Introduction

According to the Organisation for Economic Co-operation and Development (OECD), “health is determined by a number of factors, one of which is healthcare. Healthcare … is defined as the combined functioning of public health and personal medical services” (Kelley and Hurst 2006). Healthcare corporations are defined in this chapter, accordingly, as those corporations that manufacture and sell products and services that are used by the public health system and by personal medical services.

Global healthcare corporations are not a homogeneous type of business. They are in fact extremely diverse and include public and private hospitals and clinics, pharmaceutical multinationals, health insurance groups, manufacturers and distributors of hospital equipment and medical supplies, vertically integrated business groups, clinical laboratories, networked consortiums of hospitals and laboratories, medium or large family-controlled firms and groups in highly specialized healthcare niches, and small start-ups with or without the participation of big healthcare groups. This diversity emerged from the combination of a path-dependent co-existence of business typologies and regulatory frameworks. Forbes 2000, Bloomberg, and Nasdaq include as healthcare corporations firms and groups that work in: the pharmaceutical industry; the biotechnology and life sciences; and instruments and medical equipment and services. In some countries, such as Japan or Spain, a single healthcare corporation has branches in some or all of these different industries. In other countries, such as Germany or the United States, healthcare corporations tend to specialize in a single branch, and in the United States vertically integrated businesses dominate.

From the late 1880s to today, global healthcare corporations have been praised as much as they have been condemned. Healthcare companies have contributed to reducing first deadly epidemic infectious diseases, and later chronic diseases, improving life expectancy and our quality of life (Billings 1901: 638). Since the late nineteenth and early twentieth centuries in the most developed economies, and from the 1950s elsewhere (except much of Africa), global public and private healthcare corporations have greatly helped to eradicate or at least control some of the deadliest diseases in human history: the bubonic plague; venereal diseases like syphilis; cholera and infectious diseases of the digestive system; smallpox (before 1900, smallpox killed around 500 million people); yellow fever; tuberculosis; influenza or flu; perinatal complications;
tetanus; malaria; leprosis; measles; pertussis; ebola; avian influenza; meningitis; heart diseases; autoimmune diseases; neuronal diseases; and mental illness.¹

Despite the positive contributions of life sciences and healthcare corporations, newspapers have often published about their darker side: their mistakes, abuses, and scandals, particularly regarding their methods and their prices. Sometimes it was the uncertainty about new methods and drugs, and sometimes it was criminal behavior, that caused the poisoning and death of thousands of persons through drug or medicine experiments and trials. Such scandals started when large healthcare corporations began to globalize in the early 1900s. Thus, since the early twentieth century, health authorities in the United States, and in Europe, and (a bit later) in Asia and Latin America, slowly regulated quality control processes and, in some countries, set maximum prices for healthcare products.

Whether life-saving champions, speculators, or criminals, healthcare companies and business groups are business organizations, and therefore have diverse and changing structures and strategies. These structures and strategies both function for individual companies and for the industry as a whole through powerful oligopolies, interest groups, and lobbies. As such, healthcare corporations can be studied by business historians.

The following text is organized in four sections. The first identifies the leading internationalized healthcare companies headquartered in developed economies; I conclude that most of them were founded a century ago, and are enduring examples of the resilience and strength of the pioneering first-movers and their control of today’s global markets in pharmaceutical products, biomedical products, and medical equipment. A second section explains this endurance and some of its consequences using an analytical model that combines four driving explanatory forces from the supply and demand side of the industries as well as broader social and entrepreneurial forces. A third section outlines three of business history’s most relevant contributions to the heterogeneous scientific disciplines that have studied the creation of world healthcare systems and industries. Business history scholarship has, first, created a chronology of the industry’s evolution since the mid-nineteenth century. Second, business historians have traced the complexity and variety of connections of industries, companies, and entrepreneurs within a broader social, economic, and institutional environment. Third, business historians have provided in-depth case studies that explore the dynamic path-dependent construction of the myriad healthcare systems that exist today. A fourth section presents very briefly some examples of this variety of healthcare systems and the diverse interplay between public and private initiatives that have shaped and shape the business of healthcare. The conclusion summarizes some of the key topics and debates about the dynamic evolution and origins of the diversity of the global healthcare systems and players.

Global corporations in the businesses of healthcare

Table 22.1 of leading healthcare listed corporations in stock market indexes for the year 2016 shows that most of them were founded before 1930.

Only a few companies were created after World War II during the golden age of capitalism or after 1980. This chronology confirms many of Chandler’s (2005) observations about how the largest chemical and pharmaceutical corporations that pioneered the industry have endured, and created powerful barriers to entry for new entrants. Most of these resilient corporations have their headquarters in countries whose economies pioneered advanced knowledge and businesses in the chemical, pharmaceutical, electromechanical, and insurance industries around the turn of the twentieth century, when two revolutions took place in those countries: the therapeutic and the managerial.
Table 22.1 Internationalization of large healthcare companies in selected countries, 2017 (market capitalization of leading national stock market indexes, in billion US dollars 2017)

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Company</th>
<th>Sales (USD bn)</th>
<th>Employees</th>
<th>Market cap (USD bn)</th>
<th>Founded/year started</th>
<th>Subsidiaries (number of countries)</th>
<th>Internationalization started</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Johnson &amp; Johnson</td>
<td>71.94</td>
<td>126,400</td>
<td>335.67</td>
<td>1886</td>
<td>60</td>
<td>1924</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Roche Holding AG</td>
<td>50.40</td>
<td>94,052</td>
<td>222.35</td>
<td>1896</td>
<td>100</td>
<td>1897–1910</td>
</tr>
<tr>
<td>USA</td>
<td>Pfizer Inc.</td>
<td>52.82</td>
<td>96,500</td>
<td>204.45</td>
<td>1849</td>
<td>14</td>
<td>1950</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Novartis AG</td>
<td>48.52</td>
<td>118,393</td>
<td>198.22</td>
<td>1996</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>Merck &amp; Co. Inc.</td>
<td>39.81</td>
<td>68,000</td>
<td>182.50</td>
<td>1891</td>
<td>140</td>
<td>1912</td>
</tr>
<tr>
<td>USA</td>
<td>UnitedHealth Group Inc.</td>
<td>184.84</td>
<td>230,000</td>
<td>160.46</td>
<td>1977</td>
<td>125</td>
<td>–</td>
</tr>
<tr>
<td>France</td>
<td>Sanofi</td>
<td>36.36</td>
<td>115,631</td>
<td>112.90</td>
<td>2004</td>
<td>100</td>
<td>–</td>
</tr>
<tr>
<td>UK</td>
<td>GlaxoSmithKline Plc</td>
<td>42.15</td>
<td>101,255</td>
<td>101.51</td>
<td>2001</td>
<td>100</td>
<td>1891(^1)</td>
</tr>
<tr>
<td>Germany</td>
<td>Bayer AG</td>
<td>50.29</td>
<td>115,200</td>
<td>98.66</td>
<td>1863</td>
<td>78</td>
<td>1881–1914</td>
</tr>
<tr>
<td>UK</td>
<td>AstraZeneca Plc</td>
<td>23.00</td>
<td>59,700</td>
<td>73.85</td>
<td>1999</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Merck KGaA</td>
<td>15.84</td>
<td>50,414</td>
<td>47.81</td>
<td>1668</td>
<td>66</td>
<td>1887</td>
</tr>
<tr>
<td>Germany</td>
<td>Fresenius SE &amp; Co. KGaA</td>
<td>31.27</td>
<td>232,873</td>
<td>45.07</td>
<td>1912(^2)</td>
<td>100</td>
<td>1955</td>
</tr>
<tr>
<td>Japan</td>
<td>Takeda Pharmaceutical Co. Ltd.</td>
<td>14.67</td>
<td>31,168</td>
<td>36.36</td>
<td>1781</td>
<td>40</td>
<td>1914</td>
</tr>
<tr>
<td>Japan</td>
<td>Astellas Pharma Inc.</td>
<td>11.14</td>
<td>17,217</td>
<td>28.99</td>
<td>1923(^3)</td>
<td>50</td>
<td>1986</td>
</tr>
<tr>
<td>Italy</td>
<td>Luxottica Group SpA</td>
<td>9.77</td>
<td>78,933</td>
<td>25.20</td>
<td>1961</td>
<td>150</td>
<td>1981</td>
</tr>
<tr>
<td>Spain</td>
<td>Grifols SA</td>
<td>4.35</td>
<td>14,890</td>
<td>14.23</td>
<td>1940</td>
<td>26</td>
<td>1960</td>
</tr>
<tr>
<td>Italy</td>
<td>Recordati Industria Chimica e</td>
<td>1.24</td>
<td>4,116</td>
<td>6.69</td>
<td>1926</td>
<td>31</td>
<td>1961</td>
</tr>
<tr>
<td>Sweden</td>
<td>Getinge AB</td>
<td>3.43</td>
<td>15,500</td>
<td>4.05</td>
<td>1904</td>
<td>40</td>
<td>1960</td>
</tr>
</tbody>
</table>

Source: Own elaboration. For market capitalization, leading stock market index in each country (Dow Jones for the US; SMI for Switzerland; CAC40 for France; FTSE100 for the UK; DAX30 for Germany; NIKKEI225 for Japan; MIB40 for Italy; IBEX35 for Spain; OMXS30 for Sweden).

Notes
1. Plough Court pharmacy established (1715).
2. Opening the Hirsch Pharmacy: 1462.
3. Yamanouchi Yakuhin Shokai (1923); Fujisawa Shoten (1894); Astellas Pharma (2005).
Table 22.1 uses leading stock market indexes of the United States, Switzerland, France, the United Kingdom, Germany, Japan, Sweden, and Spain to show that the top 11 companies in the healthcare businesses born before 1930 had their headquarters in the United States and Germany (three in each), in Japan (two), and in three small economies of North and Southern Europe (Italy, Sweden, Switzerland, one each). Three companies that started business between 1930 and 1980 were created in the United States, Italy, and Spain. The four largest healthcare companies created after 1980 are headquartered in Sweden, France, and two in the United Kingdom.

Seven of the 12 large healthcare corporations in Table 22.1 started operations abroad before World War II. These corporations were headquartered in the USA, Germany, UK, and Japan. The other five first internationalized after 1945 and have headquarters in the USA, Germany, Japan, Italy, and Spain.

The table confirms findings from available business history (Chandler 2005; Galambos and Sturchio 1998) suggesting that the leading economies of the second technological revolution pioneered the creation of global healthcare giants and global healthcare markets, and established powerful economic and scientific barriers to entry that very few healthcare corporations could surmount after 1945. Also, the inclusion in this table of other countries not often considered by North American scholars shows that, next to the pioneering giants in the pioneering industrial powers, there have been understudied or relatively ignored small or medium firms in late industrialized countries like Spain and Italy, in some specialized market niches in which they were able to grow and become competitive global champions.

**Driving forces in the evolution of global healthcare players**

The sample of corporations analyzed in the previous section are only the tip of the iceberg. The evolution of global healthcare markets and corporations over the last 200 years saw a complex long-term interplay between four driving forces: (1) healthcare demand; (2) healthcare supply; (3) the actions of social forces and public institutions to reduce inequalities in healthcare access; (4) entrepreneurship.

The first most important driving force has probably been the expansion of healthcare demand, first in the most developed economies, due to the increase in the purchasing power of the world population and the increase of life expectancy at birth. The expansion of healthcare demand fostered the slow transition from the old tradition of receiving informal non-regulated medical attention at home, to the increasing concentration of medical attention in regulated and controlled centers and institutions. This transition was a major revolution that occurred parallel to processes of demographic transition and urban growth. It started in the interwar period in large industrial cities such as Paris, Berlin, London, New York, and Tokyo, that experienced fast population growth (usually linked to an accelerated influx of migrants). This slowly expanded after the 1950s into rural areas with low density populations and into regions of the world with a weak and less regulated healthcare system.

Connected to increased demand was the second driving force of an evolving healthcare supply of products and services. Increased supply was intertwined with two parallel events: the accumulation of technological and scientific human capital in the life sciences; and the growth in scale and scope of companies able to manufacture and commercialize such innovations in domestic and foreign markets. From the nineteenth century until the 1980s, healthcare supply centers, scientists, and corporations have concentrated physically often in local or regional healthcare districts around Paris, London, Berlin, Harvard, New York, San Francisco, Buenos Aires, Mexico DF, Tokyo, Osaka, Geneva, Buenos Aires, or Barcelona. After the 1980s, the
forces of globalization disseminated and reduced the territorial basis of those districts, favoring
the global connections of distant healthcare supply forces in the world, and creating global clus-
ters of healthcare between headquarters and subsidiaries as today is the case in the Siemens
Group in medical equipment, and the Grifols Group in biomedicine and diagnostic equipment.
In these leading global groups, cross-border globalized consolidation strategies are developed in
close connection with strategies of national coordination with providers and clients by local
management teams. Global value chains are essential for global healthcare clusters, connecting:
(a) subsidiaries in regions of the world supplying good quality raw material; (b) subsidiaries in
regions of the world with highly qualified human capital; (c) regions of the world with expand-
ing markets; and (d) old metropolitan hubs of the world that concentrate abundant and varied
supply of financial resources, and dynamic markets of intangible resources (patents, licenses,
brands). One well-known example of the construction of global value chains is the case of the
Grifols corporation, or the Almirall and Ferrer groups (Fernández Pérez et al. 2017; Fernández
Pérez 2017).

A third major driving force has been the actions of social groups, associations, and public institu-
tions. In some countries like the United States, United Kingdom, Switzerland, France, and
Germany, locally or regionally embedded philanthropic individuals and associations pushed for
better healthcare until World War I. A transnational approach started from the late 1880s and
the interwar years with global initiatives aimed at disseminating and transferring innovation in
healthcare knowledge: the International Health Commission of the Rockefeller Foundation
founded in 1913 with programs in 80 countries; the Red Cross founded in 1863; the League of
Nations Health Committee in 1922, and the International Hospital Association created in 1929.
After World War II, these non-profit networks expanded with globalized institutions like the
World Health Organization in 1948, UNICEF, and private foundations focused on healthcare
initiatives as in the Bill and Melinda Gates Foundation from the United States, the Li Founda-
tion in China, or the Center Esther Koplowitz for Biomedical Research in Spain.

Finally, entrepreneurship has shaped the form of the healthcare corporations, with great diver-
sity in ownership and management. Bad practices may kill people, so owners, managers, and all
employees in a firm must pay special attention to reducing health risks. Entrepreneurship, as
startup entrepreneurs in healthcare with innovative ideas, was the driving force behind the first
modern private clinics and hospitals in the United States, Japan, Germany, France, Spain, Argent-
tina, or Mexico, during the last two decades of the nineteenth century and first decades of the
twentieth century (Fernández and Sabaté 2016; Fernández 2017). Entrepreneurship, as entre-
preneurial initiatives for funding, has been very important to sponsor and organize modern large
public hospitals in the first half of the twentieth century in those countries like the Memorial
Sloan Kettering Cancer Center in New York, or the Sant Pau Hospital in Barcelona. The biog-
raphies of founders and managers of innovative healthcare companies have stories of sacrifices
and personal losses or suffering, when a new treatment or a new method of diagnosis was tried
by an enthusiast healthcare entrepreneur in his/her own body or in the bodies of relatives,
sometimes with fatal effects. César Comas Llabería, the pioneer of x-rays in Spain in 1896, died
from the effects of radiation, for example (Portolés 2010; Sinca 2009).

The evolution of each of these four driving forces has varied dramatically around the world,
creating path-dependent forces that explain the strengths and weaknesses of national healthcare
systems, the rise and decline of healthcare corporations, and the inequalities in social access to
healthcare products and services. There have been diverse typologies of national health systems,
characterized by a dynamic and varied, often changing, relationship between the private and the
public initiative (and power) in the provision of sanitary services and products to the population,
a relationship often determined by the changing capacity of the state to encourage and use taxes
for health spending with or without criteria of social equal access to healthcare. Depending on the equilibrium of such powers, there exists in the world different typologies of healthcare provision with more or less private initiatives. Where more private initiative has been allowed in the provision of national healthcare in the last two centuries, as in the United States or Japan, scholars usually find more large private corporations in the life insurance industry, the pharmaceutical and drug industries, the distribution of drugs, the construction of hospitals, and the provision of healthcare services, with subsidiaries abroad. Where less private initiative has been allowed, as in China, France, Australia, or Cuba, or Sweden, researchers usually find large national organizations manufacturing or distributing products and services, and fewer global makers of the healthcare industries. The most abundant typologies are mixed, with a combination of private (national, foreign) and public (governmental and non-governmental) initiatives fluctuating in the last century–and–a-half, as in Southern Europe, Latin America, Africa, and Asia.

**Business history of healthcare corporations: an approach to major research directions**

There is a vast bibliography about hospitals, and biographies about medical or pharmaceutical entrepreneurs, but a more limited number of monographs and studies about the history of healthcare corporations and their internationalization in the last century–and–a-half. There are a few overviews of recent published research on hospitals from a business history approach (Donzé 2005). Most research has focused on the financing of healthcare, the history of scientific and medical discoveries and technologies, and the history of the chemical and pharmaceutical corporations. On financing healthcare and hospitals (Rosner 1982; Stevens 1999; Labish and Spree 2001; Gorsky and Sheard 2006; Domin 2008–2013); about medical technology in the hospitals (Löwy 1993; Howell 1995; Stanton 2002; Schlich 2002; Boersma 2003); and about the pharmaceutical industry from a business history perspective (Vagelos and Galambos 2004; Chandler 2005; Cramer 2015; Malerba and Orsenigo 2015). As the industry is so heterogeneous, scholars’ sources, methodologies, and objectives have been similarly diverse. As specialists in the field have noted, the work of different disciplines overlaps in the study of large-scale firms that have tried to adapt to the external technological and market opportunities created in the last two centuries in healthcare (Galambos and Sturchio 1998; Donzé 2015).

The most significant research directions from a business history perspective include the context and chronology of technological waves of innovation in the pharmaceutical industries (Liebenau 1984, 1987a; Galambos and Sewell 1995; Galambos and Sturchio 1998; Malerba and Orsenigo 2002, 2015; Chandler 2005; Cramer 2015). Archival work and corporate case studies have provided a wealth of empirical evidence about the largest players and pioneers in the pharmaceutical and biomedical industries such as Merck, Sharp and Dohme, Mulford, Bayer, Cutter, Baxter, CSL, Green Cross, and Grifols (Galambos and Sewell 1995; Galambos and Sturchio 1998; Kobrak 2002; Chandler 2005; Malerba and Orsenigo 2002, 2015; Fernández Pérez 2016; Umemura 2014, 2016; Henderson et al. 1999; Hughes 2011; De Chadarevian 2011; Fernández Pérez et al. 2017). Business history has also analyzed the opportunities for growth for healthcare insurance corporations with the rise in demand for healthcare products and services, and how this led to the creation of a diversity of public and private health insurance corporations and systems (Ford Chapin 2010, 2015, 2016; Murray 2007; Pons and Vilar Rodriguez 2011, 2014). The urbanization and the increase in life expectancy that led to the transformation of charity-based hospitals to modern patient-based hospitals and clinics are processes studied by scholars focusing on the industry of hospital construction and hospital equipment, who have revealed the
complex interactions between private and public interests, and between competition and cooperation in the private industry in very different countries like the United States (Sturdivant 1970; Howell 1995), Switzerland and Japan (Donzé 2005, 2007, 2015), and Spain (Fernández Pérez and Sabaté 2017). The same complex relationship between private and public interests in various periods and countries has been found in research about political regulations in manufacturing and commercialization of healthcare services and products (Jasso-Aguilar et al. 2005; Gandillière and Hess 2013); marketing (Gandillière and Thoms 2015), and the financing of healthcare (Gorsky and Sheard 2006; Rosner 1982; Domin 2008–2013), and the emergence of healthcare companies in late industrialized developing markets (Kale and Little 2007; Conroy 2006; Santesmases 1999; Fernández Pérez 2016; Fernández Pérez and Sabaté 2017). In all of these studies a recurrent issue of analysis and debate has been the existence of asymmetric information in national healthcare markets between producers and consumers that has resulted in myriad healthcare systems in the world. Also, second, these studies have revealed the existence of private firms and business groups that have lobbied in the last century-and-a-half, in very diverse institutional national settings, in Europe, North and South America, and Asia. The goals of many lobbies and healthcare insurance and pharmaceutical associations have usually been, first, to obtain protection with which to invest in healthcare innovation while reducing the market share of foreign competitors. And, second, and more often in corporations headquartered in late industrialized countries, grow by consolidation and acquisition, and the quick imitation or adoption of foreign technical and organizational healthcare knowledge. The diversity of interests and financial or political muscle to impose those interests by policymakers, consumers, startups, and global healthcare players, have been studied as determinant forces in the evolution of national and global healthcare industries.

Business historians of healthcare industries and services have demonstrated that these firms and groups have experienced three, or four, big waves of technological and economic revolutions in the last century-and-a-half. The first saw the gradual acceptance of the germ theory of disease at the end of the nineteenth century and first decades of the twentieth century; the second occurred during the chemical and therapeutic revolution from the 1930s to the 1960s. The third wave, based on recombinant (artificially produced) DNA technology and molecular genetics, called the biotechnological revolution, started in the 1970s and 1980s. A fourth is unfolding in the 2010s and focuses on personalized nanotechnological treatments for autoimmune and chronic neuronal diseases. These revolutions have shifted the focus of the industry from germs, to antibiotics, tissue biochemistry, cell biochemistry, molecular structure, and nano science. Each revolution has increased scientific and technological complexity of knowledge, manufacturing, and commercialization. Also, each revolution has increased the complexity of ethical and institutional regulations. Each revolution has produced industries and firms where high productivity, profits, and ROAs (return on assets) emerged from the firm’s (own or acquired) dynamic capabilities to adapt to more challenging and expensive industry and regulatory requirements.

In the pharmaceutical and chemical industries, the pioneering firms first established scientific and technological new knowledge and learning bases between the 1870s and the 1930s. After World War II until the 1990s, the pioneers established solid barriers to entry to avoid competitors at home and particularly abroad in the markets they were creating with disruptive new products and services. Only from the end of the 1990s onwards did global competition from challengers erode the competitive basis of some first movers (Chandler 2005; Malerba and Orsenigo 2015). This chronology explains the establishment of leaders like Bayer, Ciba Geigy, and Sandoz, in the United States, Germany, France, the United Kingdom, Switzerland, and Japan. In late industrialized countries like Sweden, Japan, Italy, Spain, Cuba, Argentina, or
Mexico, many of these innovative products and services arrived due to early nineteenth-century contacts of scientists with the leading pioneering centers and corporations, and the efficient networks established among them by Faculties of Medicine and Pharmacy in Europe, America, and Asia to communicate quickly and efficiently knowledge about innovations.

In the manufacture and distribution of hospital equipment, in Europe, North America, Latin America, and Asia, small and medium companies with scientists–entrepreneurs soon started to register their commercial activity in order to take advantage of the expanding market opportunities opened with the concentration of millions of sick patients in the large industrialized cities that started to grow with industrialization and globalization after the mid-nineteenth century (Sturdivant 1970; Donzé 2015; Fernández Pérez and Sabaté 2017). Studies about trademarks and monographies of companies have revealed the coexistence of multiple pathways of development of this multiplication of small entrepreneurship in the production of chemical drugs and medicines that appeared in the mid- and late nineteenth century. Some grew serving the military needs of their armies (Nobel in Russia, Behring in Germany, Abbott and Baxter in the United States); some were transformed into large multinationals in the food industry in the twentieth century (like Nestlé, Danone, or Coca Cola); some developed due to government support to cover large population needs due to the isolation of key drug providers during war times (CSL in Australia); some changed headquarters due to war pressures and became large multinationals in other countries or continents (Danone moved from Spain to France; Andrómaco from Spain to the United States and then to Central and Latin America). But from the long lists of small laboratories that existed before the 1920s, very few remained after the 1950s: many did not survive the two world wars and the collapse of global trade in the interwar period.

After World War II, there was a decline in the number of small- and medium-sized family-owned companies in the healthcare industries in Western Europe, particularly in the United Kingdom, and a concentration of the chemical, pharmaceutical, and medical drugs business into larger corporations. North American corporations were particularly well placed to assume leadership, also in the healthcare industries of manufacturing and distribution of hospital equipment and drugs. As the need for complex technologies and medical drugs expanded with population growth in the post-war period, and as hospitals grew in numbers to serve this increased number of potential sick people, hospitals needed to purchase diagnostic instruments, pharmaceuticals, and laboratory equipment, such as sterilizers, masks, gloves, and microscopes. During the late nineteenth century in the United States, as in Europe, there were many small manufacturers of such items like the Gendron Wheel Chair Company (1872), Davol Rubber Company (1874), American Sterilizer Company (1894), Beckton, Dickinson and Company (1897), Bard-Parker Company Inc (1915). In the pharmaceutical industry, Merck and Company, Abbott Laboratories, Cutler Laboratories, and Mead Johnson and Company were founded between 1883 and 1900 (Sturdivant 1970: 7). However, most manufacturers had to sell their products directly to thousands of hospitals spread through the country, and the transaction costs were high. The American Surgical Trade Association founded in 1902 had tried to organize the industry, but unsuccessfully. By contrast, a talented medical supplies salesman named Foster McGaw founded the American Hospital Supply Corporation in 1921. By 1985, it became one of the world’s largest wholesale distributors of hospital supplies (Sturdivant 1970). New hospital supply companies succeeded because they connected distant manufacturers, established price convergence across distant hospitals in the country and abroad, and organized a professional salesforce specially trained in the products they had to sell. This “Chandlerian” corporation would be difficult to imitate in other countries until the late 1980s. In Western Europe, particularly in Germany and German-speaking countries, the concentration took place, though for different reasons. Around 20 local manufacturers and distributors were taken over during World
Healthcare industries and services

War I by the X-ray equipment producer Reiniger, Gebbert & Schall, a company based in Erlangen and founded in 1887. In 1921, a holding company, Industrie-Unternehmungen AG (INAG) took control of this group to provide all the technical equipment needed by hospitals and independent doctors. In 1924, Siemens & Halske purchased INAG and established itself as a leader in hospital equipment business.

Business historians have also studied how organizational forms of large corporations have adapted with more or less success to the challenges of technoeconomic revolutions and diverse regulatory frameworks after World War II. On the one hand, healthcare corporations adapted to the changes in the scientific advances by combining hierarchical integrated forms of business organization (often for products and services belonging to past technoeconomic healthcare revolutions where greater scale and scope is needed), with alliances and joint ventures with smaller very innovative companies and start-ups (for new technoscientific challenges where risks are high and long-term patient investments needed). On the other hand, healthcare corporations have adapted to the historical waves of globalization and de-globalization, and to changing national healthcare regulations, that had for instance opened a period of fast foreign direct investment (FDI) in the healthcare businesses for the pioneering US, German, Swiss, and Japanese healthcare corporations in the rest of the world between the 1930s and the 1980s (Galambos and Sewell 1995; Galambos and Sturchio 1998; Chandler 2005); and a period of relative decline in growth rates of FDI of these pioneers with a parallel increase in shares of world FDI of the healthcare industries led by corporations from emerging markets (Fernández Pérez 2016; Fernández Pérez et al. 2017).

The diversity of world healthcare systems: between public and private initiative and pressures

Changes in public healthcare systems strongly influenced the expansion of commercial healthcare markets (Lethbridge 2005; Jasso Aguilar et al. 2005). In countries with a public healthcare sector, or the influence of public institutions in shaping rules of the game, healthcare companies tried to access their clients with strategies that prioritized the expansion into public sector markets. This applies to the diverse European national healthcare systems created since the mid-nineteenth century, despite the European Union’s efforts to standardize practices and rules. A good example of this is Sweden. In a context of economic underdevelopment, an agricultural economy, and sparsely populated territory, Sweden brought together in the early eighteenth century local governments and religious sanitary centers in cities, and established provincial doctors for the rural areas financed with state funds from 1773. Between 1946 and the early 1990s the government controlled healthcare. Over 80 percent of doctors worked in government-run hospitals, and private healthcare almost disappeared. Healthcare corporations had to adapt to Sweden’s strict regulations, including a state monopoly over the distribution of pharmaceutical drugs with price controls. Problems appeared in the 1990s and first years of the twenty-first century, with long waiting lists and complaints, which led to reform and some privatization of primary health services (Hogberg 2007).

In China, economic underdevelopment, a largely agricultural economy, and a very dispersed population in rural regions meant high mortality rates during waves of famines, until at least the 1950s. The lack of resources made Chinese local, regional, and national authorities use provincial rural doctors to heal the sick in the rural districts, as happened in Sweden. From the mid-twentieth century, there was a sharp rise in the construction of publicly funded and regulated public hospitals in larger cities. Thus medical services and products were controlled by rural practitioners with little formal educational; large corporations only appeared after 1950. In
1951, for instance, the Department of Health of the Guangdong Province established China Pharmaceutical Company Guangdong Branch (the predecessor of Guangzhou Pharmaceuticals Corporation) in Shamian, Guangzhou, which in 1955 established a first attempt of joint public–private business, and a joint venture with foreign interests in 2007 to distribute pharmaceuticals (Guangzhou Pharmaceuticals Corporation undated).

By contrast, in countries where the public sector was weak, companies prioritized strategies of introducing diverse healthcare systems of health insurance, which favor high and middle income groups’ access to private healthcare and establish tough penalties for low income and poor people, like in the United States (Ford Chapin 2015).

In Australia, a public-led healthcare system of innovation unfolded during the twentieth century, and some of the most outstanding healthcare corporations in 2016 were created during the two revolutionary healthcare periods: the therapeutic revolution of vaccines during the first third of the twentieth century, and the biomedical cellular and molecular revolutions after the 1980s. During the first revolution, the following corporations were created: Australian Pharmaceutical Industries (1910), Sigma Pharmaceuticals (1912), CSL Limited (1916). After the 1980s some of the new outstanding healthcare companies in Australia were Biopharm Australia (1980), Cochlear Limited (1981), Healthscope (1985), Florigene (1986), Ausmed (1987), Chemeq (1989), IQNovate (2011). The geographical distance with Western centers of healthcare supply, and several wars in Europe during the twentieth century made the Australian policymakers well aware of the need to be self-sufficient, and, second, about the driving role of the state in long-term investment in research and development of healthcare products and services for Australians. Excellent scientific networks with leading Western centers and state support explain the strength in Australia of public healthcare corporations, until the 1990s when major private groups and funds started becoming major players first in partnership with state firms and then alone in the Australian healthcare markets, like in the case of the plasma derivatives industries and the vaccines industries.

**Conclusions**

Healthcare is a basic human need. Protectionist healthcare regulations sometimes ignore that disease is a global problem requiring cooperative approaches. Political ignorance about the complexities of the economics of healthcare, protectionist regulations, and economic de-globalization have made the role of global healthcare corporations of outstanding relevance today to help us face the challenges of an aging population in the developed world, and the resurgence of old infectious deadly diseases everywhere in the world, as classic drugs and vaccines become less effective. Germs do not know borders and do not respect immigration controls.

More research is needed to analyze and understand how the business of healthcare products and services changed from a preindustrial system of production and distribution, controlled by individuals educated in the power of natural remedies, to our current world controlled by the interests of distant drug and technology manufacturers, health insurance companies, and the changing regulations of political parties.

Also, more research is needed in the archives of governments about the role of imperial powers and military interests to finance new scientific centers and new scientists to support their imperial conquest, reduce the risks of deadly diseases in their armies and employees, and their contribution to subsidize some of the first pioneering global corporations in the pharmaceutical and healthcare industries. Behrinwerke in Germany, Cutter and Armour in the United States, CSL in Australia, or Siemens, for instance, first grew to serve the public needs of their armies in war times, and grew in scale and scope, thus establishing the enduring basis of global corporations in the biomedical or
hospital equipment industries. In other cases, global private non-governmental institutions subsidized scientific research in close connection with economic imperial projects, like in the case of the International Health Division of the Rockefeller Foundation Commission.

There is also much research to do on the evolution of the markets and how conditions of the external environment created business opportunities, first used by scientists–entrepreneurs in the pioneering countries where conditions were more favorable to generate investments in research: Germany, Switzerland, France, the United Kingdom, the United States, Japan. Scientists–entrepreneurs received public and private resources to advance discoveries, and also increase the scale and scope of the manufacturing and distribution of new medical and pharmaceutical products.

New archival research could also uncover the diversity of healthcare policies. Healthcare corporations very early established for technological and economic reasons tough entry barriers to their knowledge, and their markets. They also had the extraordinary positive opportunity to meet the growing and stable demands of an expanding market, due to the increase in life expectancy in the world after the 1880s, first in the Western world, and after the 1950s to 1960s in the rest of the world. In this context, lobbies emerged very early close to the centers of political power, to influence laws regarding barriers to local and foreign competitors, though we have little research to date on the consequences of this development.

There are many debates in the media today about the degree of coverage and efficiency of privately based and public supported healthcare systems, but we know very little about their origins in every country, and above all we must try to establish new methodologies that allow international comparisons and a historically based narrative about the global construction of healthcare systems.

Finally, more research is needed on the management of the global players of the healthcare industries, such as their efficiency, their lobbies, and connections with interest groups and regulators. We also need to know more from national public agencies about safety and in helping to guarantee a fair price, about the abuses and frauds they commit, and the transparency and efficiency of and access to these corporations’ healthcare products and services.

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Notes

2 See, forthcoming, in Business History, the Special Issue Health Industries guest edited and with an Introduction by Pierre-Yves Donzé and Paloma Fernández Pérez, with an Introduction that provides an overview to some of the most outstanding authors and contributions.

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