

## Tuberculosis: the sanatorium season in the early 20<sup>th</sup> century

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### Summary

The creation of hospitals providing specialist care is not a prerogative of our time. As the world wonders how to cope with new pandemics and the age-old problems of the transmission of infections and the isolation of the sick, while the COVID-19 pandemic has been raging, it might be worth glancing back at the period – just over a century ago – when sanatoriums were set up in Italy as part of the fight against consumption.

**Key words:** TBC, sanatorium, BCG

### Introduction

In 18<sup>th</sup>-century Europe, the importance of isolation in the treatment of infectious diseases had been very clear already for some time. Countless leper colonies had been set up over the previous centuries, and in the 13<sup>th</sup> century, there were 19,000 of them dotted all over Europe. The building of lazarettos for isolating people who contracted the plague began in the 15<sup>th</sup> century and, where possible (as in Venice and later in Marseille), they were built on islands off the coast. With time, the lazaretto came to be used to isolate patients suffering from other diseases too, such as petechial typhus or smallpox, and in the 17<sup>th</sup> century “hospitals for the incurable” were built for patients with syphilis <sup>1</sup>.

With the century of Enlightenment came a change in the medical world’s approach to tuberculosis (TBC), leading to new public health measures being first adopted and later withdrawn <sup>2</sup>. The slow, chronic course of this disease, with occasional flare-ups of the symptoms involved, made it hard for physicians of the time to understand its contagious nature, although consumption had been common and well known since the time of Hippocrates.

During the 19<sup>th</sup> century, there was evidence in Italy of sporadic experiments with isolation - at the San Luigi sanatorium in Turin, for example, and in “colonies” dotted around the Grand Duchy of Tuscany. But it was a physician from Piedmont, Biagio Castaldi <sup>3</sup>, who first reported on the efficacy of sanatoriums in the Alps for treating patients with TBC. He claimed that the incidence of the disease dropped at higher altitudes, and became much rarer beyond 1000 m above sea level. He had been preceded by Herman Brehmer, a German physician who had moved to the Himalayas after becoming ill with tuberculosis, and returned after his recovery to founded the first sanatorium in the mountains in Germany <sup>4</sup>. Conferences on climatology and internal medicine held in Boston (1889) and Berlin (1890) <sup>5</sup> confirmed the importance of sanatoriums, which

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were already operating by the dozen or under construction in many parts of the world. Isolation, clean air, sunshine and plenty of food (it was believed that patients should be given 6000 calories a day [2]) were the core elements of the treatment. The second half of the 19<sup>th</sup> century saw a flourishing of sanatoriums in England, Germany, Austria, Hungary, Russia, the Netherlands, Denmark, Norway, Switzerland and the USA. These institutions were founded largely by specialist physicians with the help of philanthropic societies or individual benefactors, or were even supported (as in Germany) by health insurance funds<sup>6</sup>. Many of these sanatoriums were intended for ordinary people and the poor, but there were also luxury versions for the wealthy and some of the latter (in Germany, Austria and Switzerland) were mountain sanatoriums situated more than 1000 m above sea level.

Davos, with its altitude of 1560 m, its sunny position, and its dry and airy winters, had one of the greatest concentrations of sanatoriums in Europe. After the first sanatorium founded in 1889 by the German physician Karl Turban, dozens of similar clinics large and small were established in the surrounding area over a period of around 40 years<sup>6</sup>. These institutions have often provided the setting for stories and figured in famous novels as places in which to breathe clean air to heal the lungs along with the late-Romantic atmosphere of the time. In Thomas Mann's novel "The Magic Mountain," the wealthy guests would spend whole seasons there ("*Our smallest unit is the month. We reckon in the grand style*"), simply resting ("*Settembrini says we live horizontally – he calls us horizontallers*")<sup>7</sup>. The sanatoriums were seen as places for the psychological and physical convalescence of patients suffering from a disease that – according to many physicians (ignorant of its etiology) – predisposed them by a sort of passionate sensitivity. This was nothing to be ashamed of, not like having cancer (as Susan Sontag wrote, patients with neoplastic diseases were commonly perceived in a negative light – an attitude that thankfully seems to have faded nowadays)<sup>8</sup>. Even so, the sanatoriums seemed to generate individuals who found it hard to return to their normal lives and social roles after being discharged from these lengthy hospital stays.

With the second industrial revolution, TBC began to spread in Italy too, becoming widespread among the lower classes. Farmworkers moved to the cities and went to work in factories where the conditions were often unhealthy. The quality of the air in the town centers rapidly deteriorated due to industrial pollution, and there were food shortages as a result of the growth in the population.

## The situation in Italy

The mortality rate attributable to TBC in Italy at the start of the 20<sup>th</sup> century was around 50,000 to 55,000 deaths a year, and this figure had not improved in a long time<sup>2,6</sup>. In the absence of specialized hospitals, it had come to seem impossible to lower the numbers of people falling victim to the so-called "white plague": Italy was to have its first real sanatorium only in 1903. This was the "Pineta di Sortenna" (Fig. 1), a high-altitude sanatorium (like those in the Engadin region of Switzerland) built in Sondalo in Valtellina<sup>6</sup>. It took a lot of determination for the expert on TBC, Ausonio Zubiani (a socialist physician with an enterprising spirit), to succeed in founding this first Italian sanatorium. At around the same time, the foundations were also being laid for a public sanatorium in Prasomaso, again in Valtellina. These were the first dedicated buildings, apart from the sanatorium built in Gries (Bolzano, or Bozen, which was still part of Austria's Tyrol region at the time)<sup>2,5,6</sup>.

In 1909, Gaetano Pieraccini (a physician and member of the Italian Senate) gave a depressing update on the situation at the second national conference: in all, there were 13 institutes specializing in the treatment of TBC, but six of them were hospitals, two were "sanatoriums for children predisposed to tuberculosis"; two were called "hospices for patients with tuberculosis" (one in Rome and one in Livorno), and one was a "lazaretto for TBC" in Catania. Only two were sanatoriums proper: the Pineta di Sortenna (the "first Italian sanatorium") established by Dr. A. Zubiani in Sondalo in the province of Sondrio; and the public sanatorium in Budrio, in the lowlands outside Bologna, which was run by the hospital<sup>5,6</sup>.

In 1910, Francesco Gatti - a pupil of Carlo Forlanini, who takes the merit for introducing therapeutic pneu-



**Figure 1.** The sanatorium "Pineta di Sortenna".

mothorax<sup>9</sup> (the only genuine novelty in the treatment of TBC) – reinforced the message<sup>10</sup>: “Of public sanatoriums in Italy there is one about to be opened (the one in Prasomaso in Valtellina with 120-130 beds) for people with chest diseases coming from the city and province of Milan, and one is about to be closed, in Budrio. A third, in Livorno, should be classified as a hospital-cum-sanatorium because it admits patients with pulmonary TBC in every stage of the disease. Then there is the criminal sanatorium on Pianosa, where the Ministry has decided to build another four wings. (...) [So, in Italy, in 1910,] there is only one efficient public sanatorium, whereas Germany has 99, France 13, Denmark 12, Sweden 10, Switzerland 8, Norway 3, Holland 3, the United Kingdom about 30, and the United States 240”

In short, at a time when antibiotics were still unknown, sanatoriums were seen as the only solution to contain the spread of TBC by isolating patients in dedicated facilities in particular geographical locations with the multiple specialties needed for the diagnosis and treatment of the disease. These included radiology (Fig. 2) and surgery (pneumothorax, but also lobec-



Figure 2. Poster of 1909.

tomies and pneumonectomies, despite the problems of surgical technique that remained to be solved)<sup>11</sup>, and lengthy rehabilitation programs. The growing demand for public sanatoriums (which were in very short supply) is a sign of the increasing awareness of the need for the public health services to have a role in the treatment of a disease that continued to spread among the lower classes.

The frustration emerges from pages of the journal *Pathologica* referring to the sanatoriums in Europe<sup>12</sup>, and in this journal there was a profusion of articles describing the laboratory tests and the anatomo-pathological features of TBC that is needless to quote. The debate between Koch and Virchow (who rejected the idea of Mycobacterium having a causal role, creating quite a stir in the German scientific world) was over, but it was kept alive among the public for decades, with the help of the cinema of the Nazi era<sup>13</sup>. Challenges between scientists in the limelight have always had their appeal, and stories were handed down of how Virchow had left the room out of spite on the evening when Robert Koch presented his findings to the Berlin Physiological Society<sup>14</sup>.

*Pathologica* also contains plenty of articles and abstracts of conference presentations about experimental studies on vaccines against TBC, especially in the years after Calmette and Guérin made their discoveries (between 1908 and 1921). Vaccination against tuberculosis with the bacillus Calmette-Guérin (BCG) was first seen as holding great promise, but was shelved after the “Lübeck disaster” unfolded in 1930<sup>15</sup>. What went wrong? There were 251 infants in the German city who were vaccinated with contaminated strains of BCG: 173 of them developed TBC, and 72 died within a year (with autopsy confirming the diagnosis of TBC in 68 of them). This happened because the vaccines had been contaminated with two virulent Kiel strains during their preparation in the laboratory. So the culprit was not the vaccine in itself, but this did not prevent the fear of it from spreading, delaying the fine adjustment of BCG for use in clinical practice for years<sup>16</sup>. “Calmette’s views as to the freedom from danger of his method is not universally accepted”, declared GB Dixon, chief tuberculosis officer in Birmingham<sup>16</sup>. Hence, the German accident reinforced a conviction well established for decades that only sanatoriums and prophylaxis could serve as an effective defense against infection with TBC and the related disease.

Turning now to the situation in Italy on the eve of the First World War, most provincial capitals had hospitals, or wings or departments for isolating TBC patients, but there were only seven sanatoriums in the country as a whole, and four were public facilities<sup>6</sup>.

The estimated costs of building and managing such facilities (which were too high to be sustainable by private benefactors alone) had meant that a national network of public sanatoriums had remained a dream. Instead, there had been a growing awareness of the importance of anti-TBC dispensaries as places with the means to offer prophylaxis and treatment.

Things were made worse by the hardships caused directly by war, with the displacement of troops and overcrowding in trenches, and even more by the tragic (and tragically ignored) state of malnutrition and abandon experienced by the prisoners of war. The “wartime TBC patients” amounted to 100,000, and the mortality related to the disease during and immediately after WWI rose by 40%. From the approximately 50,000 deaths a year in the three years from 1912 to 1914, the figure rose a record number of 73,000 in 1918<sup>2</sup>.

In the end, the government tried to take remedial action. It shouldered the burden of hospitalizing disabled ex-servicemen with TBC, establishing the *Opera Nazionale Invalidi di Guerra*, that subsequently treated soldiers and ex-soldiers with the disease as well. With legislation in 1919, strongly supported by associations of war veterans and socialist members of parliament, the funds budgeted for building sanatoriums, operating new dispensaries for dealing with TBC, and training specialist personnel was raised tenfold<sup>2,5</sup>. Over the years that followed, action was taken to reinforce and combine the groups of volunteers to form the *Federazione Nazionale Italiana per la Lotta contro la Tu-*

*bercolosi*. The Red Cross adapted facilities previously used to provide care for soldiers into sanatoriums for civilians. A minimum per capita tax was imposed to fund treatments for TBC, and by 1927 there was compulsory insurance for all employed workers. Various *ad hoc* anti-TBC campaigns were started (Fig. 3)<sup>2,5,6</sup>. Already by 1922, the number of dispensaries had risen from 27 to 111, and within 20 years there were approximately 60 hospital-cum-sanatoriums built around the country. The number of beds available in the sanatoriums amounted to 12,000 in 1923, rising to 32,000 by 1930<sup>17</sup>. But sanatoriums alone were not enough to defeat a disease for which there was still no specific therapy, as emphasized by Eugenio Morelli, an expert on TBC and member of the Senate. Morelli was also the promoter of the huge sanatorium in Sondalo (one of the largest in Europe [Fig. 4]), which was not completed until 1940. In a report in 1931 he wrote: “Sanatoriums only represent the treatment part, which would be in vain if it were not supported by prevention measures”<sup>6</sup>.

## Conclusions

The first effective pharmacological therapies against tuberculosis date from the late 1940s (streptomycin) and early 1950s (isoniazid in 1952), so public health decisions regarding how to treat TBC patients in the 1920s and 1930s focused on the sanatorium. In truth, not everyone agreed with the public health policy



**Figure 3.** Postage stamps celebrating efforts to combat TBC.



**Figure 4.** The Sanatorium Village in Sondalo.

based on mass admissions to sanatoriums during the Fascist period. This was clear, for instance, at a conference in Milan in 1927, significantly entitled “How to combat tuberculosis,” where it was emphasized that the core elements of the campaign against TBC included not only “the treatment in the sanatoriums and the prophylaxis at the dispensaries,” but also territorial medicine. In other words, there was a need for education on hygiene that demanded an involvement of general practitioners providing patient care at home. “It would be necessary to give patients the chance to live with their own families in modern, hygienic homes. Patients should have their own rooms, which should be disinfected regularly,” wrote Clelia Lollini, one of the first women in Italy to graduate from university in medicine<sup>18</sup>.

Over a period of 20 years, the mortality rate for TBC nonetheless nearly halved, dropping 60,000 to 33,000 deaths a year by the end of the 1930s, despite Italy’s population increasing by more than five and a half million. Expanding the horizon, TBC killed more than 62,000 people in Italy in 1887, and in 1951 (a year before isoniazid was introduced in clinical practice), the

figure had already dropped to 18,844. This improvement is probably at least partly thanks to the creation of hospitals providing specialist care.

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