ENVIRONMENTAL HEALTH

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

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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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