



# Public health in Catalonia between 1885 and 1939

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## ABSTRACT

In the 50-year period falling between two health emergencies, a cholera epidemic and the Spanish Civil War (1885-1936), Catalonia underwent a profound transformation in all aspects of life. This was expressed in an awakening and desire for modernisation and the recovery of its national personality. In the first 25 years, which dovetailed with the Modernist era, Catalan society became aware of its situation – in the field of health, as well – and civil society and towns started testing grassroots solutions. In the second stage, with the creation of the Mancomunitat de Catalunya and the influence of Noucentisme, a “regional state” began to be built which planned and initiated improvements in the health conditions all over the land, albeit with many limitations.

**KEYWORDS:** epidemics, municipal microbiology laboratory, hygiene, beneficence, social assistance, public health

## INTRODUCTION

The 19th century was a period of social, economic, demographic, ideological and technological changes and transformations. Catalonia experienced the effects of the Industrial Revolution, the phenomenon of urbanisation, the appearance of a new social class – the proletariat – and the awakening of Catalanist feeling with the revival of its language. While the influence of Romanticism predominated in the first half of the century, positivism and libertarian thinking came to the fore in the latter half.<sup>1</sup>

In terms of health, the 19th and first third of the 20th centuries were characterised by the outbreak of recurring epidemics of cholera (1834, 1854, 1865, 1884 and 1911) and yellow fever (1803, 1821 and 1870),<sup>2</sup> as well as outbreaks of epidemics of varying intensity of rabies (1902), dengue fever (1905), smallpox (1877, 1904 and 1906), the plague (1906, 1913 and 1931)<sup>3</sup> and other illnesses causing diarrhoea such as one called “colerina” (1903, 1904 and 1911), typhus (1908), typhoid fever (1914) and the flu (1919). The first third of the 20th century was marked by the swift spread of tuberculosis, which became known as the “white plague”. There were also several bouts of malaria in the river deltas, coasts and rice-growing regions.

In addition to infectious-contagious diseases, we can also find a series of problems that aggravated the health conditions of the majority of the population, such as pov-

erty or pauperism,<sup>4</sup> the lack of schooling, poor working conditions, unhealthy homes, deficient nutrition, alcoholism,<sup>5</sup> prostitution, venereal diseases, problems with the drinking water and the lack of sewer systems.

Even though the mid-19th century marked the peak of fertility and had the highest birth rate in Catalonia, it was accompanied by a notable increase in the death rate and mortality of both children and adults. Between 1900 and 1935, the very high child mortality rate dropped from 138 per 1,000 to 87 per 1,000,<sup>6</sup> although this was compounded by the deaths caused by wars, uprisings and other violent events.

In this scenario, the public administrations only intervened occasionally, and the Spanish state limited itself to issuing laws and regulations, although they were never enforced because of a lack of resources. Only a few municipalities which had hospital asylums were able to house the poor, old, orphaned and decrepit.

Ideologically, the Hippocratic-Galenic ideas of the humours and environmental causes of illnesses still prevailed in medicine in the first two-thirds of the 19th century. Medical training was basically theoretical and speculative in nature. Treatments solved little and were thus counterproductive.

All of these factors reveal a fairly precarious health scene with a host of shortcomings.<sup>7</sup>

Yet the 19th century in Catalonia was also a time of changes, growth and transformation in all spheres: political, economic, social, demographic, scientific and health. There was an awakening of collective capacities, a mobilisation of human and economic resources, a yearning for

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progress, a desire for freedom, a period of linguistic and cultural revival, and a desire for collective self-affirmation, modernity and internationalisation.

This wave of creative vitality became even more obvious and tangible in the last third of the 19th century, when it penetrated all layers and spheres of society, thought and action. The drive for the much-needed social and structural reforms and transformations in Catalonia emerged from the grassroots: civil society (doctors, urban planners, athenaeums and working-class associations, a few industrial organisations, etc.) and the municipalities, but not the Spanish state administration, which revealed itself to be insensitive, impotent and indolent.

### THE MIXED CONSTRUCTION OF A REGIONAL WELFARE STATE IN CATALONIA

The Spanish state administration refused to act to palliate or resolve these health issues, which sparked unrest and alarm in society, including repeated outbreaks of violent uprisings. This led to the emergence of voices from individuals and organised civil society, such as scientific societies, working-class athenaeums, general newspapers, professional magazines and the more sensitive members of a few Town Halls, to complain about the state's negligence and propose a wide range of solutions.

At the same time that the Bourbon Restoration regime was being instated in Spain in the last quarter of the 19th century, a nationalist revival movement called the *Reixenç*a was gestating in Catalonia. Among its goals were to revive some of the local institutions of political self-governance lost in the 1714 War of the Spanish Succession between the Hapsburg and Bourbon rivals.

At that time, Catalan society felt neglected, marginalised or even punished by the Spanish state, and it sought alternative formulas to deal with its specific needs. This gave rise to the mobilisation of the active forces in society, which gradually created instruments that allowed the problems to be palliated and the creation of an institutional system that would cover the shortcomings of the Spanish state. To achieve this, the public administrations closest to the citizens – Town Halls and provincial councils – along with private initiative attempted to develop what has been called the “regional state”.

In the 50-year period encompassed in this article, Catalan society went through two stages with different characteristics, known as Modernism and Noucentisme. They were ideological movements that permeated many aspects of society, including politics, economics, art, science, culture and health, and thus individuals' everyday lives.

Modernism was characterised by spontaneity, individualism, boldness, a return to nature (naturalism), references to the Middle Ages (Gothic art) and the revival of the local language and traditions. In science, it is associated with positivism, which rejects theoretical or specula-

tive knowledge and replaces it with laboratory medicine. In the practice of health, we can find the start of active prevention through vaccinations (for cholera, rabies, the plague, etc.) and the antiseptic method with physical and chemical disinfection.

Noucentisme was characterised by order, arbitrariness, teamwork, measure, a return to norms (normativism), a reference to classical antiquity (Mediterraneanness) and the recovery of a certain degree of self-governance. In science, experimentalism prevailed, with the appearance of research centres. In the practice of health, Noucentisme signalled the start of public health and social assistance, with the creation or modernisation of major infrastructures.

### MODERNIST HYGIENE (1885-1910)

The healthcare professionals known as “hygiene doctors” were the first to make their condemnations of the people's deficient hygiene and health conditions heard. The members of this profession, who were in close, constant contact with the precarious living and health conditions of the majority of people, raised their voices and set pen to paper to condemn the causes of that situation and suggest reform-oriented solutions.<sup>8</sup> In this context, the only public institution with the sensitivity and ability to respond was the Barcelona Town Hall, which went from simply issuing healthcare laws to implementing programmes and institutions promoting modern hygiene.

#### Pauperism

Poverty, alcoholism and prostitution were the scourge of urban industrial society in the 19th century. Salaries that were insufficient to cover the most basic needs of the proletarian population<sup>9</sup> predisposed them to the phenomena of marginalisation, personal degradation and social ills like alcoholism and prostitution. Within this context, the concept of physical and moral “degeneration” and “regenerative” moralism emerged. Pere Felip Monlau was one of the first to point out that the majority of medical problems among the working class originated from and could be solved by economic and social means. He described it in these terms: “Poor people, despite the resources with which they strive to meet their needs, rarely have a healthy diet; a clean, decent ventilated room; clothing that protects them from harm from the weather and the seasons. Hence their physical degeneration; hence transmitting life to devilish and ailing beings like themselves; and hence the enervation of the generations. Physical degeneration comes hand in hand with moral degradation: poverty is naturally affected by incurable dejection, by extreme negligence: hence the habits of a lack of foresight, drunkenness and libertine behaviour which can be observed in the indigent population.”<sup>10</sup>

Hygienists called for fair, sufficient wages, along with education and morality for the working masses. The birth

of savings and loans and the advent of mutual social welfare societies in the mid-19th century were the responses to these problems from civil society, trade unions and professional or regional organisations. Others, such as the republican Anselm Clavé, strove to raise workers' morale through song and music.

The *Sexenni revolucionari* (Six Years of Revolution, 1868-1874) pressured the public administrations to provide social and health services.<sup>11</sup> Provincial charities cared for the poor and destitute in asylums and orphanages. Those who cared for orphans and foundlings tried to fight against the high child mortality rate of the period. Until the 1890s, the Town Halls met the social needs of the poor in hostels and the ill in first-aid hospitals. And starting in the 1860s, the Barcelona Town Hall had published statistics from the civil registry, with data on births, deaths and the causes of death by age, sex, profession, home and place of origin. This provided the empirical framework for the reforms undertaken in the 1880s and 1890s.

In 1891, The Barcelona Town Hall adopted three important resolutions: approval of the sanitation plan, the issuance of new municipal ordinances, and the creation of the Institut Municipal d'Higiene (Municipal Hygiene Institute), which had a section called "special hygiene" devoted to controlling prostitution.<sup>12</sup>

### Housing and urban planning

The first problem worth noting was housing,<sup>13</sup> which was related to the walls that encircled many cities. The swift industrial growth and the need for labour led to an exodus of people from the rural areas towards the cities. This meant overcrowding in poorly ventilated, moist houses and flats with no running water, no sanitation services (toilets, showers) and waste water elimination through cesspools. These conditions fostered the transmission of infectious and contagious diseases, which spread like wildfire. Likewise, the existence of cesspools with faecal water led to the contamination of the drinking water, which came from wells, cisterns, fountains or channels in poor condition.

The first person to condemn these conditions was Pere Felip Monlau in 1841 with a manifesto entitled "Abajo las murallas" ("Tear Down the Walls"). Later, in 1853, Josep Brun proclaimed the "public health need for the municipal authority of Barcelona to intercede in the interior layout of the homes built there". On the 28th of December 1861, the Ateneo Catalán announced a competition to award a prize to the best project on working-class homes submitted. Josep Xifré and Albert Lauth submitted a project to build freestanding houses with gardens, ground floors and one upper floor for a total cost of around 12,000 *rals*.<sup>14</sup>

The condemnations by hygiene doctors were joined by the voices of engineers and architects, who pointed out the health, urban planning and economic problems caused by the existence of the walls. Based on meticulous statistical studies, they showed the health inequalities by neighbourhood, kind of home, income level, diet and social class.

The urban design by Ildefons Cerdà i Sunyer, a civil engineer, was chosen for Barcelona's enlargement after the walls were torn down. He was the author of *Teoría general de la urbanización*, which even today is a model of socially sensitive urban planning.<sup>15</sup>

The 1885 cholera epidemic laid bare the health deficiencies of the city of Barcelona. Mayor Joan Coll i Pujol appointed a commission to study the sanitation of the city's subsoil, leading to the creation of a section of sewer supervised by the engineer Pere Garcia Faria.<sup>16</sup>

An international medical and pharmaceutical conference was held from the 9th to 15th of September 1888, dovetailing with the Barcelona World's Fair. At the conference, studies that Garcia Faria himself had performed were presented, pointing out the connection between the sanitary conditions of homes and human pathology. He believed that the salubriousness of homes depended on six parameters: location, building materials, layout, light and ventilation, cubage and general services (water, toilet, gas, electricity). He believed that from both the hygienic and moral standpoints, the ideal home was occupied by a single family.<sup>17</sup>

The doctor Josep Nin Pullés, a pioneer in health statistics, also participated in the conference. He noted that overcrowding led to impure air and caused organic impoverishment. This factor was omnipresent in working-class houses. He also posited a close relationship between a series of infectious diseases (especially tuberculosis and measles) and urban overcrowding. He stated that mortality rises with population density inversely to the amount of space available.<sup>18</sup>

In 1892, Enrique Robledo Negrini presented a study on working-class housing. He believed that poor housing was the cause of disease and ultimately death. He thought that death in the working class had two negative consequences: a decline in production and an increase in social spending. He posed the dilemma of whether the social classes should live mixed in the same neighbourhood or segregated, and whether they should live in single-family homes or apartment buildings. He thought that workers should be able to buy their own home, but that the public administration had to provide them with services such as water, sewage and electricity. He praised the initiative of several workers' cooperatives and companies which were building homes for the working class.<sup>19</sup>

In 1895, the urban planner Garcia Faria published a monograph entitled *Medios de aminorar las enfermedades y mortalidad en Barcelona*, in which he pointed out that Barcelona had 419 streets which were narrower than six metres and that the population density meant just ten square metres per inhabitant.

### Diet

Food was another of the problems that concerned the hygienists. In the first half of the 19th century, the poor essentially lived on bread and pap, although they might add a bit of lard to it, while the proletariat might add a piece of

bacon, perhaps some legumes, potatoes and vegetables, for a dish nicknamed “hort i porc” (vegetables and pork).<sup>20</sup> Dr Font i Mosella believed that consuming meat was essential for the individual health and development of workers. Practically the only meat that could be eaten relatively frequently was pork, which was thus regarded as a “savings bank”. In 1879, in a lecture series that several doctors delivered to the workers at the Ateneu, Dr Emerencià Roig i Bofill spoke about the problem of workers’ diets, stating that they ate little and poorly. Dr Giné i Partagàs, a professor in the Faculty of Medicine, pointed out the need for equal parts vegetables and meat in the diet of the poor and immigrants.<sup>21</sup>

In order to deal with the issue of food, several initiatives were launched. One provided assistance, or charity. After the industrial crisis of 1864, a series of protectors, organisations in a protective board of working-class restaurants, opened food kitchens for unemployed workers and families where they could get a nutritious, varied meal for a minimal price.<sup>22</sup>

Another initiative called for reforms of the system by which food was manufactured and commercialised, as well as lower taxes on meat and the abolition of Barcelona’s *dret de portes* tax, which charged for the entry of any animal and encouraged speculators to introduce poor-quality meat. Dr Mas i Alemany from the Acadèmia d’Higiene de Catalunya (Hygiene Academy of Catalonia) supported the draft law submitted by Elias de Molins in 1919 which asked that a livestock farmers’ union, a cooperative and an animal science school be created, while simultaneously asking the Town Halls and provincial councils to promote livestock farming. They also asked that meat from foreign countries be allowed to enter the country tax-free.<sup>23</sup>

The third initiative was to increase the consumption of legumes which, according to Dr Carles Ronquillo, “produce flesh, blood and milk and for this reason are the hope and consolation of the poor”. This led to the appearance of shops that sold cooked legumes, most of them in working-class neighbourhoods.

### Malaria

In the Mediterranean basin, malaria had been an endemic problem since ancient times. In Catalonia, people had begun to gain awareness of its human and economic cost in the late 19th century. In September 1888, on the initiative of the General Board of the Barcelona World’s Fair, a series of medical conferences were held. The hygiene section, which was presided over by Dr Carles Ronquillo, examined the problem of malaria in the Baix Llobregat region, which was the infected area closest to Barcelona. One speaker, the homeopath Dr Benavent, proposed that land be left fallow in order to allow rainwater and overflows to circulate freely. Dr Roquer from the Academy of Medical Sciences suggested using sand dunes to fill the ponds and cover lowlands. Hermenegild Puig i Sais from El Prat de Llobregat asked that quinine be used to treat

people infected with parasites. Giné i Partagàs recommended that maritime pine trees be planted in the region, and Rodríguez Méndez recommended that lands be drained, ponds be buried and pine trees be planted. Bartomeu Robert and Lluís Suñé Molist, speaking on behalf of the Academy of Medicine and Surgery, presented a report entitled “Sanejament de Castelldefels i pla del Llobregat” (“Sanitation in Castelldefels and the Llobregat Plain”).<sup>24</sup>

Spurred on by the railway companies, the Barcelona Town Hall and the Acadèmia d’Higiene de Catalunya (Hygiene Academy of Catalonia) launched epidemiological studies and therapeutic and prophylactic tests limited to the delta of the Llobregat River, with promising results.<sup>25</sup>

Between 1898 and 1906, there was a surge and increased deadliness in the clinical forms of malaria which were attributed to the repatriation of emigrants and troops from Cuba and the Philippines, although the government did nothing about it. In 1912, the left channel of the Ebro River was opened, which led to a significant rise in the number of malaria cases in the region between 1913 and 1915.

### Contagious diseases

Infectious and contagious diseases were a scourge that was difficult to control until the arrival of antibiotics. People were ignorant and defenceless or subjected to arbitrary restrictions that never managed to bring the problem under control. As a strategic zone of transit for both people and goods with its active maritime ports, Barcelona was more exposed to contagion than other inland or more isolated areas. This explains the repeated, varied epidemics that periodically besieged Catalonia.

Between 1885 and 1915, there was no general action plan in the field of public health except for occasional actions on the initiative of the local health authorities and towns when epidemics sprang up. Hence the importance of the new preventative vaccinations created by Jaume Ferran during this period. He spoke about “Large-scale Hygiene” represented by vaccinations, as opposed to “Small-scale Hygiene” of quarantines and fumigations. Compared to the earlier merely defensive approach, this new change in approach to anticipate or prevent infectious and contagious diseases was not warmly welcomed by all political and professional sectors in Spain, some of which were aligned with the more conservative ideology. They disagreed with using virtually experimental measures and tried to block any advances in this sphere.

The threat of the cholera epidemic in 1886 is what aroused and sparked a mobilisation to find solutions. On the 22nd of July 1884, when the cholera epidemic in Marseille was at its peak, Dr Bartomeu Robert suggested that a committee be appointed to study cholera in southern France in view of the passivity of the Spanish health authorities. The Governing Commission accepted this proposal, although it noted that the Madrid government should, in fact, send the committee. On the 5th of August 1884, the Governing Commission decided to announce a



competition to assemble a committee with two doctors and a naturalist. They stipulated a series of conditions that had to be met and earmarked sufficient sums of money to pay for the travel and accommodations of the committee members. The doctors had to draw up a report after the mission, while the naturalist had to write a separate one. The announcement was published in newsletters of Barcelona and the Provincial Council. Fourteen people submitted their candidacy for three places, one of them Jaume Ferran i Clua. The two doctors chosen were Joan Montserrat i Archs from the Royal Academy of Sciences and Arts, the author of a botanical treatise and a winner of the City's Gold Medal for services during the yellow fever epidemic, and Enric Corominas i Moreu, another doctor of medicine and sciences.

Jaume Ferran received his marching orders on the 31st of August 1884, even though he had not yet been officially appointed, accompanied by his partner Innocent Paulí i Galceran. They reached Marseilles and set up the laboratory in Pharo hospital, and there they worked with the microbiologists Nicati and Rietsch, with whom they learned to discover the cholera microbe in the excrement of people suffering from malaria. After a 22-day stint in Marseilles, the Barcelona committee deemed its job concluded and went on to Toulon. There, Ferran wrote a study for the Barcelona Town Hall entitled "On the Most Expeditious Way to Find the Cholera Microbe in Defecations", which was extremely helpful in diagnosing the disease.

Ferran's report from December 1884, "Studies on Cholera", described the topographic study in Marseilles and Toulon, paying attention the subsoil, the drinking water and the latrine system, and he conducted a meteorological study during the outbreak of the epidemic. He also provided a morphological description of the microbe with three hand-drawn plates, and he announced that by hypodermically inoculating rabbits with the cholera microbe, they developed resistance against the disease. This is the first description of an effective prophylactic method against cholera, the outcome of a study conducted in a private laboratory with no public financing.

One display of society's sensibility towards these scientific and health problems is the article by the future doctor Lluís Claramunt i Furest, who wrote the following in the newspaper *La Renaixença* on the 9th of October 1885: "Before the Town Hall of this city begins work on the installation of a laboratory to cure rabies following Mr Pasteur's system, we believe it is appropriate to make a few observations which we believe are worth taking into account. Everyone is aware that the research resources in Spain to perform experimental studies in the medical sciences and anything that is more or less related to them are deficient, and no one is unaware of the state's deplorable abandonment of the Faculties of Medicine in anything referring to the new experimental studies in microbiology. This sloth is so great that not even in the latest decree reforming the studies in that Faculty has the Ministry re-

membered to create a chair with the corresponding Faculty. The Town Hall of this city, which is so distinguished by the creations which are said to be of its exclusive initiative, could not find a better time than the present to equip this capital with an institution for the study of microbiology, since the institute to cure rabies should have a very well-equipped laboratory, for which this Town Hall makes praiseworthy sacrifices, and in it the enlightened doctors and students whose absence we complained of above could be welcomed."

On the 28th of September 1886, in his laboratory in Tortosa, Jaume Ferran sent a letter to the mayor of Barcelona, Rius i Taulet, emphasising the scourge of rabies and noting that failure to combat it properly was sheer neglect on the part of the authorities since Pasteur had discovered a vaccination. Ferran altruistically offered to remedy this problem. On the 2nd of November of that same year, the Governing Commission of the city decided to launch a more ambitious microbiology institution. On the 16th of November, Ferran was appointed director of the future Municipal Microbiology Laboratory, which was to both teach and conduct research in bacteriology, while it was also supposed to develop and administer vaccinations. The modernity of the institution and its mission were quite clear.

In January 1887, before the facilities were fully built, the laboratory started operating on lands within the former military citadel of Barcelona.<sup>26</sup> This opening, which came before that of the Pasteur Institute, occurred without the approval of the Provincial Health Board, which was the official state representative on health matters. The first vaccination against rabies in Spain was administered in this provisional laboratory on the 17th of May 1887.

The administration of Pasteur's rabies vaccination had been associated with several deaths, which led to a campaign against vaccinations. Given this, Ferran came up with the idea of a way to prepare the vaccination different to Pasteur's method, which he called "supra-intensive"; it was safer and led to fewer undesirable reactions.

Between 1887 and 1892, the first typhoid vaccinations in the world were administered, while research was still underway on carbuncles and diphtheria. The Municipal Microbiology Laboratory started to prepare lympho, a fresh vaccination to prevent smallpox, closely following Jenner's method. Work also got underway on tuberculosis.

Given the social and health needs of the population of Barcelona, in 1891 the Institut d'Higiene Urbana (Institute of Urban Hygiene) was created. The physician Lluís Comenge i Ferrer was appointed director. He launched urban epidemiological studies which were extraordinarily important in finding the focal points of contagion and infection. He started the first disinfection centre in the state and implemented the first household disinfections.

In 1891, the Laboratory's first internal regulations were approved. They were written by Ferran and clearly stated: "The staff shall primarily work on experimental studies of all the scientific problems related to the aetiology, proph-

ylaxis and pathogeny of the infectious diseases which are of truly practical interest, and whose solutions may be immediately applied.” Here he emphasises the clearly experimental mission of the municipal laboratory, which would offset the shortcomings of the state in the sphere of modern biological education and research.

In late 1894, Ferran managed to prepare an equine-based serum to counter diphtheria, inspired by the Behring-Roux method, which triggered fewer complications and offered greater protection. Later, the laboratory made several contributions to studying tuberculosis and cultivating anaerobes and tetanus.

Faced with the outbreak of bubonic plague in Porto in 1899, the Barcelona Town Hall commissioned Dr Ferran to study the problem there. Speaking before an international commission, he stated that the mice he had vaccinated survived, while those which had been inoculated for the plague with Haffkine’s vaccination died.

In 1906, the Municipal Laboratory, also known as the Laboratory in the Park because of its location, changed management and was reorganised. Three sections were created: rabies led by Lluís Claramunt, microbiology led by Ramon Turró, and food analysis led by Dr Calvet. The latter had come from the Instituto de Reconocimiento de las Substancias Alimenticias (Institute to Check Food Substances), which had been created by the Barcelona Town Hall in 1882 to ensure the quality of food and prevent food adulteration.<sup>27</sup> In the same vein, we should recall the milk regulation issued by the mayor of Barcelona in 1865, which is regarded as the first of its kind in the world.

This centre’s stimulus for research could be seen through the publication of scientific studies, such as *La toxina del Bacilus virgule* by Lluís Verderau Solà, *Los injertos de próstata, las inyecciones de prostatina y su influencia sobre las funciones sexuales* and *Papel de la próstata como reguladora de las funciones espermatogénicas y espermatorreicas* by Narcís Serrallach, both in 1908, along with *Polimorfismo del bacilo tuberculoso* by Josep Alomar in 1910. Between 1904 and 1909, Ramon Turró and August Pi Sunyer presented numerous papers on immunity from a fully physiological vantage point.

In 1908, the Catalan Students’ Association wrote a letter to the mayor of Barcelona asking for an ongoing course on general physiology to be held at the Municipal Laboratory and taught by August Pi Sunyer, the professor of this subject in Seville. They also wrote another letter to the Ministry of Public Instruction and the Faculty of Medicine at the Universitat de Barcelona to request that this course be considered an “extension of official education”.

The dark spot in health matters in Barcelona in the early 20th century was the control of the drinking water. In 1909, bacteriological controls of meat, milk and water were started. These controls showed that there was an increase in contamination in the water coming from Montcada en route to Barcelona. Finally, a typhoid epidemic was declared in 1914, with a steep rise in the number of deaths caused by this disease.



FIGURE 1. Poster advertising social assistance for tuberculosis victims of Barcelona. By Ramon Casas (1921). AGDB. Arxiu General de la Diputació de Barcelona.

### Medical training

Even though the Universitat de Cervera permanently moved to Barcelona in 1843, university studies were still predominantly theoretical and somewhat impervious to the new developments happening abroad. It was not until new professors were hired in the 1860s that medical education began to welcome the influence of the new positivistic currents, such as clinical medicine, Darwinism, experimentation and laboratory medicine. This start of scientific change happened to dovetail with political change.

The advent of the Spanish First Republic led to the decree of freedom of education and the possibility of choice in independent study. This led to several initiatives outside of official education which incorporated the new scientific currents, practical teaching and experimentation.

A free university and Faculty of Pharmacy<sup>28</sup> were created in Girona (1871-1874), promoted by the Town Hall, with 274 students enrolled.

In Barcelona, too, the Glorious Revolution of 1868 paved the way for the creation of the Institut Mèdic de Barcelona (Medical Institute of Barcelona), which was established as a free medical school that sought to offer Bachelor's and doctoral degrees. It was the initiative of one professor from the official Faculty of Medicine who was concerned about the immobility and structural and functional limitations of official degree programmes and yearned for modernisation in pedagogy and teaching. This enthusiastic promoter was Dr Joan Giné i Partagàs, a prominent member of what was known as the medical generation of 1888, who had the boldness and tenacity to break with the past and open up to the new currents in European medicine.

With the support of the Barcelona Town Hall, this institute carried out practices in osteology, physiology, biological chemistry and other subfields. It introduced courses on subjects like the history of medicine, the history of pharmacy, phrenology and ophthalmology. The faculty was made up of prominent physicians in the nascent specialities along with some professors from the official university. Even though it lasted only a brief time (1866-1872), the Medical Institute of Barcelona signalled the start of a series of non-official educational institutions which incorporated the new positivistic medical doctrines and practices from Europe and exerted a major influence on the development of medicine in Catalonia in the late 19th and early 20th centuries. The most significant institute, which still exists today, is the Acadèmia i Laboratori de Ciències Mèdiques (Academy and Laboratory of Medical Sciences), also created through a free association of professors and students who shared an interest in medical experimentation.

### The shortage of hospital beds

The lack of hospital beds in Catalonia had been obvious since the mid-19th century, especially in Barcelona, which only had the Hospital General de Santa Creu. The repeated epidemics throughout the century made the problem even more acute. The technical and scientific advancements of the period rendered the establishments in operation obsolete. The state, which was in charge of psychiatric care, had not a single establishment in Catalonia.

In this context, both physicians and society raised their voices to demand solutions to the situation. During the period known as the Democratic Sexennium (1868-1874), 22 proposals to build healthcare facilities were submitted, most of them public.<sup>29</sup> This was accompanied by an intense debate in the newspapers and professional medical journals, in which professors from the Faculty of Medicine like Joan Giné i Partagàs participated actively. In 1878, Giné i Partagàs organised a series of lectures under the title of "Nosocomial Needs of Barcelona" at the Ateu-neu Lliure de Catalunya.

The first initiative emerged from civil society: a group of bourgeois ladies from Barcelona, with the support of the bishopric, founded a private hospital to serve as a centre of specialities in 1879. The medical direction was entrusted to a prestigious surgeon, Dr Salvador Cardenal, who soon attained well-deserved fame for his application of antiseptic surgery.

During the same period, pressed by repeated epidemics and the lack of healthcare facilities, the Barcelona Town Hall built a provisional quarantine area near the sea: in 1899 it purchased the land on which it was later built in 1905, under the threat of an outbreak of the plague.<sup>30</sup> In 1914, with the health crisis triggered by the outbreak of typhoid fever, this provisional facility became a permanent municipal hospital for infectious diseases.

The Faculty of Medicine of Cervera's return to Barcelona in 1837 spotlighted the shortcomings of the Hospital de la Santa Creu in terms of teaching, as well as the repeated clashes between the professors and the hospital administration, which limited practical teaching. This was behind the faculty's 1879 request to the state to build a separate, properly equipped university hospital. In 1888, dovetailing with the Barcelona World's Fair, the authorities laid the first stone in the building that would house the future Faculty of Medicine and the Hospital Clínic (Clinical Hospital), although progress did not continue because of economic and administrative hurdles. The driving force behind this project was professor Giné i Partagàs.<sup>31</sup> The architect chosen was Josep Domènech i Estapà, who completed construction in 1901.<sup>32</sup> Countless external and internal obstacles had to be overcome which ultimately delayed this facility for 25 years. Finally, it was opened and started providing teaching and healthcare in 1906. This new infrastructure brought major improvements as well as the adoption of new concepts of medical education and modern patient care.<sup>33</sup>

Barcelona's former Hospital de la Santa Creu, founded in 1401 by the merger of six smaller hospitals, had become insufficient and inadequate for modern healthcare and teaching needs. The hospital administration, which was in the hands of the Town Hall and the bishopric of Barcelona, also acknowledged that its location and facilities did not meet the conditions for its mission, so a location was sought where a new hospital adapted to modern medicine could be built. This was also a long, complicated process, and Dr Bartomeu Robert<sup>34</sup> served as a driving force in this project. Lands which met the ideal conditions for a healthcare establishment were purchased in the Guinardó neighbourhood, and the architectural design was commissioned to Modernist architect Lluís Domènech i Montaner, the designer of other major hospital facilities. The architect designed the construction of 24 freestanding pavilions which were connected by underground walkways; each was devoted to the nascent medical specialities, some for women and others for men. In terms of economics, it benefited from the legacy of the Catalan banker Pau Gil, despite the fact that the testator wanted a secular



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FIGURE 2 Entrance hall of the Hospital de la Santa Creu before the services were moved to the Hospital de Sant Pau in 1921.  
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hospital institution. The first stone was laid in 1902, and the facility, named the Hospital de la Santa Creu i de Sant Pau, was opened in 1916. Only half of the pavilions designed were ultimately built because the bishopric and Town Hall failed to contribute funds. These facilities were at the vanguard of the most advanced hospital architecture of the period.<sup>35</sup> The patients and hospital services were gradually transferred there until the late 1920s.

### Mental health

The “degenerationist” ideas which predominated in the 19th century led to the creation of establishments on the outskirts of cities to treat and regenerate the mentally ill. In the second half of the century, several mental hospitals were founded near Barcelona, all of them totally independent and unrelated to the Hospital de la Santa Creu. They had been promoted by private initiative and spearheaded by physicians like Antoni Pujadas i Mayans, after he returned from exile in Great Britain; Emili Pi i Molist, who was influenced by the German “vitalists”; and Joan Giné i Partagàs, with his Nueva Belén sanatorium which followed the “organicist” trend. The Torre Lunática (“Lunatic House”) was also founded in Lloret de Mar, as was the Institut Pere Mata in Reus, which had separate pavilions built in the Modernist style.

Proof of the importance attached to this branch of medicine was the first Spanish psychiatry conference in 1888, along with the advent of the first specialised publication:<sup>36</sup> the *Revista Frenopática Barcelonesa*.

### PUBLIC HEALTH DURING NOUCENTISME (1911-1936)

The Mancomunitat de Catalunya (1914-1925)<sup>37</sup> and the Generalitat de Catalunya (1931-1939)<sup>38</sup> were the first two attempts to establish a local administration which fit the characteristics and needs of Catalan society. With few economic resources and little legal authority, they undertook an innovative public health initiative, shifting from charity to healthcare, and improving and creating teaching, research and healthcare institutions.

### The diet of the proletariat

In the early 20th century, food accounted for two-thirds of total spending in the household budgets of the working classes. Noucentista physicians wrote on the topic with a great deal of ethical honesty and undeniable scientific veracity. Dr Àlvar Presta hinted at the possibility that this inadequate diet might be the cause of mental retardation.<sup>39</sup> In his work *Higiene de l'alimentació*, part of the popular “Minerva” collection published by the Institut d'Educació General (Institute of General Education) of the Mancomunitat de Catalunya, Josep Tarruella recommended minimum meat consumption of 200 grams per person per day.<sup>40</sup>

In 1915, the director of the Institut Català de Sant Isidre, J. Raventós, wrote a booklet entitled *L'alimentació de l'home*. The Barcelona Town Hall distributed thousands of copies of it among the working class and their associa-



tions. This book recommended making a purée of “water, potatoes, carrots, onions, barley, fava beans, lentils and green beans”, which is easy to digest and has a high nutritional value. Raventós then classified the foods by placing a maximum nutritional value on “concentrated foods” such as almonds, hazelnuts, walnuts, oil, etc.

Working-class organisations promoted initiatives such as the creation of consumer cooperatives which sold products at cost price. Some Town Halls created food kitchens for the poor along with cafeterias in some public schools in the more depressed neighbourhoods.

### Improvements in urban planning and working-class housing

The problem of housing occupied a prime place in the First Hygiene Congress of Catalonia held in 1906. The lecture by E. Monturiol classified housing into six groups: the first was old homes in walled cities; the second was new homes in peripheral neighbourhoods; the third was new homes in recently industrialised towns; the fourth was homes far from workplaces; the fifth was private houses near factories, which were expensive; and the last one was factory colonies, built by the factory owners, which were extremely deficient and had communal toilets. He advocated single-family homes with gardens and the establishment of housing cooperatives.<sup>41</sup>

At the start of the 20th century, working-class housing conditions were still quite precarious. Civil society launched actions in favour of workers' housing, such as “La obra del hogar”.<sup>42</sup> In 1913, the socialist-inspired physician Ramon Pla i Armengol lamented the fact that working-class homes had horrible hygiene conditions, especially in the large cities. He said: “The worker's home is small and gloomy, without either light or ventilation, where the family lives piled upon each other, young and old alike, and often with sexual promiscuity.”<sup>43</sup>

The Noucentista idea of “Catalonia city” sought to urbanise the countryside and countrify the city,<sup>44</sup> that is, to spread the comforts of the city to rural homes and to bring the benefits of the countryside to urban zones. During this period, trees were planted and parks, gardens and children's playgrounds were created in cities. Despite this, in 1924 Dr Pons Freixas noted that 30,000 people in Barcelona lived in shanties.<sup>45</sup>

In a lecture, Dr Jaume Aiguader i Miró, who served as mayor of Barcelona during the 1930s, revealed the consequences of the swift demographic growth of Barcelona during this period and the fact that many workers lived in subleases with strangers with whom they shared no kinship ties, only mutual need and poverty.<sup>46</sup>

During the first few months of the Spanish Civil War, urban property was municipalised. In this context, the Architects' Union of Catalonia drew up proposals for urban actions and improvements in homes in Barcelona's old quarter, which were ultimately not carried out when the anarchists left the government of the Generalitat after the “Fets de Maig” (Events of May) of 1937.

### Creation of healthcare infrastructures

In the 20th century, the problem of hospitalisation continued to spark the attention of professionals at conferences<sup>47</sup> and in magazines,<sup>48</sup> where they asked the public administrations to do something about the shortcomings of the healthcare infrastructures.<sup>49</sup>

The creation of the Mancomunitat de Catalunya signalled a qualitative and quantitative change in the allocation of resources to and organisation of healthcare in Catalonia. In the period from 1914 to 1919, despite the fact that it had no legal responsibilities for healthcare, it commissioned Dr Jacint Reventós to carry out a planning study in 1917 on healthcare and hospital regionalisation,<sup>50</sup> an initiative that was ahead of its time. He applied the philosophy of common sense and pragmatism and sought bottom-up integration based on what already existed on the ground: physicians, chemists, asylums, hospitals, etc. He sought the cooperation of all of those isolated and underused elements to create a modern, effective healthcare network. It was a functional, cooperative model which sought synergies among the existing healthcare elements on the ground without duplications, while also respecting the freedom and autonomy of the individuals and institutions involved. This gave rise to the creation of the first regional hospitals. Meantime, the Mancomunitat provided funding to around 100 charitable health institutions, organisations and services.

During this early period, construction on the Clínica Psiquiàtrica in Santa Coloma de Gramenet and the Casa Maternal Catalana in Les Corts de Sarrià got underway.<sup>51</sup> These two projects were emblematic and exemplified the Noucentista worldview. The goal was to project an image of scientific modernity and social inter-classism. Both institutions welcomed patients from all social classes who needed first-class medical care – psychiatric or obstetric, respectively – at modern facilities where these medical specialities were also researched and taught. The Patronat de Malalts Mentals Curats (Board of Cured Mental Illness Patients) sought to provide post-hospitalisation support in order to encourage the social and workplace reintegration of former mental illness patients. The new Maternitat (Maternity Ward) of Barcelona, with its different pavilions built between 1890 and 1925, sought to increase the birth rate in the country and lower child mortality by offering high-quality medical and technical services, and by encouraging working-class women and workers to use these services with all the guarantees of hygiene and comfort for their health and their social image.

In Barcelona as well, the Casa de Caritat, whose services were scattered around different buildings in the city, opened the Colònia Escola in Horta, on the outskirts of the city, pavilions for epileptics in the Torre dels Frares estate and a sanatorium for children with tuberculosis in the Collserola mountains. At the same time, subsidies were given to mutual societies and private centres that provided social and health services not covered by the public administrations, such as the Institut Pere Mata de Reus and dispensaries for breastfeeding babies.

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FIGURE 3 Pavelló Rosa (Pink Pavilion) for the maternity ward for secret single mothers. Barcelona, 1928.

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FIGURE 4 Hospital de Sant Pau (Barcelona). Art Nouveau design by the architect Lluís Domènech i Montaner, built between 1902 and 1930 in two phases. The former Hospital de la Santa Creu (15th century) was moved there.

The hospital situation in Lleida was quite precarious, with just the Hospital Municipal de Santa Maria, which dated from the Middle Ages. The Mancomunitat built a new hospital in line with the new advances in hygiene and medicine on a plot of land granted by the Town Hall, with the Provincial Council's commitment to oversee its operations. Reform and expansion projects were carried out at the Casa de Maternitat to provide a children's school and nursery. Sections for the blind and deaf-mutes were created at the Casa de Misericòrdia.

The situation in Tarragona was similar, so in 1924 the Mancomunitat started construction on a new provincial hospital under the same conditions. The Casa de Beneficència, which served the Maternitat and Casa de Misericòrdia, was totally restored and a new school for children was added.

At the Hospital de Santa Caterina in Girona, major reforms of the building were undertaken, with the creation of a surgery ward and the modernisation of the medical and surgical supplies and equipment. The Casa de Maternitat was also modernised, and the nursery school facilities were improved. The Casa de Misericòrdia, which housed minors, adults, the elderly, the blind and deaf-mutes, was expanded, and its users were separated by age or physical or sensorial deficit. The mental hospital of Salt, which was nothing more than country home, was reformed and expanded and turned into a modern mental health sanatorium with all the equipment needed for the scientific, rational treatment of psychiatric problems, along with an agricultural colony where occupational therapy could be practised in a natural setting.

At the same time, the social work department of the Caixa de Pensions per a la Vellesa i d'Estalvis de Catalunya promoted or funded health initiatives, such as the Dispensaris Blancs and the Torre Bonica Sanatorium for patients suffering from tuberculosis. It also promoted educational initiatives such as the Nursing School, welfare initiatives such as the Mutualitat de Santa Madrona for pregnant women and charitable initiatives, such as the Centre de Rehabilitació de Mutilats.<sup>52</sup>

However, the shortage of hospital beds still persisted during the period of the Republican Generalitat, which had neither the time nor the resources to solve it. During the Civil War, numerous buildings were confiscated from the religious orders to be used as provisional hospitals.

### Malaria

After the Mancomunitat de Catalunya was established in 1914, the first health project it undertook was malaria. On the 30th of July of the same year, it commissioned the Sciences Section of the Institut d'Estudis Catalans to conduct a scientific study of malaria as a step prior to the health-care actions to be taken to combat it. The Malaria Technical Service was set up with this purpose, made up of four people: Lluís Sayé, Rossend Carrasco i Formiguera, Pere Agustí and Manuel Dalmau, who embarked upon an epidemiological study with the cooperation of the physicians in the zones where malaria was prevalent.<sup>53</sup> This spurred other physicians to publish their data as well.<sup>54</sup>

In 1917, a dispensary was opened in Amposta<sup>55</sup> and in 1920 one opened in Tortosa with the purpose of diagnosing and administering quinine injections to treat poor people or workers suffering from malaria. In 1921, more malaria dispensaries were opened in Campredó and Vinallop. At the same time, mechanical protection efforts for houses, and companies selling mosquito netting for doors and windows also progressed, along with hydraulic projects to clean irrigation channels, drain marshy lands and fill reservoirs.

These anti-malaria projects also extended to Lleida and Girona.<sup>56</sup> There was a significant rise in the number of malaria cases in the Llobregat River Delta in 1921, which led to the establishment of a dispensary in the town of El

Prat de Llobregat with the same purposes as those described above.<sup>57</sup>

As proof of the efficiency and prestige of the Mancomunitat's public health efforts, the Directorate General of Health, created upon the establishment of the military dictatorship of Primo de Rivera, requested the collaboration of the Mancomunitat's Health Service to advise the anti-malaria campaign that the Central Committee wanted to launch in the struggle against malaria throughout all of Spain.

### The health "campaigns"

The organisation of public health in Catalonia during the first third of the 20th century adopted the guise of a "campaign" or monothematic battle against certain diseases which had heavy medical and social repercussions but whose characteristics meant that they could not be treated individually by a given physician but instead needed to be addressed in a group or collective way by the health authorities.

The Mancomunitat started to study and systematically treat malaria, since this effort required the participation of professionals in different disciplines (physicians, entomologists, engineers, etc.) and supra-municipal legal and economic resources.

The campaign against tuberculosis was approached in a global way with five-year plans encompassing both the strictly medical factors and those related to the social milieu (economic, family, etc.). It stressed prophylactic measures in order to break the epidemiological chain and lower the overall morbidity and mortality rates.

In 1926, the Barcelona Municipal Laboratory began to administer locally manufactured Calmette-Guérin therapy (BCG) to prevent tuberculosis, only the second country after France to do so.

Waterborne diseases were a public health problem all over Catalonia, with repeated cholera and typhoid fever epidemics. The Mancomunitat assembled a team of engineers and physicians to deal with it, since the origin was drinking water contaminated by waste water. Not only did many towns, both large and small, have no sewer network, they often did not even have a network to collect and distribute potable water in a safe way. After the pertinent analyses and epidemiological studies, a line of economic assistance for towns was started so they could build or update drinking and wastewater channels. Vaccinations for susceptible people were also started with a locally created typhoid vaccination.

The dire flu epidemic in 1918-1919 was handled using prophylactic hygiene measures.

The campaign against infant mortality was tackled on three fronts: *a*) social, with awareness-raising in society and the support of child protection institutions; *b*) educational, by encouraging adult literacy and schooling for children; and *c*) medical, through the creation of dispensaries and Gotes de Llet, associations set up to provide milk to impoverished families that could not afford it.

Endemic goitre and cretinism were frequent in the mountainous areas of Catalonia and therefore also received the attention of the Mancomunitat.

The campaign against tuberculosis, which was started by the Mancomunitat, was carried on and expanded by the Generalitat, with the Obra Antituberculosa Universitària (University Anti-Tuberculosis Campaign) entrusted to the same physicians as in the earlier period. It continued its medical and social guidance with support for families of the ill, the participation of visiting nurses, and the BCG vaccination for contacts, schools and barracks.<sup>58</sup>

Before the introduction of penicillin, venereal diseases were a serious problem. The Generalitat created dispensaries all over Catalonia which provided diagnosis, prevention, treatment and education. A specialised hospital, called La Magdalena, was also founded in Barcelona.<sup>59</sup>

Infant mortality was another serious health problem with both economic and social repercussions.<sup>60</sup> The Generalitat continued creating dispensaries for newborns and babies in towns and industrial nuclei, which were complemented with a network of visiting nurses who went to the homes of newborns to help their mothers and provide them guidance them on child-rearing (food, hygiene, etc.). Civil society launched what was called the Segell Pro-Infància (Pro-Child Seal) with the goal of raising funds to build and maintain nurseries in the factory nuclei and preventoriums for infant tuberculosis<sup>61</sup> near the sea.

Since Barcelona was a port city which received passengers from other continents and was therefore exposed to exotic diseases, the Municipal Laboratory took on the responsibility for the biological diagnosis of these diseases.

### Mental health

Mental health was a responsibility of the state that was totally neglected, since it ran no public mental hospital in Catalonia where the mentally ill could be treated. As soon as it was created, the Mancomunitat took charge of this problem. It commissioned three psychiatrists to conduct a study on how to organise this public service and on the material needs (kinds of buildings and facilities, etc.) and the human needs (specialised staff) required to bring it to fruition. The report submitted suggested that a service be organised on three levels of complexity: local dispensaries for out-patient diagnosis and treatment, provincial clinics to house patients with acute problems, and psychiatric hospitals for people with classified chronic problems. It also suggested that agricultural colonies and other specialised establishments be created.

The second step, in addition supervising the psychiatric patients admitted by the provincial councils to private establishments, was to start construction on a psychiatric hospital on the outskirts of Barcelona and to reorganise the mental hospital in Salt, which was overseen by the Girona Provincial Council.

With the arrival of the Second Republic in Spain and the creation of the Generalitat de Catalunya, construc-



tion was completed on the psychiatric centre in Santa Coloma de Gramenet. Family or free treatment of the mentally ill got underway, as did preventative and mental hygiene activities.

The Spanish Civil War (1936-1939) created a higher demand for psychiatric services, which was handled by creating urban dispensaries and hospitalisation in confiscated convents. In the summer of 1937, a Mental Hygiene and Psychiatric Care Conference was sponsored by the Regional Ministry of Health, which laid out the action strategies in this field.<sup>62</sup>

### Training of healthcare staff

In the early 20th century, university education in Spain was oriented at issuing degrees but barely considered students' real education. The facilities were obsolete, the curricula antiquated and the majority of professors unmotivated to teach. Given this situation, in 1902 Catalan student associations, with the participation of a few professors, announced the *Primer Congrés Universitari Català* (First Catalan University Congress). They asked the academic authorities to modernise education and to make the universities more Catalan, involved in local culture and needs.

The lack of response from the universities gave rise to the birth of the *Estudis Universitaris Catalans* (Catalan University Studies), and in the field of medicine to the emergence of the *Escola Lliure de Medicina Catalana* (Catalan Independent School of Medicine). This initiative consisted of a series of monographic theoretical and practical courses which furthered the knowledge taught in the classes at the Faculty of Medicine, or even offered subjects that were not part of its official curriculum. These courses were taught by freelance professors who specialised in the subjects; they were held at the facilities of the Academy of Medicine and its Medical Sciences Laboratory, which had a complete library, a journals collection which included publications from overseas, and laboratories equipped with the appropriate instrumentation. These courses, which were extremely popular, admitted both graduated physicians and students still pursuing their education.

In 1917, the students once again announced the *Segon Congrés Universitari Català* (Second Catalan University Congress), which demanded autonomy in the management of the *Universitat de Barcelona* in order to improve its organisation and the quality of its education, in addition to making it more Catalan and thus more accessible to Catalan culture and society. The Spanish authorities' response consisted of proposals aimed at more national standardisation, which did nothing to improve the lack of communication between society and the university.

Only with the arrival of the Spanish Second Republic and the autonomy of the *Universitat de Barcelona* was it possible to transform and modernise medical education and open it up to modern Catalan and European society. All the most prominent clinical centres and professionals

in each speciality were brought into medical education, which gave rise to one of the most brilliant periods in Catalan medicine.<sup>63</sup>

Despite the Spanish state's lack of interest in modernising medical education, the *Mancomunitat* launched mechanisms of modernisation and research in the medical field. The purpose of the "outpatient and laboratory courses" targeted at physicians, chemists and veterinarians was to update these professionals' knowledge, while the "monographic advanced study and exchange courses" allowed professionals to get in touch with professors with a high degree of specialisation in a given area from both Spain and abroad.

Research in emerging disciplines was facilitated by the creation of laboratories and research institutes like the *Institut de Fisiologia* (Institute of Physiology), with August Pi Sunyer at the helm; the *Generalitat's Institut Psicotècnic* (Psychotechnical Institute), led by Emili Mira López; and the *Laboratori de Psicologia Experimental* (Experimental Psychology Laboratory), all of which earned international scientific prestige.<sup>64</sup>

In the early 20th century, families or volunteers without adequate preparation were still in charge of treating the ill. Given this, in 1917 the *Mancomunitat* created the *Escola d'Infermeres Auxiliars de Medicina* (School of Nursing) and endowed it with the economic and teaching resources needed for this kind of training. The reasons cited were: *a*) to train nursing staff (technical or professional reason); *b*) to contribute to the social and workplace development of women (socioeconomic reason); and *c*) to lower the mobility and mortality rates of the population (health or demographic reason). After two training courses, they could attend a third course specialising in treating children or the mentally ill or laboratory work. During the *Generalitat* era, "visiting nurses", who travelled to homes to gather relevant hygienic information, played a prominent role in public health activities.

Civil society, too, participated. The *Caixa de Pensions* created the *Santa Madrona Nursing School* to meet the needs of society's social and healthcare institutions.

### Health education among the general population

The *Institut d'Educació General* (General Education Institute), created by the *Mancomunitat de Catalunya* in 1914, was the instrument designed to bring culture to the lower classes and to shape their habits and customs, health-related ones as well. It primarily used information and persuasion to achieve these results.<sup>65</sup>

A collection of popular books in what was called the "Minerva" collection was created on a series of subjects, with titles like *La infecció*, *Puericultura*, *Higiene de l'alimentació*, *La neurosi i els neuròtics* and *Lliçons pràctiques de cuina*, all written by well-known physicians like August Pi Sunyer, Josep Roig i Raventós, Josep Tarruella and J. Alsina i Melis.

A series of popular lectures was offered all over Catalonia which discussed issues like physical education, moral



FIGURE 5 Poster for the Laboratori Provincial d'Higiene (Provincial Hygiene Laboratory) of Barcelona in the campaign against flies. Biblioteca de Catalunya.

education, birth, childcare, and individual and collective hygiene. Prominent physicians spoke, and they used projections to help their audiences understand the information. Between 1922 and 1923, 21 lectures were held on hygiene in 11 towns with 10,000 people attending.

A third educational resource used was posters, with messages referring to tuberculosis, malaria, flu, flies, etc. They were designed by renowned artists and are veritable works of contemporary art.<sup>66</sup>

In the 1930s, the Generalitat continued to use posters as instruments of information, and they added a new and more modern vehicle: hygiene messages broadcast on the radio.<sup>67</sup>

### Projection abroad of Catalan medicine and surgery

Unfortunately, wars are circumstances that lead to advances in medical knowledge and practice. The Spanish Civil War offered the opportunity to make headway in the surgical treatment of the wounded and broken bones caused by firearms. Dr Josep Trueta at the Hospital General de Catalunya tested the treatment of open wounds with the surgical cleansing of burned, dying tissue and the application of casts to immobilise bones in open fractures on the extremities. Wound suppuration was absorbed by the plaster, which smelt very bad. This confused the sur-

geons, who were unaware of this technique and thought that the extremity was succumbing to gangrene, which at times led to unnecessary amputations.

Another major innovation was spearheaded by Dr Frederic Duran i Jordà, who worked in the field of blood transfusions, which were done directly arm to arm or from the donor directly to the recipient. In addition to accidents during transfusions, this prevented blood from reaching the war front, where it was needed the most. Dr Duran i Jordà introduced the method of mixing blood from several different donors and adding a bit of citrate to prevent it from clotting. After being properly bottled and refrigerated on ice, this blood was sent to the blood hospitals at the battle front and enormously benefitted the wounded soldiers. He also organised voluntary blood donation drives in the rearguard.<sup>68</sup>

We should also mention the surgeon Pere Gabarró, a pioneer in the technique of skin grafts, and the anaesthesiologist Jaume Raventós Pijoan, the discoverer of the inhaled anaesthetic fluothane.

These vital, transcendent medical innovations were known to British spies, who recruited these Catalan healthcare professionals to teach their techniques to British physicians after the war in Spain concluded, with World War II on the horizon.

The end of the Spanish Civil War led to the exile of the most prominent figures in Catalan medicine from the first third of the 20th century, most of whom went to Latin America, where they taught, created research institutions or excelled in the practice of a variety of medical specialities.<sup>69</sup>

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