



## INFECTIOUS DISEASES IN MALTA

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### ABSTRACT

*Monitoring the disease status of a nation has long been considered of great importance in helping to decrease the spread of disease to the population. In recent years it can be said that there are no borders as regards Infectious Diseases with the increase in global travel and mass migration of people, with large numbers of people considered as displaced. This has led to the introduction of new diseases in countries that previously had no experience of them as well as the re emergence of diseases that had been considered controlled. During the past 5 years Malta and the rest of Europe has seen an increase in various infectious diseases such as TB, HIV, other STIs, vector borne diseases as well as outbreaks of vaccine preventable diseases notably measles. Collaboration and cooperation between European countries is essential to control and manage these events. Robust surveillance data is critical to monitor and inform the public health response in an accurate and timely fashion.*

## History of infectious disease surveillance in Malta

From the beginning of the nineteenth century, there was a gradual acknowledgement that a number of environmental factors affecting health could best be tackled by a specialised group of doctors. Before the nineties, medical officers based in various districts and regions in Malta provided a fragmented public health service, however this changed with the establishment of the Public Health Department in 1991.

The Disease Surveillance and Control section of the Department was responsible for monitoring the disease status of the nation. Previous efforts in this field had been rather haphazard with various sections contributing in no particular order of priority. This section reduced duplication of work and promoted a coordinated policy, defining priorities for the medical profession. The areas for preliminary action included all notifiable infectious diseases as well as the priority non-communicable diseases - namely cardiovascular disease, diabetes and cancer.

This branch combined the work of the Medical Officers of Health with the District Health Inspectors and the Public Health Laboratory Service. It provided support to relevant research in these fields and provided a basis for future planning of services in this sector. As a consequence of the ongoing reform of the Civil Service which gathered momentum in the early 1990s, the Infectious Disease Surveillance Unit (DSU) was created in 1993 within the new Department of Public Health to act as the national surveillance centre for communicable diseases in Malta.

Nowadays, the Infectious Disease Prevention and Control Unit (IDCU) in Malta is the national centre responsible for the surveillance, prevention and control of infectious diseases. Data is collected from various sources, which include medical doctors, hospitals, laboratories, patients and death certificates.

There are 71 statutory notifiable infectious diseases under Article 27(a) of the Public Health Act of 2003. Notification is mandatory by law from all registered doctors working in Malta, both in the public and private sectors.

## Assessment of the top 5 priority infectious diseases and future outlook

### HIV/AIDS

As far as can be established, the Human Immunodeficiency Virus (HIV) was first introduced into Malta in 1984 via contaminated Abbott Anti-Haemophilic Factor, and in a few returned HIV positive homosexual men, previously domiciled and infected abroad.

In December 1986, a National Advisory Committee on AIDS was established. Initial cases of HIV/AIDS were followed up at Boffa Hospital by dermatologists. In 1995 the patients started to be reviewed by Infectious Disease clinicians. The initial antiretroviral treatment available to HIV patients was azidothymidine followed up by triple therapy in 1997.

HIV and AIDS became a notifiable disease in Malta in 2004 and reliable data has been collected since then. This data shows that there has been an increase in the numbers of HIV cases especially since 2012, always with a predominance in males. In the early years, heterosexual transmission was the most common mode of transmission but since 2013 there has been a steady increase in the number of men who have sex with men (MSM) being diagnosed.

The greatest increase in numbers over the past few years was seen in the foreign population (EU and non EU) as compared to Maltese nationals. The situation in Malta compares with the situation in general in the European Region[1].

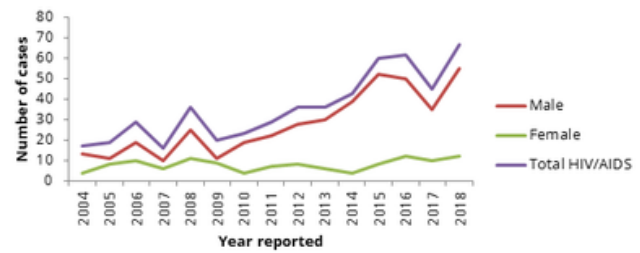


Figure 1. Number of cases of HIV/AIDS reported annually to IDCU from 2004 to 2018 by gender

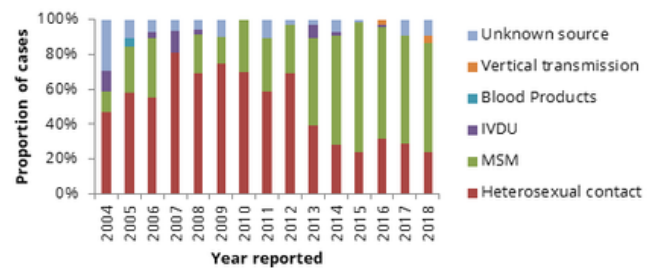


Figure 2. Percentage of cases of HIV/AIDS reported annually to IDCU from 2004 to 2018 by source of infection

### Future Outlook

Of primary importance is to have dedicated human resources and finances to promoting sexual health awareness especially amongst risk groups with emphasis on strengthening human resources at the GU clinic to deal with the increasing number of patients. HIV testing and linkage to care needs to be expanded to ensure early diagnosis and access to treatment; thereby reducing the number of late presenters to improve treatment outcomes. Programmes for men who have sex with men should be developed and strengthened further. HIV cases among migrants are a reality as is evidence of post-migration HIV acquisition, so prevention services need to take this into consideration and adequate harm reduction measures must continue to prevent HIV among people who inject drugs. A challenge is to introduce the generic, affordable TDF/FTC combination pill as PrEP in Malta with the participation of patients in purchasing such medication.

### Other Sexually Transmitted Infections (STIs)

In Malta, cases of Chlamydia, Gonorrhoea and Syphilis reflect the situation in Europe with increasing numbers being seen over the

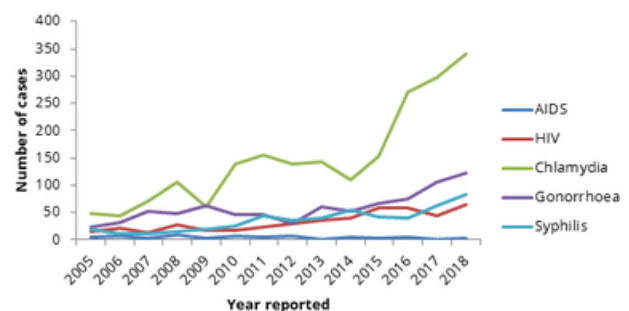


Figure 3. Number of cases of sexually transmitted diseases reported annually to IDCU from 2005 to 2018

With improved diagnostics and surveillance and increasing attendance to the GU clinic as more people are aware of the services offered, more cases are being diagnosed. The main cause of such an increase is due to low condom use, multiple partners and risky sexual practices. [2] [3] [4]

Data on Chlamydia, Gonorrhoea and Syphilis started being collected in Malta in 2005. The vast majority of cases were and still are notified by the Genito-Urinary (GU) Clinic. The clinic has been seeing and treating an increasing number of patients each year but it needs to expand, and augment its services in order to meet the demand fuelled by the increasing rate of STIs locally.

#### Future Outlook

Education is of prime importance and this needs to be targeted to other health care professionals, risk groups and the general population. There is the need of setting up a service that offers contraception advice, family planning, counselling on STI issues, advice on PrEP and PEP and also monitor persons on such medications.

### Food-borne Illness (FBI)

FBI resulting from contaminated food and water remain a major public health problem worldwide. WHO estimates on the global burden of FBI show that 1 in 10 people fall ill every year from eating contaminated food[5]. The overall picture of reported food related disease is a gross underestimation of the actual incidence in the community as only a small percentage of cases are notified and these are usually the most severe/hospitalised cases or those involved in outbreaks[6].

Food safety is facing new challenges mostly due to the globalisation of food production leading to more imported food and increasing likelihood of international outbreaks; [7] New and emerging bacteria, toxins and resistance; changes in consumer preferences and habits; changes in the environment and food production, thereby increasing likelihood of food contamination.

With the setting up of international communication networks and surveillance as well the introduction of enhanced diagnostics such as PCR and whole genome sequencing (WGS), this has enabled countries to respond more efficiently and effectively to such threats[8].

In Malta, surveillance for several FBI has been ongoing since the mid-nineties based on reported culture results. In 2018, PCR was introduced at the pathology department at MDH further enhancing the detection of FBI as well as the timeliness of case reporting.

### Campylobacteriosis

Campylobacter is the most commonly reported gastrointestinal bacterial disease in the European Union with notification rate of 64.84 cases per 100 000 in 2017 mostly associated with broiler meat and fresh poultry[9]. Adults are often the most affected age group, but the highest notification rates are seen in young children.

In Malta, cases of campylobacteriosis showed a significantly increasing trend from 2007-2017. Confirmed cases more than doubled from 98 in 2007 to 343 cases in 2018. During the same period, the notification rate increased from 24 cases per 100 000 population per year to 72.1.

### Salmonellosis

Salmonellosis is the most frequently reported cause of foodborne outbreaks and the second most commonly reported enteric infection in the EU with a notification rate of 19.6 cases per 100 000 in 2017 mostly associated with eggs and poultry.[9]

In Malta, reported cases of salmonellosis showed a slightly increasing trend from 2007-2017 although this was not statistically significant. Confirmed cases increased from 83 in 2007 to 123 cases in 2018. During the same period, the notification rate increased from 20 cases per 100 000 population

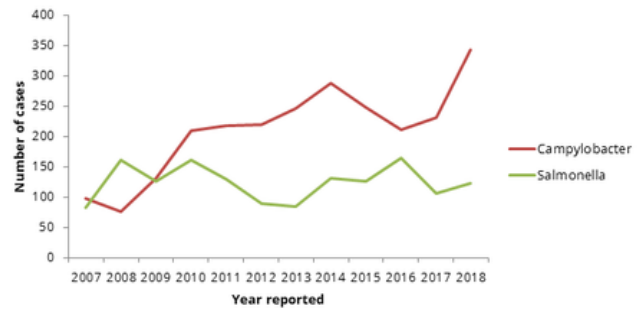


Figure 4: Number of confirmed cases of Salmonella and Campylobacter reported annually to IDCU from 2007 to 2018

Although restaurants and take-outs account for a significant amount of the implicated establishments, most of the cases are household acquired. This highlights the importance of increasing awareness of personal hygiene and food safety practices in the household.

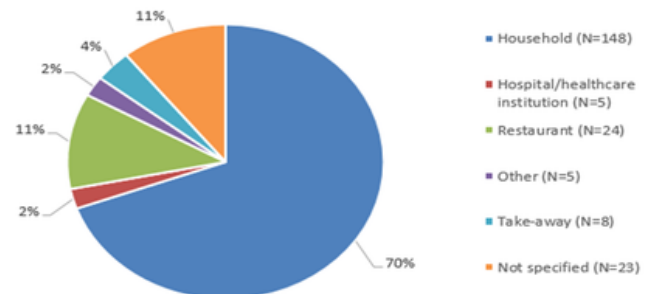


Figure 5: Suspected sources of infection for locally-acquired confirmed cases of campylobacteriosis, Malta, 2007-2017 (N=213)

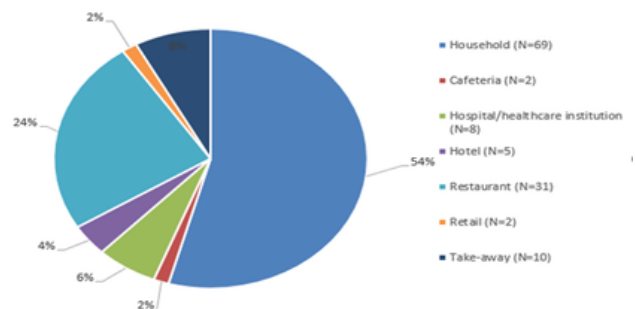


Figure 6: Suspected sources of infection for confirmed cases of non-typhoidal salmonellosis, Malta, 2007-2017 (N=127)



Characterisation of food-borne pathogens up to the optimal discriminatory level by molecular typing methods is very important to link otherwise sporadic cases to the same epidemiological incident and to trace the implicated food sources. This is especially important in the investigation of multi-country outbreaks which would benefit from a functional collaborative network of laboratories between countries sharing WGS data.

### Future Outlook

With the advances in technology, some of the challenges involve the introduction of whole genome sequencing (WGS) which would enable linkage of dispersed cases to the same outbreak, trace implicated food sources and also compare sequences with those of other countries to better investigate and manage international outbreaks of food-borne illness. This must be reflected in an increase in human resources and trained personnel to effectively respond to the increased number of outbreaks that would be picked up with innovative methods such as WGS.

Improving the accessibility of testing of suspected cases of food-borne illness in the community will help give a better picture of the prevalence of FBI in the community and it is also important to enhance efforts to increase awareness of food safety practices particularly in households.

Other challenges include enhancing the tests and techniques available for testing of environmental and food samples by the Public Health lab to improve timeliness of detection of food-borne pathogens and timely implementation of outbreak control measures and further improving notification methods by clinicians through the potential use of innovative methods such as mobile apps to better enhance reporting, particularly of suspected food-borne outbreaks

Strengthening intersectoral communication and sharing of data between IDCU, environmental health and the veterinary department will lead to a better understanding of the trends of zoonosis and potential transmission via food of animal origin. This can be achieved by integrating surveillance data to better understand the risks across the food chain. Another challenge is better tracing of foodstuffs imported from other countries, especially outside of the EU.

Of considerable importance is upgrading the database at IDCU to allow for automatic baseline data analysis and detection of exceedances that would prompt rapid investigation.

### Tuberculosis

Pulmonary tuberculosis became a notifiable disease in Malta in 1908. However, it was some 40 years later that extrapulmonary TB became a legally mandatory notifiable disease. Like other Western European countries, the TB notification and incidence rates in Malta have decreased steadily among the Malta-born population in recent decades, occurring mostly in the elderly, mainly due to reactivation of old TB.

Malta is a low TB incidence country. A large proportion of TB cases in Malta are imported cases, in people coming from high TB endemic countries. From 2010-2017, a total of 327 TB cases were notified in Malta, with an average notification rate of 9.6 cases per 100,000 population.

Of these cases, 87% (285/327) were foreign-born and 13% (42/327) were Malta-born. 71% (231/327) were pulmonary cases while 29% (96/327) were extra-pulmonary TB. During this period, 2 cases of multidrug-resistant TB and 1 case of extensively drug resistant TB were reported; all cases were imported. Of all TB cases with a known HIV status, 10.8% had TB/HIV co-infection.

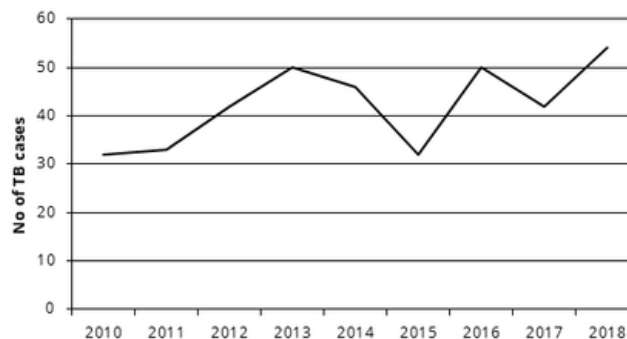


Figure 7: Number of confirmed cases of tuberculosis reported annually to IDCU from 2010 to 2018

### Future outlook

Major challenges with tuberculosis control in Malta are incompliance to TB treatment and organization of directly observed treatment (DOTS) which could lead to drug resistant TB. Remaining vigilant about TB even in low incidence countries is important, due to the potential resurgence of this disease, especially in the light of increased population mobility and multidrug-resistant TB.

### Vaccine Preventable Diseases

Increased vaccine hesitancy and decreasing rates of vaccination uptakes seen across EU had led to a re-emergence of previously decreasing diseases such as measles which was targeted by WHO for elimination by the year 2020 [10]. Increasing travel and migration to Malta led to an increase of cases being detected locally from unvaccinated persons with local transmission occurring in 2018.

### Future Outlook

Some major challenges are addressing vaccine hesitancy via health promotion campaigns to increase awareness on the importance of vaccination uptake and ensuring good vaccination uptake by healthcare workers, and those most susceptible including young children and the elderly. The introduction of more vaccines in the national immunisation schedule free of charge is a step in the right direction as is strengthening of checks to ensure that all children attending school have all the necessary vaccinations offered by national immunisation schedule.

### Vector-Borne Diseases (VBD)

Climate change is having a direct impact on vector borne diseases. The Asian mosquito tiger was first discovered in Malta in September of 2009 and following surveillance for a whole year between 2010-2011, results confirmed that the mosquito spread to all of Malta and even reached Gozo by December of 2012. [11]

This particular mosquito can be the transmitter of a number of VBD which include West Nile Fever, Dengue fever, chikungunya, yellow fever and many other. It is now endemic in our country since our climate provides the ideal environment for this mosquito to breed. Increased travel internationally and increased migration to Malta make VBD a priority to address.

Neighbouring Mediterranean countries like Italy, France, Greece and Spain has reported outbreaks of West Nile virus, chikungunya, and also clusters of Dengue and Malaria in the past 5 years.[12] Presently surveillance is being done during the adult phase from May to November using ovitraps to determine the high density areas in Malta where this mosquito breeds to undertake control measures.

### Future Outlook

Vector borne diseases are emerging as a major, public health threat. Some of the challenges in this area include having a dedicated budget and human resources to set up and implement continued vector borne surveillance locally to promptly identify introduction of new vectors and implement effective control measures where high density areas are found.

Local expertise and technologies are needed as these are lacking, through establishing alliances and support from other MS for training on surveillance and control measures. A Vector borne disease strategy needs to be prepared as well as a preparedness and control plan to deal with a VBD outbreak.

Other areas to be tackled are increasing the awareness of VBD amongst clinicians to ensure detection of cases and increasing the awareness amongst the general public on mosquito control measures. Another consideration would be surveillance of vector borne disease through screening of human samples ex in blood bank.

### Conclusion

The persistent and unpredictable nature of infectious disease emergence, climate change and global population migration, represents a continual challenge. Malta has had an increased influx of migrants from across the globe, affecting the local scenario on the incidence and prevalence of infectious diseases.

They are a significant burden on public health and economic stability of societies all over the world. Despite significant advances, especially during the past 2 decades, Infectious Diseases, continue to kill several millions of people each year. New and more virulent pathogens continue to emerge and re-emerge. Antimicrobial resistance is on the rise, rendering the treatment of infectious diseases more challenging.

Effective surveillance is the cornerstone to the prevention and control of communicable diseases. Timely and accurate information regarding infectious diseases is necessary for accurate monitoring of local trends and ensuring the implementation of timely public health measures. This requires a National electronic database which is linked with key stakeholders.

Diagnostic facilities for infectious diseases are to be strengthened, including human resources and latest testing technology to improve identification rates. PCR and genome sequencing are being introduced locally, leading to an increase in identification of cases and identifying links between cases due to improved sensitivity and specificity.

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