

Health Protection Inequalities on the Island of Ireland

An introductory Paper

Prepared by Dr Lorraine Doherty,
On behalf of the Institute of Public Health In Ireland



Health Protection Inequalities on the Island of Ireland An Introductory Paper

**Prepared by Dr Lorraine Doherty,
On behalf of the Institute of Public Health In Ireland (IPH)**

February 2016

CONTENTS

Foreword	2
Introduction	2
Acknowledgements	4
Chapter 1 Setting the context - Health Inequalities	5
Chapter 2 Health Protection Inequalities – The evidence	11
Chapter 3 Tackling health inequalities and strengthening health protection	25
Chapter 4 Tackling health protection inequalities on the Island of Ireland – Recommendations	31
References	33
Appendix 1	38
Appendix 2	39
Appendix 3	40

Foreword

Public health services in Ireland, North and South, are committed to addressing inequalities in health on the island of Ireland. Addressing health inequalities is seen as a global health priority by the World Health Organization (WHO). Public health services on both sides of the border have led programmes of work to address the imbalance in society's health and to improve the health of those who are at a disadvantage, by virtue of where they live, employment status etc.

This report specifically highlights health inequalities in relation to infectious diseases and other areas of health protection such as chemical hazards and environmental disruption. Infectious diseases disproportionately affect the most vulnerable in society. These vulnerable groups bear the highest burden of disease in relation to infectious diseases. The report also highlights the impact of climate change on health protection and the impacts for water, food and vector borne diseases.

The aim of this report is to enable a programme of work to begin to document health protection inequalities and develop action plans for addressing them on an all island basis. Infectious diseases know no borders and with the extent of travel for both leisure and work, not only over the border between the North and South of Ireland but also globally therefore we must work collaboratively to address issues relating to infectious disease threats.

We are grateful to Dr Lorraine Doherty and her colleagues who developed this paper with the support of the Institute of Public Health in Ireland (IPH). We endorse the need for a North/South forum in Ireland to tackle this issue together.

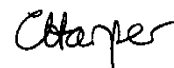
Signed



Dated: 6th October 2015

Dr. Kevin Kelleher
Assistant National Director for
Northern Ireland, Public Health & Child Health
Health & Wellbeing Division
HSE

Signed



Dated: 6th October 2015

Dr Carolyn Harper
Director of Public Health for
Public Health Agency

Introduction

Health Protection Inequalities

A letter from the author

Tackling health inequalities is a global public health priority and there are specific areas of inequalities which relate to health protection issues such as infectious diseases in disadvantaged populations. This paper has been produced in collaboration with colleagues in the Institute of Public Health in Ireland (IPH), the Health Service Executive (HSE) (Republic of Ireland) and the Health Protection Surveillance Centre (Republic of Ireland) (ROI).

IPH, the health departments North and South, and the Public Health Agency (PHA) Northern Ireland (NI) have policies in place to address health inequalities and work programmes addressing specific issues. However, to date there has been no in-depth consideration of the issues around inequalities in respect of infectious diseases or in other health protection areas.

This paper attempts to reflect the documentation of health protection inequalities in other jurisdictions, the approaches taken to tackling inequalities and some broad information on populations who are affected by health protection inequalities. By identifying particular vulnerable groups in society the intention is not to stigmatise or marginalise these groups but instead to highlight the need to examine the socio-economic and cultural issues leading to these groups bearing a disproportionate burden in relation to infectious disease and impacts arising from environmental factors.

The aim is to gather information that can help to inform effective interventions and target services that may help to improve their health outcomes in relation to key health protection areas. The European Centre for Disease Control (ECDC) has prioritised this area and has recommended action to be taken. The aim of this introductory paper is to stimulate a collaborative work programme on the island of Ireland, under IPH sponsorship, to start addressing issues around health protection inequalities.

Dr Lorraine Doherty
Assistant Director of Public Health (Health Protection)
Public Health Agency NI

Acknowledgements

Dr Lorraine Doherty produced this paper with the support and input of colleagues from the Health Protection Service, PHA (NI), IPH, Health Protection Surveillance Centre and HSE (ROI) as follows:

Health Protection, PHA (NI)

Cathriona Kearns
Neil Irvine
Michael Devine

Health Protection Surveillance Centre, HSE (ROI)

Darina O’Flanagan
Derval Igoe
Joan O’Donnell
Lelia Thornton
Paul Mc Keown
Suzanne Cotter

HSE

Kevin Kelleher

IPH

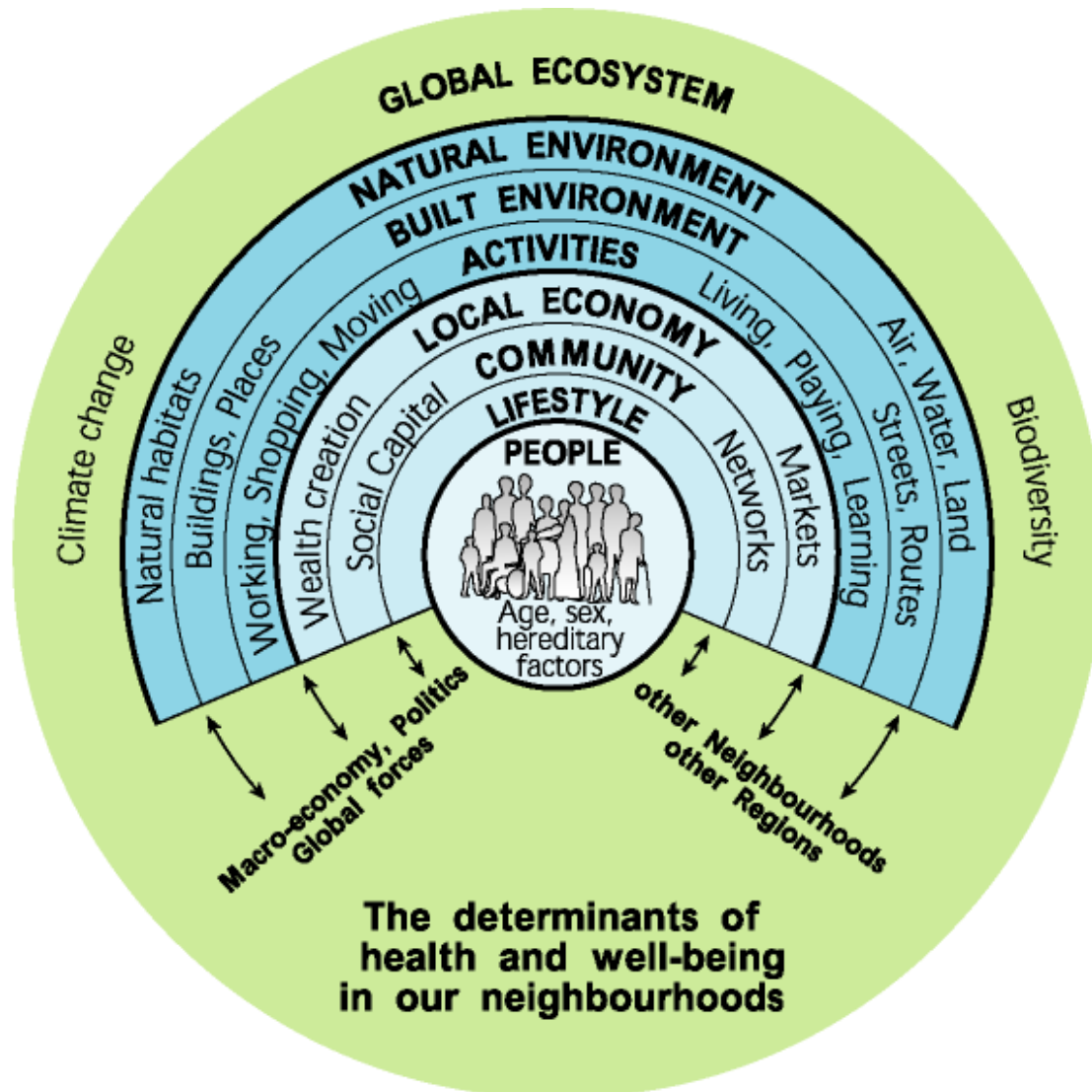
Elizabeth Mitchell
Owen Metcalfe

Chapter 1 Setting the context - Health Inequalities

- 1.1 Health inequalities are preventable and create unfair differences in health status between groups, populations or individuals. They exist because of unequal distributions of social, environmental and economic conditions within societies which determine the risk of people getting ill, their ability to prevent sickness, or opportunities to have access to the right treatments.
- 1.2 An individual's health is determined by individual factors such as age, gender and genetic makeup. These factors are modified during the life course by the individual's lifestyle. Lifestyle and health are influenced by the environmental conditions in which the individual lives. Beyond this, health is influenced by the community and social conditions and in turn influenced by the wider political and economic circumstances.
- 1.3 Health inequalities are often observed along a social gradient "a stepwise or linear decrease in health that comes with decreasing social position" (1). This gradient exists in all countries and the pattern can be observed when looking at factors such as income, level of education, geographic region, gender, or ethnicity. This means that the more favourable your circumstances in relation to these factors the better your chances of enjoying good health and a longer life. These broader influences on health are illustrated by Figure 1.

Figure 1

Barton H, Grant M. A health map for the local human habitat. *Journal of the Royal Society for the Promotion of Health* 2006. 126 (6).



Fair Society, Healthy Lives (The Marmot Review)

- 1.4 In November 2008 Professor Sir Michael Marmot was asked by the UK Secretary of State for Health to chair an independent review to propose the most effective evidence-based strategies for reducing health inequalities in England from 2010. The report of the review Fair Society, Healthy Lives (The Marmot Review) - was published in 2010 (3).

The review outlined a number of key messages in respect of health inequalities:

- Reducing health inequalities is a matter of fairness and social justice.
- There is a social gradient in health – the lower a person’s social position the worse his or her health.
- Health inequalities result from social inequalities.
- Action on health inequalities requires action across all the social determinants of health.
- Focusing solely on the most disadvantaged will not reduce health inequalities sufficiently.
- To reduce the steepness of the social gradient in health actions must be universal but with a scale and intensity that is proportionate to the level of disadvantage. This is called *proportionate universalism*.
- Action taken to reduce health inequalities will benefit society in many ways. It will have economic benefits in reducing losses from illness associated with health inequalities.
- Economic growth is not the most important measure of our country’s success. The fair distribution of health, well-being and sustainability are important social goals.
- Tackling social inequalities in health and tackling climate change must go together.

- 1.5 Six main policy objectives are outlined in the Marmot Review as crucial to achieving health equity:
1. Give every child the best start in life;
 2. Enable all children, young people, and adults to maximise their capabilities and have control over their lives;
 3. Create fair employment and good work for all;
 4. Ensure a healthy standard of living for all;
 5. Create and develop healthy and sustainable places and communities;
 6. Strengthen the role and impact of ill-health prevention.
- 1.6 Achieving the above policy objectives will require action across government as well as the health sector, private sector and community groups. Working to empower individuals and local communities to engage in participatory decision making around issues which affect their health is essential.
- 1.7 The Marmot Review was a seminal report in the context of tackling health inequalities. It has significantly influenced strategic approaches and action on health inequalities in the UK and Ireland.

Strategic Approach in Northern Ireland

- 1.8 The Department of Health, Social Services and Public Safety in NI issued a new public health strategy in July 2014 (4) – *Making Life Better – A Whole System Framework For Public Health 2013-23* (<https://www.dhsspsni.gov.uk/publications/making-life-better-strategy-and-reports>). It is designed to provide direction for policies and actions to improve the health and wellbeing of people in NI to reduce inequalities in health. Through strengthened co-ordination and partnership working in a whole system approach the framework seeks to create the conditions for individuals and communities to take control of their own lives and move towards a vision for NI where all people are enabled and supported in achieving their full health and wellbeing potential. The aims are to achieve better health and wellbeing for everyone and reduce inequalities in health.

The framework is structured around 6 themes:

1. Giving Every Child the Best Start
2. Equipping the Individual Throughout Life
3. Empowering Healthy Living
4. Creating the Conditions
5. Empowering Communities
6. Developing Collaboration

It seeks to create a whole system approach across the various levels of the system at which work needs to be taken forward.

Strategic Approach in the Republic of Ireland

- 1.09 In November 2012 the Department of Health and Children (ROI) published the new national framework for strategic health service reform *Future Health* a strategic framework for the reform of the health service (5). In addition to a commitment to service reform which makes things fairer for patients the strategy also has a focus on improved health and well being. It recognises the need for a whole-of-government approach to addressing health issues and commits to the development of a comprehensive health and wellbeing policy framework.
- 1.10 The new framework for improved health and wellbeing was published in Ireland in 2013 *Healthy Ireland* (6). *Healthy Ireland* draws on existing policies but proposes new arrangements to ensure effective co-operation and collaboration across government, the health system and other relevant areas. It is about each individual sector helping to improve health and wellbeing through multiplying both our efforts and results.

The framework has 4 strategic outcome focused goals:

- Goal 1 Increase the proportion of people who are healthy at all stages of life.
- Goal 2 Reduce health inequalities.
- Goal 3 Protect the public from threats to health and wellbeing.
- Goal 4 Create an environment where every sector of society can play their part.

- 1.11 Targeted outcome indicators are being developed for each strategic goal and will need to be disaggregated by key equality characteristics including:
- Demographic, socio-economic or educational variables, e.g., experience of poverty and deprivation, levels of educational attainment.
 - Social exclusion measures, e.g., unemployed people, people living in disadvantaged communities, people with disabilities, minority ethnic groups, members of the Traveller population, and Lesbian Gay Bisexual and Transgender (LGBT) groups.

Institute of Public Health in Ireland (IPH)

- 1.12 Tackling inequalities in health across the island of Ireland is a focus for all of the work of the IPH (<http://www.publichealth.ie/>). In 2008 the Combat Poverty Agency Ireland together with IPH published a report - *Tackling Health Inequalities, An All Island Approach to Social Determinants (7)*. The report shows how social, economic and environmental conditions play a major role in determining health in the ROI and NI and aims to help key decision-makers to understand the impact their decisions have in determining people's opportunities for health. The report highlights the need to have robust systems in place to map and measure health inequalities. Adequate baseline data is necessary to help us understand health inequalities more fully and to help identify appropriate targets and interventions to reduce them. The routine availability of data on health inequalities is also useful for keeping the issue on the policy agenda and for monitoring the effect of agreed strategies and interventions.

The HealthWell

- 1.13 The *HealthWell*, which was developed by IPH, is an All Island health information website. It provides information which can promote health and wellbeing, by supporting evidence informed decision making on both sides of the border. The Health Inequalities Hub at The HealthWell can be accessed at <http://healthinequalities.thehealthwell.info>.

Chapter 2 Health Protection Inequalities – The evidence

- 2.1 Infectious diseases disproportionately affect the most socioeconomically deprived communities as well as groups made vulnerable by virtue of ethnicity and social circumstances. Vulnerable groups bear a disproportionate burden in relation to infectious diseases and this burden is not restricted to TB or HIV but also a wide array of other infectious diseases (8) (Appendix 1). Elevated infectious disease rates in vulnerable populations pose a health threat, not only to them, but to society at large (9). It is essential that tackling the social determinants of infectious diseases becomes a public health priority on the island of Ireland.

Global and National Evidence

- 2.2 WHO work programme dedicated to tackling the social determinants of health (http://www.who.int/social_determinants/en/) provides a global focus to work in this area. It has also determined action on a range of infectious diseases to reduce health inequalities. Examples of this include HIV(http://www.who.int/hiv/mediacentre/feature_story/hiv_strategy/en/) and gender inequalities in sexually transmitted infections (STI's) (<http://www.afro.who.int/en/clusters-a-programmes/frh/sexual-and-reproductive-health/programme-components/control-of-sexually-transmitted-and-reproductive-tract-infections-and-hiv-aids.html>).

Ethnicity and infectious disease

- 2.3 A national epidemiological study in New Zealand looked at more than 5 million hospital admissions for infectious diseases (10). Results indicated that in 2004- 2008 the proportion of hospital admissions due to infectious diseases was 26% and that infectious diseases make the largest contribution to acute hospital admissions for any cause. However, the risk of hospitalisation for infectious disease causes was disproportionately higher in the most economically disadvantaged populations including Maori and Pacific peoples and in the oldest and youngest age groups. In terms of risk ethnic inequalities had a much stronger effect on infectious than non-infectious diseases. The gradient across ethnic groups was much higher for infectious than non-infectious diseases. The increased health risk for Maori and Pacific people, compared with European and other groups, was much higher for infectious than for non-infectious diseases thus prevention of infectious diseases is likely to be an effective way to reduce ethnic inequalities. The study findings support the need for stronger prevention efforts for infectious diseases. They also indicate the need to reduce ethnic and social inequalities and to address

disparities in broad social determinants such as income levels, housing conditions and access to health services.

- 2.4 An investigation into the impact of ethnicity and socio-economic status on incidence and outcomes of Staphylococcal aureus (*S.aureus*) bacteraemia showed that indigenous Australians suffer from a higher rate of *S. aureus* bacteraemia than non-indigenous Australians particularly for community-associated MRSA (11). However, ethnicity and socio-economic status were not associated independently with mortality from *S. aureus* bacteraemia in these populations. Risk factors for community associated MRSA include close skin to skin contact, openings in skin such as cuts and abrasions, contaminated items or surfaces, crowded living conditions and poor hygiene (<http://www.cdc.gov/mrsa/riskfactors/index.html>). A previous study showed that risk factors for community MRSA acquisition are highly prevalent in indigenous communities (12). Thus there are opportunities for targeted prevention interventions for community-associated MRSA in communities with these risk factors.

HIV and inequality globally

- 2.5 Inequality is said to drive the global HIV epidemic. Poor countries have a higher prevalence of infection and the poorest people in those countries are disproportionately affected. Poverty is part of the cause of HIV and is also its inevitable result (13). In sub-Saharan Africa, countries with the most unequal distribution of wealth such as Botswana, Namibia, and South Africa have the highest prevalence of HIV. Inequality between the sexes is also relevant. The spread of HIV is disproportionately high among many groups that experience discrimination and suffer from a lack of human rights protection. This includes groups that have been marginalised socially, culturally and economically such as injection drug users, sex workers, migrants and homosexual men or men who have sex with men (MSM). Women's susceptibility to HIV is further enhanced in members of marginalised or migrant populations (13).

Social determinants and TB

- 2.6 TB is a serious bacterial disease spread from person to person most commonly affecting the lungs. There is growing awareness of the role of social determinants in the occurrence of TB as well as other infections such as HIV/AIDS. In 2010 there were more cases of TB globally than ever before in human history but these cases continued to cluster among disadvantaged groups such as the poor, the hungry and ethnic minorities (14). Key structural determinants of TB epidemiology include global socioeconomic inequalities, high levels of population mobility and rapid urbanisation and population

growth. These conditions give rise to unequal distributions of key social determinants of TB including food insecurity and malnutrition, poor housing and environmental conditions, and financial, geographic, and cultural barriers to health care access. Social determinants are among the key risk factors for TB. For example poor ventilation and overcrowding in homes, workplaces, and communities increase the likelihood of uninfected individuals being exposed to TB infection. Poverty, malnutrition and hunger may increase susceptibility to infection, disease, and severity of clinical outcome.

TB- ROI and NI

- 2.7 In ROI 328 cases of TB were notified in 2014, 40.9% of notified cases were born outside of Ireland (Figure 2) (<http://www.hpsc.ie/A-Z/VaccinePreventable/TuberculosisTB/Epidemiology/AnnualReports/2014/File,15057,en.pdf>). A recent study by researchers from the School of Medicine in Trinity College Dublin in conjunction with the Health Protection Surveillance Centre (HPSC) and the Pavee Point Traveller and Roma Centre found a 3-fold higher rate of TB in Irish Travellers (15).

In 2013 in NI there were 74 notified cases of TB giving a rate of 4.0 cases per 100,000 population. A high proportion (40%) of notified cases was in people born in countries with a high-burden of TB (Figure 3). Time from entry into NI until TB diagnosis was known for 80% of cases born outside the UK/Ireland in 2013. Of these 21% were diagnosed within 2 years of entry; 68% were diagnosed between three and nine years of entry; and the remaining 11% had been in NI for ten years or more before diagnosis(<http://www.publichealthagency.org/sites/default/files/directorates/files/N%20Ireland%20TB%20Surveillance%20Report%202013.pdf>). This is a similar picture to the rest of the UK where in 2013 almost three quarters of TB cases (73%) occurred among people born outside the UK and only 15% of these were recent migrants (diagnosed within two years of entering the UK) (16). In addition TB is concentrated in the most deprived populations. In 2013 70% of cases were resident in the 40% most deprived areas, nearly half (44%) of cases were not in employment and 10% had at least one social risk factor (history of alcohol or drug misuse, homelessness or imprisonment).

Figure 2: Number of tuberculosis notifications in ROI and rate by country of birth and year of notification 1998-2014*

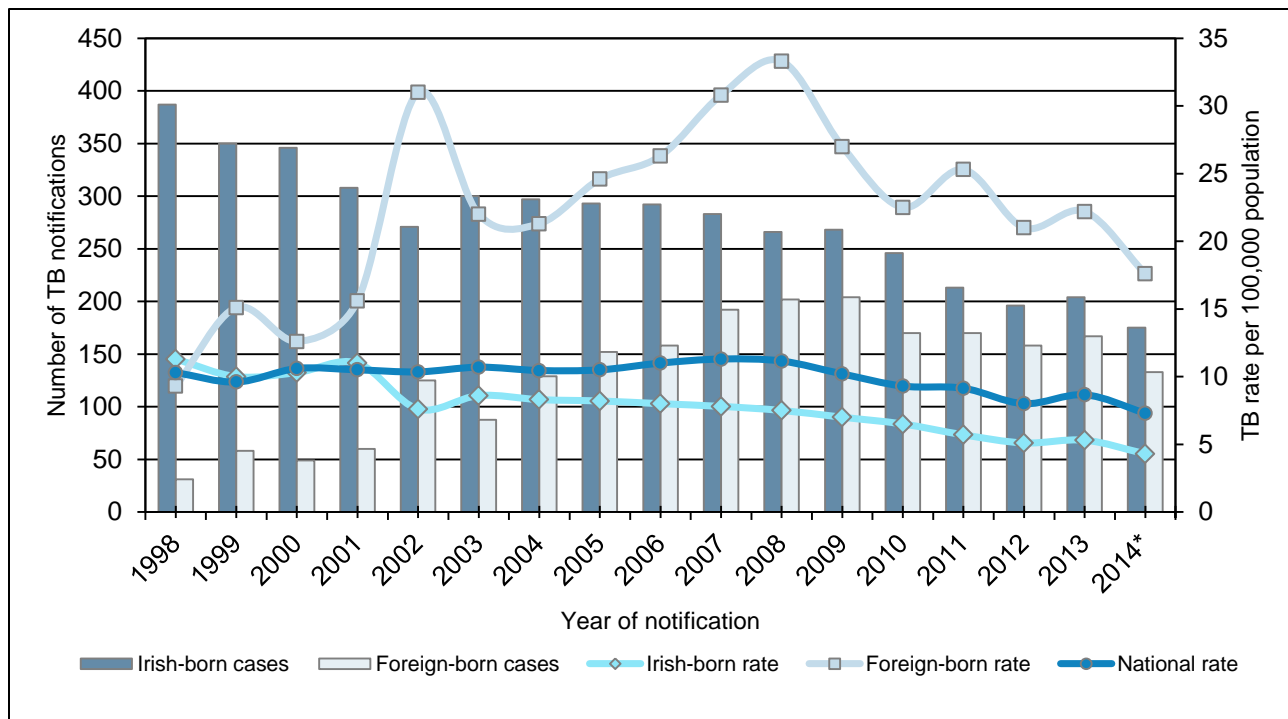
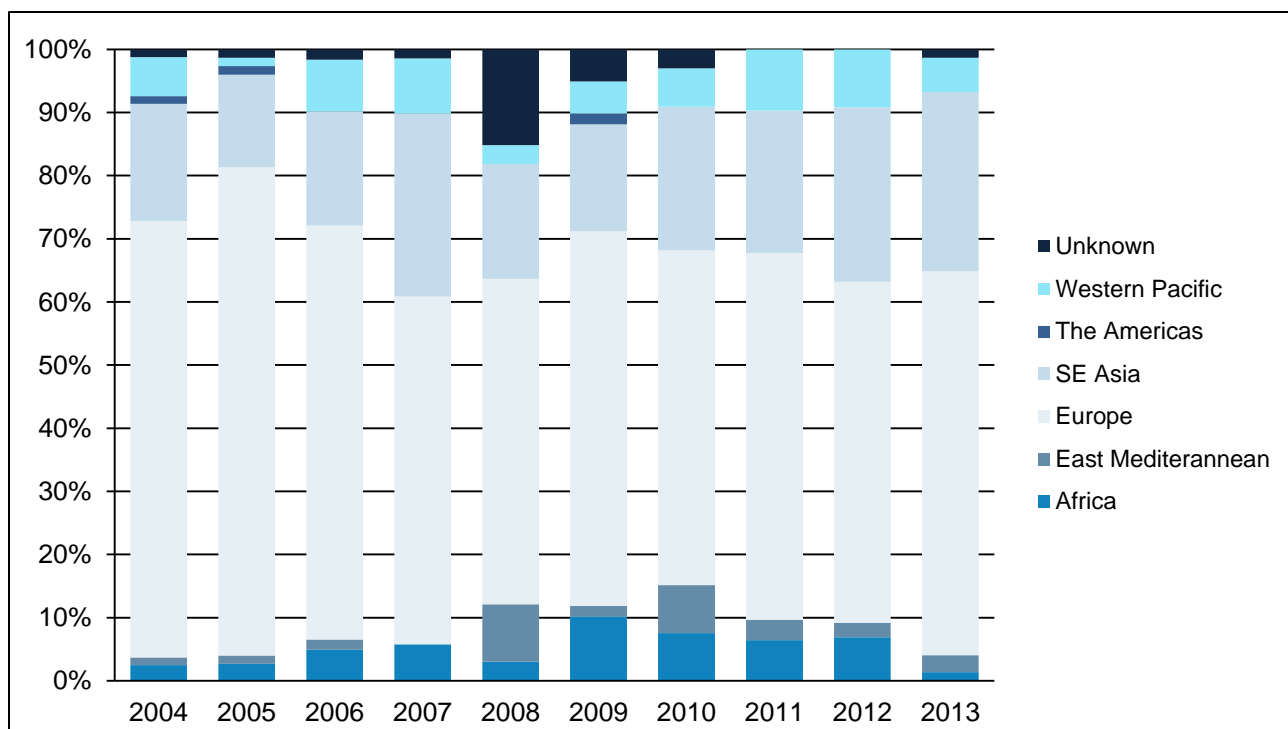


Figure 3: NI number and proportion of UK born and Non-UK born tuberculosis case reports, 2004-2013



Immunisation

- 2.8 Globally immunisation rates against infectious diseases in childhood have increased, reducing mortality and morbidity from these infections in childhood. However, it is estimated that a fifth of the world's children were not fully immunised against infectious diseases in 2010 (17). A child's immunisation status is strongly associated with their household wealth, mother's education and whether they live in an urban or a rural location. In countries where inequalities are most acute the poorest children are three times less likely to receive the Diphtheria, Tetanus and Pertussis vaccine 3 dose schedule (DTP3) than the richest with DTP3 vaccination coverage most unequal in Nigeria where the ratio between poorest and richest children was 1:9 in 2008. The Decade of Vaccines Collaboration (DoV) was established in 2010 with the support of well recognised international partners including WHO, the Bill and Melinda Gates Foundation, and Global Vaccine Alliance (GAVI) (<http://www.dovcollaboration.org/about-us/vision/>). The vision for the DoV is a world in which all individuals and communities enjoy lives free from vaccine-preventable diseases. Its mission is to extend, by 2020 and beyond, the full benefits of immunisation to all people, regardless of where they are born, who they are, or where they live.

Inequalities in immunisation

- 2.9 Inequalities in immunisation uptake have been documented in the UK. Inequalities in uptake of influenza vaccine by deprivation level and by risk group has been shown in a time trends analysis using UK data from general practice (18). In the UK the National Institute for Clinical Excellence (NICE) has produced guidance for the UK countries on reducing differences in the uptake of immunisation in children and young people aged less than 19 years. Evidence exists to show that certain groups of young people and children are at risk of not being fully immunised: children and young people who have missed previous vaccinations; looked after children (children in care); children with physical and learning difficulties; children of teenage or lone parents; minority ethnic groups and vulnerable children such as those whose families are travellers, asylum seekers or homeless (19). A UK study has concluded that in spite of high overall uptake of Human Papilloma Virus (HPV) immunisation in the UK some girls remain at risk of not being immunised or of not completing the course, specifically girls not in education and 'vulnerable girls' such as girls with learning difficulties, looked after children (children in care), girls from the Traveller community and girls from deprived communities (20). As this immunisation programme was introduced to prevent cervical cancer in women it is important that inequalities in access to or in delivery of the programme are addressed. This study found that school nursing teams were committed to interventions to immunise 'hard to reach' and vulnerable groups. Further work is needed to look

at the organisation of immunisation delivery programmes to ensure all sections of society are reached.

- 2.10 A recent audit of immunisation uptake among Roma children (aged < 16 years) attending two clinics in Dublin was undertaken for the period 2014/15. Of the 98 children included in the audit (all children on books at the two clinics) only 41 (42%) were age-appropriately vaccinated with the recommended vaccines. In addition 15% (15/98) of all children on whom vaccination status was recorded did not appear to have initiated any vaccines based on the data available; 60% (9/15) of children by the age of 12 months had completed the recommended vaccines; 52% (15/29) of children by the age of 24 months had completed the recommended vaccines and 42% (35/83) of children eligible for MMR were vaccinated (21).

The Gypsy-Traveller communities are widely recognised as having an excess burden of measles infection – one study in the UK showed a more than 100-fold higher incidence in these communities compared to incidence in the rest of the population (22). Low vaccination coverage has been identified in some Gypsy-Traveller communities and the reasons for this are diverse.

- 2.11 Irish Travellers are a group who are at higher risk of vaccine preventable diseases as a result of factors associated with living conditions and health risk behaviours such as smoking as well as lower uptake of childhood immunisations. Factors affecting immunisation uptake include cultural factors, misinformation about MMR vaccine, lack of targeted immunisation catch-up programmes, lack of trust in health care workers and poor access to health services. However, the most likely risk factor driving a prolonged (3 years) outbreak of invasive meningococcal disease in an extended Irish Traveller family in Ireland, which persisted in spite of robust and targeted control measures, was overcrowding in living conditions (23).

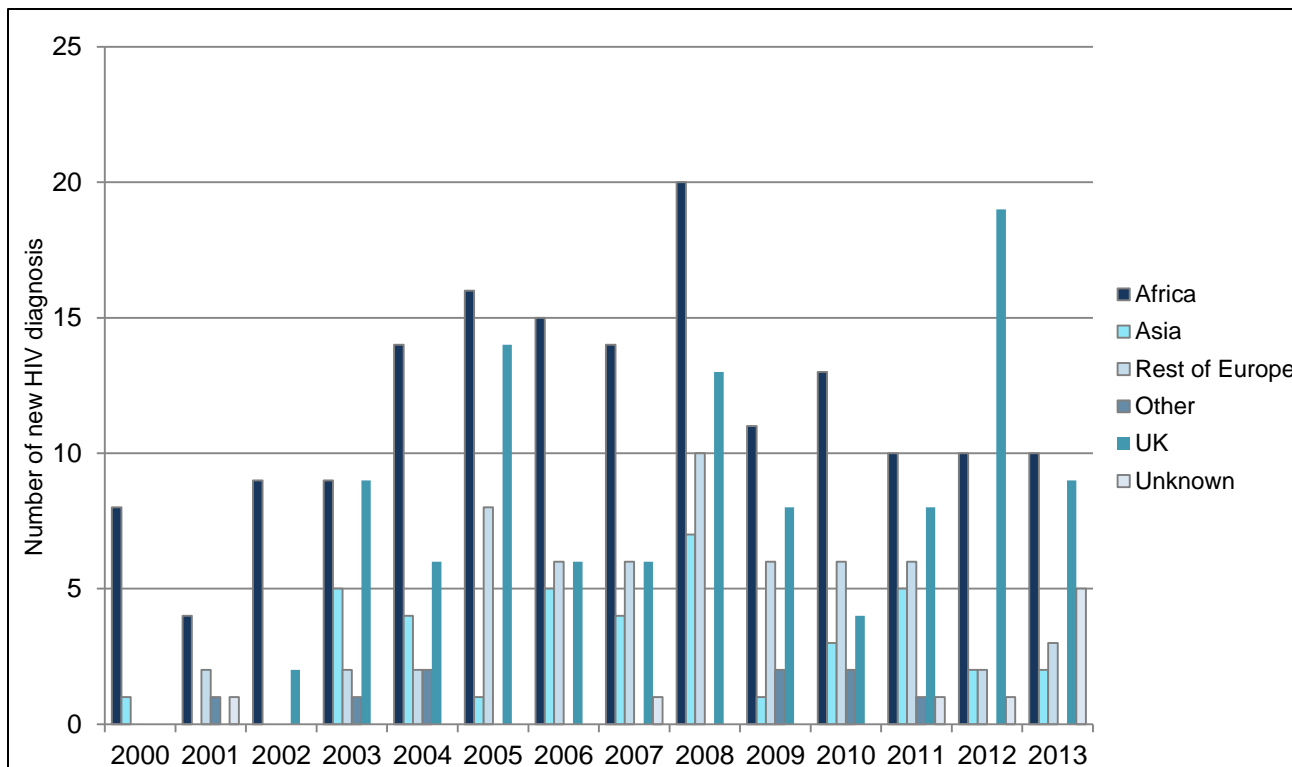
Sexually transmitted infections (STIs)

- 2.12 STIs can have long term effects on people's lives with possible associated complications such as infertility, cervical cancer and ectopic pregnancy. Sexual ill-health can affect anyone however some groups are particularly vulnerable. In NI, men who have sex with men (MSM) are at disproportionate risk of contracting STIs. While this group makes up an estimated less than 5% of the male population, they account for 83% of male syphilis, 46% of male gonorrhoea, 23% of male herpes and 12% of male chlamydia infections (23). Although 2013 saw a 5% decrease in annual numbers of new STI diagnoses made in NI Genito-Urinary Medicine Clinics (GUM) this masks an increase in diagnoses of gonorrhoea, infectious syphilis and genital herpes. There were 537 new episodes of uncomplicated gonorrhoea diagnosed in NI GUM clinics

in 2013 compared with 451 in 2012 an increase of 19%. Males represented 380 (71%) of these and, of these, 46% (175/380) were attributed to MSM. NI has, in common with elsewhere in the UK and Europe, experienced a marked increase in infectious syphilis since 2000 the majority of cases affect MSM.

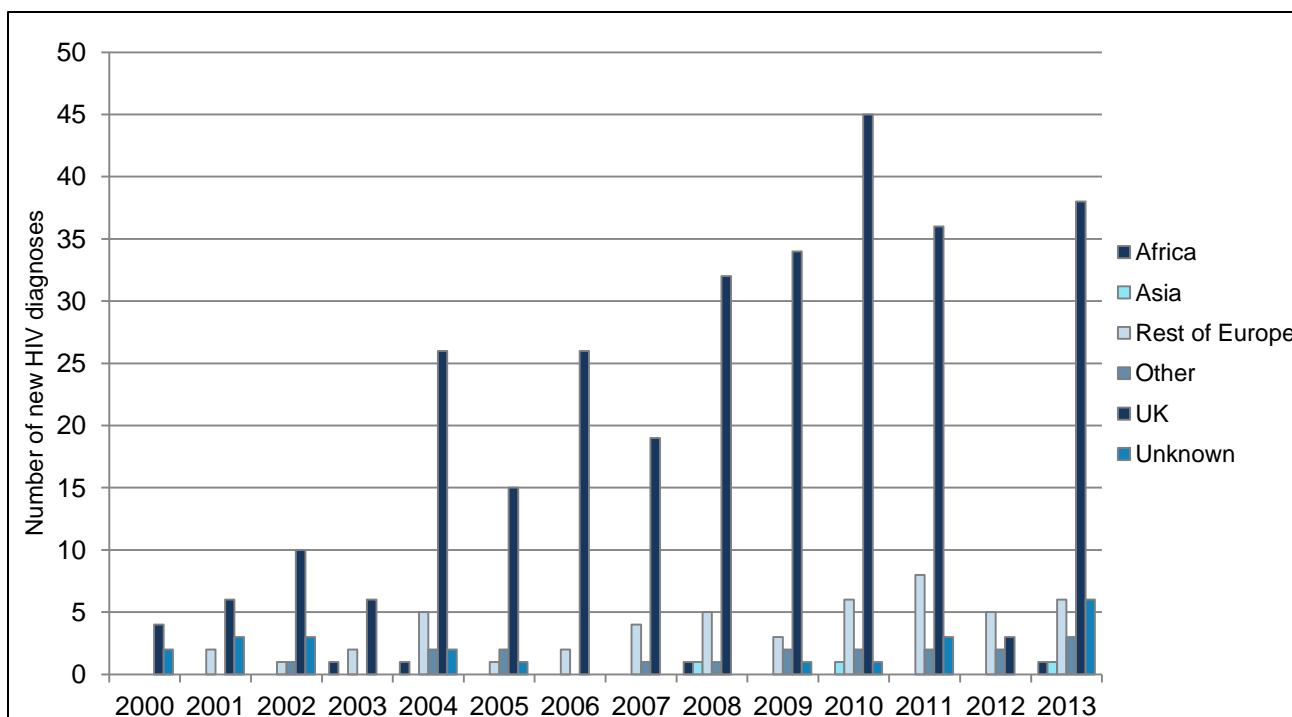
- 2.13 Chlamydia is the commonest bacterial sexually transmitted infection in NI. Chlamydia accounted for 30% (1,772/5,977) of all new STI diagnoses made in NI GUM clinics during 2013. The highest rates of infection in both males and females were in the 20 – 24 years age group accounting for 41% of male and 44% of female diagnoses. The rate of diagnoses in the 16 – 19 years age group is nearly twice as high in females as in males. This is an issue of concern due to the potentially serious health consequences of untreated Chlamydia infections including pelvic inflammatory disease, ectopic pregnancy and infertility. In 2013, 12% (109/930) of the total male diagnoses occurred in MSM.
- 2.14 During 2013 there were 94 new cases of HIV diagnosed in NI. 57% of these new diagnoses were in MSM (24). Of cases occurring in MSM 90% acquired their infection in the UK. Cumulative data from 2000–2013 show that for cases acquired through MSM exposure the majority were infected within the UK (82%:347/421). In contrast for cases acquired through heterosexual exposure and where location of exposure was known the majority were infected outside the UK (72%:270/374). However, during 2013 the majority of heterosexual acquired cases (63%) acquired their infection outside of the UK (Figures 3a and 3b).

Figure 3a: By heterosexual route of infection, 2000-2013



Source: HIV Surveillance in Northern Ireland 2014, PHA.

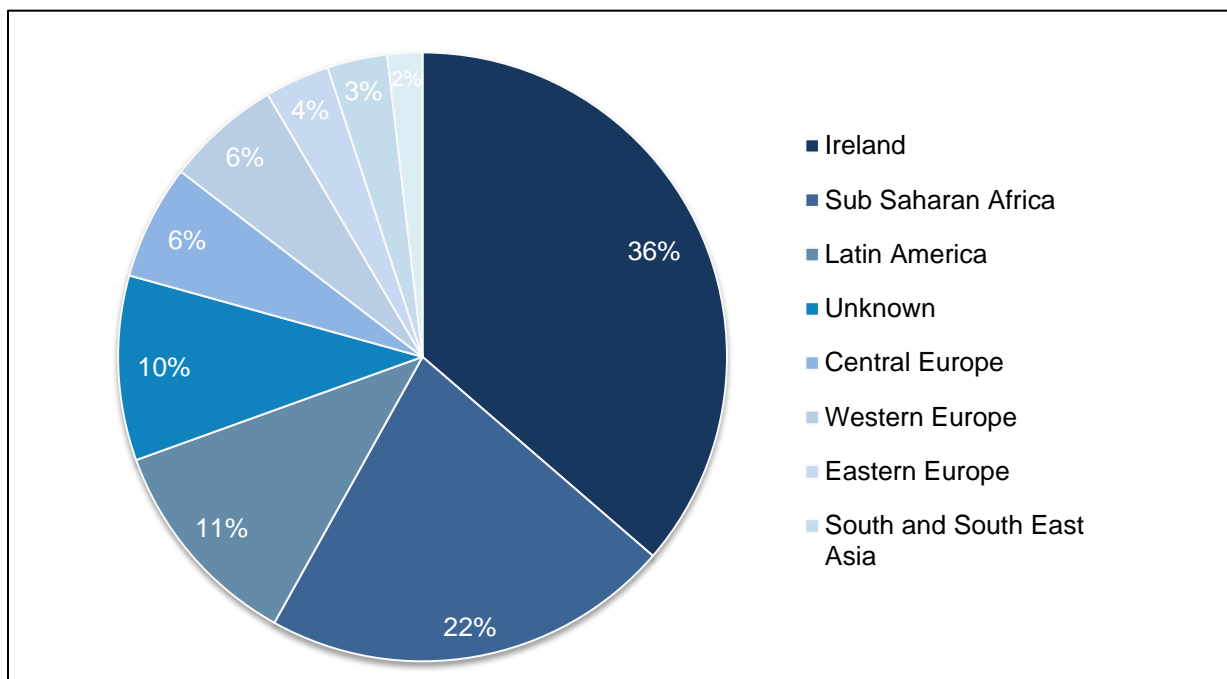
Figure 3b: By MSM route of Infection 2000-2013



- 2.15 In 2014, 377 new HIV diagnoses were notified in ROI giving a crude notification rate of 8.2 per 100,000 population (26). This is an increase of 11% compared to 2013 and can be accounted for by an increasing number of HIV notifications among MSM and people who inject drugs (PWID). The highest number of new diagnoses was among MSM (183; 49%). This is the highest number ever reported in MSM in ROI. Heterosexual contact was the second most commonly reported mode of transmission in 2014 (125; 33%). Since 2010 the number of diagnoses among heterosexuals has remained stable ranging from 125 to 133 diagnoses per year. The majority of heterosexuals (62%) diagnosed in 2014 were born in countries with generalised HIV epidemics^[1]. There were 27 (7%) new diagnoses among PWID in 2014 the highest number reported in this risk group since 2009. Of the 377 new diagnoses in 2014, 137 (36%) were born in ROI and 203 (54%) were migrants. Information on country of birth was unavailable for the remaining 37 cases (10%).
- 2.16 Of the 203 migrants with HIV/AIDS, the largest number were born in sub-Saharan Africa (82) followed by Latin America (43), Western Europe (23), Central Europe (23), Eastern Europe (13) and South and Southeast Asia (12) (Figure 4). Migration and social exclusion make migrants highly vulnerable to HIV/AIDS and their related complications. Migrant populations, largely people from sub Saharan Africa, represent a considerable and growing proportion of both HIV and AIDS cases reported in the EU28 countries along with Norway and Iceland. However, a significant percentage of reported cases in MSM are related to migrants from Western Europe, Latin America and the Caribbean (Figure 5). The contribution of migrant populations to the HIV epidemic is markedly higher among female highlighting the need for gender specific intervention strategies and policies (27).

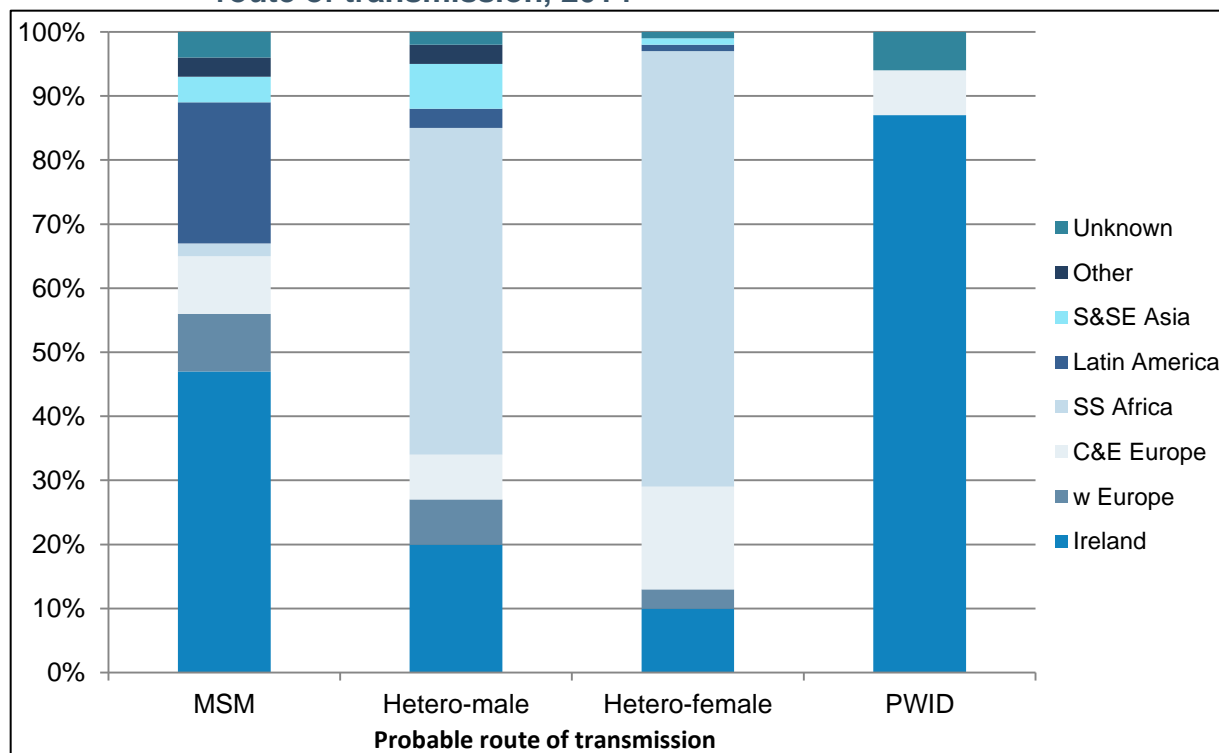
^[1] A generalised HIV epidemic is where greater than 1% of the general population is HIV positive.

Figure 4: New HIV diagnoses In Ireland by geographic origin, 2014



Source: HIV in Ireland – 2014 Report www.hpsc.ie

Figure 5: New HIV diagnoses in Ireland by geographic origin and probable route of transmission, 2014



Source: HIV in Ireland – 2014 Report www.hpsc.ie

Migration

- 2.17 Migrants comprise close to 12% of the UK population (28). Data from the 2011 NI Census indicate that 4.5% of the population of NI were born outside of NI or ROI (29). Migrants are at risk of acquiring infectious diseases in their country of origin (prior to migration or during return visits), during migration as well as in their destination country. A small proportion of the non-UK born population bears the greatest burden of infectious diseases such as TB and HIV in the UK. Health risks to immigrants can continue for many years after entry into the UK or ROI (e.g. reactivation of latent TB and acquisition of new infection when visiting friends and family in their country of origin). Diseases in migrants can have particular features for example compared with UK-born heterosexuals migrant heterosexuals are more likely to be diagnosed with HIV at a late stage and migrants have an increased rate of extra-pulmonary TB. They also have a higher risk of HIV and TB co-infection and/or of multi-drug resistant tuberculosis (MDR TB) (30).

The migrant population in ROI has been changing in recent years. Many migrants are young healthy adults who have chosen to come to ROI to study or work while the number of migrants entering the country seeking asylum has declined significantly in recent years. To reflect the changing needs of this diverse group the HSE Population Health Directorate requested the Health Protection Surveillance Centre (HPSC) Scientific Advisory Committee (SAC) to review and update the national guidelines on communicable disease screening for migrants. These guidelines highlight the need for healthcare professionals to be aware of specific diseases that are more prevalent in certain ethnic or migrant groups and also identify a group of 'vulnerable migrants', e.g. asylum seekers. The guidelines offer best practice advice on assessment of migrants in the context of infectious diseases (31).

Climate change

- 2.18 It is well known that climate change is likely to have a number of adverse effects on health in the coming century. Extremes of weather in the UK and natural disasters have already impacted on the daily lives of certain communities for example those who have been affected by extreme weather events and flooding (32). Climate change will have the effect of overall warming with heat waves becoming more common; rainfall will decrease in the summers and increase in the winters. Heat-related mortality is likely to increase particularly in older populations who are most vulnerable to extremes of temperature. However, in the first half of the century cold-related mortality is likely to be a greater issue. Flooding can have a range of effects on human health and welfare including disruption to services, problems with access to clean water and implications for health including health protection risks such

as infectious diseases.

- 2.19 ECDC has explored the possible impacts of climate change on infectious diseases in Europe and concluded that effects will come about through alteration of the distribution and transmission of communicable diseases by:
- Direct impact on vector distributions which may carry diseases;
 - Direct impact on human behaviour leading to changing patterns of exposure to infectious diseases (32).

Vector-borne diseases appear to be the most climate-sensitive of the infectious diseases. Climate change effects (such as hotter and longer summers, warmer winters, and/or increased annual rainfall) may alter the incidence of arthropod-borne diseases transmitted by ticks (tick-borne encephalitis (TBE) and Lyme disease), mosquitoes (e.g. Chikungunya fever, Dengue fever) or sand flies (e.g. visceral leishmaniasis) by extending their habitats leading to introduction to areas in which they were previously unknown. As part of a process to monitor the likely effects of progressive climate change monitoring of vector species as potential harbingers of this change should be a core element of overall surveillance of these diseases. Development of robust vector surveillance systems in ROI and NI should be a priority (33).

- 2.20 For food-borne diseases such as salmonellosis, long known to be highly temperature sensitive, increased annual average temperatures could have important implications for food safety. Climate change might influence water quality and availability (both drinking and bathing) and increased risk of flooding could add to potential impact. Thus water-borne diseases, such as those caused by *Cryptosporidium* in drinking water and *Vibrio* in bathing water, will require further examination to determine their potential links to climate change in addition to air-borne and rodent-borne diseases.

- 2.21 The Health Protection Agency UK (HPA UK) 2012 report Health Effects of Climate Change (34) highlighted the key issues below:
- Premature deaths and respiratory hospital admissions related to ozone exposure may increase as a result of climate change. The warmer climate will mean that the UK pollen season may start earlier and last longer.
 - Climate change may lead to increased risks to health from building overheating, and biological and chemical contamination indoors.
 - Populations of exotic mosquitoes, which could spread chikungunya and dengue fever, are establishing in Europe, and the chances of these mosquitoes establishing in the UK will increase with changing climatic conditions.

- Climate can affect human behaviour, such as food consumption and preparation practices, which can increase the risk of food-borne diseases. In addition, warmer weather and milder winters will allow pathogens such as Salmonella to grow more readily in food and will favour flies and other pests that affect food safety.

2.22 Climate change is likely to affect river and coastal flood risk in the coming decades. Some areas in the UK have been identified as particularly vulnerable to coastal flood risk, including South Wales, Northwest Scotland, Yorkshire and Lincolnshire (especially the Humber Estuary), East Anglia and the Thames Estuary. Our knowledge of the health implications of flooding has improved particularly with regards to impacts on mental health and the implications for health from flood impacts on critical infrastructure (i.e. water supply and hospital services). All populations are at risk of the health effects associated with flooding however poorer communities are at higher risk of coastal flooding in the UK while higher income households tend to be at higher risk of river flooding. Limited evidence indicates that older people are most at risk of flood mortality in the UK (23).

2.23 The UK Climate Projections published by the Department of Environment (http://www.doeni.gov.uk/index/protect_the_environment/climate_change/uk_climate_change_projections-3.htm) indicate that we are likely to see hotter drier summers and warmer wetter winters, coupled with increased frequency of extreme weather occurrences such as heat-waves, dry spells, heavy rain and flooding. Some of the key findings from the Climate Change Projections estimate that by the 2050's Northern Ireland will have:

- An increase in winter mean temperature of approximately 1.7 °C;
- An increase in summer mean temperature of approximately 2.2°C;
- Changes in winter mean precipitation of approximately +9%;
- Changes in summer mean precipitation of approximately -12%;
- Sea level rise for Belfast of 14.5cm above the 1990 sea level.

2.24 It is argued that inaction and delay in making decisions on reducing greenhouse gas emissions and other assaults on the environment is potentially catastrophic, not just for now, but for thousands of years to come. Dr Eric Chivian, founder of Harvard's Center for Health and the Global Environment argues "to wait until we have absolute proof of what will happen is to take a risk with the physical, chemical, and biological systems of the planet, to do a global experiment with our own health and lives, that no member of parliament or Congress, no Prime Minister or President, no one should ever be willing to take" (35).

2.25 A recent literature review has been undertaken to review the available evidence on the health impact of environmental nuisances and their impact on health inequalities (36). The Lancet Commission on Health and Climate states that climate change adaptation is essential to protect health (37). Furthermore the health community has a vital role to play in unlocking the health benefits realised by moving to a low carbon global economy. It states that they are well placed to encourage behavioural change, and engage in policy and advocacy at the local and national level. They have a crucial role to play in ensuring that health equity considerations are integral to national and international climate policy.

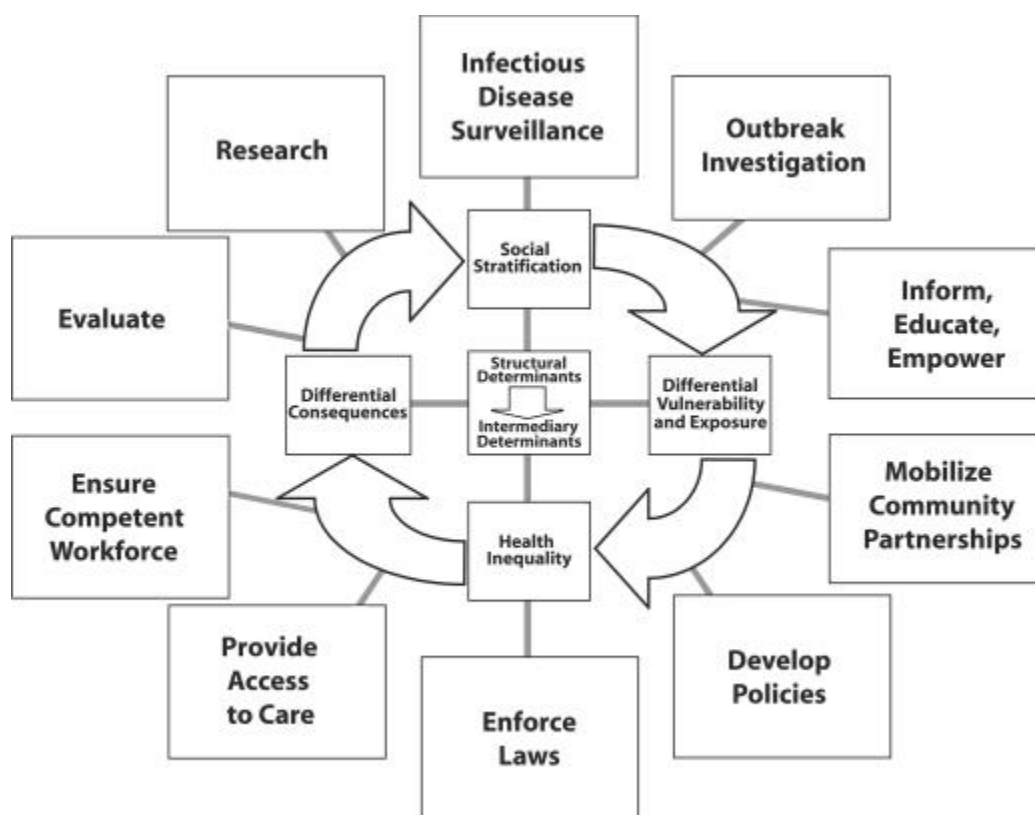
The Economic context

- 2.26 There is currently limited capacity in Europe to monitor the impact of the global economic crisis on control of communicable diseases. However, a recent paper using qualitative methodology has highlighted some potential impacts of the financial crisis (38) including:
- Increased prevalence of risk factors for spread of disease and increased pool of susceptible and particularly vulnerable population groups. The economic crisis will adversely impact employment and increase migration.
 - Economic hardship is known to be associated with higher risk of infectious diseases by virtue of increases in poverty, migration, homelessness, unemployment, and malnutrition.
 - Restricted access to health care.
 - Health services cuts and restructuring leading to reduced capacity to respond to infectious diseases.
 - Preventive services are most vulnerable to disinvestment (e.g. immunisation services in vulnerable populations), as well as surveillance programmes, hospital infection control activities and capacity of systems to respond to outbreaks.

Chapter 3 Tackling health inequalities and strengthening health protection

- 3.1 A collaborative approach to tackling inequalities and strengthening health protection is essential to complement the comprehensive work programmes and policies on the island of Ireland which are dealing with social determinants of health and inequalities. These issues should be addressed by involving a range of public health functions including surveillance, outbreak investigation, health education/promotion, working with communities, access to services, strategy and policy development and working across different sectors. A comprehensive approach should consider the socio-political context, intersectoral action, community participation and evidence-based interventions (39) as shown in Figure 6.

FIGURE 6 — Comprehensive approach to intervening on inequalities in infections.
Source: Semenza JC, Giesecke J. Intervening to Reduce Inequalities in Infections in Europe. *American Journal of Public Health* 2008; 98:5:787-792



Structural determinants (e.g., political context, income, education) frame intermediary determinants (e.g., housing, occupational conditions) and give rise to social stratification. This process leads to different vulnerabilities and exposures between the better- or worse-off socioeconomic groups, which manifest as health inequities. These inequalities in turn have differential consequences and exacerbate social stratification.

Interventions are designed to target the 10 essential public health functions that are fundamental and indispensable to public health.

- 3.2 In order to map and monitor indicators of health protection inequalities it is necessary to have arrangements for collecting and analysing relevant data. Broad-based surveillance of infectious diseases has an advantage in that many infectious diseases have a short latency and are thus well suited for monitoring of their effects on a population. These diseases seem to be especially sensitive to the effects of health inequalities (9). Robust arrangements exist in the ROI and NI for surveillance and monitoring of infectious diseases to inform relevant public health action. However, current surveillance systems are limited in identifying and monitoring infectious disease inequalities and in informing targeted interventions. Enhancing data fields within existing surveillance systems and formal data linkage with relevant data sets would confer a stronger ability for health protection services to map and monitor health protection inequalities.
- 3.3 Enhanced surveillance arrangements would help with the early identification and investigation of outbreaks in vulnerable populations and inform an appropriate response. Outbreak interventions in these communities can be enhanced through strong links with community leaders and interpreters and a knowledge of cultural norms and customs which may be relevant to the outbreak and its management.
- 3.4 Identifying the needs of specific populations in terms of health protection including infectious diseases and developing services and approaches based on this needs assessment is essential. For example the PHA in NI has identified the health protection issues regarding migrants in three main categories which include vaccinations, STIs and blood borne diseases. PHA has worked with the Belfast Trust to set up a Northern Ireland New Entrant Service (NINES) for migrants including asylum seekers (<http://www.belfasttrust.hscni.net/2118.htm>). Services include screening for blood borne viruses, immunisation, liaison with Emergency Departments and enhanced communication between primary and secondary care.
- 3.5 Three potential intervention strategies for inequalities in infections are discussed in a paper from the ECDC including population-at-risk, population and vulnerable population (39):
 - The **population-at-risk** approach targets the population with the highest level of risk for a specific disease. This could include targeting a specific group with high risk for transmission for a serious infection such as measles and offering MMR

immunisation. Such an approach has been used in the UK to limit transmission of mumps and of meningococcus C in teenage populations. Interventions such as these are highly effective in preventing health threats in a defined small proportion of the population. However, the underlying determinants of disease are not targeted with this approach so the overall health of the population may not improve.

- The **population** approach assumes equal risk for an infection across the population and equal levels of response to an intervention. However, populations lower on the socio economic scale which may be at highest risk tend not to respond as well to health promotion interventions and thus those at lowest risk may benefit most from intervention.
- In the **vulnerable population** approach a subset of the population such as migrants, prisoners or refugees is targeted with interventions such as education and training to improve their social position and their health benefits. The overall aim is to alter the life trajectory for vulnerable populations by focusing on risk factors across a range of outcomes. However, this approach would not be appropriate where swift action is required to immediately limit transmission of a serious infection in a community.

3.6 The above shows us that there is no 'one fits all' approach and a combination of approaches is most likely to be more effective. Moreover, combined interventions need to be taken forward through a joined up approach across a range of sectors including health, education and environment.

3.7 In 2013 the ECDC published a further technical report *Health Inequalities, The Financial Crisis, and Infectious Disease in Europe* (40). The report states that turmoil created by the financial crisis has compounded the challenges related to addressing health inequalities in Europe as many structural and intermediary determinants have taken a turn for the worse. This has led to even greater socio-economic inequalities and thereby potentially exacerbating health inequalities. Not only are some populations more vulnerable but 'the provision of public health in Europe has been further challenged as many Member States have had to reduce their expenditures on health' ([http://www.ecdc.europa.eu/search/Pages/results.aspx?k=ALL\(health%20inequalities%2c%20the%20financial%20crisis%2c%20and%20infectious%20disease%20in%20europe\)](http://www.ecdc.europa.eu/search/Pages/results.aspx?k=ALL(health%20inequalities%2c%20the%20financial%20crisis%2c%20and%20infectious%20disease%20in%20europe))).

3.8 ECDC has prioritised work on health inequalities in relation to infectious diseases as it is clear there are systematic and avoidable differences in infectious diseases between different social groups that are affected by variables such as income, education and occupation. There is increasing

evidence that the European- wide financial crisis has had an influence on the spread of infectious disease, and also on the ability of individual member states to respond effectively to infectious disease threats. A survey of public health experts on possible effects of financial austerity on preventive and disease control programmes found that services for vulnerable and hard to reach groups were reported to be particularly at risk (41).

In the last five years, many EU countries cut public spending that is affecting allocations for public health prevention activities (40). There are examples from across Europe of how this can have impact on infectious disease, for example, a large outbreak of HIV among people who inject drugs (PWID) which began in Athens in 2011, has been linked anecdotally to the financial crisis, increased unemployment and increased injecting drug use (40). Further evidence exists that a wide range of infectious diseases have shown to be related to health inequalities. Examples include *Clostridium botulinum*, affecting injecting drug users at risk in Ireland; influenza with low vaccine uptake in socioeconomically deprived populations in Britain; and outbreaks of syphilis associated with risky behaviour among men having sex with men. This list is by no means meant to be complete or exhaustive but indicates how infectious diseases are associated with inequalities.

- 3.9 In addition, there are a number of highly vulnerable populations in Europe who are more likely to be subject to social determinants which adversely affect their health. Examples of such vulnerable populations include the homeless, people who inject drugs, people in prison, those who are unemployed, young children, and certain migrant populations such as the Roma population. ECDC places a particular priority on migrant health and on Roma populations because these groups are particularly vulnerable and their health outcomes have been worse compared to the average levels of the general EU population. In 2006, a Lancet publication indicated that the most important health issue facing migrants was increased vulnerability to infectious diseases (42). The data available is not robust, however it suggests that migrant populations from countries with a high prevalence of infectious diseases are disproportionately affected by HIV, STIs, TB, Hepatitis B and C, and a range of other infections. Roma communities represent the largest ethnic minority in Europe and one that is highly marginalised in all aspects of life. Roma often lack access to, or do not use, preventative health care and, according to some studies, over 25% of Roma children are not fully vaccinated, thus being of higher risk of acquiring vaccine preventable diseases. Roma often live in poverty and have low socioeconomic status and thus are more vulnerable to diseases such as TB, measles, and Hepatitis. It is important to note that the health inequity associated with poverty is important but in the context of the Roma population, discrimination of Roma in healthcare provision is a major factor (40).

3.10 Having considered the broader European Commission strategies around health inequalities, as well as the links between health inequalities and infectious diseases, ECDC have prioritised their work to address health inequalities and infectious diseases in Europe around three key pillars – the AID Framework. This stands for promoting:

Action: enhance Member States' capacity to act on health inequalities among vulnerable groups.

Information: advance evidence through studies and investigations, and by leveraging existing data sources such as the European Surveillance Systems.

Dissemination: communicate best practices and expand networks to key actors and stakeholders in the field.

3.11 ECDC state that improving the exchange of information on public health interventions as well as improving their efficacy in terms of addressing health inequalities is should be a key priority for member states. This included improvements in surveillance data. For example, routinely incorporating socioeconomic indicators like education and place of origin in disease reporting. However, these proposals present challenges for member states and may be difficult on the island of Ireland outside of enhanced surveillance programmes. However, in order to take effective action, it is necessary to have access to timely and appropriate information on social determinants of infectious disease which will enable us to identify and focus not only on vulnerable groups but also to moderate trends and key determinants and how these impact disease outcomes. The dissemination of research practice would strengthen the approach to addressing health inequalities in respect of infectious diseases, and enable closer working between all relevant stakeholders. This is potentially an area which could be facilitated by IPH.

Outcomes Monitoring

3.12 A health protection inequalities outcomes framework may have merit in measuring progress in tackling the inequalities. The *Public Health Outcomes Framework -England* was published in November 2012 and concentrates on two high-level outcomes to be achieved across the public health system in England (43). These are:

- increased healthy life expectancy;
- reduced differences in life expectancy and healthy life expectancy between communities.

- 3.13 The outcomes reflect a focus not only on how long people live but on how well they live at all stages of life. The second outcome focuses attention on reducing health inequalities between people, communities and areas. Using a measure of both life expectancy and healthy life expectancy will enable the use of the most reliable information available to understand the nature of health inequalities both within areas and between areas. A set of supporting public health indicators will help focus understanding of progress year by year nationally and locally on those things that matter most to public health. The indicators, which cover the full spectrum of public health and what can be currently realistically measured, are grouped into four 'domains':
- Improving the wider determinants of health;
 - Health improvement;
 - Health protection;
 - Healthcare, public health and preventing premature mortality.
- 3.14 There are eight outcome indicators which relate to health protection, five of which relate specifically to infectious diseases (TB, HIV, Chlamydia, Vaccine preventable diseases) and three to broader health protection areas – air pollution, sustainable development, interagency public health incident response plans.

Chapter 4 Tackling health protection inequalities on the Island of Ireland – Recommendations

- 4.1 Health protection inequalities on the island of Ireland need to be appropriately described and addressed. There is a need to increase professional and public knowledge and awareness in this area and, also, for joined up approaches to tackling health protection inequalities to be developed North and South and implemented on an all island basis.

North/South Leadership Forum on Health Protection Inequalities

- 4.2 Action to tackle health protection inequalities could be driven and facilitated by the establishment of a *North/South Leadership Forum on Health Protection Inequalities*. The Forum could bring leadership and oversight to work in this area and would be accountable to IPH. The Forum could consider adopting an overarching approach such as the *Advocacy Composite Logic Model (44)* (Appendix 3). This model helps advocates, funders, and evaluators articulate an advocacy or policy change strategy or theory of change and also helps to guide decisions about the design of an advocacy and policy change evaluation.
- 4.3 The Forum would develop a forward work programme based on the ECDC Framework of Action, Information, and Dissemination (AID), linked to existing strategies in ROI and NI to address health inequalities and drawing on Public Health Leadership across the island. Key areas to address include **Leadership, Action, Information** and **Dissemination** and these are explored in more detail below:

Leadership

Senior Health Protection Leaders from Public Health Organisations on the island of Ireland working in partnership to:

- Champion the important issue of health protection inequalities under the auspices of IPH.
- Use the Advocacy Composite Logic Model to determine potential policy goals, define desired outcomes and required inputs.
- Advocate for specific action in areas and populations with identified needs.

Action

- Strengthening prevention in specific health protection areas while considering population-at-risk, entire population and vulnerable populations.
- Linking approaches to tackling health protection inequalities to the wider work programmes on tackling health inequalities for example on migrant health and health of the homeless.
- Strengthening collaboration with existing organisations who work to address health needs of diverse and disadvantaged communities for example the 'Stronger Together Network' in NI which began as an informal network of organisations who work predominantly with culturally and linguistically diverse communities. The network has grown and developed more formalised structures with an extended membership which includes Black and Minority Ethnic (BME) organisations and groups, BME individuals, community sector, volunteer sector and public service sector (45).
- A new strengthened community planning role is envisaged for the new councils recently formed in NI under the programme for local government reform (46). Councils will lead and facilitate a community planning process, working in partnership with other public sector providers and departments. This will require a process of active community engagement, with the whole community, to inform service planning and delivery. The specific needs of communities disproportionately affected by issues such as environmental hazards, transport problems in accessing services may be considered and addressed.

Information

There is a need to strengthen surveillance and monitoring of health inequalities in infectious diseases/health protection issues including:

- Reviewing existing health protection surveillance systems North and South in terms of making recommendations to amend systems to support work on inequalities.
- Developing data linkage between key data sources, e.g. between infectious disease datasets and indices of deprivation, postcode.
- Developing approaches to environmental public health surveillance.

Dissemination

- Raising awareness of health protection inequalities amongst politicians, policymakers, health services, public and across other government sectors.
- Actively disseminating and sharing information on health protection inequalities.
- Facilitating education and training through IPH.

5 References

1. Marmot M. Status Syndrome: How Your Social Standing directly affects your Health and Life Expectancy. Michael Marmot 2004. ISBN 0747570493 Bloomsbury.
2. Barton H, Grant M. A health map for the local human habitat. Journal of the Royal Society for the Promotion of Health 2006. 126(6).
3. Fair Society, Healthy Lives. The Marmot Review. 2010. ISBN 978-0-9564870-0-1.
www.instituteofhealthequity.org/projects/fair-society-healthy-lives-the-marmot-review
4. DHSSPS: Making Life Better: A Whole System Strategic Framework for Public Health Changing lives 2013-2023. June 2014
<http://www.dhsspsni.gov.uk/mlb-strategic-framework-2013-2023.pdf>
5. Department of Health and Children. Future Health. Strategic Framework for Reform of the Health Service 2012-15. November 2012.
<http://health.gov.ie/blog/publications/future-health-a-strategic-framework-for-reform-of-the-health-service-2012-2015/>
6. Department of Health and Children. Healthy Ireland. A Framework for Health and Wellbeing 2013-2025.
<http://health.gov.ie/blog/publications/healthy-ireland-a-framework-for-improved-health-and-wellbeing-2013-2025/>
7. Farrell, C., McAvoy, H., Wilde, J. and Combat Poverty Agency (2008)
8. *Tackling Health Inequalities – An All-Ireland Approach to Social Determinants.* Dublin:
9. Semanza JC, Giesecke J. Intervening to Reduce Inequalities in Infections in Europe. Am J Public Health. 2008;98:5:787-92
10. Semanza JC, Suk JE, Tsolova S. Social determinants of infectious diseases: a public health priority. Euro Surveillance. 2010; 15 (27): pii=19608. Available online at: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19608>
11. Baker MG, Telfar Barnard L, Kvalsvig A, Verrall A, Zhang J, et al. Increasing incidence of serious infectious diseases and inequalities in New Zealand: a national epidemiological study. The Lancet. 2012; 379; 9821: 1112-1119.
12. Tong SY, Van Hal SJ, Einsiedel L, Currie BJ, Turnidge JD. Impact of ethnicity and socio-economic status on Staphylococcus aureus bacteraemia incidence and mortality: a heavy burden in indigenous Australians. BMC Infectious

Diseases 2012, 12:249
<http://www.biomedcentral.com/1471-2334/12/249/abstract>

13. Tong SY, McDonald MI, Holt DC, Currie BJ: Global Implications of the emergence of community-associated methicillin-resistant *Staphylococcus aureus* in Indigenous populations. *Clinical Infectious Diseases* 2008, 46(12):1871-1878
14. Piot P, Greener R, Russell S. Squaring the Circle: AIDS, Poverty and Human Development. *PLoS Med* 2007 4(10): e314.
oi:10.1371/journal.pmed.0040314
<http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.0040314#pmed-0040314-b004>
15. Hargreaves JR, Boccia D, Evans CA, Adato M, Pettigrew M, Portter JD. The Social Determinants of Tuberculosis: From Evidence to Action. *Am J Public Health* 2011; 101(4): 654-662.
16. R. F. O'Toole, S. Jackson, A. Hanway, J. O'Donnell, C. M. Comiskey, T. R. Rogers and D. O'Flanagan. Tuberculosis incidence in the Irish Traveller population in Ireland from 2002 to 2013. *Epidemiology and Infection*, available on CJO2015. Doi: 10.1017/S0950268815000138.
17. Public Health England. Tuberculosis in the UK. 2014 Report.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/360335/TB_Annual_report__4_0_300914.pdf
18. Save the Children. Finding the Final Fifth. Inequalities in Immunisation. Save the Children 2012.
<http://www.savethechildren.org.uk/sites/default/files/docs/Finding-the-Final-Fifth.pdf>
19. Coupland C, Harcourt S, Vinogradova Y, Smith G, Joseph C et al. Inequalities in uptake of influenza vaccine by deprivation and risk group: Time Trends analysis. *Vaccine* 25 (2007) 7363–7371.
http://www.qresearch.org/public_documents/inequalities%20in%20uptake%20of%20influenza%20vaccine%20by%20deprivation.pdf
20. National Institute for Health and Clinical Excellence (NICE). Reducing differences in the uptake of immunisations (including targeted vaccines) in children and young people aged under 19 years. NICE Public Health Guidance issued September 2009. <http://publications.nice.org.uk/reducing-differences-in-the-uptake-of-immunisations-ph21>
21. Boyce T, Holmes A. Addressing Health Inequalities in the Human Papilloma Virus Vaccination Programme: Examining the Role of the School27-31 Nurse. *Plos One*. 13 September 2012. DOI: 10.1371/journal.pone.0043416
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0043416#s4>

22. Fitzpatrick G. Audit of Vaccination among Roma Children, Dublin region, 2014. HPSC Ireland (unpublished data). www.hpsc.ie
23. Maduma-Butshe A, McCarthy N. The Burden and Impact of Measles among Gypsy-Traveller Communities, Thames Valley 2006-2009. *Journal of Public Health* (2013) 35 (1): 27-31
24. O'Connor L, Ward M, Bennett D, Mulhall R, O'Lorcain P, Cunney R et al. A prolonged outbreak of invasive meningococcal disease in an extended Irish Traveller family across 3 Health Service Executive (HSE) areas in Ireland, 2010 to 2013. *Euro Surveillance*. 2015; 20(21): pii=21139.
<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=21139>
25. Public Health Agency, Health Protection Service. Sexually Transmitted Infection surveillance in Northern Ireland 2014. An analysis of data for the calendar year 2013.
<http://www.publichealth.hscni.net/directorate-public-health/health-protection/sexually-transmitted-infections>
26. Public Health Agency, Health Protection Service. HIV surveillance in Northern Ireland 2014. An analysis of data for the calendar year 2014.
<http://www.publichealth.hscni.net/directorate-public-health/health-protection/sexually-transmitted-infections>
27. Health Protection Surveillance Centre, Ireland. HIV in Ireland. 2014 Report, Published June 2015.
<http://www.hpsc.ie/AZ/HIVSTIs/HIVandAIDS/SurveillanceReports/File,15208,en.pdf>
28. ECDC. Migrant health: Epidemiology of HIV and AIDS in migrant communities and ethnic minorities in EU/EEA countries. Technical report. July 2009
29. Health Protection Agency. Migrant Health: Infectious Diseases in non-UK born populations in the UK. 2011.
http://webarchive.nationalarchives.gov.uk/20140714084352/http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317131998682
30. Krausova A, Vargas-Silva C. The Migration Observatory at the University of Oxford. Northern Ireland: Census Profile. Briefing.
http://www.migrationobservatory.ox.ac.uk/sites/files/migobs/Briefing%20-%20Northern%20Ireland%20census%20profile_0.pdf
31. Wagner K.S., Lawrence J, Anderson L, Yin Z, Delpech V, Chiodini PL, Redman C, Jones J. Migrant Health and infectious diseases in the UK: findings from the last 10 years of surveillance. *Journal of Public Health* 2013. 1-8.
<http://jpubhealth.oxfordjournals.org/content/early/2013/03/20/pubmed.fdt021.full>

32. Health Protection Surveillance Centre Ireland. Infectious Disease Assessment for Migrants. July 2015.
<http://www.hpsc.ie/A-Z/SpecificPopulations/Migrants/File,14742,en.pdf>
33. Semenza JC, Menne B. Climate Change and infectious diseases in Europe. *Lancet Infect Dis.* 2009 Jun;(6):365-75
34. HPSC Ireland. Ranking of Likelihood of Emergence of Selected Vector borne Diseases in Ireland.
35. Vardoulakis S, Heaviside C. Health Effects of Climate Change in the UK 2012.
http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317135969235
36. Chivian E. Why doctors and their organisations must help tackle climate change. *BMJ* 2014;348:g2407
37. Tomlinson A, Brunt H. The health impacts of environmental nuisances and their contribution to health inequities. *Journal of Environmental Health Research* 2013; 13:1: 68-82
38. Lancet Commission on Health and Climate. UCL Policy Briefing for Health Policy Makers and Health Professionals.
<https://climatehealthcommission.files.wordpress.com/2015/04/policy-brief-health-professionals1.pdf> accessed 10 July 2015
39. Rechel B, Suhrcke M, Tsoлова S, Suk J, Desai M, Mc Kee M et al. Economic crisis and communicable disease control in Europe: A scoping study among national experts. *Health Policy* 2011; 103:168-75
40. Semenza JC. Strategies to intervene on social determinants of infectious diseases. *Euro Surveillance.* 2010; (27); pii=19611. Available on line at:
<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19611>
41. European Centre for Disease Prevention and Control. Health inequalities, the financial crisis, and infectious disease in Europe. Stockholm: ECDC; 2013
http://www.ecdc.europa.eu/en/publications/publications/health_inequalities_financial_crisis.pdf
42. Rechel B, Suhrcke M, Tsoлова S, Suk JE, Desai M, McKee M, et al. 2011. Economic crisis and communicable disease control in Europe: a scoping study among national experts. *Health Policy* 103(2–3):168–175.
43. Editorial. Migration and health: a complex relation. *Lancet.* 2006. 368: 1039

44. Department of Health (London). Improving Outcomes and Supporting Transparency. Part 1: A public health outcomes framework for England 2013 2016.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263659/2901502_PHOF_Improving_Outcomes_PT1B_v1_1.pdf
45. Innovation Network. Common Language: The Composite Logic Model.
http://www.innonet.org/index.php?section_id=6&content_id=637
46. Stronger Together. <http://www.strongertogetherni.org/>
47. Local Government Reform. Back to basics – what are the benefits? February 2013 http://www.doeni.gov.uk/benefits_of_local_government_reform.pdf

Appendix 1

Key Populations affected by Health Protection Inequalities

1. Children
2. Vulnerable Groups
 - Travellers
 - Migrants/Refugees
 - Drug users
 - Homeless
 - Looked after children
 - Men who have sex with men (MSM)
 - Prisoners
3. Ethnic Groups known to be Vulnerable, e.g. migrants and others from :
 - **Western Pacific** e.g. China, Cambodia, Vietnam.
 - **SE Asia** e.g. Bangladesh, Sri Lanka, Pakistan.
 - **Eastern Europe** e.g. Bulgaria, Latvia, Lithuania, Romania, Poland, Russian Federation.
 - **Eastern Mediterranean** e.g. Afghanistan, Syria.
 - **Sub-Saharan Africa** e.g. Kenya, Uganda, Zimbabwe, South Africa, Somalia, Sudan.

Specific Infectious Diseases which disproportionately affect disadvantaged populations

- Tuberculosis
- Sexually Transmitted Infections
- Blood Borne Viruses
- HIV
- Vaccine Preventable Diseases
- Health Care Associated Infections
- Gastrointestinal infections
- Viral Haemorrhagic Fevers

Other Issues

Emergency Preparedness and response

- Climate change

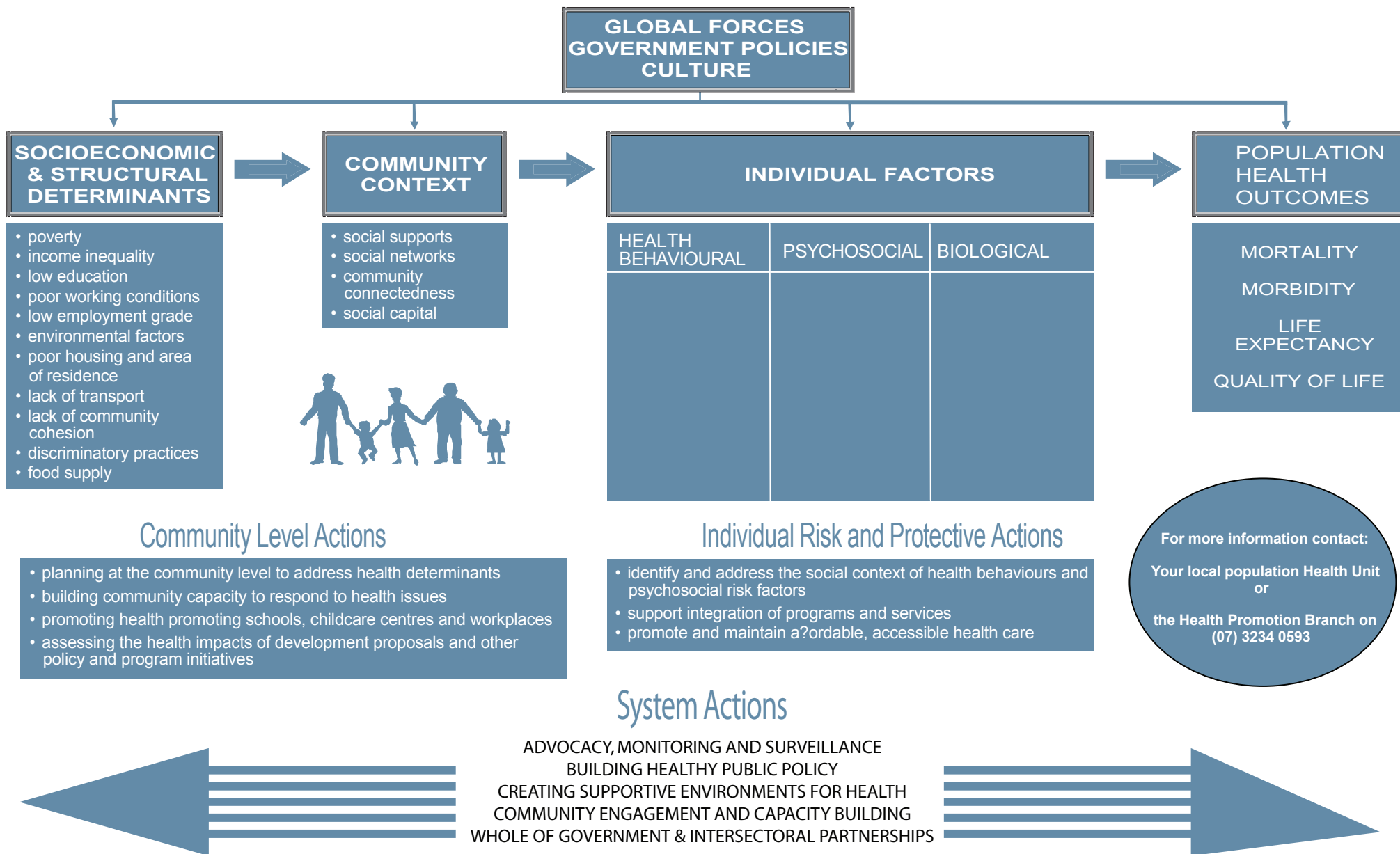
Appendix 2

Whole Systems approach

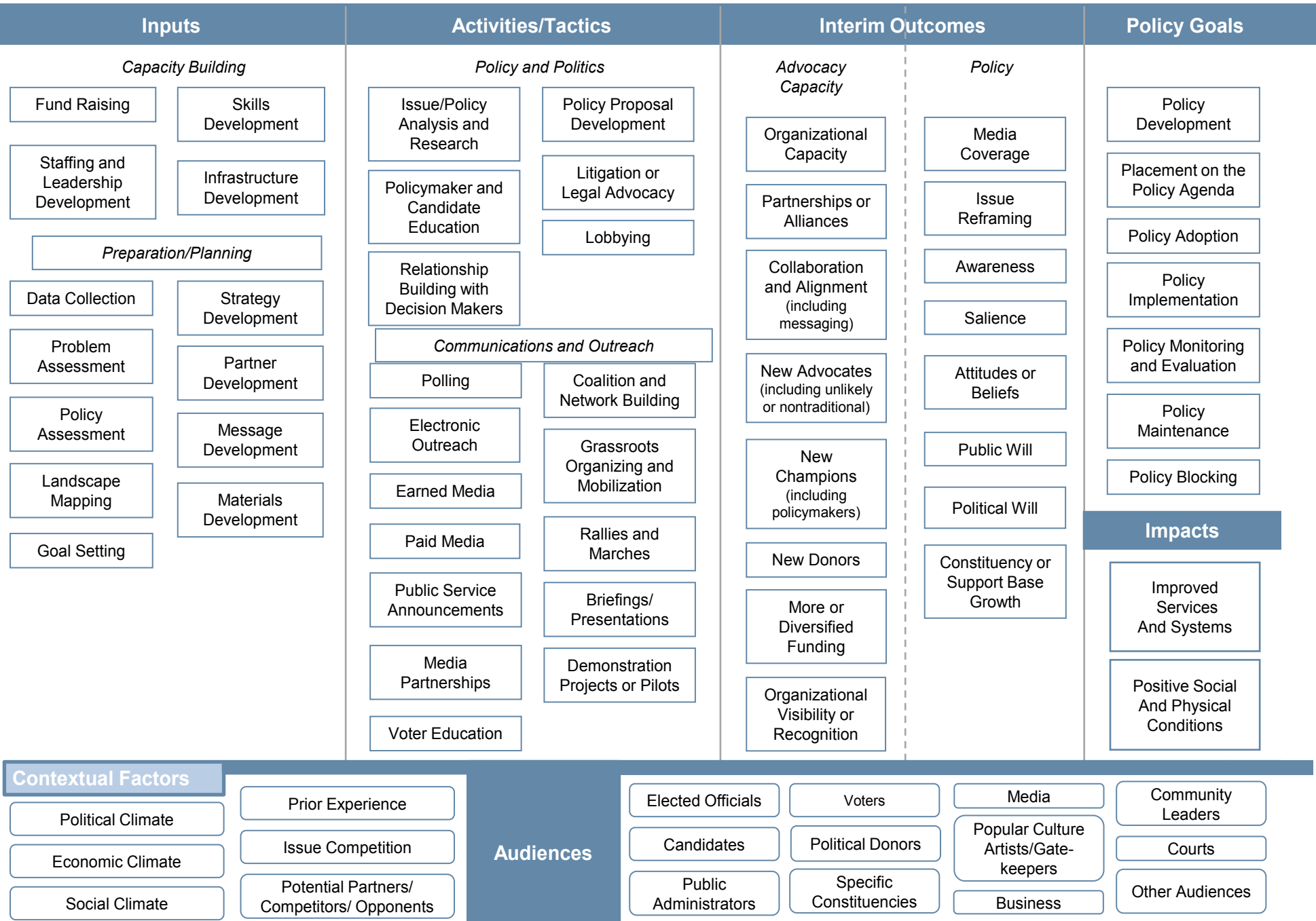
FRAMEWORK 5 — A FRAMEWORK FOR ADDRESSING THE SOCIAL DETERMINANTS OF HEALTH AND WELLBEING (QUEENSLAND HEALTH, 2001)

A framework for addressing the social determinants of health and well being

Health is a matter that goes beyond the provision of health services as people’s health cannot be separated from the social, cultural and economic environments in which they live, work and play



Advocacy and Policy Change Composite Logic Model



Institute of Public Health in Ireland

5th Floor
Bishop's Square
Redmond's Hill
Dublin DO2 TD99

Forestview
Purdy's Lane
Belfast
BT8 7AR

Ph: 00 353 1 4786300
Fax: 00 353 1 478 6319

00 44 28 9064 8494
00 44 28 9069 4409

www.publichealth.ie

February 2016

