Migrant Health

Infectious diseases in non-UK born populations in England, Wales and Northern Ireland
A baseline report - 2006
Acknowledgements:

The preparation of this report was led by Ruth Gilbert (RG) and Jane Jones (JJ) of the Travel and Migrant Health Section (TMHS) at the Health Protection Agency, Centre for Infections (CfI). It has been produced in close collaboration with the Respiratory Diseases Department, the HIV and STI Department and the Immunisation Department at the Centre for Infections as well as the Health Protection Agency Malaria Reference Laboratory at the London School of Hygiene and Tropical Medicine. It brings together data on migrants and their health from across the Agency and from external organisations. Unless otherwise stated the material was written by RG and JJ who also edited the disease specific chapters, contributed to the discussion sections and summarised the public health recommendations.

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The United Kingdom has always been populated by people from very diverse backgrounds who have contributed uniquely to its history, prosperity and culture. Today, migrants arrive in the UK from a wide range of countries for a wide variety of reasons. Most are young adults with a similar range of health needs to people born in the UK, and many come from countries with no higher risk of infectious disease than the UK. Some however arrive from countries which have a high burden of infectious disease compared to the UK and they may therefore have increased health needs. It is important to understand these health needs in order to adequately meet them, and to prevent and control disease transmission. I am therefore very pleased to present the Health Protection Agency’s baseline report on migrant health, which for the first time brings together surveillance data from across the Agency to describe the infectious diseases experienced by migrants in England, Wales and Northern Ireland. The report is intended as a resource for health professionals and others interested in migrant health. As well as providing information about specific infectious diseases it also aims to provide a summary of the range of health issues facing migrants and general information on migration, with further sources of information or guidance on specific areas.

In the 21st century we live in a ‘global village’; population movements around the world continue to increase and migration affects virtually all countries of the world. Global infectious disease epidemiology is changing as a result, and the report demonstrates that most of the burden of certain infectious diseases in England, Wales and Northern Ireland now falls on particular groups of people who were not born here. Much of this disease is likely to have been acquired prior to arrival in the UK, in countries with a high incidence of disease. Public health action here is still very important, however, to ensure rapid diagnosis and treatment of cases and to prevent further transmission in the UK. While there is little evidence to suggest that the general population is at risk of acquiring disease from migrants, people in their immediate family and community, often other first or second generation migrants, may be. Some migrants may also be at ongoing risk of infectious disease after arrival in the UK; for example through travel back to their country of origin to visit friends and relatives. The information that is presented in this report is used to recommend public health action to help maximise the health of this diverse group of people; who in turn contribute to the richness of our way of life in the UK.

PROFESSOR PAT TROOP
Abbreviations used in the report

ACMP  HPA Advisory Committee on Malaria Prevention in UK Travellers
AIDS  Acquired immune deficiency syndrome
BBC  British Broadcasting Corporation
CDC  United States Centers for Disease Control and Prevention
CfI  Centre for Infections
CUKC  Citizen of the UK and Colonies
EEA  European Economic Area
GP  General practitioner
GUM  Genitourinary medicine
HAART  Highly active anti-retroviral therapy
HBsAg  Hepatitis B virus surface antigen
HBV  Hepatitis B virus
HCV  Hepatitis C virus
HIV  Human immunodeficiency virus
HMSO  Her Majesty’s Stationary Office
HPA  Health Protection Agency
IDUs  Injecting drug users
IPPR  Institute for Public Policy Research
IPS  International Passenger Survey
IQR  Interquartile range
ISC  Indian subcontinent
MDR TB  Multi-drug resistant tuberculosis
MRL  Malaria Reference Laboratory
MSM  Men who have sex with men
NHS  National Health Service
NASS  National Asylum Support Services
NaTHNaC  National Travel Health Network and Centre
NICE  The National Institute for Health and Clinical Excellence
NMC  Nursing and Midwifery Council
NOIDS  Statutory Notifications of Infectious Diseases
OECD  Organization for Economic Co-operation and Development
ONS  National Statistics
SOPHID  Survey of Prevalent HIV Infections Diagnosed
SPRU  Special Pathogens Reference Unit
STH  Soil-transmitted helminths
STIs  Sexually transmitted infections
TB  Tuberculosis
UK  United Kingdom
UN  United Nations
USA  United States of America
VFRs  Visiting friends and relatives
WHO  World Health Organization
Definitions, denominators and data

Throughout this report the term ‘migrant’ rather than ‘immigrant’ is used in line with United Nations (UN) definitions. Between 1993 and 1996, in an attempt to standardise the definitions used and results presented, the international migration statistics were reviewed by the United Nations Statistics Division and the Statistical Office of the European Communities, in consultation with the United Nations Population Division, the regional commissions, the Office of the United Nations High Commissioner for Refugees, the International Labour Organization, the Organization for International Cooperation and Development, other interested organisations, and representatives of the statistical offices of selected countries. Subsequently in 1998 the United Nations published updated definitions relating to country of usual residence, long-term and short-term migrants (see box). These definitions are not, however, used by all organisations and, in terms of health surveillance, it is often difficult to apply these definitions since limited data are collected. For example, many surveillance systems do not collect any information on migration status, and those that do simply collect country of birth and possibly year of entry into the UK. Therefore, throughout this report the burden of infectious diseases is calculated as the percentage of cases that occur in the non-UK born population as a whole, rather than in migrants specifically.

A wide variety of data sources has been used in the compilation of this report. There are variations in the definition of geographical regions by these data sources and in the date of the most recent information available. For consistency, and to allow direct comparison between infections, all infectious disease specific data presented are for England, Wales and Northern Ireland in 2004, unless otherwise stated. Much of the disease specific data are already publicly available, but have been brought together for the first time in this report. Data were correct at the time of writing, however, additional cases may subsequently be reported which may result in discrepancies with data presented in subsequent publications. Migration and other statistics are generally presented for the UK unless otherwise stated, and the most recent data available at the time of writing have been used wherever possible.

Definitions of world regions used by different data sources are available as an Appendix to the web based version of this report.

UN definitions of migration

**Country of usual residence:** The country in which a person lives, that is to say, the country in which he or she has a place to live where he or she normally spends the daily period of rest. Temporary travel abroad for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage does not change a person’s country of usual residence.

**Long-term migrant:** A person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence. From the perspective of the country of departure the person will be a long-term emigrant and from the country of arrival the person will be a long-term migrant.

**Short-term migrant:** A person who moves to a country other than that of his or her usual residence for a period of at least 3 months but less than a year (12 months) except in cases where the movement to that country is for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage. For purposes of international migration statistics, the country of usual residence of short-term migrants is considered to be the country of destination during the period they spend in it.

*Source: United Nations 1998*
Executive Summary

This is the Health Protection Agency’s first report on infectious diseases affecting migrants. Its primary focus is surveillance data from England, Wales and Northern Ireland for 2004 on non-UK born cases of a variety of infectious diseases. It is important to recognise, however, that migrants have a range of health needs, which may or may not include needs related to infectious disease. Many migrants to the UK are at no greater risk of infectious diseases than the UK born population. Because infectious diseases in non-UK born populations need to be understood in this wider context, the report provides background information on migration to the UK and on the general health needs of migrants. It aims to provide a resource to health professionals and others with an interest in migrant health, as well as making recommendations for public health action to improve the health of migrant communities and contribute to overall communicable disease control in the UK.

Migration affects virtually every country worldwide and globally migration is increasing. In 2001, 7.53% (4,301,280) of the people living in the British Isles were non-UK born and in 2004, an estimated 542,000 people migrated to England and Wales for a period of 12 months or longer. Migrants are a very diverse group in terms of their reasons for migration and their country of origin. Most are work permit holders and students. A much smaller and decreasing number are asylum seekers. The NHS is one of the largest employers of migrants in the UK. Most migrants live in London and the South East although there is some variation in geographical distribution according to country of origin. They live in a variety of social circumstances in the UK, but in London the wards with the highest proportions of non-UK born residents also tend to be the wards with the highest levels of deprivation.

Migrants have a range of health needs reflecting the diversity of the group but affected by three key determinants: their individual characteristics (e.g. age, sex, ethnicity), their country of origin and the circumstances of migration, and the socioeconomic conditions in the host country. Eighty-five percent of migrants are aged between 15 and 44 years and will have general health needs similar to individuals of equivalent age and sex in the indigenous UK population. Most students and economic migrants are young adults who have voluntarily chosen to migrate and many originate from countries which have a low prevalence of infectious disease such as Western Europe, North America or Australia. Others are, however, from countries which have a high burden of infectious disease.

The report demonstrates that for certain infections, the major burden of disease in England, Wales and Northern Ireland falls upon particular groups of people who were not born in the UK. None of the surveillance systems described in this report successfully capture country of birth information for all cases. Among cases for which information was available, 70% of TB cases and HIV cases reported in England, Wales and Northern Ireland and 70% of malaria cases reported in the UK in 2004 had been born outside the UK. In any given year, it is also estimated that the majority of chronic hepatitis B infections newly added to the existing numbers of such infections in England and Wales are likely to be in the non-UK born. Migrants may furthermore have a disproportionate burden of other infectious diseases, including those that are commonly thought of as travel related. It is, however, important to note that the fact that the major burden falls on some of the non-UK born, does not mean that these groups overall have a very high prevalence of infectious diseases. For most diseases prevalence data in specific population groups is unavailable, but it has been demonstrated for example that the HIV prevalence among sub-Saharan African attendees of genitourinary medicine clinics in England, Wales and Northern Ireland is less than four percent. There is, furthermore, little evidence that the wider UK population is at risk of significant levels of transmission of disease from affected migrants, especially during normal social contact. This needs to be conveyed to the general public since the fear of a perceived health threat can lead to prejudice which increases stigma and may have untoward public health consequences.

The increased burden of infection in some non-UK born populations is in large part related to the higher prevalence of specific infections in the countries from which they originate, and many infections are likely to have been acquired prior to arrival. The report shows, however, that some migrants may be at ongoing risk of infectious diseases after arrival.
Consequently it is important to identify factors that may be amenable to public health action in the UK, such as the role of socioeconomic circumstances and travel. It is also important that affected communities and their health care practitioners should be aware of their risk of infectious disease, not just at the time of arrival in the UK but as part of an ongoing process, and that migrant groups are able to become more engaged with diagnostic services. Innovative approaches are required and community organisations may be invaluable in this regard. Some groups of migrants may be at particular risk of infectious diseases but have very limited entitlement to health services. This particularly applies to undocumented migrants but because this group are hard to reach it is difficult to estimate the burden of infectious disease they experience.

The key public health recommendations arising from the report are summarised in its final section. Among the most important is that health services for infectious diseases need to reflect the needs of the population groups most affected by these diseases, and that health care professionals require support to meet those needs. The role of primary care is likely to be particularly important in this regard, since it is ideally placed to consider the range of possible health needs of a migrant. Other recommendations include suggestions for research and improvements to routine surveillance to increase understanding of the diseases experienced by migrants. For example, a key measure is to improve capture of travel history, country of birth and reason for travel on disease reports.

Many organisations could play key roles in addressing the recommendations and the Agency will take this work forward by holding discussions with them on identifying the optimal public health response.

Improving the health of migrants in the UK is important because they represent a small but diverse proportion of our population that contributes to our economy and culture. The bigger challenge in addressing the burden of infectious diseases in migrant populations is to tackle global infectious disease burdens, which in turn means tackling the global inequality, poverty and governance issues that facilitate transmission. Although UK based organisations and the UK Government may contribute to this challenge, this is something that requires concerted action from all nations.
CHAPTER I

An introduction to migration and migrant health
I An introduction to migration and migrant health

**KEY POINTS**

- Migration affects virtually every country worldwide and globally migration is increasing.

- The difference in infectious disease burden between high and low income countries and increasing population movements mean that global infectious disease epidemiology is changing.

- There is no single comprehensive system for collecting data on the movement of migrants to and from the UK. Migration patterns are estimated using several different sources of data all of which have limitations in analysis of health needs.

- In 2001, 7.53% (4,301,280) of the people living in the British Isles were non-UK born; just over one third more than in 1991. India was the most frequently reported country of birth outside the UK, followed in order by Pakistan, Germany, the Caribbean and the USA.

- Most migrants live in London and the South East but there is considerable variation in geographical distribution according to country of origin.

- In 2004, an estimated 542,000 people migrated to England and Wales for a period of 12 months or longer; this was 217,100 more people than left in that year.

- Migrants are a very diverse group in terms of reasons for migration and health needs.

- Work permit holders (130,700) and students (127,700) were the largest groups of migrants arriving in England and Wales in 2004. They predominantly arrived from the Americas and Asia.

- Approximately 30,700 principal asylum seekers arrived in the UK in 2004 and were thought to have remained for at least 12 months. This number is lower than in previous years. They arrived predominantly from Africa and Asia.

- Migrants live in a variety of social circumstances in the UK, but in London the wards with the highest proportions of non-UK born residents also tend to be the wards with the highest levels of deprivation. Home ownership is lower and unemployment higher in non-UK born than UK born populations.

- Three key determinants affect a migrant's health needs: their individual characteristics (e.g. age, sex and ethnicity), their country of origin and the circumstances of migration, and their socioeconomic conditions in the host country.

- Migrants have a range of health needs reflecting the diversity of the group. Infectious diseases may or may not form a significant part of their health needs depending upon their individual circumstances.

- Eighty-five percent of migrants are aged between 15 and 44 years and will have general health needs similar to individuals of equivalent age and sex in the indigenous UK population.

- Most students and economic migrants are young adults who have voluntarily chosen to migrate and many originate from countries which have a low prevalence of infectious diseases such as Western Europe, America or Australia. Others, however, are from countries which have a high burden of infectious diseases.

- There are estimated to be 430,000 irregular or undocumented migrants in the UK. They may have significant health needs but have very limited entitlement to health care within the National Health Service due to their irregular status and for most, no financial resources to fund alternative treatment.

- The NHS is one of the largest employers of migrants in the UK.
This report describes infectious diseases in non-UK born people in England, Wales and Northern Ireland in 2004. It is, however, important to recognise that many migrants to the UK will be at no greater risk of infectious diseases than the UK born population, and also that they may have a range of other health needs. This chapter sets the context in which infectious diseases in the non-UK born occur. It gives an overview of international migration and its impact on global infectious disease epidemiology, presents data on migration to the UK and outlines the range of health needs that might be experienced by migrants to the UK. Subsequent chapters then focus on infectious disease specific surveillance data from England, Wales and Northern Ireland in 2004. Based on these data, recommendations are made to meet the infectious disease related health needs of the non-UK born and to contribute to overall communicable disease prevention and control.

An overview of international migration and its impact on infectious disease epidemiology

In recent years the worldwide importance of international migration flows has increased markedly, with the result that international migration issues have gained prominence both on the national agenda of many countries and internationally. Migration has affected virtually every country worldwide, and the number of countries that are sources or destinations of sizeable migrant inflows or outflows continues to increase. In 2000, there were estimated to be 175 million migrants in the world, accounting for approximately 3% of the world’s population. This figure has increased two fold since 1960 (76 million) and is predicted to continue rising². Western Europe is home or host to 36-39 million international migrants, approximately a fifth of the world’s migrant population³.

The reasons for the increase in global migration are multiple and complex including an increasing global population size (estimated to be 6057 million in 2000 but predicted to rise to 9000 million by 2050⁴) and an integrated world economy; where goods and services flow more freely across borders, people inevitably follow. There has also been a major rural to urban migration in the world’s most populous countries. This is expected to follow a classic trajectory; rural to urban and then urban to international. Migration is driven by a number of ‘push’ and ‘pull’ factors (social, political, economic, academic and environmental⁵) that either drive people to leave their country of origin or attract them to a particular host country. Economic factors often constitute a major driver for migration both from the point of view of the migrant, and also from the perspective of the host country. Current migration trends are largely being driven both by widening disparities in wealth between high and low income countries, and the growing need for young labour in high income countries².

In 2001, nearly one fifth of the world’s population lived in extreme poverty (an income of less than $1 per day⁶). Although between 1981 and 2001 the total number of people worldwide who were living in extreme poverty decreased from 40% to 21%, the decline predominantly occurred in East Asia (58% to 15%) and South Asia (52% to 31%), driven by rapid economic growth in these areas. By contrast, extreme poverty has increased in sub-Saharan Africa (42% to 47%), and Eastern Europe and Central Asia (0.7% to 4%). There has also been limited progress in reducing the number of people living on an income under $2 per day (67% to 53%). In 2005, 80% of the world’s gross domestic product belonged to the one billion people living in high income countries. The remaining 20% was shared by the five billion people living in low income countries⁷.

The combination of decreasing fertility rates and increased life expectancy in wealthier countries has led to an ageing, less economically active population. For example, in the UK the fertility rate (the number of children that would be born to a woman if current patterns of fertility persisted throughout her childbearing life) declined from a peak of
2.95 in 1964 to 1.63 in 2001. Fertility rates subsequently rose slightly to 1.77 in 2004. Meanwhile, the median age of the population increased from 34.1 years in 1971 to 38.6 years in 2004, and is projected to rise to 42.9 years by 2031. The number of people of pensionable age has also increased. The percentage of people aged over 65 years increased from 16% in 1971 to 19% in 2004 and is predicted to rise to 23% in 2031. Attracting young workers from other countries can be economically advantageous to host countries, such as the UK, as can be attracting students who bring with them their education fees. The economic imperatives of host countries contribute to the significant role that migration now plays in population growth throughout Europe.

From the migrant’s perspective, beliefs that there will be greater opportunities for income growth, education and social wellbeing in another country are important driving factors. The typical migrant is not, however, in the lowest income range. People generally move from ‘good’ to what they believe will be ‘better’. Increased information about opportunities available (through worldwide communications) and reduced transportation costs make migration increasingly available as a life choice to those who can afford it. People with marketable qualifications are attracted by perceived greater professional opportunity and/or higher salaries in the destination country. Migrants from low income countries may also be motivated by the desire to contribute to the development of their own country through remittances and the transfer of skills. In spite of globalisation, the poorest people in the world often continue to lack information on opportunities elsewhere, as well as the resources to be able to move. These people generally only become migrants following a natural or man-made event that threatens the lives of local people or destroys their local economy. In this case, the migrants generally move to an adjacent country or area, rather than migrating large distances to another continent. More than 70% of refugees are given refuge in a neighbouring country which usually also has a low income economy.

Although one of the most important drivers of migration is the global economy, other factors are also important including the ‘push’ factors of conflict, political/social unrest, persecution and in some cases expulsion. For some communities, for example in South East Nigeria, migration is highly valued culturally and young people are often expected to migrate at some stage in their career. This demonstrates that migration has numerous forces and varied causes, and that each individual may have many different motives. As a result, migrant populations are extremely diverse. Although they can be categorised according to their primary reason for migration, this fails to take into account other important characteristics such as economic status, education, legal status and the local environments pre- and post-migration. All these factors in turn may have a significant impact on the health of migrant populations in host countries.

Infectious diseases are still the world’s biggest killers of children and young (economically active) people resulting in 14 million deaths worldwide each year. Over 80% of these are due to six high mortality infections: malaria, HIV, diarrhoea, acute respiratory infections, measles and tuberculosis (TB). The distribution of disease and death is, however, closely linked with global wealth distribution. Infectious and parasitic disease accounts for 25% of the disease burden in low and middle income countries compared with only 3% in high income countries, and approximately 25% of all deaths worldwide but half of all deaths in low income countries. Figures 1-5 show the global distribution of some of the most important infectious diseases and Figure 6 shows the global distribution of income. The close correspondence between countries with low income and high burden of infectious disease is apparent.

Against a background of disparities in income and infectious disease burden, countries throughout the world are becoming increasingly linked in terms of communication, finance, travel, commerce and education. Distances and borders that used to prevent travel and migration are becoming less important and consequently the numbers of travellers and migrants are increasing each year. With increased population mobility around the world, the global epidemiology of infectious diseases is inevitably changing. In many high income countries, disease control and prevention strategies have successfully reduced the incidence and prevalence of many infectious diseases in the indigenous population. Changing patterns of migration mean, however, that these countries may now receive increasing numbers of migrants from parts of the world with higher rates of disease and/or worse health care infrastructure. For example, migrants to the UK historically arrived from Western Europe, the Caribbean and South Asia. More recently greater numbers have also arrived from countries in Africa and Eastern and Central Europe.
Some of the countries from which migrants come have a high burden of infectious disease. In addition, the symptoms of some chronic infections may appear many years after infection, and long after a person has migrated. Host countries may therefore face challenges both to health services in addressing the immediate and long-term health needs of migrants, and to national disease control and eradication programmes.

Migrants in the UK

Migration to the UK is not a recent phenomenon. The British Isles have been populated by migrants from mainland Europe and beyond throughout their history. Appendix One summarises the history of migration to the UK. The earliest legislation which aimed to restrict immigration to the UK was the Aliens Act in 1905. Since then there have been many Acts of Parliament passed to regulate the flow of migrants into the UK; these are summarised in Appendix Two.

Later in this chapter an overview of the health needs of non-UK born populations living in the UK is provided. These health needs are related to: where they have come from, why they have migrated, the socioeconomic conditions they experience after arrival, and their individual characteristics (e.g. age, sex, ethnicity). This section therefore describes the different groups of migrants currently living in the UK and their distribution, their reasons for migration and their socioeconomic circumstances in the UK. Asylum seekers represent a small subset of migrants to the UK, but they may have increased health needs relative to other migrants. Appendix Three aims to give the reader a broad understanding of the asylum process and current health measures in place for this group.

Sources and limitations of migration data in the UK

There is no single comprehensive system for collecting data on the movement of migrants to and from the UK. Therefore, migration patterns are estimated using several different sources of data. None of the systems are designed solely to collect data on international migration and most are geared towards collecting data on the economic impact of migration. All have limitations for analysis of the health needs of migrants.

The number of people living in the UK who were born abroad can be estimated using the census data. The 2001 Census provided data on where migrants were born, their age and sex profiles, and where they were living. Comparing multiple census results provides data on long-term trends in migration patterns but the ten year census cycle means that these data cannot be used to explain short-term changes in population movement or disease prevalence. Interim population estimates may be obtained from the Labour Force Survey published by the Office for National Statistics (ONS), though data on many groups of migrants must be treated with caution due to the small sample size. Consequently data must usually be grouped by world region of birth. These two data sources were used by the Institute for Public Policy Research (IPPR) and the British Broadcasting Corporation (BBC) to create the report Born Abroad, An Immigration Map of Britain. The report provided a detailed overview of where different groups of migrants lived in 2001 and how this had changed since the previous census in 1991.

It is difficult to ascertain the number of people who were born overseas who arrive in the UK each year. An estimation of the flow of migrants to and from the UK for a 10 year period is provided by the ONS publication International migration – migrants entering or leaving the UK and England and Wales, 2004. The report only includes migrants who were resident in the UK for a period of 12 months or more, and who, therefore, meet the 1998 United Nations definition of a migrant. Since there is no single system available in the UK to monitor population flows, ‘Total International Migration’ figures are calculated in the report using data from the International Passenger Survey (IPS), the Home Office data on asylum seekers entering the UK and the Irish Central Statistics Office. Additional information, such as the reason for migration and the intended length of stay were calculated using the IPS alone.

In addition, the Control of Immigration Statistics papers published by the Home Office provide details of the number of passengers who were subject to immigration control under the Immigration Act 1971, using information collected from the landing cards completed by non-European Economic Area (EEA) nationals. Most passengers are short-term visitors to the UK but the reports also provide information on people who intend staying in the UK for a longer period of time such as students, work permit holders and their dependents.
These documents provide a useful overview of the different reasons for travel to the UK and any changes over time. Many of the tables, however, simply collate the number of journeys, therefore individuals are counted each time they enter the UK and consequently may be included in the statistics several times during a given year. There is also no breakdown by age or sex for most groups of migrants and because of the small numbers of migrants arriving from many countries, most data are grouped into world regions. The regions presented may not be the most appropriate or useful for health related analysis, for example, data on the number of people arriving from sub-Saharan Africa, an area with a high burden of infection, is not routinely available. Furthermore, there is often a lack of consistency between the way the data are grouped and presented over several years or between different groups of migrants making trend analysis difficult.

### The non-UK born population living in the UK

In 2001, 7.53% (4,301,280) of the people living in the British Isles were non-UK born; a 36% increase since 1991. In contrast, during each of the two previous decades the non-UK born population had increased by approximately 15%\(^13\). Analysis by the Organization for Economic Co-operation and Development (OECD) shows that the percentage of the population who were not born in member countries varies substantially, ranging from 33% in Luxembourg to <1% in Mexico. The UK is ranked 15th out of the 30 countries\(^16\) (Table 1).

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage of Total Population</th>
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<tbody>
<tr>
<td>Luxembourg</td>
<td>32.6</td>
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<tr>
<td>Australia</td>
<td>23.0</td>
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<tr>
<td>Switzerland</td>
<td>22.4</td>
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<tr>
<td>New Zealand</td>
<td>19.5</td>
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<tr>
<td>Canada</td>
<td>19.3</td>
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<tr>
<td>Austria</td>
<td>12.5</td>
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<tr>
<td>Germany</td>
<td>12.5</td>
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<tr>
<td>USA</td>
<td>12.3</td>
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<tr>
<td>Sweden</td>
<td>12.0</td>
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<tr>
<td>Belgium</td>
<td>10.7</td>
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<tr>
<td>Ireland</td>
<td>10.4</td>
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<tr>
<td>Greece</td>
<td>10.3</td>
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<td>France</td>
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<td>UK</td>
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<tr>
<td>Norway</td>
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<tr>
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<td>Portugal</td>
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<td>Spain</td>
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<td>1.9</td>
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<td>Mexico</td>
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Source: Census data except for Germany (register of foreigners 2002)
FIGURE 7: THE PERCENTAGE OF THE POPULATION LIVING IN EACH LOCAL AUTHORITY AREA IN ENGLAND AND WALES WHO WERE BORN ABROAD, BY WORLD REGION OF BIRTH IN 2001
Most migrants live in London and the South East, though there is some variation associated with the country of origin. For example, many South Asians live in major cities in the Midlands and the North West regions (Figure 7). In 2001, 25% of the population of London (1,779,300 residents) had not been born in the UK, an increase of 44% between 1991 and 2001. Even within London, the proportion of the population who were non-UK born varied significantly from area to area; Wembley had the highest proportion (51.9%) (a 10% increase since 1991) while Upminster North had the lowest (3.9%). Large increases in the non-UK born population between 1991 and 2001 were seen in other regions including the North East (42% increase), South East (36%), Scotland (34%) and the South West (34%)\(^{13}\).
Analysis of data from the 2001 Census demonstrates that ethnicity does not necessarily correlate with country of birth. For example, 63% of black Africans living in the UK were born in Africa while 34% were born in the UK. Of the Asian population living in the UK 43% were born in Asia, 47% were born in the UK and 9% were born in Africa (Figure 8). This indicates the number people living in the UK who are descended from migrants.

### Table 2: The Ten Most Frequently Reported Countries of Birth, Excluding the UK, in the 2001 Census and the Percentage Change Since 1991

<table>
<thead>
<tr>
<th>Country</th>
<th>Population Size in 2001</th>
<th>+/- % Change in Population Since 1991</th>
<th>% of the UK Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>466,416</td>
<td>14.00</td>
<td>0.82</td>
</tr>
<tr>
<td>Pakistan</td>
<td>320,767</td>
<td>36.98</td>
<td>0.56</td>
</tr>
<tr>
<td>Germany</td>
<td>262,276</td>
<td>21.92</td>
<td>0.46</td>
</tr>
<tr>
<td>Caribbean</td>
<td>254,740</td>
<td>-4.56</td>
<td>0.45</td>
</tr>
<tr>
<td>USA</td>
<td>135,030</td>
<td>7.97</td>
<td>0.27</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>154,201</td>
<td>46.96</td>
<td>0.27</td>
</tr>
<tr>
<td>South Africa</td>
<td>140,201</td>
<td>106.43</td>
<td>0.25</td>
</tr>
<tr>
<td>Kenya</td>
<td>129,356</td>
<td>15.04</td>
<td>0.23</td>
</tr>
<tr>
<td>Italy</td>
<td>107,002</td>
<td>17.57</td>
<td>0.19</td>
</tr>
<tr>
<td>Australia</td>
<td>106,404</td>
<td>45.09</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Source: BBC, IPPR. Born Abroad: An immigration map of Britain 2005

### Table 3: The Ten Countries with the Greatest Percentage Increase in Population Living in the UK Between 1991 and 2001

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>154</td>
<td>2,270</td>
<td>1,174</td>
<td>0.00</td>
</tr>
<tr>
<td>Ex-Yugoslavia</td>
<td>13,846</td>
<td>47,410</td>
<td>242</td>
<td>0.08</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>6,280</td>
<td>16,972</td>
<td>170</td>
<td>0.03</td>
</tr>
<tr>
<td>Greece</td>
<td>14,459</td>
<td>35,007</td>
<td>142</td>
<td>0.06</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>21,427</td>
<td>49,303</td>
<td>130</td>
<td>0.09</td>
</tr>
<tr>
<td>South America</td>
<td>34,518</td>
<td>76,412</td>
<td>121</td>
<td>0.13</td>
</tr>
<tr>
<td>China</td>
<td>23,846</td>
<td>51,717</td>
<td>117</td>
<td>0.09</td>
</tr>
<tr>
<td>Finland</td>
<td>5,397</td>
<td>11,228</td>
<td>108</td>
<td>0.02</td>
</tr>
<tr>
<td>South Africa</td>
<td>67,918</td>
<td>140,201</td>
<td>106</td>
<td>0.25</td>
</tr>
<tr>
<td>Sweden</td>
<td>11,001</td>
<td>22,366</td>
<td>103</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Source: BBC, IPPR. Non-UK born: An immigration map of Britain 2005
Migration to the UK is a continuous process with large numbers of migrants arriving in and/or departing from the UK each year. In 2004, an estimated 582,100 people migrated to the UK for a period of 12 months or longer, 542,000 of whom arrived in England and Wales. During the period 1995 to 2004 there was a 1.9 fold increase in the number of migrants, and the total migrant population (both in the UK and in England and Wales) continued to increase each year as more migrants arrived than left the country. In 2004, 217,100 more migrants arrived in England and Wales than left.14

Migrants fall into a number of different categories (see box). One of the largest groups of migrants to England and Wales are economic migrants14,18. In 2004, 130,700 work permit holders arrived in England and Wales, a 2.4 fold increase on the number who arrived in 1994. Another large group of migrants are those planning to undertake formal study. In 2004, 127,700 students arrived in England and Wales, a 2.2 fold increase in the number of students who arrived in 1995. In addition, 95,300 entrants gave accompanying or joining another visa holder as their primary reason for migrating, compared to 59,900 in 1994. Approximately 30,700 principal asylum seekers, plus 5,700 dependents, arrived in the UK in 2004 and were thought to have remained for at least 12 months. A peak in asylum applications was seen between 1999 (79,900 applicants) and 2002 (95,900 applicants), but the number of applications has since declined.15

Definitions of migrants

Students: a large group which includes people of any age moving to another country for the purpose of full time study.

Economic migrants: people leaving their usual place of residence to improve their quality of life. This may include long-term migrants or short-term seasonal workers.

Frontier workers are migrants who retain their usual country of residence but work in a neighbouring state returning daily or weekly.

Asylum seekers: people with a fear of persecution for reasons of race, religion, nationality, membership of a particular social group or political opinion, who enter a country and claim asylum under the 1951 Geneva Convention. Once the fear has been proven to be well founded, the claimant is granted refugee status.

Irregular migrants (or undocumented or clandestine): migrants without legal status owing to illegal entry or the expiry of their visa.

Displaced persons: people fleeing an armed conflict or escaping natural or man-made disasters or their effects. This term primarily covers persons displaced within the borders of their country of origin (i.e. internally displaced persons) who would not come under the 1951 Geneva Convention.

Using data from the Home Office, the nationality of different groups of migrants entering the UK can be analysed. In 2004, 58% of the economic migrants and 53% of the students were male, while 60% of the migrants accompanying/joining were female (Figure 9). If the sex distribution of migrants is considered by country of birth, it can be seen that there were some significant differences in the male:female distributions; 70% of migrants from Pakistan were male whereas 73% of migrants from Canada were female (Figure 10).

In 2004, 85% of migrants were aged between 15 and 44 years. There has been no significant change in the age group distribution since 1995. Sixty-five percent of students were aged 15-24 years and 67% of migrants with work permits were aged 25-44 years. Dependents tended to be either younger (30% were aged <15 years) or a similar age to those migrating to the UK for work (37% were aged 25-44 years) (Figure 11).

Over the past 10 years there have been roughly similar proportions of male and female migrants arriving in the UK. In 2004, 58% of the economic migrants and 53% of the students were male, while 60% of the migrants accompanying/joining were female (Figure 9). If the sex distribution of migrants is considered by country of birth, it can be seen that there were some significant differences in the male:female distributions; 70% of migrants from Pakistan were male whereas 73% of migrants from Canada were female (Figure 10).

Using data from the Home Office, the nationality of different groups of migrants entering the UK (from outside the EEA) can be analysed. The largest group of migrants with work permits valid for less than 12 months arrived from the Americas (37%), while a similar proportion holding work permits valid for longer than 12 months arrived from the Indian subcontinent (ISC) (36%). Dependents were also most likely to arrive from the Indian subcontinent. Students predominantly arrived from Asia (excluding the ISC) (35%) and the Americas (32%). (It should be noted that the data for students are reported as the number of journeys rather than number of individuals, so some nationalities may be over or under represented).

In contrast, 44% of asylum seekers arrived from Africa and 30% from Asia (excluding the ISC) (Figure 12).
FIGURE 10: THE DISTRIBUTION OF MIGRANTS TO THE UK BY REGION OF BIRTH AND SEX IN 2004


FIGURE 12: A COMPARISON OF THE NATIONALITY OF PASSENGERS GIVEN LEAVE TO ENTER THE UK BY PURPOSE OF JOURNEY IN 2004

The Labour Force Survey can be used to estimate how long migrants have been living in the UK. In 2004, 40% of the non-UK born population living in the UK had arrived within the previous 10 year period and approximately 25% within 5 years; 7% had lived in the country for one year, 7% for two years and a further 6% for three years. There is, however, significant variation between migrants born in the different regions of the world (Figure 13). Over half of the migrants from Central and Eastern Europe (73%), South America (65%), rest of Asia (54%), Oceania (53%), sub-Saharan Africa (51%) and the Middle East (51%) had been living in the UK for less than 10 years. In contrast, many migrants from South Asia have been resident in the UK for more than 40 years and many from Western Europe originally arrived more than 60 years ago. The most unusual pattern is seen with migrants from Central America and the Caribbean where 40% of migrants arrived between 1955 and 1964, and a further 21% in the subsequent 10 year period. The 1948 British Nationality Act allowed people from the Empire and Commonwealth, who carried a British passport, unhindered rights to enter Britain. Migration from this area subsequently fell as a result of the immigration acts passed in 1962, 1968 and 1971.19.

The socioeconomic circumstances of migrants living in the UK

This section describes the diversity of socioeconomic circumstances that migrants might experience while living in the UK, and which may affect their health.

Although ethnicity has previously been shown to be a poor proxy for country of birth, in some instances it is the only information available to describe the non-UK born population living in the UK. A survey by the Joseph Rowntree foundation in 1994 found that ethnic minority populations were concentrated in the major cities, particularly London. White people tend to live in areas of low ethnic minority population, regardless of the level of deprivation. Ethnic minorities, and in particular South Asians, tend to live in areas with a high proportion of ethnic minorities. Their choice of where to live appears to be dictated by ethnic and social background and connections, religion, and level of skills and employment.20 This is supported by data from the 2001 Census. Individuals born in South Asian countries such as India, Pakistan or Bangladesh account for up to 20% of residents in the wards most popular with this group. In contrast, however, the proportion of Africans is generally lower. Kenyans, one of the most frequently reported African nationalities in the UK, account for only 8% of the population in Greenhill, London, the ward most popular with this group.21 In ten wards in London, over 40% of the residents were non-UK born; Wembley had the highest proportion in the country with over 52% of residents born outside the UK. In London, the wards with the highest proportions of non-UK born residents also tended to be the wards with the highest levels of deprivation (Figure 14). Elsewhere, in five wards (all of which were in the Midlands or Yorkshire and Humber regions) more than 30% of the residents had been born outside the UK; most were born in Southern or Eastern Africa or South Asia.

Ethnicity and country of origin also seem to be associated with the conditions in which families live.22 Black Caribbean and white households have an average of 2.3 people per household, whereas other ethnic groups tend to have larger families; Bangladeshi households are the largest with an average of 4.7 people. Ethnic minority households are three times more likely to become statutorily homeless than the white population; the black African and black Caribbean populations are twice as likely to become homeless as those of Indian, Bangladeshi and Pakistani origin. Data from the Labour Force Survey can be used to demonstrate variations in home ownership depending on country of birth. Due to limitations of the sample size, countries are grouped by world region. Seventy-four percent of the UK born population own their own homes (either outright or with a mortgage) compared with 65% of residents who were born in South Asia (Table 4). The lowest rate of home ownership is seen in those from the Middle East (43%). There are wide variations, however, in levels of ownership within populations from some world regions. For example, among migrants from South Asia, 71% of adults born in India own their home, in comparison with just 46% of those born in Bangladesh. Levels of home ownership are also dependent on how long migrants have been in the UK. As might be expected, just 15% of migrants owned their home a year after arriving in the UK, compared with 52% of migrants who had been living in the UK for a period of 10 years.
**FIGURE 13: THE DECADE OF ARRIVAL IN THE UK BY WORLD REGION OF BIRTH FOR THE NON-UK BORN POPULATION LIVING IN THE UK IN 2004**

<table>
<thead>
<tr>
<th>Region of Birth</th>
<th>Total</th>
<th>% Who Own Home</th>
<th>% Who Rent Free</th>
<th>% Living Rent Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>53,434,089</td>
<td>74%</td>
<td>25%</td>
<td>1%</td>
</tr>
<tr>
<td>SOUTH ASIA</td>
<td>986,310</td>
<td>65%</td>
<td>33%</td>
<td>2%</td>
</tr>
<tr>
<td>NORTH AMERICA</td>
<td>238,046</td>
<td>62%</td>
<td>36%</td>
<td>2%</td>
</tr>
<tr>
<td>WESTERN EUROPE EXCL.</td>
<td>1,368,554</td>
<td>61%</td>
<td>37%</td>
<td>1%</td>
</tr>
<tr>
<td>CENTRAL AMERICA AND THE CARIBBEAN</td>
<td>216,198</td>
<td>58%</td>
<td>41%</td>
<td>1%</td>
</tr>
<tr>
<td>OCEANIA</td>
<td>150,065</td>
<td>54%</td>
<td>44%</td>
<td>2%</td>
</tr>
<tr>
<td>REST OF ASIA</td>
<td>440,842</td>
<td>48%</td>
<td>47%</td>
<td>5%</td>
</tr>
<tr>
<td>NORTH AFRICA</td>
<td>59,400</td>
<td>47%</td>
<td>44%</td>
<td>8%</td>
</tr>
<tr>
<td>SOUTH AMERICA</td>
<td>89,421</td>
<td>45%</td>
<td>52%</td>
<td>3%</td>
</tr>
<tr>
<td>SUB-SAHARAN AFRICA</td>
<td>928,505</td>
<td>45%</td>
<td>53%</td>
<td>2%</td>
</tr>
<tr>
<td>CENTRAL AND EASTERN EUROPE</td>
<td>330,361</td>
<td>44%</td>
<td>52%</td>
<td>3%</td>
</tr>
<tr>
<td>MIDDLE EAST</td>
<td>183,923</td>
<td>43%</td>
<td>52%</td>
<td>5%</td>
</tr>
</tbody>
</table>

* The most deprived ward is ranked as 1, therefore the higher the number the lower the level of deprivation.

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**FIGURE 14: DEPRIVATION AND PERCENTAGE NON-UK BORN POPULATION IN LONDON WARDS IN 2001**

<table>
<thead>
<tr>
<th>Ranked multiple index of deprivation</th>
<th>% of population born abroad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 50</td>
<td>5% of non-UK born, 4% of UK born</td>
</tr>
<tr>
<td>51 to 200</td>
<td>4% of non-UK born, 4% of UK born</td>
</tr>
<tr>
<td>201 to 300</td>
<td>4% of non-UK born, 4% of UK born</td>
</tr>
</tbody>
</table>

* The most deprived ward is ranked as 1, therefore the higher the number the lower the level of deprivation.

Source: 2001 Census
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Health Protection Agency, 100016969, 2006
Data from the Labour Force Survey in 2004 show that unemployment rates are often higher among adults who were non-UK born than those born in the UK. Using the International Labour Force definition of unemployment, the average unemployment rate for adults born in the UK is 2% compared to 7% for those born in South America, 5% for those born in the Middle East and 5% for those born in sub-Saharan Africa (Table 5). The pattern of unemployment primarily reflects the different reasons for migration from different regions of the world. For example, most asylum seekers are legally prevented from taking up paid employment, whereas economic migrants usually arrive with a work visa for a pre-arranged job. The unemployment rates for women are generally lower as many are classed as ‘inactive’, that is, not available for work and/or not actively seeking work (reasons for this include looking after the family and home). A similar pattern, however, is seen with higher rates in those born in South America (6%), Central America and the Caribbean (5%), the Middle East (5%), and sub-Saharan Africa (5%), in comparison to women born in the UK (2%) (Table 5).

Eight percent of the UK born population claim a state benefit or tax credit (excluding child benefit or state pension) compared with 15% of those born in the Middle East or North Africa. In contrast only 2% of migrants from Oceania claim any benefit (Table 6).

The type of work that migrants are able to do will, in part, be affected by the qualifications they hold. Again migrants are a diverse group, while many are highly qualified others have no formal qualifications. Fourteen percent of the UK born population have a degree or equivalent qualification. In contrast, the proportion of the non-UK born population qualified to this level is higher among migrants from everywhere except Central America and the Caribbean (10%), and Central and Eastern Europe (9%). A high proportion of migrants do not hold any academic qualifications (Table 7), particularly those from South Asia (28%).

### Table 5: Unemployment Rates in the UK, by World Region of Birth and Sex in 2004

<table>
<thead>
<tr>
<th>Region of Birth</th>
<th>All Unemployed</th>
<th>Unemployed Males</th>
<th>Unemployed Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>1,157,906</td>
<td>678,497</td>
<td>479,409</td>
</tr>
<tr>
<td>North America</td>
<td>5,878</td>
<td>3,005</td>
<td>2,873</td>
</tr>
<tr>
<td>North Africa</td>
<td>1,660</td>
<td>1,660</td>
<td>-</td>
</tr>
<tr>
<td>Oceania</td>
<td>3,840</td>
<td>2,084</td>
<td>1,756</td>
</tr>
<tr>
<td>Western Europe excl UK</td>
<td>45,822</td>
<td>23,946</td>
<td>21,876</td>
</tr>
<tr>
<td>Central America and the Caribbean</td>
<td>7,945</td>
<td>2,241</td>
<td>5,704</td>
</tr>
<tr>
<td>Central and Eastern Europe</td>
<td>12,647</td>
<td>6,595</td>
<td>6,052</td>
</tr>
<tr>
<td>Rest of Asia</td>
<td>15,968</td>
<td>8,474</td>
<td>7,494</td>
</tr>
<tr>
<td>South Asia</td>
<td>44,228</td>
<td>28,153</td>
<td>16,075</td>
</tr>
<tr>
<td>Middle East</td>
<td>9,773</td>
<td>5,850</td>
<td>3,923</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>47,886</td>
<td>24,184</td>
<td>23,702</td>
</tr>
<tr>
<td>South America</td>
<td>6,311</td>
<td>2,709</td>
<td>3,602</td>
</tr>
</tbody>
</table>

## Table 6: Claims for UK State Benefits or Tax Rebates by World Region of Birth in 2004

<table>
<thead>
<tr>
<th>Region of Birth</th>
<th>Total Number of People from Each Region</th>
<th>Number (%) Claiming at Least One Benefit</th>
<th>Percentage Claiming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>UNEMPLOYMENT BENEFIT</td>
<td>INCOME SUPPORT</td>
</tr>
<tr>
<td>UK</td>
<td>53,434,089</td>
<td>4,164,299</td>
<td>8%</td>
</tr>
<tr>
<td>Central America and the Caribbean</td>
<td>216,198</td>
<td>28,014</td>
<td>13%</td>
</tr>
<tr>
<td>Central and Eastern Europe</td>
<td>330,361</td>
<td>34,408</td>
<td>10%</td>
</tr>
<tr>
<td>Middle East</td>
<td>183,923</td>
<td>27,322</td>
<td>15%</td>
</tr>
<tr>
<td>North Africa</td>
<td>59,400</td>
<td>8,717</td>
<td>15%</td>
</tr>
<tr>
<td>North America</td>
<td>238,046</td>
<td>7,835</td>
<td>3%</td>
</tr>
<tr>
<td>Oceania</td>
<td>150,065</td>
<td>3,019</td>
<td>2%</td>
</tr>
<tr>
<td>Rest of Asia</td>
<td>440,842</td>
<td>27,228</td>
<td>6%</td>
</tr>
<tr>
<td>South America</td>
<td>89,421</td>
<td>5,976</td>
<td>7%</td>
</tr>
<tr>
<td>South Asia</td>
<td>986,310</td>
<td>126,684</td>
<td>13%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>928,505</td>
<td>116,402</td>
<td>13%</td>
</tr>
<tr>
<td>Western Europe Excl UK</td>
<td>1,368,554</td>
<td>131,040</td>
<td>10%</td>
</tr>
</tbody>
</table>


## Table 7: Qualifications by World Region of Birth in 2004

<table>
<thead>
<tr>
<th>Region of Birth</th>
<th>Total</th>
<th>Highest Qualification Obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Degree or Equivalent</td>
</tr>
<tr>
<td>UK</td>
<td>39,363,602</td>
<td>5,550,091 14%</td>
</tr>
<tr>
<td>Central America and the Caribbean</td>
<td>210,433</td>
<td>22,069 10%</td>
</tr>
<tr>
<td>Central and Eastern Europe</td>
<td>289,581</td>
<td>25,923 9%</td>
</tr>
<tr>
<td>Middle East</td>
<td>147,031</td>
<td>33,994 23%</td>
</tr>
<tr>
<td>North Africa</td>
<td>53,471</td>
<td>11,359 21%</td>
</tr>
<tr>
<td>North America</td>
<td>176,658</td>
<td>43,206 24%</td>
</tr>
<tr>
<td>Oceania</td>
<td>134,887</td>
<td>27,890 21%</td>
</tr>
<tr>
<td>Rest of Asia</td>
<td>384,418</td>
<td>85,680 22%</td>
</tr>
<tr>
<td>South America</td>
<td>83,100</td>
<td>19,235 23%</td>
</tr>
<tr>
<td>South Asia</td>
<td>936,966</td>
<td>129,231 14%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>782,626</td>
<td>168,260 21%</td>
</tr>
<tr>
<td>Western Europe Excl UK</td>
<td>1,225,125</td>
<td>210,638 17%</td>
</tr>
</tbody>
</table>

All adults aged over 20 years are included. Source: National Statistics. The Labour Force Survey Spring 2004. © Crown copyright material reproduced with the permission of the Controller of HMSO
Overview of migrant health

This report focuses on infectious diseases but as previously stated it is important to remember that migrants have a range of health needs, of which infectious diseases may or may not form a significant part. The data presented to this point demonstrate that migrants to the UK are an extremely heterogeneous group. Three key determinants of health needs will, however, affect all migrants. These are their individual characteristics (e.g. age, sex and ethnicity), their country of origin and the circumstances of migration, and their socioeconomic conditions in the host country. Most students, economic migrants and their dependents arriving in the UK are young adults who have voluntarily chosen to migrate and many originate from countries which have a low prevalence of infectious diseases such as Western Europe, America or Australia. Therefore, the prevalence of infection in this group is unlikely to be significantly different from the UK population in general. Many, however, arrive from Africa and South Asia where the prevalence of infection is significantly higher.

This section gives an overview of migrant health issues in general, and discusses the infectious diseases most likely to affect migrants to the UK. Later chapters concentrate in more detail on specific infectious diseases using surveillance data available from England, Wales and Northern Ireland in 2004.

Individual characteristics

Age, sex, ethnicity and genetic make-up are individual factors that will all have an impact on health. As already shown 85% of migrants to the UK are aged between 15 and 44 years. They are likely to have general health needs similar to individuals of equivalent age and sex in the indigenous UK population. For this age group acute infectious illnesses, minor accidents and trauma, reproductive health issues (e.g. birth control), and child-health concerns are likely to be the most commonly encountered health needs in general practice, irrespective of the country of birth. Older migrants, in common with older members of the indigenous UK population, may suffer from age related chronic conditions such as cardiovascular and/or cerebrovascular disease, cancers and rheumatological problems. In addition to the intrinsic factors listed above, cultural beliefs may impact on the nature of a health need and the individual’s response to it, as well as affecting presentation to health services.
Ethnicity is recognised to have particularly significant associations with health. Its causal role is, however, difficult to ascertain since it is frequently associated with factors such as socioeconomic circumstances that also increase risk of disease. The Health Survey for England\textsuperscript{22} has highlighted a higher prevalence of heart disease in some ethnic groups. For example, Pakistani men (31\% compared with 13\% of men in the general population equivalent) and Indian women (15\% compared to 9\% of the general population equivalent) have an increased prevalence of angina. The prevalence of heart attacks in Pakistani men and woman is higher than in the general population (19\% vs. 10\% and 7\% vs. 5\% respectively) and relatively high rates of stroke are reported among black Caribbean and Irish men (12\% and 9\% respectively, compared to 6\% in the general population), and Bangladeshi and Pakistani women (12\% and 10\% respectively, compared to 5\% in the general population). The prevalence of other chronic diseases is also higher in some ethnic groups. The prevalence of diabetes is higher in black Caribbean and many Asian populations. Among children, obesity rates are high among black African, Caribbean and Pakistani boys (42\%, 39\% and 39\% respectively, compared to 30\% in all boys) and black African and Caribbean girls (42\% and 40\% respectively, compared to 31\% of all girls). People of African and Afro-Caribbean heritage may also have a higher incidence of glaucoma\textsuperscript{23}. In addition, some conditions are specific to certain populations, such as sickle cell disease in the black African population and thalassaemia in people of black African, Indian, Pakistani, Roma, Middle Eastern or Eastern Mediterranean ancestry\textsuperscript{23}.

The prevalence of diagnosed mental health problems also varies between ethnic groups, reflecting the diversity of cultural and socioeconomic experiences as well as health service response. In general, people from minority ethnic groups living in the UK are more likely to be diagnosed with mental health problems\textsuperscript{24}. They are more likely to be admitted to hospital as a result and to experience a poor treatment outcome, resulting in them subsequently disengaging from mainstream mental health services, which leads in turn to social exclusion and deterioration in their mental health. Irish people living in the UK have much higher hospital admission rates for mental health problems compared with other ethnic groups. African Caribbean people living in the UK have lower rates of minor psychiatric disorders than other ethnic groups but are more likely to be given a diagnosis of severe mental illness. They are also more likely to be held under a section of the Mental Health Act and are over-represented in special hospitals, secure institutions, medium secure units and prisons. These differences do not necessarily reflect actual prevalence of illness, but may also be the result of a number of other factors, including challenges faced by mainstream mental health services in understanding or meeting the needs of minority ethnic communities.

Factors affecting health prior to migration – country of origin and circumstances of migration

The health of migrants will be affected by conditions in the country of origin and the reasons for migration. Prior to migration, health may be affected by environmental factors such as the local climate, levels of nutrients and toxic substances, and socio-political factors such as economic status and access to health care, including preventative measures such as immunisation and education. For example, non-infectious diseases that may be dealt with easily in a country with a strong health infrastructure may lead to chronic health problems or disability where the health infrastructure is weak. Cultural practices in the country of origin may also have health effects e.g. female genital mutilation\textsuperscript{25}.

The health of asylum seekers is likely to be of greater concern than other groups of migrants. Although the majority of people seeking asylum are young and relatively healthy, a minority may have faced imprisonment or torture prior to migration. In 2003, Amnesty International reported that people were repeatedly tortured or ill treated by security forces, police or other state authorities in 106 countries\textsuperscript{26}. Many asylum seekers may have lived in areas with poor health care provision and some may have lived in refugee camps with an increased risk of infection associated with poor sanitation, higher prevalence of communicable disease and poor nutrition.

The disparity in income and infectious disease burden between different countries in the world has already been outlined and for the purposes of this report risk of exposure to infectious diseases in the country of origin is of primary interest. For example, living in unsanitary conditions will increase the risk of intestinal parasites, typhoid and cholera. International studies on refugee populations have shown that up to 56\% of African refugee children may be infected with intestinal parasites\textsuperscript{27,28}. In addition, some migrants are at higher risk of disability causing infectious diseases which are endemic in many areas of the world such as leprosy, lymphatic filariasis, onchocerciasis, guinea worm and polio.
Some migrants may have been in situations which put them at risk of blood borne viruses. Situations of risk include unprotected sex (especially non-consensual or paid sex), blood transfusions, contaminated medical equipment, injecting drug use, or mother-to-child transmission. In 2005, an estimated 40.3 million people worldwide were living with HIV, including 2.3 million children under the age of 15 years. The total number of cases continues to increase and there are approximately 5 million new infections each year. Two thirds of the people living with HIV are in sub-Saharan Africa, though there are growing epidemics in Eastern Europe and in Central and East Asia.

Worldwide, over 2 billion people have been infected with the hepatitis B virus (HBV) and more than 350 million have chronic, lifelong infections. In much of the developing world, including sub-Saharan Africa, most of Asia and parts of North and South America, most people become infected with HBV during childhood, and eight to ten percent will subsequently become chronically infected. In the Middle East, the southern parts of Eastern and Central Europe and the Indian subcontinent, about five percent of the population are chronically infected. The WHO estimates that 170 million people, three percent of the world's population, are infected with hepatitis C virus (HCV) and are at risk of developing liver cirrhosis and/or liver cancer. The prevalence of HCV infection in some countries in Africa, the Eastern Mediterranean, South East Asia and the Western Pacific is high compared to some countries in North America and Europe.

In 2004, 14.6 million people were infected with TB worldwide and there were 1.7 million deaths. Of incident cases globally 35% occur in South East Asia, but the estimated incidence per capita in sub-Saharan Africa is nearly twice that of South East Asia (356 cases per 100,000 population compared to 183 per 100,000 population).

Approximately 40% of the world's population is at risk of malaria which is found throughout the tropical and sub-tropical regions of the world and causes more than 300 million acute illnesses and at least one million deaths annually. Furthermore, throughout Europe, the number of cases of malaria diagnosed in migrants is continuing to increase associated with recent waves of immigration.

In many countries a lack of health care facilities means that immunisation coverage levels will be either poor or non-existent in some groups of migrants. Since immunisation schedules and levels of coverage vary from country to country, migrants and in particular children, may not have received all the immunisations offered to the UK population leaving them at risk from vaccine preventable diseases. For many countries the cost of vaccines may be prohibitive while others lack health care staff to administer the doses. In addition, particularly for asylum seekers and refugees, conflict may have disrupted immunisation programmes, or the family may have left before a course had been completed. Measles remains a leading cause of death among young children worldwide, despite the availability of a safe and effective vaccine for the past 40 years. Globally, more than 30 million people are affected each year by measles, and in 2004, 454,000 people, the majority of them children, died from measles. Measles is highly contagious and almost all non-immune children will contract measles if exposed to the virus. In 2004, 48% of deaths due to measles occurred in Africa and 44% in South Asia. These deaths are primarily due to a failure of vaccination campaigns to deliver at least one dose of vaccine to 90% of children in any area.

Factors affecting health during migration

In general, the journey itself is inconsequential in terms of the overall health of migrants. Since it is usually of short duration, accident and injury generally represent the greatest risk for most travellers. However, irregular migrants, such as those experiencing trafficking or smuggling, or asylum seekers, particularly those who have passed through refugee camps, may encounter additional problems which adversely affect their health such as exposure to extreme temperatures and lack of access to safe food and water. These groups may also encounter violence and other stressful conditions affecting health, compounded by a lack of access to health care. Gastrointestinal symptoms are the most frequently reported health problem by these groups and may be caused by the stress associated with migration or consuming unfamiliar food. In addition, migrants travelling for prolonged periods may have consumed contaminated food or water en-route resulting in parasitic infections, gastroenteritis and more occasionally cholera, bacillary dysentery and typhoid.

Factors affecting health following migration – socioeconomic circumstances in the host country

Once migrants arrive in the destination country, their health will be determined by physical, social, economic and cultural factors in the receiving country. Ill health and disease transmission may continue to occur, and may be exacerbated by difficulties in accessing health care.
Finally, a group of migrants who may have significant health needs are the irregular or undocumented migrants. This group have very limited entitlement to health care within the National Health Service due to their irregular status and most will lack financial resources to fund alternative treatment. There are estimated to be 430,000 irregular or undocumented migrants in the UK. This migrant group includes those who have failed to leave the country when their visa expired as well as a significant number of people who have entered the UK illegally, often with the help of traffickers and human smugglers. As with regular migrants, the health of irregular migrants will be affected by the circumstances surrounding their migration and the conditions in which they live both before and after migration. In the UK, irregular migrants often fill low skilled job vacancies particularly within construction, agriculture/horticulture, contract cleaning and residential care; however, they have few, if any, rights, and consequently may be exploited. Some members of this group may be at particularly high risk of contracting infectious diseases, and subject to mental illness, substance abuse and violence. They may be highly dependant on traffickers who may be abusive and may live in lodgings which are dirty and overcrowded. They are also more likely to work in unregulated sub-standard conditions. It is predominantly women who are trafficked, mainly for the sex industry, so they may be at significantly higher risk of contracting and transmitting sexually transmitted infections. Despite probable increased health needs undocumented migrants are largely hidden to health services and public health initiatives.

Some migrants may also suffer from malnutrition due to limited finances, language difficulties and a lack of culturally familiar and acceptable foods available locally. Chronic under-nutrition will generally have the greatest impact on children, resulting in stunted growth, rickets, scurvy and thiamine deficiency. Upon arrival in the UK, some migrants may suffer from psychological distress caused by the loss of family and friends, social isolation, poverty, loss of status, uncertainty, racism and hostility. Much of the psychological distress reported by asylum seekers is related not to prior exposure to violent events, but to a variety of exile-related stressors. Psychological issues may have a negative effect on health in general. Distress is not expressed in the same way in all cultures or communities. A common way in which distress is expressed in many parts of the world is through somatisation; that is people complain of physical symptoms that are mainly caused by emotional or psychological worry, anxiety or stress. Complaints can include vague aches and pains, headaches, palpitations, dizziness and weight loss.

The socioeconomic circumstances of migrants in the UK have already been described. Some migrants live in poor conditions here and consequently may be at increased risk of infections transmitted by close association and related to deprivation such as TB, other respiratory diseases and possibly blood borne infections. In general, those who were most disadvantaged prior to travel will remain at greatest risk.

The risk of acquiring infection may continue for many years after arrival as many migrants maintain links with family and friends in their country of origin. In 2004, data from the International Passenger Survey showed that UK residents made 64 million visits abroad, and almost 10 million (15%) were made primarily for the purpose of visiting friends and relatives (VFRs). Seventy-six percent of trips to Pakistan, 44% of trips to India and 33% of trips to sub-Saharan Africa were made for the purpose of visiting friends and relatives. These migrants are at risk of acquiring new infections each time they travel, particularly if they fail to use appropriate prophylaxis. For example, migrants from areas where malaria is endemic, rapidly lose their immunity to the parasites and consequently any protection they had acquired. The use of malaria prophylaxis is known to be poor in this group and an increasing proportion of cases of malaria occur in migrants. Some migrants also appear to be at increased risk of HIV and other sexually transmitted infections when visiting friends and family in their country of origin.
Entitlements to Health Services


In the UK, certain health services are exempt from charges for everyone:

- Primary care services (although this is currently under review). Patients may be accepted by a general practitioner (GP) either as a permanent registered patient or a temporary resident depending on circumstances.

- Treatment in Accident and Emergency departments or NHS walk-in centres.

- Diagnosis and hospital treatment of certain notifiable communicable diseases, necessary to protect public health, for example TB, polio, meningitis, food poisoning.

- Treatment of STIs (for HIV/AIDS free treatment is limited to a diagnostic test and counselling associated with the test or its result).

- Compulsory psychiatric treatment given to people detained under the provision of the Mental Health Act 1983 or as part of a court probation order.

- Community nursing, midwifery or health visiting services, the emergency ambulance service, and family planning services.

The Department of Health leaflet for visitors to the UK summarises those who are entitled to free NHS hospital treatment43. However, briefly, the following groups are entitled to free treatment:

- Refugees, asylum seekers (but see below) and others who have sought refuge in the UK.

- Detainees, prisoners, people in removal centres.

- Anyone who at the time of receiving treatment has been living in the UK for the previous 12 months.

- Anyone who has come to the UK to take up permanent residence, including those economic migrants who take up lawful employment.

- Any full time students on a course of at least 6 months duration, or a course that is substantially funded by the UK Government if less than 6 months.

- Husbands, wives and dependant children of anyone who is entitled to free health care.

Asylum seekers access to health care

Asylum seekers who have formally applied for asylum are entitled to free NHS treatment (both primary and secondary care) for as long as their application (including appeals) is under consideration. Those granted refugee status or other forms of leave to remain in the UK continue to be entitled to free health care in line with other UK residents.

Amendments to the NHS (Charges to Overseas Visitors) regulations mean, however, that since 1st April 2004, failed asylum seekers, including those getting NASS Section 4 (formerly ‘hard case’) support while awaiting departure from the UK, are required to pay for non-urgent in-patient hospital care44. Asylum seekers are entitled to free prescriptions under the same conditions as any other patient45. They must be aged under 16, under 19 if in full-time education, over 60 or holding an exemption certificate on maternity or medical grounds. Details are in the leaflet Are you entitled to help with health costs?46. All asylum seekers who are supported by NASS receive an HC2 form which entitles the holder to free prescriptions and some other medical treatments. Others have to make a Low Income Scheme HC1 claim46.
Migrants and the NHS

In recent years, the NHS has filled many otherwise vacant posts using migrant workers. In 2003, nearly a third (29.4%) of doctors working in the NHS had obtained their qualifications outside the UK, an increase of 5.7% since 1993. The NHS is one of the largest employers of migrants in the UK; the proportion of non-UK born doctors in the NHS is significantly higher than the proportion of non-UK born workers in the wider economy (4.9% in 2003). This may, however, change in the future as the immigration rules relating to postgraduate doctors were amended in March 2006. NHS trusts are now required to prove that a genuine vacancy, which cannot be filled by a suitably qualified or experienced UK or EEA national, exists before a visa will be granted.

The Nursing and Midwifery Council (NMC) estimate that approximately 10% of the 65,000 nurses and midwives on their register trained overseas. In 1999/2000 overseas admissions to the register started to increase rapidly and in 2003, 44% of initial entrants on the NMC register were from overseas. The greatest change can be seen in the significant increase in the number of nurses arriving from the Philippines, India and South Africa (Table 9).

A similar picture is seen with dentists; in 2003 over 40% of new admissions to the General Dental Council’s register obtained their qualifications abroad. However, in contrast to medical and nursing staff, approximately 50% of dentists from overseas were recruited from within the EEA.

### Table 9: The Top Fifteen Countries from Which New Nursing and Midwifery Registrants Have Arrived Over a Six Year Period and the Number of Nurses and Midwives Per 100,000 Population in That Country in 2004

<table>
<thead>
<tr>
<th>Country of Birth</th>
<th>Number of Registrants in</th>
<th>Nurses &amp; Midwives Per 100,000 Population in Country of Birth*</th>
<th>World Ranking</th>
<th>More Nurses &amp; Midwives Per 100,000 Population Than UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>52 1,052 3,396 7,235 5,593 4,338</td>
<td>621</td>
<td>37</td>
<td>YES</td>
</tr>
<tr>
<td>India</td>
<td>30 96 289 994 1,830 3,073</td>
<td>62</td>
<td>155</td>
<td>NO</td>
</tr>
<tr>
<td>South Africa</td>
<td>599 1,460 1,086 2,114 1,368 1,689</td>
<td>388</td>
<td>69</td>
<td>NO</td>
</tr>
<tr>
<td>Australia</td>
<td>1,335 1,209 1,046 1,342 920 1,326</td>
<td>835</td>
<td>22</td>
<td>YES</td>
</tr>
<tr>
<td>Nigeria</td>
<td>179 208 347 432 509 511</td>
<td>119</td>
<td>131</td>
<td>NO</td>
</tr>
<tr>
<td>West Indies</td>
<td>221 425 261 248 208 397</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>52 221 382 473 485 391</td>
<td>54</td>
<td>157</td>
<td>NO</td>
</tr>
<tr>
<td>Ghana</td>
<td>40 74 140 195 351 354</td>
<td>84</td>
<td>146</td>
<td>NO</td>
</tr>
<tr>
<td>New Zealand</td>
<td>527 461 393 443 282 348</td>
<td>868</td>
<td>16</td>
<td>YES</td>
</tr>
<tr>
<td>Zambia</td>
<td>15 40 88 183 133 169</td>
<td>113</td>
<td>133</td>
<td>NO</td>
</tr>
<tr>
<td>Kenya</td>
<td>19 29 50 155 152 146</td>
<td>90</td>
<td>140</td>
<td>NO</td>
</tr>
<tr>
<td>USA</td>
<td>139 168 147 122 88 141</td>
<td>773</td>
<td>26</td>
<td>YES</td>
</tr>
<tr>
<td>Pakistan</td>
<td>3 13 44 207 172 140</td>
<td>47</td>
<td>164</td>
<td>NO</td>
</tr>
<tr>
<td>Mauritius</td>
<td>6 15 41 62 59 95</td>
<td>233</td>
<td>107</td>
<td>NO</td>
</tr>
<tr>
<td>Botswana</td>
<td>4 0 87 100 39 90</td>
<td>241</td>
<td>100</td>
<td>NO</td>
</tr>
<tr>
<td>Others</td>
<td>400 474 606 559 641 914</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total</td>
<td>3,621 5,945 8,403 15,064 12,730 14,122</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The UK has 540 nurses and midwives per 100,000 population, ranking 44th highest in the world
†The table does not include nurses and midwives trained within the European Union
NA = Data not available

In addition, there are over 1000 doctors registered with the British Medical Association’s Refugee Doctors’ Database, only 7% of whom are currently known to be working within the NHS. The remainder are ineligible to work due to their legal status or because their qualifications are not recognised in the UK49. A similar pattern is seen with nurses, there are currently over 200 nurses on the Refugee Nurse database, of whom approximately 50% have permission to work. However, only 50% of this group are actually employed47. Other obstacles that prevent qualified refugees working in their chosen field include language barriers, provision of training to update qualifications and skills, and discrimination47.

Worldwide, 47 countries (mainly in sub-Saharan Africa) have less than 20 doctors per 100,000 population, the minimum standard recommended by the WHO50. Many of these countries have been badly affected by the HIV/AIDS epidemic50. Migration has recently been placing additional pressure on these struggling health care systems. The movement of health care professionals around the globe is not new. Historically, many migrants travelled to centres of excellence to enhance their careers, but in the past they subsequently returned to their country of origin. In recent years, however, many migrants have failed to return. Therefore, due to the considerable pressures already present, migration is seriously affecting the sustainability of the health care system in many countries51. As seen in Table 9 migrants frequently originate from countries which have lower numbers of medical staff per 100,000 population than the UK. Other groups of health care professionals also suffer from similar shortages, for example a significant number of pharmacies in Zimbabwe have closed due to an outflow of pharmacists50. While the UK has drawn up a code of practice to prohibit the NHS recruiting from certain countries, this is not binding on the private sector, and many nurses continue to arrive in the UK from these countries50.

One of the greatest issues for the sending countries is the financial loss associated with migration of health care workers. For example, it has been estimated that low income countries may lose up to $500 million per year, training medical personnel who subsequently migrate and fail to return50. In contrast, however, some countries, such as India and the Philippines have intentionally invested in the training of health workers for export. In return, migrants contribute to their home countries with remittances and exchange of enhanced skills50.

Summary

The number of migrants around the world is increasing and the pattern of migration is continually evolving since it is driven by ‘push and pull’ factors such as sustained economic disparity, conflict within a country, including social or political unrest, population pressures, and the economic imperatives of receiving countries. The UK is no exception, and while traditionally the UK has received migrants from Western Europe, the Caribbean and the Indian subcontinent, more recently, with changes to the European Union and global political situations, large numbers of migrants have started arriving from Eastern Europe, Africa and the Middle East.

Currently there is no single comprehensive system for collecting data on the movement of migrants into and out of the UK and the data available have limitations in the analysis of health needs. Improved data on migration would be beneficial in analysing health trends in the UK. For the purposes of this report multiple sources of data have been compiled to give an overview of migration patterns. In general, migrant populations are clustered in major cities, mainly in London and the South East. However, there are sizeable migrant populations from Eastern and Southern Africa, South Asia and the Caribbean in cities in the Midlands and the North West. Although approximately 25% of all migrants have been living in the UK for less than five years, there are some migrant communities that have been established for many years (e.g. from the Caribbean and the ISC).

Migrants are an extremely diverse group in terms of their experience prior to, during and subsequent to migration and this diversity extends to their health needs. Although many migrants to the UK are young adults from countries with a low prevalence of infection, some groups of migrants will have increased health needs in relation to infectious diseases. The remainder of this report considers health needs in relation to specific infectious diseases in more detail. Based on surveillance data from England, Wales and Northern Ireland in 2004 it makes recommendations for addressing those needs that will contribute to infectious disease prevention and control in the UK.
CHAPTER 2 | Tuberculosis
Introduction

Tuberculosis is a disease caused by the bacterium *Mycobacterium tuberculosis* and is curable with a combination of specific antibiotics. Tuberculosis usually affects the lungs, but can affect other parts of the body, such as the lymph nodes, the bones and (rarely) the brain. Only some individuals with tuberculosis in the lungs are infectious to other people. Such cases are called ‘sputum smear positive’ or ‘open’. Non-pulmonary forms of tuberculosis (e.g. lymph or bone) are not infectious. The infection is transmitted via the inhalation of aerosol droplets carrying the bacteria, which are produced when someone with open lung tuberculosis coughs or sneezes. Close and prolonged contact with such an individual is needed for transmission of infection. Although anyone can catch tuberculosis, for most people in the UK the risk of contracting the disease is very small.

Infection with *M. tuberculosis* does not necessarily lead to tuberculosis. Of those infected only 5%-10% will go on to develop tuberculosis at some point. The risk of developing disease is greatest within the first five years following infection. Sometimes disease can, however, present many years after initial infection, when it is termed ‘reactivation’.

Tuberculosis was declared a ‘global emergency’ by the World Health Organization (WHO) in 1993. It is estimated that in 2004 there were around 9 million new tuberculosis cases worldwide and 1.7 million deaths attributable to tuberculosis. The WHO’s African region has the highest estimated annual incidence (at around 356 cases per 100,000 population in 2004), while the highest number of cases occur in the South East Asia region, which accounted for 35% of all notified cases in 2004. In 2004, tuberculosis incidence was stable or falling in five out of the six WHO regions, but overall was growing at 0.6% per year globally. This is because the incidence is still rising in Africa, fuelled in part by the spread of HIV (there is a synergistic relationship between tuberculosis and HIV with each...
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The rate of increase in cases notified from Africa is, however, slowing each year. In Eastern Europe, despite an increase during the 1990s, tuberculosis incidence is now declining. Between 1999 and 2002 the WHO conducted a survey of anti-tuberculosis drug resistance. This demonstrated that drug resistant tuberculosis, including multi-drug resistant TB (MDR TB, resistant to at least the two main first-line TB drugs, isoniazid and rifampicin) was present in all regions of the world. There was in particular an exceptionally high prevalence of MDR TB in almost all countries of the former Soviet Union. Central Europe and Africa meanwhile reported the lowest levels of drug resistance. In 2006, following a joint survey by WHO and the US Centers for Disease Control and Prevention (CDC), Extensive Drug Resistant TB (also referred to as XDR TB, or Extreme Drug Resistance) was first described. This was defined as MDR TB that is also resistant to three or more of the six classes of second-line drugs. Using this definition, data from 2000-2004 the survey showed that XDR TB had been identified in all regions of the world but was most frequent in the countries of the former Soviet Union and in Asia. Resistance to anti-TB drugs in populations is a phenomenon that occurs primarily due to poorly managed TB care. Problems include incorrect drug prescribing practices by providers, poor quality drugs or erratic supply of drugs, and also patient non-adherence.

The Department of Health published an action plan for tuberculosis in England in 2004. The most important aspect of the public health control of tuberculosis is prompt diagnosis and effective treatment of disease. Treatment is usually for a minimum of six months and some patients may require considerable support to complete treatment. If the course is not completed properly then drug resistant disease may develop. Those at highest risk of disease are those who are known contacts of an infectious case and so tracing and investigating contacts is also an important activity. Screening other high risk groups such as the homeless or those from endemic countries also plays a part, as does immunisation of high risk groups. In the UK, BCG policy is to immunise infants living in districts where the tuberculosis incidence is greater than 40 per 100,000, or in other areas, infants with parents or grandparents born in an endemic country. New entrants who have not previously been immunised may also receive BCG after tuberculin skin testing. The National Institute for Health and Clinical Excellence (NICE) published guidelines in 2006 on the prevention and treatment of tuberculosis.

Sources of data and their limitations

In England, Wales and Northern Ireland cases of tuberculosis are reported through the Statutory Notifications of Infectious Diseases (NOIDs) system, and the Enhanced Tuberculosis Surveillance system. Since 1912 it has been a statutory requirement in England and Wales to notify all cases of clinically diagnosed tuberculosis through the NOIDs system. The system collects limited demographic data, however, and no clinical information on cases. From the mid-1960’s, the information provided by NOIDs was supplemented by national surveys, the last of which was carried out in 1998. Enhanced Tuberculosis Surveillance commenced in January 1999 in England and Wales, and the following year in Northern Ireland, with the aim of continuously providing detailed and comparable information on the epidemiology of tuberculosis, and specifically to enable more precise estimates of trends in tuberculosis incidence in subgroups of the population. The dataset includes demographic, clinical and microbiological information on all reported cases of tuberculosis. Information on cases is reported via a standard case report form which is sent to local co-ordinators, then via Health Protection Agency Regional Units to the Tuberculosis Section at the Health Protection Agency Centre for Infections where it is collated, cleaned and analysed at national level. Enhanced Tuberculosis Surveillance collects data on whether or not individuals were born in the UK, country of birth if non-UK born, and time since entry to the UK. It does not collect information on migration status.
The UK Mycobacterial Surveillance Network (MycobNet) was developed in 1994 to monitor tuberculosis drug resistance in the UK. Information on all cases of tuberculosis confirmed by culture at seven laboratories (including the Mycobacterium Reference Unit and Regional Centres for Mycobacteriology) is collated by the Tuberculosis Section at the Health Protection Agency Centre for Infections. Information collected on initial isolates includes species (M. tuberculosis, M. bovis or M. africanum), drug sensitivity results, and some demographic and clinical data.

The majority of data presented in this chapter come from the Enhanced Tuberculosis Surveillance system. Where possible cases reported to this system have been linked with information on isolates reported through MycobNet to improve clinical and microbiological information on cases including drug susceptibility results. All data are for England, Wales and Northern Ireland except trends which include information from prior to 2000; these data are for England and Wales only. The data presented were correct at June 2006.

The reporting of cases to the Enhanced Tuberculosis Surveillance system is not mandatory and so, as with any such surveillance system, some cases will go unreported. Furthermore, information on some variables is missing, including information on place of birth which is not reported for all cases. There are also some limitations to the process of matching cases with their respective isolates (reported to the MycobNet system), and thus this is not possible for all cases.

Population estimates used for rate calculations were provided by the Labour Force Survey (Spring quarter) for 2004 except the overall rate which was calculated using the Office for National Statistics mid-year estimate for 2004. The Labour Force Survey is based on a population sample, so the estimates are liable to sampling errors, particularly for smaller subgroups. Rates should therefore be interpreted with caution.

The classification of ethnic group was based on the definitions used by the Office for National Statistics. Countries of birth were grouped into world regions based on the United Nations (UN) classifications, adjusted to take into account the global epidemiology of tuberculosis, and migration patterns to the UK. For example, the five African regions defined by the UN, were grouped into two regions (North Africa and sub-Saharan Africa). North America and Oceania were grouped together based on the similar epidemiology of tuberculosis in these areas.

Proportions are calculated among cases with known information only. Incidence rates are calculated per 100,000 population.

Definitions

The following definitions are used for the reporting of tuberculosis cases to the Enhanced Tuberculosis Surveillance system:

a) Culture confirmed case: Culture confirmed disease, due to M. tuberculosis complex (M. tuberculosis, M. bovis or M. africanum).

b) Other than culture confirmed case: In the absence of culture confirmation, a case that meets the following criteria: A clinician’s judgement that the patient’s clinical and/or radiological signs and/or symptoms are compatible with tuberculosis and a clinician’s decision to treat the patient with a full course of anti-tuberculosis therapy.

Pulmonary tuberculosis is defined as tuberculosis involving the lungs and/or tracheo-bronchial tree, with or without tuberculosis at an extra-pulmonary site.

Findings

Tuberculosis notifications in England and Wales declined for most of the last century, from around 117,000 cases in 1913 to a low point of around 5000 cases in 1987. Since then notifications have been increasing and currently around 7000 cases are reported annually (Figure 1).

Since the late 1980s, an increased proportion of cases have occurred in the non-UK born population (Figure 2).

In 2004, 7167 tuberculosis cases were reported in England, Wales and Northern Ireland, representing an overall rate of 13 per 100,000 population. Information on place of birth (UK or abroad) was available for 92% (6560/7167) of cases, and 70% (4607/6560) of those were born abroad. The tuberculosis rate was 23 times higher in the non-UK born population (94 per 100,000) than in the UK born population (4 per 100,000).

1 Provisional data available at the time of writing for 2005 show an increase over 2004 in both total case numbers and the proportion of total cases who were non-UK born.
The rate of disease in the non-UK born population increased from 78 per 100,000 to 94 per 100,000 between 2000 and 2004. Over the same time period the rate of disease in the UK born has remained low and relatively stable (Figure 3).

Of the 4607 non-UK born tuberculosis cases reported in 2004, information on country of birth was reported for 96% of cases. Of those, 45% originated from South Asia and 39% from sub-Saharan Africa; all other regions each accounted for 4% of cases or less (Table 1).

**TABLE 1: NON-UK BORN TUBERCULOSIS CASES BY WORLD REGION OF BIRTH, ENGLAND, WALES AND NORTHERN IRELAND, 2004**

<table>
<thead>
<tr>
<th>Region of Birth</th>
<th>Number of Cases</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Asia</td>
<td>2013</td>
<td>45.3</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>1714</td>
<td>38.6</td>
</tr>
<tr>
<td>South East Asia</td>
<td>178</td>
<td>4.0</td>
</tr>
<tr>
<td>Western Europe</td>
<td>124</td>
<td>2.8</td>
</tr>
<tr>
<td>East Asia</td>
<td>98</td>
<td>2.2</td>
</tr>
<tr>
<td>Central Europe</td>
<td>86</td>
<td>1.9</td>
</tr>
<tr>
<td>South and Central America and the Caribbean</td>
<td>79</td>
<td>1.8</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>69</td>
<td>1.6</td>
</tr>
<tr>
<td>North Africa</td>
<td>46</td>
<td>1.0</td>
</tr>
<tr>
<td>North America and Oceania</td>
<td>19</td>
<td>0.4</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>19</td>
<td>0.4</td>
</tr>
<tr>
<td>Total with known</td>
<td>4445</td>
<td>100</td>
</tr>
<tr>
<td>Missing data</td>
<td>162</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4607</td>
<td></td>
</tr>
</tbody>
</table>


* Surveys carried out over 6 months, number of tuberculosis cases multiplied by scaling factors as follows: 1.3348 for 1988 and 1.886 for 1993

Source:
In 2004, the highest rate of disease in the non-UK born occurred in people who had entered the UK less than two years prior to diagnosis (280 per 100,000). The rate of disease declined with time since entry into the UK but, among those diagnosed 10 years or more after arrival (41 per 100,000), was still much higher than the overall rate for England, Wales and Northern Ireland. Most cases were not diagnosed until two years or more after arrival (23% had entered the UK less than two years prior to diagnosis, 32% had entered between two and four years prior, 15% had entered between five and nine years prior, and the remaining 30% had entered 10 years or more prior to diagnosis). The median duration of stay prior to development of tuberculosis disease was four years.

Fifty-three percent (2454/4601) of non-UK born cases were male compared with 59% (1150/1952) of UK born cases. The age distribution of cases varied between those born in the UK and those born abroad. The median age of non-UK born tuberculosis cases was 33 years (interquartile range [IQR]: 26-46 years) compared to 42 years (IQR: 24-65 years) in those born in the UK. Seventy-one percent of non-UK born cases occurred in those aged 15-44 years compared to 39% among those born in the UK. The proportion of cases aged below 15 years was lower in those born abroad (3% vs. 14%) as was the proportion of cases aged over 75 years (4% vs. 14%) (Figure 4). Nearly all UK born cases aged 75 years and older belonged to the white ethnic group (99.6%), while among those aged less than 15 years only 28% were white.

In all ethnic groups, the tuberculosis rate was higher among non-UK born persons than among those born in the UK. Among non-UK born persons the highest rate occurred in the black African ethnic group (401 per 100,000), followed by the Indian, Pakistani and Bangladeshi ethnic group (200 per 100,000). Among UK born persons a similar pattern was seen, though at lower rates, with the white UK born population having the lowest rate of disease (Figure 5).

The site of tuberculosis disease also differed between the non-UK born and UK born population. Non-UK born cases were less likely to have pulmonary disease than UK born cases (52% vs. 73%) (Table 2).

The overall proportion of isoniazid resistant cases was slightly higher in non-UK born patients than in those born in the UK (7.7% [209 cases] vs. 5.5% [55 cases] respectively), while the proportions of MDR cases (resistant to at least isoniazid and rifampicin) were similar: 1.0% (28 cases) vs. 0.9% (9 cases) respectively.
Discussion

Since the late 1980’s the overall number of tuberculosis cases reported in England and Wales has increased slightly. A greater increase has, however, been observed in the proportion of cases who were born outside the UK. During the period 1998 to 2004, migration to England and Wales increased 1.3 fold. The greatest increases were recorded in migrants arriving from South Asia (2.0 fold) and Africa (1.8 fold). These two regions also accounted for the largest number of tuberculosis cases; nearly half of the non-UK born cases were diagnosed in people born in South Asia and a further 39% were diagnosed in people born in sub-Saharan Africa. There has also been an increasing rate of disease in the non-UK born population. This may reflect changing patterns of migration from endemic countries as well as a changing prevalence of disease in those countries. For example, more migrants now come from parts of Africa where there are increasing rates of tuberculosis and HIV.

In 1998, 3.3% of TB cases aged between 16-54 years in England and Wales were co-infected with HIV. The prevalence of co-infection was highest in London and in patients of white and black African ethnicity. Estimation of the extent of TB and HIV overlap in more recent years is currently underway. Other factors such as socioeconomic conditions in England, Wales and Northern Ireland may also have an impact on rates of disease, though routine surveillance does not currently collect information on this.

Despite an increased rate of disease in the non-UK born population, the rate in the UK born population has remained low and stable. Tuberculosis is transmitted by close association, generally within households and it has been shown that many migrants live with other migrants of the same ethnicity. From the surveillance data presented here there is no good evidence of significant transmission of disease from the non-UK born to the white indigenous population. UK born minority ethnic groups were, however, at increased risk of disease.

Although the highest rates of tuberculosis among the non-UK born population occur in those who have recently arrived in the UK, individuals continue to be at risk of developing disease for many years after arrival; only 23% were diagnosed within two years of arrival. Although it is likely that many migrants will have been infected with tuberculosis prior to migration (reflecting the prevalence of

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TABLE 2: TUBERCULOSIS CASE REPORTS BY SITE OF DISEASE AND PLACE OF BIRTH (BORN IN THE UK vs. NON-UK BORN), ENGLAND, WALES AND NORTHERN IRELAND, 2004

<table>
<thead>
<tr>
<th>PLACE OF BIRTH</th>
<th>PULMONARY**</th>
<th>EXTRA-PULMONARY***</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>UK BORN</td>
<td>1410</td>
<td>73</td>
</tr>
<tr>
<td>NON-UK BORN</td>
<td>2360</td>
<td>52</td>
</tr>
<tr>
<td>TOTAL***</td>
<td>4109</td>
<td>58</td>
</tr>
</tbody>
</table>

* Pulmonary with or without extra-pulmonary site
** Extra-pulmonary site only
*** Includes cases with unknown place of birth

Source: Enhanced Tuberculosis Surveillance

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FIGURE 5: TUBERCULOSIS RATE BY PLACE OF BIRTH (BORN IN THE UK vs. NON-UK BORN), AND ETHNIC GROUP, ENGLAND, WALES AND NORTHERN IRELAND, 2004

The data clearly show that the burden of tuberculosis falls upon some non-UK born population groups, and provision of health services for tuberculosis need to reflect this. The non-UK born should have access to appropriate tuberculosis services, which include language support and an understanding of health beliefs about, and cultural attitudes towards, the disease.

At risk communities and their health care practitioners need to be made aware of the disease and its symptoms to ensure early diagnosis and patients need to be supported through their treatment. The NICE guidelines have made recommendations for diagnosis and treatment of disease which should be followed with this group as with other patients.

The UK Government currently has a policy of limited TB screening for those from high incidence areas, who are subject to immigration control, and who are planning to stay in the UK for more than six months. This screening may happen in the country of origin prior to arrival in the UK, at the port of entry, or by follow up after entry. These systems require evaluation for their cost effectiveness and impact on overall tuberculosis control. The NICE guidelines make recommendations for more comprehensive NHS screening of new entrants for tuberculosis and for occupational health screening (many health care workers come from tuberculosis endemic areas - see Chapter 1). It is important to remember, however, that since most disease presents at least two years after arrival, and further exposure may occur (either in the UK or through travel to endemic areas), consideration of the risk of tuberculosis needs to be ongoing, not just at first entry. Once migrants arrive in the UK, primary care providers may be well placed to provide an effective and thorough investigation of risk on both an initial and ongoing basis. In the UK it is considered that tuberculosis care should be provided by tuberculosis specialists but the primary care practitioner has a very important role to play in educating patients, considering an individual’s risk, referring to appropriate services for investigation and treatment and ensuring early diagnosis. This does, however, mean that primary care practitioners need to be adequately supported in these functions and that the non-UK born require equitable access to primary care. Recent advances in the development of new...
diagnostic blood tests for tuberculosis infection (such as the T-SPOT.TB and QuantiFERON – TB Gold tests) may help tuberculosis control through the accurate identification of individuals with latent infection who may then be offered chemoprophylaxis.

Tuberculosis is a disease that may be associated with stigma in particular communities (e.g. African/South Asian), and this might be a barrier to seeking help which could delay diagnosis. Addressing stigma requires culturally appropriate approaches with the affected groups but also education of the wider population. The general public need to be better informed about tuberculosis and their very low risk of acquiring it through normal social contact. This will help correct any misconception that the non-UK born pose a health threat to the general population, which can lead to prejudice that is unlikely to contribute to overall tuberculosis control. For the white UK born population the risk of acquiring tuberculosis is very low. UK born minority ethnic groups with links to endemic countries are, however, at higher risk, and both they and their health care practitioners need to be aware of this.

FURTHER RESEARCH/SURVEILLANCE REQUIREMENTS

Tuberculosis has always been a disease associated with deprivation and poverty. Social conditions experienced in the UK may impact on a migrant’s risk of developing disease after arrival, but this is not adequately captured by current surveillance systems. Return travel to endemic countries may also play an important part in ongoing risk but little information is available about this. Research in these areas would be beneficial. Molecular typing methodology may contribute to determining where an infection has been acquired and in what time frame, as well as giving insight into transmission patterns, all of which may help in guiding appropriate preventive activity. Tuberculosis in migrants to the UK occurs against a background of a global pandemic of the disease. It would therefore be useful to review the current UK contribution to tuberculosis control programmes in source countries for migrants, and to consider how this contribution might be enhanced.

Health Protection Agency recommendations

Non-UK born communities should have access to culturally appropriate and language supported tuberculosis services.

Awareness of the disease should be raised in at risk communities and their health care professionals.

NICE guidelines for tuberculosis prevention and treatment should be followed.

Risk of tuberculosis in the non-UK born should be considered on an ongoing basis not just when they first arrive in the country.

Primary care practitioners should be supported to fulfil a role in tuberculosis control in the non-UK born.

Screening programmes for tuberculosis should be evaluated for public health impact.

New technologies for more rapid diagnosis should be researched and implemented where appropriate.

The impact of socioeconomic factors in the UK on tuberculosis risk in migrants should be investigated through research and improvements in routine surveillance.

The role of travel in ongoing risk of tuberculosis after arrival in the UK should be investigated.

Molecular typing methods should be used to investigate transmission patterns.

The overlap between tuberculosis and HIV in the non-UK born requires further assessment.

Where HIV and TB co-exist joined up care between specialities is important.

The current UK contribution to tuberculosis control programmes in source countries for migrants should be reviewed with consideration of how this contribution might be enhanced.
CHAPTER 3 | HIV
3 HIV

KEY POINTS

• In 2004, approximately 70% of the 4251 persons who were newly diagnosed with HIV in England, Wales and Northern Ireland, and for whom country of birth information was available, were born outside the UK.

• The majority of non-UK born cases probably acquired their HIV infection through heterosexual contact, and 90% were born in sub-Saharan Africa. Around 85% of these cases probably acquired their infection in Africa.

• Overall, however, the HIV prevalence in heterosexuals born in sub-Saharan Africa attending genitourinary medicine clinics in England, Wales and Northern Ireland is only four percent, and two percent in women born in sub-Saharan Africa attending a sample of antenatal clinics.

• Although most HIV in non-UK born heterosexuals is acquired abroad, this group are also at risk of HIV infection in the UK.

• 17% of non-UK born individuals had an AIDS defining illness at the time of their HIV diagnosis.

• The most common AIDS defining illness in non-UK born heterosexuals was pulmonary TB.

• The number of non-UK born cases seen for HIV treatment and care outside the London area increased between 2000 and 2004.

• Up to ten percent of non-UK born heterosexuals did not start anti-retroviral therapy at the appropriate time in the course of their HIV infection.

• Since the start of the epidemic in the UK, more non-UK born heterosexual women have been diagnosed with HIV than men.

• Only a quarter of men who had sex with men who were diagnosed with HIV in England, Wales and Northern Ireland were born abroad. Most were of white ethnicity.

• Non-UK born men who have sex with men are at risk of acquisition of HIV in the UK.

• Most non-UK born injecting drug users with HIV were of white ethnicity and were born in Southern Europe.
Introduction

Human Immunodeficiency Virus (HIV), the virus that causes Acquired Immune Deficiency Syndrome (AIDS) can be transmitted through unprotected sexual intercourse, sharing contaminated needles and syringes, and contaminated blood products. In the UK, however, all blood donated for medical transfusions has been screened for HIV since 1985, ensuring there is minimal risk of infection through hospital blood transfusions. The virus can also be passed from an infected mother to her baby during birth or breast feeding, although the risk of transmission during birth can successfully be reduced by anti-viral medication. In the UK, the population groups at highest risk of HIV infection are men who have sex with men (MSM), men and women who have lived in countries where the HIV prevalence is high (notably sub-Saharan Africa), injecting drug users and children born to infected mothers.

Although no signs or symptoms may occur at the time of infection, the virus selectively attacks and destroys the CD4+ T-lymphocyte white blood cells, gradually weakening the immune system. Once the CD4 cell count drops from a healthy level of approximately 1000 cells per mm³ of blood to less than 200 cells per mm³, the infected individual becomes highly susceptible to opportunistic infections, such as tuberculosis and pneumonia, as well as malignancies. At this stage, a diagnosis of AIDS is often made. Although HIV infection cannot currently be cured, combination anti-retroviral therapy (sometimes called Highly Active Anti-Retroviral Therapy [HAART]) can significantly improve survival rates in countries which can afford the drugs and have the infrastructure to deliver them.

In 2005, the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated there were 40.3 million people living with HIV infection worldwide and approximately 5 million people newly infected with the virus. Between 2003 and 2005, the number of people living with HIV increased in all regions but the Caribbean. Approximately two thirds of all cases live in sub-Saharan Africa, as do three quarters of all women with HIV. There is, however, increasing concern about growing epidemics in Eastern Europe and Central Asia, and in East Asia.

Globally, AIDS has killed more than 25 million people since it was first recognised in 1981. In 2005 alone, an estimated 3.1 million people died, including more than half a million children, despite improvements in access to anti-retroviral treatment. In the past two years, treatment coverage in countries such as Argentina, Brazil, Chile and Cuba has exceeded 80%. The situation is different elsewhere in South America and the Caribbean, in Eastern Europe, most of Asia and in sub-Saharan Africa. At best, one in ten Africans and one in seven Asians in need of anti-retroviral treatment were receiving it in mid 2005.

There are overlaps between HIV and other sexually transmitted infections (STIs) as well as TB. STI control is an important component of HIV prevention (see Other infections - Chapter 6). Similarly there is a synergistic relationship between TB and HIV with each disease increasing the speed of progression of the other.

There is no vaccine available to prevent HIV infection. Prevention efforts therefore currently focus primarily on behaviour modification (sexual, injecting drug use) and risk reduction (e.g. condom use). The Behavioural Surveillance Section at the Health Protection Agency Centre for Infections was established to define, collate and monitor key behavioural indicators relevant to HIV and STI transmission within England and Wales. In addition to behaviour modification those at risk are encouraged to get themselves tested for HIV and all mothers should be offered antenatal HIV screening. The National Strategy for Sexual Health and HIV sets out the Government’s aims for tackling HIV in England.
Sources of data and their limitations

This chapter describes the epidemiology of HIV in persons (>14 years of age) born outside the UK and living in England, Wales and Northern Ireland, since migration status is not collected by national HIV surveillance systems.

National surveillance of new diagnoses of HIV infections

Reports of HIV diagnoses in England, Wales and Northern Ireland are received by the Health Protection Agency from laboratories (since 1985) and clinicians (since 2000). Laboratory and clinical reports relating to the same person are matched within the HIV dataset to form an individual patient record. Country of birth has been included on the clinical reports of HIV diagnoses since 2000. However, clinical reports are not always received for newly diagnosed cases and therefore country of birth is unknown for some cases. Furthermore, even when clinical reports are received country of birth is not always reported. The proportion of reports which include country of birth data has varied over time (2000-2004) and by exposure category. Differential reporting of country of birth over time and/or by exposure category may introduce bias so care should be taken when interpreting these figures. The analysis includes all reports, received prior to the end of December 2005, of cases diagnosed during the years 2000-2004.

In addition, data are collected on CD4 cell counts (the number of CD4+ cells in one mm$^3$ of whole blood) throughout the course of infection. These are used as an indicator of the level of immunosuppression in HIV infected adults. They can also be used to estimate how long patients have been infected prior to diagnosis and to inform treatment protocols. It is generally recommended that the majority of people should initiate therapy when they have a CD4 count between 200 and 350 cells/mm$^3$.

The Survey of Prevalent HIV Infections Diagnosed (SOPHID)

SOPHID collects information on all individuals accessing HIV-related care services in England, Wales and Northern Ireland on an annual basis. Although country of birth is not collected, data show that being of black African ethnicity is currently a good proxy for HIV-diagnosed heterosexuals born in Africa (around 80% of individuals of black African ethnicity were born in Africa); results are presented on this premise.

Unlinked anonymous surveys

Since 1990 information on the prevalence of diagnosed and undiagnosed HIV infection among attendees of selected sentinel genitourinary medicine (GUM) clinics in England, Wales and Northern Ireland has been estimated by testing anonymised residual blood samples taken for syphilis testing. Information collected includes probable route of infection and country of birth.

Similarly, since 1990, unlinked anonymous testing of new-born infant dried blood spots covering London and five other regions in England has been used to estimate the prevalence of diagnosed and undiagnosed HIV infection in women giving birth.

\* Note that this is an exception to the general rule described in Chapter 1. On the whole ethnicity is not a good proxy for country of birth
Findings

The total number of persons newly diagnosed with HIV in England, Wales and Northern Ireland rose from 3608 in 2000 to 6859 in 2004, an increase of 90%. Country of birth is reported for approximately 62% of cases, and of these cases, the number of non-UK born persons newly diagnosed with HIV rose from 1438 in 2000 to 2939 in 2004, a two fold increase (Figure 1). This represents around 40% of the total diagnoses in 2004 (in England, Wales and Northern Ireland) or 70% of diagnoses where country of birth was reported. In comparison to HIV diagnoses, the number of AIDS diagnoses in non-UK born persons remained relatively stable over time, while the number of deaths has increased from 49 in 2000 to 140 in 2004, representing 31% of all deaths (454) reported in 2004.

The majority of non-UK born persons diagnosed with HIV in England, Wales and Northern Ireland between 2000 and 2004 probably acquired their HIV infection through heterosexual contact (Figure 2), and most were born in sub-Saharan Africa. In contrast, the large majority of UK born persons diagnosed with HIV were men who have sex with men (MSM). The number of HIV diagnoses among non-UK born MSM and injecting drug users (IDUs) has remained relatively constant over time (Figure 2). Most of the non-UK born MSM were born in another European country, and most non-UK born IDUs were born in Southern Europe.

Heterosexual men and women

HIV diagnoses

Country of birth was reported for 11,769 (69%) of the 16,965 heterosexuals who were diagnosed with HIV in England, Wales and Northern Ireland between 2000 and 2004. Of these, 88% (10,366) were born abroad. The number of women diagnosed has risen 2.5 fold from 737 in 2000 to a peak of 1838 in 2003 (Figure 2), while the number of men diagnosed has increased 2.4 fold from 384 cases in 2000 to 913 in 2003. In 2004, the median age at diagnosis for non-UK born heterosexual women was 31 years (interquartile range (IQR): 27-36 years) compared to 35 years (IQR: 30-40 years) for men.
Ninety percent (9385/10,366) of the non-UK born heterosexual men and women were born in sub-Saharan Africa. Ninety-eight percent of these individuals were of black African ethnicity (Table 1). The greatest increase in the number of HIV diagnoses has occurred among heterosexuals born in South Eastern Africa (2.8 fold increase, 452 diagnoses in 2000 to 1265 diagnoses in 2004) (Figure 3). The majority (83%, 4185/5024) of these individuals were born in Zimbabwe. To a lesser extent, there have also been increases in the number of diagnoses associated with individuals born in other sub-Saharan African regions. The majority (8960/9385) of heterosexuals born in sub-Saharan Africa probably acquired their infection in sub-Saharan Africa (Figure 4).

Between 2000 and 2004, HIV diagnoses in England, Wales and Northern Ireland also increased among heterosexual men and women born in Asia and the Caribbean. Most of those born in Asia were of other/mixed ethnicity and most of those born in the Caribbean were of black Caribbean ethnicity. Where reported, 83% (203/246) of those born in Asia were probably also infected there, with a further 11% (26/246) infected in the UK. Similarly, 74% (267/360) of the heterosexual men and women born in the Caribbean were also infected in their country of birth, with a further 21% (75) infected in the UK.

### Table 1: HIV Diagnoses in England, Wales and Northern Ireland of Heterosexual Men and Women Born Outside the UK by World Region of Birth and Probable Region of Infection: 2000-2004

<table>
<thead>
<tr>
<th>Region of Birth</th>
<th>White</th>
<th>Black African</th>
<th>Black Caribbean</th>
<th>Indian/Pakistan/Bangladeshi</th>
<th>Other/Mixed</th>
<th>Not Reported</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>592</td>
<td>9202</td>
<td>11</td>
<td>28</td>
<td>77</td>
<td>47</td>
<td>9424</td>
</tr>
<tr>
<td>Asia</td>
<td>3</td>
<td>8</td>
<td>347</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>365</td>
</tr>
<tr>
<td>Caribbean</td>
<td>164</td>
<td>29</td>
<td>2</td>
<td>1</td>
<td>36</td>
<td>6</td>
<td>233</td>
</tr>
<tr>
<td>Europe</td>
<td>160</td>
<td>29</td>
<td>2</td>
<td>1</td>
<td>36</td>
<td>6</td>
<td>233</td>
</tr>
<tr>
<td>Rest of World</td>
<td>37</td>
<td>6</td>
<td>18</td>
<td>1</td>
<td>38</td>
<td>3</td>
<td>93</td>
</tr>
<tr>
<td>Total</td>
<td>261</td>
<td>9248</td>
<td>378</td>
<td>117</td>
<td>295</td>
<td>67</td>
<td>10,366</td>
</tr>
</tbody>
</table>

1. Ethnicity was not collected prior to 1999
2. HIV/AIDS reports. Reports received by the end of December 2005
3. Numbers will rise as further reports are received
Accessing HIV related treatment and care services

There were 13,186 diagnosed, HIV infected, black African heterosexuals living in England, Wales and Northern Ireland who accessed HIV related care in 2004, as reported to SOPHID\(^6\). This represents a 3.4 fold increase since 2000 (3819). Two thirds (67%, 8867/13,186) of black African heterosexuals seen for HIV related care in 2004 were women. Of these women, 68% (5994/8867) were aged between 25 and 39 years compared to 57% (2480/4319) of men. Where the number of anti-retroviral drugs received was reported, two thirds (8670/12,986) of diagnosed black African heterosexuals were receiving anti-retroviral therapy when last seen for treatment in 2004; a similar proportion to those of other sexual orientation or ethnicity\(^7\). Ninety percent (3926/4380) of those not receiving treatment were in the earlier stages of HIV infection (CD4 cell count ≥200 cells/mm\(^3\)) and therefore did not require anti-retroviral therapy. The remaining 10% (454/4380) had a CD4 cell count less than 200 cells/mm\(^3\) indicating that treatment should probably have been initiated. However, this figure will include some individuals with advanced HIV disease who were attending the clinic to obtain their HIV diagnosis and who would have subsequently started to receive treatment.

There were large variations and differential increases in the number of black African heterosexuals seen for HIV related treatment or care by region of residence (Figure 5). In both 2000 and 2004, London had the largest diagnosed black African heterosexual population (3019 in 2000 and 6710 in 2004). However, London experienced the smallest proportional increase over time (2.2 fold). The largest proportional increases occurred in Yorkshire and Humberside (almost a 15 fold increase from 52 to 764) and the North East (a 13 fold increase from 16 to 208).

**FIGURE 5: NUMBERS OF HIV INFECTED BLACK AFRICAN HETEROSEXUALS ACCESSING TREATMENT AND CARE SERVICES BY AREA OF RESIDENCE, ENGLAND, WALES AND NORTHERN IRELAND: 2000 AND 2004**

![Map showing numbers of HIV infected black African heterosexuals accessing treatment and care services by area of residence, England, Wales, and Northern Ireland: 2000 and 2004. The map shows varying shades indicating different ranges of numbers. The source is SOPHID.](image)

Year of arrival was reported for 73% (7519/10,366) of non-UK born heterosexual men and women diagnosed with HIV in England, Wales and Northern Ireland between 2000 and 2004. Where reported, about two thirds were diagnosed with HIV within two years of arrival into the UK.

**Late diagnoses**

In general, non-UK born heterosexuals are diagnosed at a late stage of infection, 92% of non-UK born cases were diagnosed with AIDS within three months of their HIV diagnosis. It is difficult to compare this with UK born heterosexuals due to the small number of cases in the latter group, therefore MSM are used as a control group. Between 2000 and 2004, the median CD4 cell count at diagnosis (where reported) for non-UK born heterosexuals was 240 cells/mm\(^3\) (IQR: 104-402 cells/mm\(^3\)). In comparison MSM diagnosed in England, Wales and Northern Ireland between 2000 and 2004 had a median CD4 cell count at diagnosis of 380 cells/mm\(^3\) (IQR: 190-567 cells/mm\(^3\)). Seventeen percent (1795/10,366) of non-UK born individuals have an AIDS defining illness at the time of their HIV diagnosis. The most common AIDS defining illness was pulmonary TB, followed by *Pneumocystis carinii* pneumonia.

The median CD4 cell count at diagnosis was higher for non-UK born individuals who probably acquired their infection in England, Wales and Northern Ireland rather than abroad. Black African heterosexual men and women who were born in Africa but infected in England, Wales and Northern Ireland had a median count of 369 cells/mm\(^3\) (IQR: 217-511 cells/mm\(^3\)) compared to 231 cells/mm\(^3\) (IQR: 101-390 cells/mm\(^3\)) for those infected in Africa.
Previously undiagnosed HIV prevalence among sentinel GUM clinic attendees

In 2004, the prevalence of previously undiagnosed HIV infection remained higher among heterosexual sentinel GUM clinic attendees in England, Wales and Northern Ireland who were born outside the UK (Figure 6). The highest prevalence was observed among heterosexuals born in sub-Saharan Africa (3.8%, 190/4973), followed by the Caribbean (0.7%, 19/2652). Among Asian born heterosexuals, prevalence was low at 0.3% (6/1888). In comparison, the prevalence of previously undiagnosed HIV infection was 0.2% (140/59,508) among heterosexuals born in the UK.

HIV prevalence among women giving birth

The unlinked and anonymous testing of dried blood spots from newly born infants in England, Wales and Northern Ireland has shown that women born in countries with a high HIV prevalence are the most likely to be HIV infected (Figure 7). In 2004, 2.2% (415/18,883) of the women born in sub-Saharan Africa who gave birth in selected regions of England were HIV infected; those born in Central Africa had the highest prevalence (3.43%, 53/1544). There was also a relatively high prevalence of HIV among women born in Central America and the Caribbean (0.61%, 16/2636). This compares to a prevalence of 0.2% in UK born women.

\[1\] Previously undiagnosed HIV infection includes those diagnosed at the clinic attendance and those remaining undiagnosed

Source: Unlinked Anonymous Prevalence Monitoring
Men who have sex with men

HIV diagnoses

Between 2000 and 2004, country of birth was reported for 5070 (56%) MSM diagnosed with HIV in England, Wales and Northern Ireland. Of these, 26% (1314) were born abroad. This number has remained relatively constant over time (Figure 2). In 2004, the median age at diagnosis of non-UK born MSM was 32 years (IQR: 28-38 years).

Between 2000 and 2004, Europe was the most frequently reported region of birth (44%) for non-UK born MSM (Table 2). Ninety-six percent (539/564) of these men were of white ethnicity. In comparison to non-UK born heterosexuals, 47% of MSM born in sub-Saharan Africa and diagnosed in England, Wales and Northern Ireland were of white ethnicity, the majority from South Africa.

Qualitative research findings and previous analyses have indicated that MSM born abroad are at risk of acquiring HIV within the UK. Of the 1314 non-UK born MSM diagnosed in England, Wales and Northern Ireland between 2000 and 2004, up to 51% (450/887) had probably been infected in the UK. However, this varied by world region of birth, from 41% (42/103) of MSM born in North America to 67% (43/64) of MSM born in Asia (Figure 8).

Previously undiagnosed HIV prevalence among sentinel GUM clinic attendees

The prevalence of previously undiagnosed HIV varies by world region of birth among MSM attending sentinel GUM clinics in England, Wales and Northern Ireland. In 2004, the previously undiagnosed HIV prevalence was 4.2% (76/1791) among non-UK born MSM compared with 3.3% (153/4691) of UK born MSM. The highest levels of previously undiagnosed HIV infection were observed among MSM born in the Caribbean (8.5%, 4/47), and Central and South America (6.0%, 13/215).

Injecting drug users

HIV diagnoses

Just over half (184/320) of all IDUs diagnosed in England, Wales and Northern Ireland between 2000 and 2004, for whom country of birth was reported, were born abroad.

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### TABLE 2: HIV DIAGNOSES IN ENGLAND, WALES AND NORTHERN IRELAND OF MEN WHO HAVE SEX WITH MEN BORN OUTSIDE THE UK BY WORLD REGION OF BIRTH AND ETHNIC GROUP\(^1\), 2000-2004\(^2\)

<table>
<thead>
<tr>
<th>REGION OF BIRTH</th>
<th>WHITE</th>
<th>BLACK AFRICAN</th>
<th>BLACK CARIBBEAN</th>
<th>INDIAN/PAKISTANI/BANGLADESHI</th>
<th>OTHER/MIXED</th>
<th>NOT REPORTED</th>
<th>TOTAL(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRICA</td>
<td>85</td>
<td>86</td>
<td>1</td>
<td>9</td>
<td>11</td>
<td>1</td>
<td>193</td>
</tr>
<tr>
<td>ASIA</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>53</td>
<td>4</td>
<td>92</td>
</tr>
<tr>
<td>CARIBBEAN</td>
<td>3</td>
<td>0</td>
<td>101</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>104</td>
</tr>
<tr>
<td>EUROPE</td>
<td>539</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>23</td>
<td>21</td>
<td>585</td>
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<tr>
<td>REST OF WORLD</td>
<td>230</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>95</td>
<td>8</td>
<td>340</td>
</tr>
<tr>
<td>TOTAL(^3)</td>
<td>868</td>
<td>87</td>
<td>110</td>
<td>33</td>
<td>182</td>
<td>34</td>
<td>1314</td>
</tr>
</tbody>
</table>

\(^1\) Ethnicity was not collected prior to 1995

\(^2\) HIV/AIDS reports. Reports received by the end of December 2005

\(^3\) Numbers will rise as further reports are received
The number of HIV diagnoses among non-UK born injectors each year has remained low (Figure 2). Recently, more than three quarters (146/184) of the non-UK born IDUs have been male. In 2004, median age at diagnosis (men and women) was 33 years (IQR: 28-38 years).

Of the 184 IDUs born abroad, most (81%) were of white ethnicity and of these 79% (113) were born in Southern Europe, mainly in Portugal. Seventy-six percent (91) had probably been infected in Southern Europe.

Discussion

In recent years, there has been a large increase in the number of non-UK born individuals diagnosed with HIV in England, Wales and Northern Ireland. In 2004, around 70% of those diagnosed with HIV, for whom a country of birth was reported, were born outside the UK. This figure may not truly reflect the contribution of non-UK born cases to the total case load, however, since it is unknown whether cases with no country of birth recorded are more or less likely to have been born abroad than those with this information.

The majority of non-UK born individuals diagnosed with HIV were black Africans from sub-Saharan Africa who acquired their infection through heterosexual contact in their country of origin. The total number of migrants living in the UK who were born in sub-Saharan Africa has increased in recent years. Between 1991 and 2001, the number of migrants from Zimbabwe increased by 2.3 fold, the fifth largest increase in migrant numbers from any one country, while the ninth largest increase was in migrants from South Africa (2 fold). In 2001, South African migrants were the seventh largest group of migrants living in the UK, while the eighth largest group were Kenyans. These increases in migrants from areas with a high prevalence of HIV may be responsible in part for the increase in numbers of cases in African born heterosexuals currently living in the UK, but the continued rise in incidence of HIV in Africa may also play a role. Although the HIV pandemic still affects Africa most severely, other areas of the world have developing epidemics. There have been increases in the numbers of heterosexually acquired HIV cases reported in England, Wales and Northern Ireland in people born in Asia or the Caribbean. Once again this reflects both migration patterns and global HIV epidemiology. Although most African born heterosexual cases acquired their infections in Africa, there is evidence for some acquisition in the UK. Higher proportions of heterosexual cases born in Asia and the Caribbean than those born in Africa probably acquired their infection in the UK. This demonstrates that HIV risk may continue after migration to the UK, perhaps as a result of sexual mixing patterns within at risk communities in the UK, or related to travel back to high incidence areas.

Non-UK born persons accounted for the majority of new HIV diagnoses in 2004 and over a third of persons seen for HIV care. Many are diagnosed late in the course of their infection. Up to one third of cases were diagnosed two or more years after arrival in the UK. This is not consistent with the view sometimes expressed that migrants might come to the UK to seek treatment for HIV, and also demonstrates a need for the HIV risk in migrants from high incidence countries to be considered earlier. The number of deaths in non-UK born cases of HIV has increased between 2001 and 2004; this may be related to late diagnosis, or in some cases to not starting anti-retroviral therapy at the appropriate time.

Although the data show that most non-UK born infected heterosexuals commence anti-retroviral therapy appropriately, as many as ten percent do not.

Over time, the locations where the non-UK born have been seen in England, Wales and Northern Ireland for HIV treatment and care have changed. This is not fully understood, however, changes in settlement patterns may be relevant. Although the HIV surveillance systems do not collect information on migration status, Government policy to disperse asylum seekers (many of whom come from sub-Saharan Africa) from the South East to the North of England may partly explain this finding.

The unlinked anonymous survey data show that under diagnosis of HIV is more common among non-UK born people than among the UK born which raises questions about awareness of risk in non-UK born communities and their health care practitioners, perceived stigma and access to diagnostic services. The data show that African born women in particular are disproportionately affected by HIV and that non-UK born women tested antenatally have a higher prevalence of HIV than the UK born.

The number of non-UK born persons who acquired their HIV infection through other probable routes of transmission (including sex between men and injecting drug use) has remained relatively low and stable in recent years, however, perceived stigmatisation and discrimination associated with these risk factors may result in their under reporting as well as influencing the uptake and decision to HIV test. MSM who were born abroad are at risk of acquiring HIV in the UK and are slightly less likely than UK born MSM to have their infections diagnosed.
**HIV - Public Health Recommendations**

**INDIVIDUAL CARE AND DISEASE CONTROL**

The data clearly show that the burden of HIV falls upon some non-UK born communities, and provision of health services for HIV/AIDS needs to reflect this. The non-UK born must have access to appropriate HIV services which include language support and an understanding of their health beliefs about, and cultural attitudes towards, the disease. Women are disproportionately affected so services need to reflect the particular needs of women with HIV. The British HIV Association has issued guidelines for the treatment of HIV which should be followed with this group as with other patients.

At risk communities and their health care practitioners need to be made aware of the disease to ensure early diagnosis and those at risk should be encouraged to come forward for testing. They also need to be aware that risk may be ongoing, both in the UK or as a result of travel back to high incidence countries. Primary care practitioners may be ideally placed to consider HIV risk in their assessment of a patient’s health needs as a new entrant to the UK, and need to be supported in this role. Other approaches to raise awareness (e.g. through community organisations, such as the African HIV Policy Network who are already active in this field) should be supported and resourced.

Department of Health policy on antenatal screening should be followed for the non-UK born as for the UK born.

HIV can be associated with stigma in many communities and this can be a barrier to seeking help which could delay diagnosis. Addressing stigma requires culturally appropriate approaches with the affected groups as well as education of the wider UK population. The general public need to be reassured that they cannot acquire HIV through normal social contact with affected individuals. This will help to avoid the misconception that the non-UK born pose a health threat to the general population which can lead to prejudice that is unlikely to contribute to overall HIV control.

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**FURTHER RESEARCH/ SURVEILLANCE REQUIREMENTS**

HIV surveillance continues to develop and further improvements could be made in collection of country of birth data. The impact of socioeconomic factors on disease risk and disease progression is also not captured by current surveillance. The surveillance data raise several interesting questions for further research. A better understanding is required of the reasons for late diagnosis and the increase in deaths in non-UK born heterosexuals, as well as the change in the geographical distribution of cases. The overlap between HIV and TB requires further assessment, and the role of travel after migration as a risk for HIV infection should be investigated. HIV in migrants to the UK occurs against a background of a global pandemic of the disease. It would therefore be useful to review the current UK contribution to HIV control programmes in source countries for migrants, and to consider how this contribution might be enhanced.
Health Protection Agency recommendations

Non-UK born communities should have access to culturally and gender appropriate and language supported HIV/AIDS services.

Guidelines for HIV treatment should be followed.

Awareness of the disease should be raised in at risk communities and their health care professionals to encourage early diagnosis.

Risk of HIV in the non-UK born should be considered on an ongoing basis.

Primary care practitioners should be supported to fulfil a role in HIV control in the non-UK born.

Department of Health guidelines on antenatal screening should be followed for all pregnant women.

The overlap between HIV and TB in the non-UK born should be further assessed.

Where HIV and TB co-exist joined up care between specialities is important.

Late diagnoses and an increase in deaths in non-UK born heterosexuals require investigation.

Recent changes in the geographical distribution of cases in black Africans within England should be further explored.

Improvements to routine HIV surveillance should include improved capture of information on country of birth and socioeconomic status.

The role of travel in ongoing risk of HIV after arrival in the UK should be investigated.

The current UK contribution to HIV control programmes in source countries for migrants should be reviewed with consideration of how this contribution might be enhanced.
Hepatitis B virus (HBV) is a blood borne virus that causes hepatitis B infection. The infection may be transmitted via a number of different routes including vertical transmission from mother to child, and horizontally from person to person, through injecting drug use and sexually. Although primarily spread through contact with infected blood, occasionally other infected bodily fluids such as saliva and semen may be involved in transmission.

Acute infection with HBV when acquired in adulthood will often resolve with no long-term health consequences, though it may occasionally lead to fulminant hepatic necrosis which can be fatal. The major health impact of hepatitis B infection arises when the acute infection does not resolve and chronic infection results. Chronic infection increases the risk of developing severe liver diseases such as cirrhosis and primary liver cancer. The virus is the leading global cause of both of these chronic liver diseases and worldwide around 20-25% of people with chronic hepatitis B infection will go on to develop progressive liver disease. Many people are asymptomatic and unaware of their chronic infection and consequently will remain undiagnosed until they present with overt disease.

Chronic hepatitis B is defined as persistence of the hepatitis B surface antigen (HBsAg) in the blood for six months or more. The presence of hepatitis B e antigen (HBeAg) is indicative of high infectiousness. The risk of developing chronic infection depends on the age at which acute infection takes place. Chronic infection occurs in about 90% of those infected perinatally. In children infected at between one to five years of age, 20-50% will develop chronic infection. Infection in adulthood leads to chronic infection in around six to ten percent of cases though this risk is increased in those with immune impairment.

Worldwide 350 million people are chronically infected with the virus and it is estimated that up to one million die annually as a result of HBV related liver disease.
The prevalence of chronic hepatitis B infection varies between countries. The World Health Organization (WHO) has divided the world into three distinct areas in relation to the prevalence of chronic hepatitis B infection. High prevalence areas have a prevalence of chronic infection equal or greater than eight percent and include parts of North America, parts of South America, sub-Saharan Africa and most of Asia. Intermediate prevalence areas have a prevalence ranging from two to seven percent and include parts of South America, North Africa, parts of Western Europe, Eastern Europe and the Indian subcontinent. Low prevalence areas with a prevalence estimated to be less than two percent include most of North America, Australia and most of Western Europe including the UK. The main route of transmission of the hepatitis B virus tends to vary according to the prevalence of infection. In countries with a high prevalence of infection, hepatitis B is mainly transmitted vertically or horizontally (non-sexually) from person to person, predominantly in childhood. In intermediate prevalence countries the virus is frequently transmitted sexually or through injecting drug use, although transmission in early childhood also occurs. In low prevalence countries such as the UK, acute infection is primarily acquired in adulthood either sexually or through injecting drug use.

In high income countries chronic hepatitis B infection is sometimes treated with a combination of drugs, which can help some cases, patients with severe liver disease are sometimes given liver transplants, and for liver cancer, surgery and chemotherapy can prolong life. These options are, however, very expensive and not available to most patients in low income countries. It is, however, preferable to prevent hepatitis B with vaccine than to try and cure it. Hepatitis B vaccine has an excellent record of safety and effectiveness with over one billion doses used worldwide since 1982. Studies have shown that the vaccine is 95% effective in preventing children and adults from developing acute and chronic infection if they have not yet been infected. Since 1991, the WHO has called for all countries to add hepatitis B vaccine into their national vaccination programmes. As of March 2000, 116 countries had included hepatitis B vaccine in their national programmes including most countries in East and South East Asia, the Pacific Islands, Australia, North and South America, Western Europe and the Middle East. However, many low income countries in sub-Saharan Africa, the Indian subcontinent and the Newly Independent States of the Former Soviet Union do not use the vaccine, a major obstacle to its use being price. The UK has a policy of selective pre-exposure immunisation in groups at risk because of lifestyle, occupation or other risk factors (e.g. long-term travel to endemic areas). Immediate post-exposure vaccination is also used to prevent infection, particularly in infants born to infected mothers or following needle stick injuries.

Other control measures in the UK to limit transmission to others include screening all pregnant women antenatally for infection, screening of blood donations and screening and vaccinating all health care workers.

Sources of data and their limitations

In England and Wales hepatitis B is a notifiable infectious disease and therefore clinicians have a statutory duty to notify the local authority of any cases. Notifications will subsequently prompt local investigation and action to control spread of the disease. Notifications are, however, mainly based on a clinical diagnosis rather than laboratory confirmation and acute hepatitis B infection is virtually indistinguishable from other forms of acute viral hepatitis. In addition, chronic cases may also sometimes be notified. The combination of these limitations means that notifications of hepatitis B are not the most accurate source for following trends in the disease incidence. Instead national surveillance of acute hepatitis B infection in England and Wales is based on laboratory reports of confirmed cases of acute hepatitis B infection. Although demographic data are collected on each case, country of birth and ethnic group are not currently routinely collected. In addition, travel information is requested but this field is not always completed. This means it is not possible to
routinely present data on acute hepatitis incidence in terms of these case characteristics. Underreporting of infection may furthermore occur as many cases of acute hepatitis B infection are asymptomatic, symptomatic cases may not be diagnosed, and confirmed cases may not be reported. Estimating the prevalence of chronic hepatitis B infection is also not possible from routine surveillance systems but has been attempted by serological surveys in specific groups e.g. genitourinary medicine clinic attendees and antenatal women. The data quoted in this section are drawn primarily from such surveys.

Findings

Laboratory reports to the Health Protection Agency of acute hepatitis B in England and Wales fell from a peak of around 2000 in 1984 to a low of around 500 in 1992. This fall was largely due to a decline in cases in injecting drug users and sexual behaviour modification in response to the HIV epidemic. Since then, between 600 and 800 cases have been reported every year.

In the UK the Department of Health have estimated that the prevalence of chronic hepatitis B infection is 0.3%, equivalent to around 180,000 people living with the infection. This order of prevalence was confirmed by a study that looked at the prevalence of chronic hepatitis B infection in individuals aged 15-44 years using blood samples submitted to 16 microbiology laboratories in England and Wales. The overall prevalence was 0.37%. Although overall this study showed a low prevalence of chronic hepatitis B infection in England and Wales there was a strong association between evidence of exposure to hepatitis B and being born in either Africa or Asia. Furthermore, prevalence within England and Wales varies between inner city and rural areas which also have very different population mixes. This is reflected in the prevalence of HBSAg found among antenatal patients in some inner city urban (1%) and rural areas (0.05% to 0.08%). A later study looking at the incidence of acute hepatitis B infection reported a higher incidence among individuals who were ethnically South Asian than among other ethnic groups, with infections among this group occurring more often during childhood. HBV infection among South Asian children in England and Wales is more common, with transmission in the household and while travelling being more frequently reported. These studies both reflect the global epidemiology of hepatitis B and the higher prevalence of chronic infection in individuals from high and intermediate prevalence countries.

Another study has used data from 1995 to 2000 to attempt to calculate the number of new chronic infections arising within England and Wales from acute hepatitis B infection, and estimate their contribution to the overall burden of chronic cases added to the existing numbers of such infections in England and Wales in any one year. In England and Wales, over this period an average of 673 cases of acute hepatitis B infection were reported annually. Approximately 70% of the cases were in males, and the majority of acute infections occurred in young adults aged 15-24 years and were mainly acquired through injecting drug use and sexual exposure. Taking into account underreporting and the asymptomatic nature of acute hepatitis B infection it is estimated from these data that an average of 3780 new cases of acute hepatitis B infection occurred in England and Wales every year from 1995 to 2000, though it is not possible to determine from the data whether these new infections might have affected the UK born or the non-UK born. Based on what is known about the natural history of hepatitis B infection, modelling estimated 269 cases of chronic hepatitis B infection would have arisen annually from these 3780 cases of acute hepatitis B infection. Between 1996 to 2000, net migration to England and Wales was 90,220 persons. Of these 90,220 persons, modelling (based on WHO estimates of chronic hepatitis B disease in different countries) estimates that 6571 would have been chronically infected with HBV. Chronic infections in migrants can therefore be estimated to account for around 96% (6571/269+6571) of all chronic hepatitis B infection newly added to the existing number of such infections in England and Wales over this period, with only four percent of new chronic infections arising as a result of acute infection diagnosed in England and Wales. The majority of migrants with chronic infection are likely to have acquired their infection in a high or intermediate prevalence country during childhood.
Discussion

Trends in acute hepatitis B infections in England and Wales have remained fairly stable over the last ten years despite an increase in migrants coming from endemic countries. Migration to the UK therefore appears to have had little impact on the epidemiology of acute hepatitis B infection in England and Wales. Acute infections are mainly attributable to transmission through injecting drug use or sexual exposure and specific groups who are at higher risk are targeted for vaccination, notably people who inject illicit drugs, those in prison and those who have multiple sexual partners. There is insufficient information available from routine surveillance as to whether particular population groups having these exposures are more affected than others, which prevents any further refinement of targeting of health messages or interventions. Travel to endemic areas plays a role in acute hepatitis B acquisition but this information is not always complete. Acute infections are likely, however, to only contribute a very small proportion of all new chronic infections seen in England and Wales each year.

In any given year the majority of chronic infections added to the existing number of such infections in England and Wales can be estimated to occur in migrants to the UK who have been infected in their country of origin. Many of the migrants with chronic hepatitis B infection will have acquired their infection at an early age and therefore any existing UK hepatitis B vaccination policy will be unable to protect existing migrants or new entrants from acute or chronic hepatitis B infection. For this group diagnosis and treatment may, however, contribute to reducing the impact of the infection on their individual health, and awareness of the disease can prevent transmission to others, particularly transmission to babies from their mothers, hence the Department of Health policy on antenatal screening.

While the prevalence of hepatitis B remains high in countries from which some migrants arrive, and with sub-optimal vaccination programmes in at risk groups in the UK, complications related to chronic HBV infection will continue to be a UK health problem.
The general public need to be better informed about hepatitis B and their very low risk of acquiring it through normal social contact, to avoid any misconception that the non-UK born pose a health threat to the general population. This could otherwise lead to prejudice that is unlikely to contribute to overall hepatitis control.

**INDIVIDUAL CARE AND DISEASE CONTROL**

The burden of chronic hepatitis B infection and its serious health consequences is likely to fall predominantly on some non-UK born people. Health services managing the consequences of chronic infection therefore need to reflect this with provision of appropriate services for this group, including language support and an understanding of health beliefs about, and cultural attitudes towards, the disease. NICE guidelines for the treatment of hepatitis B should be followed in this group as in any other. Migrants from hepatitis B endemic countries and their health care practitioners need to be aware of their risk of chronic infection. Increased testing for chronic infection will help to identify those who may benefit from treatment and contribute to preventing onward transmission. In particular there is a need to identify and protect children from ethnic minorities whose parents originate from high prevalence countries, since those infected in childhood are most likely to develop chronic infection. Although recognised infection in children is rare, the incidence of hepatitis B infection is higher in children from certain ethnic minorities. Universal infant immunisation in parts of the country with a high proportion of ethnic minorities may, therefore, be more cost effective than a national programme. Although the consequences of chronic hepatitis B infection are generally managed in secondary care, primary care practitioners are ideally placed to consider the health needs of patients who have migrated to the UK from hepatitis B endemic countries, including testing for chronic infection and offering vaccination to uninfected migrants maintaining links with endemic countries. Such testing should be seen as being conducted primarily for the benefit of the individual, both to avoid stigmatising at risk groups and because there is little evidence of significant transmission to the UK general public.

**FURTHER RESEARCH/SURVEILLANCE REQUIREMENTS**

Continued surveillance of hepatitis B infection is essential to inform future immunisation strategies. Improvements in data collection by laboratory reports of acute infection (to include details of country of origin, ethnicity and complete recent travel history) will assist in directing appropriate public health action. Further surveys of the prevalence of chronic infection in different population groups will also contribute to the planning of health services related to managing and controlling the disease. Evaluation of the cost effectiveness of screening for chronic hepatitis B infection in the primary care setting is also required. Most migrants with chronic hepatitis B infection will have acquired the infection in their country of origin. It would therefore be useful to review the current UK contribution to hepatitis B prevention programmes in source countries for migrants, and to consider how this contribution might be enhanced.
Health Protection Agency recommendations

Non-UK born communities should have access to culturally appropriate and language supported health services for the management of chronic hepatitis B infection.

NICE guidelines for treatment of chronic infections should be followed.

Awareness of hepatitis B risk needs to be raised in at risk groups and their health care practitioners.

Current Department of Health guidelines on screening those at increased risk of transmitting the disease to others (pregnant women and health care workers) and on immunisation of at risk groups should be followed.

Improvements are needed in routine surveillance of hepatitis B infection to improve information on risk groups and where infection is acquired to help inform appropriate public health action.

Economic evaluation is required to consider the cost effectiveness of testing and vaccinating (where appropriate) all new migrants from high prevalence regions for hepatitis B in primary care.

The current UK contribution to hepatitis B prevention programmes in source countries for migrants should be reviewed with consideration of how this contribution might be enhanced.
CHAPTER 5 Malaria

Plasmodium falciparum parasite photo, courtesy of CDC/M Melvin
Malaria is caused by four different species of the protozoan parasite *Plasmodium: P. falciparum, P. malariae, P. ovale* and *P. vivax*. The parasite has a complex life cycle involving stages in both mosquito and human hosts and is transmitted between the two by anopheline mosquitoes which predominantly bite at night.

Malaria can cause a wide range of symptoms but frequently presents as a ‘flu-like illness, with fever, headache and general malaise. The four species of *Plasmodium* differ in their incubation periods, and their clinical signs and symptoms. *P. falciparum* is usually responsible for the most serious illness, including cerebral and other complicated forms of malaria; it also causes most fatalities. *P. vivax* and *P. ovale* cause less severe disease but have persistent liver stages and can cause relapses for up to a year after the initial infection if untreated. *P. malariae* causes a milder form of malaria and may also have a delayed presentation.

Immunity to malaria is acquired slowly and is usually incomplete. Some adults from highly malarious areas are semi-immune and this may give them some protection against developing severe malaria. Many adults in Africa, however, have little or no immunity, including those from highland areas and some urban settings. Furthermore, on leaving a malarial area, immunity declines rapidly over a few years. Therefore, most migrants may have only limited immunity, if any, even when they initially arrive in the UK as new entrants. Studies comparing the clinical presentation of malaria in British people of African descent compared to Caucasians demonstrate little difference between them in terms of severity.

Approximately 40% of the global population, many of whom live in the world’s poorest countries, are at risk of malaria. Worldwide, over 100 million people are infected each year. In many parts of Africa and some parts of Asia
inhabitants are infected with malaria several times a year; in some areas it is more common than influenza is in the UK. Malaria is also responsible for over one million deaths annually, 90% of which occur in sub-Saharan Africa, mostly among young children.

The different species of *Plasmodium* have different global distributions. *P. falciparum* causes 95% of infections in sub-Saharan Africa, the region where it is most common, and is responsible for the high mortality in the region. *P. vivax* is widely distributed, especially in the sub-tropical regions and across the Indian subcontinent. By contrast, *P. ovale* is less common and is predominantly found in West Africa.

The global epidemiology of malaria has changed during the last century as a result of global efforts to eradicate the infection, and changes in socioeconomic factors and land and water management. By 1970, malaria had been eradicated from Europe, North America (north of Mexico) and many islands. A substantial reduction in malaria was also achieved in Asia, Oceania and Latin America. The campaign had relatively little effect in Africa, however, except for in the north and extreme south. In South Asia, there has been a resurgence of malaria and substantial transmission now occurs in many areas. These have also been global changes in drug resistance with chloroquine resistance spreading during the 1980s from South East Asia to Africa, where it is now widespread. In addition, multiple drug resistance has spread throughout South East Asia leading to an increase in the number of deaths from malaria worldwide.

Although malaria used to be endemic in the UK, almost all cases are now imported. (Very occasionally malaria may be transmitted within the UK through blood transfusions or through sharing of needles). Around one third of patients who have recently returned from Africa and who present to the Hospital for Tropical Diseases in London with a fever have falciparum malaria. Deaths from malaria do still occur every year in the UK; many are in young, otherwise healthy individuals and almost all are potentially preventable.

Four steps are essential to prevent damage to health from malaria (the ABCD): Awareness of the disease, avoidance of insect bites, Compliance with appropriate Chemoprophylaxis and prompt Diagnosis and treatment. The latest UK guidelines for prevention of malaria produced by the Health Protection Agency Advisory Committee on Malaria Prevention in UK Travellers (ACMP) are available on the Health Protection Agency website.

Sources of data and their limitations

The Health Protection Agency’s Malaria Reference Laboratory (MRL) provides a reference parasitology service for malaria and undertakes epidemiological surveillance of malaria for the whole of the UK. Surveillance data for malaria is based on notifications and routine laboratory reporting. Both of these systems under-ascertain cases and collect only very limited clinical and demographic information. Further cases are identified, and additional information gathered on cases, by the MRL reference diagnosis service. These data are therefore the best source of information about malaria cases occurring in the UK.

The majority of laboratories diagnosing malaria send samples to the MRL for confirmation of diagnosis and speciation. This is not, however, a mandatory system so the MRL will not be aware of all malaria cases diagnosed in the UK. Any cases of malaria that the MRL do become aware of, either through this route or from notifications, are followed up using a standard ‘blue form’ which has been used since 1987. This records details of the patient’s travel history (including date of arrival in the UK), clinical history, places visited and duration of travel, and chemoprophylaxis taken with dosage. Information on country of origin, reason for travel, and ethnicity is also requested, though the fields are not completed for all cases. No data are collected on migration status.
Definitions and methods

The following definition of malaria is used by the MRL: a notified case in which parasites are proven by laboratory investigation, either by light microscopy of blood or more recently by molecular methods.

The classification of ethnic group used by the MRL until 2003 was based on observer-reported ethnicity reflecting normal practice when the data collection was initiated; self-reported ethnicity has superseded this.

Countries of birth (self-reported) are grouped by the MRL into world regions based on the broad pattern of malaria transmission globally.

Findings

Between 1987 and 2004, a total of 35,825 cases of malaria were reported to the MRL. The number of cases of malaria reported each year increased from 1816 in 1987 to a peak of 2500 in 1996; there was a subsequent decline to 1660 cases in 2004. During this period there was an increase in the number of cases of P. falciparum from 724 in 1987 to a peak of 1576 in 2001, falling slightly to 1221 cases in 2004 (Figure 1). Sixty-six percent of falciparum malaria cases in the UK are reported from the London area. There is a wider distribution of vivax malaria cases; the West Midlands and London contribute 54% of all vivax cases. Other regions, including Scotland, Wales and Northern Ireland, have relatively low numbers of imported malaria cases.

The country of birth was known for 22,160 (62%) cases who acquired malaria from 1987-2004 and of those, 15,599 (70%) were born outside the UK. Forty percent of cases were born in Africa, 37% in Europe and 20% in South Asia (Table 1). After the UK (6561, 30%), the most common countries of birth were Nigeria (3809, 17%), India (2745, 12%), Ghana (1959, 9%) and Pakistan (1364, 6%). Since 1987, the proportion of malaria cases born in Africa has increased while the proportion born in South Asia has decreased. Between 1987 and 1999, 30% of malaria cases diagnosed in the UK were born in Africa and 25% in South Asia; from 2000-2004 the figures were 55% and 7.5% respectively. The countries where malaria is acquired reflect this pattern.

For the UK as a whole, the regions where malaria was acquired in 2004 are outlined in Table 2. Furthermore in 2004, over 80% of all malaria cases diagnosed in the UK (with information available) were of African or South Asian ethnic origin.

### Table 1: Cases of Malaria Diagnosed in the UK from 1987-2004 by World Region of Birth

<table>
<thead>
<tr>
<th>Region of Birth</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>8,757</td>
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</tr>
<tr>
<td>Europe</td>
<td>8,285</td>
<td>37.4</td>
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<tr>
<td>South Asia</td>
<td>4,359</td>
<td>19.7</td>
</tr>
<tr>
<td>Oceania</td>
<td>394</td>
<td>1.8</td>
</tr>
<tr>
<td>Americas</td>
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</tr>
<tr>
<td>Middle East</td>
<td>80</td>
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</tr>
<tr>
<td>Far East</td>
<td>73</td>
<td>0.3</td>
</tr>
<tr>
<td>West Indies</td>
<td>44</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>22,160</td>
<td></td>
</tr>
</tbody>
</table>

FIGURE 1: CASES OF MALARIA DIAGNOSED IN THE UK: 1987-2004
Overall, in 2004, 60% (999/1660) of the malaria cases were male and 32% (534/1660) were female. Thirty-nine percent of those born in Africa and 43% of those born in Asia were female. In 2004, 62% of the malaria cases (990/1608) were aged 15-44 years and 13% (201/1608) were aged less than 15 years. The median age of malaria cases was 31 years for those born in Africa and 39 years for those born in Asia, compared to 27 years for UK born cases. Of the cases with a known ethnicity, most children were black Africans (46%; 79/172) or of black African descent (37%; 63/172). Only 2% (4/172) of cases aged under 15 years were white British. Of the cases aged 15-44 years, 71% of cases were of black African ethnicity or black African descent (550/775) compared to 10% who were white British (76/775) (Figure 2).

### TABLE 2: CASES OF MALARIA BY SPECIES AND REGION OF ACQUISITION: 2004

<table>
<thead>
<tr>
<th>REGION OF ACQUISITION</th>
<th>Pf</th>
<th>Pv</th>
<th>Pm</th>
<th>Po</th>
<th>Pf/Pv</th>
<th>Pf/Pm</th>
<th>Pf/Po</th>
<th>TOTAL</th>
<th>2003</th>
</tr>
</thead>
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<tr>
<td>NORTH AFRICA</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>CENTRAL AFRICA</td>
<td>58</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>63</td>
<td>72</td>
</tr>
<tr>
<td>EAST AFRICA</td>
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<td>11</td>
<td>9</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>121</td>
<td>173</td>
</tr>
<tr>
<td>SOUTHERN AFRICA</td>
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<td>0</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>70</td>
<td>79</td>
</tr>
<tr>
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<td>50</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>812</td>
<td>836</td>
</tr>
<tr>
<td>AFRICA - UNSPECIFIED</td>
<td>24</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>1</td>
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<td>34</td>
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<td>0</td>
<td>169</td>
<td>116</td>
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<td>0</td>
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<td>1</td>
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<td>0</td>
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<td>12</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>CENTRAL/S AMERICA</td>
<td>2</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>OCEANIA</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
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<td>2</td>
<td>32</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>344</td>
<td>364</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1221</td>
<td>278</td>
<td>28</td>
<td>121</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>1660</td>
<td>1720</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Pf</th>
<th>P. falciparum</th>
<th>Pf/Pv</th>
<th>Pf/Pm</th>
<th>Pf/Po</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pv</td>
<td>P. vivax</td>
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<td></td>
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<tr>
<td>Pm</td>
<td>P. malariae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Po</td>
<td>P. ovale</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
* mixed infections

### FIGURE 2: CASES OF MALARIA BY AGE AND ETHNICITY: 2004
Most cases of malaria, and especially falciparum malaria, occur in people visiting friends and relatives in their country of origin or the country of origin of their parents. Of the 24,810 malaria cases diagnosed between 1987 and 2004 for whom the reason for travel was known, 2,333 (9.4%) were categorised as new entrants and 11,555 (46.6%) had visited family in the country of origin. The distribution of cases by reported reason for travel in 2004 is shown in Figure 3. Visiting friends and relatives is a far more common reason for travel in those with malaria than holiday travel.

Among all patients with malaria in 2004, where the history of prophylaxis was obtained, 685/888 (77%) had not taken prophylaxis and a high proportion of the remainder did not take the prophylaxis recommended for their travel destination by the ACMP.

Discussion

Globally malaria is a common disease which can be fatal. In the UK, malaria predominantly affects the non-UK born population and their families, particularly those from Africa and South Asia, largely due to relative rates of travel to malarious areas. Malaria (particularly falciparum malaria) is a short incubation illness (for example when compared to TB/HIV). Most migrants, where information is available, acquired the infection during visits (from the UK) to friends and relatives in the country of origin rather than prior to migration. The data also show that in addition to migrants born in malarious countries, the UK born population who visit friends and relations in such countries are also at increased risk.

The distribution of the different types of malaria diagnosed in the UK tends to reflect migrant settlement patterns across the country, with higher rates of falciparum malaria in London where African migrants have historically tended to settle, and higher rates of vivax malaria in the Midlands where many South Asian migrant families live. The low rates of malaria elsewhere in the UK probably reflect the lower proportion of non-UK born residents outside major cities in the Midlands and South East. The species of malaria predominantly reported in the UK has also changed over the last 25 years from vivax to falciparum malaria. This partly reflects changes in migration and travel patterns, though the explanation for the decline in vivax malaria remains incomplete.

Although 85% of migrants to the UK are aged 15-44 years, malaria cases tend to be younger and only 62% of cases fall within this age group. This may reflect travelling patterns as well as the fact that malaria cases are a mixture of migrants and their UK born relatives. Most of the children diagnosed with malaria were either born in Africa or were of African descent. Children in general are highly susceptible to malaria, and UK born children with no previous exposure to the parasite particularly so.

Although most cases of malaria are preventable, surveillance data show that the great majority of travellers who acquire malaria either fail to use prophylaxis, or use inappropriate prophylaxis. Preliminary data suggest that people visiting friends and relatives are significantly less likely to take anti-malarial prophylaxis than other travellers to Africa. Reasons for this are currently being explored, but there are indications that those visiting friends and relatives in Africa substantially underestimate the risk of acquiring malaria, and overestimate the amount of protection that having been brought up in Africa may give them.
Malaria - Public Health Recommendations

**INDIVIDUAL CARE AND DISEASE CONTROL**

The burden of malaria in the UK falls upon some groups of the non-UK born and their families. Health services for malaria need to reflect this with provision of appropriate, readily accessible services for this group to include language support and an understanding of health beliefs about, and cultural attitudes towards, the disease.

Four main factors can contribute to malaria prevention. These are: raising awareness of risk, promoting the effective use of chemoprophylaxis, promoting the use of effective measures to prevent mosquito bites, and encouragement of early presentation if symptoms of malaria occur on return to the UK.

Awareness needs to be raised, particularly among those travelling to visit friends and relatives, that malaria is a potentially severe disease. Those born in malarious countries need to be made aware that: any immunity they may have acquired is rapidly lost after migration to the UK, that second-generation members of their families have no clinically relevant immunity of any kind to malaria, and that their children are particularly vulnerable. Health advisers, including primary care practitioners, can have a major role to play in educating their patients, so their awareness also needs to be raised. Opportunistic discussion about travel plans in other consultations may for example be beneficial.

Health information should be targeted to migrant communities, especially of African descent, to stress the importance of chemoprophylaxis. Effective chemoprophylaxis taken correctly should reduce the risk of malaria by around 90%, especially if combined with sleeping under insecticide-treated bednets.

ACMP guidelines should be applied for all British residents travelling to malarious areas, irrespective of country of origin. Barriers to migrant communities accessing effective chemoprophylaxis should be identified in order that they might be reduced. The most frequently cited is the cost of effective anti-malarials. Some health authorities in areas with large populations of ethnic Africans allow general practitioners to prescribe anti-malarials on FP10 forms for the standard prescription charge. Most do not, so the cost of chemoprophylaxis falls on the traveller. For trips of more than a week (and visits to friends and relatives are usually longer) this can be significant. It is not clear whether reducing the financial barrier to chemoprophylaxis would lead to any increased uptake in the migrant community, but this issue should be explored.

Most mosquitoes which transmit malaria bite between dusk and dawn. Sleeping under bed nets reduces the risk of malaria, especially if the net is treated with insecticide (50% or more reduction in risk). Pre-treated nets bought in the UK are designed largely with the holiday traveller in mind. They may be either small and light (ideal for the backpacker but uncomfortable to sleep under for prolonged periods in hot climates), or bulky making them difficult to transport. Large nets are, however, available in almost all countries at risk, and are generally very cheap. They are usually not treated with insecticide, however, and insecticide may not be available in malaria endemic countries. Those visiting friends and relatives, especially for prolonged periods, should therefore be encouraged to buy nets in their country of destination and to take insecticide for treating the nets with them. This is widely available in camping and travel shops in the UK, and is cheap and easily transportable. Leaving behind such treated nets for friends and relatives at the end of trips will also help to protect at risk communities in malarious areas.

If treated early, malaria seldom becomes severe. If there is a delay in starting effective treatment the patient may develop life-threatening disease. Delays occur either because the patient presents late or occasionally because the doctor fails to recognise that malaria is likely. Patients who feel unwell following any trip to tropical areas should be encouraged to present to their doctors early, and to inform the doctors that they are at risk of malaria. Patients of African origin, and occasionally even doctors, can underestimate the severity of malaria in this group. Health messages targeted both to the migrant community and to their medical advisers need to stress these points.
Further research is required to better understand the reasons why travellers, particularly those visiting friends and relatives, may not take adequate precautions to protect themselves and their families from malaria. Research is also required to determine how best to target this group for health messages, since they may not seek health advice prior to travel. The use of community organisations, school education, local media, pharmacists and travel agents among others needs to be explored. There should also be investigation of whether the cost of anti-malarials discourages their use. Further economic analysis is required on the relative cost to the NHS of free or prescription cost provision of anti-malarials versus the costs of hospital treatment of cases. All migrants with malaria will have acquired their infection in malarious countries, usually their country of origin. It would therefore be useful to review the current UK contribution to malaria prevention programmes in source countries for migrants, and to consider how this contribution might be enhanced.

Health Protection Agency recommendations

Non-UK born communities should have access to culturally appropriate and language supported health services for the management of malaria.

Awareness of the risks of malaria, particularly in those visiting friends and relatives needs to be raised in at risk communities.

Health care providers, particularly in primary care, may have an important role in addressing malaria risk with their non-UK born patients, and they should be supported to do this.

ACMP guidelines for malaria prevention should be followed for all travellers, regardless of migration status and ethnicity.

Research is required to understand why those visiting friends and relatives do not protect themselves adequately against malaria.

Health messages need to be targeted to at risk groups to improve protection against malaria and encourage early presentation with symptoms; research is required to determine the most effective ways of doing this.

Cost effectiveness studies of provision of free or prescription-cost anti-malarials to those visiting friends and relatives should be considered.

The current UK contribution to malaria prevention programmes in source countries for migrants should be reviewed with consideration of how this contribution might be enhanced.
CHAPTER 6 Other infections

Salmonella Enteritidis
6 Other infections

SUMMARY OF KEY POINTS

- Many surveillance systems do not currently record country of birth, travel history or reason for travel. This means that it is not possible to determine the burden of many diseases in migrant populations, nor to distinguish between disease in travellers and migrants.

- Gastrointestinal infections have a worldwide distribution and are the most commonly reported travel-associated infections in England, Wales and Northern Ireland. In 2004, around 4500 laboratory confirmed cases of gastrointestinal illness with a recent history of travel abroad were reported. It is not, however, possible to distinguish between travel-associated infections in migrants, those visiting friends and relatives, or other short-term travellers. Salmonella spp, Campylobacter spp and Cryptosporidium spp are common worldwide, but are most frequently reported in travellers to Europe, and in particular to Spain and Greece. Migrants would not be expected to be at disproportionately higher risk of these infections than other travellers. Shigella spp, Entamoeba spp and Giardia were most frequently reported in travellers to the Indian subcontinent and sub-Saharan Africa. These infections may be more likely to affect migrants or those visiting friends and relatives in these areas.

- Enteric fevers are frequently reported by travellers who have visited the Indian subcontinent, a region with which many migrants to the UK have close links.

- In England, Wales and Northern Ireland in 2004, the helminths most frequently reported and associated with travel abroad were Taenia spp, Trichuris spp and Ascaris spp. Although helminths generally have a worldwide distribution, infections in the UK are usually associated with migrants from tropical regions.

- Imported hepatitis A is reported infrequently, but where travel history is available, cases have mainly travelled to the Indian subcontinent, an area from which many migrants come and to which many travel to visit friends and relatives. A similar pattern is also seen with hepatitis E.

- Polio is now rare worldwide but some migrants may come from countries which have not yet eradicated the disease. They may be at risk if not immunised, either as a result of exposure prior to arrival in the UK or as a result of travel back to their country of origin.

- Importations of confirmed and probable cases of dengue fever have been increasing in recent years. In 2004, the majority of dengue cases (with a known history of travel) had travelled to South Asia, an area from which many migrants come and to which they may return to visit friends and relatives. Repeated visits may put them at risk of dengue haemorrhagic infection.

- Only small numbers of cases of filariasis are imported into England, Wales and Northern Ireland each year. In 2004, Loasis was the most frequently reported infection with eight cases reported; only two of which had a travel history provided.
• Measles, mumps and rubella are prevalent in varying degrees throughout the world, including the UK, and every year a few cases are imported from countries where vaccine coverage is low.

• Toxigenic diphtheria is very rare in England and Wales. Of three cases that occurred in 2003, two were imported from Asia. Migrants may be at risk of infection if they are not fully immunised, either as new entrants or when visiting friends and relatives in their country of origin.

• Meningococcal disease may be a risk for migrant populations travelling to see friends and relatives in the African meningitis belt or to Saudi Arabia for the Hajj pilgrimage.

• Sexually transmitted infections are common worldwide and migrants from high prevalence countries may have specific health needs in this regard. The STI surveillance programmes do not, however, currently collect information on country of birth, so the prevalence of sexually transmitted infections in the non-UK born is unknown.

• Hepatitis C is common worldwide and migrants from high prevalence countries may be at increased risk of infection. The HCV surveillance programmes do not, however, currently collect information on country of birth, so the prevalence of HCV in the non-UK born population is unknown.

• Most cases of schistosomiasis were in young males and associated with travel to sub-Saharan Africa.

A range of other infections may affect migrants to the UK. The following sections briefly outline some of these diseases and their epidemiology and describe the data available on cases reported in England, Wales and Northern Ireland for 2004 (unless otherwise stated). Some of these infections are considered to be travel-associated so the reader is also referred to the reports produced by the Travel and Migrant Health Section of the Centre for Infections on travel-associated illness. These reports also cover diseases that are seldom reported in the UK and are therefore not discussed in detail here but to which migrants may be exposed, including cholera, leptospirosis, leishmaniasis, yellow fever, (non-arboviral) viral haemorrhagic fevers, rabies and encephalitis-causing viruses. Surveillance systems for most of these diseases generally do not capture travel history well and it is not possible in most cases to distinguish between disease in British travellers and migrants to the UK. The limitations of surveillance data in relation to travel-associated disease are described in full in 'Illness in England, Wales and Northern Ireland associated with foreign travel'. Migrants may have been exposed to infections prior to their first arrival in the UK, but it is also important to recognise that migrants form a substantial part of the population of travellers since they may return to their country of origin to visit friends and relatives. In 2004, 15% of travellers were visiting friends and relatives. Furthermore the living conditions associated with travel to visit friends and relatives as opposed to holiday travel are not the same e.g. travellers visiting friends and relatives are less likely to be living in hotel accommodation and more likely to be having contact with local populations. The duration of trip is also generally longer. Their risk of infection may therefore continue through repeated travel back to their country of origin.
Food and waterborne illness

Introduction

Gastrointestinal infections occur throughout the world, including the UK and may be caused by a variety of bacterial, viral or protozoal organisms. They are generally not vaccine preventable (although there is a cholera vaccine available for use in some circumstances). Bacteria such as Escherichia coli, Salmonella spp and Campylobacter spp have a worldwide distribution, as do viruses such as rotaviruses and noroviruses and the protozoan Cryptosporidium spp. Other bacteria such as Vibrio cholerae and Shigella spp and protozoa such as Entamoeba spp and Giardia are more likely to occur in regions of the world where food hygiene and sanitation are poor. Transmission of these agents may be via contaminated food or water, or by direct person to person spread. Symptoms usually involve one or more of diarrhoea, vomiting and abdominal pain and sometimes fever. Worldwide, diarrhoea in particular is a major cause of morbidity and mortality in young children, but most cases are relatively mild in healthy adults. The severity and nature of the illness usually depends on the causative agent. Shigella dysenteriae and Entamoeba histolytica may cause dysentery (diarrhoea with blood in the stools) and Vibrio cholerae may cause profuse watery diarrhoea. Persistent diarrhoea is usually caused by protozoan parasites such as Cryptosporidium spp and Giardia.

KEY POINTS

- Gastrointestinal infections have a worldwide distribution and are the most commonly reported travel-associated infections in England, Wales and Northern Ireland. In 2004, around 4500 laboratory confirmed cases of gastrointestinal illness with a recent history of travel abroad were reported. It is not, however, possible to distinguish between travel-associated infections in migrants, those visiting friends and relatives, or other short-term travellers.

- Salmonellosis was the most commonly reported gastrointestinal illness associated with recent travel abroad in England, Wales and Northern Ireland.

- Salmonella spp, Campylobacter spp and Cryptosporidium are common worldwide, but are most frequently reported in travellers to Europe, in particular to Spain and Greece. These destinations are popular with British travellers in general and migrants would not be expected to be disproportionately at risk.

- Shigella spp, Entamoeba spp and Giardia were most frequently reported in travellers to the Indian subcontinent and sub-Saharan Africa. These infections may particularly affect migrants or those visiting friends and relatives in these areas.
Sources of data and their limitations

Data were extracted from Labbase 2 on 25 January 2006. Laboratory reports of all faecal isolates of Bacillus cereus, Campylobacter spp, Clostridium perfringens, Cryptosporidium spp, Cyclospora spp, Endolimax nana, Entamoeba spp, Escherichia spp, Giardia lamblia, Listeria spp, Plesiomonas spp, Salmonella spp (non typhoidal), Shigella spp, Staphylococcus aureus and Vibrio spp (non cholerae) were included. Comments and features fields for all reports were searched to obtain travel history information.

Data for Shigella spp in England and Wales were supplied by the CfI Laboratory of Enteric Pathogens. Data for Shigella spp in Northern Ireland were supplied by CDSC Northern Ireland.

In general these sources of data do not capture travel history well and do not capture reason for travel at all.

Findings

In 2004, there were 89,241 laboratory reports of gastrointestinal illness. Of those, Campylobacter spp accounted for approximately half the cases (51%), followed by enteric viruses (23%) and non typhoidal Salmonella spp (15%). Travel history reporting was incomplete but 5% (4558/89,241) of the laboratory reports were associated with recent travel abroad; no travel history was available for 88%. Of the 4558 reports that stated known recent travel abroad, over half were due to Salmonella spp infection (52%), almost a third were due to Campylobacter spp (29%). The remaining cases were due to Giardia (7%), Shigella spp (6%), Cryptosporidium (2%) and other organisms (4%).

Bacterial infections

Eighteen percent (2353/13,151 total reports) of salmonella infections reported to Labbase 2 stated recent travel abroad (Table 1). Europe was the most frequently reported region of travel (37%, 878/2353) (mainly to Spain 19%, 440/2353 and Greece 8%, 186/2353), followed by North Africa and the Middle East (17%, 405/2353). A further 314 cases (13%) were reported from the Indian subcontinent (including: India 6%, 131/2353 and Pakistan 4%, 87/2353).

Three percent (1305/44,828 total reports) of campylobacter infections reported recent travel abroad. Europe was the most frequently reported region of travel (41%, 535/1305) (of which 60%, 320/535 reported travel to Spain), followed by the ISC (22%, 281/1305) (of which 64%, 181/281 to India and 17%, 48/281 to Pakistan).

<table>
<thead>
<tr>
<th>REGION OF TRAVEL</th>
<th>CAMPYLOBACTER</th>
<th>SALMONELLA</th>
<th>SHIGELLA</th>
</tr>
</thead>
<tbody>
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<td>EUROPE</td>
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<tr>
<td>INDIAN SUBCONTINENT</td>
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<td>110</td>
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<td>SOUTH AND CENTRAL AMERICA</td>
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<td>2353</td>
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</table>
In 2004, there were 1368 laboratory reports of Shigella spp in England, Wales and Northern Ireland of which 267 stated recent travel abroad. Seventy percent (37/53) of S. dysenteriae reports stated recent travel abroad, mainly to Pakistan (11), India (eight) and Egypt (six). Fifty-five percent (62/113) of S. boydii reports stated recent travel abroad, mainly to India (18), Egypt (12) and Pakistan (11). For S. sonnei, S. flexneri and unspecified reports associated with recent travel abroad (168), the most commonly reported country of travel was Egypt (35 reports), followed by India (31).

Protozoal infections

In 2004, there were 3724 laboratory reports of Cryptosporidium in England, Wales and Northern Ireland, of which 112 (3%) had reported recent travel abroad (Table 2). The most frequently reported country was Spain (25 cases), followed by Pakistan (16) and India (14).

There were 3173 reports of Giardia, of which 321 (10%) stated recent travel abroad. However, enhanced surveillance has previously shown that around 30% to 60% of giardiasis in England and Wales is travel-associated. The Indian subcontinent was the most frequently reported region of travel (41%, 132/321); the majority of cases had travelled to India (92 reports) and Pakistan (28 reports). The next most commonly reported regions of travel were sub-Saharan Africa (14%, 45/321) followed by north Africa and the Middle East (11%, 34/321).

There were 377 laboratory reports of Entamoeba spp, 14% of which (54 reports) had reported recent travel abroad. Of those, 31% (17 reports) stated travel to ten different countries in sub-Saharan Africa and 15 stated travel to the Indian subcontinent, mainly India.

Discussion

Gastrointestinal illness occurs frequently both in the UK and around the world. Although only 12.4% of all infections reported by laboratories in England, Wales and Northern Ireland included details of whether the case had recently travelled abroad, enhanced studies have shown that travel-associated infection is significantly underestimated. Even where the travel history field is completed, the reason for travel cannot be ascertained; therefore it is difficult to know whether these infections were diagnosed in the non-UK born population, either new entrants or VFRs, or whether they were short-term travellers. However, many of the cases with travel history are known to have acquired their infection in the Indian subcontinent or in sub-Saharan Africa. The International Passenger Survey has shown that up to half of the UK residents travelling to these regions are visiting friends and relations. In particular, Shigella spp, Giardia, and Entamoeba spp infections are predominantly associated with travel to lower income countries with less robust sanitation such as the Indian subcontinent and sub-Saharan Africa. Therefore, although limited data are available, it is likely that gastrointestinal infections may affect migrants to the UK, either through exposure prior to migration or as a result of trips back to visit friends and relatives.
Sources of data and their limitations

Data were extracted 25 January 2006

Findings

In 2004, 197 cases of typhoid fever were reported in England and Wales (there were no reports from Northern Ireland). A travel history was included for 75% of cases, of whom 61% (120) had stated recent travel abroad. Of those, 74% (89/120) reported travel to the Indian subcontinent (46 to India, 33 to Pakistan, eight to Bangladesh and two to Nepal). A further 13% had travelled to sub-Saharan Africa (16/120), three quarters of whom had travelled to Nigeria. Four cases had travelled to Europe and a further four cases had travelled to South East Asia and the Far East. No country of travel was stated for seven reports.

Sixty percent of the typhoid cases who had travelled were male, of which 52% were aged between 15 and 29 years. Female cases were more evenly distributed among all age groups.

In 2004, 217 cases of paratyphoid were reported, 204 cases were of S. Paratyphi A, ten S. Paratyphi B and three S. Paratyphi C. Seventy-seven percent (166/217) of reports had travel history information, of which 64% (137) stated recent travel.

Of the 204 S. Paratyphi A cases, 132 reported recent travel abroad. Of those, 118 (89%) had travelled to the Indian subcontinent (67 to India, 31 to Pakistan, 15 to Bangladesh, four to Nepal and one to Sri Lanka), five had travelled to South East Asia and the Far East, and two to Europe. The destination was unknown for seven cases. Only five cases of S. Paratyphi B had reported recent travel abroad, two had travelled to Peru, two to Turkey and one to South America. The single case of S. Paratyphi C with travel history information had travelled to India.

Introduction

Typhoid and paratyphoid are enteric fevers caused by the bacteria Salmonella enteritidis Typhi and Salmonella enteritidis Paratyphi A, B, or C respectively. They are usually transmitted by food and water contaminated by the faeces of patients and carriers. Although polluted water is the most common source of typhoid transmission, contaminated shellfish, vegetables and dairy products have been shown to be a source of infection. Typhoid fever is characterised by the sudden onset of sustained fever, severe headache, nausea, loss of appetite, constipation or sometimes diarrhoea. A typical rose spot rash may also develop. Paratyphoid fever has similar symptoms to typhoid but tends to be milder, with a lower case fatality rate.

The WHO estimates that typhoid fever affects 17 million people per year with approximately 600,000 deaths. Typhoid has a typical case fatality rate of 10%, which can be reduced to as little as 1% with appropriate antimicrobial therapy. Although typhoid infections are rare in high income countries they are endemic in countries with poor hygiene and sanitation. S. Paratyphi has become predominant in some provinces in China and increasing numbers of cases are also being reported from Pakistan.

The typhoid vaccine, used to protect people travelling to endemic areas, has an efficacy of approximately 50-70%. There is no effective vaccine against paratyphoid.

KEY POINTS

- 74% of typhoid fever cases and 88% of paratyphoid A cases who had a recent history of travel had been to the Indian subcontinent, a region with which many migrants to the UK have close links.
Discussion

The Indian subcontinent is the most frequently reported region of travel for cases of S. Typhi and S. Paratyphi A. Although routine surveillance for enteric fever does not capture country of birth and reason for travel, this region is frequently visited by migrants living in the UK who maintain links with family and friends in their country of origin. A vaccine against typhoid fever is available for travellers to these areas and its use should be promoted in this population group. No vaccine is available against paratyphoid fever, however, so advice on good hygiene is also important in preventing enteric fevers. A pilot of enhanced surveillance of enteric fever began in England, Wales and Northern Ireland in May 2006. One of its aims is to improve the quality of information available about travel history and country of birth. This should provide better insight into which population groups are most at risk of infection and thus enable preventive activities to be targeted more effectively.

SOIL-TRANSMITTED HELMINTHS (GEOHELMINTHS)

KEY POINTS

• In England, Wales and Northern Ireland in 2004, reports of helminth infections most frequently associated with travel abroad were Taenia spp, Trichuris spp and Ascaris spp.

• Although helminths generally have a worldwide distribution, infections in the UK are usually associated with migrants from tropical regions.

Introduction

Most soil-transmitted helminths (STH) are common in moist, tropical and sub-tropical regions of the world. Strongyloidiasis is caused by the threadworm Strongyloides stercoralis. It is transmitted primarily through skin contact with soil contaminated with free-living filariform larvae, although infection through the buccal mucosa (mouth lining) may also occur. Many cases of strongyloidiasis, especially in endemic areas, are asymptomatic. A heavy burden of infection may, however, result in gastrointestinal problems, pulmonary symptoms and skin rashes. In immunosuppressed individuals a fatal hyperinfection may occur.

Strongyloidiasis has a worldwide distribution in the tropics and sub-tropics. The burden of infection is particularly high in areas of Africa, Brazil, Colombia and South East Asia which have a wet climate. It also occurs in temperate areas, associated with poor sanitation. It does not generally occur in the UK.
Cestodes (or tapeworms) are flatworm parasites and there are four species that affect humans: *Taenia saginata* (beef tapeworm), *T. solium* (pig tapeworm), *Hymenolepis nana* (dwarf tapeworm) and *Diphyllobothrium latum* (fish tapeworm). Humans generally become infected with *Taenia* spp following consumption of contaminated undercooked or raw meat. Infection is generally asymptomatic and the first sign of infection may be small chains of the tapeworm (proglottids) which bud off and pass out in the faeces. ‘Irritable bowel syndrome-like’ symptoms may occur in some cases.

Tapeworms are endemic worldwide, particularly where beef or pork is eaten raw or undercooked and where sanitary conditions are poor. Typically, they are most prevalent in poorer countries, particularly in regions of South America, Africa, South East Asia and Eastern Europe.

*Hymenolepis nana*, also known as the dwarf tapeworm, infects humans mainly after consumption of faecally contaminated material. The main symptoms of hymenolepiasis are abdominal pain, anorexia and eosinophilia, however, irritability and headaches may also occur.

*H. nana* is very common in warmer climates particularly in South America, Africa, Asia and Eastern and Southern Europe. Infection is closely associated with institutions such as orphanages where sanitation may be poor, or in households with food handlers who are infected.

Infection with *Ascaris lumbricoides* is frequently asymptomatic. The roundworms are transmitted by ingestion of contaminated soil or unwashed food. The first signs of infection may be the appearance of worms in the stools. Occasionally worms may emerge from the mouth or nose.

*A. lumbricoides* is widespread throughout the world, but the highest prevalence occurs in countries with a moist tropical climate and poor sanitation. In these areas up to 50% of the population may be infected. Children of school age are most at risk of infection.

Hookworm infection can result in anaemia particularly in poor countries where iron intake may be low and malaria is endemic. Similarly, vitamin A deficiency may occur in heavily infected individuals.

Both *Ancylostoma* and *Necator* are endemic in tropical and sub-tropical regions especially in South East Asia, the South Pacific and East Africa (although usually one species predominates in any particular country depending on environmental conditions such as temperature and humidity). In 2002, it was estimated that over 1300 million people were infected with either *A. duodenale* or *N. americanus* and associated anaemia causes at least 65,000 deaths annually.

Humans are the principal reservoir for the whipworm *Trichuris trichiura*. Infection is acquired by ingestion of eggs that have matured in soil for around three weeks. The main vehicle for transmission therefore tends to be unwashed vegetables, but children may also acquire infection from unwashed hands. Infection may cause blood-containing mucoid stools and diarrhoea. Very heavily infected children, usually aged between five and 15 years, may suffer from rectal prolapse, clubbing of the fingers, hypoproteinaemia and anaemia.

*Trichuris trichiura* is common worldwide, especially in warm, moist tropical regions.

Sources of data and their limitations

Laboratory reports of species of *Ascaris*, *Diphyllobothrium*, hookworms, *Hymenolepis*, *Strongyloides*, *Taenia* and *Trichuris* with earliest specimen dates in 2004 were extracted from Labbase 2, 25 January 2006. Travel history is not captured well in Labbase and reason for travel and country of birth are not recorded.
Findings

In 2004, there were 324 laboratory reports of helminth infection. A history of recent travel abroad was reported for only 51 of these cases; no travel history was provided for the remainder of the cases. Overall the most frequently reported helminths were Taenia spp (particularly T. saginata) (Table 3). Of the reports of infections associated with recent travel, the most frequently reported helminths were Taenia (16 reports), Trichuris (12 reports) and Ascaris (nine reports).

Of the Taenia spp reports with a recent history of travel abroad, nine cases had travelled to sub-Saharan Africa (five to Ethiopia, two to Kenya, one to South Africa and one to an unspecified destination), three had travelled to Thailand, two to Turkey, one to Israel and one to Sri Lanka.

There were 12 reports of Trichuris spp with a travel history provided, of which four stated travel to sub-Saharan Africa (two to Nigeria, one to the Congo and one to Kenya), four to the Indian subcontinent (all to Bangladesh), one each to Indonesia, the Philippines and Peru; no country of travel was specified for one case.

Of the nine Ascaris spp reports that stated recent travel abroad; three stated travel to the Indian subcontinent (one each to India, Pakistan and Bangladesh), one each to Rwanda, the Congo and Indonesia and three had no country of travel stated.

There were eight reports of hookworm infection associated with recent travel abroad. Four stated travel to sub-Saharan Africa (one each to Sierra Leone, Tanzania, Uganda and Zambia), one each to Bangladesh, Philippines and South America and one report had no country of travel stated.

There were five reports of Strongyloides spp where there was known recent travel abroad, of which two reported travel to South East Asia and the Far East (one to Thailand, the other unspecified) and one each to Nigeria, Bangladesh and Brazil.

One report of Hymenolepis spp stated travel to India.

Discussion

Helminth infections are reported in small numbers in England, Wales and Northern Ireland. It is not generally possible to distinguish between infections in travellers and new entrants to the UK using the information available in Labbase 2. It has been reported previously, however, that helminth infections may be more common in migrants rather than shorter term travellers and the infections described above were acquired in regions that many migrants arrive from or subsequently return to when visiting friends and family.
KEY POINTS

• In 2004, there were 652 laboratory reports of hepatitis A in England, Wales and Northern Ireland. A history of travel was only recorded for 4%. Travel history is, however, poorly captured by hepatitis surveillance so this is likely to be an underestimate.

• Of the cases with a history of travel, 15 of 23 cases had travelled to the Indian subcontinent. Fifty percent of travellers to this area are those visiting friends and relatives and unimmunised/non-immune migrants making such trips may be at risk of acquiring hepatitis A infection.

Introduction

The hepatitis A virus causes an acute viral disease of the liver that is typically transmitted by eating or drinking contaminated food and water. Outbreaks of infection have also been linked to injecting or non-injecting drug use. A few days after infection an abrupt onset of fever, lethargy, loss of appetite, nausea and abdominal discomfort occurs, subsequently followed by jaundice. Although the disease is usually self-limiting, symptoms may be present for as little as a week or up to several months. In highly endemic areas, most infections occur during early childhood, the majority of cases do not show any symptoms and cases of fulminant acute hepatitis are rare. In non-endemic areas, or in travellers from these areas, a more serious infection may occur in non-immune adults.

Hepatitis A is particularly common in countries with poor sanitary and hygiene conditions such as Africa, Asia and Central and South America. It is also common in countries with economies in transition and some regions of industrialised countries where sanitary conditions are sub-standard such as Southern and Eastern Europe and some parts of the Middle East.

The WHO estimates that globally 1.5 million clinical cases occur each year. The incidence of hepatitis A is closely related to socioeconomic development and sero-prevalence studies show that the prevalence of anti-HAV antibodies in the general population ranges from 15% to 100%.

Hepatitis A infection can be prevented by good hygiene, particularly effective hand washing and consumption of safe drinking water and food. Vaccination can be used to protect groups at high risk of infection, including people who have been in contact with someone else with the infection, travellers to countries where the infection is common and other groups such as injecting drug users.

Sources of data and their limitations

Laboratory reports for 2004 were extracted from Labbase 2 on 16 March 2005. Data for Northern Ireland supplied by CDSC Northern Ireland.

Findings

In 2004, there were 652 laboratory reports of hepatitis A in England, Wales and Northern Ireland; only 23 reports (four percent), all from England, reported a history of recent travel abroad. Of these 23 cases, nine had travelled to Pakistan and six to India. In addition, cases also reported travel to Egypt, Eritrea, Greece, Russia, Spain and Thailand (no country of travel was reported for two cases). Thirteen of these cases were male and nine were female.
Discussion

A history of recent travel was only reported for four percent of hepatitis A cases in 2004. Capture of information on travel history for cases of hepatitis A is, however, very poor\(^9\), so this is likely to be an underestimate. For the cases with a travel history the reason for travel and country of birth are unknown. However, 15 of 23 cases, had travelled to the Indian subcontinent and the International Passenger Survey has shown that up to 50% of travellers from the UK to this region were visiting friends and relations\(^{61}\). Therefore, non-immune non-UK born residents and their families may be at increased risk of acquiring hepatitis A when visiting friends and relatives in their country of origin, particularly in the Indian subcontinent.

**Hepatitis E** is transmitted in the same way as hepatitis A and has a similar clinical course; however, it can cause high mortality in pregnant women during the third trimester. There is no vaccine available. Hepatitis E is highly endemic in parts of the world with inadequate sanitation and poor supplies of clean water (including South and South East Asia and most parts of Africa), where it can account for up to half of all cases of acute hepatitis and fulminant hepatic failure\(^{98}\). Only small numbers of cases are reported in England, Wales and Northern Ireland each year (e.g. 42 laboratory reports in 2003) and travel history is poorly captured. Where a travel history is given this is most often to the Indian subcontinent\(^{91}\) so migrants from this area travelling back to visit friends and relatives may have an increased risk of infection.

**Polio** is an enterovirus that can cause paralysis. It is a vaccine preventable disease and transmission occurs predominantly via the faecal-oral route in conditions of poor sanitation. The last case of wild-type poliovirus to occur in the UK was acquired and diagnosed in India in 1993\(^{99}\). In 1988, the WHO launched a global initiative to eradicate polio by the end of the year 2000. The number of cases worldwide has since fallen by over 99%, from an estimation of more than 350,000 cases in 1988 to 1255 reported cases in 2004\(^{100}\). The number of polio-infected countries currently stands at four (Nigeria, India, Pakistan and Afghanistan\(^{100}\). Migrants from these countries may be at risk if not immunised, either as a result of exposure prior to arrival in the UK, or as a result of travel back to their country of origin.
Arthropod borne disease

KEY POINTS

• Importations of confirmed and probable cases of dengue fever have been increasing in recent years.

• The majority of dengue cases (with a known history of travel) in 2004 had travelled to South Asia, an area from which many migrants come and to which they may return to visit friends and relatives. Repeated visits may put them at risk of dengue haemorrhagic infection.

INTRODUCTION

Dengue virus is transmitted by female *Aedes* mosquitoes which primarily feed during daylight hours. After an incubation period of approximately eight to ten days the initial symptoms may appear similar to influenza; most cases suffer from headaches and fever, and a rash may appear three to four days later. Dengue can be a debilitating illness and an infected person may feel tired for up to three months after infection. Dengue haemorrhagic fever is a more serious and potentially fatal disease which usually results from a second or subsequent infection with a different serotype; the patient may subsequently go on to develop the more severe dengue shock syndrome, caused by massive intravascular fluid loss.

Dengue is endemic in over 100 countries in tropical and sub-tropical areas of Asia, the Pacific Islands, the Americas, Africa and the Eastern Mediterranean. The highest burden of disease occurs in South East Asia and the Western Pacific, but over the last few years there has also been a rising trend in South America and the Caribbean. An estimated 2.5 billion people (roughly 40% of the world’s population) are at an ongoing risk from infection. It is estimated that annually there are 100,000 cases of dengue haemorrhagic fever (DHF) worldwide. There is currently no vaccine available to prevent dengue fever.

SOURCES OF DATA AND THEIR LIMITATIONS

Laboratory reports from the Special Pathogens Reference Unit (SPRU), Health Protection Agency, Porton Down, Salisbury.

Cases are classified as suspected, probable, confirmed and past exposure, using defined criteria and laboratory diagnosis which may be confirmatory (positive isolation and/or the polymerase chain reaction test) or supportive (by serology i.e. ELISA for IgG or IgM). Travel history information is not always provided. Reason for travel and country of birth are not recorded.

FINDINGS

Since 2001, there has been an increase in confirmed and probable cases of dengue fever imported into the UK. In 2004, there were 70 confirmed cases of dengue, 55 of which had a history of recent travel abroad, although all are presumed to be travel-associated. Twenty-four cases had probably acquired the infection in South Asia (nine in India, five in Bangladesh and eight in Sri Lanka), 14 in South East Asia (including seven in Thailand, six in Indonesia and one in the Philippines) and five in the Caribbean. There were also cases from Africa (three), Central America (three), South America (three) and North America (three).
In addition, there were 83 probable cases, 57 of which reported recent travel. Thirty-one had travelled to South Asia (14 to Sri Lanka, 11 to India, five to Bangladesh and five to Thailand). Ten had travelled to the Caribbean, seven had travelled to Africa, four to South East Asia, three to South America, one to Central America and one to the Middle East.

Discussion

The prevalence of dengue is continuing to increase worldwide. Relatively small numbers of cases are imported into the UK, though in recent years the numbers have been increasing. Although no data are available on the reason for travel, or whether the cases were travellers or migrants, 44% of confirmed cases and 54% of probable cases with a history of travel probably acquired their infection in South Asia. The 2001 Census showed that over 1,000,000 people living in the UK had been born in South Asia, with the highest numbers from India and Pakistan. Approximately 50% of trips to this area are made by VFRs61. It is also estimated that over 80,000 migrants from South Asia arrived in the UK in 200414, therefore there are a large number of migrants living in the UK who may be at risk of dengue infection (and of dengue haemorrhagic fever if they suffer repeated infections with different subtypes) through visits to see friends and relatives.

FILARIASIS

KEY POINTS

• Only small numbers of cases of filariasis are imported into England, Wales and Northern Ireland each year.

• In 2004, loasis was the most frequently reported infection; eight cases were reported, however, a travel history was only provided for two.

Introduction

Filaria is the term used for a syndrome of illnesses that may occur after infection with nematodes of the Filaroidae family. They are transmitted by arthropods such as mosquitoes, black flies and tabanid flies depending on the infectious organism90.

Lymphatic filariasis may be an acute or chronic infection, with or without fever and is caused by several different nematodes which are transmitted by various species of mosquito. It has a wide range of clinical manifestations including: lymphangitis, spermatic cord lesions, hydrocele and elephantiasis. Wuchereria bancrofti occurs throughout tropical regions of Africa, Asia, South America and the Pacific, Brugia timori occurs in small foci in Indonesia and Brugia malayi occurs in South East Asia and the Far East. It is estimated that 120 million people in at least 80 countries are infected with lymphatic filarial parasites and that 1 billion people are at risk of acquiring the infection.

Globally, onchocerciasis (also known as river blindness) is the second most common infectious cause of blindness. The infection is caused by Onchocerca volvulus, transmitted by a black fly of the genus Simulium.
In addition to blindness it can also cause rashes, nodular skin lesions, intense itching and depigmentation of the skin, lymphadenitis and general debilitation. Onchocerciasis is endemic in 35 countries worldwide, 28 of which are in tropical Africa. Globally, approximately 18 million people are infected, 99% of whom are in Africa.

**Loasis** is caused by *Loa loa*, transmitted by the tabanid fly of the genus *Chrysops*. The most common clinical manifestation is a Calabar swelling but other symptoms may include fatigue, generalised pruritis and arthralgia. Sometimes worms can be seen migrating across the eye causing nodules on the conjunctiva. More serious complications may result from *L. loa* invasion of the central nervous system and other vital organs. Loasis only occurs in Africa, primarily in the rain forest and swamp forest areas of west and central Africa. It is estimated that 20 to 30 million people may be at risk of acquiring the infection; the prevalence rate is particularly high in Cameroon.

*Mansonella perstans* is transmitted by biting midges of the genus *Culicoides*. Most infections are asymptomatic, but in some individuals (particularly those from non-endemic areas) clinical manifestations may include Calabar-like swellings, pruritis, fever, or pain in the joints. *M. perstans* is endemic throughout tropical regions of Africa, South America and parts of the Caribbean. Microfilarial prevalences can reach more than 80% in adults in highly endemic areas.

**Discussion**

Only a small number of cases of filariasis are imported into England, Wales and Northern Ireland and travel history reporting is limited. In addition, it is not possible to tell from the data whether the cases were short-term travellers to endemic countries, or whether they were migrants to the UK. The acute manifestations of lymphatic filariasis tend to develop more often and more quickly in non-immune travellers than in local populations who have been exposed to infection for a prolonged period, potentially putting those visiting friends and relatives at risk.¹⁰²

**Sources of data and their limitations**

Laboratory reports for 2004 were extracted from Labbase 2, 25 January 2006. Travel history is not captured well in Labbase and reason for travel and country of birth are not recorded.

**Findings**

In 2004, 10 cases of filariasis were reported in the UK; nine cases were male and one was female. Since filariasis does not occur in the UK, it is assumed that all these cases were imported. A travel history was, however, only provided for four cases. There were eight reports of loasis, two of which had a recent travel history and were diagnosed in males aged 25 and 23 years who had probably acquired their infection in Nigeria. One case of *Mansonella perstans* was reported in a 16 year old male who had probably acquired the infection in Chad and one case of onchocerciasis was reported in a 16 year old male who had probably acquired the infection in Cameroon.
This section considers some diseases of close association that are vaccine preventable and are now generally more common in other parts of the world than in the UK.

MEASLES, MUMPS AND RUBELLA

KEY POINT

• Measles, mumps and rubella are prevalent to varying degrees throughout the world and every year a few cases are imported into England and Wales from countries where vaccine coverage is low.

Introduction

Measles, mumps and rubella are viral infections that are preventable by vaccination. Measles vaccination is offered by all 192 WHO member states as part of the WHO expanded programme on immunisation. There are also effective vaccines available against mumps and rubella, although not all countries offer all of these vaccinations as part of their routine immunisation schedule. High levels of vaccine coverage are required to prevent outbreaks of measles, mumps and rubella.

Measles causes an acute illness. The first sign of infection is usually a high fever which begins approximately 10-12 days after exposure and lasts for up to a week. The patient may also develop cold-like symptoms, red and watery eyes and small white spots inside the cheeks. After several days, a rash develops, usually on the face and upper neck which subsequently spreads downwards to the hands and feet over a period of about three days. Severe measles is most common in poorly nourished young children. The most serious complications include blindness, encephalitis, severe diarrhoea, ear infections and severe respiratory infections (the most common cause of death associated with measles).

Measles remains a leading cause of death among young children and is a major cause of morbidity in low income countries. It is common in parts of the world where vaccine coverage is low. In 2004, the WHO estimated that worldwide there were 454,000 deaths from measles; the highest numbers were reported from sub-Saharan Africa (216,000 deaths) and South Asia (202,000 deaths).

About a third of children infected with the mumps virus have no symptoms. Swelling in the parotid glands may, however, occur 14 to 21 days after infection. Other symptoms include pain when chewing or swallowing, fever, weakness and tenderness and swelling in the testicles.

Mumps occurs worldwide with varying incidence between countries. By the year 2000, approximately 120 countries or regions had included mumps vaccination in their national programmes. However, in some regions, particularly Africa and South East Asia where mumps vaccine is not offered, incidence remains high with epidemic peaks every two to five years, mostly affecting children five to nine years of age.

Rubella is usually a childhood illness which causes a mild rash and slightly raised temperature. The infection is spread by airborne droplets when an infected person coughs or sneezes and has an incubation period of 14-21 days. However, if a woman is infected with rubella early in pregnancy, she has a 90% chance of passing the virus on to her foetus which may result in the death of the foetus or congenital rubella syndrome.

Rubella occurs worldwide with varying incidence. In 2001, 123 countries/territories reported a total of 836,356 rubella cases, however, few countries undertake rubella surveillance so limited accurate data are available. Epidemics occur...
Molecular fingerprinting of isolates indicates, however, that other measles cases may have been imported or occurred secondary to imported strains. For example, measles virus from the case infected in the British Virgin Islands was identified as a D8 strain. A cluster of five secondary measles cases in a nursery were associated with this case, and a D2 measles strain imported from Kenya caused five secondary cases in a boarding school.

**Mumps**

In 2003, the incidence of mumps increased to 1545 confirmed cases in England and Wales, compared with only 497 reported in 2002. Most of the cases occurred in older teenagers and young adults in secondary schools and universities throughout England and Wales indicating widespread indigenous mumps transmission. When there is indigenous transmission it becomes difficult to identify imported cases. Three cases had histories of travel to Egypt, Pakistan and Turkey respectively. As genotypes were not identified, it was not, however, possible to definitively state where the individuals were infected.

**Rubella**

In 2003, there were 17 confirmed cases of rubella in England and Wales including two infants born with congenital rubella syndrome. The mother of one of the infants had acquired rubella infection in her country of origin (Africa) early in her pregnancy before coming to the UK. Two other cases of rubella infection were associated with travel to South Africa.

**Discussion**

The prevalence of measles, mumps and rubella varies throughout the world depending on the vaccine coverage rates. As shown by these data, migrants from regions such as Africa, South Asia and Europe may import vaccine preventable infections into the UK, where secondary spread may occur if vaccine coverage levels are sub-optimal.
Sources of data and their limitations

Laboratory reports of toxigenic *C. diphtheriae* from the Streptococcus and Diphtheria Reference Unit, Respiratory and Systemic Infections Laboratory, Centre for Infections, provided 1 February 2005. Reason for travel and country of birth are not recorded.

Findings

In 2003, there were three isolates of toxigenic *C. diphtheriae* in England and Wales. Two were cutaneous infections both acquired abroad; one was acquired in Cambodia, the other in Bangladesh. There were no cases reported in 2004.

Discussion

Toxigenic diphtheria is now very rare in the UK and recent cases have often been cutaneous infections imported from Asia. Migrants arriving from endemic countries with a low vaccination coverage rate may have been at risk of infection. In addition, many migrants return to their country of origin to visit friends and family in these areas and may be at risk of becoming infected if not fully immunised.

Introduction

Diphtheria is an infectious disease caused by *Corynebacterium diphtheriae*. The infection is spread from person to person by respiratory droplets produced through coughing and sneezing\textsuperscript{105}. Symptoms occur two to five days after infection and range from a moderately sore throat to toxic life-threatening diphtheria of the larynx, or of the upper and lower respiratory tracts. Diphtheria is often complicated by diphtheritic myocarditis (toxic damage to heart muscles) and neuritis (toxic damage to peripheral nerves). The disease can be fatal, between five and ten percent of diphtheria patients die despite receiving the correct treatment. Cutaneous diphtheria may occur in countries where the disease is endemic. The lesions which appear on exposed areas of skin usually start as vesicles and quickly form small, clearly demarcated, and sometimes multiple ulcers\textsuperscript{106}.

There is an effective vaccine available against diphtheria, which is part of routine immunisation programmes in most countries of the world, although coverage may be variable and may be low in poorer countries\textsuperscript{78}. Diphtheria is endemic in the Indian subcontinent, South East Asia and South America and during the 1990s, also re-emerged in the Newly Independent States of the Former Soviet Union\textsuperscript{105}. The disease became rare in England and Wales following the introduction of mass immunisation in 1942; primary vaccine coverage (three doses) for children aged two has been 94% since 2001, just below the WHO target of 95%.
MENINGOCOCCAL DISEASE

KEY POINT

• Meningococcal disease may be a risk for migrant populations travelling to see friends and relatives in the African meningitis belt or to Saudi Arabia for the Hajj pilgrimage.

Meningococcal disease is caused by the bacteria Neisseria meningitidis. Meningococci are divided into distinct serogroups, according to their polysaccharide outer capsule. The most common serogroups that cause disease worldwide are groups A, B, C, Y and W135. Most disease in the UK is caused by serogroups B and C. Serogroup A is the main cause of disease in Africa and Asia. Transmission occurs via the respiratory route and clinical meningeal or septicemic illness may occur after an incubation period of up to ten days. The immunisation schedule in the UK includes vaccination against serogroup C. Around 1500 cases (all serogroups) have been seen each year in England and Wales in recent years \(^{107}\). No data, however, are available on the number of cases that occur in migrants and very limited data are available on travel-associated disease \(^{90,91}\).

The highest burden of meningococcal disease in the world occurs in the 'African meningitis belt', which extends across the dry, savannah parts of sub-Saharan Africa from Senegal in the west, to Ethiopia in the east. Epidemics in the 'meningitis belt' countries occur in cycles, usually in the dry season. Migrants from this region may be at risk of exposure prior to arrival in the UK or as a result of travel back to their country of origin.

In 2000, an international outbreak of meningococcal infection due to serogroup W135 was associated with the Hajj pilgrimage. Over 330 cases (in pilgrims or contacts of pilgrims) in 12 countries were reported to the WHO between 28 February 2000 and 26 May 2000 \(^{108}\). The majority of cases were identified in Saudi Arabia (241 cases, 73%), and the remainder were identified in the UK (31 cases, 9%), France and Oman (18 cases, 5% each), the Netherlands, Singapore, the United States, Morocco, Germany, Iran, Kuwait and Finland. There were 71 deaths associated with the outbreak. The quadrivalent (A, C, W135, Y) vaccine was recommended for pilgrims attending the Hajj in 2001 but uptake was not 100% and cases of W135 associated with the Hajj occurred again in 2001 \(^{109}\). Quadrivalent vaccine was, therefore, made an entry requirement for all pilgrims to the Hajj and Umrah from 2002 and is currently the only meningococcal vaccine available for travellers from the UK.
Sexually transmitted infections

In England, Wales and Northern Ireland KC60 returns for all new diagnoses seen are made to the Centre for Infections and CDSC Northern Ireland from GUM clinics. At present, most surveillance systems used to monitor STIs do not, however, routinely collect information on country of birth. Although there are no data available on the burden of STIs in the non-UK born population, health care practitioners should be aware that migrants from high prevalence countries may have specific health care needs in this regard and need to be managed accordingly within the UK health care system. Information on country of birth may in future be collected as part of the proposed Common Data Set for Sexual Health that will collect information from a variety of health care settings. This information should allow a more detailed exploration of sexual health among migrants and the burden of STIs seen within migrant communities in the UK.

There are more than 20 pathogens that can be transmitted by sexual intercourse. Most of them are curable with appropriate treatment. Sexually transmitted infections (STIs) are a major global cause of acute illness, infertility, long-term disability and death. In low income countries STIs are among the top five diseases for which adults seek health care, and in women of child bearing age STIs (not including HIV) are second only to maternity as causes of death and disability. STIs also enhance the transmission of HIV and adequately treating STIs is an important component of HIV prevention.

In 1999, the WHO estimated that worldwide 340 million new cases of curable STIs, including syphilis (12 million), gonorrhoea (62 million), genital chlamydial infection (92 million) and trichomoniasis (174 million), were seen in men and women aged between 15 and 49 years. There is considerable heterogeneity in the incidence of infection both between and within countries. The largest number of new infections occurred in South and South East Asia (151 million) followed by sub-Saharan Africa (69 million) and South America and the Caribbean (38 million), but the highest rates of new infections occurred in sub-Saharan Africa (119/1000 population). In general the prevalence of STIs globally tends to be higher in urban populations, and particularly in the unmarried and in young adults. Females with STIs tend to be younger than males, reflecting sexual mixing patterns.

KEY POINT

• Sexually transmitted infections are common worldwide and migrants from high prevalence countries may have specific health needs in this regard. The STI surveillance programmes do not, however, currently collect information on country of birth, so the prevalence of sexually transmitted infections in the non-UK born population is unknown.

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Hepatitis C

KEY POINT

- Hepatitis C is common worldwide and migrants from high prevalence countries may be at increased risk of infection. The HCV surveillance programmes do not, however, currently collect information on country of birth, so the prevalence of HCV in the non-UK born population is unknown.

Although there are no data available on the burden of HCV in the non-UK born population, health care practitioners should be aware that migrants from high prevalence regions may be at increased risk of infection.

Hepatitis C is a major cause of acute hepatitis and chronic liver disease, including cirrhosis and liver cancer. Globally, an estimated 170 million people are chronically infected with HCV and 3 to 4 million people are newly infected each year\(^{31}\). HCV is spread primarily by direct contact with human blood and the predominant routes of transmission of HCV infection worldwide are the use of unscreened blood transfusions, and re-use of needles and syringes that have not been adequately sterilised. In England and Wales the infection is treated with a combination of interferon alpha and ribavirin\(^{112}\), however, such treatment is too expensive for use in many countries and no vaccine is available.

The WHO estimates that the regions with the highest prevalence of HCV infection are Africa (5.3%), the Eastern Mediterranean (4.6%), the Western Pacific (3.9%) and South East Asia (2.2%). By contrast the prevalence is estimated to be approximately 0.5% in England\(^{113}\).

The prevalence estimate for hepatitis C in England was based on sero-prevalence studies undertaken in antenatal and GUM clinic attendees. Routine surveillance of hepatitis C monitors laboratory reports to the Health Protection Agency Centre for Infections and the prevalence of anti-HCV in blood donors and injecting drug users. In addition, the molecular epidemiology of HCV in the UK is being analysed by a sentinel surveillance study. At present, however, these studies do not collect any data on country of birth.
Schistosomiasis

KEY POINTS

- The most important region of acquisition for schistosomiasis continues to be sub-Saharan Africa.
- Most cases occur in young males.

Introduction

Schistosomiasis is a parasitic infection caused by blood flukes (trematodes). Fresh water becomes contaminated with Schistosoma eggs by the urine or faeces of infected people. After an intermediary life cycle stage in a snail, infection is passed on when larvae hatch and penetrate the skin of people wading, swimming, bathing or washing in contaminated water. Schistosomiasis has a low mortality rate, but can be very debilitating. A rash may occur when the larvae initially penetrate the skin, followed by fever, chills, cough and muscle ache within one to two months of infection. However, most symptoms of schistosomiasis result from an immune response to the eggs and repeated infection over many years can result in damage to the liver, intestines, lungs and bladder.

Schistosomiasis is endemic in 76 countries and territories and is one of the most widespread infections of man. A major factor associated with the spread and increased prevalence of schistosomiasis is water development projects, particularly man-made lakes and irrigation schemes, which can lead to changes in the snail population. The three major species of schistosoma that cause human disease are S. haematobium, found mainly in Africa and the Middle East, S. mansoni, found mainly in Africa, the Middle East, eastern South America and the Caribbean and S. japonicum found mainly in the Far East. Over 600 million people are at risk of infection, with an estimated 200 million people infected worldwide. The largest burden of infection occurs in Africa where there may be up to 200,000 deaths per year. The most severely affected countries in Africa are Angola, Central African Republic, Chad, Egypt, Ghana, Madagascar, Malawi, Mali, Mozambique, Nigeria, Senegal, Sudan, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe.

Sources of data and their limitations

Laboratory reports for 2004 were extracted from Labbase 2, 25 January 2006. Travel history is not captured well in Labbase and reason for travel and country of birth are not recorded.

Findings

In 2004, 73 cases of schistosomiasis were reported in England, Wales and Northern Ireland. Forty-two percent (31/73) of cases were due to S. haematobium and 22% (16/73) of cases were caused by S. mansoni. Of the reports in 2004, 73% (53) were in males and 23% (17) in females, and the majority of cases (57) occurred in those aged between 15 and 39 years. Over half of all cases were reported from London.

In 2004, only 29% (21/73) of reports had a travel history provided. Of those, 16 reported recent travel to sub-Saharan Africa, (four to Malawi, three to Uganda, two each to Zambia and Zimbabwe, and one each to Sudan, Somalia, Congo, Madagascar and Eritrea).
Discussion

Total reports of schistosomiasis have declined since 1995 for reasons which are unclear. S. haematobium continues to be the organism which is most frequently imported into England, Wales and Northern Ireland and young males seem to be at highest risk. Forty-four percent of asylum seekers (approximately 14,745 people) and 8% of non-UK born students (24,600) arrived from African countries in 2004 and some may have been at risk of schistosomiasis. In addition, over 400,000 people travelled to Africa to visit family and friends. Therefore, a large number of migrants to the UK are potentially at risk of infection. Further information about the country and reason for travel would assist in identifying the proportion of infections in new entrants or those visiting friends and relatives, and would help determine which groups are at greatest risk of infection.
FURTHER RESEARCH/SURVEILLANCE REQUIREMENTS

It is clear from the data presented that many surveillance systems do not capture country of birth/travel history/reason for travel. This information would help to determine the burden of disease in migrant populations and efforts should therefore be made to improve surveillance systems to capture this information. This requires not only that surveillance systems are further developed to capture this information, but also that the health care practitioners providing surveillance data are aware of the importance of recording this information and are supported with appropriate information technology to enable them to do this.

Many of the infections to which migrants may be exposed are endemic in low income countries and poverty alleviation in these countries would help reduce the burden of infection. The potential role of the UK’s contribution to global poverty alleviation on domestic disease burden is worthy of consideration.

INDIVIDUAL CARE AND DISEASE CONTROL

This chapter has demonstrated some of the range of infections to which migrants may be exposed, either prior to arrival in the UK or through return visits back to their country of origin to see friends and relatives. Health care practitioners, particularly those in primary care, need to be aware of this range when first assessing a new entrant’s health needs, but also when advising those travelling. Sources of information on travel advice are listed in the resources section of this document. In order to properly assess and manage the health needs of migrants, practitioners may require language support and an appreciation of different cultures’ understanding of, and beliefs about, diseases. Making sure that a migrant’s immunisations are up to date (either on arrival in the UK and/or using travel consultations opportunistically to do this) is important when the migrant has come from, or is making return trips to areas with low vaccine coverage.

Migrants travelling to visit friends and relatives may not consider that they are at risk of illness (see Malaria - Chapter 5) and consequently may not seek professional health advice prior to their trip. Therefore, information on the risk of infection may need to be promoted in other settings e.g. by the use of community organisations, school education, local media, pharmacists and travel agents among others.
Health Protection Agency recommendations

Non-UK born communities should have access to culturally appropriate and language supported health services including travel health advice.

Primary care practitioners in particular should be supported to assess the range of migrant health needs.

Health care practitioners should ensure that migrants are offered a full set of immunisations according to the UK schedule.

Awareness of a range of disease risks associated with travel back to their countries of origin should be raised in migrant communities and with their health care professionals.

Travel health advisors should follow recommended guidance when advising those visiting friends and relatives, as for any other traveller.

Surveillance systems should be improved to better capture information on country of birth, travel history and reason for travel.

The potential impact of the UK’s contribution to alleviation of global poverty on domestic disease rates could usefully be considered.
CHAPTER 7

Public health recommendations - a summary
Throughout this report public health recommendations have been summarised for individual infectious diseases. There is much overlap in these recommendations with many similar issues. This final chapter draws together all the common themes in the recommendations to guide public health actions.

The report has demonstrated very clearly that for certain infections the major burden of disease falls upon particular groups of people who were not born in the UK. None of the surveillance systems described in this report capture information on country of birth for all cases, but in 2004, among those for whom information was available, 70% of TB cases and HIV cases reported in England, Wales and Northern Ireland, and 70% of malaria cases reported in the UK occurred among the non-UK born. It can also be estimated that in any given year the majority of chronic hepatitis B infections newly added to the existing numbers of such infections in England and Wales are likely to be in the non-UK born. Migrants may also experience a range of other infectious diseases, including those that are commonly thought of as travel related. The fact that the major burden falls on some of the non-UK born does not mean, however, that these groups overall have a very high prevalence of infectious disease. For most diseases prevalence data in specific population groups are unavailable, but the unlinked anonymous HIV programme has demonstrated for example that the HIV prevalence among sub-Saharan African attendees of genitourinary medicine clinics in England, Wales and Northern Ireland is less than four percent. Surveys to examine the prevalence of other infections in migrants would be helpful.

Secondary health services for infectious diseases need to reflect the needs of those most affected by these diseases; this in particular means ensuring that access is equitable and that adequate language support is provided, but also making sure that health care practitioners are provided with training and information about health beliefs and cultural understanding of various illnesses in different groups. There are already some good resources available to support health care practitioners in this regard\footnote{16,17} but research to identify gaps in what is required would be helpful. For some infectious diseases, such as HIV and sexually transmitted infections, gender appropriate services are also an important consideration and it needs to be recognised that different cultures vary in their view of what constitutes a gender appropriate service. Defining best service models requires engagement with affected groups.

The reason for the increased burden in some of the non-UK born is in large part related to the prevalence of disease in the countries from which they originate, and it is likely that many infections are largely acquired prior to arrival. However, there is a danger in assuming that this is the entire explanation and it is important to investigate this further. For malaria it is well recognised that the risk is related to return travel to malarious areas after migration to the UK, and the role of such travel in determining the burden of other diseases requires research. Furthermore, the role of transmission in the UK within migrant groups, or between migrants and other risk groups, is not well described. The impact of socioeconomic circumstances within the UK on risk of acquisition of disease and risk of disease progression also requires exploration. These risk factors are important to investigate because they are amenable to public health action in the UK, whereas prevalence of disease in the countries from which migrants originate is much more difficult, though not impossible, for the UK to influence. Better surveillance of infectious disease in the non-UK born (to improve the number of cases with information available on country of birth and to better capture travel history, reason for travel and socioeconomic circumstances), is essential to help to guide appropriate public health action. Improved data on migration would also be beneficial for the analysis of health trends.

There are guidelines in place for the prevention and treatment of certain infections which have been referenced in this report. These guidelines apply to all patients irrespective of where they were born, though the specific needs of people not born in the UK should be taken into consideration in their application. (For example, anti-malarials are not generally available on the NHS but an analysis of the current cost effectiveness of providing them to those visiting friends and relatives would be useful). Most people who come to settle in the UK will be entitled to free care at the point of use, as for any UK resident. Anyone, irrespective of residence status, is entitled to NHS care for notifiable infectious diseases, which include malaria, TB and diarrhoeal diseases. Patients, including those with uncertain immigration status, need to be made aware of this. For those with non-notifiable transmissible infectious disease (including HIV) who are not entitled to NHS care and who cannot afford
risks of infectious diseases also needs to be raised in the
general UK born population. Migration is undeniably a politically
sensitive subject and the general public have divergent
attitudes towards it. Indigenous populations in all countries of
the world may be anxious about migration for
a variety of reasons, including concerns about employment,
housing and culture. Sometimes these anxieties focus on health
threats but there is little evidence that the wider population are
at risk of significant levels of transmission of disease from
affected migrants, especially during normal social contact.
This needs to be conveyed to the general public since fear can
lead to prejudice which increases stigma and is unlikely to be
beneficial to public health. The media have a responsibility in
this regard.

Primary care is a hugely important aspect of health care
delivery in the NHS and is uniquely placed to consider the
totality of any patient’s health needs. Most migrants are young
adults and will have similar health needs to UK born people of a
similar age. Some will, however, have greater needs that may or
may not be associated with infectious diseases. This report has
focussed on infectious diseases because they are within the
remit of the Health Protection Agency, but infectious disease
risk needs to be seen in the context of a range of health needs
which will vary enormously depending upon the individual and
their circumstances. For example, dealing with the
psychological effects of trauma may be the first health priority
initially for some asylum seekers. Ideally, when a migrant first
settles in the UK, they should be encouraged to register with a
general practitioner as soon as practicable and given equitable
access to primary care services. Consideration should be given
to the concept of an extended ‘new patient’ check for certain
groups of migrants in primary care, which could provide an
opportunity to consider a range of health needs, including
those related to infectious disease (for example making sure
that full immunisation has been offered as per the UK
schedule). Importantly, however, this could also act as a
mechanism for health education and health promotion and, in
view of the possibility of continuing risk exposure, could begin
a dialogue about infectious diseases that would help these
migrants at risk protect themselves and their families in the
long-term. Many GPs will already be considering what special
needs their patients might have if born abroad, but in order to
best identify these needs and contribute to the health of their

One of the issues that has been demonstrated in this report is
that migrants at risk of infectious disease may not be aware
either that they are infected or that they may be at ongoing
risk of disease after arrival in the UK. Furthermore the families
and immediate community of migrants (usually other first or
second generation migrants) may also be at increased risk of
disease. Awareness of risk therefore needs to be raised in
migrant communities, and in ethnic groups with links to
migrant communities, as well as in health care practitioners
looking after these groups. For some diseases, such as HIV and
chronic hepatitis B infection, encouragement of at risk groups
to be tested for the disease may also have individual and public
health benefit. In some cultures there is stigma attached to
many infectious diseases. Awareness must be raised and stigma
reduced in a culturally appropriate way for each community
and the help of community organisations may be invaluable
in this regard. Innovative ways to reach these communities and
help them protect themselves need to be shared and further
developed. This is particularly pertinent in relation to travel.
A migrant travelling to their country of origin to see friends and
relatives may not seek travel advice since they are perhaps
visiting a familiar environment and erroneously assume
they have some immunity to the diseases common there
(e.g. malaria). Finding ways to engage with this group to
provide them with appropriate travel advice on a range of
subjects is particularly challenging. Awareness about the
risks of infectious diseases also needs to be raised in the
general UK born population. Migration is undeniably a politically
sensitive subject and the general public have divergent
attitudes towards it. Indigenous populations in all countries of
the world may be anxious about migration for
a variety of reasons, including concerns about employment,
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threats but there is little evidence that the wider population are
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a dialogue about infectious diseases that would help these
migrants at risk protect themselves and their families in the
long-term. Many GPs will already be considering what special
needs their patients might have if born abroad, but in order to
best identify these needs and contribute to the health of their

to pay for recommended treatment privately, there remains a
gap between what may be done in the public health interest
and what is publicly funded. This may apply particularly to
undocumented migrants who have limited entitlement to NHS
treatment or care and yet who may be at particular health risk.
Research to determine the level of risk in this group would be
useful, though by definition this group are hard to reach.
Government sponsored projects to provide health care for
undocumented migrants operate in some other European
countries (e.g. Italy) and research into the likely cost
effectiveness of provision of such services in England, Wales
and Northern Ireland would be helpful. In this regard it should
be remembered that for diseases such as TB and HIV,
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development of drug resistant disease, which has serious
public health and economic consequences.
migrant communities, they need to be supported in this function. Language support and an understanding of different cultures are just as important in the primary care setting as in specialist services for infectious diseases. National NHS guidance on what health issues to consider in which groups would also be helpful.

Screening for infectious diseases in migrants may be considered for three reasons: for the individual’s benefit, for occupational reasons, or for public health reasons. It is always important to be clear why any particular screening programme is being offered. Since the burden of many infectious diseases falls upon some non-UK born people, screening new entrants for infections to which they may have been exposed, with the aim of treating them, may be appropriate, particularly for individual health gain. The NHS is one of the biggest employers of migrants in the UK and guidelines already exist for occupational screening of NHS employees whether migrant or not. Wider screening programmes that are operated with public health justification must be adequately evaluated for both public health impact in the UK and cost effectiveness. It should also be remembered that, with little evidence of a significant threat, screening based on a concept of protecting the general population from disease in migrants is both misleading and stigmatising. Where screening of new entrants is carried out it should be patient centred and should not stigmatisate affected groups. The migrant should perceive the benefit of the activity to them and their family. It is also preferable that screening should not be fragmented but that there is continuity of care from first consideration of infectious disease risk to decision making about results and provision of any treatment. This is particularly important for populations who may be mobile, such as asylum seekers, or where there is a risk that patients will be lost to follow up. These considerations suggest that the setting of any screening is important. Screening for certain infectious diseases by the NHS (such as TB and HIV) is generally done in the specialist setting, but consideration could be given to whether some testing for infectious diseases might be more widely done in primary care. Feasibility studies and cost effectiveness modelling of such activity could help inform policy. It must also be remembered, however, that the risk of disease may continue after arrival in the UK, and so should be considered on an ongoing basis, not just at first entry. Development of more rapid diagnostic testing would also be beneficial in this regard and advances are being made in this field for TB. Rapid non-invasive testing for infectious diseases would be the ideal for infectious disease management generally, but this is applicable to all groups, not only migrants.

Current surveillance of infectious diseases does not gather information on migration status of cases. This means that it is difficult to get an accurate picture of which categories among the non-UK born may be most at risk, which in turn inhibits focussed public health action. For example asylum seekers may be at higher risk of certain infectious diseases because of the circumstances associated with their forced migration. It is particularly important to ensure that this group have access to appropriate health services. As with undocumented migrants, studies into the burden of infectious disease in this group would be helpful and the outcome of any health screening programmes (e.g. in induction centres) should be evaluated. The impact of asylum policy on the health of asylum seekers also needs exploration. Failed asylum seekers may constitute a particular at risk group since their support and access to services is very limited. As for undocumented migrants, a study of the cost effectiveness of providing health care to this group before they leave the UK would be helpful.

Finally, migration occurs against, and is in part driven by, a backdrop of global inequalities, and infectious disease epidemiology is very closely associated with poverty and deprivation. In a globalised world where goods and services flow freely across borders people inevitably follow, and so do infectious diseases. Improving the health of migrants in England, Wales and Northern Ireland is important because they represent a small but diverse proportion of our population that contributes to our economy and culture. But unless the burden of infectious disease is reduced in the countries from which they come then each new generation of migrants to the UK may face the same health issues. It would therefore be useful to review the current UK contribution to disease control programmes in source countries for migrants, and to consider how this contribution might be enhanced. Tackling global infectious disease burdens inevitably also necessitates tackling global poverty, inequality and governance issues. Although UK based organisations and the UK Government may make contributions to this, the biggest of health challenges, this is something which requires concerted action from all nations of the world.

Many organisations could play key roles in addressing the recommendations described here, including the NHS, the UK Government, academic institutions, the Health Protection Agency, NaTHNaC, non governmental and community organisations, the media, professional organisations and industry. Having outlined its recommendations the Health Protection Agency will now take this work forward by holding discussions with these stakeholders to identify optimal public health action to improve the health of migrant populations in the UK.
Health Protection Agency recommendations

Non-UK born communities should have access to culturally appropriate and language supported health services to include primary and secondary care and travel health advice.

Resources to support practitioners in managing the health issues of non-UK born patients should be further developed.

Primary care practitioners in particular should be supported to assess the range of migrant health needs, including where appropriate those associated with infectious diseases; consideration should be given to an extended new patient check for some groups of new entrants, but risk of infectious disease should be considered on an ongoing basis.

Health care practitioners should ensure that migrants are offered full immunisation according to the UK schedule; opportunities to do this include new patient registration in general practice and travel health consultations.

Guidelines for prevention and treatment of infectious diseases should be followed for migrants as for any other group, though any particular needs they have should be taken into consideration.

Awareness of a range of infectious disease risks should be raised in migrant communities, and those with ethnic links to migrant communities, and the health care professionals looking after these groups.

The general UK population should be better informed about infectious diseases in non-UK born people and their very low risk of being affected through normal social contact.

Stigma associated with particular diseases in certain groups of migrants should be addressed in culturally appropriate ways.

Health services should work with community organisations representing migrants groups to develop appropriate services, raise awareness of disease and address stigma. Innovative approaches for health services to reach migrant groups to help them protect themselves and their families from infectious disease should be shared and further developed.

Assessment of the burden of disease in particular risk groups such as asylum seekers and undocumented migrants should be attempted.

Cost effectiveness analysis should be performed on the improved provision of health services for migrant groups with very limited current entitlement.

Consideration should be given to whether testing for infectious diseases may be more widely done in primary care.

Screening for infectious diseases must be patient focused, non-stigmatising and with attention to continuity of care.

The role of factors amenable to public health action in the UK in determining disease burden in migrants should be investigated e.g. socioeconomic circumstances and travel.

The impact on the health of migrants of policy in non health areas (e.g. asylum policy) should be investigated.

Standard surveillance systems should be improved to better capture information on country of birth, travel history, reason for travel and socioeconomic circumstances.

Improved data on migration would be beneficial in analysing health trends in the UK.

Further prevalence studies of disease in migrants would help inform policy development.

The current UK contribution to disease control programmes in source countries for migrants should be reviewed with consideration of how this contribution might be enhanced.
I. WEBSITES

Migration statistics – UK

British Broadcasting Corporation (BBC). Born Abroad – an immigration map of Britain
http://news.bbc.co.uk/1/shared/spl/hi/uk/05/born_abroad/html/overview.stm

Home Office – UK Government department dealing with immigration
http://www.homeoffice.gov.uk/

Home Office Immigration and Nationality Directorate - regulates entry to, and settlement in, the UK
http://www.ind.homeoffice.gov.uk/

Home Office Research, Development and Statistics Directorate (RDS) – Government statistics on immigration, asylum and nationality
http://www.homeoffice.gov.uk/rds/immigration1.html

National Statistics – information on Britain’s economy, population and society at national and local level. Published data include: the Labour Force Survey, Census and International Passenger Survey
http://www.statistics.gov.uk/default.asp

National Statistics International Migration – data on international migration to and from the UK

Global prevalence of infectious diseases

Gideon global infectious diseases database – online information on the diagnosis, epidemiology, therapy and microbiology of infectious diseases
http://www.gideononline.com/

Health Protection Agency – includes surveillance data on the incidence and prevalence of infectious diseases in the UK
http://www.hpa.org.uk/

WHO global health atlas - standardised data and statistics for infectious diseases at country, regional, and global levels
http://globalatlas.who.int/globalatlas/

WHO immunisation schedules and coverage – global data
http://www.who.int/immunization_monitoring/en/globalsummary/scheduleselect.cfm

Migration statistics – worldwide

Migration Information Source - collates data from numerous global organisations and governments, and provides global analysis of international migration and refugee trends
http://www.migrationinformation.org/index.cfm

Organization for Economic Co-operation and Development (OECD) - trends in international migration and migration policies
http://www.oecd.org/department/0,2688,en_2649_33931_1_1_1_1_1,00.html

The European Migration Network - an EU wide network of National Contact Points which collates, provides access to and facilitates the exchange of information on migration and asylum nationally and across Europe
http://www.homeoffice.gov.uk/rds/emn.html
Legislation

Immigration, Asylum and Nationality Act 2006

The Immigration Law Practitioner's Association - provides information to members about domestic and European immigration law, and promotes and improves the advising and representation of immigrants
http://www.ilpa.org.uk/

Disease specific resources

Tuberculosis:
Department of Health: TB action plan

NICE clinical guidelines: Tuberculosis - clinical diagnosis and management of tuberculosis, and measures for its prevention and control
http://www.nice.org.uk/page.aspx?o=CG033

HIV:
British HIV association (BHIVA) - general information on HIV including treatment guidelines
http://www.bhiva.org/

Department of Health: Guidance for pre-test discussion on HIV testing

Department of Health: The national strategy for sexual health and HIV implementation action plan

Health Service Circular (HSC) 1999/183: Reducing mother to baby transmission of HIV
http://www.dh.gov.uk/PublicationsAndStatistics/LettersAndCirculars/HealthServiceCirculars/HealthServiceCircularsArticle/fs/en?CONTENT_ID=4003931&chk=YixHyY

Hepatitis B:
NICE clinical guidelines: Guidelines for the treatment of chronic Hepatitis B
http://www.nice.nhs.uk/page.aspx?o=TA96

Malaria:
Advisory Committee on Malaria Prevention in UK Travellers (ACMP) - formulates guidelines on malaria prevention in the UK
http://www.hpa.org.uk/infections/topics_az/malaria/ACMP.htm

Other infections:
Department of Health: Getting ahead of the curve: a strategy for combating infectious diseases

Department of Health: Green book (immunisation)

Department of Health: Screening for infectious diseases in pregnancy: Standards to support the UK antenatal screening programme

Travel health

Department of Health Advice for Travellers – information on how to get medical treatment abroad, including information on the European Health Insurance card (EHIC)
http://www.dh.gov.uk/PolicyAndGuidance/HealthAdviceForTravellers/fs/en

Fit for Travel (Health Protection Scotland) - public access website providing travel health information for people travelling abroad from the UK
http://www.fitfortravel.scot.nhs.uk

Health Information for Overseas Travel – travel health advice for professionals
http://www.nathnac.org/pro/yellowbook_revision.htm
International Society of Travel Medicine (ISTM) – international society committed to promoting healthy and safe travel, in co-operation with national and international health care providers, academic centres, the travel industry and the media
http://www.istm.org

International Travel and Health (World Health Organization) - offers guidance on the full range of health risks by destination and types of travel
http://www.who.int/ith

National Centers for Disease Control and Prevention (CDC): Travellers' Health - comprehensive advice for travellers from the United States
http://www.cdc.gov/travel

National Travel Health Network and Centre (NaTHNaC) – aims to improve the quality of travel health advice available to GP practices and other health care providers
http://www.nathnac.org

UK Foreign and Commonwealth Office (FCO)
http://www.fco.gov.uk/travel

Others

Citizens Advice - a service that helps people resolve their legal, money and other problems by providing free, independent and confidential advice
http://www.citizensadvice.org.uk/

Commission for Racial Equality – a UK Government organisation working for a just and integrated society, where diversity is valued
http://www.cre.gov.uk/

Health for Asylum Seekers and Refugees Portal - information, practical tools, and articles written by those with expert knowledge of working with asylum seekers and refugees. Includes basic information about different cultures
http://www.harpweb.org.uk/

International Organization for Migration - the leading international organisation for migration
http://www.iom.int/

Médecins du Monde Project: London - Médecins du Monde provides healthcare to vulnerable people in Europe
http://www.medecinsdumonde.org.uk/projectlondon/default.asp

http://www.nice.org.uk/page.aspx?o=CG026

Refugee Council - the largest charity in the UK working with asylum seekers and refugees
http://www.refugeecouncil.org.uk/

The Medical Foundation for the Care of Victims of Torture - aims to provide survivors of torture in the UK with medical treatment
http://www.torturecare.org.uk/

The Specialist Library for Ethnicity and Health - a specialist electronic library providing links to information on the specific health care needs of minority ethnic groups living in Britain
http://www.library.nhs.uk/ethnicity

United Nations Refugee Agency - leads and co-ordinates international action to protect refugees and resolve refugee problems worldwide
http://www.unhcr.org/cgi-bin/texis/vtx/home

2. BOOKS ON MIGRANT HEALTH


Appendix One:
The history of migration to the UK

The origins of the population of Europe are unclear. Although many paleoanthropologists believe that the earliest Europeans were hunter-gatherers who followed a route from North Africa, genetic data has recently shown that the DNA of Western Europeans resembles that of the people of India, suggesting that an inland migration from Asia seeded Europe between 40,000 and 30,000 years ago.\(^{118}\)

The British Isles were part of the Eurasian landmass until around 6500 BC when the English Channel was formed. Since then the population of the islands has consisted of multiple cultural groups and identities. The table below illustrates some of the key groups of migrants who have arrived in the UK and the contribution they have made to the British way of life.\(^{119-122}\)

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>40,000 – 30,000 BC</td>
<td>The first Europeans may have been hunter-gatherers who followed a route from North Africa, however, genetic data has recently shown that the DNA of Western Europeans resembles that of the people of India, suggesting that an inland migration from Asia seeded Europe.</td>
</tr>
<tr>
<td>6,5000 BC</td>
<td>The English Channel was formed. The British Isles were colonised by Celt and Pict tribes.</td>
</tr>
<tr>
<td>1st Century</td>
<td>In 43 AD the Romans invaded bringing with them four legions and about 20,000 auxiliary troops, predominantly from France, Germany and Eastern Europe. By 47 AD, the legions had penetrated as far as Cornwall, Wales and the Humber.</td>
</tr>
<tr>
<td>5th Century</td>
<td>The Roman troops left Britain around 410 AD to meet threats elsewhere. They were replaced by settlers from the German regions of Angeln and Saxony, the Anglo-Saxons. They brought their own language, which gave rise to the English spoken today. Jutes and Frisians from Denmark were also settling in the British Isles.</td>
</tr>
<tr>
<td>11th Century</td>
<td>The Anglo-Saxon period lasted for approximately 600 years, coming to an end in 1066 with the Norman conquest. In common with previous settlers, the Normans brought with them their early French language and culture which fundamentally changed the direction of the English language, government and law. During the Medieval period the first Jews were invited to settle in England to develop commerce, finance and medicine.</td>
</tr>
<tr>
<td>13th Century</td>
<td>The Jews were expelled and were followed by new waves of migrants, including German merchants and Italian bankers.</td>
</tr>
</tbody>
</table>
In 1560 Dutch Protestants fleeing religious persecution made their way to Britain.

In 1685 religious persecution forced 100,000 Huguenots to flee from France to the British Isles, bringing with them skills in silk weaving and making clocks and guns.

Black slaves, many from the Caribbean, began appearing in wealthy households in the UK as a result of the slave trade.

Merchants expanded the slave trade and increased the number of Africans living in the UK. After the 1798 Rebellion, many Irish people fled to Manchester. Irish men were frequently employed in the construction of new canals. Irish women worked as domestics and street vendors.

Further Irish migrants fled to the UK in the 1840s due to the Great Famine. Many Irish women worked in the mills while the men worked on the canals and railways.

In the 1800s, following the abolition of the African slave trade, some wealthy families brought Indian servants to Britain. Small numbers of professionals from India, mainly doctors, businessmen or lawyers, also started to establish themselves in Britain.

Black and Chinese seamen started putting down roots around some British ports.

In 1892, Britain’s first non-white MP, Indian Dadabhi Naoroji, was elected.

Following the Second World War there were significant labour shortages.

157,000 Polish people were among the first groups to be encouraged to settle in the UK; they were followed by other displaced persons from Italy, Ukraine and Germany.

Many Eastern Europeans sought refuge in the UK following the establishment of Communism.

The partition of India in 1947 was the starting point for large scale migration and settlement of people from South Asia.

On 22 June 1948 the Empire Windrush docked at Tilbury in London, delivering hundreds of men from the West Indies. Mass migration to the UK continued over the following years; the National Health Service and organisations like London Transport recruited many men and women from the Caribbean.

80,000 Asian Africans were expelled from Uganda in 1972, many of whom held British passports. 28,000 were admitted to the UK.

Large numbers of Australians, New Zealanders and South Africans moved to the UK.

Ethnic conflict in the Balkans forced thousands to seek asylum in the UK.

Changes in the EU have allowed many Eastern Europeans to work in the UK.

Source:
James, S. Peoples of Britain. 2006. http://www.bbc.co.uk/history/ancient/prehistory/
Appendix Two: Key British legislation affecting migrants

**Aliens Act 1905**
Targeted ‘undesirable aliens’: paupers, lunatics, vagrants and prostitutes. The diseased and criminal could be refused entry to Britain.

**British Nationality and Status of Aliens Act 1914**
Granted the common status of British subject upon those persons who had specified connections with the Crown’s dominions. This included: persons in the UK, and British colonies and self-governing dominions (Australia, New Zealand, South Africa, Canada and Newfoundland). This status was held by people born within the Crown’s dominions, or naturalised in the UK and by the first generation born elsewhere, but only through legitimate descent in the male line.

**Aliens Restriction Act 1914**
Allowed restrictions on aliens entry and place of abode and allowed deportation of aliens.

**Aliens Act 1919**
Repealed 1905 Act. Re-enacted 1914 measures and introduced charges for sedition and industrial unrest by aliens.

**Polish resettlement Act 1947**
Allowed Polish people to settle in Britain.

**British Nationality Act 1948**
A major change in the law of nationality throughout the Commonwealth, as a result of Canada’s decision to enact its own citizenship law in 1947. Dominions each adopted their separate citizenships, but retained the common status of British subject.
Provided a new status of ‘Citizen of the UK and Colonies’ (CUKC), which included all British subjects who had a relationship with the UK and its remaining colonies through birth or descent.

**Commonwealth Immigrants Act 1962**
Introduced a work voucher scheme for potential Commonwealth migrants.

**Commonwealth Immigrants Act 1968**
Required potential migrants to supply proof that either they, their parents or grandparents had been born in Britain.

**Immigration Act 1971**
Created the definitions of patriality or right of abode in the UK. CUKCs and other Commonwealth citizens only had the right of abode in the UK if they, their parents or grandparents were born in the UK and islands (the Channel Islands and Isle of Man). This created a situation whereby the UK was denying some of its nationals entry into their country of nationality. Also gave immigration officers powers to detain asylum applicants.

**British Nationality Act 1981**
Replaced citizenship of the UK and colonies with three separate citizenships: British citizenship, British Dependent Territories’ Citizenship (BDTC) and British Overseas Citizenship. Individuals who fell within the first two categories were entitled to register as full British citizens on completion of five years residence in the UK. Women married to British citizens were no longer entitled to registration, but spouses of either sex could apply for naturalisation after three years residence in the UK. Citizenship could be passed through either the male or the female line, except in the case of an illegitimate child, where it could only be acquired through the mother.

**Carriers’ Liability Act 1987**
Introduced fines on airline and shipping companies for carrying undocumented passengers.

**Immigration Act 1988**
Ensured that only one wife or widow of a polygamous marriage had a right to enter. Made the offence of overstaying one’s granted period of leave to enter a continuing offence. Ensured persons with the right of freedom of movement in the European Community did not need leave to enter or remain in the UK. Enabled the immigration examination of passengers to take place prior to arrival in the UK.

**Dublin Convention 1990**
Introduced the concept of ‘safe third country’, giving EU countries the option to remove asylum applicants who have travelled via another ‘safe’ EU country back to that country.
Immigration and Asylum Appeals Act 1993
Incorporated the UK’s obligations under the 1951 UN Convention on Refugees into UK law.
Ensured that refused asylum seekers had the right to appeal negative decisions on their applications, but laid down strict time limits.

Asylum and Immigration Act 1996
Made it a criminal offence to employ anyone subject to immigration control unless they had permission to live and work in the UK.

Immigration and Asylum Act 1999
Removed remaining benefit entitlement from all asylum applicants and created the National Asylum Support Service to support and disperse destitute asylum seekers.

Nationality, Asylum and Immigration Act 2002
Put emphasis on the control and removal of unsuccessful applicants.
Required an individual to have ‘sufficient knowledge’ of life in the UK, relating to language and society.
Expected successful applicants aged 18 or older to attend citizenship ceremonies which included taking an oath/affirmation to the Queen and a pledge of loyalty to the UK.
Abolished the distinctions between legitimate and illegitimate children.

Asylum and Immigration Act 2004
Introduced substantial changes to the asylum appeals process, including the replacement of a two-tier adjudicator and tribunal appeals process with a single tier Asylum and Immigration Tribunal.
Extended the safe third country provisions and list of behaviours that could damage an applicant’s application.
Made changes to asylum support adding provision to allow termination of support to families and a power to attach a condition of community activity to hard case support.
Created new penalties for people who arrive in the UK without valid documentation.

Immigration, Asylum and Nationality Act 2006
Entry visas awarded according to a 5-tier points based system; rights to appeal limited.
Illegal working tackled through a civil penalties scheme for employers.
Data shared between the Immigration Service, police and customs, as part of the e-Borders programme and the facility to deny asylum to terrorists and subsequent deportation of those who pose a serious risk to security.
Appendix Three: The asylum process

This appendix aims to provide readers with a broad understanding of the asylum process. Asylum seekers arrive in the UK in a variety of ways. Most people claim asylum on arrival at a port or airport, after arrival, or after arrest or detection as an illegal entrant or as a result of overstaying their work or study visa. If asylum is not applied for “as soon as reasonably practicable” then financial support by National Asylum Support Services (NASS) may be denied (Section 55 of the Nationality, Immigration and Asylum Act 2002). The asylum seeker undergoes an initial interview to establish basic information about their identity. Most claimants will then go through an induction process where they learn about their rights and responsibilities; this often takes place in a designated induction centre. In most cases health assessments are conducted in induction centres and each asylum seeker residing in an induction centre will be issued with a national hand held record also known as a blue book (there is a different book for children).

While people wait for their claim for asylum to be processed they are normally prohibited from working. Asylum seekers may apply to NASS for two different types of support. NASS will provide accommodation and subsistence for those who need financial support and somewhere to live, or it will provide subsistence only for those who have accommodation. If asylum seekers choose the subsistence only option NASS will make no contribution to their accommodation costs. NASS provides subsistence support equivalent to approximately 70 percent of current income support levels (100 percent for those under 16 years of age).

Asylum seekers may be accommodated in a variety of ways. Some may be held at a detention centre which is more likely after illegal entry. Others stay with friends or relatives and are required to provide a single address where they intend to stay throughout the process. They may alternatively be held at an accommodation centre, or housed by NASS, in which case they cannot choose where they live and may be dispersed across the UK. NASS policy is that dispersal accommodation should generally be in areas that either have an established ethnic minority community or are able to sustain a new ethnic group and where voluntary and community infrastructures are in place or can be developed. It is very important that dispersed asylum seekers are linked in to primary care health services. The handheld record should be shared with health staff in dispersal areas and aims to reduce the amount of time taken for any health checks or general practice registration medicals that are undertaken in dispersal areas. Asylum seekers who have been subject to sexual abuse or torture may not disclose this at their first health assessment in induction centres because of many factors including fear and stigma. This important information may only be disclosed once trust has been established with a health care practitioner. Medical evidence is often very important in supporting an asylum application.

There are four outcomes of the assessment process. These categories have an impact on people’s status and their access to social benefits and housing. If asylum is granted the applicant is given refugee status and is allowed to stay in the UK indefinitely. These people have the same welfare rights as other citizens. They have the right to work and to have family members join them in the UK. Sometimes an applicant may be awarded humanitarian protection for up to three years. This is granted where the applicant does not qualify for asylum but is judged to be at serious risk of being subjected to the death penalty, unlawful killing, torture, inhuman or degrading treatment or punishment in their country of origin. People have the same welfare rights as other citizens and they may work, but they do not have the right to family reunion. An applicant may alternatively be awarded discretionary leave for up to three years. This is awarded in other situations where the applicant does not qualify for asylum or humanitarian protection but where it would be inappropriate to remove them from the UK for other reasons, e.g. unaccompanied children. Failed asylum seekers are people whose claims have been turned down by the Home Office and who have no right to remain. They do not have the right to work. Section 4 support is available for asylum seekers who have been
refused asylum, who have no further appeal rights and who are unable to leave the UK, due to physical impediment (for example having a severe medical condition or being in the late stages of pregnancy) or exceptional circumstances. To receive support, a person must be able to show that they are complying with efforts to remove them.

In February 2005, the Government announced a new five year plan on asylum and immigration entitled ‘Controlling our borders: Making migration work for Britain’. This includes a ‘New Asylum Model’126. The new model aims to speed up the processing of asylum claims and allocates case managers working in teams to handle cases from start to finish of a claim.


