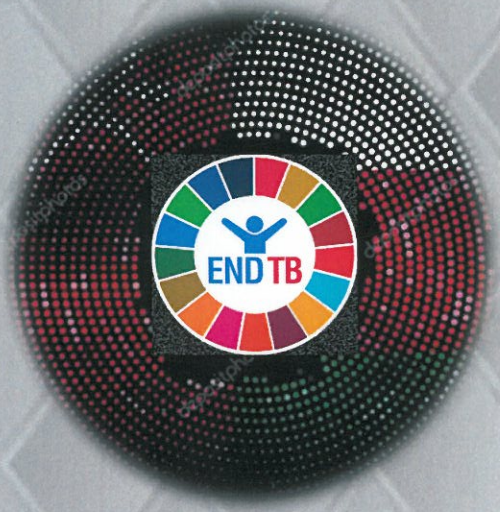

Ministry of Health
Sultanate of Oman

National Strategic Plan (NSP) for TB Elimination

2021-2025

Directorate General for Disease Surveillance and Control

Ministry of Health
Sultanate of Oman

National Strategic Plan (NSP) for TB Elimination

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Directorate General for Disease Surveillance and Control

Reader Information

Policy	This is the official policy document of **Ministry of Health, Sultanate of Oman**
Document Purpose	For information and action of all partners of the Communicable Disease Surveillance and Control
Title	**National Strategy for Elimination of Tuberculosis in Oman**
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Authors	Task force member of National Strategy Plan, Director General for Disease Surveillance and Control, Muscat, Oman
Reviewers	Experts from the NSP committee, Ministry of Health
Target Audience	All the Health Institutions in Oman who are directly or indirectly involved in health care & all other stakeholders
Description	The document outlines the tuberculosis elimination strategy for the **Ministry of Health, Sultanate of Oman** and would complement the Tuberculosis Diseases Surveillance Guidelines. The document is based on the recommendations of the Global Strategic Plan for Tuberculosis Elimination
Cross References	Key documents namely Global TB report 2019, The end TB strategy and WHO's document on "Towards tuberculosis elimination: an action framework for low-incidence countries"

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Abbreviation

AIIR	**Airborne Infection Isolation Room**
BCG	**Bacillus Calmette-Guérin**
CDOT	**Community Directly Observed Treatment**
CFR	**Case Fatality Rate**
CPHL	**Central Public Health Laboratory**
CXR	**Chest x ray**
DM	**Diabetes mellitus**
DOT	**Directly Observed Treatment**
GCC	**Gulf Cooperation Council**
HIV	**Human immunodeficiency virus**
INH	**Isoniazid**
LTB	**Latent tuberculosis**
LTBI	**Latent tuberculosis infection**
MOH	**Ministry of Health**
NSP	**National Strategic Plan**
NTCP	**National Tuberculosis Control Program**
PLHIV	**People living with HIV**
TB	**Tuberculosis**
WGS	**Whole Genome Sequencing**
WHO	**World Health Organization**

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Executive Summary

This strategic framework offers a coherent approach for eliminating tuberculosis (TB) in Oman which is a low-incidence country. It is designed to guide those responsible for technical aspects of the national TB response in accelerating efforts towards elimination. The document will also be informative for public health surveillance officers, practitioners and nongovernmental and civil society partners working on national TB care and prevention.

The World Health Assembly approved WHO's post-2015 global TB strategy in May 2014. The long-term vision of the strategy is a world free of TB and the strategic goal is to end the global TB epidemic by 2035, defined as a global incidence of fewer than 100 cases per million population. This will require a 95% reduction in the number of deaths due to TB and a 90% reduction in the incidence of TB.

Oman's TB elimination strategy emphasizes collaboration and national adaptation based on the nature of the local epidemic and health system context. It provides an adaptation of global strategy for low-incidence countries – those which have already reached a TB incidence of less than 100 per million. In order to progress further towards "pre-elimination" of TB (defined as <10 TB cases per million), and elimination of TB as a public health problem (<1 TB case per million) the current low-incidence countries need to introduce new innovative tools in order to further reduce the incidence annually.

This document makes reference to existing guidelines and policy documents, challenges, achievements and activities planned for future towards the goal by 2025. Rapid progression towards pre-elimination and elimination will require accelerated annual decreases in TB incidence with intensified efforts at the governorate level. The response must be multisectoral. Further progress towards elimination will require better access to high-quality diagnosis and care and more effective TB prevention, including addressing the social determinants of TB with special attention to groups at the highest risk for TB. However, if we continue to do what we have been doing, we will not reach our goals on time; therefore this strategy is addressing a new approach towards combating TB which focuses on the use of molecular tests for rapid diagnosis, prevention by tackling high risk group e.g. migrants, and standardizing and scaling up the private engagement for TB elimination while maintaining adequate and quality assured treatment based on a patient-centred approach.

Background

Introduction

TB is an infectious disease caused by ***Mycobacterium tuberculosis.*** It is an age old disease that has unnerved numerous challenges in the prevention, control and elimination for the policy makers around the world.

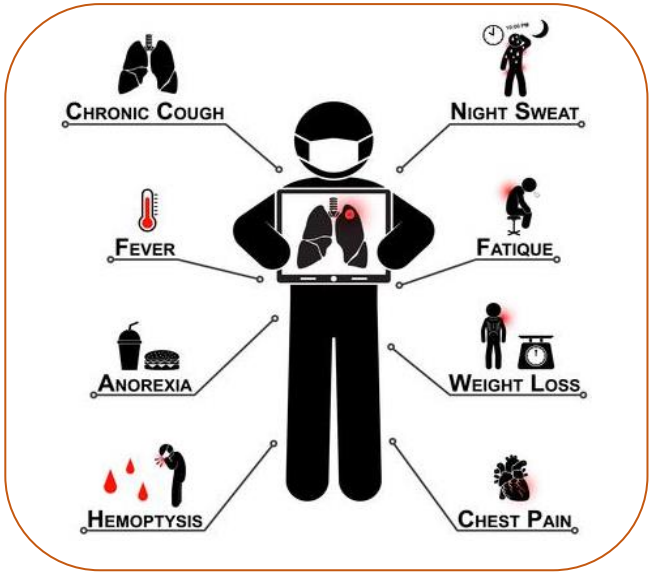
The World Health Assembly approved WHO's post-2015 global TB strategy in May 2014. The long term vision of the strategy is a world free of TB and the strategic goal is to end the global TB epidemic by 2035.

With timely diagnosis and treatment with anti-tubercular drugs, most people who develop TB can be cured and onward transmission of infection curtailed. The global elimination target, i.e. incidence of <100 cases per million population will require a 95% reduction in the number of deaths due to TB and a 90% reduction in the incidence of TB.

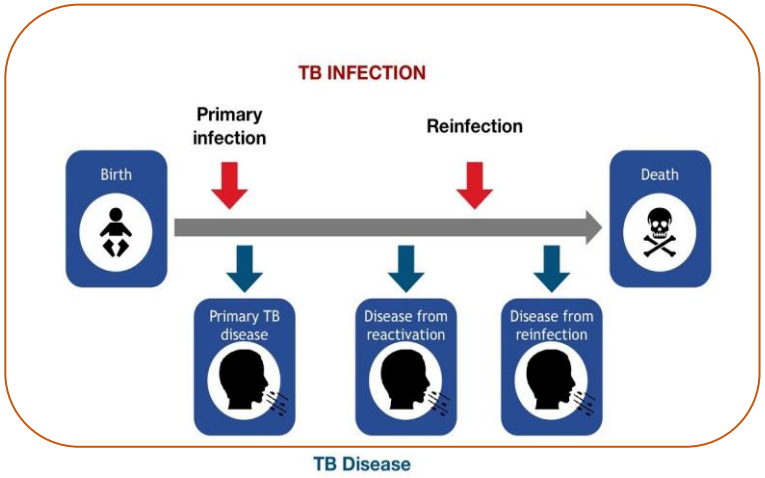
Low-incidence countries like Oman need to achieve incidence of <10 TB case per million as a target in 2035 and <1 TB case per million population in 2050 to achieve elimination of TB as a public health problem.

This **strategic plan** outlines the key pillars and the plan to implement the various topics related to the diagnosis, treatment and preventive aspects of TB elimination in Oman.

TB symptoms



TB Disease Course



Global strategy for elimination of TB

Globally, several countries have adopted TB elimination as a national goal, and many were able to achieve notable progress in the past decades

'The End TB Strategy' was launched with the vision of ***'a world free of tuberculosis – zero deaths, disease and suffering due to tuberculosis'***

Nearly 54 million lives have been saved worldwide and there was a 33% drop in deaths due to TB between 2000 and 2017

TB, however, remains a major public health problem around the world especially in the Asian and African subcontinent

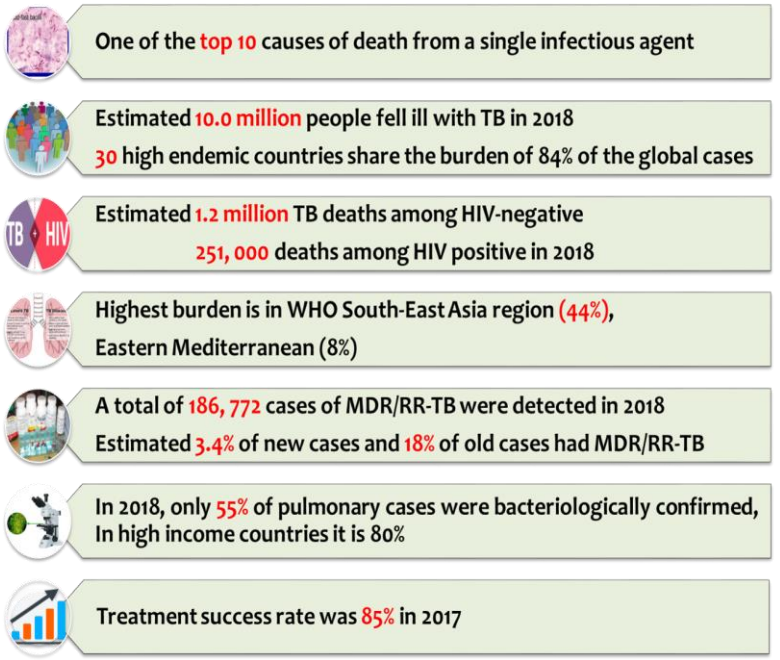
The four principals of the global strategy are

1. Government stewardship and accountability with monitoring and evaluation
2. Strong coalition with civil society organizations and communities
3. Protection and promotion of human rights, ethics and equity
4. Adaptation of the strategy and targets at country level with global collaboration

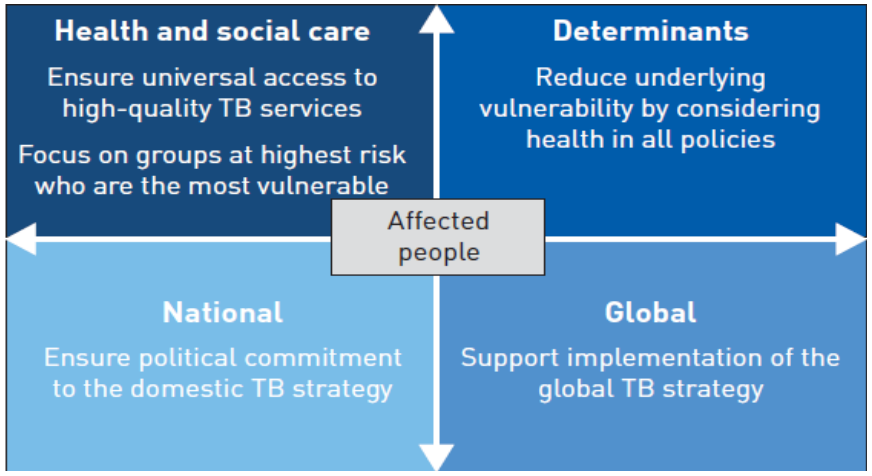
Pillars and components of global strategy are

- Integrated, patient-centred care and prevention
- Bold policies and supportive systems
- Intensified research and innovation

Global tuberculosis facts



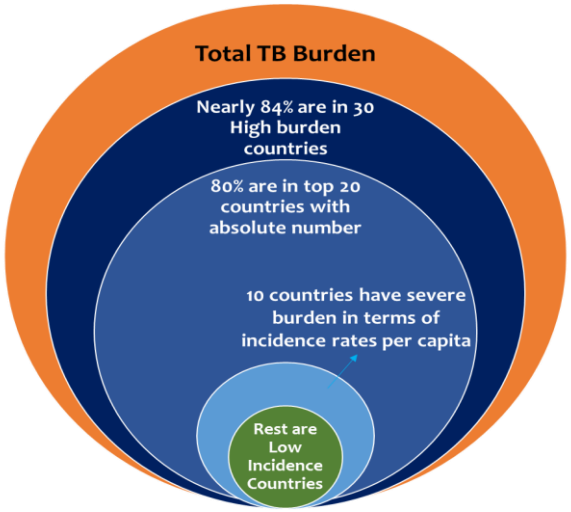
Four dimensions of TB elimination in low-incidence countries



Global situation of TB

High Burden Countries

High burden countries are those with most cases of TB in the world.



Low-incidence Countries

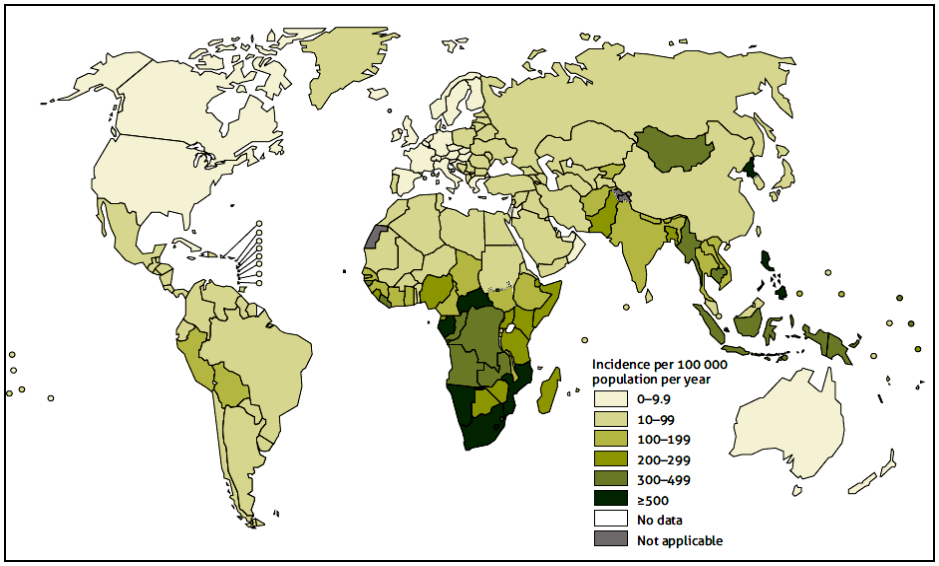
Low-incidence countries are defined as those with a TB incidence rate of ‹100 TB cases (all forms) per million population per year.

Out of the nearly 31 low-incidence countries, with the exception of a few very small countries, none are approaching TB elimination, while a few are getting close to pre-elimination burden, recent trends show only four may reach pre-elimination.

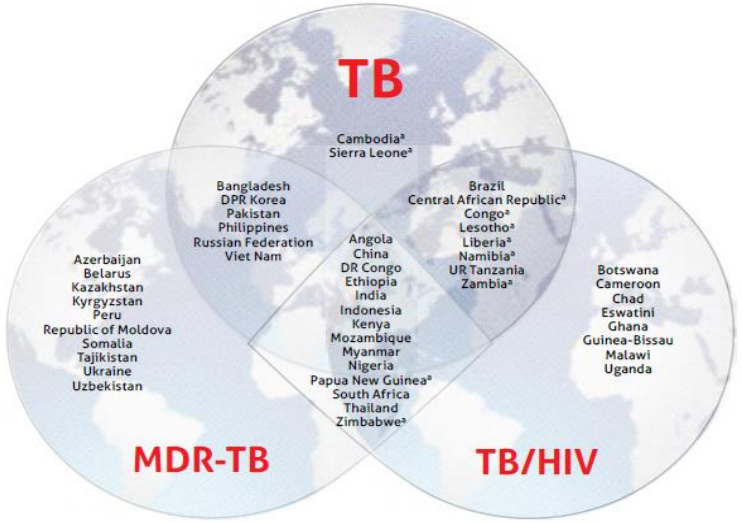
"Pre-elimination" = ‹10 notified TB cases/million population/year.

"Elimination of TB as a public health problem" = ‹1 notified TB case (all forms)/million population/year.

Estimated TB incidence rates, 2018



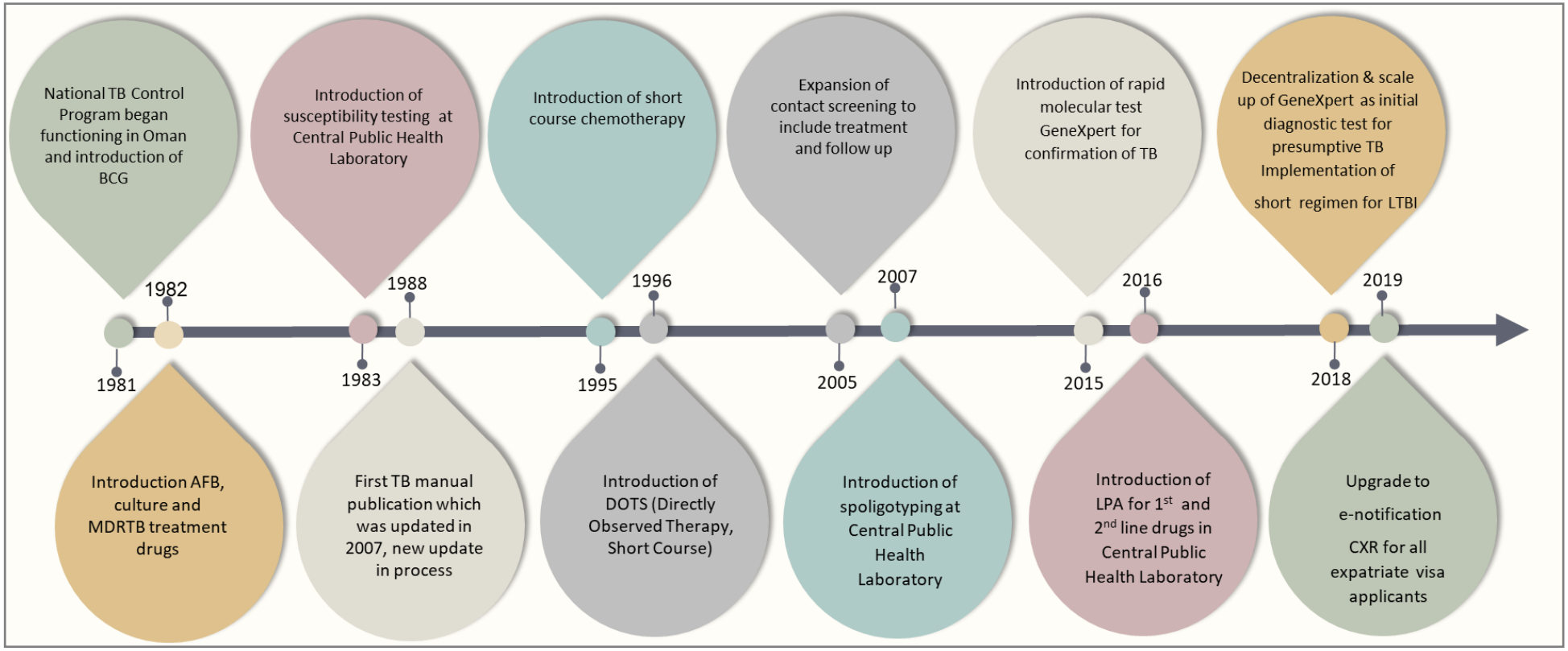
The three high-burden country lists for TB, TB/HIV and MDR-TB defined by WHO for the period 2016–2020, and their areas of overlap



Epidemiology of TB in Oman

Oman is situated in the south-eastern quarter of Arabian Peninsula and covers a total land area of 309,500 km^2. The total population in 2018 was 4.8 million; the Omanis constitute 2.5 million and the expatriate 2.1. As per ***Royal Decree No 114/2011 issued on 26th of Oct 2011,*** the sultanate of Oman is divided into 11 governorates which are in turn divided into 61 wilayats (districts).

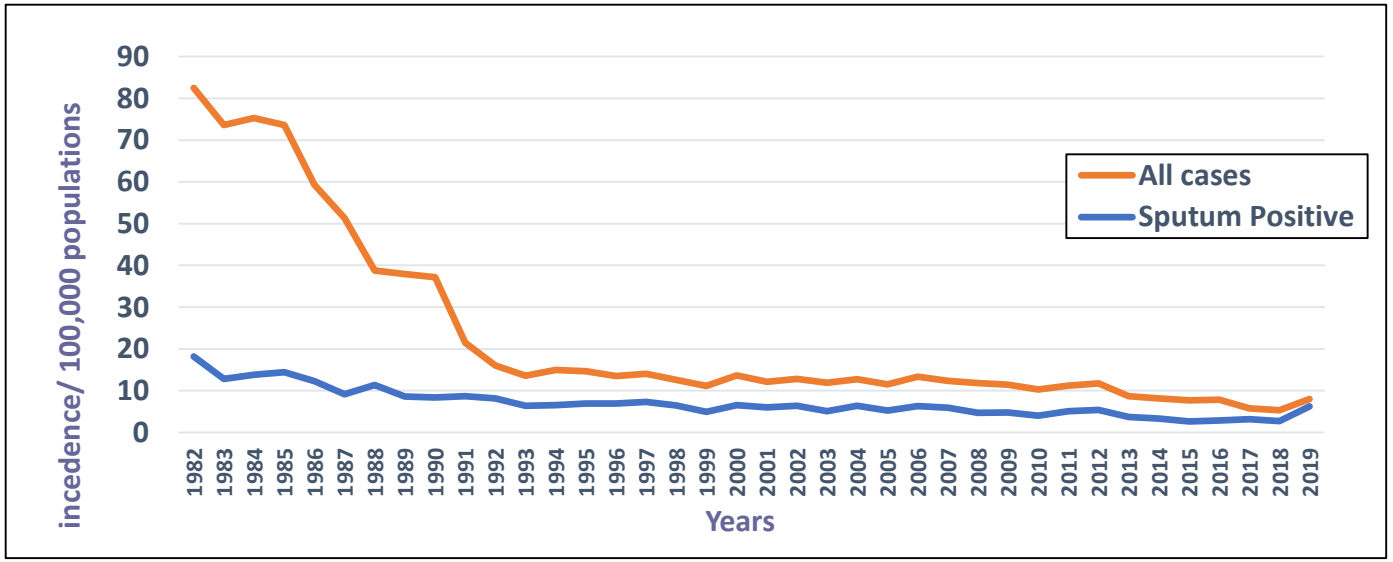
Schematic representation of milestones of National TB Control Program in Oman



Incidence rate:

Incidence rate of TB in Oman dramatically reduced in the last 30 years from 90.98 per 100,000 population in 1981 to 5.3 in 2018 (all forms) and 19.61 to 2.7 per 100,000 (for sputum positive pulmonary TB) in nationals.

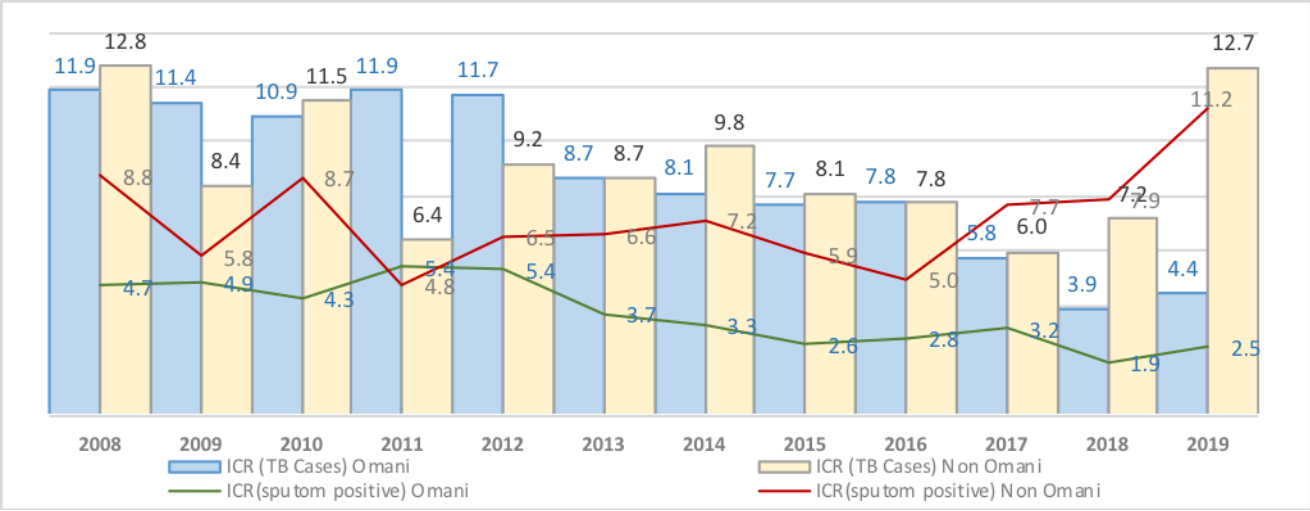
TB Incidence Rate per 100,000 Population in Oman: 1981-2019



Notification rate:

There is an overall down trend of total notified TB cases particularly in Omani nationals over the last 10 years as shown in this figure. For non-nationals, the number is fluctuating with an upward trend in the last year as a results of a change of screening

TB case notifications and rate (nationals versus non-nationals 2008-2019)

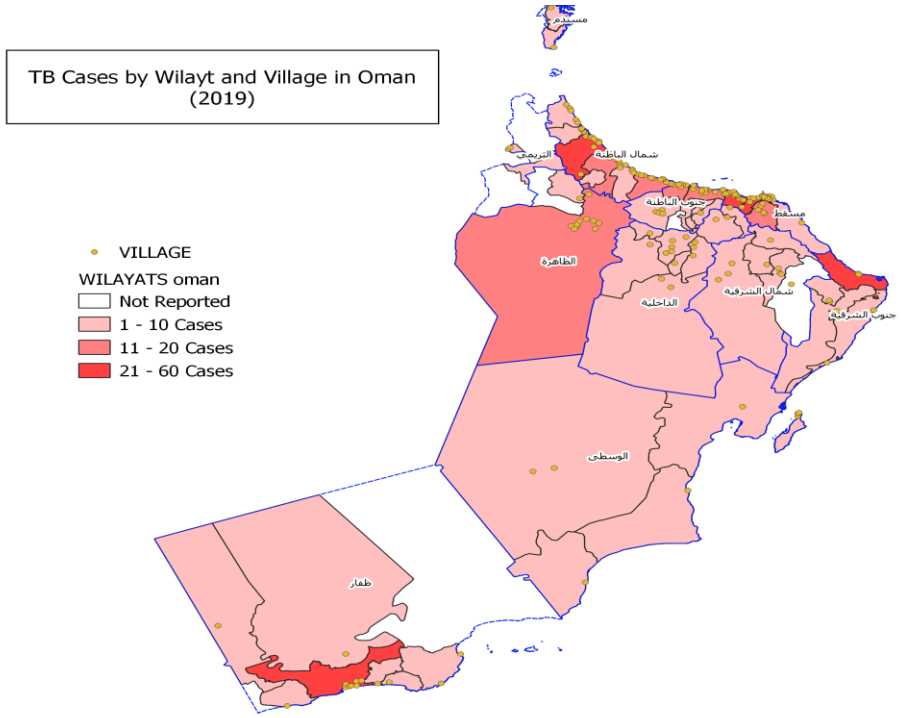


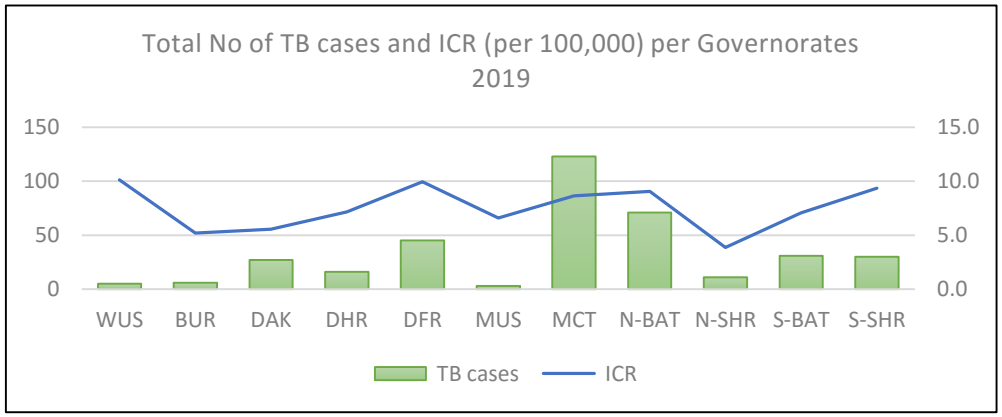
Distribution by governorate/wilayat/village

The following map shows the distribution of TB cases (all forms) as per governorates.
It is noticeable that the cases are concentrated mainly in the wilayats with dense population (e.g. Muscat, Al Batinah North and Dhofar).

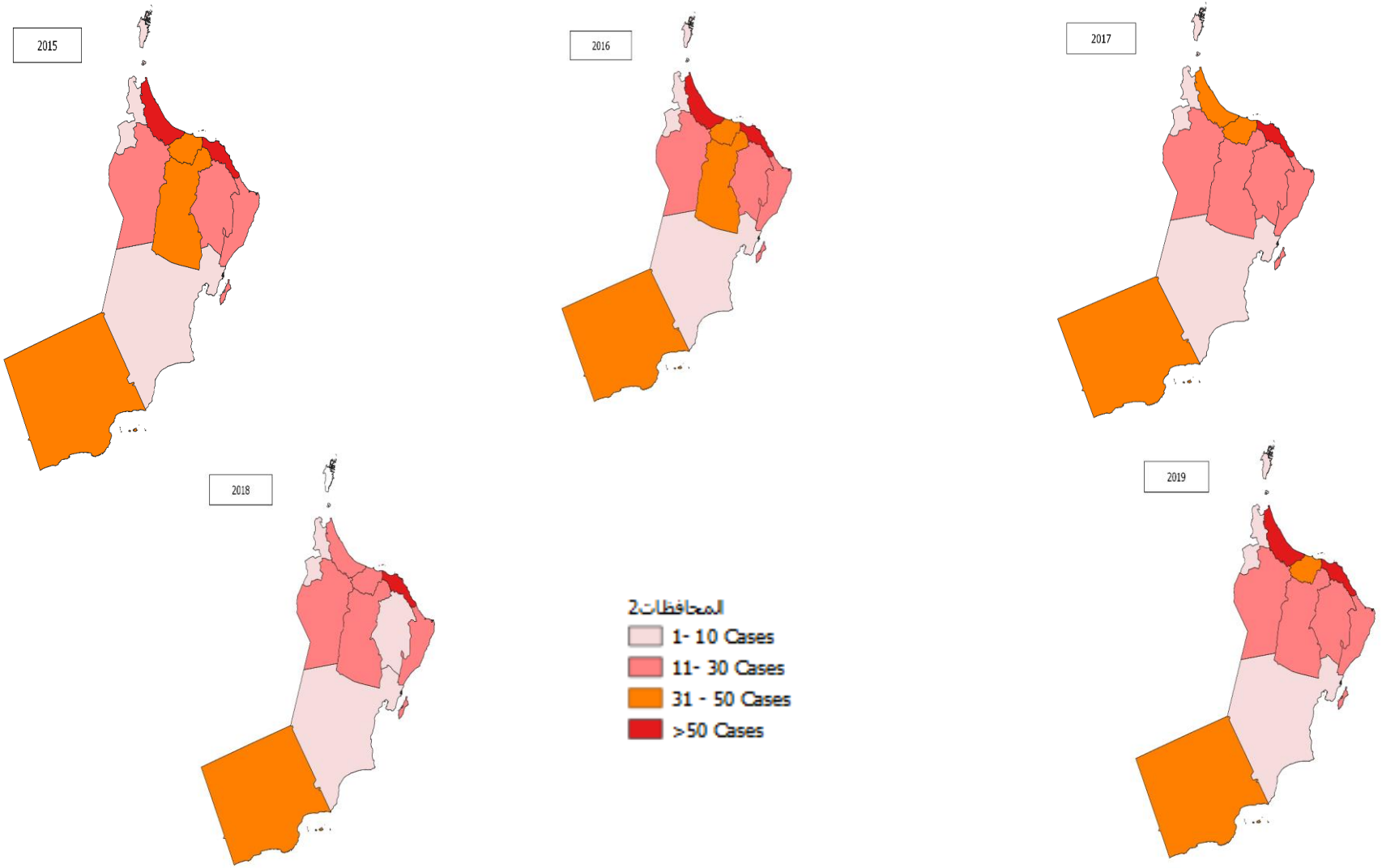
In addition, the small yellow dots show the distribution of cases in villages. This may reflect the high expatriate population in these governorates, and the higher TB cases within them.
Please note that the number of cases plotted for village distribution constitutes only those with available data for village name (180 out of 368 cases).

The second figure represents the overall incident per 100,000 population rate for each governorate in which Al Wusta and Dhofar governorates show the highest incidence and this may reflect the high migrant population present there.





The distribution of reported cases per governorate over the period from 2015-2019

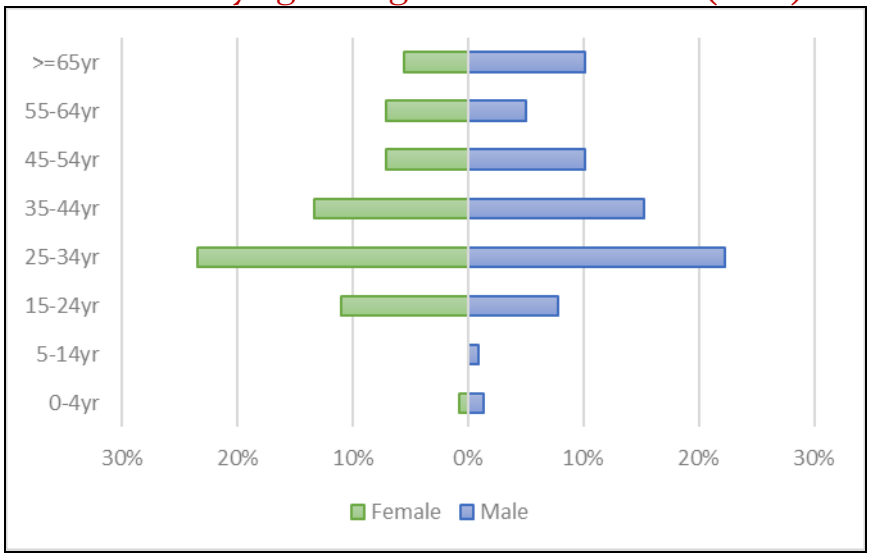


The above heat map shows the reported cases per governorate and the progression of these numbers over a 5 year period beginning in 2015. The number of cases remains stable in Muscat (›50 cases), Musandam, Al Buraimi and Al Wusta (‹10 cases in each of them). On the other hand, the number of reported cases in Al Batinah North Governorate rose sharply in the last year after trends of constant reduction in the number of cases. The other governorates were showing trends of reduction in the number of reported cases throughout the 5-year period.

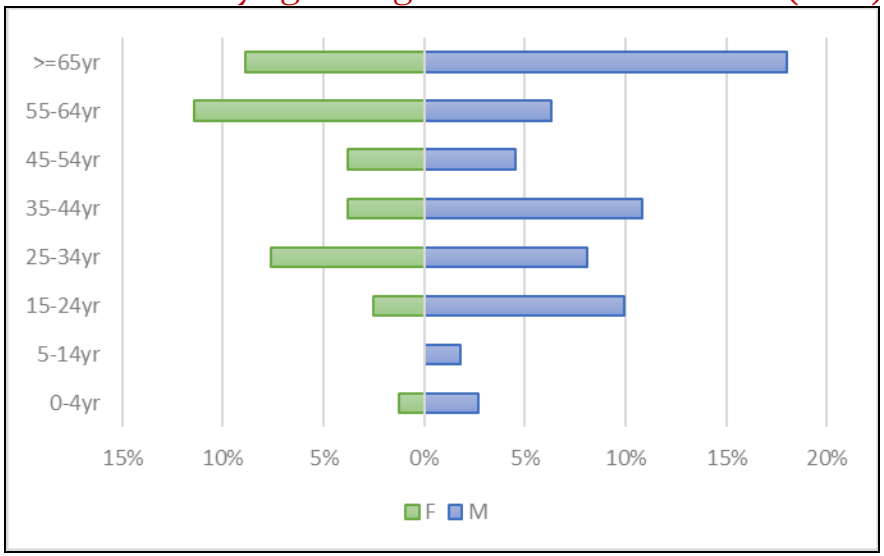
Distribution by age and gender:

The male to female ratio is 1:2, falling within the range estimated by WHO of 1.5-2.1. Although the percentage of males and females are almost similar in the 25-34 year age group, the percentage in males tends to be higher at ›65 years of age group mainly among nationals.
The excess in the number of cases in the younger age group is mainly attributed to the non-national workforce. This pattern is similar to industrialized countries where weaning immunity and presence of comorbidities that weakens the immune system contributed to the chances of reactivation of the disease such as diabetes mellitus (DM).

Distribution by age and gender in nationals (2019)



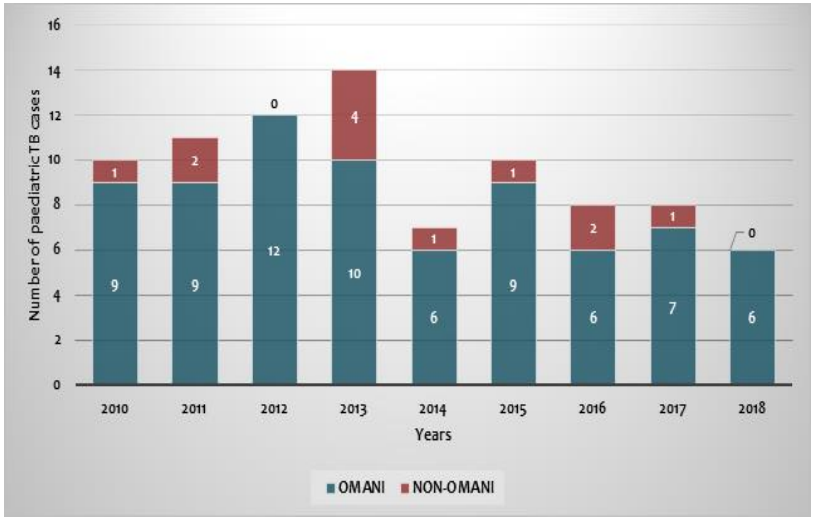
Distribution by age and gender in non-nationals (2019)

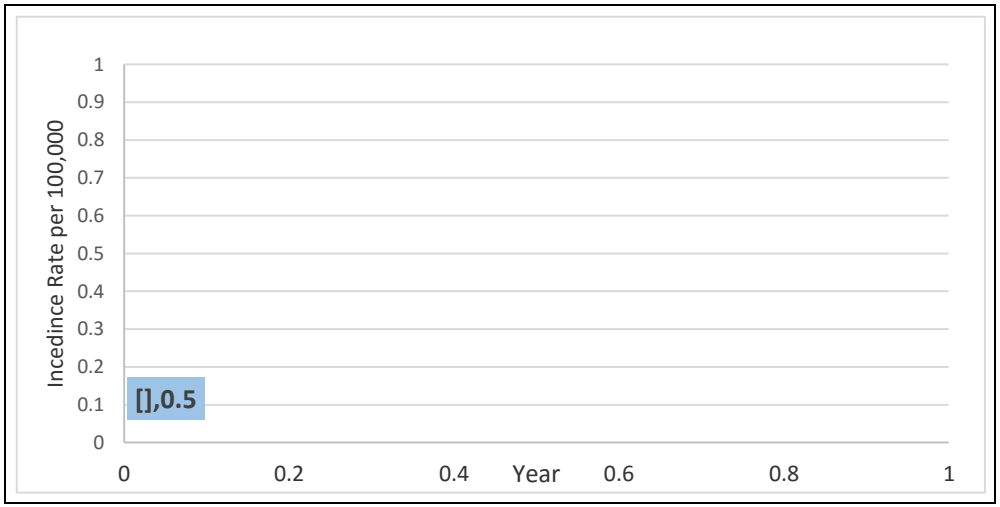


TB in children:

TB incidence in children reflects local transmission rates, and therefore is a potential indicator for TB control. Additionally, it will reflect the appropriate management of active cases and prompt initiation of contact tracing and INH preventive treatment in children <5 years. The number of cases remains low and relatively more among Omanis as the majority of migrants are not accompanied by their families. The incidence rate falls dramatically after 2013 and remains below 1/100,000 since 2015 and 0.5/100,000 in 2019. The burden of latent TB in children is not precisely known as collecting data on testing and completeness of treatment is a challenge, therefore standardization, implementation and improving data collection is warranted.

Paediatric TB cases by nationality: 2010-2018 TB incidence rate for paediatrics (per 100,000 population)





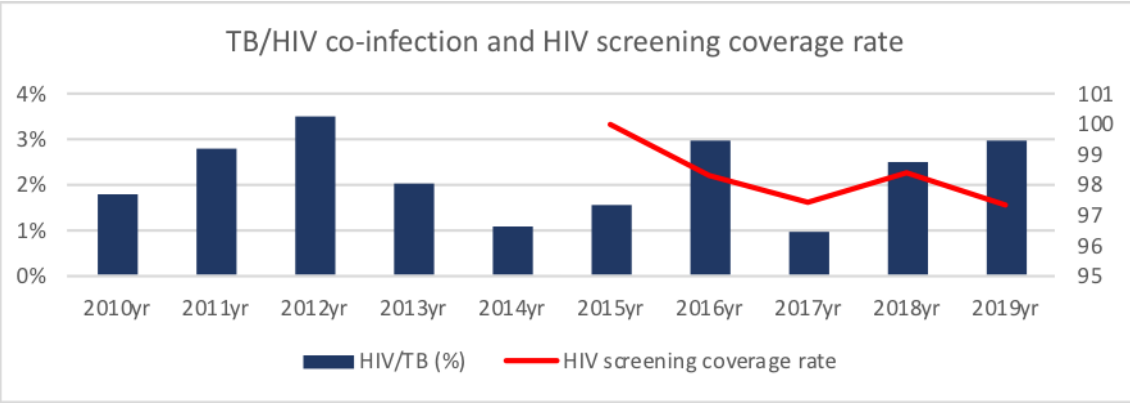
Risk factors:

Diabetes and smoking are the major risk factors identified in 2018 (20% for each one of them). DM has been recognized as a risk factor for TB, in which risk of TB increases three times in a person with diabetes. However, no consensus or guideline recommend systematic screening of diabetes for active TB has been come to so far although evidence is accumulating. In Oman the prevalence of diabetes is reaching 14%, and with the shift of TB cases to the elderly population, a group who may be likely to have multiple comorbidities including DM, a strategy for screening diabetic patients for TB should be looked into.

TB/HIV co-infection and HIV testing among TB cases:

The estimated incidence of HIV in Oman is 0.1-0.2.
The rate of HIV in TB patients is fluctuating over the past years ranging from 1% in 2014 to 3% in 2019.
The TB/HIV coinfection cases either are defaulters or newly diagnosed who were detected as part of TB screening policy for HIV. The coverage rate for screening of TB patients for HIV at time of diagnosis was 97.3% for 2019.

TB/HIV rate: 2010-2019



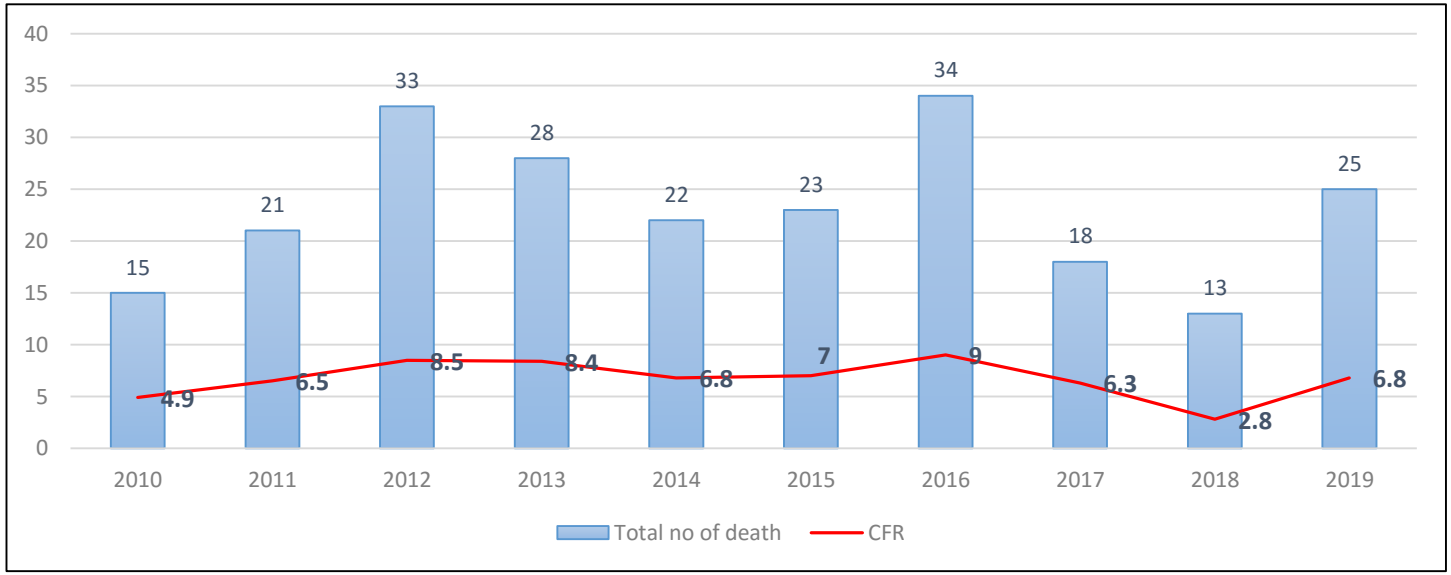
Mortality:

All cause mortality rate in 2019 among the nationals reached 0.6 per 100,000 populations with a case fatality rate (CFR) of 6.8% which is higher than the WHO target of <5%.

In the majority of patients, TB is not the primary cause of death. Instead, secondary causes such as septicaemia and cardiovascular incidents contributed to death. This is a situation similar to other low-incidence countries in which the majority of death occurs in the elderly population who are suffering from variety of chronic diseases.

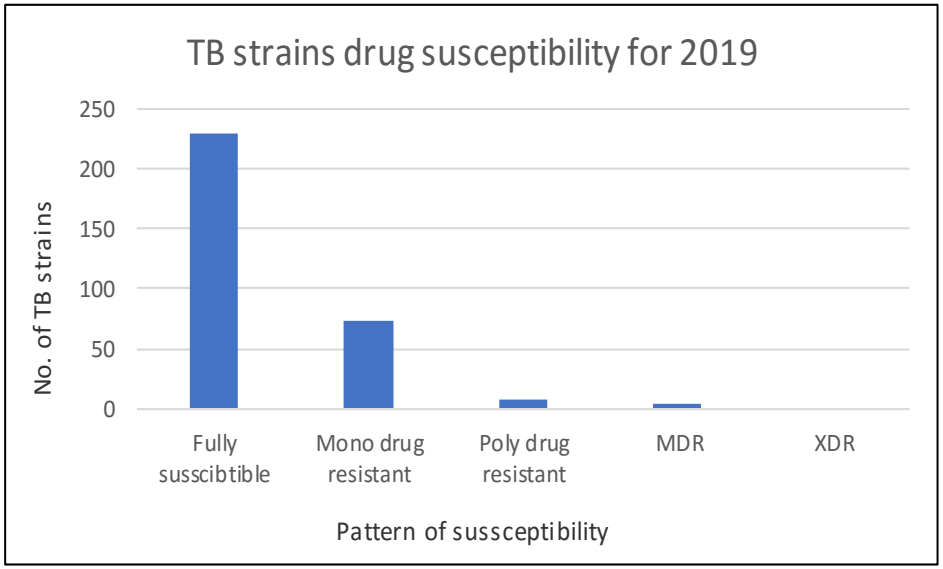
Death cohort analysis is mandatory for each case to identify primary and secondary causes of death and elicit any gaps in the system that can be corrected. A higher rate of death was observed in patients >65 years of age (73.3%, 44% in 2016 and 2019 respectively). This age group has multiple comorbidities such as hypertension, diabetes and other complications, which can contribute to their primary causes of death.

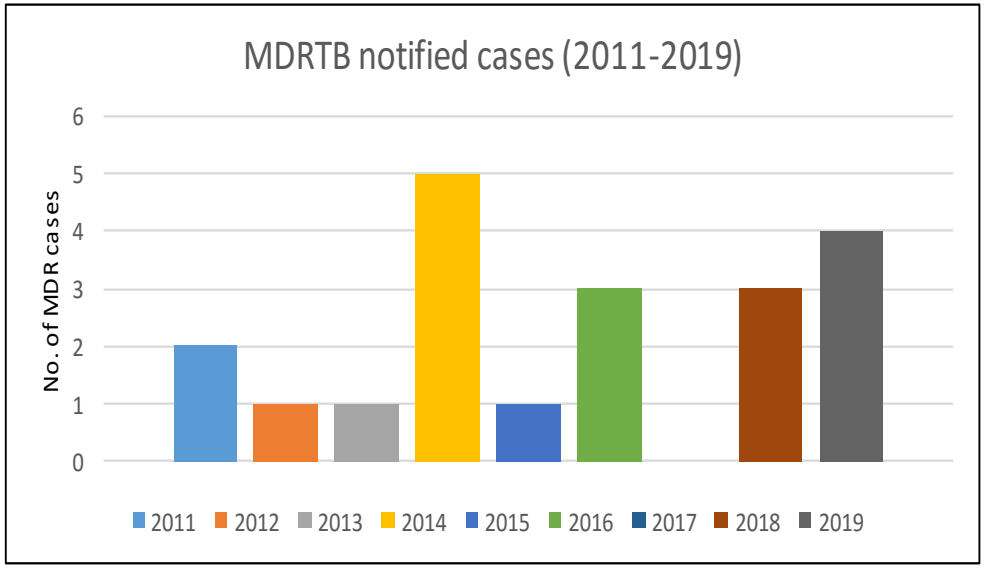
TB mortality (all cause) and CFR



Drug susceptibility

Of the strains tested in 2019, 81.2% were susceptible to the first line. Overall mono resistance constituted 25.9% (73 strains) from the total tested. Isoniazid (INH)-mono resistant strains constituted 4.6% (13 strains) out of all strains tested in comparison to 4.8% (9 strains) in 2018. Four multidrug resistant TB (MDRTB) strains registered in 2019 reflecting a stable pattern of MDRTB cases that was seen in the country in the preceding 10 years (ranging 0-5). No extensively drug resistant (XDR) strains have been reported in 2019.





Contact tracing and latent TB treatment

Contact investigation is very crucial for TB control to identify those at risk and place them on effective prophylaxis, especially children <5 years of age who are at greater risk for the development of active disease. In 2018 only 71.7% of contacts registered are screened which is below the target set by WHO as well as national target of >100%. The treatment regimen choices have been expanded to include INH monotherapy and shorter courses such as 12 dose rifapentine and INH combination and rifampicin (3-4 months).

Treatment success rate of confirmed TB cases:

The overall treatment completion has increased from 80% in 2016 to 83.5% in 2018 for the nationals. In Oman the challenge in assessing the overall success rate because of significant numbers of expatriates who leave the country at different stages of the treatment period leading to count the final outcome as non-evaluated (as we don't receive an update on the final outcome from the original country) therefore affect the overall success rate negatively.

Pre-entry screening program for non-nationals:

A pre-entry screening program for non-nationals is currently for active TB based on GCC Expatriates Health Check-up Program at Gulf Health Council. In 2018 the screening policy for health centres was upgraded for active systematic chest x ray (CXR) for all newcomers and for renewal processes which were implemented gradually in different governorates and faced with the challenge of availability of CXR services in health centres.

NSP for TB elimination in Oman: 2020-2025

Globally in 2014, TB became the world's leading infectious disease killer with ›10 million people infections and 1.5 million deaths. Thus, the World Health organization approved the End TB Strategy, a 20-year strategy to end the global TB epidemic with the vision of a world with ***"zero deaths, disease and suffering due to TB"***.

VISION	A world free of TB – zero deaths, disease and suffering due to TB			
GOAL	End the global TB epidemic			
INDICATORS	MILESTONES		TARGETS	
	2020	2025	Sustainable Development Goals (SDG) 2030	END TB 2035
Reduction in number of TB deaths compared to 2015 (%)	35%	75%	90%	95%
Reduction in TB incidence rate compared to 2015 (%)	20% (‹85/100 000)	50% (‹55/100 000)	80% (‹20/100 000)	90% (‹10/100 000)
TB-affected families facing catastrophic costs due to TB (%)	Zero	Zero	Zero	Zero

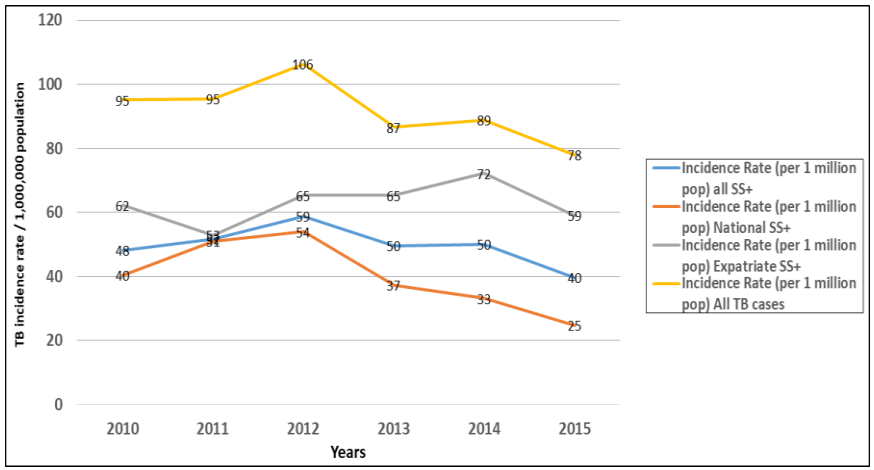
The epidemiology of TB in Oman more or less follows that of low-incidence countries which are characterized by a low rate of transmission in the general population, occasional outbreak and that the majority of TB cases generated from progression of latent TB rather than recent transmission. In Oman, a significant contribution of TB rates comes from cross-border migration and changes in age distribution towards the highest number of cases among elderly nationals. Transmission among family members still occurs due to the low rate of latent tuberculosis infection (LTBI) treatment acceptance.

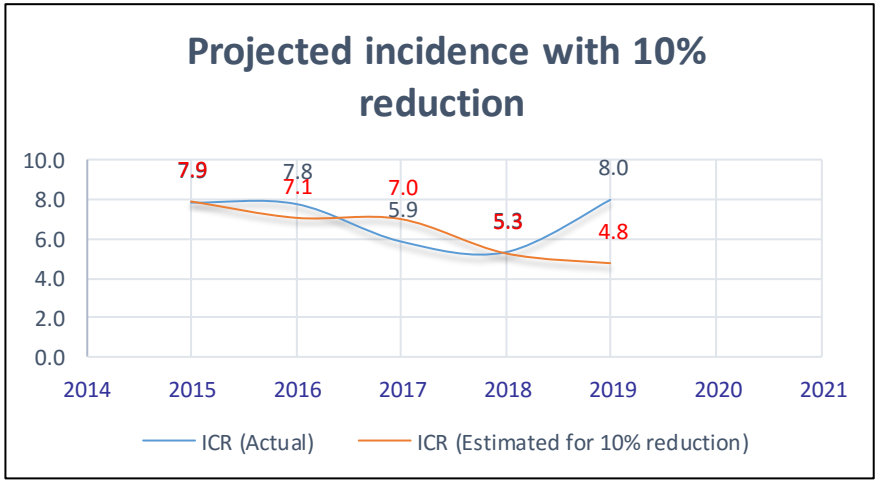
The first figure shows that the incidence in the expatriate population is trending high. Oman has adapted the global framework towards TB elimination in low-incidence countries proposed by WHO.

Locally, Oman is considered a low-incidence country as per WHO criteria (‹100 per million population). This incidence has been sustained since 2013 [2013 (8.7), 2018 (5.3) per 100,000 populations for all forms].

To reach the elimination goals, the projected rate to reach 90% reduction in TB incidence (‹1/100,000) compared to 2015 (7.86/100,000 population) has been estimated. The incidence rate needs to be reduced by 10% annually to reach the target which will require innovative intervention. The NSP for Tuberculosis Elimination (2019-2024) is a statement of commitment by Ministry of Health Oman. It builds on the success and learning of the TB control program that manages to bring and keep the incidence rate below 100 per 1000,000 population which subsequently reach a plateau since 2013. The strategy will incorporate the bold and innovative steps required to eliminate TB in Oman taking into account the complexity of the population. It is in line with other health sector strategies and global efforts such as WHO's end TB strategy, sustainable development goals of United Nations and Oman's health for all strategy. Political commitment with adequate resources for TB care and prevention is key for the success of Oman's elimination goals.

TB incidence rate per 1,000,000 population





- Zero death, disease and suffering due to TB in Oman which will contribute to the overall vision of a world free TB

- Move forward into the elimination by strengthening the detection, early treatment and prevention strategy

- To achieve a 95% reduction in TB deaths and 90% reduction in the TB incidence rate by 2035, compared with levels in 2015 at a national level. This will reduce the rate from < 100/1000, 000 populations to < 10/1000, 000 populations i.e. to pre-elimination rate
- To enhance abrupt detection by using rapid molecular diagnostic testing, thus reducing the transmission
- To optimize management by using patient centred approach by expanding the treatment using the community DOT, and enhancing IP&C measures at all levels of health care
- Focusing on LTBI diagnosis and management by expanding at risk group and improve cascade of care and introducing newly recommended shorter regimen
- To advocate for community awareness of all forms of the disease (active & latent) and promote operational research that can improve the service

Strategies to achieve objectives – four pillars: Detect, Treat, Prevent And Promote

Pillar 1 - Detect

AIM: Early identification of presumptive TB cases at first point of care in public and private sectors using rapid molecular testing that allow accurate detection of TB disease and drug resistance to ensure prompt initiation of appropriate treatment. Emphasis also on timely notification using e-notification and standardized engagement of the private sector with programmatic approach.

Existing Policy	Challenges	Achievements	Activities
• Scaling up the diagnostic policy from conventional smear microscopy to more sensitive rapid molecular test (GeneXpert) as an initial diagnostic test for presumptive TB • Mandatory screening for active TB by clinical examination and CXR for all visa applicants of which resulted in improvement in case finding • Currently the private institutions are involved in diagnostic services only though they lack standardization and appropriate legislation	• Universal use of rapid molecular test for presumptive TB is lacking especially in private where conventional methods are still used. • Improve case finding among at risk groups e.g. migrants, PLHIV • To address LTBI screening in large populations of migrants originating from high endemic country (risk of reactivation either on arrival or during the first 2-5 years of staying in the country) • Timely electronic surveillance system that does not cover all health institutes including private and Non-MOH	• Scale up the use of rapid molecular testing for TB diagnosis as an initial diagnostic test for presumptive TB (annex 1) • De-centralization of rapid molecular testing services to the governorate hospitals with higher burden of disease • Expansion on rapid detection of first and second line drug resistant by using GeneXpert, LPA, at Central Public Health Laboratory • Mandatory screening for active TB by clinical examination and CXR for all visa applicants which resulted in improvement in case finding (annex 2).	• Action plan of Public Private Mix to improve detection among migrants at private institutions (annex 3) • Improve case finding in at risk group mainly migrants, contacts, and PLHIV using sensitive and specific test that identify patients who can progress to active disease • Establish the facility for Whole Genome Sequencing in CPHL to track transmission in the community with future plan for routine use • Upgrade the surveillance to electronic version involving private and non-MOH institutions as web-base notification (annex 4) • Support high-quality network of laboratory services, validated through proficiency testing and other quality control mechanisms for public and private laboratories and strategic plan to decentralize and upgrades the governorate laboratories (annex 5)

Pillar 2 - Treat

AIM: Sustain free high-quality TB (all forms) treatment, care and support services to nationals and non-nationals of all ages through patient-centered approach through community DOT while ensuring implementation of infection prevention and control at all levels of care while strengthening treatment, improve compliance and support the introduction of newly recommended shorter regimen for LTBI.

Existing Policy	Challenges	Achievements	Activities
• Quality ensured (WHO pre-qualified) anti-TB drugs for drug sensitive and resistant strains are provided for nationals and non-national patients free of charge in hospital in the initial phase (early discharge based on sputum conversion is also practiced) with implementation of IPC followed by community treatment for continuation phase • Currently the LTBI treatment regimens are (INH) mono-therapy and rifapentine and INH combination which is the preferred regimen. The sustainability of supply of the latter is a limitation	• Limited isolation rooms • Individual patient social and personalized barriers for hospital stay • IPC barriers for long duration of isolation • Non-standardized system for referral from and to government and private institutes for Omanis and expatriate with subsequent treatment delay and complication • Poor compliance with current regimen for treatment of LTBI and lack of standardization of monitoring of the outcome	• Sustained provision of quality ensured (WHO pre-qualified) anit-TB drugs for drug-sensitive and drug-resistant cases • To refer all cases of drug-resistant tuberculosis to a tertiary hospital with expertise in the management of MDRTB/ XDRTB and appropriate IPC measures including (AIIR) to ensure high success rate and close monitoring of side effects (annex 6) • TB in children (active and latent cases) treatment and investigation being supervised by Infectious diseases specialist through referral or consultation according to updated treatment guideline	• Update the national TB policy referral system (annex 6) & update TB manual • Ensure sustained supply of quality-controlled drugs. Introduction of pharmaco-vigilance approach in monitoring side effect as per the national pharmaco-vigilance policy • Introduce patient-centred approach care into the management of tuberculosis through community DOT at national level (annex 8) • Update programmatic monitoring and evaluation system to ensure monitoring of TB program at district, governorate and central level by updating the Monitoring & Evaluation framework (annex 9) • Introduction of shorter regimen policy for LTBI treatment • Expand alliance with HIV program by integrating some of TB/HIV services (co-management of TB comorbidities) (See HIV guideline)

Pillar 3 - Prevent

AIM: Scale up the latent TB screening and preventive therapy to meet the goals of TB elimination by including additional at-risk group including HCWs, have a well-established cascade of care that can retain patients and improve the compliance that result in reduction of incidence rate, and scale up IPC measures that control transmission within health care facilities e.g. training HCWs & and increase AIIR.

Existing Policy

- Prevention of TB currently concentrate on contact screening including preventive therapy for <5 years contacts and policy of BCG vaccination for all newborns
- Guideline for preventing transmission of TB in hospital (GCC infection control Manual last updated 2017)

Challenges

- Improve initiation of treatment and compliance for LTBI treatment
- Expand on at-risk group such as migrants and PLHIV
- Screening and establishing a standard cascade of care for the management of LTBI in a large migrant population coming from high endemic countries is a challenge for any TB program
- Establish screening for TB infection in HCWs
- Availability of AIIR within health care facilities
- Training for HCWs on appropriate use of respirators including N95 and PAPR

Achievements

- Continue BCG vaccination for newborns
- Contact screening and IPV for <5 years system available
- Introduction of screening PLHIV for latent TB and IPV treatment
- Update TB screening and training for prevention of airborne infection national policy for screening and prevention of infectious diseases in HCWs
- Increasing availability of AIIR in referral inpatient facilities in all governorates

Activities

- Implementation of updated guideline for LTBI management (annex 7)
- Expand screening and preventive treatment for people with a high risk of tuberculosis such as HCWs and migrants
- Strengthen implementation of LTBI screening and treatment in PLHIV
- Update IPC section in the national TB manual
- Approval and implementation of national policy for screening and prevention of infectious diseases in HCWs
- Induction and regular training for HCWs on prevention of TB transmission within health care facilities

Pillar 4 - Promote

AIM: Health promotion is a powerful tool to advocate End TB goals. The strategy advocates to reach the targets of elimination across all levels politician and community leaders and communication to change knowledge, attitudes, behaviors, and practices among various groups of people and social mobilization to strengthen community participation for sustainability. Additionally, the strategy is promoting research that address additional knowledge and evidence of the effectiveness of interventions aimed at TB care and management and a more proactive approach to promoting operational research to optimize policies and improve outcome

Existing Policy

- Health promotion for TB among community members is being done by targeting specific groups e.g. attendants of PHC facility using conventional tools such as leaflets and TB day awareness activities

Challenges

- Knowledge of the community including stigma is not fully evaluated
- Presence of several populations with different languages that need to be targeted
- Health promotion through assessing and ensuring adequate knowledge of TB prevention and treatment for all categories of the population i.e. locals and migrants, is a challenge due to language barriers, prior lack of geographical mapping, resources and prior failure to take innovative approaches
- Paucity of operational research that addresses the current issue of TB to improve services despite huge data availability coupled with a lack of resources and personnel

Achievements

- Educational materials for general information have been prepared such as booklets
- Published studies to address the burden of the disease and mapping at-risk groups

Activities

- Knowledge, attitudes and practices study for community and HCWs to asses the general knowledge gaps
- Health promotion and risk communication by establishment of lasting partnerships across the health and social sectors (annex 10)
- Intensified research to develop and rapid uptake, development, intervention, strategies and optimize implementation
- Promote innovations by creating a research-enabling environment and enforcing the priority of TB research and priority for budget allocation and identifying resources and involving academia
- Formulation of standards and protocols and incorporation of these in the updated national, legal and regulatory framework for health by updating the public health law
- Risk communication to improve awareness, and counselling skills towards TB infection and disease

	Annexures Section name	Page #
1	Presumptive TB diagnosis and laboratory algorithms	--
2	Medical fitness centre screening manual	
3	Public private mix	
4	E-notification form	
5	Laboratory strategic plan	
6	Referral system section	
7	LTBI guideline for adults and children	
8	Community DOT (CDOT) guideline	
9	Monitoring & evaluation framework	
10	Health promotion plan	

References:

1. The end TB strategy. Geneva: World Health Organization; 2014.
2. Lönnroth K, Migliori GB, Abubakar I, et al. Towards tuberculosis elimination: an action framework for low-incidence countries. Eur Respir J 2015; 45: 928–952.

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