

# The Intriguing Story of Jews' Resistance to Tuberculosis, 1850–1920

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**T**uberculosis is a communicable disease, caused by *Mycobacterium tuberculosis*, that over the course of human history has been a constant challenge [1] due to its severe societal implications and epidemiological burden [2]. Between the middle and the end of the nineteenth century tuberculosis was the most discussed topic in the fields of hygiene and public health both in Europe and the United States [3]. Due to the increasing industrialization and immigration to the new urbanized settings, the risk of contracting the disease rose significantly.

## WHO GETS TUBERCULOSIS?

Before Koch's bacteriological explanation was accepted by the medical scientific community (after 1882) [1], social and racial explanations were proposed to account for the differences in the incidence of tuberculosis especially in urban populations. (In pre-bacteriological terminology the disease was called consumption, phthisis and tisi) [4].

Heredity and infection concurred and coexisted as an etiology even after Robert Koch had isolated the bacillus in 1882. However, until then and as tuberculosis was considered by many authors to be a heritable disease, three main questions were raised: who were the most susceptible, were there "resistant" populations, and was the predisposition individual or "racial" [5]?

The discourse about Jews' resistance to tuberculosis at the turn of the century in the U.S. originated in this epistemological setting and featured in both medical and general publications. Notably, the discussion was initiated in the U.S., which at the time had the largest number of immigrants compared to other countries. Also, because of the increasing presence of Eastern European Jewish immigrants, the discussion was held among

German, English and Italian authors as well. This discourse represented an example of the current understanding of the role(s) of the environment, microorganisms, "race," heredity and constitution, social conditions, and lifestyle, as factors causing disease [5].

The fear of contagion (which, must be borne in mind, was pre-bacteriological) was related to considerations regarding the predisposition to certain diseases of human "types." The Hippocratic notion of *habitus phthisicus*, or "consumptive look" – denoting an ugly, slender, flat-chested physique [4] – had been adopted and reinforced by the Viennese pathologist Karl von Rokitansky (1804–1878), who believed that slender persons with a narrow thorax were more prone to develop tuberculosis. Human types, in their turn, were connected to "races." Since Jews were associated with a lank physique and therefore with the *habitus phthisicus*, their alleged resistance to tuberculosis represented a paradox and raised the attention of a number of Jewish physicians [6,7]. The fear of "degeneration" was the subject of discussions and scholarly books and was introduced by Benedict A. Morel in his *Traité des Dégénéscences* published in Paris in 1857. Morel linked psychological abnormality with physical disorders and claimed that behavior (such as drinking alcohol) and living conditions (such as poverty, particularly in the slums) could trigger "degeneration," which was inherited by subsequent generations. As such, this concept was linked in the public mind with the fear of tuberculosis, an energy-consuming disease viewed as typical of the poor and oppressed workers in the sweatshops. This led to the association of tuberculosis with (poor, dirty) immigrants, resulting in a surge of antisemitic nativism: tuberculosis was considered the "Jewish disease."

But the facts were at odds with the prejudices. As several authors from Europe and America demonstrated (shown below), Jews were less prone to die from tuberculosis than non-Jews. How could this be explained? Between the second half of the nineteenth century and the 1920s physicians and statisticians produced a corpus of work on the issue of the alleged Jewish resistance or "immunity" to tuberculosis.

### CULTURE VERSUS ENVIRONMENT

Eduard Glatter (1813–1876), director of the Statistical Bureau of Vienna, inaugurated the discussion on Jews' resistance to tuberculosis in 1856 in his comparative treatise on the life expectancy of Jews and Christians. He stated that Jews were resistant not only to tuberculosis but also to other diseases of the respiratory organs because of their adherence to Jewish dietary laws (*kashrut*) and the associated ritual slaughter and meat inspection [8]. Later, Robert Koch rejected the idea of blood–milk contagion from cattle to humans in favor of inter-human aerial spread. In fact, the most feared pulmonary tuberculosis was transmitted from person to person, but the bovine strain of tuberculosis was responsible for the intestinal and skeletal forms [5]. Glatter's argument was a cultural–environmental one that did not involve a “racial” form of resistance.

At the same time, a debate started in the United States regarding Jews' alleged immunity or resistance to tuberculosis. As Sander Gilman showed in 1874, in an exchange of letters published in the *Medical and Surgical Reporter*, the physician Madison Marsh argued that Jews had a much greater tolerance for disease than did the general population [5]. The Jews, he wrote, enjoyed immunity from tuberculosis because they were hardened by centuries of “calamities” and by their ritual and hygienic practices. Moreover, in the aftermath of the Civil War (1861–1865), Marsh underlined the “difference” between Blacks and Caucasians. The latter, among them the Jews, developed a resistance to infection, a trait that would be beneficial in the period of reconstruction after the war, putting whites in an advantageous position. This view was criticized by the physician Ephraim M. Epstein, who reversed Marsh's thesis completely. In his opinion, the “immunity” of Jews was apparent and was based solely on better care and mutual solidarity [5].

In 1891 the U.S. Army statistician and surgeon John S. Billings stated that the mortality rate from tuberculosis among Jews was one-third that among non-Jews, and raised the question whether this was attributable to the habits and modes of life or to a particular “bodily organization” [9]. With regard to tuberculosis of the gastrointestinal tract, ritual meat inspection was reported by Billings to be a protective factor, whereas for the pulmonary form, from which Jews suffered less than non-Jews, an explanation was more difficult to formulate. Billings asked: “It [...] seems probable that they possess a partial immunity from and a special liability to certain forms of disease; that with prolonged residence in the United States their death-rate is increasing” [9]. He concluded: “The great majority of the peculiarities in these vital statistics appear to be connected with the occupations, social relations, and mode of life of the people rather than with special race characteristics, and they will therefore tend to disappear so far as the Jews' mode of life becomes assimilated to that of their neighbors.” In Billings' opinion, these advantages were endangered by external factors: “They have shown that they can resist adversity, but whether they can also

withstand the influences of wealth and freedom, and retain the modes of life which have heretofore given them length of days [longevity], remains to be seen” [9]. The modes of life could even be considered by some authors as a distorting factor in the statistics. In the United States at the turn of the century, Jews (like Italians) tended to send those suffering from tuberculosis to their home country to die, which explains why the death rate seemed lower [10].

The Italian physician and criminologist Cesare Lombroso (1835–1909), in his 1894 survey on Italian Jews, favored, like Billings, an environmental explanation. He stated that in Italy tuberculosis was responsible for 7% of the deaths among the *cattolici* (Catholics) and for 5% among the Jews. In his view, the dwellings and work conditions (dirt, sweatshops) in Italy were the main predisposing factors both for Jews and non-Jews, and the slight difference of 2% was due to a better diet (more meat) and an acquired lower predisposition of the Jews to respiratory diseases. Other acute respiratory diseases like pneumonia were, in Lombroso's opinion, less prevalent among the Jews since they worked predominantly indoors, which was a protective factor against tuberculosis [11]. In the same year, the British statistician Joseph Jacobs (1854–1916) vehemently opposed the theory of a racial biological purity of Jews, declaring that “all the moral, social and intellectual qualities of Jews have been spoken of as being theirs by right of birth in its physical sense [...]. But the differences are due, in my opinion, to the combined effect of their social isolation and of their own traditions and customs [...] If all the Johns and Maries of Europe were to be shut up in *ghetti* for a couple of centuries they would undoubtedly show peculiarities in habits and thought” [12].

The apparent biological characteristics of Jews, like resistance to tuberculosis, in Jacobs' opinion were not biological: “When closely examined, almost all of them are seen to turn on social characteristics” [12]. As Mitchell B. Hart [13] points out, in March 1900 “*Medicus*,” an anonymous author in the *New York Times*, proposed again the Jewish dietary laws as a model of disease prevention, specifically that the meat and milk inspection and the removal of blood from meat could protect humans from cattle tuberculosis and enhance longevity. The resistance of Jews to infection, then, was not a *racial* characteristic but a cultural one, Hart argues. In the ensuing debate in the *New York Times*, the prophet Moses was defined as a “thorough sanitarian” [13], and the adoption of meat inspection was proposed as a preventive tool for society as a whole. Similarly, Leo Sofer [14] stated that the observance of the Saturday rest (the Sabbath) had immense hygienic value and was to be seen as “a gift” for society as a whole. In 1920, Percival Wood, a military surgeon, wrote a book entitled, *Moses: The Founder of Preventive Medicine*. Moses was portrayed as a military surgeon himself, who led the Jews out of Egypt with the help of rigorous public health laws that were later instituted in their permanent settlements [13]. The Jewish habit of periodic bathing (*mikvah*,

the practice of ritual immersion to achieve ritual purity) and housecleaning, particularly before the Passover festival when homes and their contents are meticulously scrubbed, was considered a cultural protective factor as well [10], along with the increased frequency and duration of breastfeeding among Jewish women [14].

These cultural–historical explanations coexisted with an opposing doctrine, proposed by the German ethnologist Georg Buschan (1862–1943) who advocated a complete racial explanation of the resistance to tuberculosis and denied every cultural or historical influence on its epidemiology [15].

#### NATIVISM AND THE FEAR OF SICK IMMIGRANTS

In the four decades between 1820 and 1860 five million immigrants reached the United States, and between 1861 and 1900 another 14 million arrived. In particular, immigration from Russia increased significantly in inverse proportion to immigration from Great Britain: in 1854, 58,647 persons arrived from Great Britain and 2 from Russia; half a century later, in 1900, there were 12,509 new arrivals from Great Britain and 90,787 from Russia. Most of them clustered in cities: in 1890 more than 40% of the residents of New York had been born in a foreign country [16]. Notably, between 1881 and 1923, 2.5 million Jews emigrated from Russia and East Europe; most of them were skilled workers heading for the USA [17].

The last quarter of the nineteenth century was also the time of colonialism, nation building, race theories, and eugenics. The latter was based on Francis Galton's (1822–1911) assumption that social position was related to genetic traits, and on the biologist and eugenics activist Charles B. Davenport's (1866–1944) critical view of “intermarriage” [18].

At the turn of the century, the immigrant “Caucasians” were classified as northern, central, and southern (Teutonic, Alpine, and Mediterranean) in the terminology of the economist William Ripley (1867–1941) in his 1899 tract *Races of Europe* [19]. In this terminology, for example, Italians, Jews and Latinos occupied a place between “white” and “non white.” Nativism, a cluster of movements aimed at restricting immigration to the USA, developed parallel to the eugenic discourse. “Nativism” meant that the descendants of the first colonies were to be protected from foreign races (which led to measures against Chinese immigration in 1882) and from Irish Catholics, seen as loyal to the Pope and therefore not thoroughly loyal to Republican principles.

Against this ideological background, how were immigrant Jews classified? The sociologist Edward A. Ross (1866–1951) dedicated a chapter of his 1914 essay “The Old World in the New” to the “East European Hebrews,” peremptorily declaring that Jewish immigrants were interested in fighting immigration restrictions: “The systematic campaign in newspapers and magazines to break down all arguments for restriction and to calm nativist fears is waged by and for one race” [20–22], and “...In

order to admit their brethren from the Pale [Pale of Settlement, Jewish closed settlement in Russia] the brightest of the Semites are keeping our doors open to the dullest of the Aryans!” [20–22]. Ross seemed to fear the Jews precisely because of their alleged robustness: “Centuries of enforced Ghetto life seem to have bred in them a herding instinct. No other physiques can so well withstand the toxins of urban congestion” [20–22]. Being that tough, the Jews were a menace as “door openers” to further, even less desirable, immigrants.

The physician Alfred C. Reed (1884–1951) argued in a slightly different way, but with the identical purpose: he thought that Jewish immigrants were not capable or willing to assimilate, and “the Hebrew race is essentially oriental, and altogether there is at least ground for objection to unrestricted Jewish immigration” [20–22]. Reed further summarized the evolution of immigration as follows: “Previous to 1883, western and northern Europe sent a stalwart stock, 95 per cent of all who came. They sought new homes and were settlers. Scandinavians, Danes, Dutch, Germans, French, Swiss and the English islanders, they were the best of Europe's blood. They were industrious, patriotic and far-sighted [...]. But for three decades the immigrant tide has flowed more and more from eastern and southern Europe. The others still come, but they are far outnumbered by the Jews, Slavs, the Balkan and Austrian” [20–22]. Among them, Reed stated, there were hygienic and socially dangerous elements unsuspected by the general population: “The average citizen does not realize the enormous numbers of mentally disordered and morally delinquent persons in the United States nor to how great an extent these classes are recruited from aliens, and their children. Restriction is vitally necessary if our truly American ideals and institutions are to persist, and if our inherited stock of good American manhood is not to be depreciated” [20–22]. In Reed's opinion, medical arguments, particularly the presence of mental diseases or infections like tuberculosis, were the best way to enforce immigration restriction [20–22]. As Lüthi observed [17], medical arguments like Reed's were useful to define the “otherness” of the Jews, as they did not show clearly definable “racial” characteristic differentiating them from other Caucasians.

#### FISHBERG'S ACQUIRED-RESISTANCE ARGUMENT

The medical discussion about tuberculosis among Jews was, for the reasons above, highly politically charged. The Russian-born physician Maurice Fishberg (1872–1934) objected to the nativist-inspired view of the Jew as a sickly and weak tuberculosis carrier and as a danger to the “natives.” The political aspect of this was not lost on the neurologist Hugo Hoppe (who died in 1918), who noted that the rise in incidence of tuberculosis among Jews in London and New York in 1901 was linked to social and political factors, particularly the antisemitic laws in Russia and the pogroms of 1903–1906 which forced Jews to emigrate and live in poverty in overcrowded dwellings [23]. Fishberg [24–28] described Jews as resistant and robust,

being used to living in urban contexts, differently from African Americans and Italians who had recently immigrated to the cities. Klaus Hödl [29] observed that the alleged susceptibility of the African American to tuberculosis at the beginning of the twentieth century was an argument underlining their incapacity to acclimatize to urban life and, thus, a segregation argument [29]. Indeed, Fishberg later recognized that many immigrant Jews were prone to tuberculosis in crowded urban dwellings and insisted on the thesis of poverty as a strong pathogenic factor, a factor that could, with time, jeopardize their century-long resistance [6,7]. How did Fishberg argue his case? In his 1901 article on the comparative pathology of Jews based on European studies and statistics, Fishberg asserted that "...all over Europe, wherever tested, the Jews have been found, in spite of their frail physical aspect, to live longer than Christians [...]. The Christians between the ages of one and fifty have a death rate of 14 per cent, the Jews one of only 10 per cent" [24-28]. Jews showed "an unprecedented tenacity of life" and for this reason tuberculosis claimed fewer deaths among them than among non-Jews, even in poor dwelling conditions [24-28]. The general population of the United States, he asserted, had a death rate from tuberculosis three times higher than that of Jews: in 1880 it was 36.57 and 34.02 per 1000 deaths for Jewish males and females respectively, and 108.79 and 146.12 among non-Jewish males and females respectively [24-28].

In Fishberg's time, as we have seen, several explanations were proposed for the longevity and the health of Jews: such as "indolence" and "lack of exercise," "rich, highly seasoned food," "twice as many days of leisure" because of the obligation to keep Saturday (the Sabbath) holy, as well as Sunday, but all of these were discarded by Fishberg [24-28]. With regard to rituals, circumcision and meat inspection were linked to longevity, specifically for their role as protective factors against venereal diseases and bovine tuberculosis. He proposed a historical-cultural explanation, the "family spirit," whereby Jews took particularly good care of their ill and aged [24-28]. Moreover, in his tract of 1911, Fishberg reported (with regard to the Jews of Tunis) the argument of the "damp cloth," which was the preferred way to keep the house clean instead of using a brush. Since less dust was raised, the tubercle bacilli did not circulate in the air [24-28].

The most relevant protective factor that he proposed and which dominated the discussion was that centuries-long life in ghettos had exerted a Darwinian selection on Jews and only the most resistant to tuberculosis and other infectious diseases had survived. Even when they contracted the disease, the mortality rate from tuberculosis among Jews was lower than among non-Jews. This historical explanation, then, refuted the claim that racial factors played a role in the resistance. Other urban immigrant populations developed a similar resistance once they had dwelt in urban conditions long enough. The counter-example was rural dwellers, including immigrant Italians, who showed

a higher incidence of tuberculosis in American towns, as well as the populations of the European colonies [13]. Fishberg's central thesis was: "The modern Jew is, physically and mentally, a product of natural selection, of a process of survival of the fittest which has been going on for two thousand years. Being persecuted, oppressed, and tormented for centuries, only those who were the most stubborn, the most callous, the most energetic, could venture to remain Jews. All those who were too weak, sickly, and infirm, bodily and spiritually, were eliminated from the race by death or baptism" [24-28]. It should be noted that the word "race," which appeared frequently in Fishberg's writings, was used by him in quotation marks as a metaphor – he did not endorse its meaning as a *biologically* determined cluster of characters. Fishberg declared that the "Jewish 'race' is not as pure as is generally believed," and that the differences in the response to pathogens were due to social factors [24-28].

Being urban dwellers for centuries yielded disadvantages as well. In Fishberg's opinion Jews were more prone to neurological and psychological diseases (as well as metabolic disorders, such as diabetes) as they lacked the "influx of good, pure blood from the country, which counteracts the deteriorating influences of the busy, enervating city life," and they represented the prototype of the future "modern man" [24-28].

In 1908, in a German journal, Fishberg defined the resistance of Jews as a "race" to infections as "supposed" (*angeblich*), and proposed comparisons aimed at supporting his cultural-historical thesis and at refuting the idea of a biological fixed Jewish "race." In that paper, Fishberg explained the resistance of African Americans to malaria and yellow fever using a natural selection argument – namely, they had suffered in the past from these diseases and only the fittest had survived [24-28]. He hesitated, though, to name this phenomenon a "racial" characteristic (*rasenhaft*) and preferred a historical explanation. "Race" was, in this sense, a surrogate or disguise word for a collection of not yet explained phenomena of a historical nature. Fishberg explained historically other types of "resistance" as well. For example, in his view the relative resistance of European Jews to plague and cholera was related to the isolated situation of the ghettos [24-28] and to how the Jews maintained their health, which explained their response to diseases even in situations where Jews and non-Jews were exposed equally, e.g., in the modern urban context [24-28].

In his 1911 survey, in which he defined "the results of anthropological, demographic, pathological, and sociological investigations" [24-28], he claimed that his aim was neither to advocate assimilation nor to complain about "race suicide," but to document the situation of the Jews in his time. The "cause of preference of city life" was in fact the legislation on segregation in certain parts of the cities, namely, *Judengassen*, *Jewries*, ghettos (in 1911 such laws were in force in Russia). Even after such legislation was abolished Jews continued to live as city dwellers and moving from the cities to the country was unusual [30,31].

Fishberg dealt with the alleged *habitus phthisicus* as well. The “girth of the chest” was relevant for the definition of this *habitus*. It was defined in Fishberg’s time as “emaciated, flat, and narrow” and was believed to affect “fitness for military service” according to the measurements of conscripts in Europe, but in Fishberg’s opinion the slender physique of the Jews was practically irrelevant for military purposes: “This defect, if it may at all be termed as a defect, by no means interferes with their efficiency to bear arms” [24-28]. The origin of this slender look was sympathetically illustrated as follows: “The inferior hygienic, economic, and social conditions under which he was compelled to live in the Ghettos have left their mark on his body; he is old prematurely, stunted, decrepit; he withers at an early age. He is emaciated, his muscles are flabby, and he is unable to hold his spinal column erect [...] It must, however, be emphasized that this is not an ethnic trait of the Jew; it does not depend on any peculiarities of an anatomical or physiological nature. As an acquired character, due to adverse social and economic conditions, it is not transmitted by heredity.” When given the opportunity to regenerate, Fishberg continued, the Jews in Western Europe no longer exhibited this excessive slenderness [24-28].

As an example of Jews’ “tenacity of life,” Fishberg cited the census of 1889 in the United States: the death rate of the Jews was 7.11 per 1000, half the rate among non-Jews. Among non-Jews this rate was reached at the turn of the century due to better hygienic conditions, as data from Prussia showed: in the period between 1822 and 1840 the mortality rate among Jews was 73% that among non-Jews. By 1906 it had increased to 77% and “it could not sink much more” [24-28]. How could this “tenacity of life” be explained? Not by racial characteristics, which according to Fishberg were irrelevant or even non-existent, but this time by economic and occupational factors. At the turn of the century in Europe there were half as many “common laborers” among Jews than in the general population [24-28].

Moreover, Fishberg reported data from Berlin and Budapest, where Jews were economically successful and where mortality rates were 9.81 and 21.93 per 10,000 respectively. His thesis was that affluent Jews discarded most religious rituals and were nevertheless protected against tuberculosis, as in the prosperous Harlem district and Orthodox East Side in New York. Even the rarity of syphilis and alcoholism among Jews might represent a protecting factor, but not an explanation [24-28].

DeNoyelles interprets Fishberg’s insistence on the Jews’ resistance as a means to distinguish them from other ethnic groups and enhance their acceptance (DeNoyelles 2016, 365). Fishberg, a secular Jew, was anti-Zionist and advocated a broad Americanization of Jews, although that would in time lead to the loss of the acquired resistance. Paradoxically, Fishberg asserted that a thousand years resistance could be endangered during decades of urban life in America and by poor economic conditions, which aligned the Jews with other

immigrant groups (German and English). The Jews, if at all, could contract tuberculosis just as everyone else with the same living conditions and did not represent a “biological” menace. This argument aimed to counteract immigration restrictions at a time when large numbers of Russian Jews were arriving in the USA [6,7]. Jews were, as Fishberg later held, not aliens at all: “For those who look with apprehension at ‘race mixture’, it may be stated that the flow of Jewish blood into the veins of the European and American peoples does not infuse any new racial elements” [24-28].

Fishberg’s view was confirmed from the statistician’s perspective by an officer of the metropolitan Life Insurance Company of New York, Louis I. Dublin. Analyzing the data for 1910, Dublin cited an increase in mortality for the white population aged over 45, which he considered puzzling given the increasing efficiency of public health, and explained it as “the character of our recent immigration” [32]. “In both sexes, the death rates of the foreign born and of their native born offspring are considerably in excess of those for the native born of native parents after the period of middle life is reached. There is little difference during the periods of childhood, of adolescence, and of early life; but there the similarity ceases” [32]. For example, among males aged 45–64 the death rate for 1000 was 18.8 for the native born of native parentage, 28.8 for the native born of foreign or mixed parentage, and 28.0 for the foreign born. But the data showed that among male Russian immigrants, who were almost all Jews, the life expectancy at 10 years was higher than among the “native born” (53.44 and 52.96 respectively). He stated: “Their addition to the population of New York State has, therefore, an effect very different from that of other foreign peoples.” Italians ranked next, with an expectancy of 51.94 years. English, Scotch, Welsh, and Germans were next with an average of 50 years, while the Irish showed a life expectancy of just 38.69 years [32]. Again, in 1910 the tuberculosis death rate among Russian males in New York State (identified with the Jews, by Dublin) was 117.1 per 100,000, compared with 352 among the native born from native parents. “It is this favorable condition as to tuberculosis which almost by itself explains the favorable mortality which is observed in this race” [32]. For Dublin, the longevity of Jews was a self-evident long-known fact that did not require further explanation. The German-Polish physician Noè Haltrecht also favored the argument of the acclimatization of Jews to urban life [33], and the statistician William H. Guilfoyle formulated his argument of the “tenacity” as follows: “Although living in densely populated sections, the Jew by reason of his temperate habits and his inherited vitality is able to resist and overcome infection, or, as has been said, the Jew is physically ‘tough’ in the best sense of the term” [34]. In Italy, Fishberg’s view was shared by the tuberculosis specialist Giuseppe Sanarelli (1864–1940), who claimed that “the Jewish race has marvelously resisted and has grown perfectly autonomous,” while a future colonial army

(Italy wished to be a colonial power at the time) was doomed to failure because of the “tuberculosis proneness” of Africans [35].

**OBJECTIONS TO FISHBERG FROM THE MEDICAL WORLD**

In the 1920s, after years of immigration and World War I, Fishberg’s historical resistance argument was rebutted by Emil Bogen (1896–1962), research director at Olive View Sanatory in California, who advocated a “hypochondria” explanation; namely, that due to a greater concern about health, Jews were readier than non-Jews to seek medical help and could therefore often be cured from tuberculosis in its early stages [13]. Indeed, the argument regarding the particular care of individual health was supported by Fishberg (and other authors as well), although Fishberg did not credit to it much importance, since, for example, the American Jews were more compliant with vaccination against smallpox. Among Fishberg’s Russian-born colleagues like Theodore Sachs and Charles D. Spivak, who worked on the alleged resistance too, other views were represented. Sachs and Spivak [36,37] presented alternative statistics to show that tuberculosis mortality correlated with unhygienic conditions and poverty even among Jews, and such factors could not be compensated by lifestyle or “resistance.” Moreover, they noticed that there were Jewish sufferers of tuberculosis who had contracted the infection in New York and had died elsewhere, thus distorting the mortality statistics. The factors involved in the tuberculosis incidence and mortality were socioeconomic and not historical-cultural [6,7].

The Russian physician Samuel Weißenberg (1867–1928) explained the protective role of the readiness of Jews to seek medical assistance, which might in his view also be “excessive” (a hypochondria argument), but successful [38,39]. The Berlin physician Bertold Baneth confirmed the readiness of Jews to seek medical aid and pointed out that the rise in the incidence of tuberculosis at the beginning of the twentieth century was alcohol related. Life conditions and “new habits,” like drinking alcohol which was considered untypical, could reverse the favorable resistance situation of Jews [40]. For Moses Julius Gutmann, the question of resistance to tuberculosis was the “most controversial one,” because recent data from America, he stated, showed an increasing mortality rate even among Jews.

**CONCLUSIONS**

The story of the “Jewish resistance debate” at the turn of the century shows that the perception of disease was based on political factors. Tuberculosis was perceived as a disease of poverty and overcrowded housing, which certainly reflected Jewish immigrants in America. On the other hand, Fishberg’s insistence on the historical acquired partial immunity can be considered an endorsement of anti-restrictionist immigration politics at a time when not only poverty but also pogroms menaced Jewish existence in the Old World. Furthermore, the

debates show that the term “race” needs to be contextualized in every case.

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## Capsule

### Next-generation prenatal screening

Fetal DNA that is circulating in the blood of pregnant women is frequently extracted non-invasively and screened for common chromosome aneuploidies that cause disease such as trisomy of chromosome 21, which may result in Down syndrome. There are numerous other syndromes that are caused by single-gene mutations that cannot be assessed like this. **Zhang** et al. developed a next-generation DNA sequencing approach for circulating fetal DNA that can detect alterations in 30 genes

that cause monogenic disorders. Tests were performed on 422 pregnant women, and follow-up studies confirmed 20 positive results and 127 negative results, with no reported false-negative or false-positive results, suggesting that the method is highly specific and accurate.

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Eitan Israeli

## Capsule

### How sleep aids recovery

Sleep does wonders for our overall health. The benefits include a lower risk for heart disease, reduced stress, weight management, and improved mood. **Dimitrov** and fellow-scientists uncover how a good night's sleep helps us heal faster from infection. T cells are immune cells that attach to invading viruses and mark them for destruction. The researchers found that integrins – the glue-like proteins used by T cells to stick to pathogens – are more activated when we sleep. In

awake individuals, signaling molecules belonging to the Gas-coupled receptor agonist family (for example, adrenaline) were produced at greater levels. These molecules have an antistick effect, inhibit integrin production, and reduce the ability of T cells to attach to invading microbes.

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Eitan Israeli

## Capsule

### Celiac immunity scarred for life

Celiac disease (CD) is an enteric inflammatory disorder initiated and perpetuated by exposure to dietary gluten and mediated by intraepithelial lymphocytes (IELs). **Mayassi** et al. compared IELs from CD patients, CD patients on a gluten-free diet, and healthy controls. In healthy humans, V $\gamma$ 4/V $\delta$ 1+ IELs dominated, which recognize immunoglobulin-like molecules called butyrophilins (BTNLs) that are involved in fatty acid and sterol metabolism. In CD and gluten-free CD patients,

V $\gamma$ 4/V $\delta$ 1+ IELs were replaced by gluten-sensitive interferon- $\gamma$ -producing V $\delta$ 1+ IELs bearing T cell receptors. It seems that CD reaches a peak at which the loss of survival ligands, like the BTNLs, decimates V $\gamma$ 4/V $\delta$ 1+ IELs and allows V $\delta$ 1+ IELs to predominate instead. This process, termed “immunological scarring,” may contribute to other immunopathologies.

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