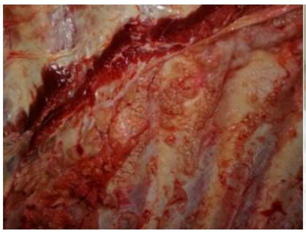
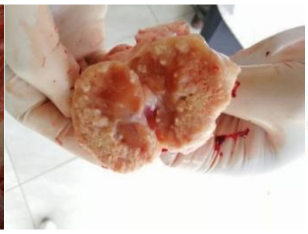
Agenda

"Enhancing Diagnostic Capacities of Coronavirus Disease (Covid19) and Mycobacterium Tuberculosis with Emphasis on their Pathology and Epidemiology "

Jordan University of Science and Technology

Irbid, Jordan

26th -27th of September , 2023

Coordinator and PI of the Regional Workshop: Nabil Hailat, DVM, Ph.D., JUST

Join Zoom Meeting

https://us06web.zoom.us/j/81708327932?pwd=NaplVa4yn5PJoyaBOoiv5rjbvwbVwz.1

Meeting ID: 817 0832 7932

Passcode: 861629

Tuesday, September 26th

TIME	ACTIVITY	SPEAKER
09:30-10:00	Registration	
10:00-10:30	Opening Ceremony – 8 welcoming speeches, 3-5 minutes each	1-Welcoming speech, Dr. Nabil Hailat, Coordinator 2-Dean of Scientific Research , **JUST** 3-Ministry of Agriculture 4-Arab Organization For Agricultural Development, Chairwoman of the Eastern Office, **Dr. Fida Rawabdeh** 5-Dean of the Faculty of Veterinary Medicine, **JUST** 6-Representative of **Egypt** 7-Representative of **Tunisia** 8-Dean of Tiaret University, **Algeria**
10:30-10:50	Coffee and Tea break	
Session 1: **Chair: Dr. Mahmoud Hanatleh**		
10:50-11:10	Veterinary services in Jordan	**Dr.Shifa Abdallah Altaha ,MoA –Jordan**
11:10-11:30	Bovine tuberculosis: rapid response & public awareness	**Dr.Amani Khudeir,** **MOA-Jordan**
11:30-11:50	Impact of Covied 19 on Tuberculosis Control	**Pr. Wagdy Abdelmoneim Hussien, General Manager in MoH –Egypt**

11:50-12:10	Coffee and Tea break	
Session 2: **Chair: Dr.Ahmed Youssef Shaaban Gad**		
12:10-12:30	Mycobacteria –tuberculosis :complexities and challenges in animal and public health)	**Prof.Mounir Jebali, National School of Veterinary Medicine Sidi Thabet –Tunisia**
12:30-12:50	Bovine TB	**Dr.Mohammad Al Sayed Nossair, Alexandria University –Egypt**
12:50-01:10	Tuberculosis as zoonotic disease	**Dr.Hemida houari ,Tiaret institute – Algeria**
01:10-02:10	Lunch, Restaurant	
Session 3: **Chair: Dr. Hemida houari**		
02:10-02:30	Bovine Tuberculosis in Afghanistan	**Dr. Samadi Assad Allah, Kabul University**
02:30-02:50	Bovine Tuberculosis in Iraq	**Dr. Mohammad Asaed,**
02:50-03:10	Mycobacterium in fish : zoonotic potential	**Marouane Ghannouchi, National School of Veterinary Medicine Sidi Thabet –Tunisia**
03:10-03:30	Wrap-up and Discussion	
7:00	**Group Dinner**	

Wednesday, September 27th

TIME	ACTIVITY	PERSON RESPONSIBLE
Session 4: **Chair: Dr. Prof. Wagdy Abdelmoneim**		
09:30-09:50	Early response to COVID-19 :the story for Jordan	**Prof. Wail hayajneh, Professor , Pediatric Infectious Disease .Saint Louis University School of Medicine SSM Health Cardinal Gelnnon Children's Hospital ,Missouri, USA**
09:50-10:10	SARS-CoV-2 Molecular Diagnostic	**Prof. Saied jaradat,JUST**
10:10-10:30	How is TB connected to Covid 19	**Prof. Mohammed khalifeh- JUST**
10:30-10:50	JCDC Role in directing health policiies to revent epidemics or reduce its burden "COVID-19"	**Dr. Sami Adel Sheikh Ali, MD. Community Medicine Epidemiologist, Public Health Advisor, JCDC**
10:50-11:10	Zoonotic tuberculosis an overview	**Dr. Irfan Khatak, Pakistan**
11:10-11:30	Tuberculosis in human	**Dr. Khaled okeh, MoH-Jordan**

11:30-11:35	Coffee& Tea break	
Session 5: **Chair: Dr.Mohammad Al Sayed Nossair**		
11:35-11:55	What will the next pandemic look like? example Covied 19	**Dr.Mehdi Boucheikhchoukh- Algeria, Institute of Veterinary Medicine El Taref University – Algeria**
11:55-12:15	Epidemiology of bovine tuberculosis in Algeria	**Dr. Fetheddine Rezig – Algeria, Institute of Veterinary Medicine El Taref University – Algeria**
12:15-12:35	Diagnostic techniques for tuberculosis in the abattoirs	**Dr.Shadi Othman- Municipality of grater Amman-Jordan**
12:35-01:00	Tuberculosis (pulmonary and extrapulmonary)	**Dr.Ahmed Youssef Shaaban Gad, Alexandria University –Egypt**
01:0-02:00	Lunch, Restaurant	
Session 6: **Chair: Dr. Will be assigned**		
2:00-2:20	Concept of One Health Control of TB	**Pr. Smadhi Hanen, Faculty of Medicine of Tunis -Tunisia**
02:20-2:40	Bovine tuberculosis and its danger to human	**Pr.Rejeb Ahmed, National School of Veterinary Medicine –Tunisia**
2:40-3:10	Discussion and Wrap Up, Path Forward	
3:10-3:40	Closing ceremony and certificates distribution	
4:00	Bus back to Hotel	
	Dinner, in Yarmouk University Street	

Opening Ceremony:

An opening ceremony, as planned in the agenda, was conducted where representative of different participating countries (Algeria, Tunisia, Egypt, Afghanistan and Jordan) and a representative of the Arab Organization for Agricultural Development (AOAD), Chairwoman of the Eastern Office, **Dr. Fidaa Rawabdeh**, gave a short speech about the importance of the regional training workshop on Tuberculosis and Covid-19. Some participants from Algeria, Tunisia, Egypt, Afghanistan, and Jordan attending and contributed to the activities of the workshop while others also from Tunisia (one human respiratory specialist and veterinary Pathologist) participated on line. Veterinarians and agriculture engineers/animal production, from the Ministry of Agriculture-Jordan, Agricultural National Research Center, Amman and Irbid Municipalities, veterinarians from the private sector and undergraduate and graduate students from the Faculty of Veterinary Medicine participated in the workshop activities, discussions and recommendations.

Chairman of the meeting, representative of the Ministry of agriculture, Representative of the AOAD and a former parlamantarian and an MD

Dr. Shereen Khlouf also introdced the outline of the training workshop, the participating countries and topics to be discussed in this regional workshop

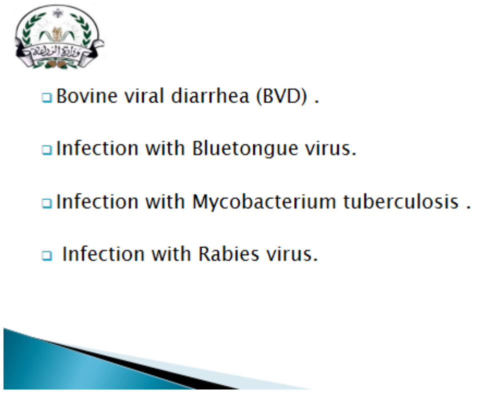
Prof. Nabil Hailat, (middle picture) the principle researcher gave an overview of animal diseases with emphasis on zoonotic diseases that are transmitted from animals to humans and their relation to climate changes and food security and the importance of capacity building of veterinarian in diagnosing animal and zoonotic diseases.

Dr. Hailat then addressed the triangle of one health concept; human health, animal health and environmental health and how they are linked tightly to starvation and poverty, unemployment and food security. Dr. Hailat gave examples of animal diseases that are related to climate changes such as Crimean-Congo Haemorrhagic Fever (CCHF) which emerged recently in Iraq. He presented the transmission routs from animals to humans where animals do not show any clinical signs. He discussed also other similar diseases that are affected by the climate changes and the great need to face animal disease national and regionally with capacity building and development of veterinary services and research, as well as increasing and empowering laboratory diagnosis of these diseases. Below are some of the slides presented to show how the disease is transmitted.

Participation of medical students.

The first session was chaired by Dr. Mahmoud Hanateleh, from the Arab Organization for Agriculture Development (AOAD).

The first speaker was **Dr. Shifa Abdallah Altaha, MoA –Jordan** who talked about Veterinary Services in Jordan. She presented the Ministry of Agriculture of Jordan mission, vision and the role of Agriculture in the social, economic and environmental sectors. She also presented the role of agriculture in rural development in transforming families from consumers to producers, and its role in poverty alleviation and unemployment. Emphasis was given to the livestock sector where laws, bylaws and instructions related to animal diseases, trade, animal movement, isolation, vaccination…etc. Also a discussion on the infectious diseases that are of importance to Jordan and to the region was also conducted, as shown in the below two slides. The approach of the veterinary services on animal diseases examination, sampling, diagnosis, treatment, isolation, quarantine, restriction of movement, waste disposal, surveillance and vaccination were also discussed.



Dr.Amani Khudeir, MOA-Jordan, presented a talk about Bovine tuberculosis: rapid response & public awareness.

According to the World Health Organization (WHO) Global TB Report 2021, approximately 25% of the world's population has immunologic evidence of prior infection with MTB as determined by surveillance testing, and 10 million people developed the active form of tuberculosis (ATB).

Tuberculosis (TB) is a contagious infectious disease caused by gram positive bacillus Mycobacterium tuberculosis (MTB) a remarkably successful pathogen that primarily infects the lungs, leading to the classic syndrome of pulmonary TB. All other organs and tissues including the lymph nodes, brain, kidneys, and spine can be affected in a disorder called extra pulmonary TB.

The disease can be transmitted in several ways; Exhaled air, Sputum, Urine, Faeces and Pus.

Bovine tuberculosis is usually a chronic infectious disease, but it could be acute or subclinical as well. **Symptoms of infected cattle with TB are:**

Untreatable mastitis in dairy and beef cows, Severe pneumonia in up to 30% of infected calves, starting as a hacking cough, Ear infections in calves, the first sign typically being one droopy ear, progressing to ear discharges and in some cases a head tilt, and Abortions.

Diagnosis of TB can be achieved by Direct microscopic examination of acid-fast-bacilli (AFB) which offers a rapid and cost-effective approach, but its limitations include low sensitivity and the inability to differentiate among various mycobacterial species.The isolation of mycobacteria on selective culture media and identification by cultural and biochemical tests or DNA techniques, such as PCR, confirms infection are aslo other methods of TB diagnosis.

Delayed hypersensitivity test – skin test (Tuberculin Test): This test is the standard method for detection of bovine tuberculosis. It involves measuring skin thickness, injecting bovine tuberculin intradermally into the measured area and measuring any subsequent swelling at the site of injection 72 hours later.

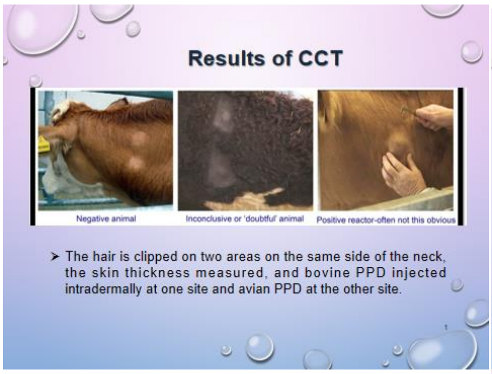
Blood-based laboratory tests- Gamma interferon assay, which uses an enzyme-linked immunosorbent assay (ELISA) as the detection method for interferon, Lymphocyte proliferation assay, which detects cell-mediated immune responses, and Indirect ELISA, which detects antibody responses.

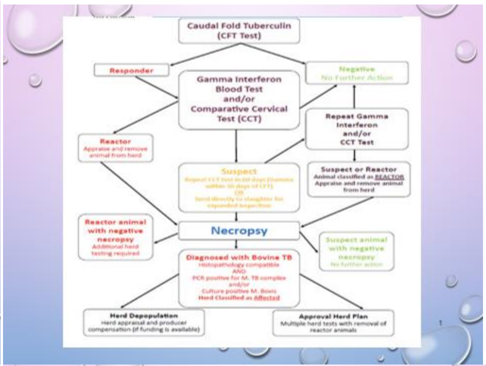
Caudal Fold Tuberculin (CFT) Test

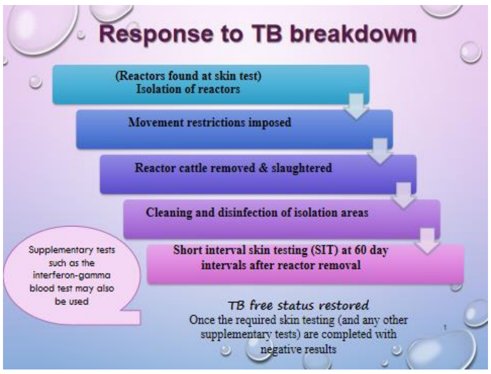
It is the primary screening test used to identify cattle infected with bovine TB. This test stimulates an immune response to Mycobacterium bovis using an intradermal injection of a Purified Protein Derivative (PPD) of tuberculin into the skin of the caudal fold (the fold of skin at the base of the tail). If the animal has been exposed to mycobacteria, the immune system responds with inflammatory cells at the injection site, causing swelling and/or discoloration of the skin.The veterinarian evaluates the response to the CFT injection by inspecting and palpating the injection site 72 hours later (+/- six hours). Any abnormality at the injection site classifies the animal as a responder.

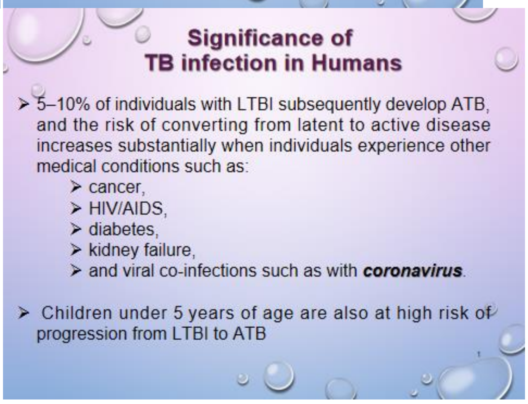
Comparative Cervical Tuberculin (CCT) Test:

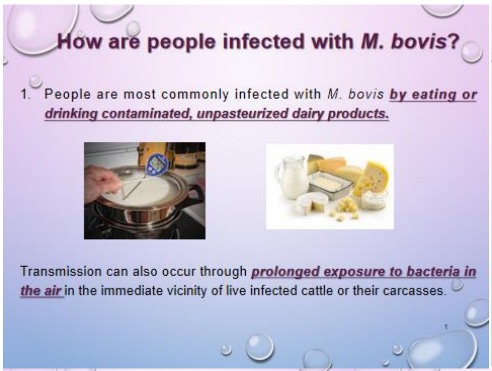
It is a secondary skin test used on CFT responder animals, performed within 10 days after the CFT injection. Responses are evaluated and measured 72 hours later (+/- six hours). The difference in the skin thickness before and after the test determine if the response is more likely due to M. bovis or M. avium. The results are used to classify cattle as negative, suspect, or reactor. CCT suspects either remain under quarantine for a retest in 60 days or are examined for lesions at post-mortem. CCT reactors are examined for lesions at post-mortem.

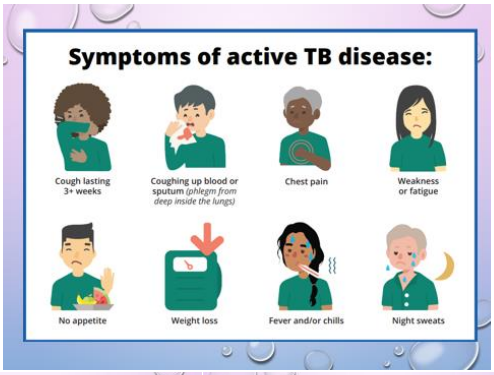


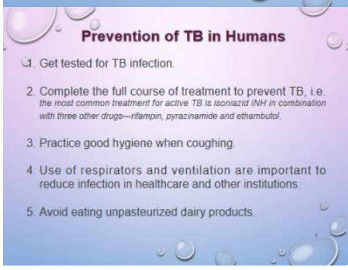


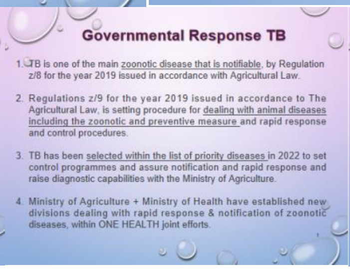


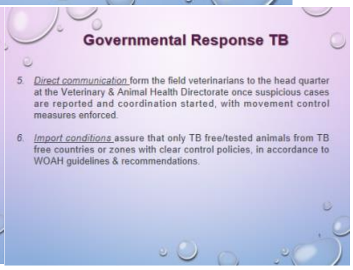




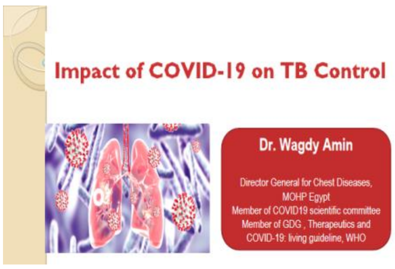


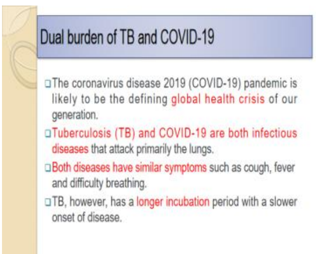


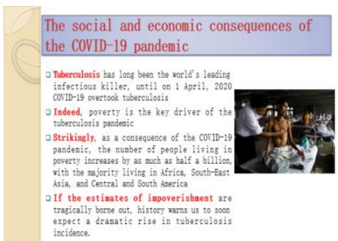


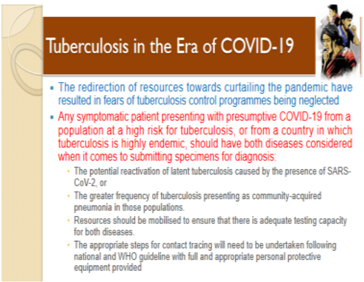


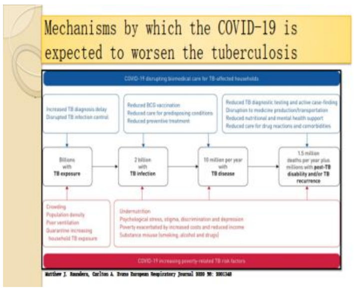
The third speaker was **Prof. Wagdy Abdelmoneim Hussien,** General Manager in MoH –Egypt who discussed the impact of Covid-19 on tuberculosis.

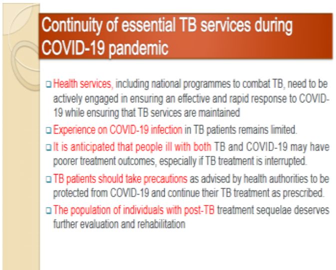


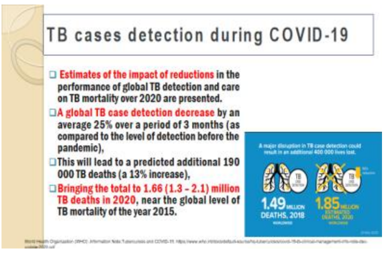


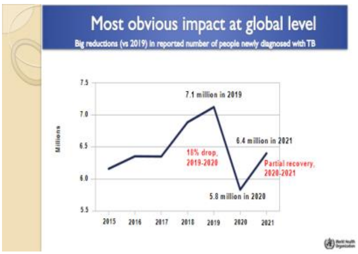


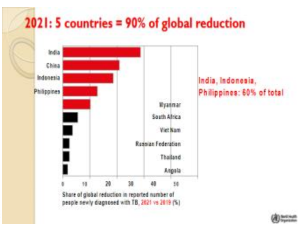


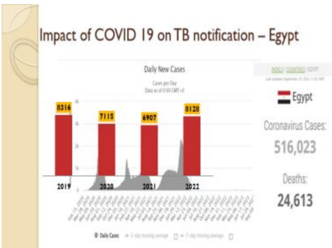


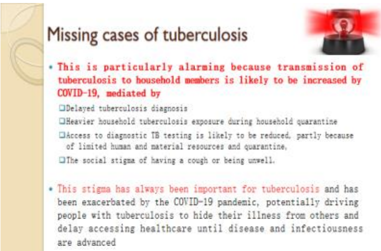


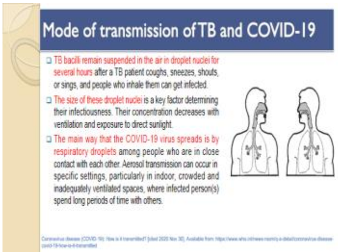


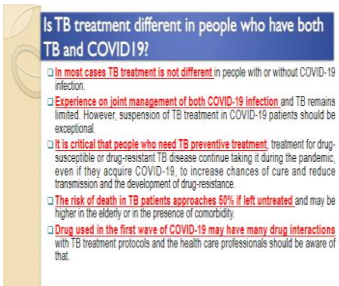












Important recommendations were presented and discussed:

1- People-centred outpatient and community-based care should be strongly preferred over hospital treatment for TB patients (unless serious conditions are requiring hospitalisation) to reduce opportunities for transmission.

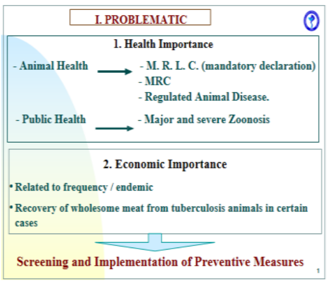
2- Provision of anti-tuberculosis treatment, in line with the latest WHO guidelines, must be ensured for all TB patients, including those in COVID-19 quarantine and those with confirmed COVID-19 disease.

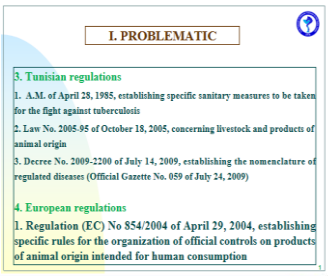
3- Adequate stocks of TB medicines should be provided to all patients to take home to ensure treatment completion without having to visit treatment centres unnecessarily to collect medicines. Use of digital technologies like electronic medication monitors and video-supported therapy can help patients complete their TB treatment.

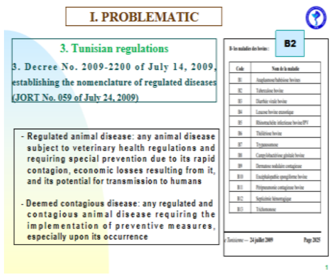
4- The replacement of paper records with electronic systems will help improve the timeliness of TB data but needs to be matched with adequate human resources, infrastructure, funding, political commitment and visionary leadership

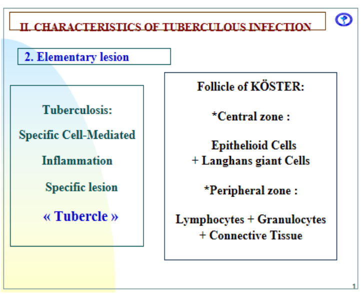
5- The response to COVID-19 can benefit from the capacity building efforts developed for TB over many years of investment by national authorities and donors. These include infection prevention and control, contact tracing, house-hold and community-based care, and surveillance and monitoring systems.
6- TB prevention and care continue uninterruptedly as Influenza and Ebola, have impinged negatively upon TB care
7- Communication with the healthcare services should be maintained so that TB patients get essential services in case of need, such as management of adverse drug reactions and co-morbidities, nutritional and mental health support, and restocking of the supplies of medicines.
8- As visits to health centres will be minimized, home-based TB treatment is bound to become the norm.

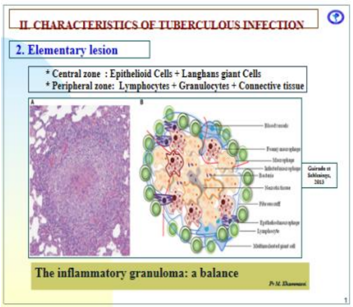
The next presentation was delivered by **Prof. Mounir Jebali, National School of Veterinary Medicine Sidi Thabet–Tunisia and entitled** Mycobacteria – tuberculosis: complexities and challenges in animal and public health. He presented the public health, economic concerns of TB. He also reviewed the regulations governed the control of TB in Tunisia.

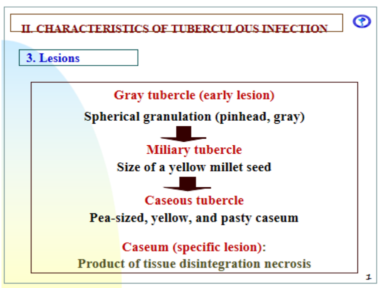


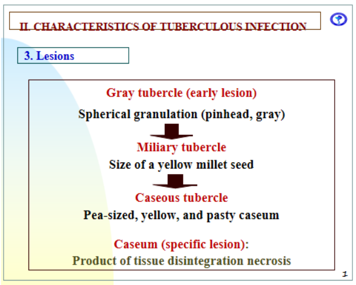


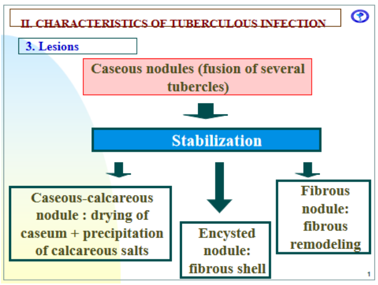


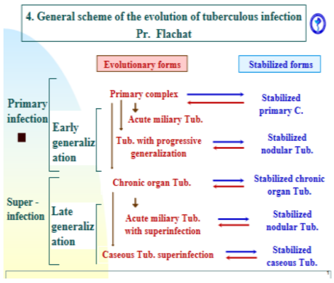


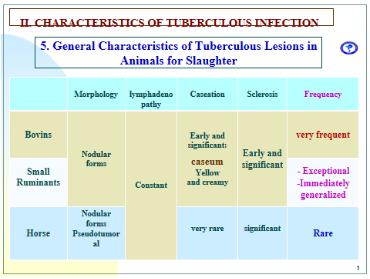




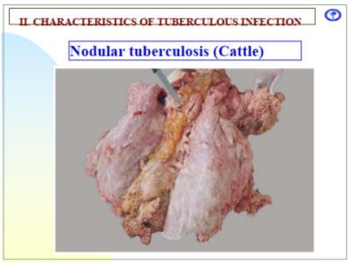


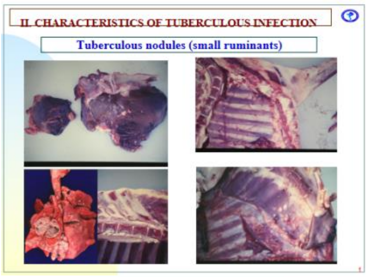


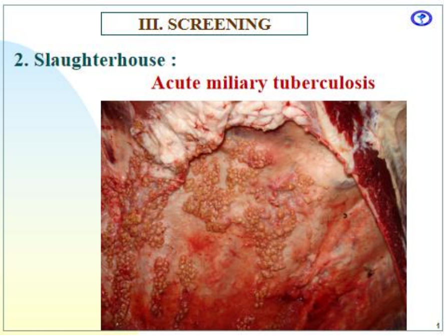


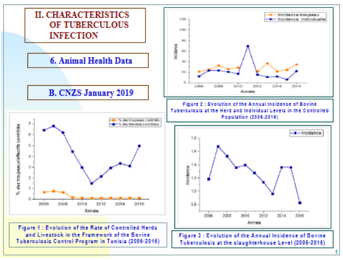


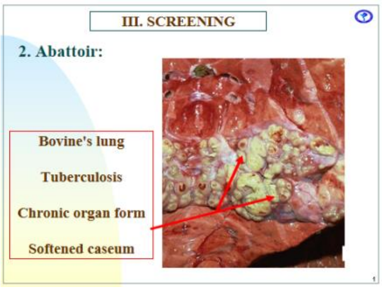
	Morphology	lymphadenopathy	Caseation	Sclerosis	Frequency
Bovins	Nodular forms	Constant	Early and significant: caseum Yellow and creamy	Early and significant	very frequent
Small Ruminants					- Exceptional -Immediately generalized
Horse	Nodular forms Pseudotumoral		very rare	significant	Rare











Regulation (EC) No 854/2004

1- Positive or doubtful reaction Separate slaughter from other animals and necessary precautions

2- Post mortem inspection :

Tuberculous lesion in multiple organs or parts of the carcass (seized).

Tuberculous lesion in a lymph node: the organ or related part (seized).

Sanitary measures

Human health:

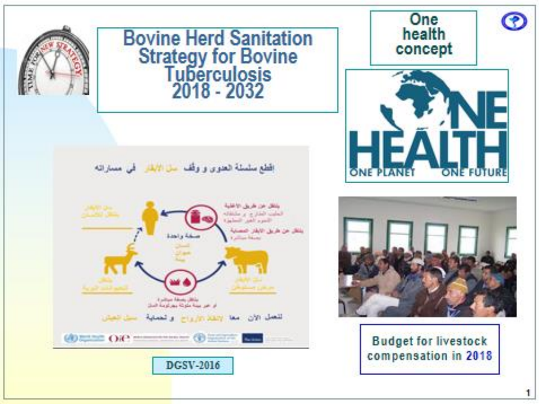
1. Personnel information, 2. Personnel vaccination, 3. Disinfection in case of injuries

Animal Health:

1. Bovine Tuberculosis: regulated animal disease: mandatory reporting to the DGSV and issuance of the elimination title pass (Decree No. 2009-2200 of July 14, 2009)

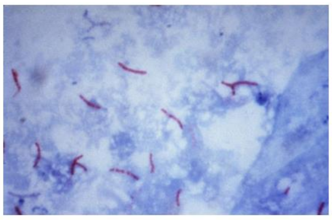
2. Open forms of tuberculosis: mandatory reporting and application of specific health police measures in livestock farming (Order of April 28, 1985):

1. Advanced lung tuberculosis
2. Mammary tuberculosis
3. Genital tuberculosis
4. Intestinal tuberculosis



Dr. Mohammad Al Sayed Nossair, Professor and Head of Department of Animal Hygiene and Zoonoses, Alexandria University –Egypt:

M. tuberculosis stained by ZN stain



Mycobacterium tuberculosis in sputum (stained red)

He gave a brief description and definition of the diseases and some staining characteristics of the causing agent.

Epidemiology:

1. **Distribution**: The disease is worldwide distributed and endemic in **Egypt.**
2. **Animal susceptible:**
   - The disease affects all species of vertebrates.
   - **Cattle, buffaloes**, pigs and humans are highly susceptible.
   - Sheep, goats, camels and equines are sporadically affected.

Factors effect on susceptibility:

- The disease is more common in dairy cattle than in fattening cattle due to the long life span of dairy cattle.
- The disease incidence is high in old animals.
- It is of low prevalence in cattle kept on pasture.
- The indoor housed animals are at high risk of the infection due to aerosol transmission.
- Stress factors as repeated pregnancy, lactation, debilitating factors (poor feeding, chronic disease), close housing and poor ventilation.

Infected cattle are the main source of infection for other cattle. TB bacilli are excreted in Exhaled air; Sputum, Feces, Milk, Urine, Vaginal and uterine discharges and discharges from open peripheral lymph nodes.

Common routes are inhalation or ingestion.

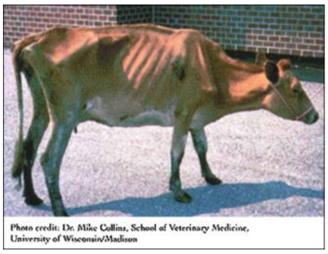
Inhalation is the almost invariable portal of entry in housed cattle.
Ingestion is possible at pasture when feces contaminates feed and drinking water.
Ingestion of infected milk by young animals.
Tuberculosis spreads in the body by two stages, the primary complex and post--primary dissemination.

Pathogenesis:

The primary complex consists of the lesion at the point of entry and in the local lymph node, especially when infection is by inhalation. More commonly the only observable lesion is in the pharyngeal or mesenteric lymph nodes. A visible primary focus develops within 8 days of entry being affected by the bacteria. Calcification of the lesions commences about 2 weeks later.The developing necrotic focus is soon surrounded by granulation tissue, monocytes, and plasma cells and the pathognomonic 'tubercle' is established. Bacteria pass from this primary focus, which is in the respiratory tract 90-95% of cases, to a regional lymph node and cause the development of a similar lesion. Post-primary dissemination from the primary complex may take the form of acute miliary tuberculosis, discrete nodular lesions in various organs, or chronic organ tuberculosis caused by endogenous or exogenous reinfection of tissues rendered allergic to tuberculoprotein. In the latter case there may be no involvement of the local lymph node.
Depending upon the sites of localization of infection, clinical signs vary, because the disease is always progressive, there is the constant underlying toxemia which causes weakness, debility, and the eventual death of the animal.

Clinical signs:

The incubation period is long and varied from 2 months to several years.
Morbidity and mortality rates are generally low (5 - 20%) and depend on the rearing system.
In most cases, progressive emaciation unassociated with other signs occurs, and should arouse suspicion of tuberculosis. A capricious appetite and fluctuating temperature are also commonly associated with the disease. Affected animals tend to become more docile and sluggish. These general signs often become more pronounced after calving. Pulmonary involvement is characterized by a chronic cough due to bronchopneumonia.
The cough is never loud occurring only once or twice at a time. It is easily stimulated by squeezing the pharynx or by exercise. It is most common in the morning or in cold weather.
In the advanced stages when much lung has been destroyed, dyspnea with increased rate and depth of respiration becomes apparent. Pulmonary involvement is characterized by a chronic cough due to bronchopneumonia. The cough is never loud occurring only once or twice at a time. It is easily stimulated by squeezing the pharynx or by exercise.
It is most common in the morning or in cold weather. In the advanced stages when much lung has been destroyed, dyspnea with increased rate and depth of respiration becomes apparent. At this stage, abnormalities may be detected by auscultation and percussion of the chest. Areas with no breath sounds and dullness on percussion are accompanied by areas in which squeaky crackles are audible. Involvement of the bronchial lymph nodes may cause dyspnea because of constriction of air passages, and enlargement of the mediastinal lymph node is commonly associated with recurrent and then persistent ruminal tympany.
Rarely tuberculous ulcers of the small intestine cause diarrhea. Retropharyngeal lymph node enlargement causes dysphagia and noisy breathing due to pharyngeal obstruction.
Pharyngeal palpation, or endoscopy, reveals a large, firm, rounded swelling in the dorsum of the pharynx. Chronic, painless swelling of the submaxillary, prescapular, precrural, and supramammary lymph nodes is relatively rare. There is tuberculous metritis, there may be infertility, or conception may be followed by recurrent abortion late in pregnancy, or a live calf is produced which in most cases dies quickly of generalized tuberculosis. Rare cases of tuberculous orchitis are characterized by the development of large, indurated, painless testicles.




In Egypt, cattle are the primary source of meat and milk and play an essential role in both economic and social life. Thus, bTB is one of the foremost animal health problems affecting bovine herds.Currently, the General Organization of Veterinary Services (GOVs) in Egypt implements a bTB eradication program using two methods for the detection of M. bovis infection in cattle:

The single cervical tuberculin test (SCT).

Slaughter surveillance that is entirely based on meat inspection at abattoirs.

The SCT has several practical drawbacks, including the lack of specificity, and subjectivity of the reading and interpretation of the test results. Other diagnostic assays such as rapid lateral-flow test and IFN-γ assay are often used by individual dairy farmers.

The passive surveillance is the main system for early detection and early warning.

It is based on the fact that all stakeholders must immediately notify any suspicion of any disease to the nearest veterinary clinics (1st line). The veterinary clinics have to notify the local veterinary authority and finally up to central Veterinary authority, GOVS.

To facilitate and support rapid notification for any disease suspicions and prompt response, the following activities have been implemented:

Transboundary animal disease information system (TAD info) in epidemiological units which receive all epidemiological data from the source (veterinary clinic records). Hotline established GOVS for receiving any notifications. GOVS receives the notification alerts by email or fax. Continuous training for veterinarians is carried out in all governorates targeting early detection and disease reporting. Community-based animal health and outreach teams (CAHO team), i.e., groups of trained veterinarians on participatory disease surveillance assigned for detection of diseases. CAHO teams carry out surveillance activities in case of suspicion of endemic notifiable diseases or exotic diseases, based on the following criteria:

Routine work in high-density animal population villages. Selection of high-risk areas for enhanced surveillance based on health records and epidemiological investigations performed in previous visits and on rumors of any health issue in a specific area, village, sub-village or farm. When communications are received from animal keepers who observed clinical signs or suspect the existence of a notifiable disease. Once notification is raised, GOVS implements rapid response including the deployment of a rapid response team to carry out epidemiological investigations and data entry in the database.

The total number of tested animals in the tuberculosis program in the last 3 years

Tested animal for tuberculosis 2018-2019-2020			
Year	Cow	Buffalo	Total
2018	207914	50371	258285
2019	181012	39426	219046
2020	169261	40339	209600

The number of confirmed positive tuberculosis animals in the last 3 years

Confirmed positive animal for tuberculosis 2018-2019-2020			
Year	Cow	Buffalo	Total
2018	44	28	72
2019	16	8	24
2020	51	2	53

Measures implemented to prevent and control of Tuberculosis in Egypt:

Egypt implement each year a national Program of surveillance, prevention, control and animal disease eradication, of those transmissible from animal to human, animal protection and

environment protection. The program is put into place by developing a figure plan which is prepared by each County Sanitary Veterinary and Food Safety Authority and its fulfillment is monitored by National Sanitary Veterinary and Food Safety Authority. In the case of animals coming from other countries, clinical inspection and verification of relevant data, including sanitary veterinary documents and other documents accompanying susceptible animal consignments coming from other countries, before unloading at destination are performed according to the NSVFSA and Agricultural and Rural Development Ministry order no.129/566/2007 approving sanitary veterinary norm regarding veterinary and zootehnical controls applicable to intra community trade with certain live animals and animal products. For ruminants coming from third countries all animals are tested.
At the end of his presentation he gave the main signs of TB in humans which was also presented by others.

Dr.Hemida houari ,Tiaret institute – Algeria

ABO blood groups in COVID-19 patients; Cross-sectional study:

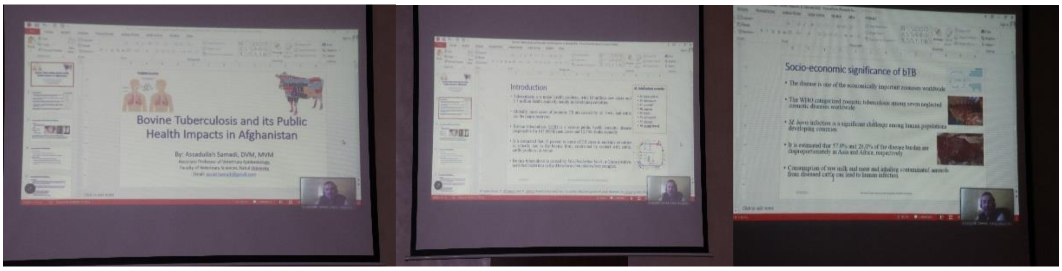
1. Since March 2020, several articles reported an association between the ABO blood group and COVID-19. These include papers by Zhao et al., Zietz et al., Zeng et al Li et al. and Wu et al., all agreeing that group A individuals would have a higher risk of becoming infected, and group O individuals would have a lower risk.
2. Research has shown some potential associations between ABO blood groups and COVID-19, but it's important to note that these relationships are complex and not fully understood.
Susceptibility: Some studies have suggested that individuals with certain blood types may have a slightly higher or lower risk of contracting COVID-19.
For example, early studies indicated that people with blood type O might be less susceptible to the virus, while those with blood type A could be at a higher risk.
However, the effect of blood type on susceptibility is relatively small, and it is just one of many factors that can influence an individual's susceptibility to the virus.
3. Disease Severity: Research has also explored the connection between blood type and the severity of COVID-19. Some studies have suggested that individuals with blood type A may be more likely to experience severe COVID-19 symptoms, while those with blood type O might be less likely to have severe outcomes.
Again, these associations are not strong enough to be the sole determining factor in disease severity, and other factors such as age, underlying health conditions, and vaccination status play a more significant role.
4. Blood Clotting: There is some evidence that blood type may be related to the risk of blood clot formation in COVID-19 patients. People with type A blood may be more prone to blood clotting, which is a common complication in severe COVID-19 cases.
It's important to emphasize that while these associations exist, they are relatively small and do not provide a definitive means of predicting an individual's risk of COVID-19 infection or severity.

COVID-19 is a complex disease influenced by various factors, including genetics, age, preexisting health conditions, and environmental factors.
General overview of the approximate worldwide distribution of ABO blood groups:
Blood Group O: Blood group O is often the most common blood group globally. It's particularly prevalent in many populations across Africa, the Americas, and some parts of Asia.
Blood Group A: Blood group A is widespread and is commonly found in many populations around the world. It tends to be more prevalent in Europe and parts of Asia.
Blood Group B: Blood group B is less common than A but still found in a notable percentage of the global population. It's often found at higher frequencies in parts of Asia and some indigenous populations.
Blood Group AB: Blood group AB is typically the least common blood group worldwide. It occurs at lower frequencies in most populations, but it is more common in some regions, particularly in parts of India and among certain ethnic groups.
Group O was found in about half of people with phenotypes (47.52%),
Group A was twice as high (30.14%) as
Group B (16.62%), and
Group AB exhibited the lowest frequency (5.72%).
Moreover, a clear predominance of rhesus positive (Rh+) subjects (91.8%) was observed compared to rhesus negative (Rh-) subjects (8.1%) among the Algerian population. (Derouiche et al, 2020).
Previous studies have shown that gender has a considerable effect on the outcome of infections and has been associated with underlying differences in immune responses to infection (Takahash et al.,2020) and also report inequalities between sexes during the disease. In fact, men appear more likely to develop severe cases than women (Tu Haitao et al. 2020).
In our study, we noted a male predominance, which corroborates the results reported in other studies with varying proportions 54.5% (Zhou et al., 2020), 73% (Huang et al.,2020) and 50.7%(Zhang et al., 2020).The male predominance could be due to the influence of female sex hormones on the regulation of the immune response (Channappanavar et al., 2017). Thus, it was experimentally demonstrated that female mice were less likely to develop SARS-CoV infection than males.
Contrary to our results, Cai (2020) reported an equal distribution of cases between the two sexes while Lavado et al; (2022) found a female predominance in the Philippines, which could be attributed to the high number of women working in sectors hardest hit by the pandemic, such as retail, restaurants and hotels Lavado et al ; (2022).
The relative frequencies of the phenotypes vary greatly from one geographical area to another. However, people of group O preferentially infect each other, since no protection by anti-A or anti-B will be able to intervene between people of the same group, the fewer there are in a population, the less likely they are to be infected (Le et al., 2021).
This is the case in Asian countries, such as Japan or South Korea, in which groups A, B and O have almost identical frequencies in the population. Conversely, in Latin America, group O is very strongly present, up to 70% in Peru or in certain regions of Brazil, while group B is very weakly present (Le et al., 2021).

CONCLUSION:

Regarding hematological parameters, we noted a significant decrease in hemoglobin level, a reduction in the number of red blood cells and a drop in the number of platelets. These abnormalities may be associated with metabolic dysfunctions and inflammatory phenomena linked to viral infection. It is important to emphasize that our study has certain limitations, notably the limited sample size and the specificity of the population studied. Additional studies, including larger and more diverse populations, are needed to confirm and deepen our results. This could contribute to a better understanding of the immunological and hematological mechanisms of COVID 19, which could be useful in the development of more effective prevention and treatment strategies.

Dr. Samadi Assad Allah, Kabul University discussed Bovine Tuberculosis in Afghanistan.



Professor Ahmed Youssef Gad, Professor and Head of chest diseases, Alexendria University, Egypt.

He discussed Tb in Egypt using recent techniques in its diagnosis. 1895 (Roentgen) Discovery of X-rays for early diagnosis of pulmonary disease. Direct sunlight kills the bacilli in 5 minutes. Bacilli may survive in dark for 5 months. In sputum, bacilli resist even 5% phenol for several hours, but 1% sodium hypochlorate liquefies the sputum and kills tuberculous bacilli rapidly. Tuberculous bacilli are destroyed by heat of 60oC at 20 minutes and 70oC at 5 minutes. Human source: Via sputum and other excreta through air-borne droplet infection. Mother to fetus: congenital TB, Animal source: Via milk.

Once inhaled by a tuberculin free person, the bacilli multiply 4 -6 weeks and spreads throughout the body. The bacilli implant in areas of high partial pressure of oxygen: lung, renal cortex, reticuloendothelial system

The hallmark of active TB infection is tubercle:

The predominant cells are non- lymphoid mononuclear cells. Epithelioid cells.

Langhan's giant cells. Central necrosis.

Types of TB reaction:

Proliferative: usually occur in primary form.

Exudative: usually occurs in the secondary TB.

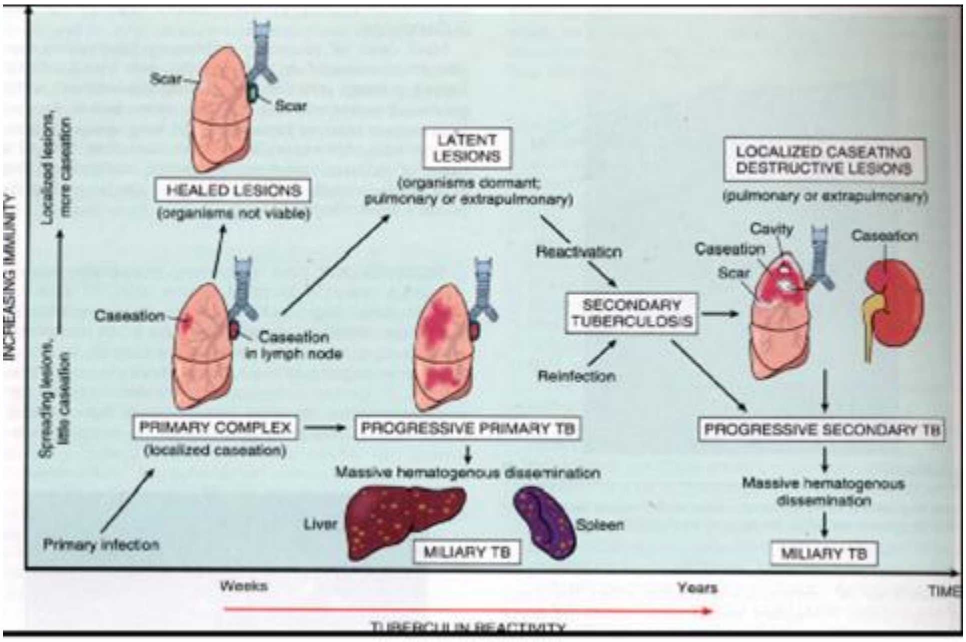
Combined: exudative and proliferative is more common than either.

Pulmonary TB may be either:

Primary TB (childhood TB), Secondary or reinfection or postprimary (adulthood TB).

- 6 million people die every year due to HIV/AIDS, TB and malaria; of those, nearly **2 million** deaths are due to TB
- TB is curable but kills **5000** people, every day
- **98%** of TB deaths are in the developing world affecting mostly young adults in their most productive years

- **2 billion people**, equal to a third of the world's total population, are infected with the TB bacilli
- **1 in 10 people** infected with the TB bacilli will become sick with active TB
- TB is contagious and **spreads through the air** like the common cold; each person with active TB infects on average 10 to 15 people every year

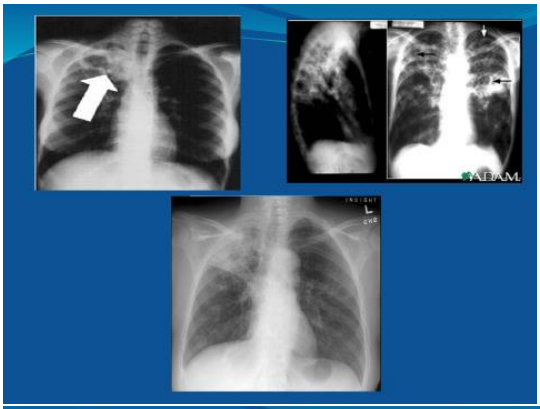


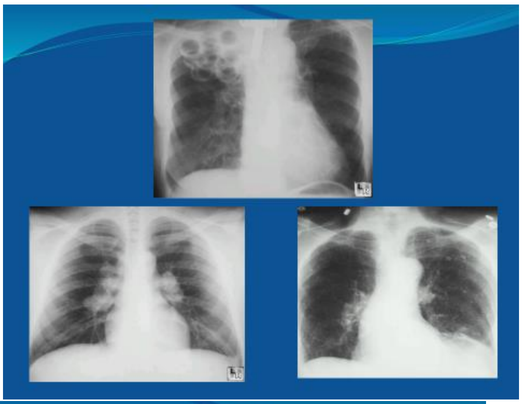
Tuberculosis Pathogenesis

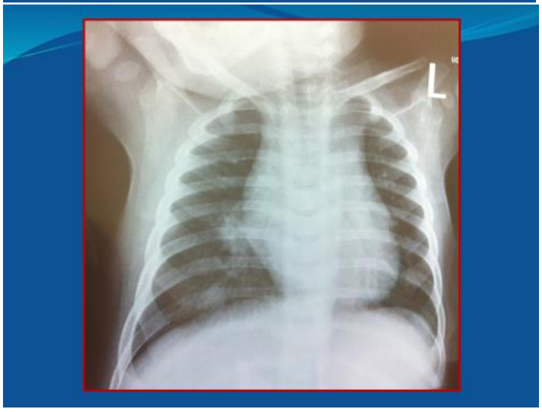
What is the gold standard method for diagnosis of TB??

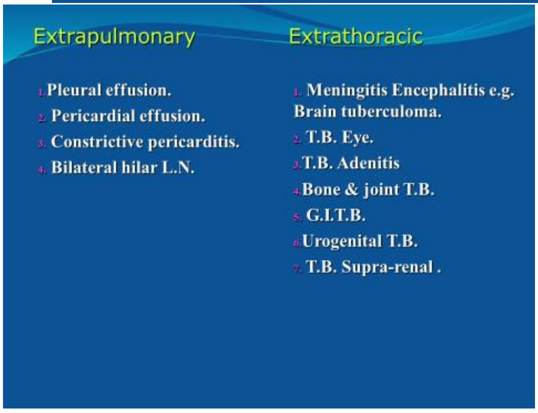
1- positive PPD skin test
2- cavitary lesion in CXR
3- positive sputum culture for TB bacilli

Is it TB or not? Active or Latent TB infection? M. Tuberculosis complex or others? Resistant or not? Monodrug resistant or MDR-TB or XDR TB?









He also discussed the different methods of diagnosis and different treatment regimes.

Marouane Ghannouchi, National School of Veterinary Medicine Sidi Thabet –Tunisia talked about Mycobacterium in fish: zoonotic potential:

Mycobacteria are widely distributed in nature, in human food (e.g., milk and butter), and in animal feeds. Most mycobacteria are saprophytic, but some species are highly pathogenic and cause diseases such as tuberculosis and leprosy in humans, and similar diseases in mammals, birds, reptiles, amphibians, and fishes. Mycobacteria that cause diseases of fishes differ considerably from those that cause diseases in humans and other mammals. Therefore, to avoid association between tuberculosis in mammals and mycobacterial infections in fishes, it is better to call the disease mycobacteriosis of fishes. Fish mycobacteriosis, also known as "piscine tuberculosis" is usually a chronic progressive disease caused by several species of the genus Mycobacterium (Jacobs et al., 2009. It is caused by an ubiquitous acid-fast-bacilli. The main species affecting fish

are Mycobacterium marinum, M. fortuitum and M. chelonae which can be classified into
1) slow grower mycobacteria such as M. marinum and
2) rapid grower mycobacteria such as M. fortuitum and M. chelonae (Novotny et al., 2004; Hashish et al., 2018).
Mycobacterium marinum is the most important fish pathogen, representing a significant threat to sea bass culture in the Mediterranean (Toranzo et al., 2005).

Agenda

- Introduction to Mycobacteria
- Definition
- Importance
- Strategic field
- Types of Mycobacteria
- Mycobacteriosis in Fish
- Zoonotic risk
- Mycobacteria in Aquatic Environments
- genomic diversity
- Fish as Vectors of Mycobacteria
- Routes of Zoonotic Transmission
- Signs and Symptoms of Fish Mycobacteriosis in Humans
- Diagnosis of Fish Mycobacteriosis in Humans
- Treatment for Fish Mycobacteriosis in Humans
- Preventive Measures Against Zoonotic Transmission
- Effectiveness of Preventive Measures
- Impact of Zoonotic Mycobacteriosis
- Current Research on Fish Mycobacteriosis
- Future Directions in Research
- Challenges in Zoonotic Mycobacteriosis Research
- Concluding Remarks on Zoonotic Mycobacteriosis

Introduction to Mycobacteria

1. Mycobacteria are a group of bacteria that can cause diseases in humans and animals.
2. Zoonotic transmission of mycobacteria from fish to humans is possible, especially for weakened immune systems.
3. Fish can be carriers of mycobacteria and can transmit the infection to humans when consumed.

Mycobacterium marinum causing skin ulcers with dark-red borders and base crater with yellowish exudate
abscesses on the right forearm extending up to the elbow, with lymphangitic spread

Importance

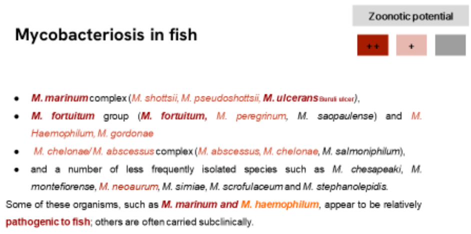
1.Public health issue
All Mycobacterium spp. infecting fish are also able to infect humans, resulting in local granulomatous inflammation usually at the extremities such as hands and fingers (Jacobs et al., 2009; Aubry et al., 2017).

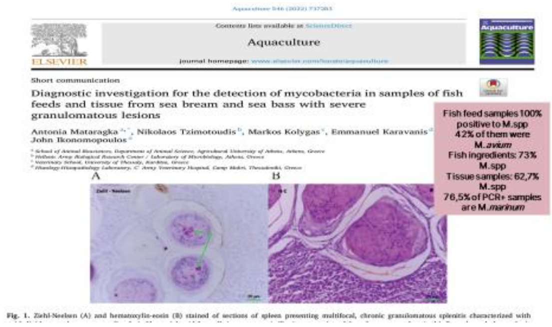
2.Animal health issue
Mortality can go from10 to 100 p100
151 sea species of fish, shellfish, turtles, mammals, molluscs....
Biodiversity health threat . aquaculture and capture

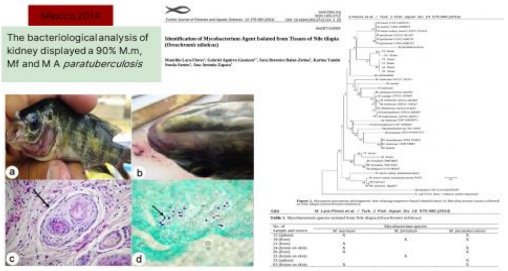
3. Economic and ecological issues

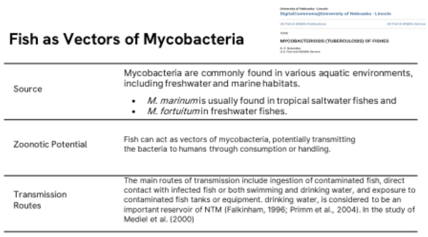
Strategic field

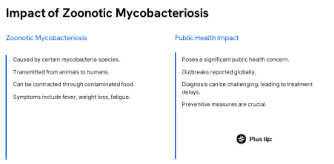
Key Figures
- Fisheries and Aquaculture in Tunisia are still considered an economically strategic sector representing a significant food resource with a production of 148.135 Tonnes in 2021.
- In 2022, exports of fishery and aquaculture products reached the record figures of 38.447 tonnes and 871 million TND (264 million €) with 62 destinations.

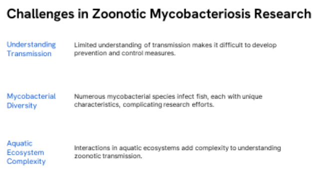


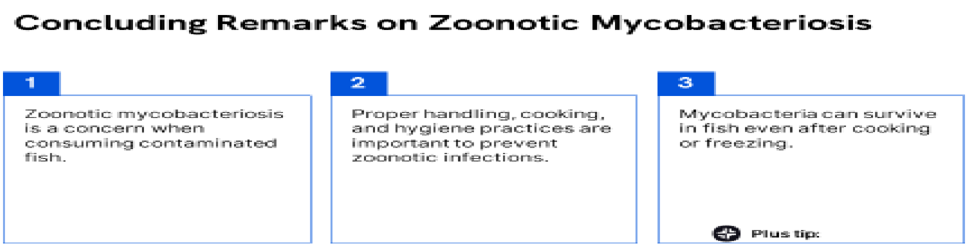






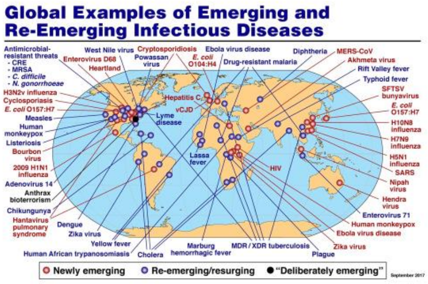






Saied Jaradat, PhD, from Jordan University of Science and Technology, Jordan. He presented his lecture with emphasis on "Insights from the Covid-19 Pandemic"

The genomic capacity of Jordan Global emerging and re-emerging infectious diseases. From SARS-CoV-2 genome sequence to vaccine developments.



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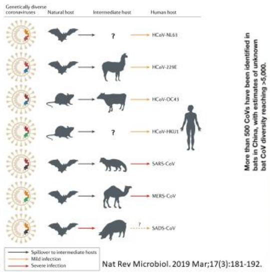
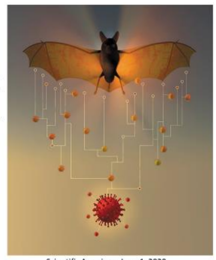
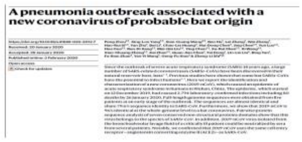


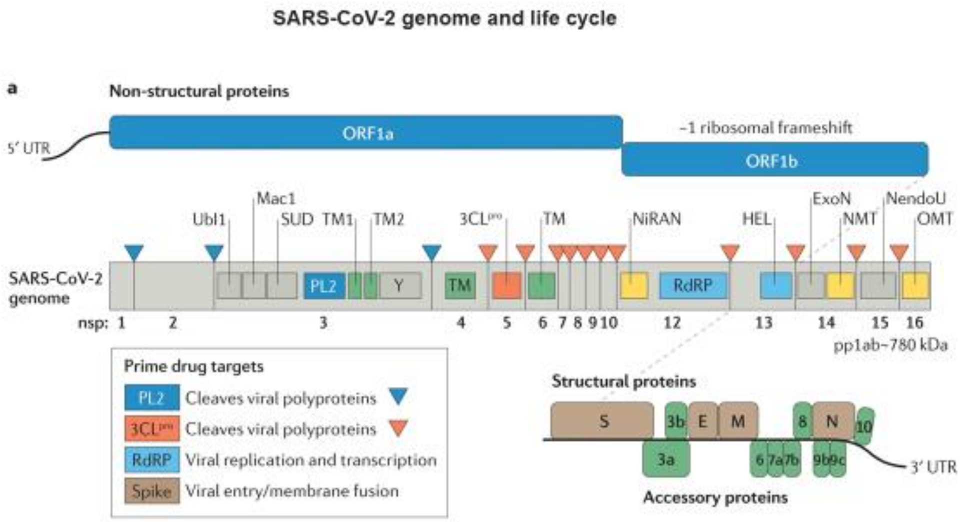
Nat Rev Microbiol. 2019 Mar;17(3):181-192.



Scientific American: June 1, 2020

Nat Rev Microbiol. 2021 Mar;19(3):141-154.



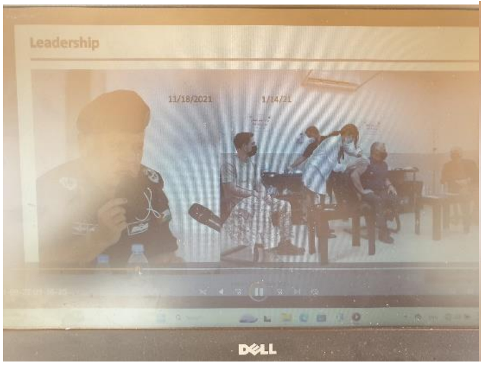


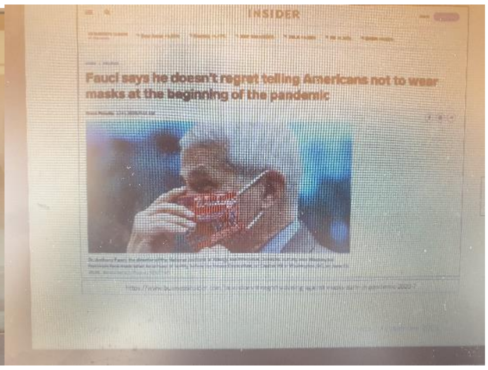
Nat Rev Microbiol. 2021 Nov;19(11):685-700

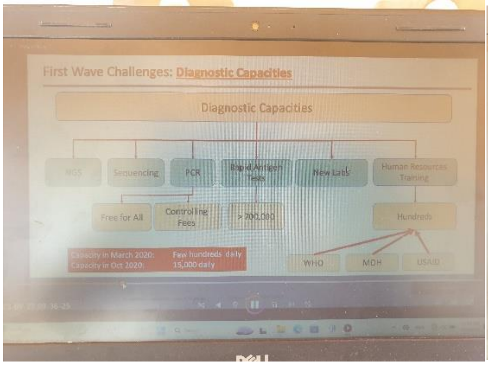
Dr. Saed explained the biotechnology approach to sequence viruses and provide accurate diagnosis and relate viruses with each other. His presentation was about his efforts provided to the public during Civid-19 outbreak.

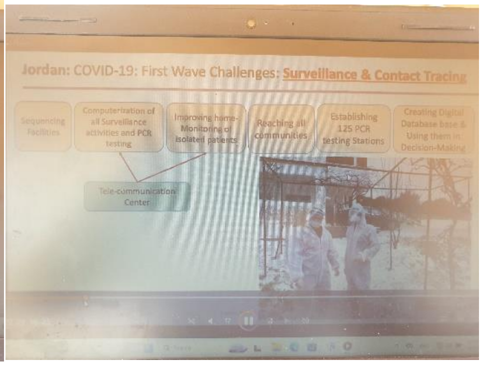
The next speaker was Prof. Wail hayajneh, Professor , Pediatric Infectious Disease .Saint Louis University School of Medicine SSM Health Cardinal Gelnnon Children's Hospital ,Missouri, USA. His presentation was about Early response to COVID-19, the story for Jordan

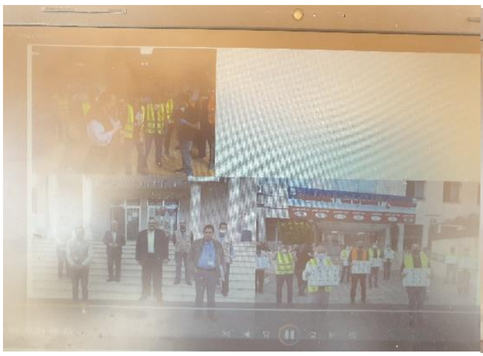
Dr. Hayajneh gave an on line presentation. He described the sequence of event for Covid-19 epidemics in Jordan as he was the person in charge in Jordan during the crisis. He described the development of active surveillance and capacities in the laboratories for diagnosis. He also compared the health measures used in Jordan with the regional and international countries of similar population and capacities. Below are some of his slides where he showed that Jordan gave covid-19 highest priority starting from the king down to every health person. In the below slides, he showed his majesty the king, and his members of the family receiving the Covid-19 vaccine to encourage people to take the vaccine.

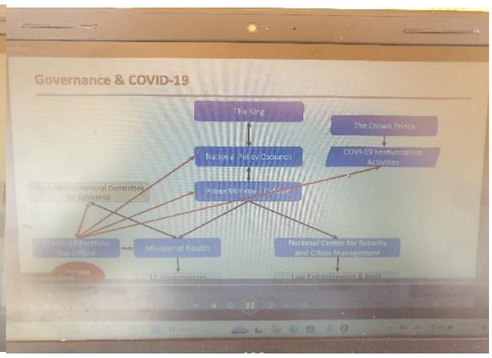


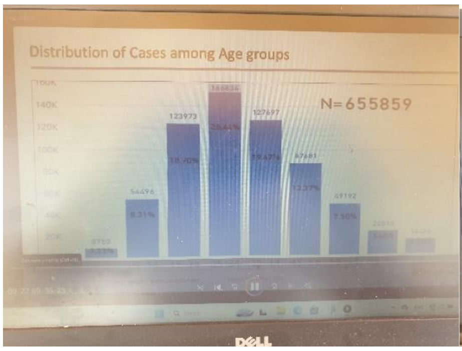


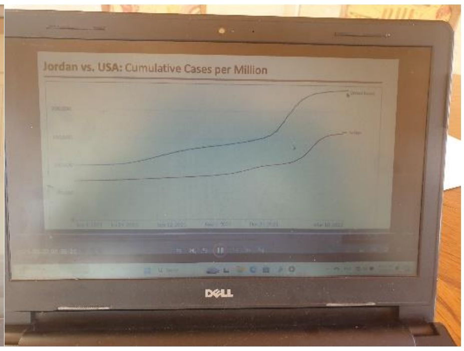


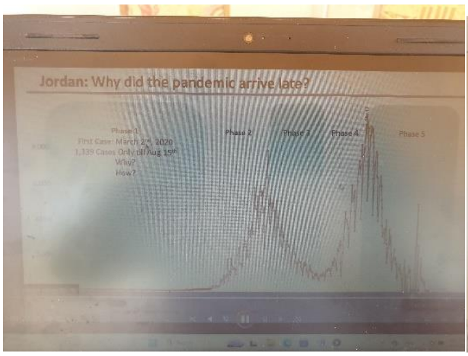


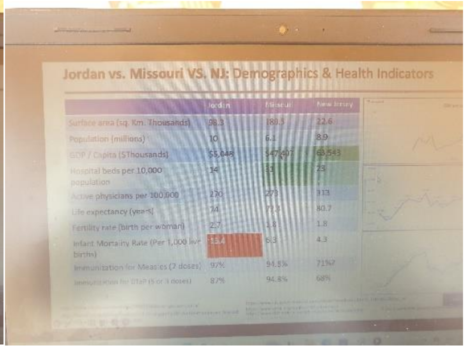




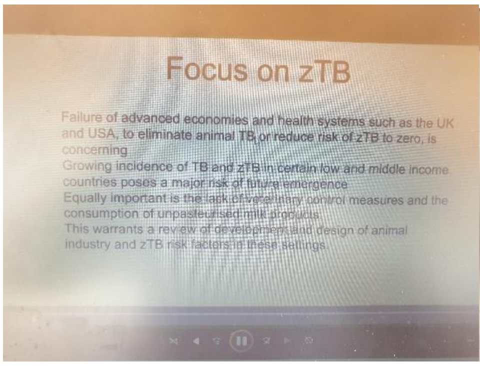


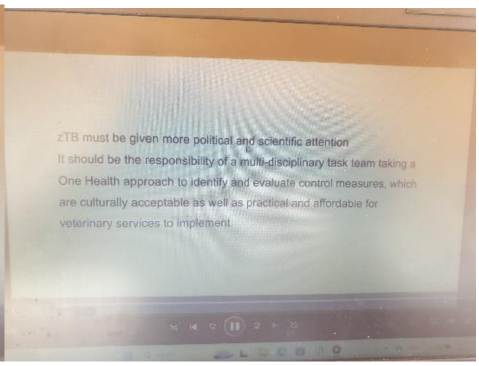


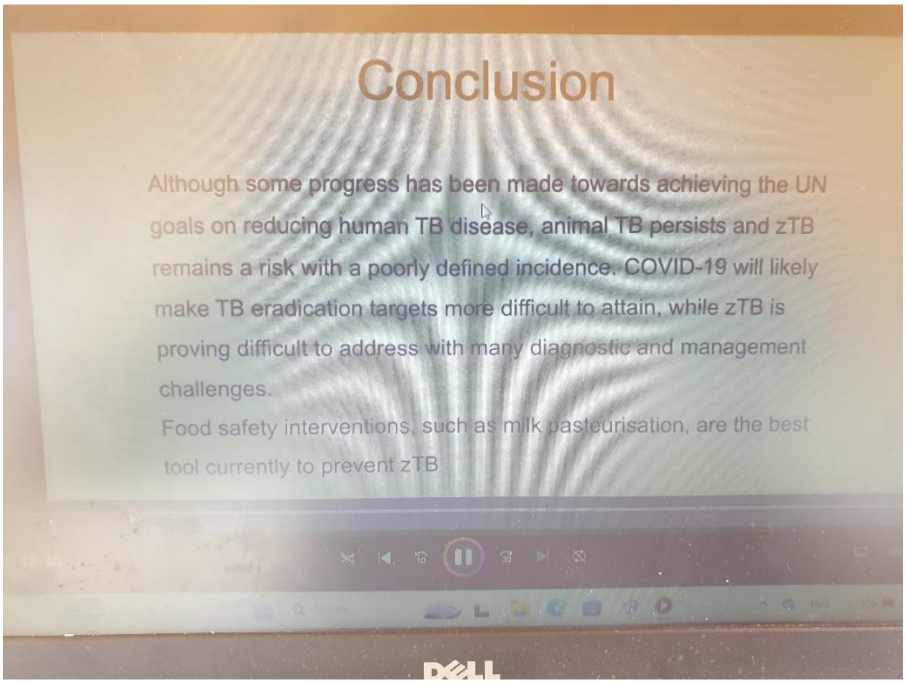




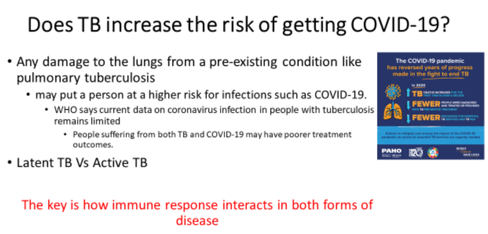
Dr. Irfan Khatak, Pakistan gave a talk about Zoonotic tuberculosis an overview. **Dr Irfan** gave an overview of Mycobacterium zoonotic (ZTB) form which is transmitted from cattle to human. He also talked about the burden of this disease and its reverse zoonotic process. He also discussed the clinical and laboratory diagnosis in regard to sensitivity and specificity tests used as well as test and kill approach. In addition he talked about vaccination of wild life and trade of the animals, and discussed the test for differentiation between naturally infected and vaccinated animals. Emphasis was given on eradication of ZTB.



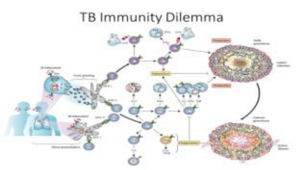


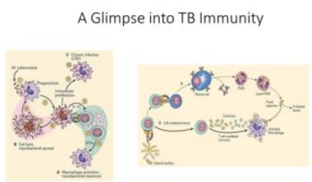


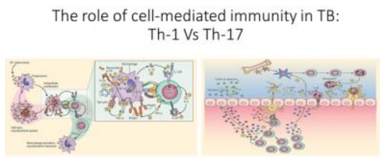
Prof. Mohammed khalifeh- JUST gave a presentation about "How is Tuberculosis connected to COVID 19:

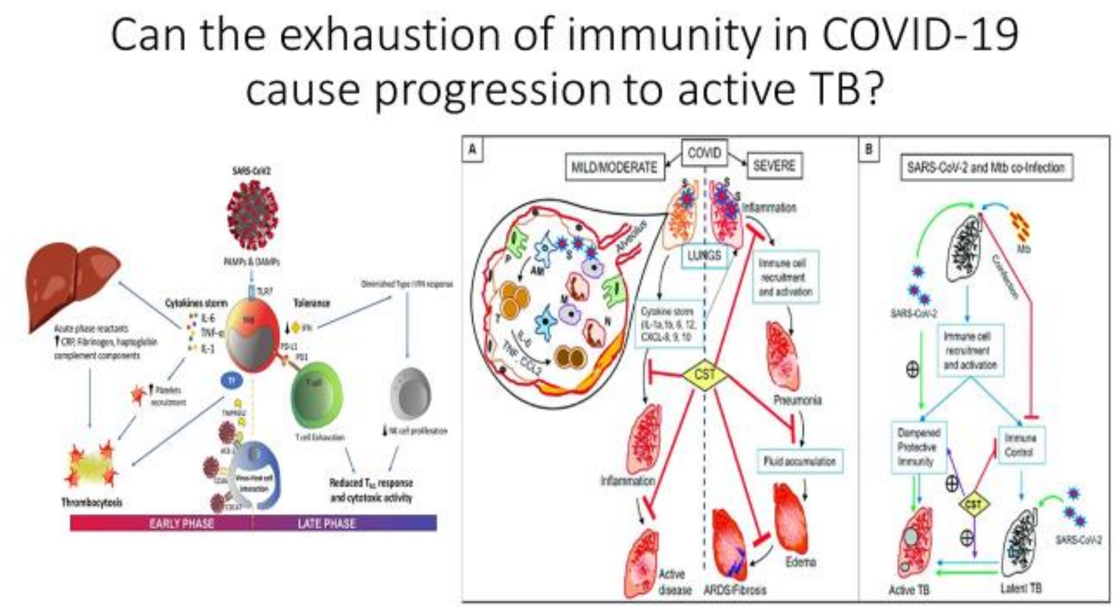


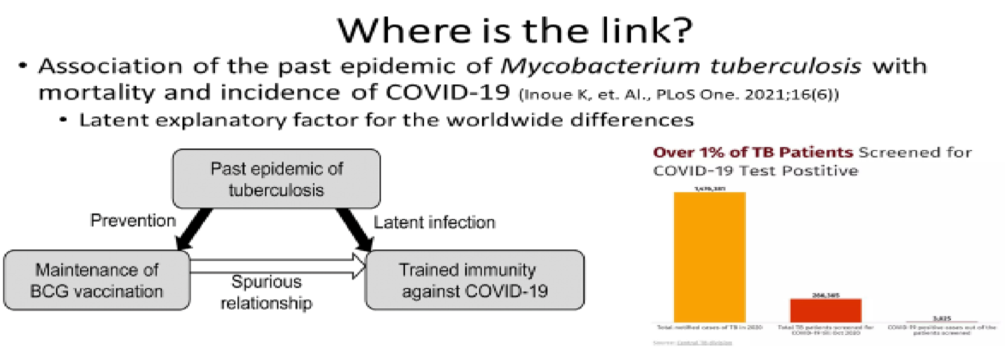
Both diseases primarily attack the lungs, people ill with TB and coronavirus infection show similar symptoms – Cough, Fever, difficulty breathing. Both biological agents spread mainly via close contact. The incubation period from exposure to disease in tuberculosis is longer, often with a slow onset.











Can a TB infection help to combat COVID-19?

Antigenic sites in SARS-CoV-2 spike RBD show molecular similarity with pathogenic antigenic determinants of many bacteria (Dakal TC, Immunobiology. 2021;226).S even of nine tested sites showed molecular similarity with 54 antigenic determinants found in twelve pathogenic bacterial species. Antigens from Mycobacterium with similarity to COVID -19 are involved in modulating host cell immune response and ensuring the persistence and survival of pathogens in host cells. Moreover, Tuberculosis infection protects mice from developing COVID-19 (Oscar RM, et al., 2022: PLOS Pathogens 18(3)) Individuals previously immunized/vaccinated or had a previous history of malaria, or tuberculosis are expected to display a considerable degree of resistance against SARS-CoV-2 infection. (Eggenhuizen PJ, et. a.l., Front Immunol. 2021;12). BCG Vaccine Derived Peptides Induce SARS-CoV-2 T Cell Cross-Reactivity. Human CD4+ and CD8+ T cells primed with a BCG-derived peptide developed enhanced reactivity to its corresponding homologous SARS-CoV-2-derived peptide. Data indicate BCG vaccination induces a specific immunity against SARS CoV-2 viral envelop protein essential for infectivity. (Nuovo G, Ann Diagn Pathol. 2020;48)

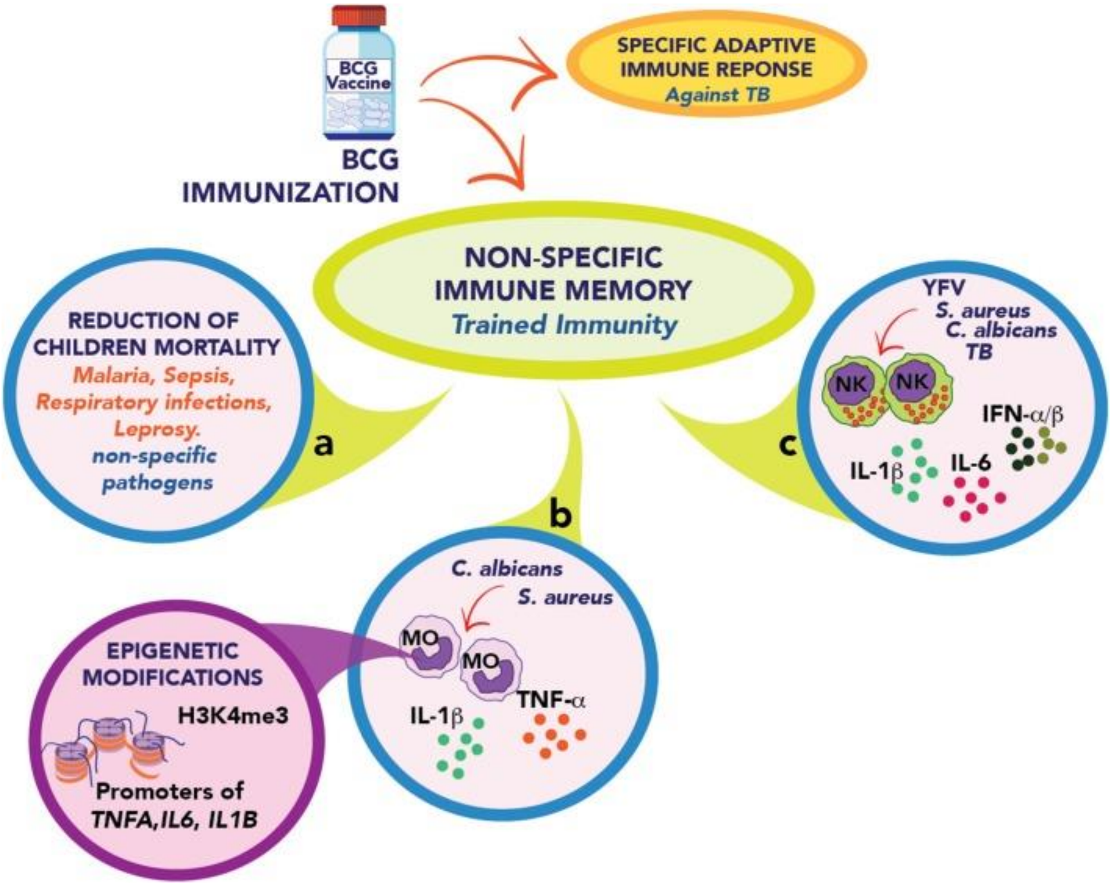
Connecting the dots:

Why some countries got hit hard by COVID-19?

I got exposed to COVID-19 but did not get ill!

I knew people that were very healthy and they got severely ill or died from COVID-19!

Immunity training

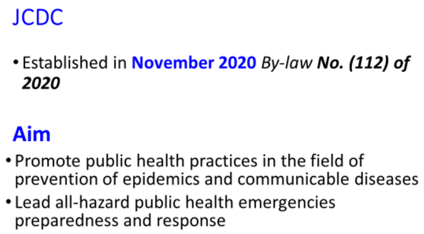


Does TB increase the risk of getting COVID-19? Yes in active format of the disease

No or maybe helpful in latent or vaccinated individuals

Immune individuals are the winners.

The next speaker was De Sami Sheike, CDC Jordan



Data integrity for policy formulation and for evidence-based recommendations

Gathering (multi-sectorial) data, ensuring its accuracy and completeness and perform advanced analysis. Building Data Repository at a national level from all sectors , Literature review, Situation analysis, Stakeholder analysis, Extract conclusions, Provide Evidence Based Recommendations.

Coordination with the concerned sectors:

Activities related to communicable diseases that have potential to turn into an epidemic, Activities related to development and update of NATIONAL plans according to epidemiological situation, Activities for linking epi and lab surveillance data, Activities related to zoonotic diseases under one health approach.

Respond

Leading the implementation procedures for epidemics of high impact on society

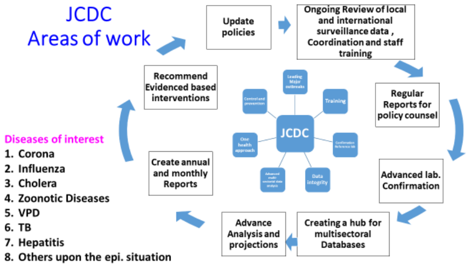
Cooperation

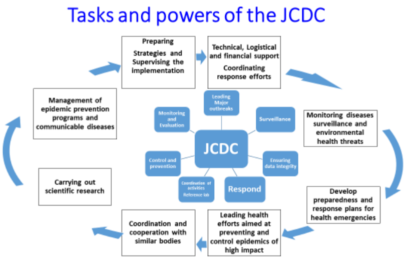
Cooperation with local, regional and international bodies, sharing Information

Cooperate with international reference laboratories, Building national laboratory network

Monitoring and Evaluation

Evaluating the measures and interventions taken to control epidemics (Post Action Review), Determine the impact of the epidemic on public health and community, Evaluating public health programs impacts.





JCDC was established during the pandemic as a result of need for a national body which have the ability to coordinate public health activities

Although of a short period a huge work was done

In this presentation will focus on activities related to COVID-19

Ongoing monitoring of the epi-situation on local, regional and global level

Ongoing projection for two weeks ahead from the data provided from MOH and other sectors

Implement studies:

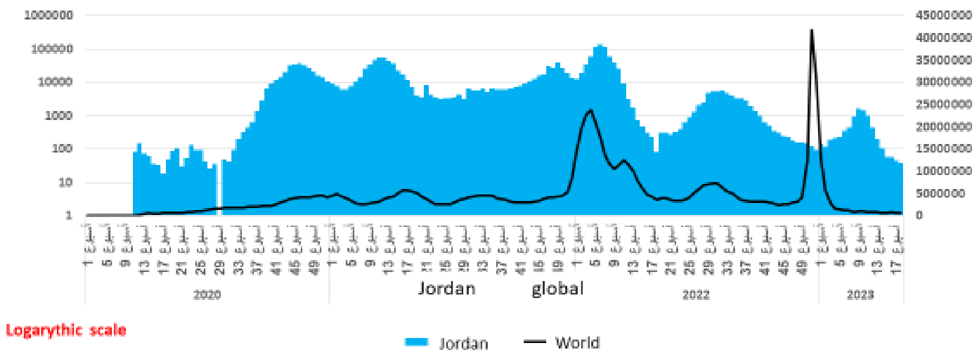
Rapid assessment for (5480) Omicron cases, Jordan, 5/October/2021 – 26/1/2022

Evaluation of the disease occurrence and severity associated with the variants of interest of SARS-CoV-2 in Jordan, February 23rd to 5th of March

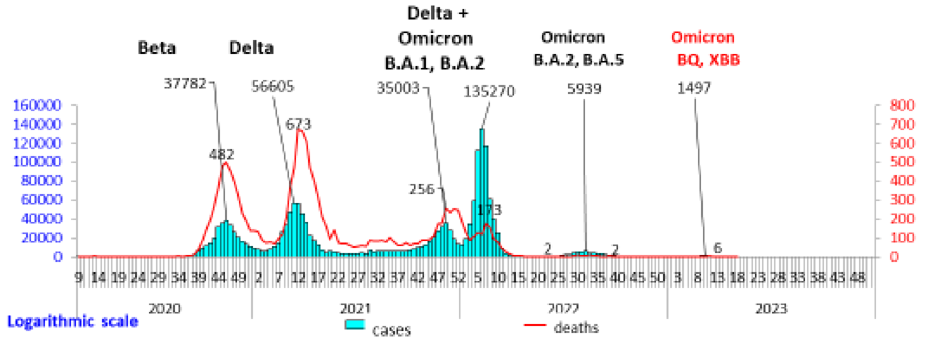
Rapid assessment for (1775) deaths due to COVID-19, Jordan, Mortality report, COVID-19, 30 Nov. 2021 – 8 Feb. 2022

Globally 6 waves

On a log. Scale it clear that there were increase as other 2 waves
The local waves were several weeks later than the global pattern,



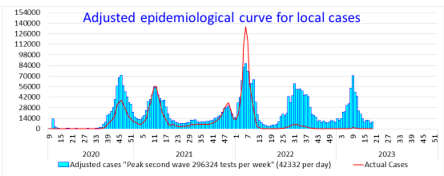
Fourth wave the highest spread , peak of reported cases 135,270 cases, but the deaths were 173 deaths, this wave was attributed to **Omicron B.A.1, B.A.2** strain.
Second wave most severe peak of reported cases 65505 cases, but the deaths were 673 attributed to the Delta variant,



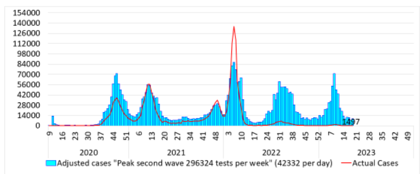
Discrepancy in number of cases attributed to the surveillance mechanism and the number of specimens;

selection bias

Number of tested specimens in each wave were adjusted as the number of tests in the **peak in the second wave** "**296324** per week" **A module** was created to calculate the number of cases if number of tests were fixed as in the peak of the second wave



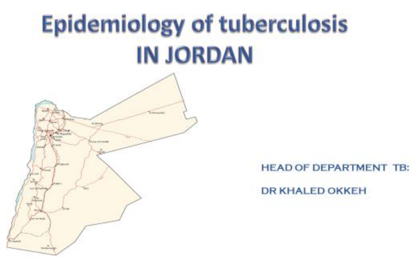
Magnitude of the waves after adjustment was clearly **changed**,
5th and 6th waves which were relatively small, appear clearly
The largest wave is the fourth wave and the undeclared 6th wave is the second as magnitude



Conclusion

- From the recent data analysis we recognize that
  - COVID-19 circulate all the time
  - The positivity in the sever cases that need hospitalization is much less than the mild cases

The next speaker was Dr. Khaled Okkeh, head department of TB, Ministry of Health.



National TB Program NTP in Jordan

The NTP in Jordan has been established to operate in 1973.

The NTP is a vertical program, partially integrated into general health services, and recently it was restructured to be within the Directorate of Epidemiology Administration As a serious communicable disease, that must be on the list of priorities. The Jordanian NTP is the sole body to provide TB care services throughout the country in 14 Chest Diseases Centers with one center in each governorate in addition to the newly established 2 centers in Sahab and Deir Ala in 2021.

Objectives of NTP in Jordan

1. To enhance stewardship, political commitment and funding for TB elimination
2. To provide access to TB prevention and care for all non-Jordanian nationals
3. To screen 90% of selected TB high-risk groups and provide treatment
4. To ensure that 90% of TB cases are notified and 95% of them are treated successfully

Strategic plane of National TB programme in Jordan

To achieve that goals; Jordan adopt accelerating strategy includes:

1. Active TB case finding between high risk groups of populations :

A. Contacts of smear positive cases.
B. PPD positive children.
C. Immune compromised people including HIV, drug users, cancer, autoimmune disease, DM, Brucellosis, and people under biological treatment.
D. Prisoners, factory workers, miner's workers, immigrants, and refugees camps, and Rehabilitation centers.

Strategic plane of National TB programme in Jordan (cont..)

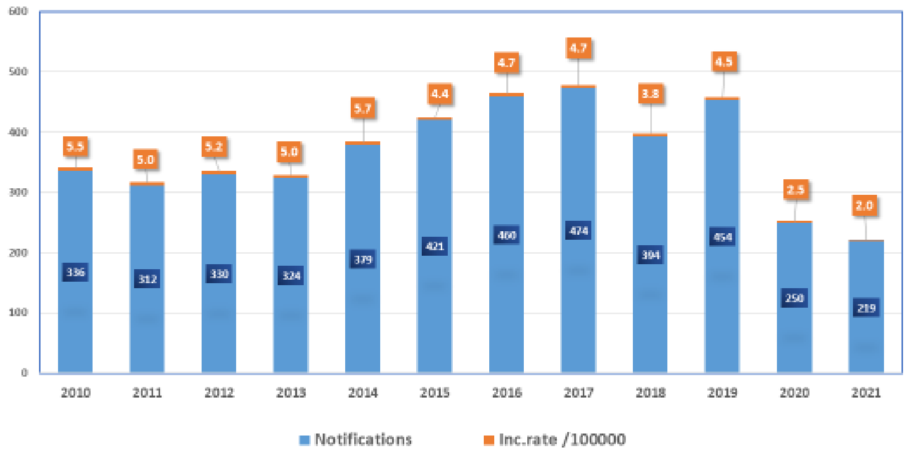
2. Encourage population complaining of productive cough for more than 2 weeks and other symptoms to access to TB centers, by conducting a national awareness campaign through mass media demonstrating places and phone numbers of these centers.

3.Cooperation and integration of all health institutes (Governmental & Nongovernmental) in Jordan in Diagnosis and management of TB cases according to National TB Program Guidelines (NTP) and (WHO).

4. Management of all detected cases and infected contacts is Free of charge.

5. TB medications are Available only in TB Centers to be assured not to misuse.

TB Notifications, Incidence Rate through 2010 - 2021



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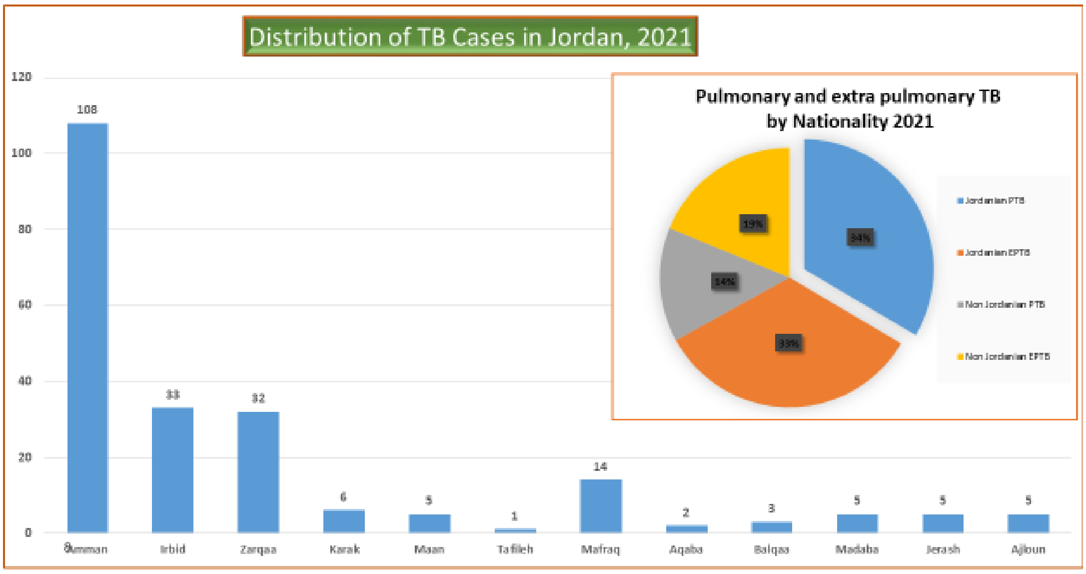


No of Syrian residents and refugees and Tuberculosis cases
Among them during the period from 2010 till end 2018

Year	Syrians attendants	TB cases	MDR
2010	1012	2	0
2011	1906	7	0
2012	3014	20	4
2013	3957	77	0
2014	9169	67	0
2015	195991	55	0
2016	67918	61	0
2017	13385	75	0
2018	9700	62	0
2019	9735	35	0
Total	306087	461	4

Burin Jordanden of TB

The population in Jordan was 11 057 000 people at the end of 2021, (53% male), with 1215 inhabitants per Km2 and 90.3% living in urban areas; 74.8% of the population is concentrated in the three main cities of Amman, Irbid, and Zarqa.

2020 WHO estimated incidence rate of TB was 4.7 cases per 100000 population and the estimated mortality rate of TB was 0.09 deaths per 100000 population.

Multidrug/rifampicin-resistant (MDR/RR) TB incidence is considered very low, with only 1 case reported by NTP in 2020 and 2 cases in 2021.
Jordan is considered a low TB incidence country at both global and regional levels.

Goal of NTP in Jordan

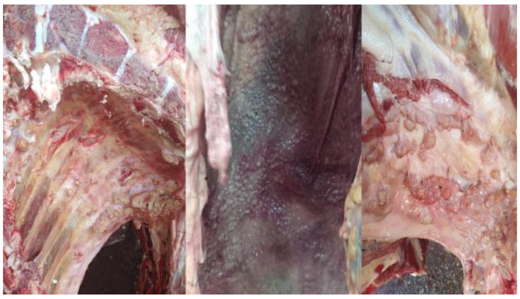
The main goal of NTP is to eliminate TB in Jordan by the end of 2027 through two objectives:

1. To reduce the TB incidence to less than 2.4 cases per 100 000 population per year
2. to reduce the TB mortality to less than 0.02 deaths per 100 000 population per year

Epidemiological situation of MDR TB in Jordan (2018-2022)

NON JORDANIAN	JORDANIAN	MDR CASES
1	0	2018
2	1	2019
1	0	2020
1	2	2021
3	2	2022

The next speaker is Dr. Shadi Al-othman, Amman abbtoires



In the belwo pictures, we show the Director of respiratory section in the Ministry of Health, egypt (left) with Dr. Nabil hailat (right) hand in the certificates for the participants as sign of appreciation and contribution.