part of the country).³⁹ The last university to be established in Finland was the University of Lapland (in 1979, in the northern part of the country). Two years after the establishment of the University of Oulu, it received its medical faculty and later two of the other new universities were gradually completed with a faculty of medicine. One of the intentions behind these new foundations was clearly to meet the still prevailing lack of physicians.

For similar reasons the government started to subsidise studying abroad for the degree of medical doctor at a foreign institution. According to Seppälä (2003), however, all these interventions failed to fulfill the demand for medical doctors. A government committee in the 1960s (led by the head of the National Board of Medicine, Niilo Pesonen) calculated that the country would need approximately 11.000 medical doctors by 1990. A few members of the committee (including Pesonen himself), however, suggested that the need for MDs would be as high as 14.000. The actual number of medical doctors in 1990 was 14.325, proving that the committee's official calculation was clearly an underestimate.⁴⁰ On the other hand, it could be the case that the numbers presented in the 1960s have actually guided the educational plans with regard to the number of students admitted to study medicine at the universities during the following years. Indeed, the number of medical students was controlled by the government, which was in this respect often in conflict with the powerful association of medical doctors. This professional body has always resisted the expansion of the number of MDs.

38 Joutsivuo and Laakso 2008, pp. 16-17; Pesonen 1980, pp. 604-10; Kaarninen and Kiuasmaa 1988, pp. 17-25.

39 Saarivirta 2003, pp. 61-62.

40 Lääkäriliitto 2008.

Complaints about the lack of physicians were continuous and even persisted after the 1950s when the number of physicians increased spectacularly in answer to the increased demand owing to the creation of the central hospital system. The provision of healthcare services and the training of medical professionals evolved hand-in-hand in response to changing demands. The 1960s special committee suggested that the universities of Helsinki and Turku should produce more graduates in medicine in order to eliminate the new imbalance between demand and supply. Both universities acted upon the committee's advice, which resulted in a duplication of the number of medical students in just a few years.⁴¹ Nowadays, the ratio of doctors of medicine to the population is 1 to 300.

Table 3. The number of doctors of medicine compared with the population between 1900 and 2008.⁴²

Year	MDs	population per MDs	10 000 inhabitants for every MD
1900	373	7120	1.4
1910	523	5628	1.8
1920	657	4791	2.1
1930	1000	3463	2.9
1940	1379	2680	3.7
1950	1997	2018	4.9
1960	2827	1573	6.4
1970	4798	958	10.4
1980	9016	531	18.8
2008	17609	301	33.2

Thanks to the suggestions and calculations made by Pesonen's 1960s committee, it became evident that the government was willing to establish a new faculty of medicine. The two main competitors were the universities of Kuopio and Tampere. In the end, both of them received a faculty of medicine in the 1970s. Seppälä (2003) has argued that the University of Kuopio was the stronger candidate in fact, and that the university authorities in Tampere owed their medical faculty only to their excellent lobbying. Owing to the financial crisis of the early 1990s, Tampere's faculty threatened to shut down to save on the overall costs of education. Again, good lobbying prevented this happening.

Nowadays, medical doctors are trained at five faculties of medicine, located in Helsinki, Turku, Oulu, Tampere and Kuopio. The central hospitals in these districts are therefore called university hospitals. Today's policy holds that medical doctors are needed even more because many regions are still suffering from a certain lack. Medical doctors are still concentrated in the south of Finland and the profession has started to be strongly 'womanised': more than 50% of the MDs are women.⁴³ It has been suggested that, owing to the domination of women,

⁴¹ Seppälä 2003, p. 13.

⁴² Pesonen 1980, p. 668; Lääkäriliitto 2008.

⁴³ Lääkäriliitto 2008.

the work ethos among MDs has differentiated recently, and that an increase in the number of MDs would not automatically lead to the disappearance of the demand.⁴⁴ Female medical doctors tend to have maternity leave and in addition many MDs have started to appreciate free time more often. For instance, the orientation of medical doctors has shifted towards greener pastures which require fewer emergency duties.

THE CURRENT STRUCTURE OF THE FINNISH HEALTHCARE SYSTEM AND THE MAIN MILESTONES

Today the Finnish healthcare system can be described as a modern and well-performing system compared with those of other countries. The system is based on the responsibility of the municipalities, which provide primary and specialist health care, supported by the government, employers and taxpayers. They are also responsible for other social services such as nursing homes, child day care, social assistance, basic education and services for the elderly.⁴⁵ Altogether, Finland spends 8.2% of its GDP on health care, 76% on the public sector and 24% on the private sector.⁴⁶

The country is divided into 20 hospital districts and every municipality has to be a member of such a district. Each district is responsible for providing hospital services and coordinating the specialised public hospital care within its area. The most challenging specialist health care is being provided in five university hospitals. The next level consists of non-university central hospitals which are smaller than university hospitals and which do not offer university education, even though medical doctors can opt to obtain their practical training for the specialist medical doctor degree at the central hospitals. The third level of hospitals is formed by district hospitals which are again somewhat smaller than non-university central hospitals. Even in the district hospitals, however, challenging treatments are often taken care of. The fourth level of hospitals is the health centers which provide primary health care. Originally, the health centers were built on the basis of the 1960s NHI (National Health Insurance) scheme and the Primary Health Care Act of 1972 which were supposed to balance the unequal distribution of health care in the country.⁴⁷ In the 1960s, the rural areas especially were in need of health care. The network of health centers was built in the 1970s to meet the demand.⁴⁸ The structure of the health care system in Finland is presented in Figure 2.

44 Lehto 2008.

45 Häkkinen 2005.

46 OECD Health Data 2008

47 The Primary Health Care Act was originally a national planning system that obliged municipalities to provide primary health care including public health services as well as family planning in health centers. Before the 1972 act, the system was fragmented (Järvelin 2002); NHI (National Health Insurance) covers all its members (residents of Finland) for sickness allowances, maternity allowances, special care allowances, student health services, rehabilitation services, and medical expenses (drugs prescribed by a doctor, private sector examinations and treatments, etc). Usually NHI pays 50 to 70% of the expenses of medical treatment up to a fixed sum depending on the treatment (drugs, private medical doctors, dentists). NHI is funded by taxes.

48 Lehto 2008; Häkkinen 2005; Harjula 2007, p. 134; Kunnat 2008; Järvelin 2002. pp. 17-20.

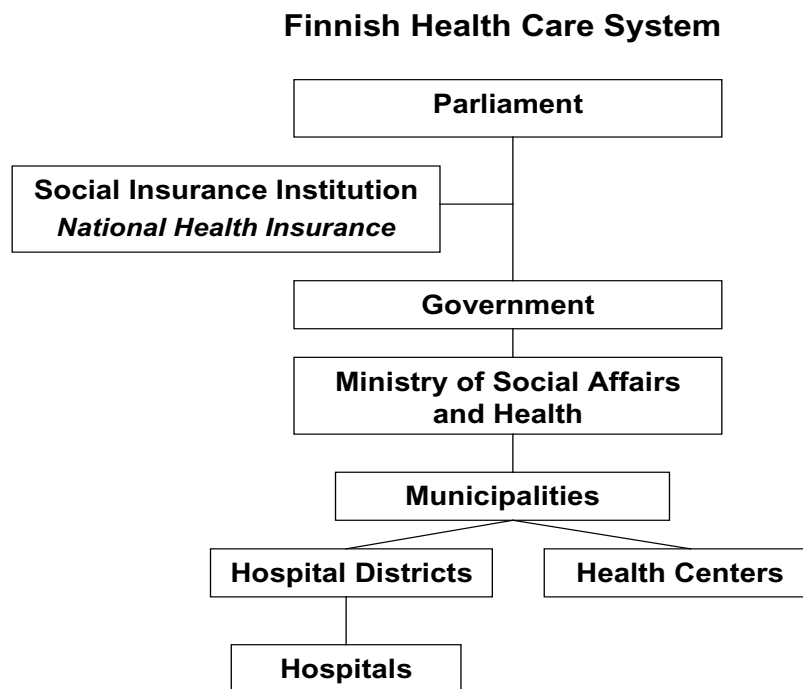


Fig. 2. Finnish health care system.⁴⁹

According to Häkkinen (2005), by the late 1970s the basic elements of the Finnish healthcare system had been developed. The next decades were a period of rationalisation and management of the system. The 1990 Hospital Act brought all municipal hospitals under the ownership and management of the hospital districts. As mentioned earlier, the government had already given a lot of freedom to the municipalities in terms of organising health care in their region. In addition to this, when the economic recession hit Finland heavily in the early 1990s, even more freedom was given to the municipalities. Häkkinen (2005) argues that one of the most important reforms the Finnish healthcare system has faced in the last decade was the change in the state subsidy system. In the old system, state subsidies to municipalities had been earmarked and related to real costs. Under the new system, however, state subsidies are no longer earmarked but lump sums that are founded on a need-based capitation formula are calculated prospectively. The aim of this reform was to reduce central government control, and to increase local freedom in providing services. Despite the past history, the current trend seems to be moving again slightly towards more government guided control. An example of this is the guarantee that any citizen will receive medical treatment within a reasonable time.⁵⁰ This *hoitotakuu*, which is imposed by the government on the municipalities, implies that, for instance, the municipalities cannot keep patients waiting forever to have a heart or knee operation.

The main milestones in the development of the Finnish healthcare system in the second half of the twentieth century can be summarised as follows:⁵¹

49 Järvelin 2002, p. 18; Häkkinen 2005.

50 Sosiaali- ja terveystietomus 2006, p. 10.

51 Järvelin 2002, p. 15.

- 1) in the 1940s: the establishment of maternal child care measures to treat and prevent tuberculosis (tuberculosis districts);
- 2) in the 1950s: the development of the hospital system;
- 3) in the 1960s: the introduction of the National Health Insurance scheme;
- 4) in the 1970s: a large increase in the number of medical doctors (which had started in the 1960s), the promulgation of the Primary Health Care Act, the establishment of health centres. In this decade the national health planning system was introduced and also occupational health care was developed;
- 5) in the 1980s: health care and social services were incorporated into the same national planning and financing system. Through a number of campaigns the population was urged to pay more attention to their personal health and in the same period the ‘personal doctor’ system was created. Towards the end of the decade the deregulation and decentralisation of the system was about to start;
- 6) in the 1990s the deregulation process was continued and the emphasis was put increasingly on municipal autonomy, reforms were introduced with regard to the subsidy system.

It is worth reflecting briefly on these developments in relation to the above-mentioned remarks on the growth of knowledge and the professionalisation of medicine. More precisely, we ask ourselves the question: what is the function of university hospitals (UH) in any health system? As many have pointed out before us, this type of organisation emerged first in the United States as a response to the need to facilitate interdisciplinary research.⁵² The environment of a university hospital offers great opportunities for joint research between medical professionals in different fields (e.g. radiologists and oncologists), as well as clinicians and other scientists whose knowledge is relevant to medicine (e.g. molecular genetics, biochemistry, etc.). Another function of university hospitals is that of facilitating the integration of patient care and medical training. This connection is crucial in relation to the broader issue of how the design of health care adapts to the pressure exerted by new scientific and clinical discoveries. Learning within practice insures the diffusion and transmission of professional routines that are tailored to the tasks and the needs at hand. As Rosenberg (2009) remarks, however, appropriate conditions need to be in place for this to happen effectively: the creation of university hospitals requires lower barriers across scientific disciplines as well as the creation of what Nelson and Sampat (2001) call ‘social technologies’, meaning professional bodies supplying the managerial skills that become necessary as the practice of health care is applied to new demands.

There is a final dimension that is worth spelling out, and that concerns the paradox that, at least apparently, characterises innovation in the healthcare realm. Innovations are usually understood as either enabling new or enhancing existing solutions; the efficacy of medical innovations, in particular, is judged on the basis of their ability to provide solutions for human health that were not formerly available. This implies that shortly after their appearance medical innovations stimulate higher demand for health which, in turn, probably generates increased expenditure. A related matter is that increased life expectancy brings about other problems, namely expectations and solutions associated with aging populations. Therefore, from a purely static perspective, medical innovations are incompatible with the ethos of ‘cost containment’, at least in the short term. The historical perspective proposed in this paper,

52 E.g. Rosenberg 2009; Gelijns and Zivin and Nelson 2001; Consoli and Mina 2009.

however, illustrates that the advance of medical know-how cannot be reduced to individual scientific breakthroughs but rather has to be framed within a wider appreciation of the myriad of incremental improvements in the organisation of healthcare supply. The story of university hospitals is therefore a testimony to the importance of viewing medical innovation as a dynamic process, one that informs policies aimed at fostering open systems of innovation, that is, systems that are capable of sustaining and coordinating a rich and necessarily unpredictable set of experiments.⁵³

CHANGING DISEASE PATTERNS AT THE TURN OF THE CENTURY IN FINLAND

Earlier in the paper we highlighted some of the commonest causes of illness and death in the early nineteenth century. Let us now assess how these patterns compare with today's mortality and morbidity statistics. The first, and perhaps obvious, observation is that much has changed, especially the incidence of infectious diseases such as tuberculosis, which as late as 1950 still affected large parts of the population, especially children. Thanks to remarkable discoveries in both medical science and practice the death toll has declined and accordingly the patterns of specialisation of hospitals have been reoriented to meet current needs.⁵⁴ What is crucial to our analysis of the emergence of new forms of organisation, like university hospitals, is that the set of routines that are developed specifically for a disease are not lost once the health emergency has been addressed successfully.

Among the commonest causes of death in Finland in the twenty-first century is heart disease, especially coronary artery disease. Its incidence has been significant in Finland since the 1960s, with an interesting contrast between the western and the eastern part of the country where the disease has claimed most victims – probably owing to a diet high in cholesterol. In their daily diet Finns used to have a lot of saturated fat, which might have been the major cause of blocked blood vessels.⁵⁵

Although the situation has improved, half of the overall deaths in Finland are ascribed to heart disease. East Finland has been a practical unit of analysis for several studies concentrating on heart diseases and many of the projects are aimed at improving the diet of people in that part of the country.⁵⁶ The factors behind the high death rates caused by heart disease in Finland are, however, still a mystery. It is not totally clear why Finns in the East have suffered more from heart disease than the people in the West, although the fat-containing food in the East is probably one of the reasons. It is known, for instance, that people in the western part eat more fish because West Finland is on the coast. According to Ignatius, it remains unclear why coronary artery disease increased tremendously in Finland in the latter part of the 1900s and why the number of people suffering from it has been decreasing rapidly as

53 Consoli and McMeekin and Metcalfe and Mina and Ramlogan 2009.

54 Pesonen 1980, p. 495.

55 Ignatius 2000, pp. 587-9.

56 Ignatius 2000, p. 588.

well.⁵⁷ Therefore, one of the explanations in the development of coronary disease might be infections. This stream of research on infections as causes of this kind of heart disease is a growing field of interest.

According to a recent publication by the National Public Health Institute, the number of deaths caused by heart disease in the 1970s declined because of the decrease of cholesterol and blood pressure levels, together with a decrease in smoking habits.⁵⁸ The deaths related to heart disease have declined by 80% compared with the situation in the early 1970s. The report concludes that “besides managing to diminish ‘risk factors’ (i.e. smoking, high cholesterol and blood pressure) the treatment for heart diseases has improved as well’. Although Finland’s situation with regard to coronary artery disease has improved a lot, its incidence is still at a high level, comparable with those of England, Scotland and Ireland.

The second commonest disease that kills Finns today is cancer. According to Järvelin, more than 25% of the whole Finnish population will suffer at least one form of cancer in their lifetime.⁵⁹ The commonest cancers for Finnish men are prostate, lung and colorectal cancers; for women, breast and colorectal cancers. Still, the prognosis for cancer patients is improving all the time, owing to remarkable improvements in diagnostics as well as research on genes.⁶⁰ Regarding breast cancer, for instance, when a lump in the breast was diagnosed in the 1970s, a biopsy was performed and sent for analysis. If a malignant tumor was identified, the whole breast was removed and the armpit was cleared of the lymph nodes. If the tumor had spread into other parts of the body, then radiation therapy after the operation was started at once. The next phase consisted of monitoring the patient’s development. At that time, this was the only possible treatment for breast cancer. Nowadays, much more is known at a molecular level. If specific hormone receptors are found, the development of breast cancer can be predicted much better. It is also known that breast cancer is still inheritable in 5 to 10% of cases. Overall, it can be said that by better diagnostics breast cancer can currently be identified a lot earlier than in the past, and therefore be treated much better. Also, the damage from radiation therapy is less than in the 1970s and 1980s, because the therapy can now be directed much more precisely. Even the technology for picturing cancer has improved tremendously, and has led to much better diagnostics than in the early days.

Other diseases Finns suffer from today fall under the categories of infection, diabetes, asthma and allergies, obstructive pulmonary diseases, musculoskeletal diseases and mental problems. A notable fact is that mental problems increased hugely during the years of economic recession in the early 1990s.⁶¹

57 Ignatius, 2000, p. 589.

58 THL 2008.

59 Järvelin 2002, pp. 6-8.

60 Holli 2008.

61 KTL 2008; Järvelin 2002, pp. 7-11.

CONCLUSION

One of the most decisive steps in the transition from pre-modern to modern medicine was the finding of the bacterium as a cause of infection around the middle of the nineteenth century. Gradually, large medico-philosophical systems according to which vital functions were explained by fixed physico-chemical processes in the solid and fluid parts of the body were replaced by treatment methods based on extensive medical examination. Until the 1850s it was very common for diseases to be treated without their cause being known. Increasingly, however, the idea of ‘miasma’ was left behind and plain and simple hygiene, for example, resulted in a remarkable slowdown in the death rates of babies. Another major innovation in modern medicine was the development of antibiotics in the 1930s. With antibiotics/penicillin, diseases caused by a bacterium could be treated.

The evolution of the Finnish healthcare system kept pace with the previously mentioned transition to modern medicine. Its beginning can be traced back to the early nineteenth century when it was realised that the death rates in Finland, certainly these of small babies, were much higher than in neighbouring countries. The solution consisted, among other measures, of an increase in the number of midwives and the obligation for all medical practitioners to be registered at the *Collegium Medicum* to enable more supervision. These were the first systematically coordinated measures that launched a new era of Finnish health care.

Starting from the 1820s, this kind of measure was supplemented by an integration of practical training in hospital for future physicians and, partly as a result of this, a gradual increase in the number of hospitals took place. In 1820, there were only eleven hospitals in the country, but a century later the number had increased to 236. In 2006, Finland had 110 hospitals, of which 50 can be considered as private.⁶² A specific characteristic of the Finnish system is that the public hospitals are run by the municipalities. Also, these hospitals, which were previously owned by the government, belong these days to the municipalities, which collaborate in hospital districts. One of the reasons behind this is that the municipalities have been active in hospital issues since the early twentieth century. There has always been a need for people to be treated locally.

Owing to the fact that the central government and the municipalities were sometimes acting apart from each other, a fragmented hospital system was built up, and it took until the 1930s for a consensus to be reached about building up a network of central hospitals which focused on specialist treatment and were spread equally across the country. The Second World War delayed the plans for a while, but, as mentioned earlier, it also boosted the plans to organise specialised medical treatment because of the increased need owing to wartime casualties. Eventually, the establishment of central hospitals took place mainly in the 1950s and 1960s. The models were drawn from the other Nordic countries and from Germany.⁶³

The most important reason for building up the hospitals was the increased awareness of the state of affairs in Finland’s neighbouring countries. It was realised that more hospitals were needed to reach healthcare standards comparable to those of other countries. This also

62 Kunnat 2009.

63 Kaarninen and Kiuasmaa 1988, pp. 8-9; Lehto 2008; Visakorpi 2008.

meant that more medical doctors were wanted. Until the 1950s, they were trained only at the universities of Helsinki and Turku but, in line with the expansion of the university network between 1950 and 1980, the training of medical doctors was now spread across the country. New medical faculties with their own university hospitals were established in Oulu, Tampere and Kuopio. Nowadays, university hospitals are highly valued and the most challenging treatment is concentrated on them. University hospitals are divided between five territorial districts and they carry out the most advanced treatments in their territories.

To conclude, the evolution of professions and organisations seems driven primarily by the need to co-ordinate specialised activities by means of standardised routines.⁶⁴ In the area of medicine these are developed through lengthy processes of training and apprenticeship. At the same time, such routines are shared among individual practitioners and other staff with similar or complementary tasks and skills, such as clinical staff or health managers. It follows that the application of medical knowledge implies the creation of practical skills to manage and co-ordinate those standardised routines in an open-ended fashion. The broader point is that the growth of knowledge triggers trajectories that involve on the one hand the diversification of competences that are relevant and on the other hand the creation of institutional mechanisms for their governance.⁶⁵

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64 Langlois and Savage 2001.

65 Gelijns and Zivin and Nelson 2001; Consoli and Mina 2009

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