

## Italy in Crisis

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Reserved Leviticus 11:4-8:

“The following however you shall not eat..... and the swine–although it has true hoofs: with the hoofs cleft through, it does not chew the cud: it is unclean for you. You shall not eat of their flesh or touch their carcasses; they are unclean for you.” –*Leviticus 11: 4-8. Masoretic text*



**Figure 1:** Regional Map of Italy

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**Bullet Point Summary:**

- The community of Chinese people in Italy has grown rapidly in the past ten years. Official statistics indicate there are at least 320,794 Chinese citizens in Italy. Milan, in Northern Italy where COVID-19 first struck, has the largest Chinese population in Italy.

- Before there was a COVID-19 Coronavirus, there was and still is, a tuberculosis global Pandemic, a Pandemic which presently kills someone approximately every 21 seconds — about 1.5 million or more in 2018 alone [ <https://www.tballiance.org/why-new-tb-drugs/global-pandemic>]. It is still treatable, but only if looked for and considered. By 2013, Faccini et al reported in *Emerging Infectious Diseases*, an outbreak of tuberculosis, Beijing strain, in a primary school in Milan, Italy which was eventually traced to include 15 schoolchildren with active TB and 173 with latent infection.

- The coronavirus, AKA Covid-19, first appeared in Lombardy and Veneto. [See Map Figure 1]. Italy's first victim was a 76-year-old woman who was found dead at her home 50 km. (30 miles) south of Milan, in Lombardy, on Thursday, March 12, 2020 and tested positive for the coronavirus. A 78-year-old man died of the infection in a hospital near Padua, in Veneto, during the next evening.

- Traditionally, Italy has a low incidence of tuberculosis (TB); and in 2008, the incidence of notified cases was only 7.6/100,000 population. Yet even by 2009, in Milan, the largest urban area and the birthplace of Italian COVID-19, in Lombardy, the incidence climbed steeply to 20.44/100,000 population. By 2019, Cuomo., *etal.* attributed this to rising immigration patterns.

- With the sharp increase in tuberculosis statistics, the basis of what would happen to Northern Italy had been laid, the tripling of an “underlying” tubercular medical condition that could provide fertile grounds to foster a second pandemic pathogen. But what would happen next in Northern Italy was an event that no one could have foreseen.

- On January 22nd, 2020, Customs authorities from the *Guardia di Finanza* in the northern Italian city of Padua seized and burnt nearly 10 tons of Chinese pig meat, potentially infected with African swine fever. By the end of 2019, half of China's swine herd —250 million pigs, were dead. Padua is located in the Veneto region of Italy. The coronavirus, AKA Covid-19, first appeared in Lombardy (Milan) and Veneto (Padua). Swine fever is deadly among pigs, though it poses no risk to humans.

- But if Italy thought it had incinerated its problems away by burning tainted Chinese pig meat, much of which probably originated from Wuhan's vast pig reservoir, it had another thought coming. Now, infectious particles were circulating through the air of Northern Italy. Furthermore, if Swine fever posed no risk to humans, what did pose a risk is a common disease in pigs called *Mycobacterium avium* (AKA MAC or fowl tuberculosis), a non-tubercular mycobacteria (NTM). In one study, the incidence of *Mycobacterium avium* (fowl tuberculosis) in a pig population was an astonishing 81%. As reported by some workers, *M. avium* isolates from swine represent a major threat to human beings. And the similarity of the IS1245 RFLP [restriction fragment length polymorphism (RFLP)] patterns of the human and porcine isolates indicated a close genetic relatedness, suggesting that *M. avium* is transmitted between pigs and humans. Such *M. avium* infection can occur wherever the right “underlying pulmonary conditions” exist, which can be an event as simple as a childhood or reactivated tubercular infection, or merely tying up the lungs with an excess of dust or particulate matter.

- Thus, just before the event attributed to COVID-19 in Northern Italy began, a deadly combination of rising TB rates followed by the introduction of porcine [from pigs] *M. avium* [also called fowl tuberculosis] into the environment would eventually first bring the Italian Northern provinces, and then the entire peninsula to its knees. This precise series of events led to the Great Pandemic of 1918 at Fort Funston and the Chinese episode at Wuhan, a major player in China's pig industry. In 2009, when Swine Flu first emerged in the

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United States — scientists later traced the virus to pig farms in Mexico — experts then warned again that a longer-term game plan was needed, one that was proactive rather than reactive.

- *Mycobacterium avium complex* (MAC) or *mycobacterium avium* is a poorly understood disease which fulfills almost all of those characteristic signs and symptoms attributed to the latest “novel” Coronavirus. In general *Mycobacterium avium* is a milder disease than *Mycobacterium tuberculosis*. The most common type of nontuberculous mycobacterial lung infection that causes pulmonary disease in the United States are due to the group of bacteria in the *M. avium complex* (MAC).

- When it appears in the lungs, *Mycobacterium avium* favors an older population with an underlying condition. As with COVID-19, not all people with a nontuberculous mycobacterial lung infection such as *M. avium* need to be treated. On the other hand, if it disseminates or spreads systemically, the patient can present with fever or high fever, diarrhea, fatigue, shortness of breath, chronic or recurrent sore throat and cough, most of which have been reported in Coronavirus patients.

- Non-tubercular-mycobacteria (NTM) such as *Mycobacterium avium* can be asymptomatic or can cause symptoms similar to tuberculosis, such as cough, fever, fatigue, and weight loss.

- It is projected that the present Italian outbreak and outbreaks worldwide will follow the timetable of Yang’s Wuhan study, which describes an annual TB surge in Wuhan as being fueled by increased transmission in the winter; peaking in March, with a second smaller peak in September.

## Introduction

Things had been changing in Northern Italy for some time. And now, after a critical mass had been reached, Italy was on lockdown. In Lodi, it was described by one infectious disease specialist as a communicable tidal wave, with one hospital there reporting more than 100 out of 120 people admitted with pneumonia. Nor were Italy’s doctors immune, as one after another fell sick, creating staff shortages.

Because antibiotics helped, they were used freely, despite the fact that they do nothing for viruses. Instead it was postured that antibiotics were being used for “secondary infections” even though such antibacterials and antimycobacterials were effective even without secondary infections. This in itself spoke for the possibility that COVID-19 could be simply a passenger virus. Italian experts said that although most COVID-19 virus cases tend to be mild, the clusters in Northern Italy were resulting in more severe cases because they are hitting an aging population with a high incidence of “pre-existing” or “underlying” medical conditions. A decree from the Italian Prime Minister’s office said that people living in hard-hit Lombardy, where Milan is the capital, as well as certain provinces nearby to Lombardy’s perimeters, must “absolutely avoid any movement into and out of the areas.” Milan, the largest urban area of Lombardy has approximately 1.6 million inhabitants. It seemed almost like a pincer-movement, a two-pronged infectious cause devastating this country.....and perhaps it was.

## Milan: Outbreak of another Kind

In 2013, Faccini et al reported in *Emerging Infectious Diseases*, an outbreak of tuberculosis, Beijing strain, in a primary school in Milan, Italy which was eventually traced to include 15 schoolchildren with active TB and 173 with latent infection. In addition there were 2 homeless men with active infection, also with the same Beijing strain, identified near the school. All of this originated from a single case of pulmonary and meningeal TB identified in a 7-year-old-boy who was in his second year of primary school, complaining of fever, headache, and general physical weakness. This boy was treated by a pediatrician; but no x-rays were taken. Two months later, the child was hospitalized because the severity of his symptoms had increased, and the Beijing strain *Mycobacterium tuberculosis* was isolated from his stomach lavage sample. [1]

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That was the warning.

By December, pleural TB was confirmed by isolation of *M. Tuberculosis* from a secondary school pupil who had attended the same primary school in Milan as the first case patient during the previous year. Genotyping confirmed that the isolate was the same Beijing strain. A search of the regional strain database found that this Beijing genotype had also been identified in a case of pulmonary TB reported in November 2009 in a homeless person who lived in the city park in front of the school. This man had been lost to therapeutic follow-up but had infected his daughter.

That was the reminder.

After the second school case was identified, health authorities extended tuberculin skin testing (TST) testing to all children who had attended the school during 2010, including those who had moved to other schools, and to all school staff members. Thirteen homeless persons who frequented the area around the school were also screened; 1 was found to have TB, and the *M. tuberculosis* isolated was of the same Beijing strain as that isolated from the other homeless man and the first 2 infected schoolchildren.

### Germ Sharing

Traditionally, Italy has a low incidence of tuberculosis (TB); and in 2008, the incidence of notified cases was only 7.6/100,000 population. [2] Yet even by 2009, in Milan, the largest urban area and the birthplace of Italian COVID-19, in Lombardy, the incidence climbed steeply to 20.44/100,000 population. [3]

Why? In industrialized countries, such as Italy, TB is increasingly associated with specific population subgroups: immigrants from countries with high endemicity. [4,5,6], ethnic minorities [4], refugees, and the homeless. [4,7] In 2019, Cuomo., *et al.* drew similar assumptions [8]: “In conclusion, our study confirms that the prevalence rates of the infectious diseases analyzed reflect those of the country of origin. Hepatitis B, and especially latent and active tuberculosis, can be a public health problem for the host nations by changing the local epidemiology.”

The basis of what would happen to Northern Italy had been laid, the tripling of an “underlying” disease that could foster a second pandemic pathogen. But what would happen next was an event that no one could have foreseen.

### Stealth Intrusion

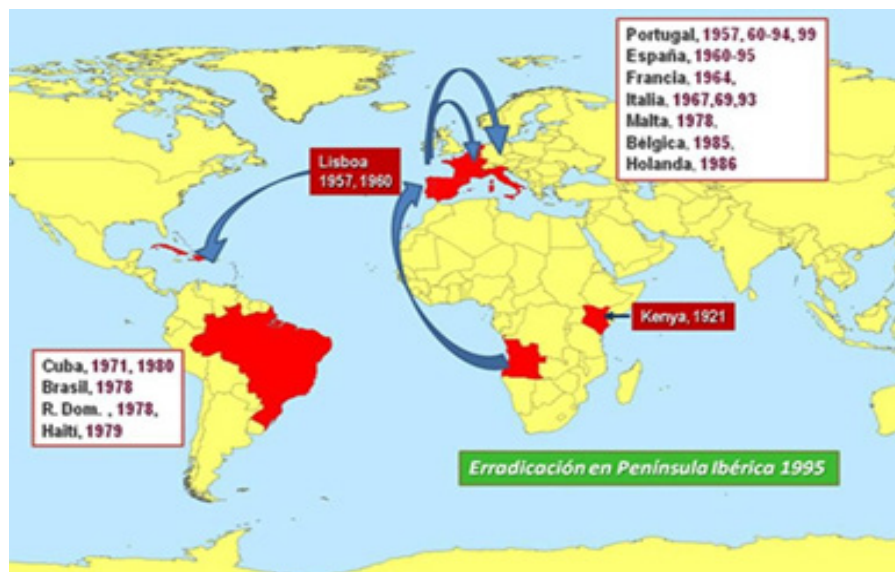
On January 22nd, 2020, Customs authorities from the *Guardia di Finanza* in the northern Italian city of Padua seized and destroyed nearly 10 tons of Chinese pig meat, potentially infected with African swine fever. By the end of 2019, half of China’s swine herd —250 million pigs, were dead. And Italy was not about to lie down and accept any of them into its borders. Therefore the Italian Ministry of Agriculture, considering this Chinese pig meat to be potentially extremely dangerous, incinerated all 10 tons of it immediately. Padua is located in the Veneto region of Italy. The coronavirus, AKA Covid-19, first appeared in Lombardy (Milan) and Veneto (Padua).

The Province of Padua is a province in the Veneto region of Italy. Its capital is the city of Padua. It was in the city of Padua that 10 tons of Chinese pig meat, potentially infected with African swine fever were seized and then burnt. Shortly thereafter, the first COVID-19 deaths in Northern Italy began.



**Figure 2:** Map highlighting the location of the province of Padua in Italy

Swine fever is deadly among pigs, though it poses no risk to humans. Italy was very sensitive to the prospect of an African swine fever outbreak, especially in its Northern region, a major site of Italian pig farming. It had happened before.



**Figure 3:** African Swine Flu (ASF) epidemiology since 1957 until 1995

Oddly, because of certain similarities, Chinese scientists maintained in 2019 that TB and malaria drugs could hold the key to fighting African swine fever. [9]

If Swine fever poses no risk to humans, then what does pose a risk is a common disease in pigs called *Mycobacterium avium* (AKA MAC or fowl tuberculosis), a non-tubercular mycobacteria (NTM). During one time-interval study, from 1953 to 1968, the incidence of *Mycobacterium avium* (fowl tuberculosis) in a pig population was an astonishing 81% . [10] As reported by some workers, *M. avium* isolates from swine represent a major threat to human beings. And the similarity of the IS1245 RFLP [restriction fragment length polymorphism (RFLP)] patterns of the human and porcine isolates indicated a close genetic relatedness, suggesting that *M. avium* is transmitted between pigs and humans. Such *M. avium* infection can occur wherever the right “underlying pulmonary conditions” exist, which can be an event as simple as a childhood or reactivated tubercular infection, or merely tying up the lungs with an excess of dust or particulate matter.

When it does go systemic, whether it be in humans or pigs, *Mycobacterium avium*, like all potentially virulent mycobacteria, assumes a preferred resistant-form learned over eons as a survival mechanism—its tiny viral-like cell-wall deficient (CWD) forms, which cannot be incinerated into non-existence, and travel on the particles of incineration in the air as potentially infective elements.

So if Italy thought it had incinerated its problems away by burning Chinese pig meat, much of which was probably from the vast pig supply in Wuhan, it would have another thought coming. Italy’s first victim was a 76-year-old woman who was found dead at her home 50 km. (30 miles) south of Milan on Thursday [Feb 20], testing positive for the coronavirus. A 78-year-old man died of the infection in a hospital near Padua the following evening. The history of the Fort Funston episode of 1918 and the Wuhan outbreak of 2019 seemed to be repeating itself. [12]

## Symptomatology

*Mycobacterium avium complex* (MAC) or *mycobacterium avium* is a poorly understood disease which fulfills almost all of those characteristic signs and symptoms attributed to the latest “novel” Coronavirus.

In general *Mycobacterium avium* is a milder disease than *Mycobacterium tuberculosis*. The most common type of nontuberculous mycobacterial lung infection that causes pulmonary disease in the United States is due to the group of bacteria in the *M. avium complex* (MAC). When it appears in the lungs it favors an older population with an underlying condition.

Not all people with a nontuberculous mycobacterial lung infection such as *M. avium* need to be treated. On the other hand, if it disseminates or spreads the patient can present with fever or high fever, diarrhea, fatigue, shortness of breath, chronic or recurrent sore throat and cough most of which have been reported in Covid-19 patients. *Non-tubercular-mycobacteria* (NTM) such as *Mycobacterium avium* can be asymptomatic or can cause symptoms similar to tuberculosis, such as cough, fever, fatigue, and weight loss. NTM lung infection, however, is often difficult to diagnose, not only in the laboratory, where its cell-wall-deficient (CWD) forms require special stains and cultures, but clinically, because symptoms are similar to those of other lung diseases such as chronic obstructive pulmonary disease.

## Crisis

By March 8<sup>th</sup> The number of people to have died from the coronavirus in Italy shot up by from 133 in a day to 366, [11] and with this, up to 16 million people in Lombardy and 14 nearby provinces needed special permission to travel under new quarantine rules. The latest figures meant Italy now had the highest number of confirmed infections outside of China, where the outbreak originated in December. More about the history of the Chinese Wuhan outbreak, and its similarity to the Italian episode can be found here. [12] The same restrictions applied to 14 provinces: Modena, Parma, Piacenza, Reggio Emilia, Rimini, Pesaro and Urbino, Alessandria, Asti, Novara, Verbano Cusio Ossola, Vercelli, Padua, Treviso and Venice. And when that didn’t seem to work, the entire nation was put on lockdown.



### The Aged and Aging.

As for pulmonary conditions resulting from *Mycobacterium avium*, they affect mostly the aged or aging. Asia has shown progressively increased TB prevalence rates amongst people over the age of 65 years. [13,14] Although pulmonary TB is the most common site of infection in elderly people, occurring in approximately 75 % of cases [15], many older patients with active TB may not exhibit its classic clinical features. Dyspnea (or difficulty in breathing) is more common and hemoptysis [coughing up blood] is less common in the elderly. There may be very few symptoms, or the symptoms can mimic age-related illnesses, such as reduced functional lung capacity, chronic fatigue, or fever of unknown origin. An accurate history may be difficult to obtain due to poor memory, impaired hearing, sight or speech.

Furthermore, The age-related changes to the immune system, so well-documented as one ages, may also compromise immunological tests for evidence of past exposure to TB or *M. avium* such as the tuberculin skin test (TST) or peripheral blood IFN $\gamma$  release TB tests (IGRA's) such as the T-SPOT.TB and QuantiFERON-TB Gold In-Tube. Lower rates of positive TST have been described in elderly populations, compared to younger people. All of this obviously makes diagnosis more difficult.

### “Underlying Conditions” or Conditions from an Unknown Infectious Cause?

Death by Coronavirus is often categorized as a phenomena of the aged or aging with “underlying” or pre-existing health conditions. Italy has one of the world’s oldest populations. But assuming that one condition has an underlying cause does not necessarily mean that that underlying cause is not just a primary chronic underlying infectious pulmonary pathogen.

The point is that the coronavirus has not been around long enough for in-depth study, it could prove to be merely a “passenger” virus, secondary to an underlying bacterial or mycobacterial cause, such as the Beijing strain of mycobacteria isolated in Milan prior to its COVID-19 outbreak. This pathogen would then assume the mantle of the true “underlying condition”, and not the virus or one of the other various disorders of unknown etiology that are presently being mentioned.

At one time or another, TB, *M. avium* and other mycobacteria have been implicated as the cause of many of the “underlying conditions” mentioned in the COVID-19 literature. To name just a few:

### Asthma

Karahyla., et al. in the Journal *Chest* mention their studies purpose[16]: “Everything that wheezes is not asthma.” And that breathlessness and rhonchi can occur in several ways as a result of mycobacterial disease: a condition which might require asthmatic as well as anti-tubercular regimens.

### Chronic Obstructive Pulmonary Disease (COPD)

A large cohort study comprised of older adults living in Guangzhou, a metropolitan city in Southern China, confirmed that “prior tuberculosis was an independent risk factor for airflow obstruction [COPD] in Chinese people.” [17] However it is doubtful that this phenomena is limited to Chinese people.

### Chronic Bronchitis, Bronchitis and Emphysema

Not only COPD (Chronic Obstructive Pulmonary disease] but emphysema, bronchitis, and chronic bronchitis were long ago linked to tuberculosis and the mycobacteria by Martin and colleagues. [18]

Other common underlying conditions that were formerly assigned to mycobacterial disease also abound in the literature.[19-33]

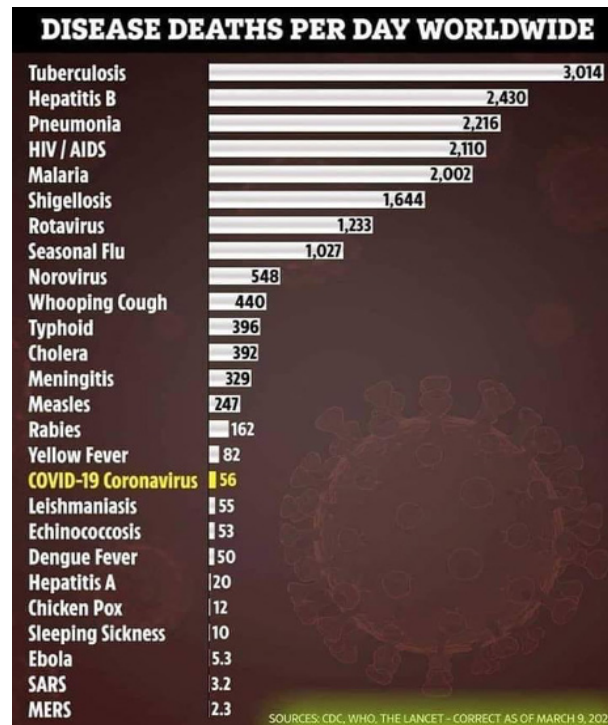
### Conclusion

Who would have taken seriously that a seemingly insignificant minor outbreak in Milan of the Beijing strain of *Mycobacterium tuberculosis* bacteria, first reported in *Emerging Infectious Diseases*, in March of 2013, could portend any significance in the current outbreak now rampant in northern Italy? Yet since then the rates for northern Italian tuberculosis have done nothing but rise, as has the swine population in northern Italy (Po Valley), which contains the regions of Lombardia, and Veneto. The Po Valley contains 70% of Italy’s swine. And then of what significance could the incineration of 10 tons of infected Chinese pig meat in Veneto from Wuhan be to an outbreak which occurred shortly thereafter?



These are questions which we do not fully understand the answer, but what we do understand is that unlike the coronavirus, TB (not to mention *M. avium*) is presently the leading cause of infectious death on the planet, and at one time, when TB killed one out of every seven people living in the United States and Europe, it assumed the mantle of “Captain of all these men of death.” It has been more than 27 years since the World Health Organization (WHO), in 1993, declared TB to be a global public health emergency. Nor has WHO lifted this global health emergency ever since. Today tuberculosis is still a global Pandemic, killing someone approximately every 21 seconds — about 1.5 million or more in 2018 alone [ <https://www.tballiance.org/why-new-tb-drugs/global-pandemic>]. It is still, for the most part, treatable; but only if looked for and considered. In the meantime we are far from done with a disease that between 2002 and 2020 alone caused approximately 1000 million [1 billion] newly infected people, over 150 million who got sick, and 36 million who died— all from TB. [34] What is the cause of the present Pandemic/Epidemic? Most seem 97% certain that it is a “virus”. But until we are 100% certain, which we are not, we still need to keep a differential diagnosis open as to the possibility that we are dealing with a “passenger” virus with a deadly underlying cause. To do otherwise, would be a disservice to many.





## References

1. Faccini M., *et al.* "Tuberculosis Outbreak in a Primary School, Milan, Italy". *Emerging Infectious Diseases* 19.3 (2013): 485-487.
2. Ministero della Salute Tuberculosis in Italy. Report 2008. [cited 2013 Jan 10].  
[http://www.salute.gov.it/imgs/c\\_17\\_pubblicazioni\\_1472\\_allegato.pdf](http://www.salute.gov.it/imgs/c_17_pubblicazioni_1472_allegato.pdf) Accessed 03/09/2020
3. [www.asl.milano.it/user/download.aspx?FILE=OBJ06171.PDF&TIPO=FLE&NOME=report\\_prevenzione\\_2011](http://www.asl.milano.it/user/download.aspx?FILE=OBJ06171.PDF&TIPO=FLE&NOME=report_prevenzione_2011). Accessed 03/09/2020
4. Ministero della Salute Update of recommendations for tuberculosis control activities. Management of contacts and of tuberculosis in the assistance area. 2009. [cited 2019 Jan 10].  
[http://www.salute.gov.it/imgs/C\\_17\\_pubblicazioni\\_1221\\_allegato.pdf](http://www.salute.gov.it/imgs/C_17_pubblicazioni_1221_allegato.pdf)
5. Moro ML., *et al.* "Two-year population-based molecular epidemiological study of tuberculosis transmission in the metropolitan area of Milan, Italy". *European Journal of Clinical Microbiology & Infectious Diseases* 21.2 (2002): 114-122.
6. Odone A., *et al.* "Epidemiology of tuberculosis in a low-incidence Italian region with high immigration rates: differences between not Italy-born and Italy-born TB cases". *BMC Public Health* 11 (2011): 376.
7. Burki T. "Surveillance, co-infection, resistance: tuberculosis in Europe". *The Lancet Infectious Diseases* 11.5 (2011): 350-351.
8. Cuomo G., *et al.* "Migration and health: A retrospective study about the prevalence of HBV, HIV, HCV, tuberculosis and syphilis infections amongst newly arrived migrants screened at the Infectious Diseases Unit of Modena, Italy". *Journal of Infection and Public Health* 12.2 (2019): 200-204.
9. <https://www.scmp.com/news/china/society/article/3036387/tb-and-malaria-drugs-could-hold-key-fighting-african-swine-fever> Accessed 03/10/2020
10. Dhama K., *et al.* "Tuberculosis in Birds: Insights into the Mycobacterium avium Infections". *Veterinary Medicine International* (2011).
11. <https://www.bbc.com/news/world-europe-51793619> Accessed 03/09/2020.

**Citation:** Dr. Lawrence Broxmeyer, MD. "Italy in Crisis" *Pulmonary Research and Respiratory Care* 4.1 (2020): 09-18.

DOI: 10.5281/ZENODO 3714795.

12. Broxmeyer L. "Questions Raised By the "New" Coronavirus: Too Many "Experts"— Too Little Thought." *Pulmonary Research and Respiratory Care* 4.1 (2020): 01-08.
13. World Health Organisation, Geneva, Switzerland. 2014. Global Tuberculosis Report 2014.
14. Onozaki I, et al. "National tuberculosis prevalence surveys in Asia, 1990–2012: an overview of results and lessons learned". *Tropical Medicine & International Health* 20.9 (2015): 1128-1145.
15. Perez-Guzman C., et al. "Does aging modify pulmonary tuberculosis?: A meta- analytical review". *Chest* 116.4 (1999): 961-967.
16. Karahyla Jai K. et al. "Tuberculosis and Bronchial Asthma: Not an Uncommon Association". *Chest* 138.4 (2010).
17. Lam KB., et al. "Prior TB, smoking, and airflow obstruction. A cross-sectional analysis of the Guangzhou Biobank Cohort Study". *Chest* 137.3 (2010): 593-600.
18. Martin CJ., et al. "Tuberculosis, emphysema and bronchitis". *American Review of Respiratory Disease* 97.6 (1967): 1089-94.
19. Hass GM., et al. "The properties of amyloid deposits occurring in several species under diverse conditions". *Archives of Pathology* 35 (1943): 226-241.
20. Schwartz Ph. "Amyloid degeneration and tuberculosis in the aged". *Gerontologia* 18.6 (1972): 321-362.
21. Engelbach K. "Transitory diabetes mellitus in two tuberculotics". *Beitr Klin Tuberk Spezif Tuberkuloseforsch* 110.5 (1954): 470-473.
22. Karachunskii MA., et al. "Changes in carbohydrate metabolism in patients with tuberculosis". *Vestn Ross Akad Mo Nauk* 7 (1995): 18-21.
23. <https://fortune.com/2018/06/21/tuberculosis-vaccine-reverse-juvenile-diabetes-study-shows/> Accessed 03/09/2020 24. Nichols GP. "Diabetes among young tuberculous patients; a review". *The American review of tuberculosis* 76.6 (1957): 1016-1030.
25. Wang H., et al. "Breast tissue, oral and urinary microbiomes in breast cancer". *Oncotarget* 8.50 (2017): 88122-88138.
26. Falagas ME., et al. "Tuberculosis and malignancy". *QJM: An International Journal of Medicine* 103.7 (2010): 461-487.
27. Yu YH., et al. "Increased lung cancer risk among patients with pulmonary tuberculosis: a population cohort study". *Journal of Thoracic Oncology* 6.1 (2011): 32-37.
28. Zhang S., et al. "Detection of Mycobacterium tuberculosis L-form infection in tissues of lung carcinoma". *Chinese Journal of Public Health* 25 (2009): 1317-1318.
29. Broxmeyer L. "Cancer and the Science of Denial –with Breast Cancer/Long Island Breast Cancer". *Journal of Tumor Medicine and Prevention* 1.3 (2017): 555563.
30. Hektoen L. "The Vascular Changes of Tuberculous Meningitis, Especially the Tuberculous Endarterities". *Journal of Experimental Medicine* 1.1 (1896): 112.
31. Osler W. "Diseases of the arteries. In: Osler W, MacCrae T, editors. Modern medicine Its theory and practice in original contributions by Americans and foreign authors". Philadelphia PA: Lea & Fabiger (1908): p. 426-447.
32. MacCallum WG. "Acute and chronic infections as etiological factors in arteriosclerosis. In: Cowdry EV, editor. Arteriosclerosis A survey of the problem". New York: MacMillan Co (1933): p. 35562.
33. Livingston V. "Mycobacterial Forms in Myocardial Vascular Disease". *Journal of the American Medical Women's Association* 20.5 (1965): 449-452.
34. Grange JM and Zumla A. "The global emergency of tuberculosis: What is the cause?" *The Journal of the Royal Society for the Promotion of Health* 122.1 (2002): 78-81.