PUBLIC HEALTH IN MALTA

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The story of Public Health in Malta

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MALTA ASSOCIATION OF PUBLIC HEALTH MEDICINE

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EDITORIAL

NATASHA AZZOPARDI MUSCAT, DANIEL CAUCHI, TANYA MELILLO FENECH

As we celebrate 20 years of MAPHM, we have asked some of our members, all experts in their respective fields, to reflect upon the main public health issues facing Malta and the added value of a vibrant public health community that has shaped the development of health and health systems in Malta during this period. We were overwhelmed by the positive response and interest that our proposed special issue elicited. The result is an overview of public health in Malta encompassing simultaneously a unique collection of historical processes and events made available in the public domain for the first time, together with the evidence-base needed to address the key challenges foreseen in the coming years.

For starters, the President and Secretary of MAPHM reflect on the key contribution that the association has made since its establishment in 1999.

In the first article, England and Buttigieg set the context within which the health system operates presently in Malta by documenting how population growth, ageing, changing fertility patterns and net immigration within the working age group have characterised the demographic transformation in Malta. Grech et. al. trace the main developments that have taken place in the health services in Malta partly triggered by Malta's accession to the European Union and digitalisation. Gatt and Distefano document the development of health information systems in Malta from their inception in the early 1980s to the current situation where Malta proudly maintains ten population-based Health Registers and a five yearly National Health Interview Survey.

Calleja and Podesta model linear projections of health care demands using adjusted population projections by age-group and gender until 2030. Their analysis reveals how significant policy and infrastructure responses are likely to be required to increase capacity of the primary health sector as well as to address bed shortages as a result of the ageing native population and a mass inflow of foreign workers.

Agius-Muscat et. al. chronicle the most important advances that have taken place in the fields of healthcare computing, eHealth and Digital Health in the Maltese Islands since 1999 demonstrating how public health physicians have been at the forefront of advances in Health IT, often acting as human interfaces between the medical and technological worlds.

Camilleri et. al. give a detailed historical analysis of the development of public mental health policy in Malta. This intimate eye-witness account is particularly timely as Malta embarks on a renewed national attempt to develop policies and strategies that need to be translated into resources and action that reap sustained improvement in population mental health and well-being for future generations.

Cardona & Debono describe the implemented of several measures to improve environmental health including legislation related to air quality, noise pollution, water and sanitation, waste management, chemicals, and electrification of the transport sector as well as strategies and polices for the promotion of active mobility such as cycling and building sustainable health system. They call for increased attention to be given to climate change which is expected to impact significantly on health and well-being in Malta given the island's geography and topography.

Borg et. al. describe how over the past five years Malta, like other countries in Europe has seen an increase in various infectious diseases such as tuberculosis, HIV, other STIs, vector borne diseases as well as outbreaks of vaccine preventable diseases notably measles. Xuereb et. al. describe the three national cancer screening programmes for breast, colorectal and cervical cancer. They discuss the challenges involved in setting up these programmes and how despite improvements in recent years, low participation rates remain a challenge.

Gauci et. al. list the strategies and measures that have been driven by public health practitioners in an attempt to address the challenges posed from unhealthy nutrition which is leading to a significant burden of disease in Malta. Baluci gives a historical overview of the myriad legislative measures that have been implemented to tackle tobacco in Malta whilst showing that in spite of decreased smoking prevalence, there remain outstanding challenges that require our attention.

In the final article of this special issue, Vincenti et. al. give a detailed account of the development of structured postgraduate training in public health medicine in Malta highlighting how public health medicine was the first specialty to have a structured programme of training established. They conclude that succession planning is crucial for the preservation of a wealth of hard-earned invaluable experience, knowledge and expertise in the speciality.

We trust that our contribution serves to shine a light on the successes, failures and ongoing challenges for health in Malta. We sincerely hope that it will inspire policy-makers, fellow health professionals and civil society to come together and work towards addressing the outstanding and emerging health challenges whilst retaining all that has worked well in order to ensure that all persons in Malta regardless of age, gender and socio-economic status are in a position to enjoy good health and wellbeing throughout their life.

TWENTY YEARS OF ADVOCACY FOR PUBLIC HEALTH

KENNETH GRECH & KATHLEEN ENGLAND

Just over twenty years ago, a small group of public health doctors met with a common vision to come together to be the voice for public health in Malta. Malta's application for EU membership had just been reactivated and in anticipation of the changes that were envisaged for specialisation and specialist training, we foresaw the need to form an association to represent the profession and also advocate for public health in Malta (and eventually in Europe).

A statute was drawn up based on these principles and we called the first general meeting with potential members on the 17th June 1999 to elect MAPHM's first Executive Committee. The Malta Association for Public Health Medicine was one of the first specialist associations to be formed and we anticipated the development of specialist training and registration by several years.

Since its inception in 1999 there have been 11 Executive Committees with 7 Presidents, who have all worked hard and striven to improve the quality of the public health specialty in Malta as well as provide a platform to discuss public health issues, both locally and in Europe.

Our membership grew to 48 full members, 7 specialist trainee members and 24 associate members, accounting for the large majority of public health doctors in Malta and of distinguished public health professionals working both within and outside of government and spanning a wide range of areas in public health. This gives MAPHM the opportunity to be at the heart of current public health issues and be the voice for public health in Malta. As a professional public health body MAPHM's role in society has always been to advocate for public health and empower the population on public health issues.

The future role of advocacy remains fundamental and MAPHM needs to continue to speak out in favour of the wider determinants of health, including: health equity and sustainability, the physical environment, health behaviour and the social determinants of health amongst other issues.

Given its nature as a voluntary organisation, its member's commitment depends on the motivation and determination of members who truly believe that MAPHM can make a difference in the health of the local population.

For MAPHM to continue to make headway into the future the increased involvement of all of its members is of utmost importance. The strength and cohesion of the specialty has allowed us to speak as one voice.This has placed MAPHM on the local and international map, gaining respect from our clinical colleagues and other public health experts abroad.

Indeed, we have been very active within European fora, sitting on the boards of the European Public Health Association, European Health Management Association, EU bodies, experts groups and agencies and for many years.

Our European credentials can be attested by the fact that Malta was selected and hosted the 5th European Public Health Conference in November 2012. Furthermore, Dr Natasha Azzopardi-Muscat a founding member and former President of MAPHM was elected to serve as President of the European Public Health Association for the period 2016-2020.

Specialist training remains a key deliverable for MAPHM. We were amongst the first to constitute a specialist training committee and indeed the first to adopt a tripartite model, with the inclusion of government and university representatives, besides those of MAPHM.

This innovative approach proved very successful in ensuring ownership and commitment from all stakeholders. We also invested in training our trainers and in developing and maintaining our training portfolio and programme. We also maintained consistent contact with foreign examiners and assessors in order to ensure objectivity in the training and assessment process. Between 2004 and 2007 15 completed their catch up training and after 2007, 21 trainees have entered our training programme.

Providing a source of independent public health local research is the next avenue which MAPHM intends to develop in the coming years. A number of entities offer funding opportunities and greater participation of MAPHM members is needed to exploit these opportunities. Further evolution of Continuous Professional Development programme and the setting up of a scientific research committee within MAPHM are more recent developments which attest to the importance MAPHM gives to this area.

This publication celebrates twenty years of advocating for public health, whilst documenting the changes that have occurred in public health in Malta over the past two decades. It also sets out the current and future challenges facing our speciality and the health of our population more broadly We augur that MAPHM will continue to grow and develop for the benefit of its membership and public health in general.

MAPHM IN NUMBERS

48 Full 24 Associate

7 Specialist Trainee

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DEMOGRAPHY

THE IMPACT OF DEMOGRAPHIC CHANGES IN MALTA ON HEALTH AND THE HEALTH SYSTEM OVER THE PAST TWO DECADES

Kathleen England, Sandra Buttigieg

ABSTRACT

Population growth, ageing, changing fertility patterns and net immigration within the working age group have characterised the demographic transformation in Malta over the last twenty years. Life expectancy has continued to increase and is above the EU average. However population growth and ageing were associated with an increase in morbidity and healthcare usage resulting in increased demand on the healthcare system. Net immigration has been associated with an increase in the cultural diversity of the population and has had an impact on the epidemiology of various conditions. Planning and delivery of health care services needs to become more targeted to meet the needs of diverse communities within the population in order to maintain and continue to build on the healthcare gains achieved so far.

Introduction

Many countries in Europe are currently experiencing a decline in the rate of population growth, population ageing and an increase in life expectancy [1], [2]. The average life expectancy at birth in the European Union in 2017 was 78.3 years in males and 83.5 years in females [3], while the median age has increased to 42.8 years[4]. In most EU Member States, this is accompanied by fertility levels which are below replacement levels[5] and the average EU fertility rate in 2017 was 1.59 [3]. Countries within the EU are also experiencing varied migration flows. In 2017, 2.4 million immigrants from outside the EU immigrated into the European Union[6] Also some countries especially in Eastern Europe are also experiencing high emigration rates of their working age population [1]. These people often migrate to other EU countries in search of work. Over the past 20 years Malta has also experienced changes in its population size and structure. Life expectancy (LE) has continued to increase and in 2017, LE in males was 80.2 years whilst that in females was 84.6 years, both above the EU average [3]. The median age in 2017 was 40.6 years [4]. Over the past two decades, demographic changes in Malta have impacted upon health and healthcare in a number of ways. While many changes have taken place within the healthcare system [7], these changes have not necessarily kept up with the evolving population changes. This paper aims to discuss the main demographic changes in Malta occurring over the past 20 years in light of their impact on the health of the Maltese population, and on the Maltese healthcare system.

Demographic trends in Malta

A number of demographic changes occurred during the period 1998-2017 in the Maltese Islands. The estimated resident population grew from 385287 in 1998 [8](mid-pop 1998) to 468056 in 2017 (mid-population 2017)[9] resulting in a 21% increase in the resident population. Population growth over this period changed from a relatively stable population growth rate up to 2011 to a much faster rate thereafter [10] (Figure 1).

This population growth was a result of different dynamics occurring across different age groups. Following the second world war similar to other European countries, Malta experienced a baby boom, which led to the rapid growth in ageing population sixty to seventy years later [11]. Gains in life expectancy over the past twenty years, which were mainly attributed to a decrease in mortality in the older age groups [12], together with a low fertility rate resulted in an increase in the older population, with persons over 65 years making up 19% of the population in 2017, when compared to 12% in 1998 (Figure 1).

A cause for concern is the fertility rate which has fallen from a low level of 1.84 in 1998 to a record low level of 1.26 in 2017 [3]. However, in contrast, the number of births has been increasing from 2007 onwards and in 2017 the number of births was similar to that observed 20 years ago. This increase in the number of births despite a decrease in the number of births per woman is mainly attributed to the increase in the number of women of child bearing age, due to net inward migration [13],[14].

In fact the number of deliveries by non-Maltese women increased from 4.9% of all deliveries in the year 2000 to 22.2% of all deliveries in 2017 [15]. Migration has affected Malta like the rest of Europe since the post second world war period[16][17]. Net immigration levels were quite low in the past, with only 5% of the population in 1995 being born outside Malta, most of them being return migrants [18].

Irregular migrants mainly from Africa started coming to Malta from 2005[19], however the greatest increase in net migration started in 2012 and continued to increase, contributing to the increased population growth in recent years. The recent increase in net migration is mainly composed of migrants from both other EU countries, as well as from countries outside the EU and outside Europe, who have entered the Maltese labour market. Indeed, 76% of net migrants in 2016 were under 40 years of age [13], resulting in an increase in the population aged 15-44 as shown in Figure 1 below

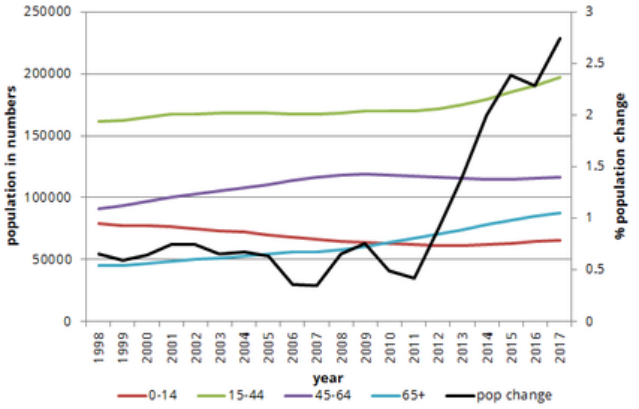

Figure 1: Trends in population figures by age group and % yearly population change from 1998-2017(10)(9)

Changes in the age structure of the population have also been accompanied by changes in the male to female ratio. For the first time, in 2014 men started to outnumber women [13] with a male to female ratio of 101.8 in 2017 compared to 98.4 in 1998. Whilst traditionally boys outnumber girls at birth and in the younger age groups (0-14 years), other age groups have observed an increase in the male to female ratio which can be attributed to an increase of inward migration of more males compared to females[13] as well as to improved mortality outcomes in males.

Demographic impact on public health

While an increase in life expectancy is a positive outcome, whether or not a person is spending that increased time in good health reflects his/her quality of life and the potential increased need for healthcare services. Over the last 10 years (Figure 2), life expectancy at age 65 years in females increased from 19.4 to 22.1[3] years. However, on average less than 60% of those years were spent in good health. In males while life expectancy at age 65 years is lower than that in females (16.2 in 2005 and 19.7 in 2016)(3), more years were spent in

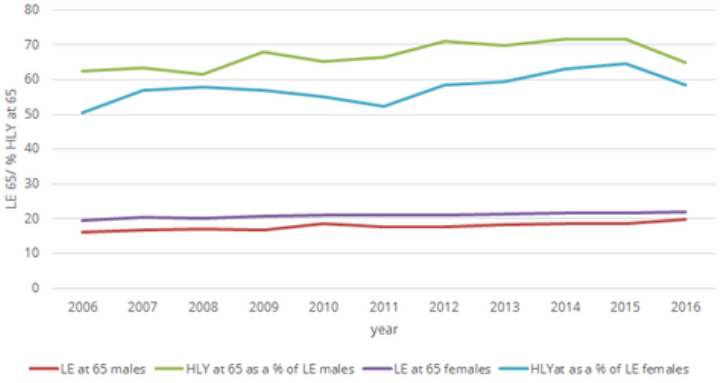

Figure 2: Life expectancy at 65 and Healthy life years at 65 as a % of life expectancy by gender (3)

According to the European Health Interview Survey carried out in 2014/15 [20], 58.7% of males and 65.1% of females aged 65 years reported a long-standing health problem, and 11.8% of males and 19.6% reported being severely limited in performing activities of daily living because of health problems. Morbidity conditions in persons 65 years and over are common (Figure 3) with the main prevailing conditions being arthritis, obesity, hypertension and diabetes in those aged 65+ years [20]. Major contributors to mortality in old age (65+) include cardiovascular diseases, neoplasms - mainly lung and colorectal cancers, pneumonia, diabetes and dementia [21].

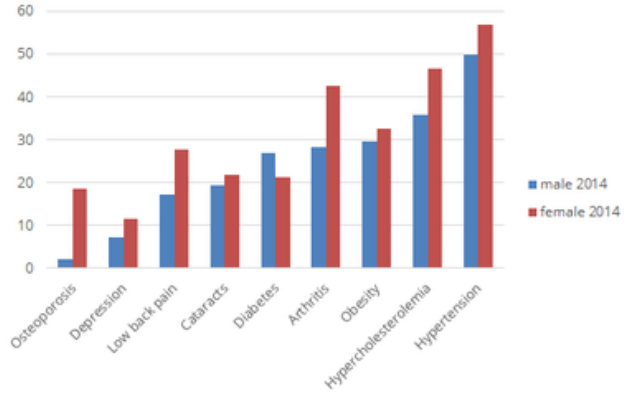

Figure 3: Major causes of morbidity in persons 65years and over (20)

Increased inward migration of a younger population as well as Malta being an attractive tourist destination has resulted in an increase in the heterogeneity of the population. This together with a more liberal society are factors which have contributed to the rise in STIs [22] [23] including HIV [24]. The incidence of HIV increased by over 50% from 2008 to 2017[25]. This increase is largely being driven by new cases amongst non-Maltese nationals. These accounted for 72% of new cases in 2018 compared to 40% in 2012 [26]. As a consequence, in 2016, Malta reported one of the highest rates of new cases of HIV in the EU/EEA[27].

A phenomenon which has been observed for some time now is the decrease in deliveries to Maltese nationals complemented by an increase in deliveries by foreign nationals [28] mostly from western and eastern Europe, but also from Asia, Middle East and Africa [15]. A local study comparing pregnant women of Maltese and foreign nationality from 2008-2017 found that whilst women of foreign nationality were less likely to be obese and have diabetes, they were more likely to have significant lower rates of first trimester antenatal visits, significant risk of more caesarean section rates and significant risk of having very lower birth weight babies [29]. Different cultures may require the healthcare services to put additional efforts to ensure the wellbeing of the pregnant mother and her baby. Also, as maternal age is increasing this too is associated with potentially increased risk during pregnancy[15][30].

Demographic impact on healthcare services

Major contributors to population change with a visible impact on the Maltese healthcare system include population growth, the ageing population and increased net immigration. These demographic changes primarily resulted in the population becoming more culturally diverse with corresponding impact on the health and healthcare needs of the population. The challenges of the ageing population had already been identified in 1987 with the establishment of a Parliamentary Secretary for the Care of the Elderly and the setting up of the Elderly Care Department in that year [19] [31].

A University of the third Age was also opened in 1992. Other changes, which were the result of pressures caused by the ageing population included the growth of residential homes for the elderly managed by public-private partnerships, the reorganisation of Zammit Clapp Hospital and Karen Grech Hospital as acute rehabilitative geriatric settings, and the setting up of a Commissioner for the Elderly [19].

The opening of a Migrant Health Unit also corresponds to the period when Malta was experiencing a high influx of irregular migrants. All these changes occurred against the background of major political changes for Malta, namely Malta's EU accession in 2004, which spearheaded changes within the healthcare system, as well as facilitated mobility of EU citizens across member states.

Population growth and population ageing resulted in increasing demand on healthcare services, which is bound to continue both due to the influx of foreigners and more so due to the ageing population. Figure 4 shows increase in the utilization of various services within St Lukes /Mater Dei Hospital [32][33]. Other services including primary care and Sir Paul Boffa Hospital/Sir Anthony Mamo hospital have also seen a rising trend in the utilization of their services [32][33].

Whilst an increasing number of visits to the A&E department has been observed between 2005-2017 for both Maltese residents as well as foreign residents and non-residents, a proportional increase in A&E attendance has been observed in both foreign residents and non-residents (Figure 5) with a corresponding decrease in the proportion of visits by Maltese residents.

Health expenditure as a percentage of GDP increased from 6.5 in the year 2000 to 9.6 in 2015. Health Vision 2000 had in 1994 already predicted increased demands on the healthcare system due to demographic shifts [31]. This increase in health expenditure was not only due to growth and ageing of the population, but also due to more advanced health technology, due to the provision of increased treatments, medicines including more costly medicines[19][31] as well as infrastructural developments including Mater Dei Hospital and Sir Anthony Mamo Hospital.

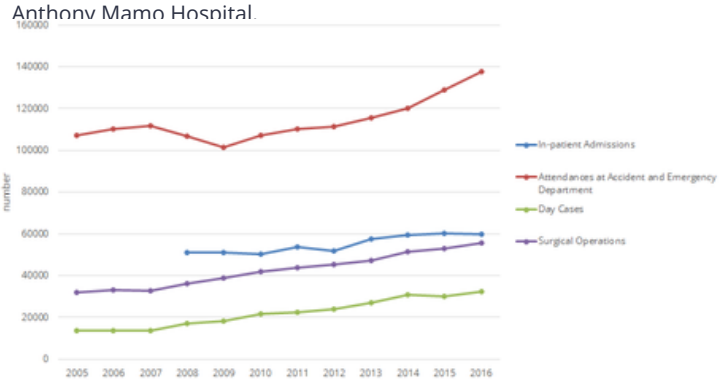

Figure 4: Trend in hospital (St Lukes/ MDH) activity between 2005-2017 [32][33]

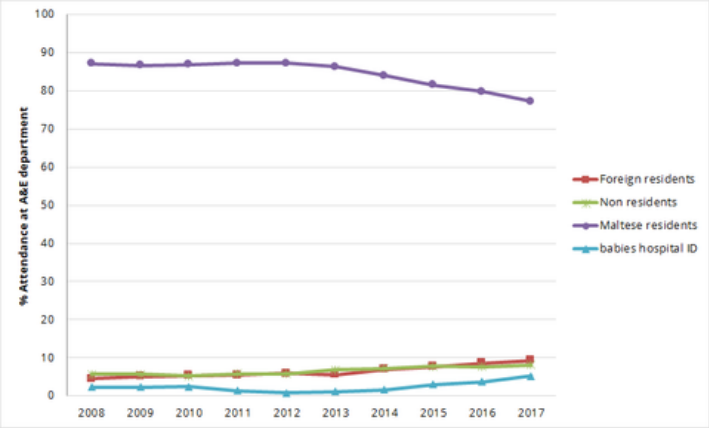

Figure 5: Trends in visits to the A&E department of SLH/MDH by type of resident[32]

Discussion: Looking to the future

Over the past twenty years Malta has undergone a rapid demographic transition with population growth, population ageing and change to a multiethnic population. Although ageing of the local population was a predictable event, the healthcare system did not prepare well enough for it but rather attempted to respond in a reactive manner with a resulting increasing strain on the main acute hospitals, emergency services and primary care services.

The needs of the ageing population emanate both from health and social services, which are often interrelated and need to be considered collectively. Better coordination and planning between the different levels of healthcare is also essential [2]. While the need for this has been recognized in the past [7] [19] [18] [31], most major health projects were constructed in isolation without adequate system-wide reorganization.

Indeed, despite the intentions by policy makers for the construction of Mater Dei Hospital to be supported by further development of primary, community and long-term health services, so as to decrease the load on Mater Dei, this in actual fact did not materialise. It had also been envisaged way back in 1994, that there would an increase in community health and social services support for the older people to remain housed in the community. This would then reduce the load on hospitals and residential care [31].

However, while some community health and social services were developed and are still running, demand rapidly outstripped supply with the impact immediately visible by overcrowding of the A&E Department and the main hospital operating at close to full capacity. Policy makers are thus attempting to balance demand and supply when it comes to the demographic shifts of the Maltese populations by investing in more public-private partnerships in geriatric settings and reorganising secondary care so as to cope with the acute inpatient population's needs.

A more positive undertaking by policy makers in labour employment, health, social policy and education has been the promotion of active ageing.

The National Strategic Policy for Active Ageing focuses on measures to promote work participation of the older age groups including involvement in the voluntary sector, promotion of social integration and promotion of independent living with effective health interventions focusing on the needs of the elderly [34].

The National Health Systems Strategy published in 2014 aimed to take a life course approach in developing health strategies with specific focus on certain population groups including children, the elderly and vulnerable groups. It also stressed the need to keep the older people in the community as far as possible, as well as emphasised the importance of strengthening health promotion, healthy behaviour and early diagnosis [35] in view of high proportion of morbidities, including hypertension, obesity and diabetes being more prevalent in older age groups. There is clear evidence of the benefits of maintaining a healthy lifestyle, as well as of exercising in old age[36].

The increasing social diversity due to net immigration being observed in recent years requires special attention to the healthcare needs of the different migrant groups. A study comparing utilization of preventive healthcare services amongst non-nationals in five different EU countries found that in most countries non-nationals particularly from countries outside the European Union had poorer access to preventive health services than nationals of that country. However this observation was not found in Malta and though may be due to limited sample size it is possible that the public health service in Malta does target these vulnerable groups[37].

The Mental Health Strategy also highlights the increased risk of mental disorders amongst migrants and their increasing demand on the mental health services[38] . However little research is available locally on migrant health and further research into this is needed to identify healthcare needs of migrants and gaps in the healthcare system vis a vis migrants.

The Maltese population today is markedly different to that of 20 years ago. Population growth, population ageing and the multi-ethnic society that has developed means that the healthcare and social needs of this population are changing and health care systems need to plan and adapt to these changes if we wish for Malta to achieve good health outcomes.

The demographic shifts have transformed the population into a heterogeneous one, whereby the social determinants of health and illness have become an urgent priority to be addressed in the planning and evaluation of services that should be more tailor-made to suit the diverse socio-economic strata of the population.

Indeed, the principles of universality and solidarity that have characterised the Maltese political system including education, health and social policies should remain prominent irrespective of the major challenges emerging from the demographic shift. Indeed, in keeping with the mantra of the Sustainable Development Goals[39], Government needs to make sure that no one is left behind.

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DEVELOPMENT OF HEALTH SERVICES IN MALTA: PAST, PRESENT AND FUTURE

Amanda Bugeja, Beatrice Farrugia, Kenneth Grech

ABSTRACT

As with other modern health systems, Malta has experienced significant changes in its health care landscape over the past two decades. Major changes have occurred, in the country itself and in its health care system, impacting both the provision and consumption of healthcare. The accession of Malta to the European Union has shaped Malta's health system by catalysing change, standardising certain processes and bringing new legislation. Investments in the infrastructure and health workforce together with innovative management policies and techniques have enhanced the delivery of healthcare to patients. The digitalisation of healthcare has also had a major boost in the past two decades, revolutionising healthcare provision while narrowing the gap between the patient and the healthcare provider. Various strategies and policies have been published and implemented to enhance the delivery of clinical services with the aim of reducing the disease burden of the Maltese population, from diseases such as cancer and diabetes. This article traces these main developments in a descriptive and analytical manner and provides a number of insights for the future.

Introduction

As with other modern health systems, Malta has experienced significant changes in its health care landscape over the past two decades. Malta's socio-economic development, EU membership in 2004 and the changing political, cultural and demographic conditions have left an indelible mark upon the provision of health care in Malta. This article traces the main developments and changes that have occurred in Malta since 1999, attempting to provide a critical appraisal apart from a descriptive account of this progress. This article only focuses on discussing health care services and excludes the wider public health dimension.

Methods

We reviewed the main policy and strategy documents and reports that have been developed in Malta between 1999 and 2018. These included national policy documents, health care service reports, medical briefs, clinical service plans, HR reports and other similar documents of relevance. The full list is provided in Appendix 1. A thematic approach was adopted, developing the main themes upon analysis. These focused upon resource developments (HR, finance, IT), infrastructure, advances in clinical services, national reforms and policies and new legislation. We reflect upon successes, areas in which less progress has been achieved and conclude by making some predictions on possible future developments.

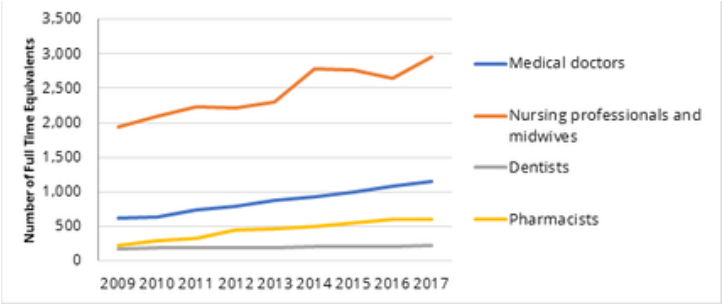
Resourcing in Health Services

Human Resource Development

The workforce continues to be the cornerstone of any health service and Malta is no exception. There have been remarkable developments in the configuration of the workforce both in numbers, complexity and diversity. The number of professionals working in the public health service has increased by 67%, from 2,966 to 4,942, between 2009 and 2017. The highest increase was registered in the number of pharmacists, which has more than doubled in this period, and in the number of doctors which increased by 88%. The number of allied health professionals, working with the public sector, increased by 26% between 2016 and 2018[1]. These changes were undoubtedly spurred by a combination of technological advancements, new service needs and the modernisation of the workforce through training, specialisation and the implementation of several significant collective agreements with unions.

The unions played an important role in moulding the way health care staff work today. Some would argue that whilst there have been many positive developments, the unions are perceived to have also hindered progress in changes to work practices and patient-centric care. Nonetheless, various initiatives have been undertaken to retain health care staff. Immediately following EU accession,

Malta experienced a worrying brain drain (2006-2009), especially in the medical workforce as several doctors were going abroad to train and work. On the 1st of June 2008, the Malta Post-Graduate Medical Training Centre was launched and it introduced the Foundation Programme and various Specialist Training Programmes for graduating medical doctors. This, together with radical changes in the working conditions of the medical class through a combination of improved conditions of work and planned career progression, has contributed to the retention and attraction of medical staff to Malta and the public health service, as can be seen in Graph 1 and Table 12.



Graph 1: Health workforce expressed as number of Full Time Equivalents working in Malta (both private and public sector) between 2009 and 2017, including doctors, dentists, nurses, midwives and pharmacists[1]

Year	Foundation Programme doctors	Specialist trainees
2012	157	269
2013	148	267
2014	190	291
2015	218	352
2016	220	380
2017	202	384
2018	237	387

Table 1: Number of doctors in training in Malta – Foundation doctors and specialist trainees (2012-2018) [2]

Collaborations have also been established with foreign institutions and hospitals to allow doctors to widen their exposure and get further training and experience from other centres. This has encouraged doctors to continue their training locally and to provide a high standard of service to our patients.

Other professions have also advanced, both in numbers and in scope. The number of registered allied health care professions has more than doubled in the past 15 years, with new professions such as medical physicists and genetic counsellors now forming part of the local health workforce. This has strengthened and consolidated their position, although they too have experienced difficulties in career progression. Conditions of work for nurses have also improved and various incentives have been in place to retain and attract local and foreign nurses. In 2018, around 415 interviews were conducted to attract local and foreign nurses to fill vacant posts[3].

Significant investment has also been placed in education and training of health professionals other than doctors. The transformation of the Institute of Health Care to the Faculty of Health Sciences is testimony to the increased importance placed upon the nursing and allied professions. A potential consequence is that educational standards may have suffered in the quest to increase numbers. Nurses and allied health professionals have also embarked on specialisation, although the route to creating specialists is likely to be different to that used by the medical profession.

A more recent phenomenon is the increasing multiculturalism of our workforce, especially in the nursing sector, where 8.5% of the total number of nurses working within the public sector are now foreign, with the greatest percentages being in Karen Grech Rehabilitation hospital (13.6%) and Mount Carmel Hospital (13.5%)[4]. This was brought about by the increasing demand on our health services and mirrors the radical demographic changes in Malta over the past few years. This presents significant challenges in terms of communication with patients, religious-cultural differences and integration into the workforce. Whilst much effort has gone into training and adapting foreign staff to the local workplace, systems need to be implemented to adequately manage this new challenge.

Financial investment in health services

Health services account for a large portion of public health finances. The main recurrent cost component is salaries (47%) given that health services are human resource intensive. Operational expenses, consumables, maintenance costs and upkeep of the building fabric account for another 11% of the recurrent budget. These exclude medicines which also constitute a major component of expenditure (around 20%)[5]. Substantial capital costs have been invested in health services most notably for the construction of Mater Dei Hospital and Sir Anthony Mamo Oncology Centre (SAMOC). The focus is now on primary care with the construction of primary care hubs, mental health and a new out-patients and mother and child complex.

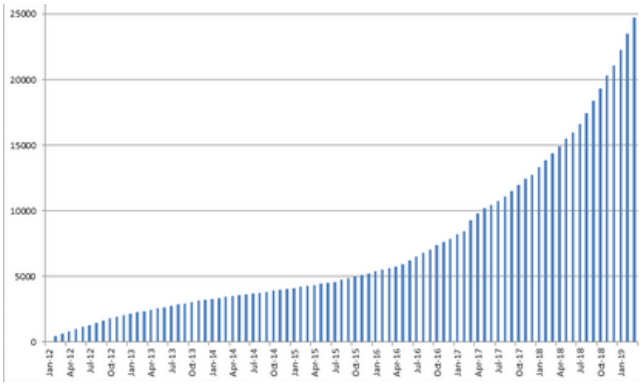
The budget for health services is based mainly on historical accounting, although itemised and activity-based costings are also calculated. Public health services have designed a pricing policy system that incorporates the BUPA coding system. However, this system has various limitations and past attempts to introduce more robust budgeting mechanisms such as Diagnosis Related Groups (DRGs) or similar systems have failed to date. Malta now officially reports in line with the System of Health Accounts and this is helpful in monitoring the various component of health financing in terms of comparative trends.

Digital Health

Various national ICT and e-health policies and plans have been drawn up over the last two decades. Consequently, several IT systems were introduced, at hospital and national level. These included a patient administration system (Patient Master Index, file tracking, admissions, discharges & transfers, outpatient appointments & registration, A&E encounters, bed management, resource management & scheduling), order communication system and corporate HR, finance and logistic IT systems.

The opening of Mater Dei Hospital, in 2007, served as an impetus to implement new technologies such as Radiology Information System, Picture Archiving & Communication System, Laboratory Information System, Pharmacy System, Operating Theatre System, Blood Bank IT system and a Cardiovascular database (CVIS). The electronic case summary and electronic medical record laid the groundwork for electronic communications beyond the hospital, to the family doctor and directly to patients through the introduction of e-health services.

MyHealth has increased, strengthened and facilitated the link between patients, health care providers and primary care. However, penetration, at least initially, was not high, as expected as seen in Graph 2, but this is steadily increasing [6].



Graph 2: Total number of people who have used myHealth at least once [6]

Most data is collected electronically through specific databases managed at hospital or ministry level. Although this should facilitate research and data collection and analysis, the use of IT in research studies and clinical studies is not as widespread as expected apart from complications which have recently arisen due to the often-erroneous interpretation and application of the new Data Protection Act.

Whilst all the above required a certain level of investment, a prolonged and sustained strategy for IT investment and development would highly benefit the healthcare sector and the country in general, as also highlighted in the National Digital Strategy 2014-20207. As part of the EU funded CONvErGE project, the introduction of electronic health records is envisaged[8].

Investment in healthcare infrastructure

The development of Mater Dei Hospital was the most material investment in the health sector (if not across all sectors) in recent decades in Malta. Its planning commenced in 1993, but it took over 14 years to open. It was the biggest and most important infrastructural project in Malta's history, but it was also very politically charged and had a convoluted history. All agreed that this investment was required and there is evidence that amenable mortality is improving[6], but how much of this is attributed to Mater Dei Hospital, is still questionable. Did Mater Dei Hospital bring about the expected quantum leap in changes in work practices and improvements in quality of care? Whilst there undoubtedly were improvements in the patient experience and certain clinical indices have improved, we may have yet to reap the full benefit of this investment. The other major sister project was the commissioning and construction of the new oncology centre, as part of a major drive to improve cancer services.

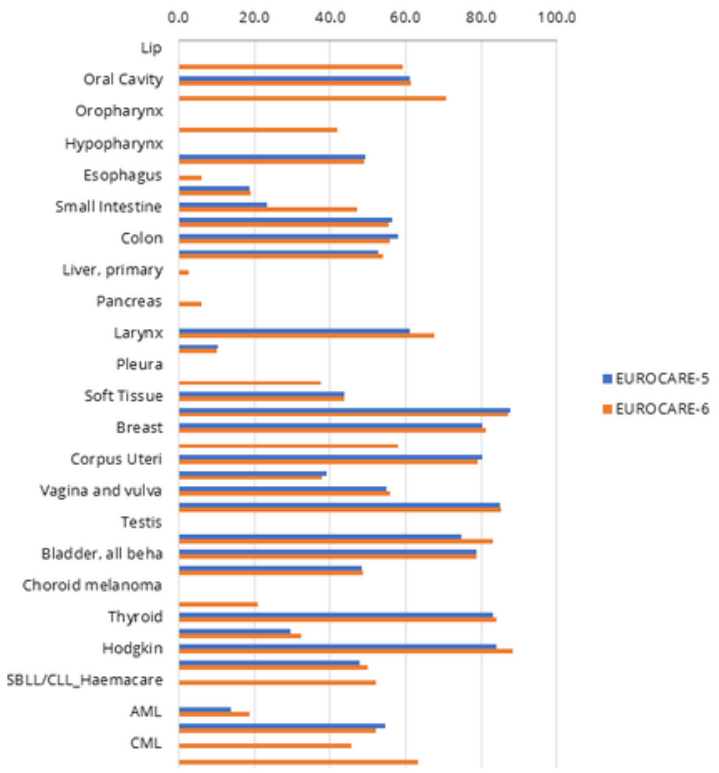
Government is currently implementing a Public Private Partnership. Originally this was intended to support investment in the infrastructure of rehabilitation services and as well as medical services in Gozo. However, after almost five years, the benefits of these concession projects are still unclear to many.

This policy was also adopted as part of its wider commissioning function, where innovative commissioning methods were employed both within Mater Dei Hospital and with the private sector to be able to tackle unmet needs and lower waiting lists. This has increased equity within the population by reducing waiting times to access certain surgical procedures, which was previously an access barrier to people who used only public health care.

Improvements in clinical services

As expected, several new and improved services were developed over the past 20 years. Most of these services were developed in response to national policy that often arose from clinical or societal needs identified at local or European level. One of the most notable services introduced was the national breast cancer screening programme which was launched towards the end of 2007[9].

Following this, colorectal cancer screening and more recently cervical screening were also introduced. To date uptake rates have not reached European norms and more effort is being put into educating and encouraging the public to attend screening. Also, although the 5-year relative survival rate for breast cancer has been increasing steadily since 1990, it continues to remain lower than the European average (based on 29 European countries grouped into five European regions)[10].



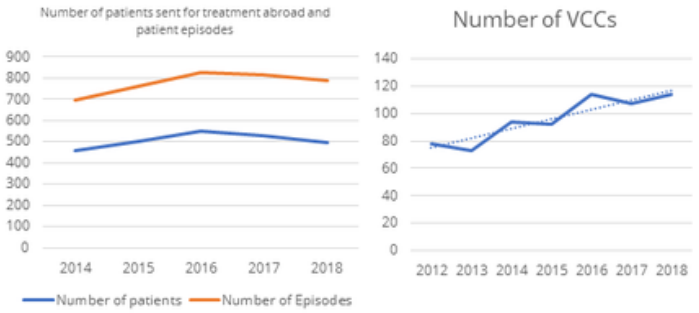
Graph 3: Comparison between EUROCARE-5 (followed up patients till 2010) and EUROCARE-6 (followed-up patients from 2011 onwards) survival estimates, for Maltese patients. Adult cases diagnosed in 2000-2007. Five-year Age Adjusted Relative Survival (AARS), Ederer II method(13).

This included investing in human resources, training, the advent of care protocols and guidelines and the construction of a new cancer centre. This Plan was followed by yet another National Cancer Plan, which was launched in 2017.

The second Plan continues to work on the success stories achieved by the first Plan while addressing new challenges. Although, the incidence of cancer, in Malta, has continued to increase, and is expected to continue increasing by 1.5-2% per year[12], we have also started seeing improvements in the survival rates of most cancers (Graph 3) thanks to various screening initiatives, the provision of a wider array of clinical services and treatments to cancer patients and the introduction and monitoring of clinical care pathways for common cancers[13].

Another new service that was rolled out after lengthy negotiations was the Pharmacy of Your Choice scheme (POYC). This was long overdue and despite the initial problems with shortage of medicines and bureaucratic paperwork and logistic problems, it is now deemed a success and is seen to benefit the public greatly. Electronic prescribing and dispensing is the next major deliverable that needs to be implemented.

Surprisingly, until 2014, Malta lacked a diabetes strategy, despite the high prevalence rates. The National Diabetes Plan was an attempt to redress this shortcoming. Various investments have been made to deal with the ever-increasing number of diabetic patients, while investing in health promotion and educational campaigns to prevent the major risk factors that increase the risk of diabetes. Investments have also been made in helping diabetic patients control their blood glucose levels.



Graph 4: (Left) Annual number of patients sent for treatment abroad (UK and outside the UK) since 2014 and the number of episodes (the number of times they were sent abroad) in comparison to the annual number of consultations performed by visiting consultants (VCCs) at Mater Dei Hospital since 2012 (right)15,16.

New medication was introduced in the Government Formulary List, the entitlement to blood glucose monitoring sticks and monitors was increased and all diabetic patients have become entitled to free dentures and spectacles, if needed[8].

Various collaborations have been established with foreign institutions and hospitals to establish a clear, safe and direct route to send our patients for treatment abroad or to get foreign experts to provide their service to our patients locally and share their expertise with our healthcare workforce.

On average, 507 patients are sent each year for treatment abroad. Figure 4 shows that while in past years the number of patients being sent abroad was increasing steadily, since 2016 this increase has been slowly reversed[15]. This was only possible thanks to the ever increasingly specialised local health workforce and to an increased number of Visiting Consultants[16].

These initiatives have allowed more patients to receive treatment locally and reduced the travelling burden on the patients and their relatives.

More recently, there have been ongoing efforts in preparation for Mater Dei Hospital to join European Reference Networks to further facilitate cross-border healthcare, specifically on rare and complex diseases.

Health service reforms and new legislation

A plethora of health service reforms and new legislation were introduced over the past two decades. Whilst it not the intention to enumerate them here, a few deserve special mention. Due to EU membership, most of Malta's public health legislation was revised or redrafted. However, due to the principle of subsidiarity on health matters, health service legislation was not directly affected by EU membership. One of the main changes in legislation was the Health Act[17], passed in 2014, determining the organisational and functional orientation of Malta's public health services. However, although this was an enabling act, subsequent legal changes were not followed up, such as detailed legislation on budgeting and pricing of clinical services. Other important legislation includes the Cross-Border Healthcare Regulations of 2013, the Human Organs, Tissues and Cell Donation Act of 2016 and the Healthy Lifestyle Promotion and Care of Non-Communicable Diseases Act of 2016, although the latter is not directly healthcare-related.

Emergency Preparedness

In 2014, the Maltese health care system showcased its emergency preparedness through its involvement in the Libyan Humanitarian Initiative. The Ministry for Health worked hand in hand with the Ministry for Foreign Affairs and the Malta Police Force to offer support to Libyan patients.

A health contingency plan for mass influx of injured migrants was created to ensure a fair triage system, safe transport of patients and their admission into various hospitals around Malta. A robust communication system was created to allow the smooth running of the said contingency plan and the tracking of these patients, for security reasons, while they were in Malta. Until the end of 2015, 165 injured Libyan patients had arrived in Malta and were given the necessary treatment. This was done without hindering in any way the smooth running of the day-to-day activities and provision of service to the local Maltese population[18].

Areas requiring further attention

Even though significant progress was registered on many fronts, some areas are still either underdeveloped or lacking the required political impetus. For example, whilst the introduction of no fault legislation has undergone consideration for many years, no steps towards its implementation have been taken.

This is deemed necessary to instil a culture of reporting incidents and near misses as part of a wider push to improve quality and standards of care. There are also some sectors of care that merit further attention, and which have been somewhat neglected for many years.

There have been several attempts at reforming primary care, none of which have succeeded. The current focus is not to implement a major reform but to develop services in the community through investment in primary care regional hubs and personnel. The new sectoral agreement for general practitioners has indeed succeeded in retaining and attracting new blood into the sector. Oddly enough, both the concept of regional hubs and the reorganisation of medical staff were two cornerstones of the last reform attempt in 2008.

Another sector in dire need of reform and change is mental health. Although much progress was achieved such as the new Mental Health Act and the institution of the Office of the Commissioner, reforms in clinical care and work practices are still required. 2019 should see the launch of Malta's first national mental health strategy, with resultant high expectations, the draft has been launched for consultation in December 2018[19]

Innovation is needed in the areas of health care financing and pricing policies, to come up with methods that will enable us to embark on and carefully monitor more commissioning projects, to ensure value for money and patient safety, while keeping the patient at the centre of our health care system6.

Conclusion

Over the past two decades, Malta has seen dramatic changes within its healthcare system. These changes have provided a more holistic and comprehensive service and a better standard of care to the Maltese population, while reducing inequalities and barriers to access to care.

This is reflected in the amenable mortality, which has decreased, in both sexes, between 2000 and 2014, by 3.8% per year[6]. Nonetheless, the ever growing and diversifying Maltese population and international pressures still pose many challenges to the Maltese healthcare system which will need to be tackled in the near future.

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MALTA'S CHANGING DEMOGRAPHY

MALTA'S CHANGING DEMOGRAPHICS - PROJECTING MALTA'S FUTURE HEALTH SYSTEM DEMANDS TO 2030

Maya Podestà, Norman Galea, Neville Calleja

ABSTRACT

Malta's health system is constantly adapting to challenges. Recent demographic changes are delineated by an ageing native population and a mass inflow of foreign workers. These economic immigrants have contributed significantly to the solid growth of Malta's economy, but have also added significant pressure on its infrastructure, including on the health care system. Using a purely demographic model, linear projections of health care demands were built using adjusted population projections by age-group and gender until 2030. Projections indicate that attendances at the Accident and Emergency Department, Primary Health Care Centres and psychiatric out-patient clinics will continue to increase, together with cancer incidence rates, a major health cost driver. Projected total number of births and attendances at the genito-urinary clinic are expected to decrease. Hospital admissions and bed night use is mostly driven by the ageing population who are expected to exert a strong pressure on public health care spending. Significant policy and infrastructure responses are likely to be required to increase capacity of the primary health sector as well as to address bed shortages.

Introduction

Over the past two decades, the health system in Malta has had to respond to multiple challenges brought about by socio-economic and demographic change. The capacity of the health system is constantly being both extended and stretched, trying to keep up with a continuously evolving environment driven by a number of factors. This is primarily led by population growth due to immigration of workers and pensioners, demographic ageing and a strong tourism industry, not to mention lifestyle factors such as risk-taking behaviours [1].

Malta is traditionally an emigration country, however, the warm Mediterranean climate, friendly English–speaking people and constantly increasing demand for both seasonal and skilled labour have attracted more and more foreigners to relocate to the island [2]. With insubstantial recent local population increases and a fertility rate of less than two births per woman since 1997 [3], the main contributor to the increase of the Maltese labour force has been foreign labour. Mass inflows of non-Maltese workers, especially since 2014 have helped to offset the declining Maltese working-age population, as well as boosted Malta's growth. Economic immigrants have contributed significantly to Malta becoming one of the most dynamic and best performing economies in Europe over the past four years [4].

Malta's economy has grown at a solid pace, maintaining momentum [5]. Real GDP growth is estimated to have reached 6.2% in 2018, and growth is expected to continue, albeit at a slower pace [4]. Growing economies in turn continue to necessitate more foreign workers, with further influx of foreign workers in Malta not only inevitable but necessary. There were almost 43,000 foreign workers registered in Malta in June 2018, more than double the figure of 21,000 in 2014. These include 12,407 non-EU workers along 30,564 from the EU [6],[7].

While the rise in potential output growth is welcome, associated population growth is likely to pose a number of challenges and additional stress on the infrastructure, including on the healthcare system. Investment to upgrade the public infrastructure is necessary to sustain the continued influx of foreign workers. The increasing diversity of the population in itself creates new challenges, and health care service planning and delivery need to continuously adapt to and target the needs of the population and its composition in order to remain responsive.

In 2016 76% of net migrants were under the age of 40 years, which has been a common phenomenon in recent years. Malta has thus noted an increase in the population aged 15-44 years, in an otherwise ageing population [8]. The changing population demographics are expected to result in altered demands on the health care system and services, especially driven by migration and the elderly. This study has selected specific areas within the health system likely to be affected by the transitional age-group population change, and built projections of what the demands on the health care system in these areas are likely to be based on population projections.

Methodology

All population projections are surrounded by considerable uncertainty since these often depend on various assumptions and are based on expectations that these will remain valid for a relatively long period of time.

National level population projections undertaken by Eurostat using 2015 as the base line were revised using the latest population data available from the National Statistics Office for 2017 to create baseline projections of the population in Malta for the next decade, with linear projections by five-year age group. These take into account the recent and ongoing trends in population change and the likely future size and structure of the population, with the working age population expected to continue growing at a steady rate until 2022 [9]. This relates to the current economic policy, which is expected to last throughout the current government legislature going through to 2022. The authors do not feel they are in a position to forecast the nation's economic policy past the time of the next general elections due to the possibility of a change in leadership. They thus thought it prudent to make the assumption that post-2022 the projected influx of migrant workers will not assume the same rate of growth, but will plateau. In this way they opted for a conservative estimate of the number of working migrants, which is in line with the decreased rate of growth forecast for Malta [4].

The latest population projections released by Eurostat provide a main scenario and four variants for population developments from 2015 to 2080 [10]. In comparison with Eurostat's 'high migration' scenario for Malta - which implies a net migration assumption to be approximately half the net migration observed since 2014 – one can note the same overall growth across all age groups. It appears that the high migration scenario falls short on two counts: firstly, that the total population does not expand enough; and secondly there is a disparity between age groups. Since select age groups are growing at a greater rate, the high migration model effectively under-estimates middle age-groups, which represent the majority of the foreign workforce.

Available health service data was requested from Mater Dei Hospital and the Directorate for Health Information and Research and applied to the projected Maltese population. Linear projections by five-year age-groups were built to project the likely future demands on the health system for specific areas. Certain health care services and indicators believed to be impacted in one way or another by the current migrant-driven population growth were selected. Baseline data by age-group, gender and identity card letter for the last available full year of clean data was collected for attendances to the public health system's main accident and emergency department, primary health care centres, psychiatric out-patient clinics and genito-urinary clinic, as well as data for the number of birth deliveries and overall cancer incidence rates. Most of the areas for projection indirectly relate to service use by the age groups in which the vast majority of the foreign workforce fall. Cancer incidence was also included as it is a significant cost driver of any health care system, and an area that impacts heavily on health expenditure.

Acknowledging that Malta's recent demographics include an ageing population coupled with increased life expectancy, projections for the health care demands of medical and surgical in-patients were calculated to estimate the hospital bed days required per year in both these areas. This was done using data for discharges from Malta's main acute teaching hospital, Mater Dei Hospital. With such utilization being higher among the older age-groups, these indicators are somewhat more native-driven and give an overview of the expected broad effects and burden on the health care system over the next decade. For the purpose of calculating surgical discharges and bed night utilization, surgery department data includes the following specialties: general surgery, emergency surgery, ENT, paediatric surgery, plastics, urology and vascular surgery.

Despite the widely referred to phenomenon of the healthy immigrant effect, where immigrants are on average healthier than the native population, with selectivity playing an important role, there is also evidence of convergence of migrants' physical health to native-born levels with time [11],[12). For the purpose of this study, it has been assumed that immigrants in Malta share the same morbidity profile as native-born, and that the future morbidity and mortality profiles of the resident Maltese population will remain the same as for the current population.
In line with the 2030 Agenda for Sustainable Development laying out the Sustainable Development goals and guiding the United Nations Development programme policy, Malta is currently developing a new forward looking overarching National Health Strategy to cover the period post 2020, to 2030. With this in mind, the timeline for which projections of health care service utilization and other related indicators were calculated extends until 2030.

Projections are purely demographic and do not take into account any other potential compounding factors which may affect healthcare demands.

Projections

Primary Health Care and Accident & Emergency Department

In general, the first points of contact for a patient with the public health care system are invariably the Primary Health Care (PHC) sector, and the Accident and Emergency Department (A&E). Both provide easy access points for any one requiring health care, with or without a referral ticket. Figure 1 demonstrates the projection of attendances in Primary Health Care and at the A&E department at Mater Dei Hospital. Basing projections on 2018 data, where 89% of PHC attendances were among Maltese citizens and the remainder foreigners, total attendances in Primary Health Care are expected to increase by 15% from 1.06 million attendances in 2019 to 1.22 million in 2030. This results in an additional 14,500 appointments per year.

The projected situation for attendances at the A&E department from 2019 to 2030 is similar, however the outlook is slightly better with an expected increase in attendances of 6.5% from 144,089 to 153,867. In 2018 20% of all A&E attendances were by non-Maltese persons, a figure which also includes tourists. In fact, 3,678 of these attendances were by citizens of other EU Member States (MS) who were entitled for free treatment on presentation of their European Health Insurance Card, but for which Malta claimed back the costs from the host Member State. Of note, the proportion of EHIC cards issued to non-Maltese increased from 2.4% in 2011 to 3.9% in 2019, with the number of EHIC claims Malta received from other EU MS for EHIC card use among foreigners increased from 74 in 2011 to 227 in 2018.

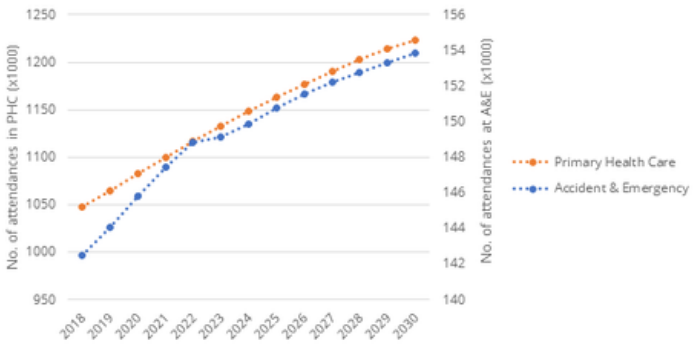

Figure 1: Projections of attendances in Primary Health Care, and at the Accident & Emergency department in Mater Dei Hospital (2019-2030)

Projected number of birth deliveries and GU Clinic attendances

The proportion of deliveries in non-Maltese mothers increased from 13.8% to 17.1% in just one year from 2013 to 2014, corresponding to the time when larger inflows of foreign workers were observed. This figure further increased to 19.9% of deliveries in 2016 (13,14). Figure 2 demonstrates that birth deliveries in Malta are projected to decrease from 4390 in 2019 to 3742 in 2030. The decreasing birth rate corresponds to a relative reduction in the projected female population of child-bearing age, which is observed among those aged 39 years or younger. With a birth rate of 1.45 in 2016, one can expect this to continue decreasing, and will further contribute to Malta's ageing population.

Total number of attendances at the Genito-Urinary (GU) clinic at Mater Dei Hospital have recorded an increase of 30-40% year on year for the past few years, which is consistent both with an increase of the population aged 15-44 years, as well as potentially higher sexually transmitted infection risk behaviours, an increasingly common occurrence mainly related to a perception gap of people underestimating their risk (15). According to our projections, using baseline data from 2018, one can expect that attendances at the GU clinic will gradually decrease slightly over the span of the next decade from 6395 appointments in 2019 to 5797 appointments in 2030. The projected rate of decrease is higher among females (11.5%) than males (8%).

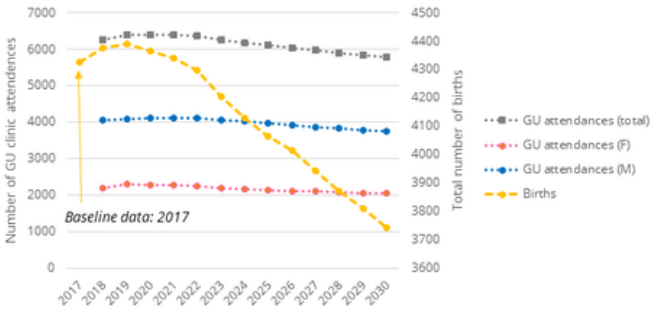

Figure 2: Projection of number of birth deliveries, and attendances at the Genito-Urinary Clinic, Mater Dei Hospital (2019-2030)

Projection of Cancer Incidence and Psychiatric out-patient attendances

Cancer remains one of the leading causes of morbidity and mortality worldwide. In 2016 there were 3291 new cases of cancer among the Maltese population, of which 1825 were in males, and 1466 were in females. The vast majority of the new cancer cases were among Maltese, with only 7% of the total number of cases among foreigners. Projections of cancer incidence show a constant rate of increase, from 3609 cases predicted for 2019, to 4515 cases in 2030, as can be seen in Figure 3.

This relates to an effective increase of 22.5% to a predicted incidence rate of 915/100,000 population in 2030. Neoplasms are major contributors to mortality in old age, and would be expected to increase in relation to Malta's ageing population (16). Cancer is a major driver of the healthcare system, with diagnostics, treatment and care contributing to a large percentage of the healthcare budget and spending. The projected 22.5% increase in incidence rate over the next decade is likely to impact significantly on the healthcare system.

While it has been suggested healthier and better educated people are more likely to emigrate, a variety of factors may over time produce a decline in what may have initially been a healthy migrant status. In fact, numerous European studies have found higher rates of common mental disorders among migrants as compared with non-migrants (17). Data on attendances at psychiatric out-patients (POP) clinics for 2017 indicate 720 out of 12,503 attendances were among foreigners (5.8%). Projections of POP attendances up to 2030 are shown in Figure 3 and indicate a steady rate of increase until 2022 following which they remain relatively stable until 2026 with a very slow rate of increase thereafter. The percentage increase of attendances from 2018 to 2030 is that of 3.8%. Appointments are more common amongst females despite the larger proportion of the males in the projected total population.

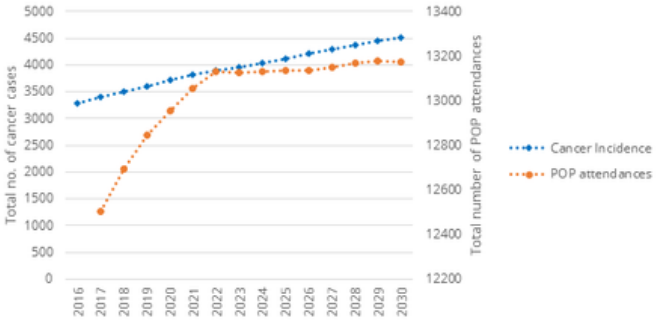

Figure 3: Projections of cancer incidence and psychiatric out-patient attendances (POP) in Malta (2019-2030)

Medical and Surgical discharges from Mater Dei Hospital

Figure 4 depicts projections of the number of the total number of bed nights used by medical and surgical in-patients at Mater Dei Hospital, and also indicates the projected numbers of medical and surgical hospital beds that will be required over the next decade to meet the projected demands. There were 26,150 discharges of medical in-patients in 2018, who collectively utilized 140,701 bed nights – an average of 5.4 nights per admission/discharge. Likewise, during 2018, Mater Dei saw 29,890 discharges of surgical in-patients who each utilized an average of 2.4 bed nights. The projections demonstrate constant rates of increase of bed nights for both medical and surgical wards, with a much higher rate noted for medical patients. Indeed, it is forecasted that by 2030 the number of bed nights required by medical patients will increase by 50% over 2018 to 211,340.

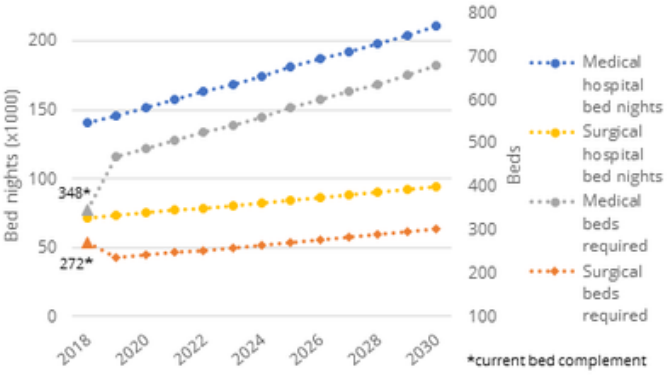

Figure 4: Mater Dei Hospital in-patients and beds
Projected utilization of medical and surgical bed nights, and Projected number of hospital beds required to meet demands (2019-2030)

Bed occupancies above 85% could adversely affect safe, effective hospital function, and an acute hospital can expect regular bed shortages and periodic bed crises if average bed occupancy rises to 90% or more [18],[19]. For this reason, the projected required number of hospital beds is based on the industry norm of 85% occupancy. While the 2018 bed complement at Mater Dei amounted to 272 surgical beds, a slightly higher amount than those required, the 348 medical ward beds are a far cry from the estimated requirements. In fact, the average bed occupancy in the medical wards and to a certain extent even in the surgical wards, almost always exceeds 90%, and it is common occurrence for surgical beds to be taken up by medical patients. When taking into consideration the drastic increase in medical bed nights that are projected by 2030, the required medical bed complement should be doubled by 2030.

Mitigating the challenges through to the future

Malta's health system faces ongoing challenges, big and small, including increasing capacity to cope with the growing population, adapting to an increasingly diverse population, redistributing resources towards the primary care sector, and ensuring access to expensive new medicines while maintaining improvements both sustainably and efficiently [1].

Our projections make it evident that the capacity of the public health system, most especially within the hospital and primary health care will need to expand to be able to cope with Malta's changing demography. Issues of an ageing population are here to stay, and are highly likely to significantly affect expected utilization in certain areas such as medicine and primary health care where increased permanent infrastructure and human resources need to be high on the agenda for long term planning. Policy measures should strongly consider expansion and capacity building in the primary sector, not only to cater for the projected increase in attendances but also beyond the projections, in terms of expanding the primary care service portfolio. Better prevention, surveillance, monitoring and healthcare delivery in the primary are likely to contribute towards reducing hospital admissions as well as addressing the noncommunicable disease burden.

Other areas such as POP, GU, and obstetrics may adapt and cope well with shorter term measures that directly address the current projected increases in service utilization which are then followed by shrinkage. This would mean that new staff employment will be followed by their redundancy.

Other options to consider as easier ways of mitigating expected short term challenges include locum or temporary employment and the re-employment and retaining of retired and retiring staff, together with public-private partnerships.

Mental health is known to differ between migrant groups yet data is scarce [20]. The out-patient psychiatry sector is one that warrants closer monitoring as it appears that it may be under-utilized by foreigners. The estimated future number of incident cases of all cancers worldwide will increase from 18.1 million to 29.5 million from 2018 to 2040 [21].

Malta is no different, and the first steps to address this are to strengthen work on prevention, promoting healthier lifestyle choices, increasing awareness and promoting the uptake of screening as means of facilitating early diagnosis. Further investment into radiology equipment will also be necessary to cope with demands in light of the projected increase in cancer incidence.

Further shift in health burden over the coming years is likely to be defined by specific groups of the population, namely the elderly and the working age migrants. Further results from projects currently underway such as that on the social determinants of health will further help to inform policy in the future. Total health expenditure as a percentage of GDP was 9.1% in 2015, with increasing government spending on health care – current health budget for 2017 increased by 11.4%, now accounting for over 15% of general government expenditure [1],[22].

Demographic change is only one of several factors driving health care spending, alongside the health status of the population, macroeconomic variables, relative cost developments in health care and the incorporation of technology (23). The Global Burden of Disease project predicts that spending on health care is expected to reach $8,586 per person by 2040, based on 2017 purchasing power parity, 2.35 times what it was in 2015 (24). With these projections it appears that further increases in spending may be required even earlier than that.

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HEALTH INFORMATION SYSTEMS IN MALTA – PAST, PRESENT AND FUTURE

Miriam Gatt, Sandra Distefano

ABSTRACT

It is well documented and recognized internationally that good quality health information is essential to public health in its endeavor to protect and promote the health of a nation. The need for dedicated health information systems within the Ministry for Health in Malta was felt more than 30 years ago, when the Chief Government Medical Officer at the time called for the introduction and implementation of a health service information system. This led to the development of a dedicated unit with the aims of providing basic statistical and epidemiological information, conducting surveys and evaluating health programmes. Over the years, this unit has developed into the current Directorate for Health Information and Research which is now responsible for maintaining ten population-based Health Registers and a five yearly National Health Interview Survey, in addition to other ad hoc research. This article traces the development of health information systems in Malta from their inception in the early 1980s to date.

Background

"Nothing exists until it is measured." [1] This famous statement made by the acclaimed Danish physicist Niels Bohr back in 1930 is acutely relevant to public health. Nowadays it is well recognized that appropriate decision-making for public health is dependent on the availability of timely and accurate data. It is the function of health information systems to provide and make sense of such data.

History is replete with examples that highlight how health information data has contributed immensely to the protection of population health. Early use of health information to influence policy and practice is evidenced in the mid-1800s with John Snow's work during the cholera epidemics of London, when the eminent English physician was able to identify the source of infection using information on deaths and addresses of each cholera victim[2] The Great Smog of London in 1952 was yet another early instance when health information was pivotal to protecting public health: information on deaths, causes and distribution identified air pollution as the cause of increased mortality.[3],[4]

More recently, health information systems have been crucial in recognizing the health risks of specific exposures and behaviours including smoking, alcohol and certain lifestyles. They have also served in vital research into the association and causation of several major public health concerns including cancer, cardiovascular disease, birth defects and dementia, to name but a few.

Recognizing the importance of having timely, accurate health information, several countries have invested in the comprehensive registration and surveillance of causes of death, patterns of disease and chronic health conditions. Such registration continues to be developed globally and is most advanced in Western countries and parts of Asia. Efforts to better document health data in low income countries is ongoing through several international initiatives[5].

Over the years, health information systems have shifted from paper-based to computer-based processing and storage, and from departmental or institution-based to regional, national and even international systems. Similarly, users of such systems have also extended from health care professionals and administrators to now include health consumers (including patients and relatives), planners and researchers[6].

Today it is recognized that effective health information systems should address several domains, including demographics, health determinants (socioeconomic, environmental, behavioural and genetic factors), health system functions (inputs, processes, performance and outputs), health conditions and outcomes and health inequities[7]

Relevance, accuracy, completeness of ascertainment, timeliness and appropriate distribution and release of information are of essence for all health information systems[8]. Having quality information is not enough to justify its collection until it is put to effective use[9].

Other important uses of routine health information systems include epidemiological surveillance and research and comparisons between countries. For purposes of country-comparisons it is essential that data collection, processing and analysis is harmonized between countries to allow for meaningful comparisons and interpretation.

Health information systems therefore serve multiple functions at various levels; at the level of individuals and communities, information may contribute to improve clinical management and service provision. At higher levels, health managers and planners can make informed decisions on the functions of health facilities, and at the highest levels health information may direct strategic policy making and resource allocation[7]

This article aims to document and trace the development of health information systems in Malta, through the review of relevant Ministry for Health documentation and personal communications with public health officials who have worked within the field.

Historical Development of Health Information Systems in Malta

Establishing a dedicated unit

The importance of effective health information systems was recognized by the Chief Government Medical Officer (CGMO) in the early 1980s, who requested that a dedicated unit responsible for coordinating the collection, collation, analysis and reporting of health information within the Maltese Health Ministry be established.

This proposal was given very high priority by Dr Alfred Grech, the CGMO at the time, partly due to the locally felt need and partly in response to the data submission requirements by the World Health Organisation (WHO), as "Malta was committed to provide Health ndicators required by WHO by the year 2000" [10]. Initial impetus was given by the CGMO setting up a meeting on the 25 June 1982 with the Computer Project Manager (Mr. Emanuel Camilleri) of the Computer Centre of Swatar, Dingli. The agenda of this meeting was the implementation of a dedicated 'Health Services Information Unit' with the aim of strengthening and evaluating Health Services in Malta(10). The objectives proposed for this Unit were:

> *"1 – To provide in a systematic, analytical and useful manner basic information (statistical, epidemiological and otherwise) fundamental to the health services and their development*
> *2 – To conduct monitoring surveys; and*
> *3 – To ensure a critical evaluation of the development and implementation of health programmes and the relevance, formulation, efficiency and cost-effectiveness of such programmes, in the light of pre-determined health indicators and of the findings derived from the aforementioned surveys." [10]*

Subsequently, Mr Ernest Causon - the Head of Medical Records at St Luke's Hospital - was assigned to lead the project to develop health information systems within the Department of Health, and in this regard was given statistical and computer training placements at the Computer Centre in Swatar [10].

In March 1983 a Health Information Unit (HIU) was officially set up at No. 6, Harper Lane, Floriana with recruitment of several staff members. The first projects proposed were the implementation of a computerised immunisation programme and recording communicable disease cases.

In March 1984, a tender for computer equipment with a 'minimum 512KB Main Memory' and an 'operating system capable of supporting 10 jobs concurrently' was requested by the CGMO. This tender was subsequently issued through the Swatar Computer Centre in July 1984.10 This computer system would be housed in Swatar, Dingli and terminals made available at the Health Information Unit.

Collaboration with WHO

Further assistance in the development of this Unit was sought through consultations with 'a team (Computer staff and Medical Epidemiologist) from the World Health Organisation European Regional Office" who would give advice on equipment and training requirements and long-term development of the system. WHO would also provide much needed financial assistance[10].

A WHO consultation visit occurred in January 1984. A report was drawn up by the WHO consultant, Dr M Kataja, identifying diabetes as '*one major health problem in Maltese islands*' and suggesting that *'a registry on diabetes could be an example of the problem oriented way of thinking towards the goal of computerised medical records…The diabetes registry could be taken first…*'[10].

Unfortunately, at the time of writing, no national operational Diabetes Register exists, although it is envisaged that such a register will be developed in the near future.

Another visit in 1985 by WHO consultant Mr K Floisand resulted in a detailed report on the plan for further development of the 'National Health Information System for Malta' (December 1985). This report suggested that the involvement of medical staff in the process was crucial, and it was expected that 'two medical specialists will qualify in Community Medicine and Statistics' in 1986[10].

Short computer training courses were provided to key members of staff between October 1984 and January 1985. This included training in: COBOL programming, Management Techniques, Presentations and Communication Skills, Basic Programming Language, Fortran Programming Language and Systems Analysis and Design.

Move to St. Luke's Hospital

In 1985, plans to relocate and develop more appropriate premises for the Unit were undertaken. The ground floor of the 'Sisters Quarters' at St Luke's Hospital were identified, and the entire unit moved to these premises that year.

According to a summary of the functions and proposed developments of the Unit written up in August 1985, at this time ongoing registration included: birth registration for purposes of tracking immunisation, notifiable communicable disease registration, obstetrics, neonatal and gynaecological recording on patients admitted to maternity and gynaecological wards and work towards setting up a National Diabetes Register.

Ongoing projects and surveys included: a diabetes and pregnancy project, an occupational therapy survey, a diabetes survey, an asthma survey, a survey of smoking and alcohol habits in school children, a screening programme on scoliosis in school children and the MONICA (Multinational MONItoring of trends and determinants in CArdiovascular disease) project study.

The latter, was the first major health survey undertaken in Malta in collaboration with WHO, the aim being the monitoring of trends and determinants of risk factors associated with cardiovascular disease[11]. Projects proposed for development at that time included: 'a phased implementation of a fully computerised system of case histories' and a 'computerised "master index" of patients'[10].

In 1987, a situation report on health information services suggested that the Unit should acquire 'independent computer facilities,' moving away from the Central Government Computer System at Swatar. In 1988, Dr Julian Mamo, a qualified medical epidemiologist joined to lead the Unit and lamented that a 'personal computer capable of storing small database on which statistical analysis could be done was not yet available.'10 The first personal computer - a Wang PC funded by WHO - arrived more than a year later .

In May 1991, under the lead of Dr. Hugo Agius Muscat, the name of the unit was changed to "Health Information Systems Unit (HISU)" through a DH circular 84/91.10 In 1993, following public service reforms, the HISU became one of the line departments of the Health Division and was renamed Department of Health Information (DHI).

The introduction of personal computers and installation of an ethernet-based Local Area Network in the early 1990s provided an undeniable boost to the collection of national health data and development of national health registers and surveys. It allowed for increased possibilities and timeliness of data retrieval; meaningful analysis of the data gathered, and increased potential of release of data, information and reports.

The existing Mortality and Cancer Registers were computerised, and a new Congenital Anomalies Register was designed and set up. A National Obstetric Information System (NOIS) was also set up, inspired by the WHO OBStetrical Quality Indicators and Data collection (OBSQID) project[12].

In 1994, it was felt that a larger 'Health Data Centre' was needed to support the major computer related projects in the Health Division, and in 1997 the DHI moved from its offices outside St Luke's Hospital to its current larger premises at 95, G'Mangia Hill. In 2007, the name of the DHI was changed to 'Department of Health Information and Research' (DHIR) highlighting the work that was being done in relation to research and population-based surveys. A few years later, this department was designated as 'Directorate for Health Information and Research', as it is known today.

Supporting legislation

Amongst the first national health registers to be kept by the unit were: Births registration (namely to support immunisation requirements), Infectious Disease, Mortality and Cancer Registers. Notification of infectious disease, mortality and cancer were statutory at the time [13],[14],[15].

In 2003, the adoption of the Public Health Act - Cap. 465 (2003)16 gave the Superintendent of Public Health the right to request data collection in the interests of public health. The adoption of the Health Act in 2013 – Cap. 528 (2013), specifies that any Department established under the Health Act '*may request all information from patients, relatives, personnel, and professionals, and from public and private healthcare providers, and such data shall be given to it in cases of emergency, for reasons of public health and to safeguard the vital interest of the patient or a third person*'[17]

It is under these legal frameworks that current data collection occurs. Subsidiary legislation to better implement the provisions of the General Data Protection Regulation is currently begin developed at the time of writing of this article.

Current functions of the DHIR

The DHIR now routinely manages ten population based National Health Registers and runs a National Health Interview Survey every five years. The National Mortality Register, one of the older registers, collects information and analyses the causes of death in the population. The Malta National Cancer Registry provides information on cancer incidence, mortality and survival. The National Obstetric Information System has depicted the changes in birth rates and maternal and perinatal health over the past years.

Furthermore, the Malta Congenital Anomalies Register registers congenital anomalies occurring in births in Malta and Gozo and the Cerebral Palsy Register records all children diagnosed with this condition. Other sources of morbidity data are the National Hospitals Information System, the Rare Disease Register and the Dementia Register. The Injury Database collects data from emergency departments and provides information on injuries sustained by the population. The Organ Transplant Register keeps information on organ transplants. Last but not least, the Health Interview Survey is an important source of information about the lifestyles of Maltese society. Without such information, the development of policies and action for the improvement of the health of the population would not be possible. All Registers and Surveys are now well established and internationally recognised, participating in European and global organisations and projects.

All health information collected by these systems is kept in accordance with the governing data protection legislation. Management and overall responsibility for the registration of infectious diseases moved to the Infectious Disease Control Unit in the mid-1990s.

Details of the functions of the current health information systems at DHIR can be found as online supplementary information on the Directorate's website at :
https://deputyprimeminister.gov.mt/en/dhir/Pages/Introduction.aspx.

Leadership

Since its inception, the DHIR has been under the lead of several Senior Civil Servants, Medical Officers, Consultants, Acting Directors and Directors. These were:

Mr Ernest Causon (1983-1985),
Mr Paul Farrugia Gonzi (1985-1988),
Dr Julian Mamo (1988-1990),
Dr Hugo Agius Muscat (1990 - 2000),
Dr Renzo Pace Asciak (2001- 2006),
Dr Miriam Dalmas (2007)
Prof Neville Calleja (2007 to present).

Conclusion

The developments leading to the current Directorate for Health Information and Research show a successful and significant growth of a unit over the past three decades, from its humble but far-sighted beginnings in 1983 to its now major role within the Ministry for Health as a Directorate.

It is recognized as the official national health data source both locally and internationally, supplying health data to several organisations including EUROSTAT, WHO Health For All and OECD (Organisation for Economic Co-operation and Development) amongst others. The addition of technology and computerisation has led to significant changes in the modus operandi; information technology has given a totally different perspective to the way data is collected, processed, analysed and ultimately released.

Are we where we want to be yet? Definitely not. Health information requirements, both locally and internationally, are dynamic and continue to evolve and grow over time, hence the importance of ongoing support and resourcing from the Department for Policy in Health.

There is scope for further development of health information on several fronts. Health professionals' awareness and notification of cancer, congenital anomalies, rare disease and cerebral palsy through the DHIR web notification form still leaves a lot to be desired.

Furthermore, Malta lacks comprehensive national registration of major health conditions of concern, including diabetes and cardiovascular disease. Our Health Interview Surveys need to also include regular health examination components. Health ministry policy and planning needs to support the development of strategic health information system plans which include exploring of new architectural health information systems, new types of data collection and technologies.

Policy development is not always based on accurate local information either because such information is not sought, or because it is not available. On a global level, the Millennium Development Goals and health-related Sustainable Development Goals all highlight the need for stronger health information systems which can then feed into evidence based decision-making[18],[19] .

It is therefore crucial that the DHIR functions will continue to receive the necessary support, resourcing, development and education required. It is augured that over the next decade(s) the MAPHM will report on the continued growth and development of health information systems in Malta.

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DIGITAL HEALTH

DIGITAL HEALTH IN MALTA

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ABSTRACT

This article looks at the most important advances that have taken place in the fields of healthcare computing, eHealth and Digital Health in the Maltese Islands since the Malta Association of Public Health Medicine was born in 1999. In the Health IT world, the jargon keeps changing, and it is now fashionable to speak of "digital health", but in essence we are talking about the use of information and communication technologies for the provision of better health services. In Malta, public health physicians have been at the forefront of advances in Health IT, often acting as human interfaces between the medical and technological worlds.

The Late Nineties

In 1997, the first integrated Patient Administration System (PAS) was launched in Government Hospitals and health centres. This was a landmark development. Before then, computing activity in the health sector was based mostly on isolated PCs and modest local area networks.

This equipment had already started to bring benefit to health services. A computerised Patient Master Index had been created; not many readers will remember the manual index used in the eighties, housed in the so-called "magna" (machine) with trays full of little yellow index cards at St Luke's Hospital.

At the Department of Health Information, epidemiological registers (such as those on mortality, cancer and congenital anomalies), hospital activity analysis (HAA) and the surgical register had been computerised. This was achieved through small but efficient dBase programs designed and built in-house. The HAA system and surgical register enabled greater use by hospital management of "solid data" in management decisions, and less dependence on perceptions.

The go-live of the PAS in April 1997, using a product from Shared Medical Systems called CliniCom, was a great leap forward, because of its ambitious scale involving all the Government's hospitals and Health Centres. It involved the creation of an extensive Ethernet network spanning the whole St Luke's Hospital/Karin Grech Hospital campus and setting up better telecommunication links with other hospitals and Health Centres.

On the hospital campus, an FDDI (Fibre Distributed Data Interface) network was introduced, using fibre-optic cable. It was one of the first large fibre-based networks in the Maltese Islands, implemented in close collaboration with the Government's IT agency (MSU, later MITTS) and the hospital engineering department.

During the PAS project, the internet reached Malta, as well as technologies that made permanent wide area network links more efficient and reliable. The arrival of PCs in wards and clinics brought workplace computing within reach of many health professionals, and slowly but surely IT literacy began to grow and spread among the health workforce.

It was during these years that the first there was the first employment of people specifically for "Health IT jobs". These included the health information system trainers and system administrators for the larger IT systems. This meant that IT work started to be given its due importance, instead of being seen as something that could be added on as an afterthought to someone's job specification. The approach taken within the Health Ministry was soon emulated by other Government ministries.

The Early Noughties

These years saw the consolidation of a lot of the work done in previous years. Further modules of the PAS were implemented, such as the one in the Accident and Emergency Department, and there were the first attempts to introduce new large IT systems (such as a laboratory system to replace the various stand-alone systems in the St Luke's Hospital laboratories). Local area networks started to be introduced in other hospitals and departments across the Ministry of Health. There was also a steady growth in online communications.

Mater Dei Hospital, and beyond

The period between 2003 and 2007 was dominated by the work done to prepare and launch new IT systems at Mater Dei Hospital. A comprehensive Information Systems Strategic Plan was drawn up in 2003, which formed the basis for a tender for an Integrated Health Information System (IHIS); this was published in 2005. A

fter a lengthy evaluation procedure, the tender had to be dropped early in 2007. From then on, Government focussed on procuring the IT systems and services that were most critical for the new hospital. The most important of these were the Radiology Information System (RIS) and Picture Archiving and Communication System (PACS), the integrated Laboratory information System (LIS), an Order Communications System and, very importantly, an HL7 interface engine which handled the exchange of structured messages between the major hospital IT systems, thus creating for the first time a truly integrated hospital information system.

These systems were originally meant for Mater Dei Hospital, and therefore most of them went live when the new hospital did, in November-December 2007 2017. However, the way in which the public health service in Malta works meant that the use of these systems needed to be extended to other Government hospitals and health centres, for the whole health service to function as well possible. This work took many years and led to the establishment of a nationwide health IT network.

myHealth

The IT developments of the late noughties widened the information gap between the public and private health sector. In a bid to narrow this gap, the Government devised the myHealth portal, which allows patients and doctors of their choice to access specific types of medical records.

The myHealth service was (and remains) of special interest to private family doctors, who need to gain access to the IT assets in the public service. The first version of the myHealth service, launched in January 2012, provided access to case summaries, POYC entitlement, lab test results, medical imaging reports and POYC entitlement.

Initial uptake was limited by the fact that, for security reasons, access depends on having national e-ID credentials. These used to be difficult to get, and this limited the uptake of the myHealth service by the general public. When in 2014-2015 the national e-ID system was overhauled and new national ID cards were issued, myHealth took on a new lease of life, and usage started growing.

In 2017, a new version of myHealth was released. This was mobile-friendly, had a friendlier user interface, was available in both English and Maltese, and incorporated new sources of data, such as vaccinations. This led to a rapid growth in uptake that has so far continued unabated. By the end of January 2019, more than 60,000 patients had linked with doctors through myHealth, clearly making it one of the Government's most important and successful online services.

myHealth has continued evolving, such as through addition of online ordering of laboratory and radiology investigations that is tightly interfaced with hospital systems, and is set to continue evolving, such as through the development of a Personal Health Record component under direct patient control, viewing of medical images and interfaces with new eHealth services currently under development.

National eHealth services

In 2016, in order to address strategic eHealth needs, the Ministry for Health started working on a set of new national eHealth services. These were eventually included in the Government's "Connected eGovernment" (CONvErGE) [1] project, which aims to create and bring together several Information Technology (IT) service applications under one umbrella. This project is co-financed by the European Regional Development Fund (ERDF) [2], and runs until 2021.

The health components in this project include:

National Electronic Health Records: a software platform, backed by new legislation, allowing public and private healthcare providers to share patient data, in a controlled, secure and standardised manner, for the purpose of providing patients with continuity of care across the whole Maltese health ecosystem;

Electronic Patient Records for Primary Health Care: a comprehensive patient records system to replace the paper-based systems in Government Health Centres, that can also be extended to private family doctors;

Health Data Exchange: a new HL7 interface engine to replace the one implemented in 2007, capable of handling structured exchange of data between Health IT systems using a wider range of technologies;

Patient Registries: a system for the Directorate for Health Information and Research that will unify separate registries and provide more facilities for consumption of data through interfaces and for analysis and reporting;

Patient Data Consent Management System: a platform for systematic patient-centric recording of consent for access to personal health data in Health IT systems;

Pharmaceutical Affairs System: a system that supports the management of the Government formularies, medicines protocols and medicines specifications, that can interact with other systems within the national health ecosystem.

Cross-border eHealth Services

Following successful participation in the second phase of the epSOS[3] project (2011-2014), the Ministry for Health made a successful bid for CEF (Connecting Europe Facility)[4] funds, in order to implement and deploy cross-border Patient Summary services between 2017 to 2020, to be used when EU citizens travelling between EU countries need unscheduled health care outside their country of residence. The Maltese services are expected to go live during 2019.

eHealth Week 2017

During Malta's Presidency of the Council of the European Union, the Ministry for Health organised eHealth Week 2017[5], effectively taking the centre of the European eHealth stage. On 9th May 2017, the EU's eHealth Network held its 11th Meeting in Malta, discussing several eHealth policy issues, and deciding, amongst other matters, on the adoption of the form of words for a multilateral legal agreement (MLA) that is an essential prerequisite for the deployment of cross-border eHealth services between EU member states.

From 10th to 12th May 2017, 2,000 delegates from all over Europe and beyond met in Malta to discuss the most important eHealth topics of the day, unified by the theme "Data for health: the key to personalised, sustainable care". The eHealth Week Conference and Exhibition was a major collaborative effort between the Ministry for Health, the Presidency Unit, the European Commission, WHO's Regional Office for Europe and HIMSS (Europe).

The future for Digital Health in Malta

Digital health in Malta is expected to play a pivotal role in the health services of the future. In the short to medium term, there will be the effects of the CONvErGE projects, especially the National Electronic Health Records and the Electronic Patient Records in Primary Health Care, both public and private.

In the longer term, there will be significant impact from scaled-up application use of clinical decision support, the Internet of Things (IoT), artificial intelligence (AI), genomics and pharmacogenomics.
The paradigm shift from medicine which is centred around the health professional to an approach and modus operandi where the patient is fully integrated within their own care team is propelled forward by the advances in Digital Health.

Artificial Intelligence in healthcare has taken strides forwards since its early inception in the 1960s and today we see all forms of implementation in different clinical specialities such as medical imaging, dermatology, oncology and even public health.

Together with Big Data, we can use Artificial Intelligence to start detecting cancers using small amount of genetic material to assess the degree to which certain genes are expressed. In practical terms, the data generated by this genetic material would normally take hours to analyse but through AI, this process is reduced to minutes.

The advances and reduction in costs in the analysis of genetic material has opened the doors wide to further research in the field of genomics, where data on an individual level could inform the design of tailor-made drugs and inform doctors of potential adverse drug reactions before a drug is prescribed; a far cry from the trial and error approach experienced by so many patients and health professionals[6]. Genomics, in the context of Public Health Genomics, could even inform health policy on a national level and empower a highly-customised approach to public health interventions.

Taking it a step further, we see the advent and wide distribution of Internet of Things to devices such as heart monitors. These medical-grade devices would be directly connected to mobile networks using sim cards such as Nano Sims and eSIMs through specific networking spectrums. This allows the medical device to provide data from the device directly to remote monitoring platforms without any intermediary devices such as smartphones.

This enables health professionals to review their patients from anywhere, thus enabling patients to be treated in the comfort of their home rather than through irregular visits to hospital outpatients. Artificial Intelligence once again comes into play, supporting health professionals and alerting them at the right moment about patients who need attention and care, with a heightened potential to reduce unnecessary hospital readmissions and reducing healthcare costs.

The role of public health physicians

It is no coincidence that this article has been authored by doctors who have specialised in public health. For the past thirty years, public health physicians have been at the heart of the most significant developments in healthcare computing, eHealth and digital health in Malta.

Technologies are of most benefit to humanity when they are applied to populations in a systematic way by persons who are professionally trained to care for others. On 10th May 2017, during the opening of eHealth Week in Malta, Dr Zsuzsana Jakab, WHO Regional Director, made a statement that resonated with everyone in the plenary hall: "we need a beautiful marriage between public health and eHealth."[7] In Malta we have experienced the benefit of such a liaison for almost thirty years; may it continue long into the future.

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THE DEVELOPMENT OF PUBLIC MENTAL HEALTH IN MALTA

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ABSTRACT

Public health practitioners in Malta have been drivers of public mental health reform throughout the last twenty-five years. However, early political and financial support for the implementation of policy and strategy dwindled over the years. Whilst services continued to expand, these were not matched with the adequate injection of human and financial resources. Twenty years later, the mental health service is still experiencing problems of underfinancing as reflected by the dire state of the psychiatric hospital infrastructure, poor leadership, management and accountability structures, and a largely insufficient albeit dedicated workforce. In 2012, the enactment of the new Mental Health Act and the establishment of a Commissioner for Mental Health recharged a national focus on mental health. Mental health is now a subject for the local media, the public is more receptive, NGOs and professionals are more vocal, the significance of mental health in schools, homes, and the workplace is taking root, and the subject has gained increasing political will, culminating with the launch of a Mental Health Strategy document for consultation in December 2018. This is our window of opportunity to ensure that policies and strategies are now translated into resources and action that reap sustained improvement in population mental health and well-being for this and future generations.

Introduction

Public health practitioners in Malta have historically been champions of public mental health since at least the early 1990s. Strong political support for the development of public mental health was present at the time, with the first bold steps towards the development of community mental health services and mental health awareness and advocacy being traced to those years.

Unfortunately, support gradually dwindled in the intervening years with the result that mental health remained underfunded and under -prioritised, with an increasingly demotivated and depleted, albeit dedicated healthcare workforce. However, recent re-discovered energy and enthusiasm for mental health advocacy, strongly led and fuelled by public health practitioners, set off a chain of events that propelled mental health once again to the top of the national agenda with publicly expressed political support[1].

A new Mental Health Act[2], enacted in Parliament in December 2012 which entered into force in October 2014, completely repealing the previous Mental Health Act[3], served to unearth a number of gaps and deficiencies in the service which needed urgent attention.

Increasing interest by the media in recent years to capitalise (rightly or wrongly) on negative elements, mishaps and disasters within the mental health service, in-house advocacy from mental health professionals and NGOs working together to publicly demand improvement in mental health services and funding[4], an increasing general public awareness, the first steps in breaking the silence by a small number of service users and their relatives who started to speak about their experience, unfailing dedication by public health practitioners pushing forward an agenda for mental health mainstreaming, mental health in all policies, and the promotion and safeguarding of mental health patient rights5, have together managed to ensure that mental health became once again an important item on the national agenda.

Development since the 1990s

During the 1990's, the Department of Health Policy and Planning (DHPP) was the main driving force for mental health reform. The situational analysis described in the ensuing policy document[6] at that time revealed significant gaps and deficiencies in the service, superimposed on the largely prevalent misinformation and negative attitudes in the general population towards psychiatry and mental patients.

Services were primarily custodial and largely delivered in a "dehumanising, impersonal and degrading hospital environment", with wards hosting mixed pathologies and ages. Community psychiatric services were poorly developed. Other shortfalls identified included a "critical shortage" of adequately trained professional staff, ineffective management, inefficient use of resources, and an absence of purposeful mental health programmes.

The DHPP promulgated a vision which aspired to change government and societal perception of mental health illness. It had the objective of converting the custodial approach to mental illness into a therapeutic, personalised, caring service. It sought to develop a nation-wide network of community mental health services as a primary source for mental health care; and foster conditions along the life-course to promote mental health and well-being.

The passion with which the Directorate promoted this vision secured political attention and in March 1994, the Minister responsible for Health set up a National Commission for Mental Health, which was initially tasked to contribute to the formulation of this policy[7]. The National Policy on Mental Health Service (1995)6 was approved by Cabinet in August 1994, and after the final changes were made, the document was published and officially launched in April 19957. Subsequently the National Commission for Mental Health was entrusted to monitor and ensure the implementation7.

Early developments emanating from the recommendations of the National Policy (1995) include the introduction of financial and managerial autonomy at Mount Carmel Hospital, a pilot community project in Qormi, and the opening of Villa Chelsea, a residential and day rehabilitation facility in Birkirkara, by Richmond Foundation.

A mental health clinic was set up within the then new and modern Qormi Health Centre, as a pilot project, to test out the feasibility and viability for widespread community service development. In keeping with the vision espoused in the policy document, family doctors practising in the area were trained in the management of common psychiatric problems within the community through a Postgraduate Certificate Course in Basic Clinical Psychiatry[7]. A day centre at Qormi followed the mental health clinic.

Drawing upon experiences and lessons learnt, a Community Mental Health Strategy[8] was drafted in 2000. This 30-page document presented a very detailed analysis of the situation at the time and provided a clear and specific implementation plan for a national stepped-up geographically-distributed (sectorised) integrated community mental health service offering three levels of care.

In line with the National Policy for Mental Health Service (1995), the provision of primary mental health care was to be provided at Health Centre level by trained family doctors, with the support of a social worker, counsellor or community nurse. Secondary mental health was to be delivered through a case management approach with a key worker, through multidisciplinary teams (MDT) led by a psychiatrist.

The MDT would include social workers, occupational therapists, psychologists and community mental health nurses. It was proposed to have 11 MDTs, 2 in each of 5 sectors for Malta, and one in Gozo. These teams were also to be responsible for 24/7 crisis intervention in the community. The tertiary care level would cover special interest areas, and would be supported with at least one multifunction day centre per sector to provide for rehabilitation and community integration.

The strategy also provided estimated numbers of the various community residences - half-way houses, long stay hostels with sheltered workshops, group homes/sheltered housing and adequately supported independent/family units - that would be required. It also gave the minimum human resource and training requirements for the service, and proposed a ring-fenced budget for community mental health services, a dedicated information system, legal and regulatory frameworks, monitoring and evaluation, and further research. It was estimated that it would take ten years to bring about the proposed changes, and that periodic reviews should be done throughout.

The Community Mental Health Strategy was presented to the Parliamentary Social Affairs Committee on 31st October 20007. Referring to Cabinet's endorsement of the National Policy on Mental Health Service (1995), the document clearly stated that "*the time has come for Cabinet to affirm this commitment to these strategies by starting to place some real investment into this sector*[8]"

Around this time, the National Commission for Mental Health led an intensive media campaign aimed at increasing the awareness of mental health amongst the general public, the reduction of stigma, and promoting empowerment and resilience[7]. In 2000, the first nine service-users from Mount Carmel Hospital were selected to benefit from a Housing Scheme arrangement for resettlement and re-integration into the community[7].

Over the next ten years, community mental health services9, 10 started to grow into the structures we know today. In addition to Qormi, primary and secondary mental health clinics were established at the Cospicua, Mtarfa, Floriana, and Paola Health Centres with Kirkop providing only a primary mental health clinic.

Primary mental health clinics to date are run by health care professionals with only 16 hours of family doctor time per week across the whole service. Individuals can self-refer directly to these clinics or be referred by their own family doctors. Secondary mental health clinics are run by psychiatrists and can be accessed through referral from either the Primary Team or the Psychiatric Outpatient Department. Both clinics are supported by teams of nurses, social workers, and psychologists.

In addition to Qormi, day centres were also set up in Cospicua, Floriana, Paola and Zejtun. Individuals are referred to day centres by their psychiatrists. Their primary aim is to provide therapeutic interventions to help recovery and social re-integration.

An Outreach Service was developed. To date it runs from a base in Mount Carmel Hospital and offers intensive support to individuals with severe and enduring mental illness in the community. Following entry into force of the Mental Health Act in 2014, members of the Community Outreach Team as well as professionals working within Primary and Secondary Teams are often appointed as Key Health Care Professionals to individuals placed under a Community Treatment Order. This new mode of involuntary care in the community is reaping its benefits as it is helping to avoid hospitalisation of patients who had previously required repeated psychiatric hospital admissions.

The drafting of the new Mental Health Act was driven once again by the Department for Health Policy and Planning. In 1997, the National Commission for Mental Health had set up a dedicated subcommittee for this purpose[7]. The final draft was presented to the Minister for Health in 2002. Subsequently the process was stalled for a number of years[11].

In retrospect, it can be argued that the timing was not right since at this time Malta's priority was EU accession. Transposition of EU mandatory law had to be completed by the end of 2003. Not being deemed EU priority, the MHA was therefore shelved with the intention of being taken up post-accession. In fact, widespread consultation on the draft was resumed in 2006 and 2007, but 2008, a general election year, saw yet again, a new re-organisation within the Ministry for Health, with a newly appointed Parliamentary Secretary responsible for mental health.

It took another four years for the Act[2] to finally make it into the Laws of Malta through Parliament in December 2012, through the renewed persistence and drive of the authors of this Article, who took up the matter in hand in October 2011, as a first deliverable of the newly set up post and Office of Designate Commissioner for Mental Health. Further developments between 2012 to date are described under the "*Assessment of Current Situation*".

Data Sources

Two of the authors of this article had been involved in different capacities in the earlier momentum for reforming mental health services throughout the nineties, and all three more recently since 2011. The main data sources used to inform this article were therefore a mix of the following: the authors' historical recollection, personally-held documents, verbal information and documentation from key public health practitioners and other actors who were actively involved at the time, consultations with stakeholders, reviews of reports and complaints, as well as a specific internet search.

Comparative analysis with other European countries

Local large-scale epidemiological data on mental disorder in Malta is lacking. The European Health Interview Survey (2015)[12] estimated 12-month prevalence of self-reported chronic depression and anxiety in the adult population in Malta at 5.3% and 6.2% respectively. Self-reported life-time prevalence stood at 6.8% and 7.9% respectively. On the other hand, cross-sectional studies by public health postgraduate students recorded a prevalence of self-reported depressive symptomatology in secondary school children of 21.3% in 2006[13] and 27.3% in 2015 [14].

According to the World Health Organisation15, the yearly prevalence of depression and anxiety in Europe is around 25%. A systematic review of data and statistics from studies conducted in EU countries, Iceland, Norway and Switzerland, indicates that 27% of the adult population under the age of 65years experiences at least one mental disorder from amongst substance use disorder, psychosis, depression, anxiety or eating disorder over the course of one year[16].

Mental disorders are estimated by WHO[15,16] to account for 36% to 40% of years lived with disability, with unipolar depressive disorder accounting for 11%, making it currently the leading chronic condition in Europe. WHO further estimates that depression and anxiety account for up to 50% of chronic sick leave.

Throughout the years, mental health service policy and strategy development in Malta has always aligned itself to the direction and guidance of the World Health Organisation. The National Policy on Mental Health (1995) clearly referred to the WHO guiding principles ascribed in its Health For All programme[17].

The WHO World Health Report 2001[18] placed mental health on a global agenda. As summarised in its Fact Sheet[19], the report commented that mental health leadership was generally poorly developed in many countries, with the mental health sector being grossly underfunded.

Even then it recommended a shift away from large psychiatric hospitals, the development of community mental health services, the integration of mental health services into general hospitals, ensuring the availability of essential psychotropic medicines, creating links between health and other sectors and the development of specialised human resources. These concepts have all been integrated in each of the Mental Health Policy/Strategy Documents developed in Malta up to the present day.

In 2008, an analysis of policies and practices for mental health in Europe[20] showed that by that time many countries had developed some form of mental health strategy. However, it was stressed that a good policy/strategy/legislation does not necessarily translate into implementation. "*Sometimes the reason is that the policies that have been drafted are politically unacceptable and are therefore not adopted. However, many ambitious strategies are accepted by ministers, governments and even parliaments but still not implemented. In the countries that lack the political will, planners and psychiatrists do not comply with legislation, which is subsequently ignored. Even the many countries with genuine commitment to the implementation of modern community-based mental health services face challenges in implementation. The obstacles can be the absences of skilled leaders, a competent workforce, infrastructure, partnerships and/or funding*."[20]

In line with the European Mental Health Action Plan 2013-2020[21] Malta now looks forward to continue improving population mental health and well-being through health promotion, addressing the determinants of mental health, with a special focus on vulnerable groups; advocate for the rights and social inclusion of people with mental health problems; and strengthening community-based mental health services.

Assessment of current situation

Following the approval of the Mental Health Act in 2012[2], the Office of the Commissioner for Mental Health (CMH Office) began to carry out its mission to promote and protect the rights and interests of persons with mental disorder. As evidenced in its series of Annual Reports between 2012 to 2017[22], and as discussed in annual sessions of the Joint Parliamentary Social Affairs and Health Committee, serious gaps and challenges in mental health service provision were still being identified and were actually not far different from those described some twenty years earlier in the National Policy on Mental Health Service (1995).

The dire state of the structure and physical environment of Mount Carmel Hospital, safety issues, and unused open air spaces, are a recurrent theme in the CMH Office's Annual Reports. Repeatedly they have also featured in the media and in a Performance Audit conducted by the National Audit Office in July 2018[23]. Substantial improvements and investment are necessary for achieving the objective of dignified care in a safe and suitable environment[24-26]. Mixed ages and pathologies on wards are still encountered. Interventions and activities that help patients in wards to maintain or regain lost skills are sorely lacking[25].

Although community services have developed, there is still geographical inequity, with the North Harbour region, the Northern region, and Gozo being greatly underserved. Family doctors have not been sufficiently incentivised nor empowered to carry out the Primary Mental Health Function envisioned in the National Policy. More psychiatrically trained staff is required to strengthen community support for patients, families and carers[27]. There is no effective crisis intervention established in the community[27].

The increased demand for services over the years has not been matched with the necessary injection of resources. Indeed, in a series of one to one meetings with consultant psychiatrists carried out by one of the authors in 2016, consultants felt that they were continuously being asked to "deliver more and better with less and less[27]"

In general, leadership, management & accountability structures were felt to be poor, ineffective or inefficient. This, coupled with the insufficient numbers of adequately trained human resources, was perceived as a major stumbling block to the formation of effective multidisciplinary teams.

The establishment of a local post-graduate training programme in psychiatry in 2008 can be considered a major turning point which can address the shortages in specialist psychiatric services in the near future. Following a slow start, the programme is now highly popular and takes in five to six new trainees every year. For nurses, an undergraduate training programme for mental health nursing was begun in 2005.

In 2015, a Department of Mental Health was established in the Faculty of Health Sciences. This subsumed the undergraduate mental health nursing programmes and started providing post-graduate specialised mental health nursing programmes. Unfortunately, the same specialised training momentum is not yet visible in the local training programmes for psychologists and social workers.

Effective Crisis Intervention Services remain a major flaw in service development and need to be reconfigured. The current adult, child and adolescent psychiatric emergency services provided at the Accident and Emergency Department, Mater Dei Hospital, are very limited[28].

The establishment of the CMH Office to promote and safeguard the rights of persons suffering from a mental disorder, has been a prime mover to get mental health back on to the national agenda. Advocacy on the media, meetings with various health professionals within and outside health, the rigorous monitoring and authorisation of every involuntary admission, overseeing curator responsibilities, responding to clients and their families as well as to various health professional complaints and/or concerns about the mental health service received or being provided, annual inspections of all licensed mental health facilities, ad hoc operational service studies, analysis and feedback to consultation of legislation, policy or strategy documents emanating from various different Ministries/Entities, facilitating meetings and collaborative action between entities, and last but not least presenting robust Annual Reports and discussing them at the Joint Social Affairs and Public Health Committees for the past four years, are few of the examples of the work being done by the CMH Office.

The CMH Office has been a major driving force for the government's commitment to a Mental Health Strategy[29] which was launched in December 2018, 23 years after the launching of the National Policy on Mental Health Service (1995).

In essence, the current Mental Health Strategy is once again proposing the same vision and strategy for the development of mental health services as were espoused in the first Policy and subsequent strategy for community services. It has taken on board all the recommendations and criticisms that have been provided by the CMH Office over the years.

Lessons learned

Successful implementation of any reform is dependent on a number of factors and conditions that need to come together at the right time and in the right circumstances. Although the political will for reforming the sector was present right from the start, the political climate and capacity at the time was concentrated almost exclusively on getting the country on track for EU accession. In this sense, mental health was not considered a priority and fell by the wayside.

Hence an important lesson to learn is that we need to create the right climate for success. A case must be made for mental health to be truly considered a national priority. We need to keep focus and ensure that it remains on the agenda. In the past, we allowed other events to take precedence. The momentum for change must be created and sustained. It must become everybody's business. The existing workforce needs to become part of the change and needs to be continually motivated, trained, and managed by competent and skilled leaders.

It cannot be denied that mental health services have indeed developed since the National Policy on Mental Health Service (1995)[6]. However, because resources have never truly matched the need in quantity and direction, service development has been maintained throughout the years largely by the sheer good will of many, albeit with many gaps and inefficiencies. Indeed, in reviewing the various policy and strategy documents, Annual Reports and other documents over this period, we can see that many of the problems seem to transcend time and space, and effectively remain the same. In 2001, it was estimated that it would take ten years to bring about the proposed changes for the development of Community Mental Health Services[8]. In 2019, we find ourselves affirming the same sentiment expressed so clearly in the Community Mental Health Strategy document "the time has come for Cabinet to affirm this commitment to these strategies by starting to place some real investment into this sector[8]."

History shows us that there needs to be a constant champion and a driver for mental health reform. Currently this position is being held by the CMH Office. But everyone needs to come on board. Together we need to mobilise mental health and well-being into the community, into our schools, into our homes and into our workplaces.

Community Mental Health Services need to become the true cornerstone and hub for mental health[29]. Emergency intervention must be available 24/7 and its main focus must be to resolve mental health problems early and in the community. Solid investment needs to be made in child and adolescent mental health services, migrant mental health, school, workplace and community resilience and wellness programmes, community therapeutic facilities for young people with challenging behaviour, community addiction services, and dignified residential accommodation for long term patients, such as severe dementia, intellectually impaired and neuropsychiatric cases. Collaborative and intersectoral working should become the norm of the day. Acute psychiatry should shift to the acute hospital setting[27].

Bold moves need to be made. New ideas need to be listened to. We need to give a voice to the recipients of the service. They need to be included in policies, strategies and action plans. The expertise that contributed to the earlier policy and strategy documents is still available. We need to merge the old with the new. Only in this way can we continue to transfer knowledge and concurrently reshape it into a modern responsive person-centred service, attuned to the evolving needs of our society.

Future outlook

It is hoped that this time, we can learn from mistakes in the past. Investment is crucial. Services need to be planned, resourced, implemented, monitored and continually challenged and reviewed. The time is ripe to implement the vision and take it to its full.

The public is now more open and receptive to mental illness, the mentally ill are becoming more vocal, established NGOs are available to continue contributing to service development, employers and unions are beginning to come on board as evidenced by the signing of a joint Maltese social partner declaration on mental wellbeing at the workplace[30] in October 2018, Government's employee support programme is more widely accessed by employees, health professionals are becoming more receptive to patient rights, various entities are beginning to grasp the meaning of mental health in all policies, and the health sector is becoming more receptive to integrating mental health within the general health service.

Successful reform requires strong management decisions, leadership that does not budge to internal or external pressures, effective reorganisation of services, policies safeguarding best practice, and adequate investment in terms of human and financial resources. This must be underpinned by forward human resource power planning, training needs assessment, and a commitment to continuous audit and performance review. The topmost priorities in the coming years are to constantly continue to bring all stakeholders together, to break silos, and to build bridges[26]. We need to ensure that this time, polices and strategies are translated into resources and action that reap measurable improvements in population mental health and well-being for this and future generations.

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ENVIRONMENTAL HEALTH

ENVIRONMENTAL HEALTH: THE LAST 20 YEARS AND FUTURE CHALLENGES ON THE ENVIRONMENT

Tania Cardona, Roberto Debono

ABSTRACT

The health of a population is intrinsically linked to the state of its surrounding environment. Environmental health proposes legislative and cultural action towards improving the state of the current environment to orient it towards improving the health of the resident population. Over the past 20 years, the main developments with regards to environmental health in Malta included EU legislation related to air quality, noise pollution, water and sanitation, waste management, chemicals, and electrification of the transport sector, and also strategies and polices for the promotion of active mobility such as cycling and building sustainable health system. Another important issue to which Malta, together with other countries, must work towards improving is climate change. Unlike other areas, global collaboration and cooperation is required to set and reach targets to prevent planetary Earth system changes that are projected to disrupt the lives of many people around the world, especially of the vulnerable including small island states with limited resources such as Malta.

Introduction

Environmental Health is the branch of public health that deals with all aspects of the natural and built environment affecting the health of the population[1]. It deals with issues of local or regional dimensions such as air and noise quality to global threats such as climate change, ocean acidification and biodiversity loss. Strong intra-national and international collaboration adopting 'whole-of-government' and 'whole-of-society' approaches are required to deliver results. [2]

Description of Public Health Issue / Health system development since 1999

Over the past 20 years, the main developments with regards to environmental health in Malta have been mainly due to European Union (EU) accession and subsequent obligations to adopt or transpose EU environmental legislation into national law. These include the Water Framework Directive, Air Quality Directive, Environmental Noise Directive, Waste Framework Directive, REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) regulation, and legislation related to climate change mitigation.

Furthermore, Malta has been an active participant in United Nations (UN) driven processes and signed or ratified a number of conventions such as the 1992 UN Framework Convention on Climate Change, the 1999 UN Protocol on Water and Health, the Stockholm Convention on Persistent Organic Pollutants (POPs), and more recently the Minamata Convention on Mercury. Over the past 10 years, Malta has been particularly active in the WHO 3 /UNECE 4 European Environment and Health Process, and more recently in the WHO/UNECE Transport, Health and Environment Pan-European Programme where the Ministry for Health uses these two international processes as a platform for international advocacy and as an opportunity to develop synergies and relationships with national stakeholders, on environmental health issues.

Assessment of the Current situation and Future Outlook

Transport

The transport situation is one of the biggest environmental sources of ill-health in Malta, which apart from contributing to climate change [5], air and noise pollution, also promotes an obesogenic environment which increases the risk of non-communicable diseases and is a leading cause of road traffic morbidity and mortality[6].

Malta has been recording a constant increase in the number of licensed cars in the past few years, reaching a record 380,000 licensed vehicles by the end of 2018, of which only around 0.6% were electric or hybrid[7]. The perceptions of car use in Malta do not look promising either, with a 2014 Eurobarometer survey indicating that 70% of respondents use the car as their primary mode of transport, while bike usage is the lowest in the EU at 0% [8]. Efforts to promote active mobility and public transport over the past two decades have been patchy, had limited effectiveness, and not aimed at reducing car ownership.

Since 2016, as car congestion reached critical levels, new schemes were introduced. This included two bike sharing services, an e-car-sharing service, free public transport to a progressively wider age-group, free school transport for children in church and private schools and launching of the first national cycling strategy and action plan[9].

Transport - Future Outlook

The vision of public health with respect to transport is towards active mobility by promotion of walking, cycling, public transport use, reduction on the dependence of private motorised vehicles, and electrification of mobility. Some challenges include the pervasive car culture, lack of options to walk and cycle safely, and an unappealing public transport service. Paradoxically, increased car congestion is an opportunity as faster alternative modes of transport are sought. Electrification of mobility is a matter of time, as by 2050, all motor vehicles in the EU market will be electric[10].

Air Quality

Ambient air pollution is the single most important public health concern in the EU, affecting health adversely by aggravating cardiovascular, cerebrovascular, and respiratory conditions[11]. It is classified as carcinogenic by IARC[12] Noteworthy airborne pollutants include fine particulate matter (PM10 and PM2.5) [13], nitrogen oxides (NOx) and tropospheric ozone (O3).9 Although Malta is one of a handful of Member States not in breach of the EU Air Quality Directive (AQW), the levels of airborne pollutants are above those prescribed by WHO, which maintains more stringent thresholds[14]. Furthermore, with the dramatic increase in motorised road transport, air pollution levels are increasing steadily with subsequent deleterious effects on health and wellbeing.

Air Quality - Future Outlook

The future outlook for better air quality depends heavily on the reduction in the use of fossil-based road vehicles, and the transition to active mobility and e-mobility. There are other secondary sources of air pollution which are either indigenous (e.g. construction sector in relation to PM10) or transboundary (e.g. from sea traffic and O3 from continental Europe). Improvements in these areas are bound to improve air quality.

Noise Pollution

Road traffic is also the principal source of environmental noise pollution in Malta. Other sources including air transport, neighbourhood noise, industrial activity, construction noise, fireworks, and night entertainment. Estimates show that around 10% of the population is exposed to harmful noise levels above 55 dB L*den* while 8% of the population is exposed to noise levels higher than 50 dB L*night* [15]. Adverse health effects from excessive noise include auditory health outcomes such as hearing impairment, and non-auditory related health outcomes such as sleep and rest interference, heart disease, and poor mental well-being[16].

Noise Pollution - Future Outlook

Overall, the future outlook is optimistic as Malta is required by the European Noise Directive to compile noise maps, prepare noise action plans, and develop policies to reduce noise pollution[17]. It does not however address impulsive noise nor prescribe environmental noise reduction targets.

The vision for public health is to attain acceptable levels according to the WHO's Environmental Noise Guidelines for Europe. These are 53 dB L*den* and 45 dB L*night*. Since the current noise levels in Malta are high or very high in many areas, a gradual incremental approach needs to be adopted.

Water, Sanitation, and Hygiene

Currently Malta enjoys universal access to safe water in urban and rural areas, with no incidents of water-related outbreaks in the previous five years. All sewage is treated before discharge and bathing water quality is excellent. Drinking water satisfies all mandatory and indicator microbiological parameters[18].

Since 2017, Malta has committed to protect its groundwater with the launch of the "New Water" project, whereby sewage effluent is treated and made available through a distribution system to the agricultural sector. The aim is to prevent over-extraction and allow for regeneration of groundwater[18]

Water, Sanitation, and Hygiene - Future Outlook

With projected climate change scenarios of increased aridity for the Mediterranean, increasing population and limited fresh water resources, the strategic objective is to ensure sustainable access to safe drinking water, sanitation and hygiene for all. This can be enhanced by protecting the availability and quality of freshwater as a precious resource and reusing wastewater, in addition to current best practice on drinking water quality and safely managed sanitation.

Waste

Economic advancement has caused an increase in the amount of waste generated with potential adverse effects on health and the environment. Malta generates more waste per capita than the EU average. The recent construction boom has spurred discussions about possible land reclamation with serious potential ecological concerns[19],[20].

Currently, approximately 85% of waste generated in Malta is deposited in landfills, 10% is recycled and 5% incinerated or composted. Construction and demolition (C&D) waste make up around 79% of the total waste, while municipal waste makes up around 16%[19]. Recent efforts to reduce waste include domestic organic waste separation, improvement in recycling efforts, banning and reduction in use of single-use plastic, and promotion to reduce and reuse construction waste[19]. Despite these efforts, Malta lags behind the targets of the EU Waste Framework Directive.

Waste - Future Outlook

Overall, the outlook for Malta is nonetheless optimistic because as an EU Member State Malta is set to transition towards a circular economy, whereby all waste is managed in line with the principles of the waste hierarchy. This involves prevention of waste generation, followed by waste re-use, recycling, recovery and finally disposal[20]. The management of C&D waste currently represents the biggest logistical challenge with justified ecological concerns, as space is running out, reuse is low and most of it is disposed.

Chemicals

There are a multitude of man-made and naturally-occurring chemicals from different environmental sources that can pose a threat to health [21], with the most notable being lead, mercury, perchlorates and pesticides. Whereas regulation is well developed on some chemicals, the development of regulatory tools on other chemicals is still in its infancy.

For example, blood lead levels in the Maltese population have been declining since the 1980s, decreasing from 274micrograms/l in 1981 to around 40.6micrograms/l in 2011 in the adult population, representing a success story resulting from regulatory measures on leaded fuel and paint, among others[22].

Similarly, despite recent news that Maltese customers are exposed to relatively higher levels of pesticides, the availability and use of pesticides in Malta is tightly regulated by the MCCAA. Regulation includes the use, banning and monitoring of produce intended for consumption, coupled with the provision of training for farmers on minimal use and handling of pesticides[23].

In contrast, legislation and improved management of mercury is still in development. This despite mercury being a global public health concern due to its predilection to cause neurological disorders with early developmental. The Minamata Convention on Mercury entered into force in 2017. An opportunistic study carried out in 2017 found high levels in some fish on the Maltese market. As Party to the Convention, Malta is set to ratchet its national policy to protect human health from mercury[24].

Similarly, literature shows that perchlorate, which is principally sourced from fireworks in Malta, may be a potential threat to human health. Exposure occurs via ingestion of contaminated food and water, and inhalation of contaminated dust. Currently, there is no official monitoring system, despite strong recommendations by the EFSA due to its predilection to cause hypothyroidism[25].

Chemicals - Future Outlook

The outlook for chemicals is promising albeit complicated due to the multitude of chemicals on the market and in the environment, and their unknown combined and synergistic effects on human health. EU legislation provides safeguards regarding certain chemicals but is lacking on others. Thus, reasonable scientific evidence should prompt national precautionary action to safeguard the health of the Maltese community[21],[23],[24]. Examples include the institution of a monitoring system for perchlorate and mercury levels. Participation in EU-wide human bio-monitoring projects is also an option worth exploring.

Environmentally sustainable health systems

Ironically, the health care sector is another environmental source of ill-health via hospital waste generation, which includes hazardous medical waste, wastewater with a large amount of pollutants not removed by standard treatment processes, and a significant amount of greenhouse gas emissions[26] It is thus imperative for the health sector to lead by example and reduce the carbon footprint and improve its environmental performance.

The challenges to reaching environmental sustainability in Malta are multiple but mostly related to lack of awareness, unclear responsibilities or lack of policy in this respect. Currently, there are no coherent strategic plans to improve the environmental sustainability of the health sector. Standard Operating Procedures (SOPs) are being used in only a few places, and few have an operating quality assurance system for the safe management of hazardous waste.

Environmentally sustainable health systems - Future Outlook

The aim for the future is for the health sector to work towards improving, restoring and limiting its impact on the environment by developing environmental sustainability policies, plans and roadmaps to reduce resource use, maximise energy efficiency, and manage waste safely. Since some health players are large employers (e.g. Mater Dei Hospital), adopting policies that promote active mobility will inspire others to follow suit.

Climate Change

The 1992 United Nations Framework Convention on Climate Change (UNFCCC) acknowledged that climate change is anthropogenic and the result of an increase in atmospheric greenhouse gas emissions[27]

The effects of climate change are diverse and include rising sea levels with a risk of flooding in low-lying areas, extreme weather conditions such as heatwaves and prolonged periods of drought, and changes in the geographical patterns of vector-borne diseases. Furthermore, climate change puts an economic strain on countries due to the radical changes that are required for adaptation[27].

The UNFCCC is the principal global process aimed at leading negotiations towards climate change mitigation[28]. Despite the hailed success of the Paris Agreement (2015), whereby all 197 Parties of the UNFCCC signed or acceded to the Agreement, average global temperatures continue to rise at an unprecedented rate.

The most recent report of the Intergovernmental Panel on Climate Change, launched in October 2018[29] describes dismal projections for the future unless urgent and radical political, social, legal and economic changes are undertaken to limit greenhouse gas emissions.

Future Outlook

The European Commission has approved a long-term strategy intended to implement a climate neutral economy by 2050, focusing on investing in technological solutions, empowering citizens and aligning key areas including the industry, finance and research while ensuring social fairness during the transition, to help reduce the effects of climate change and preserve the future for the younger generation[10]. However, global commitment and concrete action by the international community to mitigate climate change is still lacking. As a small island state with limited resources, the outlook for Malta in the face of adverse climatic projections is bound to international action, and negotiations leadings thereto, to reduce greenhouse gas emissions urgently.

Conclusions

Environmental degradation poses a significant threat to human health worldwide [1], including in a small country with limited resources and land space such as Malta [6]. At a national level, the transport sector represents the lowest hanging fruit – promoting active mobility will have positive impacts on air quality, noise quality and on risk factors leading to chronic diseases.

At a global level and over the next century, climate change and the unravelling ecological crisis poses an unprecedented threat to the survival of the human species as the biosphere approaches the prospect of a sixth mass extinction.

It is thus of paramount importance that concrete action is taken from now to prevent further worsening of the current situation in some areas (e.g transport and air quality), [5],[13] and reinforce progress in others e.g. water and sanitation.

Furthermore, economic development needs to be framed within a wider framework of environmental sustainability so that the environment, and subsequently human health, is adequately protected for the benefit of present and future generations.

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INFECTIOUS DISEASES

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 lead 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)I 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].

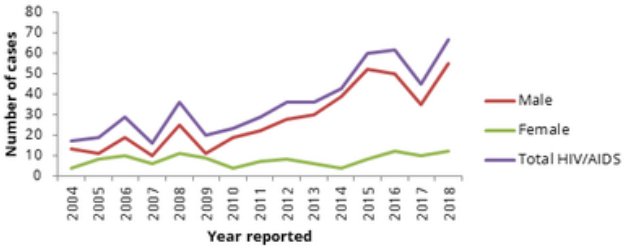

Figure 1. Number of cases of HIV/AIDS reported annually to IDCU from 2004 to 2018 by gender

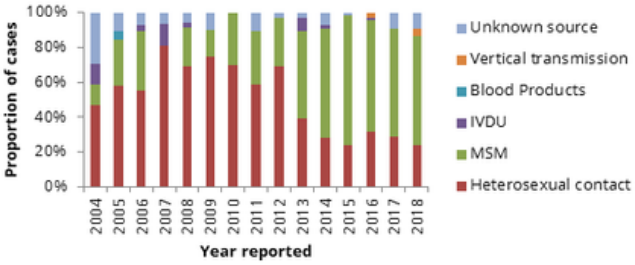

Figure 2. Percentage of cases of HIV/AIDS reported annually to IDCU from 2004 to 2018 by source of infection

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

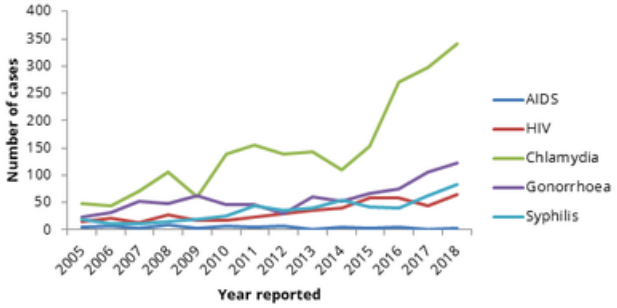

Figure 3: Number of cases of sexually transmitted diseases reported annually to IDCU from 2005 to 2018

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

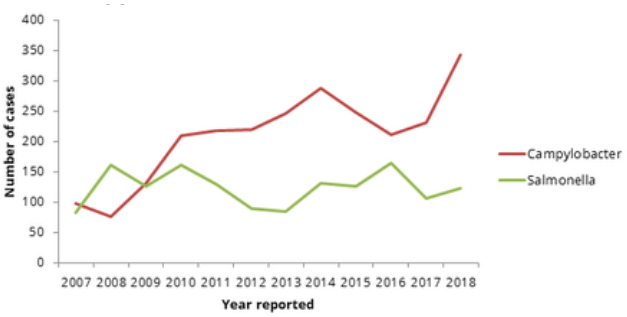

Figure 4: Number of confirmed cases of Salmonella and Campylobacter reported annually to IDCU from 2007 to 2018

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.

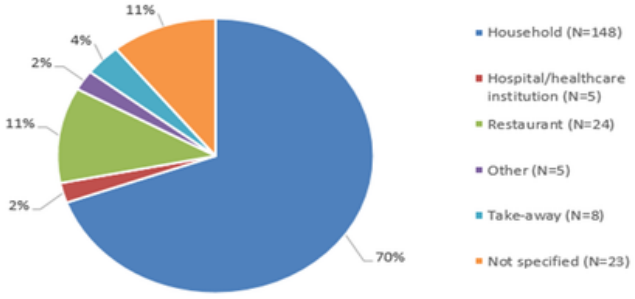

Figure 5: Suspected sources of infection for locally-acquired confirmed cases of campylobacteriosis, Malta, 2007-2017 (N=213)

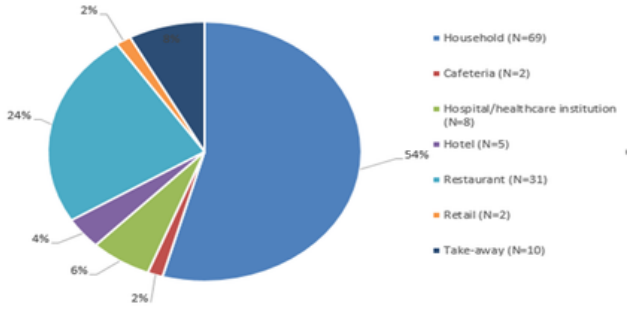

Figure 6: Suspected sources of infection for confirmed cases of non-typhoidal salmonellosis, Malta, 2007-2017 (N=127)

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.

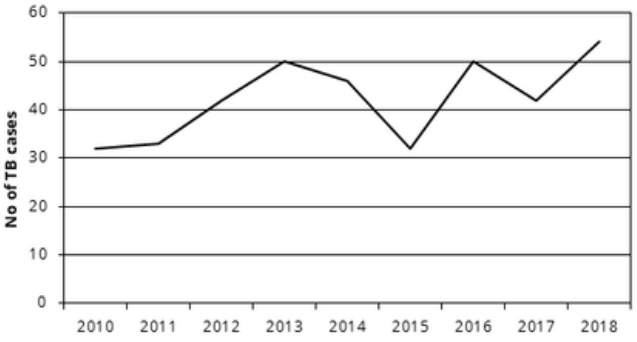

Figure 7: Number of confirmed cases of tuberculosis reported annually to IDCU from 2010 to 2018

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 were 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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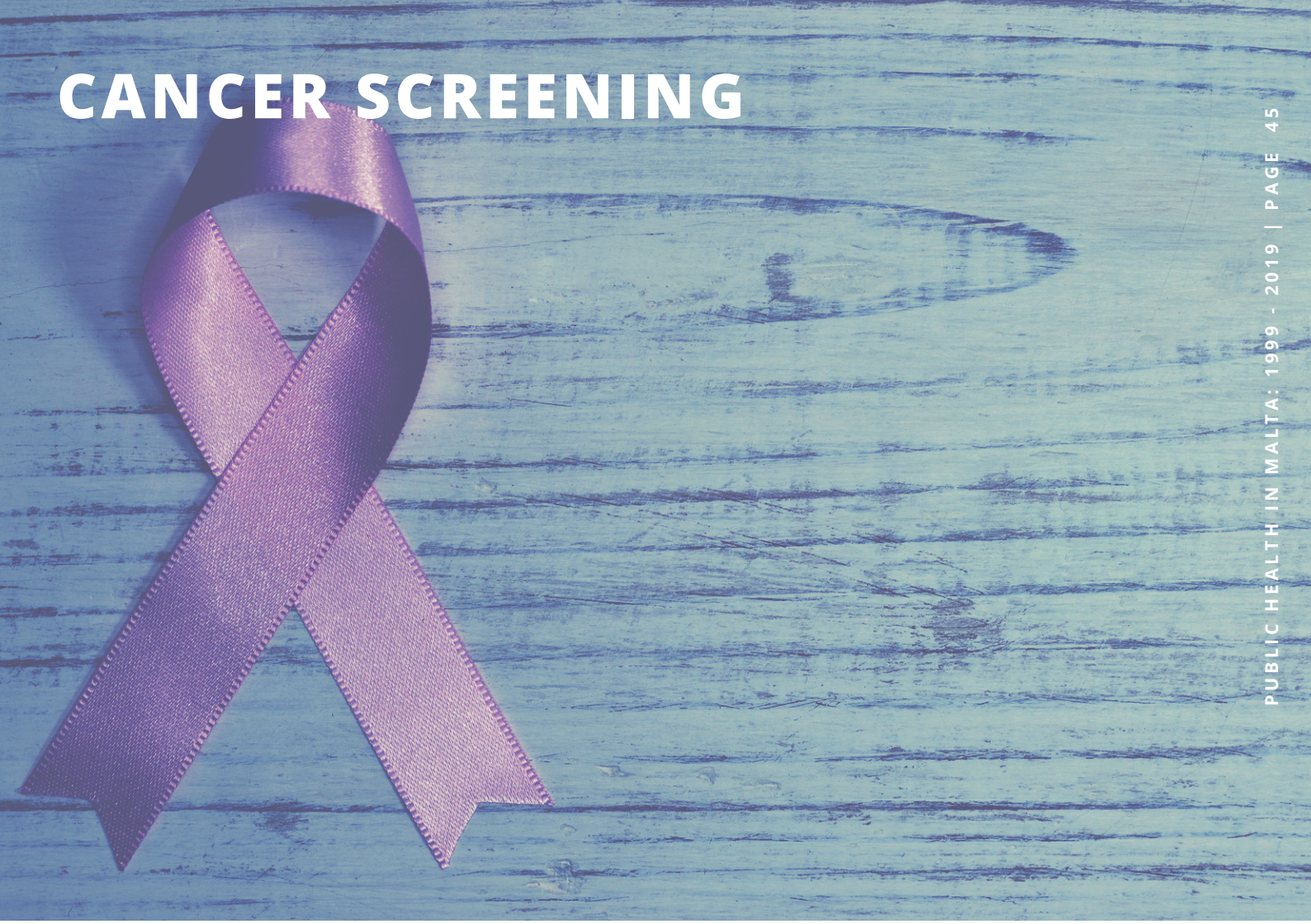

SCREENING FOR BREAST, CERVICAL AND COLORECTAL CANCER – AN UPDATE ON THE NATIONAL CANCER SCREENING PROGRAMMES

Stephanie Xuereb, Miriam Dalmas, Sascha Reiff

ABSTRACT

Early detection of cancer can significantly reduce mortality and improve the quality of life of persons with cancer. In this article we describe the three national screening programmes that have been introduced in Malta since 2009 and that are based on guidelines supported by the European Commission. Screening for breast cancer was the first national screening programme implemented in Malta. After several years of roll-out and gradual expansion of the service, this programme is now reaching the targets of the European Commission on Breast Cancer (ECIBC) Guideline Group in terms of target population and screening frequency. Colorectal Cancer (CRC) Screening was the second programme to be introduced in 2013 while Cervical Cancer Screening was launched in 2016. These programmes are being gradually scaled up, and there is continuous investment in new technologies and human resources. Low participation rates remain a challenge, however improvements have been achieved following awareness campaigns and evaluation of the invitation protocols.

Background

Cancer is a 'fierce' public health enemy. Every year it is attributed as the main cause of death for around 30% of all mortality in Malta. Nearly half of cancer deaths can be avoided with more preventive action to address and allay risks. Reducing the incidence of cancer by tackling major life-style determinants, such as smoking, nutrition and physical activity, is a major objective of public health work. Another important and effective prevention tool is screening for cancer.

Regular and systematic examinations can detect the disease early, when it is more responsive to less aggressive treatment. If followed by appropriate care, these examinations can significantly reduce cancer mortality and improve the quality of life of cancer patients.

Screening refers to the use of relatively simple tests across an apparently healthy population in order to identify individuals who have risk factors or an unrecognized disease or defect. World Health Organisation (WHO) criteria specify that a screening test is not intended to be diagnostic, and persons with a positive or suspicious finding must be referred for a confirming diagnosis and necessary treatment[1]. It is essential that screening identifies those who are more likely to be helped than harmed by further tests or treatment to reduce the risk of a disease or its complications[2].

In 2003, the Council of the European Union, in accordance with the WHO criteria, recommended cancer screening with a systematically organised population-based approach and quality assurance at all appropriate levels[3]. Screening programmes were recommended for breast, cervical and colorectal cancers in agreement with evidence-based guidelines.

Organised cancer screening programmes in Malta

Screening represents an important public health function. All three National Cancer Screening Programmes are guided by the principle that if cancers are detected at an early stage or even in the pre-cancerous stage, treatment will be less invasive, is more likely to be successful and the survival rate is improved.

As outlined in the European Code Against Cancer[4], regular participation in Breast, Cervical and Colorectal Screening Programmes is one of the ways to reduce both mortality as well as cancer risk. Screening for colorectal cancer and cervical cancer can identify precancerous stages that can be treated and stopped from developing into cancer.

The introduction of a screening programme should follow only after careful evaluation and cost benefit analysis. The publication of guidelines supported by the European Commission has paved the way considerably for the introduction and implementation of the three National Cancer Screening Programmes.

Screening programmes often feature highly on the political agenda with the decision to introduce a screening programme being subject to multiple pressures, including those from NGO's, cancer survivors and the general public. The first National Screening Programme to be introduced in Malta was that of Breast Cancer Screening launched towards the end of 2009. This was a long-awaited electoral promise with the media also drawing public attention to the fact that Malta was one of the 2 or 3 remaining EU countries not having such a programme in place.

Breast Cancer Screening

The programme initially targeted women aged between 54 to 60 years who were called for regular screening with a three-year interval cycle. Subsequently, the age group was expanded to cover an increasing spectrum of cohorts. The European Commission on Breast Cancer (ECIBC) Guideline Group5 strongly recommends mammography screening for asymptomatic women aged 50 to 69 years with an average risk of breast cancer. Currently the Breast Screening Programme has reached this target and offers mammography screening to all women aged between 50 and 69 years. In addition, the screening interval has been reduced from 3 years to a 2-year interval period, in keeping with EU international guidelines.

From the 13,000 women who are screened each year, around 7% are recalled for further investigations and under 1% of all women screened are diagnosed with breast cancer. Till the end of 2018, a total of 468 breast cancer cases have been diagnosed through the Breast Screening Programme.

The question which is often raised is: how effective is routine breast screening in reducing breast cancer mortality? In 2016 a report was commissioned by the Agency for Healthcare Research and Quality to review the 2009 US Preventive Services Taskforce Recommendation[6]. This advised biennial mammography screening for average risk women aged 50-74 years.

The researchers concluded that mammography screening does decrease mortality from breast cancer, with higher statistical significance being seen in older age groups (50-69 years) compared to the younger age groups. The number of deaths prevented was highest in the 60 to 69-year age group, with 12-21 deaths being prevented per 10,000 women screened for 10 years (Figure 1). Meta-analyses from recent reviews conducted by the EUROSCREEN working Group indicated a 25-31% mortality reduction for women aged 50-69 years.

Mammography screening at any age is a trade-off between a continuum of benefits and potential harms (through overdiagnosis and radiation) that varies at population and individual levels.

Over the past 10 years, there has been a slight reduction in the mortality rate of breast cancer since the introduction of breast cancer screening. The reason for this is unknown, but it could be the result of a combination of factors, including screening and earlier diagnosis, and the availability of new treatment options.

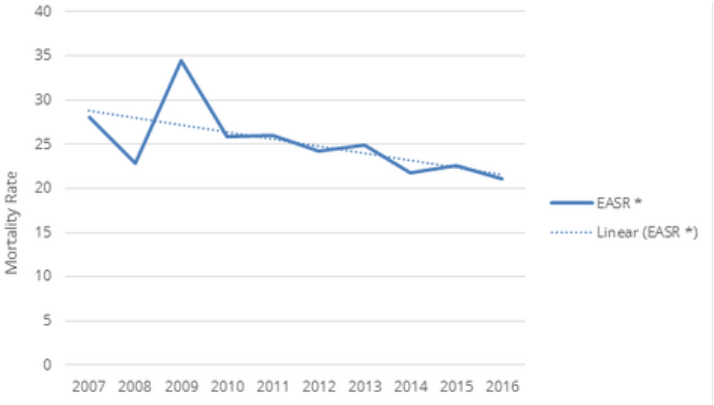

Figure 1. Mortality Rate (EASR)* of breast cancer in the Maltese Islands between 2007-2016
* EASR: age-standardized rates (per 100,000 women) using the European standard population

Colorectal cancer screening

The second programme to be introduced was that for Colorectal Cancer (CRC) Screening, which commenced a phased roll out in 2013. Both men and women aged 60-64 years were invited to participate over a 2-year period.

Colorectal cancer is a major public health problem in Malta, being the second most commonly diagnosed cancer in both men and women with approximately 253 new cases diagnosed in 2016[7]. Ninety-five percent of cases occur in people aged over 50 years.

The aim of CRC screening is to lower the burden of CRC in the population by discovering the disease in its early latent stages where treatment is more effective than if diagnosis occurs in the later stages. In addition, early treatment of invasive lesions, for example by endoscopic resection, can be less detrimental for quality of life.

Screening also identifies precursor lesions and thus has a prevention effect, with the endoscopic removal of premalignant lesions reducing the incidence of CRC by avoiding the progression to cancer. Since the introduction of the Colorectal Screening Programme in 2013, the incidence of colorectal cancer has increased, an average of incidence between 2013 – 2016 shows 275 cases per year, compared to an average incidence of 219 cases yearly picked up during the previous 4 years (Figure 2).

A possible reason for this increase is that more cases are being picked at an early stage because of repeated screening. To date, the Colorectal Screening Programme has resulted in 133 cases of colorectal cancer being detected.

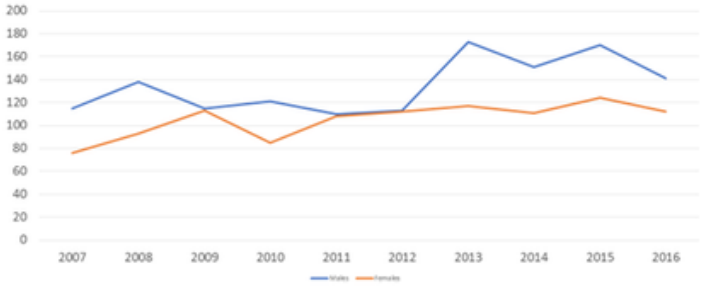

Figure 2. Incidence of colorectal cancer, Malta, 2007-2016 (source: DHIR)

There is sufficient evidence to indicate that invitation to CRC Screening reduces mortality from CRC by 14-16%8,9. A similar reduction in mortality was also reported by a systematic review commissioned for the US Preventive Services Taskforce, where a 9-22% CRC mortality reduction was reported with biennial screening after 2 to 9 rounds of screening and 11-30 years of follow up[10].

The CRC Screening Programme has expanded substantially over the years. Currently, screening through the Faecal Immunochemical Test (FIT) is offered to all men and women aged 55–69 years with a two-year screening interval. Immunochemical tests have improved test characteristics compared with conventional Guaiac-based faecal occult blood tests.

FIT is both analytically and clinically more sensitive and specific for the detection of haemoglobin, so only a single test is required without any change in diet prior to taking the test.

The FIT also allows for changes in the designated 'cut off' point at which a result is designated positive. By changing the 'cut-off' concentration, the proportion of false-positive tests and the number of colonoscopies performed can be adjusted to meet local requirements. Currently a 100ng/ml is used as the positive cut-off point.

Cervical cancer screening

The last programme to be introduced was that of Cervical Cancer Screening, which was launched in March 2016. Cancer of the uterine cervix primarily affects younger women, with most cases appearing between the ages of 35 and 50. Based on this, the selected target group for screening included women aged 25-35, with a 3-year screening interval.

Cervical cytology is the current recommended standard test for cervix screening. Liquid based cytology is used locally as a method of testing. This is preferable to conventional cytology as it is associated with a lower proportion of unsatisfactory samples and ancillary testing, such as high-risk HPV testing in the case of ASC-US (atypical squamous cells of undetermined significance), can be performed on the same sample[11].

Cervical Cancer is one of the cancers which can be most effectiely controlled by screening. Detection of cytological abnormalities and subsequent treatment where abnormalities are high-grade, avoids the development of cancer. The International Agency for Research on Cancer (IARC) reports that cytology screening at population level every 3-5 years can reduce cervical cancer incidence up to 80%[12]. Until the end of 2018, over 7,200 Smear Tests were carried out as part of the National Screening Programme and 106 cases of low-grade squamous intra-epithelial lesion (LSIL), 32 cases of high-grade squamous intra-epithelial lesion (HSIL) and 4 cases of cervical cancer were identified.

The participation rate in the Cervical Cancer National Programme is low, with a 33% intention to participate amongst women invited to take part in the programme. However, the results from the European Health Interview Survey (EHIS) 2014/201513 are more encouraging with 74% of women reporting having carried out a cervical smear test at least once, whereas 50% report having carried out the smear test in the last 3 years.

This shows a consistent improvement in comparison to similar EHIS reporting carried out in 2008 and 2002, where the number of women who reported not having ever carried out a cervical smear test where 37% and 41% respectively. Results from the latest EHIS indicate that 81% of cervical screening is carried out in the private sector.

Who is invited to participate

Screening Programme	Target Population	Screening Test	Screening Interval
Breast	Women 50-68yrs of age *(YOB 1969 -1950)*	Mammogram	2 years
Cervical	Women 27-38yrs of age *(YOB 1991 – 1980)*	Pap Smear	3 years
Colorectal	Men & Women 55-69yrs of age *(YOB 1964-1949)*	Faecal immunochemical test (FIT)	2 years

Table 1. Overview of Screening Programmes in Malta, 2019

** YOB: Year of Birth*

Barriers to participation

Although people are now better informed and aware of various cancer issues, healthy asymptomatic people are not always ready to participate in Screening Programmes. During 2017 and 2018 the National Screening Centre took several actions to mitigate non-responsiveness including the sending of reminder letters, kits rather than invites being sent to previous participants as well as aggressive awareness campaigns. As a result, an increase in the participation rate was observed over the last 2-3 years from 45% to 54%.

In their national retrospective study carried out in 2015, Marmara et al.14, reported that a variety of factors that render non-attendees statistically significantly more likely. These included women with a lower family income, widowers, non-drivers, not having a breast, having no relatives or close friends with cancer, and who were less encouraged by a physician, being unsure of the screening frequency, more anxious and fearful. Perceived benefits, barriers, cues to action, self-efficacy and emotional representations were the most significant variables to describe the differences between lifetime attendees and non-attendees. Perceived barriers and cues to action were the strongest predictors for lifetime non-attendance14.

Similarly, Deguara M.15 in her 2016/7 survey on cervical cancer awareness reported that those who attended for screening regularly were more likely to be females with children or having had a close family member with cancer. The main reasons for nonattendance were embarrassment, fear of the test and fear of a bad result.

Whilst it is important that persons are well informed and make informed choices about participation in Screening Programmes, Health Care Professionals have a pivotal role in the success of our population-based Screening Programmes, empowering people to take ownership of their health and overcome any unfounded fears.

Conclusion

Over the past ten years Malta has introduced and operated three significant organised programmes to deliver cancer screening services to different groups of people in line with the European Council recommendation and current scientific evidence on efficacy, the balance between benefit and harm and cost-effectiveness. Programmes started with a small age cohort and are being gradually scaled up to included wider age ranges, increased frequency (where applicable) and also upgraded technology where indicated.

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TWO DECADES OF ACTION ON NUTRITION FOR THE MALTESE POPULATION

Charmaine Gauci, Elaine C. Lautier, Mariella Borg Buontempo, Annalise Borg

ABSTRACT

Malta, like many other countries, has experienced significant challenges in nutrition over the past 20 years. Given the increasing prevalence of diet-related diseases and overweight and obesity across all ages, nutrition has been high on the Ministry for Health agenda over the past 15 years. Public Health practitioners in Malta have been drivers of public health nutrition reform throughout this period. The Health Promotion and Disease Prevention Directorate was set up to mainly focus on health promotion and non-communicable diseases including healthy nutrition in 2007. Over the years a number of strategies have been outlined targeting nutrition for the Maltese population including the Non Communicable Disease Strategy, the National Cancer Plan, the National Healthy Weight for Life Strategy, the Food and Nutrition Policy and Action Plan for Malta, Diabetes: A National Public Health Priority – A National Strategy for Diabetes 2016-2020, Whole of School Approach to Healthy Lifestyle: Healthy Eating and Physical Activity Policy and Strategy and the National Breastfeeding Policy and Action Plan 2015 – 2020. With input from WHO and the EU, Malta has participated in many surveys allowing for continuous monitoring and evaluation. In 2015, Malta embarked on a first National Food Consumption Survey, results of which will provide a baseline on eating habits to target priority areas for action, inform policy and monitor trends.

Introduction

Unhealthy diets, characterised by the consumption of foods high in fats, free sugars and salt, and insufficient consumption of fruit, vegetables, whole grains and other sources of dietary fibre, are key global contributors to poor health. Poor diets are linked to hypertension, overweight/obesity, hyperglycaemia and hyperlipidaemia, which are major risk factors for the development of diet-related chronic diseases such as cardiovascular disease, certain types of cancer and diabetes [1]. These diseases are the main contributors to the global burden of disease in terms of mortality, disability and related health care costs [2].

Diets therefore occupy a prominent position in most strategies for the prevention and control of non-communicable diseases (NCDs). The World Health Organisation (WHO) has a leading role in promoting and monitoring global action against NCDs and supporting healthy diets through the life course. Reduction of salt intake and elimination of industrially-produced trans-fats from food are amongst the priority actions of the 13th General Programme of Work which guides the work of WHO for the period 2019–2023 [3]. The European Commission (EC) plays a pivotal role at the EU level and consistently provides Member States with guidance and support to make progress in the area of nutrition. Extensive work targeting food reformulation and marketing of unhealthy foods is underway [4].

At the National level, cardiovascular disease, cancer and diabetes are amongst the top ten causes of mortality[5]. The prevalence of adult diabetes (~10% of the population[6],[7]), hypertension[7],[8] (Figures 1 & 2), and obesity [9],[10] (Figures 3,4) are alarmingly high and on the rise across the whole Maltese population. The total cost of obesity in Malta for the year 2016 has been estimated at €36.3 million[11].

Various obesogenic environmental factors are likely to have a negative influence on the dietary patterns of the Maltese population, including cultural norms, a marked preference for large portion sizes, pervasive advertising of unhealthy foods targeting children, widespread availability of cheap fast-foods and pastries from numerous confectioneries, 'pastizzeria' and fast-food chain outlets spread around the islands, as well as mobile vendors selling pastries, often near schools[12].

Figure 1. Self-reported* and measured** prevalence of elevated blood pressure, Malta

** Source: European Health Interview Survey (EHIS) 2014/2015 [8]*
*** Source: European Health Examination Survey (EHES) 2010) [7]*

Although a great deal has been done over the past two decades to address the burden of non-communicable diseases including the obesity epidemic, further urgent action is needed to better address this important public health challenge.

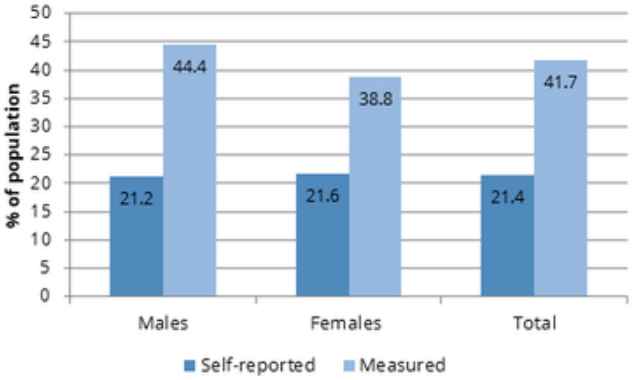

Figure 2. Self-reported* and measured** prevalence of elevated blood glucose, Malta

** Source: European Health Interview Survey (EHIS) 2014/2015 [8]*
*** Source: European Health Examination Survey (EHES) 2010) [7]*

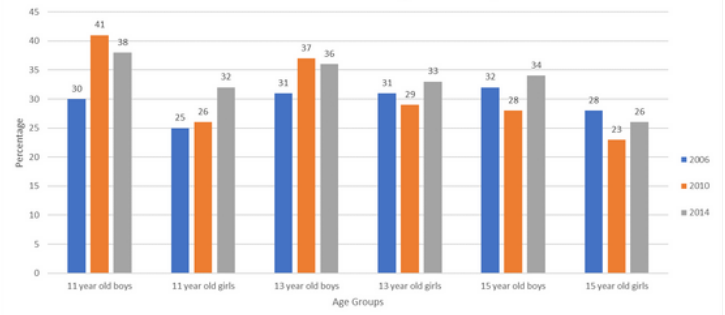

Figure 3. Prevalence of overweight, obesity and overweight & obesity combined in 6-7 year-old children in Malta across COSI rounds

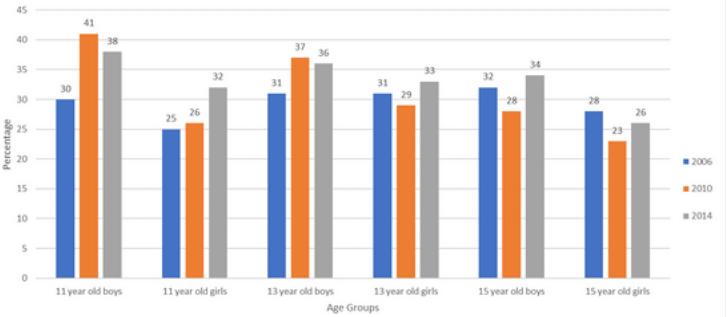

Figure 4 – Self-reported overweight and obesity prevalence in adolescents aged 11, 13 and 15 years, 2013/2014

Source: Health Behaviour in School-aged Children (HBSC) study (2013/2014 survey) [14]

Nutrition in Malta

Three decades of action in the nutrition area have tackled the matter from various angles by utilising multiple evidence- based strategies[15].

Governance and policy development

The first National Nutrition Conference took place in 1986, followed by the second Nutrition conference in 1988. The latter resulted in Governmental action through the formulation of the first version of the Malta Food and Nutrition Policy in 1989[16], and the setting up of the Nutrition Unit within the Department of Health to act as the focal point for action related to nutrition and diet-related non-communicable diseases. This was later incorporated as the Health Promotion Department within the Ministry for Health.

A reformulation exercise in 2007 saw the establishment of a specific directorate to focus on health promotion and non-communicable diseases: the Health Promotion and Disease Prevention Directorate. Through the policy arm of the Department for Health Regulation and the Department for Policy in Health, various strategies have been outlined over the years which targeted nutritional factors including the Non Communicable Disease Strategy[17], the National Cancer Plan[18], the National Healthy Weight for Life Strategy[19], the Food and Nutrition Policy and Action Plan for Malta[20], Health Systems Strategy[21], Whole of School Approach to Healthy Lifestyle: Healthy Eating and Physical Activity Policy and Strategy for all schools in Malta[22], the National Breastfeeding Policy[23] and the National Strategy for Diabetes[24].

A budget line dedicated to obesity was initiated in the Ministry of Finance budget estimates of 2011, accompanying The Healthy Weight for Life Strategy[19] and indicative of the importance given to nutrition issues. This budget line has continued since then.

Government has highlighted the issue of childhood obesity by placing it as a priority area during the Maltese Presidency of the Council of the European Union in 2017 to support action at EU level[25],[26]. During this Presidency, a midterm evaluation of the EU Action Plan on Childhood Obesity 2014-202027 was carried out. Based on the outcomes, Malta steered the development and adoption of Council Conclusions on halting the rise in childhood overweight and obesity[28]. These call upon Member States to integrate cross-sectoral measures, enabling environments that encourage healthy diets and adequate health-enhancing physical activity in their national action plans and strategies, amongst other actions. A technical report on public procurement guidelines for healthy food within school settings, which provides a useful tool for member states when issuing procurement tenders for food in schools was developed[29].

Legislative instruments

The World Health Organisation considers legislation to be a powerful policy tool for the prevention and control of NCDs30. Country experiences have shown that the introduction of appropriate legislation in combination with other approaches are central to achieving the vision of a tobacco-free Europe, reducing the harmful use of alcohol and promoting healthy diets. To this effect, WHO continues to recommend the use of law to reduce NCD risk factors, and recognizes the importance of developing legal capacity at the national level.

Malta issued such legislation with the enactment of the Healthy Lifestyle Promotion and Care of Non-Communicable Diseases Act, Chapter 550 of the Laws of Malta[31]. This legislative instrument formalised an intersectoral advisory committee which proposes actions on healthy lifestyles and NCD prevention through a Health in all Policies approach. A subsidiary legislation on procurement of food for schools has been enacted in August of 2018[32]. This emphasised the commitment of government to tackle the burden of NCDs, including diet- related disease, through all available means.

Health inequities and social determinants of health

Individuals living in low socioeconomic conditions are more prone to NCDs, including obesity, and diet is a strong contributing factor[33]. Evidence shows that health inequalities can be reduced by tackling social determinants through a Health in all Policies whole-of-government and a whole-of-society approach34 where all sectors within government and society including NGOs are involved.

With this in mind, the Ministry for Health has partnered with Government Ministries and civil society that are evidently the most influential on social determinants through the newly set up Social Determinants Unit within the Superintendence of Public Health. This project, which is supported by the World Health Organization, will focus on reducing health inequalities by establishing a national platform to address social determinants of health. This initiative includes the establishment of an intersectoral group to act on areas of health inequalities. Investment will be aimed at research, training and awareness campaigns.

Awareness and skills development

The Health Promotion Department initiated the first weight management programme in Malta in 1995. A revised lifestyle programme is ongoing, with increasing elements of skills strengthening and motivational interviewing being used to support behaviour change.

Diabetics are supported through a specific programme focusing on weight management, nutrition and physical activity. Nutrition guidance documents have been developed through interdisciplinary working groups. There are ongoing health promotion initiatives that use population- and risk-based approaches in various settings including schools, community, institutions, workplaces and through intersectoral work with various stakeholders.

Awareness campaigns have evolved along the years, using various media platforms that target specific sectors of the population. Social media is increasingly being used to reach a wider online audience.

Research

Research forms the basis of any strategy. Malta participates in several international studies including the European Health Interview Survey[8], the Health Behaviour in School-aged Children Study[14], the WHO European Childhood Obesity Surveillance Initiative[35] and the Global Physical Activity Questionnaire[36]. In addition, fieldwork for the first National Food Consumption Survey was completed in January 2017. The findings are expected to be published this year, and will guide further targeted actions in this area.

Audio-visual advertising, such as advertising of unhealthy foods especially that directed at children needs to be regulated. Currently television adverts are being evaluated to outline the current situation and eventually develop a set of recommendations to tackle this area. Research and methodologies to tackle advertising on social media used by children and young people is limited and should ideally be developed at EU level.

Monitoring and Evaluation

The purpose of evaluation and monitoring is to track the implementation process of a policy or strategy, assess its outputs, and measure the effectiveness of the process. Malta takes part in several studies allowing for monitoring through collection of data. Monitoring of overweight and obesity is done through EHIS 8 for adults every five years, and through the HBSC study for adolescents every four years. For the past decade, the COSI has measured trends in overweight and obesity among primary school-aged children 35. Further monitoring indirectly related to diet is carried out through the Household Budgetary Survey conducted by the National Statistics Office[37] (NSO) (2008 and 2015).

Lessons Learned

To maximise the probability that population dietary patterns continue to improve over time, certain key factors should be in place.

Political commitment needs to be sought and maintained throughout the lifespan of any diet-related policy or strategy, with adequate resources, a budget line for funding, and appropriate legislation put in place and enforced.

A **clear vision** must be formulated, and a **dedicated team** responsible for implementation, timeframes, resources, evaluation and a clear monitoring framework should be identified. Evaluation must be built into all policies and strategies from the start, and a dedicated budget allocated to this core component of the policy process.

For each priority identified, an action plan should include: (1) entity responsible; (2) stakeholders to be involved in that action; (3) timeframes; (4) SMART targets; (5) a detailed plan of how action is to be carried out; (6) human and financial resources; (7) outputs, outcomes; (8) monitoring and evaluation processes.

Public and stakeholder consultations may lead to opposition to some elements of the policy. Often a clear and substantial information campaign targeted at the media and the public must be carried out at the consultation stage to avoid distortion of the key messages or policy measures. This has occurred on occasion when cultural factors are challenged, such as modification of portion sizes or reformulation of traditional food (e.g. reducing salt content of bread and sugar in yogurts).

Trust built up over time with key stakeholders must be valued and nurtured to allow meaningful intersectoral policy implementation.

Policy formulation should be **evidence-based** and be flexible enough to allow changes to be made reflecting new evidence and changes within the wider societal environment, especially in ten-year strategies.

Participation in **international scientific fora**, European Union – funded projects and the provision of technical expert support from the World Health Organisation European Region has regularly proved beneficial in supporting with technical expertise and exposure to good practices. The specialist public health workforce is relatively stable ensuring that organisational memory is retained and that a stepwise approach to policy development and implementation is taken.

Future Outlook

Actions to improve nutrition requires a multifaceted approach that is outside the sole responsibility of healthcare through a whole of government and whole of society approach. The burden of diet-related diseases is becoming larger and clearly requires more focused and determined action at national level. Devolving responsibility for dietary behaviour to the individual has only had minimal impact, as shown by the provisional unpublished results of the National Food Consumption Survey (2017). Actions at national level that will be effective include working with local food producers to achieve food improvement. This action is already occurring at the European Union level and will benefit the Maltese population due to the high level of food imports. Some experience in this area has already shown some results in the reduction of salt content in bread and sugars in some yogurts. Collaboration with, as well as technical and financial support for, local producers is required.

There are important areas were legislation and enforcement are necessary to increase the availability of healthy food and regulate the availability of foods high in fat, sugar and salt in specific settings. This should include food within hospitals, workplaces, homes for the elderly, sports centres and ready-made baby food.

Fiscal incentives and taxation have not yet been used to any extent, such as in reducing the cost of vegetables, nuts and fresh fish, or incentivising the catering industry to provide more healthy options at a cheaper price. A national surveillance and monitoring system for key dietary risk factors is not yet in place with ring-fenced funding. Studies continue to occur only on an ad hoc basis. Resources to address weight management for children within the family setting are also needed.

The reality of climate change, depleting freshwater and soil degradation needs to be addressed as a priority in view of requirements for a sustainable food production system in Malta and the impact on food security given high food importation rates.

There is widespread awareness of diet-related disease within the Maltese population. It is now time to move away from health education to effective and bold population-wide measures to address nutrition effectively.

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TOBACCO LEGISLATION IN MALTA – A SHORT OVERVIEW

Christine Baluci

ABSTRACT

The aim of this article is to briefly describe legislation dealing with tobacco control in Malta. Although no actual strategy on tobacco control is in place to date, Malta's tobacco control approach is mainly based on comprehensive legislation arising mostly from of the Framework Convention on Tobacco Control (FCTC). Malta's ratification of this international WHO treaty was instrumental in the passing of such legislation of which the most important features are banning of all tobacco advertising and sponsorship, and the prohibition of smoking in public and work places. EU Regulations, most importantly Directive 2014/40/EU on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco and related products and repealing Directive 2001/37/EC, was also contributory to the introduction of stronger packaging regulations and new regulatory frameworks for the control of electronic cigarettes and new and emerging tobacco products under the classification of novel tobacco products.

While increases in excise tax is generally regarded as an effective tobacco control measure, tobacco control legislation also plays an important role in a comprehensive tobacco control strategy. Bans on tobacco advertising, bans on smoking in public and work places and pictorial health warnings on packaging denormalise smoking and are likely to make other tobacco control interventions more effective.

Introduction

'Tobacco products are not ordinary commodities and in view of the particularly harmful effects of tobacco on human health, health protection should be given high importance, in particular, to reduce smoking prevalence among young people.'[1]

This quote is an apt introduction to the necessity of strong regulation of tobacco products. Despite being legal consumer products, tobacco products have no safe level of consumption and increase mortality and morbidity when used as the manufacturer intends.

According to a 2017 Eurobarometer on the attitudes of Europeans towards tobacco and electronic cigarettes[2], 24% of the Maltese population over 15 years of age are daily smokers (cigarettes, cigars, cigarillos or a pipe) compared (EU28 26%), 22% males and 18% females (EU28 30% and 22% respectively). The annualised rates of reduction in daily smoking between 1990 and 2005 and 2005 and 2015 were 2.4 and 1.1 in males and 1.9 and 0.6 in females respectively[3] suggesting a slowing of progress in tobacco control.

In 2015, 16 percent of all deaths in adults over 30 in the European Region are attributable to smoking[4] making tobacco consumption one of the largest avoidable causes of morbidity and premature death in this region. In Malta, 434 deaths (13 % of all deaths)[5], were attributable to smoking in 2015.

The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC)

The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) was adopted in 2003 to address the global burden of tobacco use. It proposes measures to address contributing factors that lead to the uptake and continued use of tobacco. Parties to this convention (181 countries[6]) are committed to implement several tobacco control measures which build on existing experiences, practices and policies. These include measures to reduce the demand and supply of tobacco through fiscal and non-fiscal measures.

One of the supply-reduction measures in the FCTC include provisions against illicit trade in tobacco products. The Protocol to Eliminate Illicit Trade in Tobacco Products (the Protocol) aims at eliminating illicit trade in tobacco products through collaborative measures between countries. Illicit trade is considered a serious threat to public health as it increases access to cheaper (therefore more affordable especially to younger and low-income persons) and non-regulated tobacco products. To date, there are 48 Parties to this protocol[7]. Malta became a Party to the WHO FCTC in 2005 and to the Protocol in 2018.

EU Regulations

Directive 2001/37/EC of the European Parliament and of the Council[8] laid down rules at Union level concerning tobacco products. This was repealed and replaced by a new Directive 2014/40/EU[9] to reflect scientific, market and international developments made in the intervening years.

New challenges were posed by the increasing popularity of novel tobacco products and alternative nicotine delivery systems. Therefore, the scope of the new directive was adjusted to include further tobacco and related products not previously regulated including electronic cigarettes, novel tobacco products and herbal products for smoking.

Key provisions in this Directive include:

- mandatory pictorial health warnings covering 65% of both main surfaces with countries retaining the option to introduce standardised packaging nationally;
- a ban on "characterising flavours" in cigarettes, with some transitional periods;
- minimum packet dimensions to ensure greater visibility of health warnings and prohibit 'lipstick' style packs popular amongst young people;
- regulations for electronic cigarettes, novel tobacco products and herbal products for smoking;
- regulations for cross-border distance sales of tobacco and related products; and
- provisions for setting up a tracking and tracing system to help fight illicit trade.

The Tobacco Advertising Directive (2003/33/EC)[10] banned cross-border advertising of tobacco products in printed media, radio and on-line services. This Directive was supplemented by the Audio-visual Media Services Directives 2007/65/EC[11] and later by 2010/13/EC[12] which extends this ban to all forms of audio-visual commercial communications, sponsorships and product placement.

Council Recommendation on the Prevention of Smoking and on Initiatives to Improve Tobacco Control (2003/54/EC)[13] encourages further action against tobacco advertising within a wider comprehensive approach towards tobacco control, with a view to reducing the incidence of smoking-induced diseases especially young persons.

Council Recommendation on Smoke-free Environments (2009/C 296/02)[14] recommends several actions with regards to the protection of the public especially children from exposure to tobacco smoke in enclosed public places, workplaces and public transport.

Maltese Legislation

Measures Relating to the Reduction of the Supply of Tobacco - Non-fiscal measures

Protection from exposure to tobacco smoke

The Tobacco (Smoking Control) Act, 1986[15] (Chapter 315 of the Laws of Malta) prohibits smoking in cinemas, theatres, hospitals, clinics or other health institutions; in educational premises used by children under eighteen years of age; or in any television studios in any debate, discussion or other programme broadcast locally.

In 2010, the Smoking in Public Places Regulations, 2010 (L.N. 23 of 2010)[16] extended the ban to all enclosed areas except in individual rooms in accommodation premises used for sleeping purposes and which are occupied solely by smoking patrons. An unfortunate amendment to L.N. 23 of 2010, the Smoking in Public Places (Amendment) Regulations, 2013[17] allowed smoking in a designated smoking rooms within licensed casinos, still in force to date.

Children are further protected from exposure to tobacco smoke with the ban of smoking within the precincts of a playground or public garden containing playing equipment for children[18] and in private vehicles in the presence of a minor (16 years of age) [19].

The Products and Smoking Devices (Simulating Cigarettes or Tobacco) (Control) Regulations (L.N. 22 of 2010)[6] mandates that, in so far as advertising and smoking in public places are concerned, tobacco devices, defined as 'any product bearing the name cigarette or tobacco which is intended as a substitute to a conventional tobacco product or smoking requisite and includes any non-nicotine device, but excludes any pharmaceutical nicotine delivery devices', must comply with the Tobacco Act and regulations.

This means that the ban of smoking in the specified areas and advertisement apply also to electronic cigarettes and other novel tobacco products.

Regulation of the contents of tobacco products and tobacco product disclosures

Manufacture, Presentation and Sale of Tobacco and Related Products Regulations, 2016 (L.N. 67 of 2016)[21], transposing the Tobacco Products Directive 40/2014/EU reconfirms previous maximum emission levels for tar, nicotine, and carbon monoxide; mandates the reporting of emissions and ingredients of tobacco and related products and notification of their ingredients by manufacturers and importers; and their laboratory verification by the competent authorities. It also sets out mechanisms for enhanced reporting obligations for cigarette and roll-your-own tobacco additives included in a priority list to assess their toxicity, addictiveness and carcinogenic, mutagenic or reprotoxic properties (CMR properties).

Information about the constituents and emissions of tobacco and related products placed on the national market are published on a website for public information.

Packaging and labelling of tobacco products

L.N. 67 of 2016 deals extensively on packaging and labelling exceeding older requirements set in previous legislations. Labelling requirements call for large picture warnings on both principal display areas (covering 65% of their allocated area); health warnings with minimum dimensions to ensure their visibility and effectiveness; mandatory cessation information and strict rules on misleading information. The official languages (Maltese and English) must be used for these warnings and any other textual information.

These labelling provisions reflect evidence which suggests that large combined health warnings comprised of a text warning and a corresponding colour photograph are more effective than textual warnings alone. Also, the indication of the emission levels for tar, nicotine and carbon monoxide on unit packets of cigarettes may be misleading as it leads consumers to believe that certain cigarettes are less harmful than others. Therefore, any such information has been specifically prohibited.

Tobacco products for smoking other than cigarettes and roll-your-own tobacco products have a smaller market share being mainly consumed by older persons and are not generally popular with young persons. Therefore, as long as there is no substantial change of sales volumes or consumption patterns of young people, such products are exempt from stringent labelling requirements such as the combined health warnings. Full labelling is required in the case of waterpipe tobacco to avoid consumers being misled that such products are less harmful than traditional tobacco products.

Tobacco advertising, promotion and sponsorship

The Tobacco Act lays down several provisions regarding advertising of tobacco products. Direct advertising of tobacco products on television, radio or other broadcasting medium, in cinemas; advertising by means of branding; free distribution;sponsorship of events or activities having the purpose or the direct or indirect effect of promoting such products are prohibited. Health warnings and a notice that smoking is prohibited by law in cinemas are required to be shown on screen before the beginning of every film show, immediately on the resumption of the show after the interval and before the showing of any broadcast in which smoking is shown or mentioned.

Health warnings are also to be displayed in shops selling tobacco products. Sweets, confectionery or toys in the form of cigarettes, cigars or smoker's pipe are prohibited since these might attract children. Regulation against tobacco product advertising is strengthened by the Broadcasting Act (CAP. 350)[22].
Direct or indirect advertisement of electronic cigarettes is banned through LN67 of 2016 and the Products and Smoking Devices (Simulating Cigarettes or Tobacco) (Control) Regulations described above.

Measures Relating to the Reduction of the Supply of Tobacco - Fiscal measures

Tobacco products taxation

The taxation of tobacco products (import duties, value-added tax and excise taxes) is an important policy mechanism for reducing the prevalence of smoking and for reducing the quantity consumed by those that continue to smoke[1]. The industry counteracts this evidence by suggesting that increasing tobacco product prices is accompanied by increased availability of illicit products while the reduction in demand leads to economic losses in the country. However, increased tax and prices for tobacco actually benefit governments by increasing revenues resulting in a win-win result of reducing health care costs and increasing revenues.

Directive 2011/64/EU[24] requires Member States to levy a minimum rate of excise duties on cigarettes consisting of a specific (fixed) component being a percentage of the total tax burden and an ad valorem component expressed as a percentage of the maximum retail selling price. This also sets minimum excise duty rates for manufactured tobacco other than cigarettes. Presently, there is no consensus on excise duty on electronic cigarettes in the EU, but work is being carried out to harmonise taxation on these products in line with tobacco products.

In Malta, taxation on tobacco products mainly cigarettes have increased annually up till 2017. In 2017 and 2018 no further increases in taxation were decreed in the national budget.

Measures Relating to the Reduction of the Supply of Tobacco Illicit trade in tobacco products

As discussed, tobacco use generates substantial tax revenues for countries, but their illicit trade undermines tax revenues. By increasing accessibility and affordability of tobacco products, illicit tobacco products also undermine tobacco control measures aimed at reducing the smoking prevalence.

The WHO Protocol to Eliminate Illicit Trade in Tobacco Products aims at eliminating of all forms of illicit trade in tobacco products, in accordance with the terms of Article 15 of the WHO FCTC.

In particular, the Protocol seeks to secure the supply chain of tobacco products by establishing a global tracking and tracing regime.Malta, a party to this protocol, is committed to establish a track and trace regime by May 2016 for cigarettes and RYO tobacco and May 2024 for other tobacco products through regulations set down in LN67 of 2016.

Sale of tobacco products

Reduction in supply is also enabled through restrictions of sale of tobacco products. The Tobacco (Control) Act prohibits the sale of tobacco products in all health care, educational and sport facilities. The sale, supply or distribution of tobacco to persons under the age of eighteen years is prohibited while tobacco products sold from automatic sales machines must be kept under supervision to ensure that no person under eighteen years of age has access to such products[25].

There is no legislation in Malta that requires sellers of tobacco products to place a clear and prominent indicator inside their point of sale about the prohibition of tobacco sales to minors or a specific ban for the sale of tobacco products at accessible retail points, such as store shelves as required by the FCTC. There are also no legislation prohibiting smoking by under-age persons or prohibiting sales of tobacco products by minors.

Certain packaging and tobacco products including their size and appearance may appeal to minors. The supply of sweets, confectionery or toys in the form of cigarettes, cigars or smoker's pipe is prohibited by the Tobacco (Control) Act while LN67 of 2016 forbids tobacco products or their outside packaging to resemble food or cosmetic products. Individually sold cigarettes or cigarettes in small packets are banned through the regulation of appearance and content of unit packets since these features increase the affordability of such products to minors.

Recommendations

Tobacco and related products are regulated through a number of legislations enacted under the Tobacco (Smoking Control) Act with overlapping or sometimes contradictory regulations or policies within the remit of other entities such as to OHSA, Customs etc. There is also no national tobacco control strategy to date while the multidisciplinary Committee on Smoking and Health set up through the Tobacco (Control) Act meets very rarely and is not representative of key national players. Therefore, recommendations should strongly argue for a multisectoral strategy to provide a national policy framework aimed at creating a generation of non-smokers. The strategy should strongly support:

· the revision of the Committee on Smoking and Health as set by the Tobacco (Control) Act to include all players and also legal advisors, and which meets frequently and effectively to aid implementation of regulations and discuss emerging issues;
· setting up a framework for the management, monitoring and evaluation of both the strategy and the implementation of regulations;
· review of present legislation to update the Act, thereby reducing the number of subsidiary legislations and filling in gaps;
· encourage country-specific research, drawn from a variety of disciplines, including market trends into newly emerging tobacco and related products;
· consider further specific actions such as the introduction of standardised tobacco packaging (plain packaging); and
· ensure adequate funding for tobacco control measures especially enforcement of regulations.

Strong and consistent lobbying is required to persuade the competent authorities to develop and implement an effective tobacco control strategy.

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THE DEVELOPMENT OF POST-GRADUATE EDUCATION AND TRAINING IN PUBLIC HEALTH MEDICINE IN THE MALTESE HEALTH SYSTEM

Karen Vincenti, Annalise Borg, Jason Attard

ABSTRACT

The groundwork for post-graduate medical training in Malta began prior to Malta's accession to the European Union (EU) in May 2004. Public Health Medicine was the first medical speciality in Malta to have a structured post-graduate training programme in place. The first Public Health Training Committee was set up in 2003 to formulate, monitor and review the training framework and curriculum and ensure the institution of quality assured specialist training in Public Health Medicine in Malta. The first formal training programme was established in 2004 and in 2007 the first cohort of trainees was recruited. Training in public health medicine in Malta was recognised by the EU in 2008. By end 2018, 21 trainees had enrolled onto the programme; of these, 13 (62%) successfully completed training while 8 doctors (38%) were still in training. The curriculum underwent several evaluations, reviews and revisions and has progressed into a sought-after, well-organised, dynamic, and still-evolving training programme. The road ahead is an exciting one, envisioning an e-portfolio, a focus on trainer development and support, the development of special areas of interest and opportunities for training abroad. Succession planning is crucial for the preservation of a wealth of hard-earned invaluable experience, knowledge and expertise in the speciality.

Introduction

The groundwork for post graduate medical training in Malta was initiated well before Malta's accession to the European Union (EU) in May 2004. In 1995, the University of Malta had established the Master of Science in Public Health Medicine enabling the academic component of training to be available. In the years prior to accession, work was carried out on the development of the practical training programme such that Public Health Medicine became the first medical speciality in Malta to have a structured post-graduate training programme in place. This preceded the institution of the Malta Postgraduate Medical Training Centre (MPMTC) in 2008.

Background

Pre – 1999

The need for a local set up for the provision of academic learning in public health medicine was recognised in the early nineties; during this time a group of young doctors working in public health had returned from postgraduate studies abroad, mainly at the London School of Hygiene and Tropical Medicine in the United Kingdom (UK), sponsored by the Department of Health. Most of these doctors went on to qualify for Membership and Fellowship of the UK Faculty of Public Health. Prior to this time, the possession of a Diploma in Public Health (DPH) was the recognised qualification for Maltese doctors with expertise in public health; a number of these names are inscribed in the hallway of the Ministry for Health in Valletta among those at the helm of the health service (or Sanita` as it was traditionally known) as far back as 1917.

The newly qualified public health physicians returned to employment in more senior and headship positions within the Health Division and the then Department of Public Health. Besides steering through several legislative and institutional changes leading to major public health reforms, several of these doctors were instrumental in the setting up of the Malta Association of Public Health Medicine (MAPHM),and contributed largely to the setting up and delivery of formal public health training in Malta.

The first Master of Science (MSc) Course in Public Health Medicine was established in 1995 by the eminent late Professor Herbert Gilles, a founding member of the Department of Public Health (previously the Department of Community Medicine) at the University of Malta. The course, which still runs every other year, includes modules in epidemiology, medical statistics, health information, research methods, health promotion, communicable and non-communicable disease, environmental health, health care systems and management, health economics, sociology and social policy [1].

The first MSc. part-time study course, equivalent to one year of full-time study, was a success; several of the graduates followed in the footsteps of their mentors and forerunners and went on to hold consultant and senior public health positions within the Maltese health system in the roles of Chief Medical Officer, Director General, Superintendent of Public Health, Director (public health, institutional health, primary health care, policy and planning, health information and research, international health), and medical superintendent; and internationally within institutions and organisations such as the World Health Organisation, European Centre for Disease Prevention and Control, Serum Staten Institute and the European Association of Public Health Medicine.

1999-2019

The MAPHM is responsible for promoting and upholding high standards in education and formal training for the speciality in the Maltese Islands. In March 2000, the MAPHM Executive Committee presented recommendations, based on Chapter 6 of the European Charter on training of Medical Specialists in the EU for the Public Health Specialty (UEMS/PH) [2], on the requirements for competence-based training that would lead to future accreditation in the specialty of Public Health Medicine.

In September 2002, the Mutual Recognition of Qualifications Act [3] was enacted to transpose European Directive 2005/36/EC [4] on the recognition of the scheduled regulated professions and professional activities. Several discussions regarding training were held over the following year between the Association, the Public Health Department at the University of Malta, and the Health Ministry.

A Train the Trainers Programme in the form of a two-day seminar for potential trainers in public health was held in February 2003. This event, supported by the UK Faculty of Public Health, provided an understanding of the requirements for structured public health training, priming doctors working in public health for future trainer roles: Malta's first training programme was adapted from this UK model with further revisions to make it more locally relevant.

The 24th March 2003 marked an important decisive preparatory meeting concerning the setting up of the very first Public Health Medicine Training Committee (PHTC), through which the MAPHM continues to fulfil its training related role. This was guided by MAPHM recommendations as well as a detailed report commissioned by the Department of Health (2002) by visiting expert Dr Peter Donnelly regarding proposals for formalising a public health training programme in Malta. The expert report recommended areas of activity around the setting up of the training programme, noting that there were already 'excellent training opportunities within institutional health, public health[1], health promotion, policy and planning, health information and the Foundation for Medical Services'.

The Terms of Reference for the first tripartite (MAPHM, University of Malta and Health Department) Training Committee were drawn up. The Public Health Medicine Specialist Training Committee (PHTC) was entrusted with the responsibility to formulate, monitor and review the training framework and curriculum for specialist training in Public Health Medicine in Malta and the institution of quality assurance of the training programme.

The Health Care Professions Act (5) was enacted on 21 November 2003 to regulate the practice of health care professions in Malta. The Medical Specialist Accreditation Committee (SAC) as established by the Act, includes representation by the Malta Medical Council, Faculty of Medicine and Surgery at the University of Malta and the Superintendent of Public Health, together with members appointed by each of the relevant professional associations, including the MAPHM. The SAC Framework provides a general framework for Medical Specialist Training in Malta.

Following Malta's accession to the European Union on 1st May 2004, the grandfathering eligibility criteria for medical specialist registration and certification for doctors who started their training in Malta before 21st November 2003, were established in terms of Articles 53 [2] and [3] of the Health Care Professions Act [6].

The criteria for specialist registration in Public Health as formulated by MAPHM were the following: *(1) Applicants must be in possession of an MSc degree in public health or equivalent (DPH prior to 1985); AND must have practised in public health medicine for a minimum of four years full-time or pro-rata equivalent ; OR (2) Applicants must have worked in the full breadth of the speciality for a minimum of eight years to a standard satisfactory to the SAC on the recommendation of MAPHM.*

Following evaluation by the PHTC, and on recommendation to SAC by the MAPHM, the first group of 34 doctors fulfilling the criteria were recommended for inclusion in the Medical Specialist Register under Public Health Medicine in March 2005. Another 15 applicant doctors with various levels of experience of work in public health, on request of the Training Committee, successfully underwent catch up training, to ensure adequate exposure across the full breadth of the speciality to qualify for eligibility for specialist registration through 'acquired rights' (11 candidates), and through formal assessment (4 candidates who started working in public health after the enactment of the Health Care Professions Act in November 2003). Following this exercise, the first structured Public Health Medicine Specialist Training Programme was formalised with the first Training Policy document being drawn up in 2003 and published in December 2004. The first intake of basic specialist trainees in public health medicine joined the formal training programme in 2007.

A year later, in June 2008, the Malta Postgraduate Medical Training Centre (MPMTC) was inaugurated with the aim of providing structured training and career pathways for all postgraduate medical trainees and their trainers across specialities and in line with European Union medical specialisation and health care professional training standards [7].

In 2008, the EU recognized the medical speciality of Public Health (Saħħa Pubblika) in 21 member countries including Malta [8]. Postgraduate training coordinators (TCs) for each speciality were appointed by the MPMTC through an open application process and selection interview [9]. A TC for public health medicine was formally appointed in 2010; the TC chairs the PHTC and is responsible for the organisation, management and day-to-day administration of the Training Programme, coordinated through the PHTC.

Evolution of the training programme

The Public Health Training Programme has presented a challenging, evolving, dynamic and learning experience for all concerned. It underwent several internal and external evaluations and reviews and revisions based on the various recommendations and feedback.

The first training programme as established in 2004, comprised 48 months full-time equivalent (FTE) of supervised training rotations to cover operational areas of specialisation of public health and an academic component through the MSc in Public Health [10]. The areas of specialist training in the training portfolio were developed over the years to include an array of competences to be achieved. These include the use of public health intelligence for assessing population health and well-being, health protection, health promotion, assessing effectiveness of services and reducing inequalities, strategic leadership and collaborative working; health care planning, policy development and implementation, research and development and personal development.

Trainees are assessed regularly with formal assessments held annually and an exit assessment at the end of training, with the participation of an external assessor.

The results of a first evaluation by trainees of the Public Health Training Programme were presented to some 20 training supervisors, lead location trainers and location trainers during a Train the Trainers Update meeting: 'Evaluating the Public Health Training Programme' organised by the PHTC in June 2011 and moderated by external reviewer Dr Premila Webster. Trainees highlighted shortcomings regarding transition between training locations, logistical issues relating to space, IT and communication, and competing training needs in relation to the exigencies of the service to the detriment of trainees' achievement of competences in certain locations. Discussions ensued regarding actions to consolidate areas which were working well and to seek to improve problematic areas.

In September 2011, external reviewer Prof. David Strachan provided the PHTC with a detailed evaluation report at the end of a visit during which he met with the training committee, trainees and trainers. This gave the Committee the opportunity to continue to reflect on the status of the training programme and to address identified challenges for public health training in Malta. The evaluation provided constructive suggestions towards the quality improvement of training and the training experience including matters related to trainee recruitment, transition through revised training systems, timing of the academic course and its synchronisation with trainee recruitment, career progression, duration of training to possibly include a fifth year, international experience, training rotations, guidance to fulfilling required competences, IT facilities and roles and responsibilities of trainers. Despite these challenges, Prof. Strachan remarked that 'much of public health medicine is vibrant and cohesive and ...it has attracted individuals of generally high calibre, both as trainers and trainees. This bodes well for the future of the speciality in Malta...'.

Many of the issues highlighted in the reviews were addressed through the work of the PHTC. Each trainee entering the programme is loaned a laptop for the duration of training. While balancing trainee needs and service provision requirements remains a challenging reality, all efforts are made, with the help of each trainee's appointed Training Supervisor, to ensure the matching of these needs as far as is possible. Over the years, efforts were made to organise journal clubs and CPD sessions for trainees and trainers, and regular structured interactive sessions and case-based discussions on practical topics for trainees were introduced.

The PHTC also took up recommendations following a separate external evaluation report in 2012 to incorporate trainee induction, a trainee buddy system and the revision of the training logbook in consultation with trainees and trainers. Since 2013, trainee representatives have been regularly elected to observer status on the PHTC. Mandatory meetings between trainers and trainees are documented by all trainees in a standard manner. Protected time for trainees is safeguarded. Trainer support is an area in which there remains room for improvement.

Following the 2012 external review, a Training Review Subcommittee of the PHTC carried out a revision of the training framework and proposed changes to include clearer aims and objectives for trainees and trainers, further details about the training process and trainee progression, training inputs, appraisals, rights and responsibilities and accountability.

The proposed revisions undertaken by the PHTC Subcommittee were commended by external reviewer Dr Premila Webster in September 2013 and the revised framework document was approved by MAPHM and the SAC in 2013 [11].

A decision of the MAPHM Extraordinary General Meeting (EGM) held on the 19th of February 2015, mandated an increase in the training period for specialisation in Public Health Medicine to a minimum of 5 years (60 months) FTE in total, including a minimum of 24 months FTE as Basic Specialist Trainee (BST) and to incorporate special areas of interest and training exposure abroad.

A review conducted in 2016 showed favourable comparisons between the structure and competences of the local training programme and foreign training programmes under consideration (USA, UK, Ireland & Canada). This review, which identified some competences in the local training logbook as being 'difficult to achieve, vague or unclear' and made specific recommendations for improvement, informed the revisions of the Training Framework [12] and Training Portfolio documents in 2016 and 2018 respectively .

The latest version (2018) of the Public Health Specialist Training Logbook [13] also addresses points raised in a broad consultation among public health medicine specialists and past and current specialist trainees, regarding the extensive revision of logbook competences in each area of specialist practice, guidance for their achievement and their assessment, reflective practice ,the integration and application of public health competences for specialist practice and effective personal impact at Higher Specialist Trainee (HST) level.

A recent trainee evaluation of the training programme in February 2019 by means of an anonymous questionnaire completed by former and current doctors in training found that the training needs of trainees are being respected overall with adequate opportunities being given to fulfil their logbook competences.

However, more public health specialist cover in a few specific training locations is essential to ensure that trainees adequately cover the necessary competences. Areas for improvement included the need for more regular train-the-trainer initiatives as well as training for trainees on how to use the newly revised logbook which has undergone substantial changes.

Trainees also indicated that they would like to see more opportunities to pursue a special area of interest within which they will be supported to work once their training is completed. This will be facilitated through the implementation of the new training programme, which includes an additional fifth year of training aimed to fulfil this purpose.

Enrolment in Public Health Medicine Specialist Training, trainee progression and the public health medical workforce

Between 2004 and 2008, 15 doctors underwent catch up training; in 2007 the first cohort of BSTs were recruited to the formal 4-year training programme by selection interview. Since 2007, a call for a competitive interview is regularly issued by the Ministry for Health for the recruitment of medical specialist trainees in public health medicine. Eligible candidates must have obtained a degree in Medicine and Surgery, must be registered with the Malta Medical Council and be in possession of the Foundation Achievement of Competence Document (FACD), after having completed a two-year Foundation Training Programme.By the end of 2018, a total of 21 trainees were recruited to the formal training programme, of these, 13 (62%) who were recruited between 2007 and 2013 successfully completed their training while 8 trainees (38%) recruited between 2015 and 2018 were still in training (Figure 1). In addition, there were also 3 doctors-in-training who left the programme to switch speciality or transfer overseas.

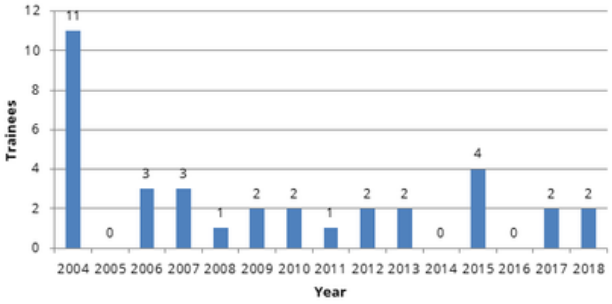

Figure 1: Number of trainees joining the Public Health Medicine Training programme by year who successfully completed their training or are still in training, Malta 2004-2018

Taster weeks in Public Health Medicine are regularly organised by the PHTC in collaboration with the Foundation Programme. Taster weeks offer foundation doctors a 5-day programme which exposes the participant to several competency areas in public health medicine at various training locations. These taster weeks have gained popularity along the years and interest in the specialty is on the increase. Since 2012, a total of 26 doctors attended a taster week. Of these, 10 (38.5%) successfully joined the training programme and 3 of these 10 doctors are now qualified specialists (Table 1). The number of applicants for the position of basic specialist trainee in public health medicine is consistently higher than the number of posts on offer, with repeat applicants also being received over successive years.

Year	Number of doctors		
	Attended a taster week	Successfully joined and are still in training	Completed their training
2012	4	3	3
2013	1		
2014	1	1	
2015	4	3	
2016	3	1	
2017	9	2	
2018	4		
2019	3 requests		

Table 1: Number of doctors who attended a taster week in the Public Health Medicine Specialty and subsequently joined the training programme and are still in training or completed their training.

At the end of 2018, there were 61 public health specialists on the medical specialist register (14). 49 doctors were 'grandfathered' or underwent a period of catch-up training achieved specialist registration between 2005 and 2009. Twelve doctors who completed the formal 4-year training programme became public health medicine registered specialists between 2011 and 2018 (Figure 2).

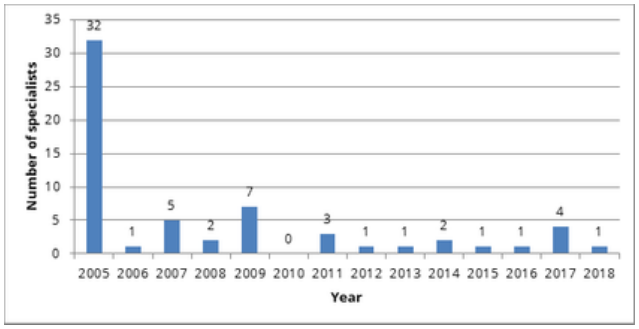

Figure 2: Number of new Public Health Medicine Specialists on the Specialist Medical Register by year of registration, Malta 2005-2018

Most registered specialists (67.2%) work in the public sector, many within leadership and senior management positions within the Maltese Ministry for Health; while another 11.5% practise their profession abroad and occupy prestigious public health positions within organisations such as the WHO and ECDC. This mix (Figure 3) adds value to the Maltese contribution to public health at the national, European and global level.

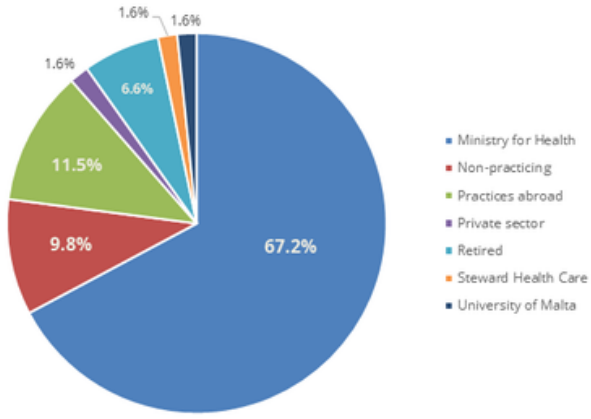

Figure 3: Specialists in public health medicine registered in the Maltese Specialist Register by area of practice as at February 2019

The future of public health medical training

It is clear from the various reviews and evaluations carried out over the years that the Public Health Medicine Specialist Training Programme has developed substantially into a sought after, well organised, dynamic and evolving training programme. The journey has been a remarkable one, with various challenges and hurdles along the way, including those relating to the building and updating of the training programme, the synchronisation of academic and practical components, and the availability of training posts and trainers. The road ahead is an exciting one, which envisions an e-portfolio to replace the current paper-based logbook, a focus on trainer development and support and the development of special areas of interest and training abroad, where further networking is required to explore and establish channels, links and exchanges internationally.

With several founding public health doctors reaching or nearing retirement age, succession planning within the health system is crucial for the sustainability of the public health medicine speciality and to ensure that the wealth of invaluable experience, knowledge and expertise gained through a generation of hard work and determination is preserved. The exceptional contribution by the speciality to the development of health services, public health and the overall improvement of health and well-being, together with the central role of the speciality in addressing ongoing and emerging health challenges evolve the need for public health doctors to remain firmly rooted within the health sector yet continuing to reach out to build bridges with other professions and sectors.

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