Migration, public health and compulsory screening for TB and HIV

Richard Coker

Asylum and Migration Working Paper 1

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Asylum and migration issues have never been higher on the political and policy agendas. The unprecedented scale of movement of people for reasons of protection, employment and family reunion to both the UK and Europe as a whole poses economic, social and political opportunities and challenges. This is an area of policy making which is fast moving and involves many different stakeholders at the international, national and local levels. ippr's *Asylum and Migration Working Paper Series* has been established to provide a vehicle for examining the evidence in relation to specific aspects of policy and practice in this area. Authored by academics, experts and policy specialists from across the public policy arena, the working papers provide an overview of key policy issues in a timely and easily accessible format. The aim is to encourage the exchange of ideas about asylum and migration issues and ensure that policy making is underpinned by empirical evidence about the nature and causes of migration, the impacts on different countries and communities and the effects – both intended and unintended – of policies which might be introduced in response. An important objective of the series is to get the findings out quickly, even if the papers are less than fully polished.

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Preface

Recent months have seen a flurry of media and public concern about an increase in rates of tuberculosis and HIV in the UK. In the context of intense public and political debate about the scale and nature of asylum and migration – and given empirical evidence that at least some of the increase in infectious diseases is immigrant-related – the two have become closely associated in the minds of some, and this has led to calls for pre-entry health screening to be introduced for all long-term migrants to the UK and for asylum seekers to be subject to compulsory screening on arrival and, if necessary, detained.

The association in the public mind between infectious disease and migration is a powerful one and drives to the heart of many wider concerns about the impact of migration on British economy and society. There are fears that the Government is unable or unwilling to control the rise in infectious disease and this is translated into concern about the ability to control migration itself. There are very real fears that the increase in rates of infection among some groups will spread to all sectors of society. And in the context of wider concerns about the quality of health service provision and public service reform there is both public and political concern about the costs to the NHS of treating imported diseases. This frequently translates into concern about the costs of migration and a perception that this vastly outstrips its benefits.

In this context, arguments for the introduction of pre-entry health checks for migrants and compulsory screening of asylum seekers on arrival to the UK have gained momentum. For many, these arguments are grounded in commonsense: if there is an increase in migration and an increase in infectious disease then the Government, it is said, clearly needs to introduce measures to protect the public from infection and the NHS from at the least, excessive burdens and at the most abuse in the form of health tourism. Its failure to do so has led it to be accused by the opposition of 'standing silently on the politically correct sidelines'.

But as with many issues in the asylum and migration area, things are not as straightforward or easily addressed as they might appear on the surface. The Government's approach to this issue is not as lax as some have assumed. Under the existing legislation, immigration officers are able to refer persons seeking leave to enter the UK, including those seeking asylum, to medical inspectors at ports of entry. Current policy is to refer for medical examination anyone who mentions health or medical treatment as a reason for their visit, or who appears not to be in good mental or physical health, or who intends to remain in the United Kingdom for more than six months and comes from an area of the world which is high risk for tuberculosis. In addition, the Immigration Rules state that those seeking leave to enter the UK for more than six months should normally be referred. People applying abroad for entry clearance to the United Kingdom are not subject to mandatory medical inspections, but the entry clearance officer has the same discretion as an immigration officer to refer applicants for entry clearance for medical examination. In addition, asylum seekers attending the induction centre at Dover are given basic health screening, which includes full medical history and tuberculosis screening and referral as appropriate. In response to public concerns about the incidence of infectious diseases such as HIV/AIDS, TB and hepatitis B and C among immigrants, the Government itself has been undertaking a Comprehensive Review of Imported Infections and Immigration since the beginning of the year and it is anticpated that the conclusions of that work will soon be reported.

This is not to suggest that there are no issues which need to be resolved around the health screening of migrants and asylum seekers or that there is no scope for improvement in the way in which policies and resources in relation to public health issues associated with infectious disease are addressed. But the evidence presented in this paper – which is written by a public health specialist with expertise in the epidemiology and control of tuberculosis and HIV – raises some very important questions about the effectiveness of screening for infectious disease, the unintended consequences that can arise from attempts to introduce compulsion into the screening process and the wider public health context within which this issue is located.

The focus of this paper is principally on the issue of whether policies of compulsory screening should be introduced for asylum seekers who come to the UK. The reason for this focus is not because tuberculosis and HIV is particularly associated with this group of migrants – the evidence indicates that asylum seekers are not only a very small proportion of all migrants and also that they are not disproportionately affected. Rather it is because this is where the political heat in relation to government policy has been most fiercely directed and arguably where, in the current political climate, the Government is under the strongest pressure to act.

But the evidence in this paper also has implications for any decision that might be taken in relation to pre-entry screening of other groups of migrants coming to the UK for purposes of employment, study or family reunion. The (in)effectiveness of screening for tuberculosis is relevant for both the UK and countries from which migrants originate. The ethical and legal issues around whether it is right to refuse entry to an individual who is HIV positive are equally applicable in both contexts (the only difference is whether we are or are not prepared to bear the additional costs of treating the individual, an important issue but one which is outside the scope of this particular paper). In the case of tuberculosis, and more especially HIV, there is the potential for stigma and ostracism that might be compounded by compulsory health screening policies regardless of the location in which that screening is undertaken. In the case of HIV there is the additional blow to the individual of finding out about the disease in an environment where the immigration process rather than health is the primary concern. And for compulsory screening in any context there is a danger of creating an environment in which individuals seek to evade immigration controls rather than present themselves and remain within the system for fear of being refused entry (in the case of pre-entry controls) or deported (if tested on entry). The consequences for the global spread of tuberculosis and HIV of pushing those with infectious diseases underground without treatment do not need to be described in detail to be understood.

The aim of this paper then is to ensure that any policies which might be introduced to respond to concerns about immigrant-related infectious diseases reflect the epidemiological situation and the evidence-base relating to the benefits and costs of compulsory screening. It is important that the response is an appropriate one from a public health perspective, and that in responding to wider concerns about migration, such health screening policies do not unintentionally serve to exacerbate rather than limit the spread of tuberculosis and HIV. It is also important to note that policies to introduce health screening for migrants to the UK (whether pre-entry or on-entry) will almost certainly be extremely expensive in terms of both start-up and recurring costs and once implemented may be difficult to halt. As the evidence in this paper suggests, these resources might be more effectively channelled into ensuring that all migrants to the UK have access to a ‘welcome health check’ – which would include a screening element – and treated as appropriate for any disease at an

early stage. Additional resources could also be more effectively directed into providing better health care services in countries of origin to prevent the spread of tuberculosis and HIV globally and the devastation that this can cause to the societies from which many migrants originate.

An earlier draft of this paper was circulated to public health experts, practitioners and policy makers with expertise in this area and was discussed at a seminar held at ippr on 8th October 2003. A list of participants in the seminar is provided at Annex 1 of this report. Although many of the comments made during and subsequent to the seminar have been incorporated into this paper, final responsibility for its content lies, of course, with the author.

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About the author

Dr Richard Coker trained in medicine at St. Mary's Hospital, London and, in 1994, became consultant physician to the hospital and senior lecturer at Imperial College School of Medicine. His interests include communicable diseases, in particular sexually transmitted diseases, HIV, and tuberculosis. In 1997, as a Harkness Fellow, he spent a year at Columbia School of Public Health in New York, USA, researching the causes and responses to the epidemic of tuberculosis that city witnessed in the late 1980s and early 1990s. His book, *From Chaos to Coercion: Detention and the control of tuberculosis*, was one of the results from this work. He subsequently worked as a Wellcome Research Associate researching public health legislative responses to infectious disease threats. In recent years he has worked in India, Russia, Ukraine, Tajikistan, and at the World Health Organisation (WHO) in public health responses to support control of infectious diseases. He joined the London School of Hygiene and Tropical Medicine as a Research Fellow in 1999 before becoming Senior Lecturer in 2001.

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Introduction

Each year, it is estimated, tuberculosis kills two million people and approximately eight million people become sick with the disease. Several factors contribute to this global failure in control including the HIV epidemic (because of the markedly increased risk of tuberculosis developing in those who are co-infected), poorly functioning control programmes, and the increasing movements of people with disease, at risk of developing disease, and who are susceptible to infection. In 1993, the World Health Organisation (WHO) described tuberculosis as a 'global emergency' (WHO 1994). Since then, global mortality and morbidity from this disease has continued to increase.

The epidemic that is HIV is the greatest public health challenge of this generation. Sub-Saharan Africa is being devastated, life-expectancy has plummeted, and massive economic hardship follows in its wake. Asia and Latin America have witnessed marked increases in prevalence and parts of eastern Europe are the settings for explosive epidemics. Both HIV and tuberculosis challenge public health on a massive scale and both are global in their scope and impact.

Increased movements of peoples are causing stress to public health responses to communicable disease threats internationally. The public health challenges of tuberculosis and HIV threaten too, therefore, domestic public health in the affluent countries of Western Europe and the United States of America. Both conditions are communicable, and rates in some immigrant populations are substantially higher than host populations.

In recent years several institutions have called for compulsory screening for tuberculosis and HIV of migrants coming to the UK in order to support national efforts to control these communicable diseases. For example, the Conservative Party (2003) recently published a consultation paper entitled *Before It's Too Late: A new agenda for public health* which advocates an approach similar to that taken in Australia, such that before individuals are given permission to remain in the UK 'three tests must be met':

1. They must not pose a risk of transmitting an infectious disease to the public
2. They must not create undue demand on restricted health resources
3. They must not create a long-term drain on the public purse

Moreover, this paper suggests that 'those entering the UK through the immigration system would require (sic) to have such tests at the point of application and to pay for them, while those seeking asylum would be detained until it was clear the criteria had been met'. In other words, that there should be pre-entry screening for all permanent migrants to the UK and compulsory on-entry testing (and in this case, detention) for all asylum-seekers.

Others have conflated anti-immigrant sentiments with public health threats through communicable diseases, and called for mandatory health testing of migrants to the UK (see, for example, Browne, 2003).

The policy measures advanced in the Conservative Party paper are not new. Many states screen immigrants for HIV and active tuberculosis (Panos Institute 1990; Hayward *et al* 2003). Indeed, the

World Health Organisation (WHO) advocates, in a model legislative framework, that when 'crucial' to public health, 'the population, or particular groups of it shall have a duty to undergo X-ray examinations, tuberculin tests, blood tests, or other comparable tests that can be carried out without danger (Pinet 2001). More specifically, the WHO also advances that:

> Foreign-born persons intending to stay in the country (other than for a stated short period of time, for example not more than three months), who are not exempt from any residential permit requirement, have a duty to undergo medical examination for tuberculosis. If the foreign-born person is 15 years of age or more, he or she also has a duty to have a chest X-ray…The examination must be carried out as soon as possible and no later than three months after entry into the country. Refugees, asylum seekers and persons applying for a residential permit for the purpose of reuniting with their families must be examined within 14 days after entry (Pinet 2001).

Taking this issue further, a report by the Institute of Medicine (2000), sponsored by the United States' Centers for Disease Control and Prevention, lists recommendations for achieving the goal of eliminating tuberculosis in the country. Among them, the recommendation is advanced to introduce a mandatory screening programme for *latent* tuberculosis[1] infection in immigrants from high prevalence countries and to link the provision of a permanent residence card ('green card') to the completion of an approved course of *preventive* treatment.

In response to growing calls by the media in the UK to test migrants and asylum seekers at the point of entry and to restrict access into the country and/or to medical services once here, the All-Party Parliamentary Group on AIDS (APPGA) established an inquiry into the impact of the UK nationality and immigration system on people living with HIV. The APPGA held four hearings during which it took evidence from HIV specialist clinicians, GPs, solicitors, national AIDS organisations, community-based organisations and migrants currently living with HIV. The inquiry found that migrants are suffering because HIV services generally in the UK are being de-prioritised, stigma is a serious issues in the UK and general practitioners are being continually faced with the ethical issue of whether to treat an individual with HIV in need or deny treatment if the person is not entitled, by virtue of their immigration status, to NHS care. In its report published in July 2003, the APPGA recommended that:

> The Government should reaffirm its commitment to the UNAIDS guidelines against mandatory testing upon entry for HIV. It would be in breach of international obligations and human rights to give mandatory HIV tests to asylum seekers upon entry and in addition there is no evidence to support that such a policy would be effective at protecting public health. The consequence of testing upon entry would be worse as people with HIV avoid presenting for testing and HIV would risk becoming further stigmatised (All-Party Parliamentary Group on AIDS July 2003)

[1] Latent tuberculosis means a person who is infected with the bacteria that causes tuberculosis, *Mycobacterium tuberculosis*, but does not have disease and cannot transmit the disease. Approximately 1/3rd of the world's population is latently infected with tuberculosis and only a small minority will go on to ever get disease.

The APPGA's report and this paper are particularly timely because the UK Government is currently considering the options for introducing health screening programmes for migrants and asylum seekers coming to the UK. In January 2003 the Government announced that it was setting up a Cabinet Office-led interdepartmental working group on imported infections and immigration (IIWG).[2] The Working Group has been examining whether individuals applying for work visas must have a health check for tuberculosis and HIV in their country of origin (Ahmed 2003). The conclusions of the group's work on this issue are expected in the very near future. Meanwhile, the UK Department of Health commissioned a substantial body of research in 2002 to look at the implications of screening immigrants for tuberculosis in the UK (this is due to be completed in about six months). The Home Office has recently evaluated health service provision (including screening for TB) in at least one of the new induction centre for asylum seekers and may be now planning to roll out the scheme. Finally, the Foreign and Commonwealth Office and the Department of Health are currently running a series of seminars on health and foreign policy which will include the issue of immigration and population mobility and health.

Disease screening is one of the most basic tools of modern public health and preventive medicine. Screening programs have a long and distinguished history in efforts to control epidemics of infectious diseases and targeting for chronic disease.[3] It is in this context – given recently highlighted concerns about the public health implications of migration to the UK – that this paper explores some of the public health issues related to mandatory screening of immigrants and asylum seekers in order to support domestic efforts to control tuberculosis and HIV.

[2] It should be noted that there has been some criticism of the fact that, with some exceptions, this inquiry has not taken evidence from outside government.

[3] It is important to note that the screening of active disease in immigrants has not been assessed against the set of internationally recognised criteria which the UK National Screening Committee currently uses to judge screening programmes, including a lack of evidence from randomized controlled trials or evidence that such programmes are clinically, socially or ethically acceptable – see http://www.doh.gov.uk/nsc/index.htm Although the term screening is used in this paper, the terms case detection or risk reduction may be more appropriate given this lack of programme justification.

But first some medicine…

Tuberculosis is transmitted through inhalation of the germ *Mycobacterium tuberculosis*, though coughing, sneezing, and singing. Disease needs to involve the respiratory tract, either the lungs or larynx, for it to be communicable from those with disease to susceptible individuals. On balance, those with more advanced disease pose more of a health threat to others.

Once people have inhaled the tuberculosis bacteria, they are infected. However, most never go on to develop disease. Of the 10 per cent or so that do, about half of these will do so within a year or two. The remainder will develop disease at sometime during the rest of their life. Of all of these who go on to get disease approximately half will develop *infectious* disease and pose a threat to the public health. It is estimated that each infectious person infects about 20 people for each year they have infectious disease – and of these two will develop disease, one of whom will be infectious. And so the cycle continues.

Tuberculosis is treatable, and those on treatment stop being infectious within about two weeks in general. For strains of the germ that are resistant to first-line treatments - so-called multidrug-resistant (MDRTB) strains - treatment is more complex, given for much longer periods of time, and people may remain infectious for longer. About 50 cases of MDRTB are seen each year in the UK. If the global threat from MDRTB rises then, clearly, this has the potential to inform cost-benefit analyses of screening programmes.

Transmission of HIV is a very different matter. Whilst tuberculosis can be transmitted to casual contacts simply through being in close proximity (usually for an extended period) HIV is transmitted through transfer of bodily fluids, usually through sex or injecting drugs or receiving contaminated blood or blood products.

HIV also differs because it is transmissible to others from the time of infection until death. Whilst treatment reduces morbidity and substantially delays the time till death, it is not curative. Nor does treatment stop transmission though it probably reduces infectiousness.

Whilst treatment for tuberculosis costs in the region of £6,000 per person in the UK (White and Moore-Gillon 2000), costs of treatment for someone infected with HIV may run into hundreds of thousands of pounds over their lifetime. The costs of treatment for someone with MDRTB are in the order of £60,000 (White and Moore-Gillon 2000).

Finally, the interaction between HIV and tuberculosis is important. HIV infection causes immune function deterioration that results in markedly increased susceptibility to tuberculosis. Moreover, HIV influences the clinical picture resulting in tuberculosis disease that is more generalised, often disseminated, and possibly impacting upon the relative infectiousness of tuberculosis.

Purpose of screening and detention

> Irrespective of the cost or efficiency of [coercive] measures, significant political advantage can be gained from their implementation. The government is seen to be taking firm, decisive action and the epidemic appears to be under control. Those targeted for compulsory testing are often stigmatised by society and held responsible for spreading HIV, making the use of coercion seem more justifiable and acceptable. Yet the effect is ultimately to divide society and to discourage those at greatest risk from seeking advice and help (Panos Institute and Norwegian Red Cross 1990:108).

What is the purpose of screening and detention of immigrants and asylum seekers? Screening refers to the systematic application of a medical test to a defined population. And it may be fraught with political controversy as the quote above suggests. Whilst screening may appeal to policy makers because of their wish to be seen to be 'doing something' about a health problem it also, by its nature, identifies individuals who may have previously been unaware of their condition. They may, as a consequence, be subjected to stigma and discrimination.

Because of the costs and potential burdens, any screening programme should be evaluated under two broad criteria:

1. Does screening detect those with the condition?
2. Will screening assist in achieving the desired public health objective?

The purpose of detention is somewhat different. It is to isolate individuals who pose (or possibly may pose) a threat to public health thereby protecting the wider population. For someone with tuberculosis, detention has been used traditionally whilst they have been infectious – either for a few weeks if they adhere to treatment, or longer of they decline treatment (Coker 2000a). For HIV, detention has been used to segregate people from the community for prolonged periods, such as in Cuba, or because the behaviour of individuals threatens others (a criminal act). The issue of detention is not addressed in detail here. It has been recently reviewed systematically for tuberculosis and there appears to be little evidence to support its use as an effective public health tool (Coker 2003). Whilst the research base on detention *per se* is poor, researchers on occasion infer that detention might be a useful measure. For example, in showing through molecular fingerprinting that individuals who were 'chronically noncompliant' (and later detained) are vectors for ongoing transmission in the community, researchers argue that 'aggressive measures, including detention … may interrupt a chain of transmission.' (O'Brien *et al* 1997) By contrast, Heyman *et al* (1998) showed that if the threat of detention discourages 18 per cent or more patients who have failed treatment from seeking re-treatment within a year, then detention would be less effective than a repeat trial treatment in the community in minimising mortality, suggesting that coercive measures may have a counterproductive effect.

For an up-to-date and balanced commentary on the Cuban policy of detention those interested should refer to *Pathologies of Power* (Farmer 2003). Briefly, Farmer shows that the compulsory Cuban AIDS residential policy evolved over ten years from a military programme to a system that, in the early 1990s, was receiving strong popular support locally, including from among the gay community. Moreover, despite the economic crisis following the collapse of the Soviet Union, funding for the national AIDS program did not fall. In the late 1980s the fences around the facility were removed, and

in 1993, residential treatment became optional. Interestingly, most residents chose to remain, probably because living conditions were better than those of many Cuban poor. A critical question, clearly, then, is to ask whether the compulsory programme supported public health. Certainly Cuba has had greater success in containing HIV than most of its Caribbean neighbours. Teasing out the impact of detention is difficult, however. Since 1983, from the time that AIDS was recognised, Cuba has been active in its efforts to protect its population in other ways including the early destruction of potentially contaminated blood products, systematic screening of all returning residents, and a policy of protecting the social and economic rights of the vulnerable. Farmer quotes the Cuban Vice-Minister of Public Health, clearly rankled by accusations levelled by international critics of the policy of detention:

> In Cuba, nobody lacks economic resources because of being an AIDS carrier. In Cuba, no one dies abandoned on the streets for lack of access to a hospital. In Cuba, we haven't had to open hospices so that patients who have been abandoned have a place to die in peace. In Cuba, no one's house has been set on fire because its inhabitants are people with AIDS. In Cuba, no homosexual has been persecuted because he's assumed to be likely to spread the virus. In Cuba, we don't have the problem of national minorities or drug addicts with high rates of AIDS (From an interview accorded Karen Wald in Farmer 1989:73)

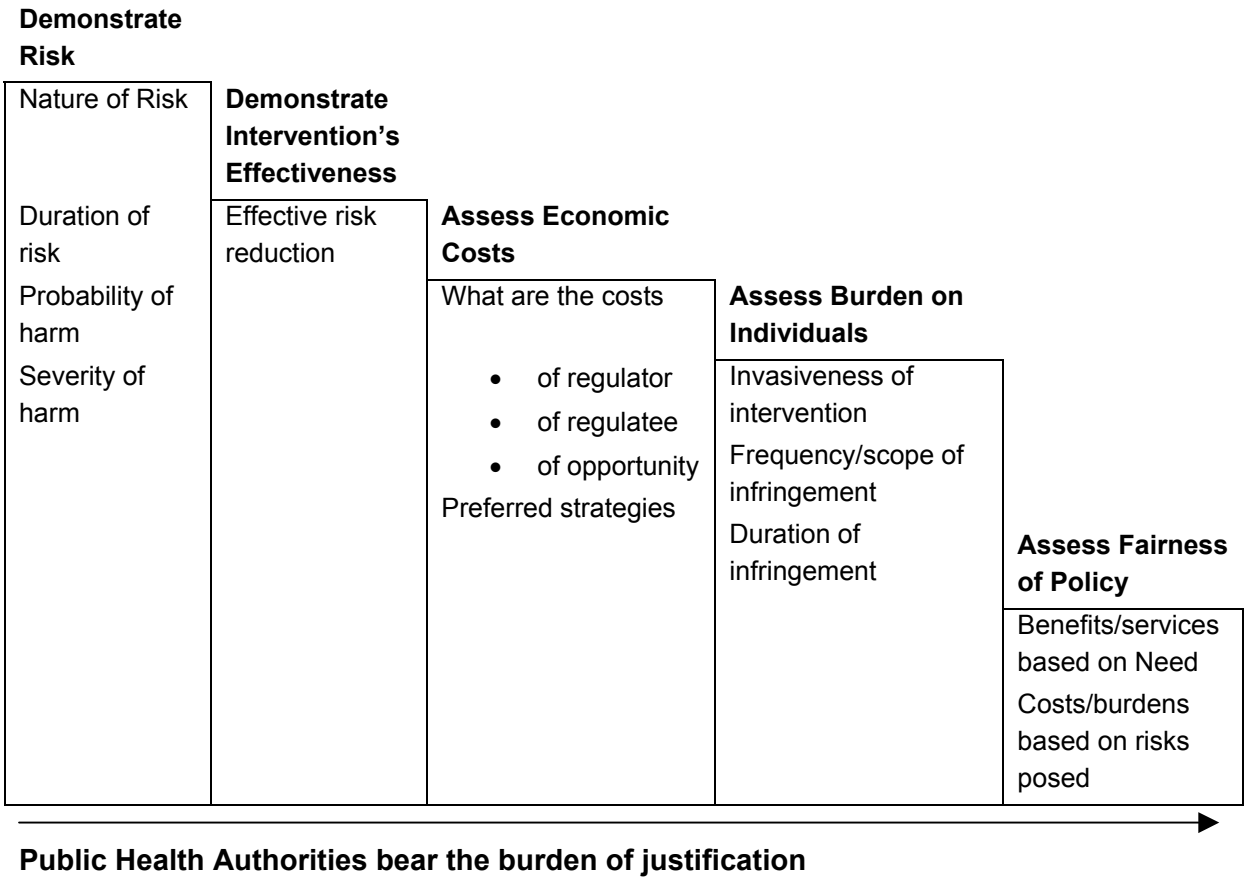
Detention linked to screening for infectious disease is clearly intended to protect public health from transmission to the resident population. For tuberculosis, although this intuitively makes sense since identifying those with infectious diseases means that treatment can be initiated and the chain of potential transmission broken, evidence in support of this is lacking and many practical and ethical issues remain unresolved. For HIV this is even more problematic since identifying and initiating treatment in people who are HIV seropositive does not render them non-infectious. Though detention clearly prevents them from transmitting infection to the general population, the period of detention may, as long as there is no cure, need to be for life. One must then question, what the purpose of detention is, whether this purpose is achievable through practicable means, and whether these means are just.

Coercion in public health

The issue of coercion has been raised in two areas in regard to immigrants and public health: screening and isolation. Historian Allan Brandt has written that there are two criteria by which any coercive public health proposal must be evaluated: 'First, effectiveness: There must be considerable evidence that any particular policy offers substantial benefit. The second criterion for public interventions should be justice: Is it the least restrictive of all positive measures?'(Brandt 1988:164). Building upon these notions, it has been suggested that before coercive public health tools are deemed justified, the risk posed should be demonstrable, the proposed interventions should be demonstrably effective, the approach should be cost-effective, any sanctions should be the least restrictive necessary to achieve the purpose, and that the policy should be fair and non-discriminatory (Gostin 2000) (Figure 1 overleaf).

In regard to coercion and screening, states may compel individuals to submit to medical screening without informed consent and this is sanctioned in a number of countries – so-called compulsory screening. Internationally, compulsory screening has been used to screen sex offenders, commercial sex workers, pregnant women, and prison inmates. Alternatively, states may apply conditional screening, whereby certain privileges or services (such as residency or release from an induction centre) may be withheld until screening has been conducted. Under conditional screening, consent is nominally given. The differences between these approaches may be important when screening of immigrants and asylum seekers are concerned not least because of the ethical and practical considerations. This paper refers principally to conditional screening, that is, where entry is conditional upon new entrants consenting to be tested. Without consent, new entrants forfeit the right to enter and reside. In the case of asylum seekers, the fact that there is no pre-entry application procedure means that a different process applies, but there are nonetheless pressures to introduce screening on entry to the UK raising considerable ethical and legal challenges in regard to what happens to an individual who is tested positive, particularly for HIV.

Figure 1: Public health regulation: a stepwise evaluation (adapted from Gostin 2000)



Historical traditions of coercive public health measures

Creating boundaries between groups to prevent the spread of disease has a long tradition. Historically immigrants and other travellers have often suffered as a consequence of fears of communicable diseases. In *Quarantine*, Markel (1997) explored how the US press and government blamed the 1892 outbreaks of typhus and cholera on eastern European Jewish immigrants and how public health and other authorities stopped immigration and quarantined the targeted population on North Brother Island in the East River off Manhattan. Others have written extensively of Western, and in particular the American, traditions of suspicion of 'the unassimilated,' and questioned the objectivity of public health responses. Examining the treatment of Italians with polio, Jews with tuberculosis, the Irish with cholera, the story of Mary Mallon with typhoid, and the recent association of Haitians with AIDS, Kraut (1994) suggested that isolation and quarantine is often amongst the first of public health measures called for but in practice is largely of uncertain benefit.

Despite the urging of bodies such as the EC and WHO in the first decade of the HIV epidemic to reject the use of coercive measures directed to those potentially infected with HIV, 81 countries introduced AIDS-specific legislation (World Health Organisation 1993). For example, in the Middle East several countries made failure to submit to HIV tests and 'promiscuous' behaviour punishable by imprisonment. Garrett (1994) calculated that between 1981 and 1989 compulsory testing of some sections of the population for HIV was legislated for in 30 countries and in three quarantine or imprisonment because of HIV status was legislated for (China, Cuba, and Japan) (Garrett 1994).[4] In Europe, Belgium, West Germany, Greece, Finland, and Spain passed legislation (or re-interpreted existing legislation) to restrict the entry of HIV-positive foreigners seeking work permits or studentships. Perhaps the most startling suggestion from Western Europe was that made in 1987 by the president of the German Federal Court of Justice that it may prove necessary to tattoo and quarantine people infected with HIV (Panos Institute and Norwegian Red Cross 1990). Currently, 46 countries require HIV tests before immigration.[5] A recent survey of 20 Western European cities shows that immigrant screening for tuberculosis is widely practiced (Hayward *et al* 2003)(Table 1). Whether this is compulsory, conditional, or voluntary screening remains unclear, however.

In the nineteenth and twentieth centuries detention, or in some cases enforced quarantine, was used in attempts to contain contagious diseases. Historical analyses have almost universally condemned the practice suggesting that its effectiveness was rarely obvious. In the 1916 New York polio epidemic, for example, children were forcibly separated from their parents for long periods, and were allowed only very limited visiting rights (Risse 1988). The use of coercion in this setting has been ascribed, in part, to the apparently well-circumscribed areas where disease was occurring, namely parts of

[4] Although Cuba's policy of segregation received widespread condemnation some years ago, more nuanced examinations of this policy (see, for example, Farmer 2003) argue that it was far less draconian than other quarantine practices being used by other countries.

5 Australia, Belarus, Belize, Bulgaria, Canada, China, Cuba, Dominican Republic, Egypt, Georgia, Hungary, India, Iraq, Jordan, Kuwait, Kyrgystan, Latvia, Lebanon, Libya, Malaysia, Mauritius, Micronesia, Moldova, Montserrat, Oman, Papua New Guinea, Paraguay, Qatar, Russia, Saint Kitts and Nevis, Saint Vincent, Saudi Arabia, Seychelles, Singapore, Slovakia, Spain, Syria, Taiwan, Tajikistan, Turkmenistan, Turks and Caicos Islands, Ukraine, United Arab Emirates, United States, Uzbekistan, Yemen (Source: US Government, reported in The *Times*, 13 Dec 2002).

Brooklyn. By acting quickly the authorities envisaged 'containing' the disease. The uncertainties over the risk of polio transmission and the uncertainty of the impact of the measures taken caused one physician of the time to note: 'As to the lessons we have learned during the epidemic, we have learned very little that is new about the disease, but much that is old about ourselves' (Tilney 1916, cited in Risse 1988). Risse (1998) suggests that shortly after the New York polio epidemic scientists 'were still debating the nature of the agent causing polio and its method of transmission'. Likewise, shortly after the contemporary New York City tuberculosis epidemic in which substantial numbers of people were detained on an island off Manhattan (Gasner *et al* 1999, Coker 2000b), epidemiologist Kent Sepkowitz was noting that much of what we believe of the infectiousness of *M. tuberculosis*, the organisms that causes tuberculosis, is dogma 'based on a few scant facts' (Sepkowitz 1996:962). Our understanding of the transmission dynamics of many infectious diseases remains poor.

Table 1: Epidemiology and screening practice of 20 Western European cities (adapted from Hayward et al 2003)

Country	**Cities targeted[6]**	**% of patients who are foreign-born**	**New entrant screening conducted routinely?**	**Annual notification rate (per 100,000)**
Belgium	Antwerp	50-74%	Yes	10-19
	Brussels	50-74%	Yes	30-39
Denmark	Copenhagen	50-74%	No	30-39
	Aarhus	N/A	No	10-19
Finland	Helsinki	0-24%	Yes	10-19
France	Paris	25-49%	Yes	40-49
Greece	Athens	0-24%	No	10-19
	Thesaloniki	0-24%	No	60-69
Iceland	Reykjavik	50-74%	Yes	<10
Ireland	Cork	0-24%	Yes	20-29
	Dublin	0-24%	Yes	10-19
Italy	Milan	25-49%	Yes	20-29
	Rome	25-49%	No	10-19
The Netherlands	Amsterdam	50-74%	Yes	20-29
	The Hague	50-74%	Yes	20-29
Portugal	Lisbon	N/A	No	>70
United Kingdom	Belfast	0-24%	Yes	<10
	Cardiff	50-74%	Yes	10-19
	Glasgow	0-24%	Yes	10-19
	London	50-74%	Yes	30-39

[6] Cities classified as experiencing a '*problem'* with tuberculosis by virtue of high notification rates (>30 per 100,000) or high levels of drug resistance are highlighted (> 10% of isolates with isoniazid resistance and/or 5% of isolates with multi-drug resistant tuberculosis [MDRTB]).

What public health risk is posed?

Tuberculosis

In 1997 it was estimated that perhaps one third of the world's population were infected with *M. tuberculosis* and that in that year there were perhaps 7.96 million (range, 6.3 million – 11.1 million) new cases of tuberculosis, including 3.52 million (2.8 million – 4.9 million) cases (44 per cent) of infectious pulmonary disease (Dye *et al* 1999). This distribution of burden is not equally shared. 80 per cent of all incident cases were found in 22 countries, with more than half occurring in five Southeast Asian countries. Nine of the 10 countries with the highest incidence rates per capita are to be found in Africa (Table 2).

Table 2: Estimates of tuberculosis burden in the 22 highest-incidence Countries (Dye et al 1999)

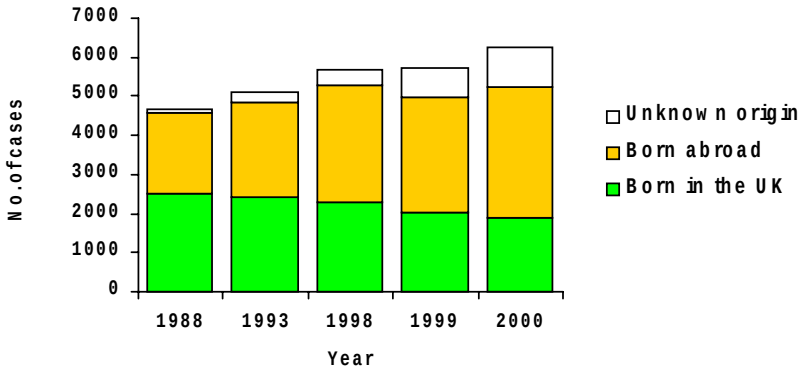
Rank	Country	Population, thousands	Incidence, numbers, thousands	Incidence rate per 100,000	Prevalence, numbers, thousands	Prevalence rate per 100,000
1	India	960,178	1,799	187	4,854	505
2	China	1,243,738	1,402	113	2,721	219
3	Indonesia	204,323	583	285	1,606	786
4	Bangladesh	122,013	300	246	620	508
5	Pakistan	143,831	261	181	583	405
6	Nigeria	118,369	253	214	454	383
7	Philippines	70,724	222	314	490	693
8	South Africa	43,336	170	392	262	604
9	Russian Federation	147,708	156	106	241	163
10	Ethiopia	60,148	156	260	221	367
11	Vietnam	76,548	145	189	221	289
12	Democratic Republic of Congo	48,040	129	269	191	397
13	Brazil	163,132	122	75	188	115
14	Tanzania	31,507	97	308	125	396
15	Kenya	28,414	84	297	106	371
16	Thailand	59,159	84	142	180	305
17	Myanmar	46,765	80	171	163	348
18	Afghanistan	22,132	74	333	167	753
19	Uganda	20,791	66	320	94	451
20	Peru	24,367	65	265	70	288
21	Zimbabwe	11,682	63	538	73	626
22	Cambodia	10,516	57	539	101	963
	Total	**3,657,421**	**6,367**	**174**	**13,728**	**375**

WHO figures released in 2003 showed that the global tuberculosis case notification rate remained more or less stable between 1995 and 2001, at around 60/100,000 population, but wide regional variations were observed (World Health Organisation 2003). Within the European region variations have been particularly marked. Whereas notification rates in Western Europe decreased by 3 per cent yearly overall between 1995 and 2000, increases in notification rates were seen in some countries (Denmark, Luxembourg, Norway and the United Kingdom) largely due to an increase in foreign-born cases. In Central Europe, notification rates fell by between 3-6 per cent yearly. In Eastern Europe, by comparison, rates in 2000 were 57 per cent higher than in 1995, with average increases of 5-12 per cent in most countries (EuroTB 2003). In 2000, tuberculosis amongst foreign-born persons or non-citizens accounted for 28 per cent of all tuberculosis cases in Western Europe but only 1 per cent of cases in both Central and Eastern Europe (EuroTB 2003).

Projected forward to 2005, the WHO estimates that the annual rate of increase of incidence of tuberculosis is likely to be about 3 per cent globally, 7 per cent in eastern Europe, and over 10 per cent in the African countries most affected by HIV (World Health Organisation 2001).

As noted, these global shifts play out in countries receiving immigrants and asylum seekers. In England and Wales since 1988, the number of cases of tuberculosis reported and the rate per 100,000 has increased steadily (Figure 2). Over this period, the proportion of cases of tuberculosis born abroad has also increased steadily, from 45.1 per cent in 1988 to 63 per cent in 2001 (Akhtar and Antoine 2003).

Figure 2: Tuberculosis case reports, by geographic origin, England and Wales, 1988 - 2000



Sources: Tuberculosis case reports (1988, 1993, 1998: National TB survey; 1999, 2000: TB Enhanced surveillance), Population figures: ONS estimates

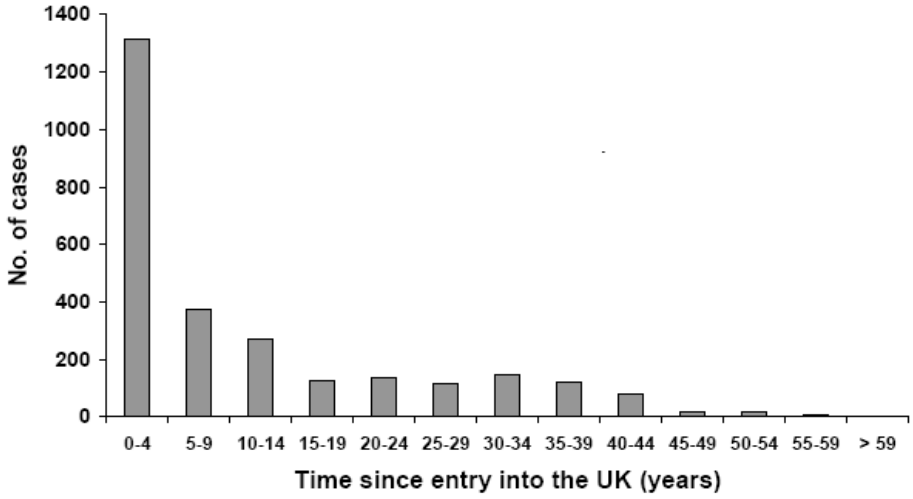
In 2001, of those born abroad, 46 per cent originated from India, Pakistan or Bangladesh, 12 per cent from other countries of Asia, 32 per cent from Africa and 7 per cent from Europe (of which 3 per cent were from Central or Eastern Europe). Whereas rates of tuberculosis were only 4.3 per 100,000 in

those born in the UK in 2001, in those born abroad the rate was 74.9 per 100,000 (Akhtar and Antoine 2003). Approximately half of individuals born abroad who develop tuberculosis do so within five years of entering the country (Figure 3).

A further issue that confuses the picture is tuberculosis in the HIV-infected. Screening for tuberculosis in HIV-infected individuals is likely to be less reliable because the radiological picture is less specific (and because other tests such as tuberculin skin tests are often negative despite infection). And whilst HIV-associated tuberculosis contributes to the overall-all national burden of tuberculosis (estimated to be in the region of 5 per cent of cases of tuberculosis cases), the relative public health threat posed by such cases is difficult to quantify.

From these data it is clear that tuberculosis in foreign-born individuals is a growing problem in the UK. However, simply being an immigrant is not the only possible reason for tuberculosis to be associated with immigration. After all, tuberculosis rates are higher in individuals from ethnic minorities even when born in the UK. It is not simply immigration and the prevalence of disease in the country of origin that is the issue, but also other factors that are associated with being an immigrant that confound the issue. The fact that existing ethnic minorities in the UK are more likely to live near to, and associate with, new migrants, and the fact that they are also more likely to visit family and friends outside the UK who live in high-risk regions, means that British citizens who are from ethnic minority groups are more likely to contract infectious disease than other groups. And disentangling the influence of immigration from, say, poverty is difficult since many of those from ethnic minorities live in poverty, in overcrowded conditions, and with others at higher risk of tuberculosis (Bhatti *et al* 1995; Bennet *et al* 2002).

Figure 3: Tuberculosis case reports born abroad by time since entry into the UK



**2001 preliminary results*
Source: Enhanced Tuberculosis Surveillance

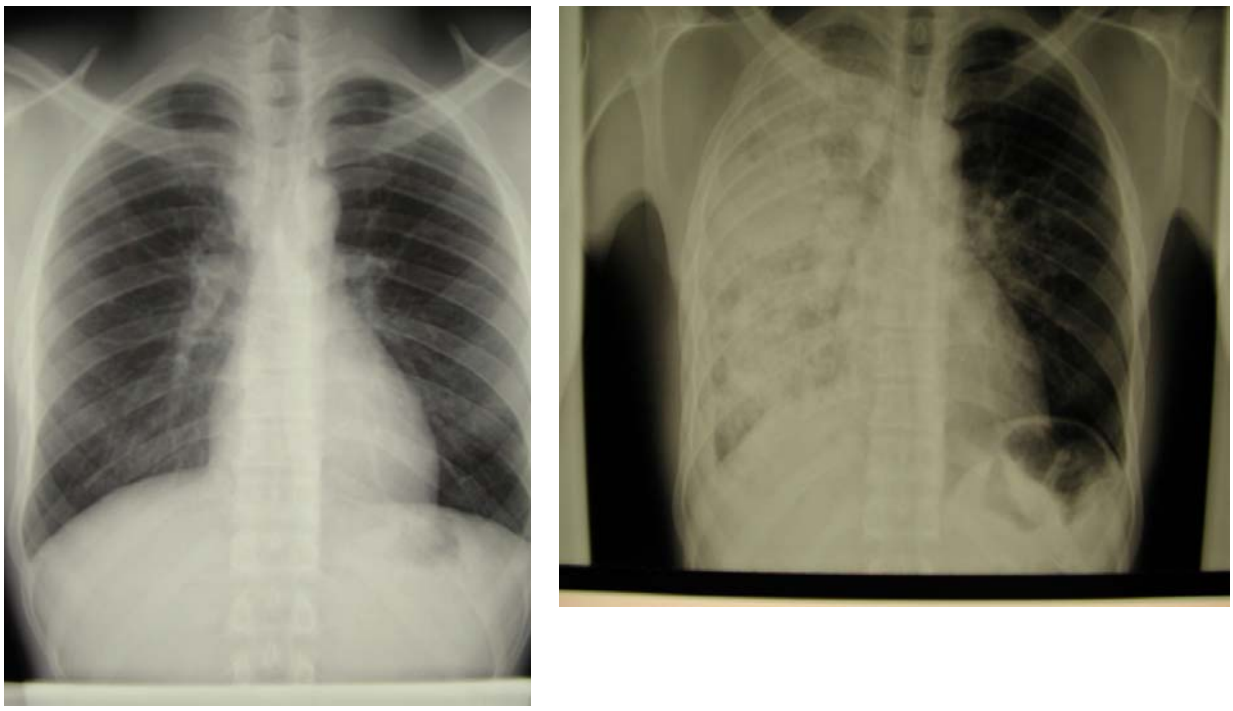
However, given the importance of disease in those born abroad, it is useful to ask what current systems of screening in the UK tell us. Experience from a Heathrow airport-based study and other UK-based reports highlight a number of issues. Under the current UK system most asylum seekers entering the country through Heathrow airport are probably screened for tuberculosis (using, in the first instance a basic clinical examination and miniature X-ray).[7] Of 41,470 asylum seekers who had X-rays between 1995-1999, 100 were found to have active tuberculosis, of whom 24 had the most infectious form, sputum smear positive (Callister *et al* 2002). Using this system, which is voluntary, only two individuals 'absconded' before further investigations were conducted to confirm or refute the diagnosis. In this study the prevalence of pulmonary tuberculosis in asylum seekers was 241/100,000, with rates from some regions such as sub-Saharan Africa very high. Rates in asylum seekers from other regions, such as the Middle East were, however, lower than rates in parts of London despite the countries of origin being high prevalence areas. As the authors note, 'despite the relatively high prevalence rates in political asylum seekers arriving at Heathrow Airport compared with average rates for the UK, the actual number of cases detected only represents a small proportion of annually notified cases (less than 0.5 per cent)' (Callister *et al* 2002, 156).

The issue of screening new arrivals in the UK has been principally focused on asylum seekers in large part because of practical issues: many new arrivals have addresses in the UK where they intend to stay and screening is meant to take place there; for asylum seekers, with no intended address, referral for screening at the port of entry has been the norm. For example, during the period of this particular study, 55,276 asylum seekers arrived in the UK through Heathrow airport compared to 169,029 immigrants, but systems to screen all immigrants are fragmented and data on the uptake and effectiveness of screening in this wider population is lacking (Callister 2002**).** This raises an important point. Focusing screening programmes on only a small proportion of overall migrants to the UK, such as asylum seekers, means that potentially many at risk of disease may not be screened. The limited impact of such measures are exacerbated if screening programmes are only available at a few points of entry and if dispersal means that these individuals do not then have routine access to follow-up screening. For example, one study estimated that only one quarter of immigrants to the UK are traced and screened for tuberculosis (Hardie and Wilson 1993). Moreover, in support of the notion that screening for many is poorly functioning, another study showed that port of arrival systems failed to identify 60 per cent of new immigrants to one area of the UK (Ormerod 1998).

As has been noted, many immigrants only develop disease some time after they have entered the country, in many cases, years after. The two X-rays below illustrate the point (Figure 4).

[7] It should be noted that the number of asylum seekers who enter the country through Heathrow is a relatively small proportion of the overall total. Nonetheless this is a significant sample size. In addition individuals claiming asylum at Heathrow are often from long-haul (and potentially high-risk) destinations, and the incidence of TB within this particular population might be expected to be higher than at other ports of entry.

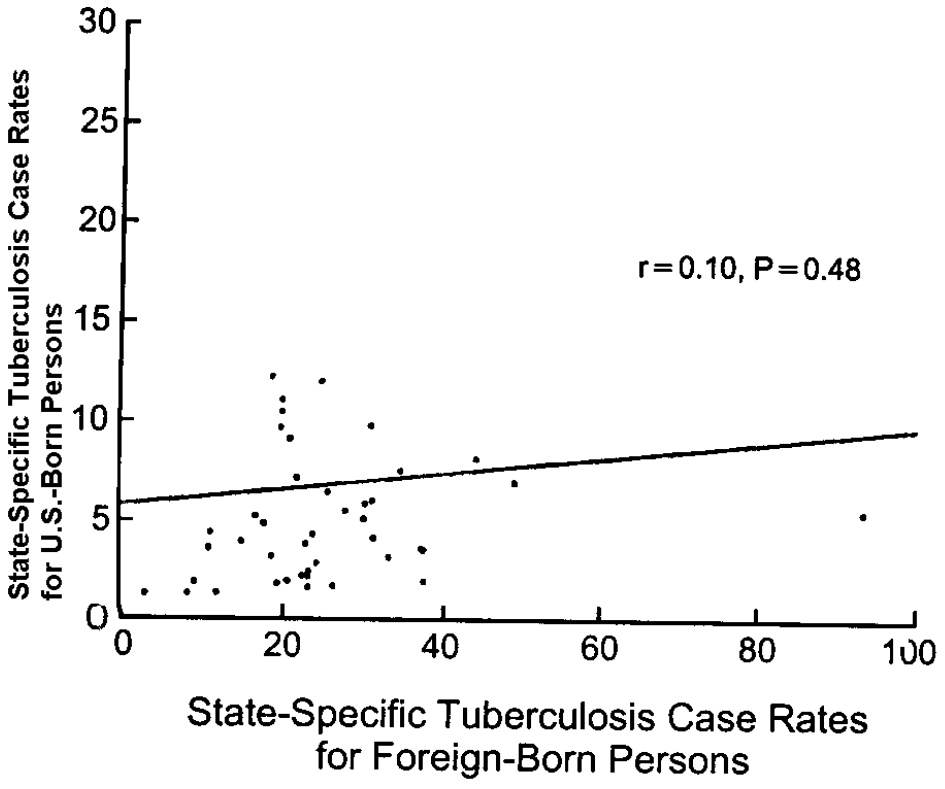
Figure 4: X-rays comparing the lungs of an asylum seeker entering Switzerland on arrival and six months later



The first is the normal X-ray of an asylum seeker entering Switzerland and undergoing screening (which is mandatory) to detect tuberculosis. Only six months later, after the man had been living in the community since being cleared through the screening process, did the man present with advanced infectious tuberculosis affecting almost the whole of his right lung. In support of this anecdotal case, a study from the Netherlands, looking at rates of active pulmonary disease in asylum seekers on entry found it to be high, at 222/100,000. In addition, rates of developing disease after entry were also high. The incidence of pulmonary tuberculosis within one year after entry was estimated at 173/100,000 (van Burg, Verver and Borgdoff 2003), that is, almost an equivalent number of cases would be detected in the year after entry as on entry.

Clearly, a fundamental public health question is to what degree immigrant-associated tuberculosis poses a threat to public health; that is, how much disease results as a consequence of transmission from recently arrived immigrant populations. Research suggests that transmission to the population born in the host country is, in fact, rare (McKenna, McCray and Onorato 1995, Lillebaek *et al* 2002, Chin *et al* 1998). For instance, in the United States an ecological study showed very little correlation between state-specific tuberculosis rates in foreign-born and the US-born population in each state (Figure 5). This means that states with high levels of tuberculosis in foreign-born individuals did not necessarily have high rates in those born in the US. Indeed, there was no association, suggesting that immigrant-associated tuberculosis was not contributing substantially to the public health burden of disease in the population born in the host country. This study could, however, be criticised since it would be expected that a considerable amount of time may pass before the impact of higher prevalence migrant populations might be seen ecologically.

Figure 5: Correlation between state-specific Tuberculosis case rates for foreign-born persons and US-born persons in the United States, 1986 to 1993 (taken from Mckenna, McCray and Onorato 1995)



Other evidence, using different research approaches, also offers insights. For example, using DNA fingerprinting a London-based study aimed to assess the degree of recent transmission that occurred in London and which populations were most affected (Maguire *et al* 2002). The study found that approximately 14 per cent of cases of tuberculosis resulted from recent transmission and that both being born in the UK and being of black Caribbean ethnicity were independent risk factors. This research showed, therefore, that most tuberculosis in London is caused by reactivation (from infection acquired years before)[8] but that a small fraction of disease results from disease in recent immigrants. And a Danish study goes further than this, showing that transmission between immigrants and individuals born in Denmark was nearly nonexistent (Lillebaek *et al* 2001).

Contrasting with these studies, however, Dutch research that predicts future burdens of disease through modelling based upon a variety of immigration scenarios suggests that, by 2030, although the prevalence of tuberculosis in the Netherlands is likely to continue to decline, more than half of cases

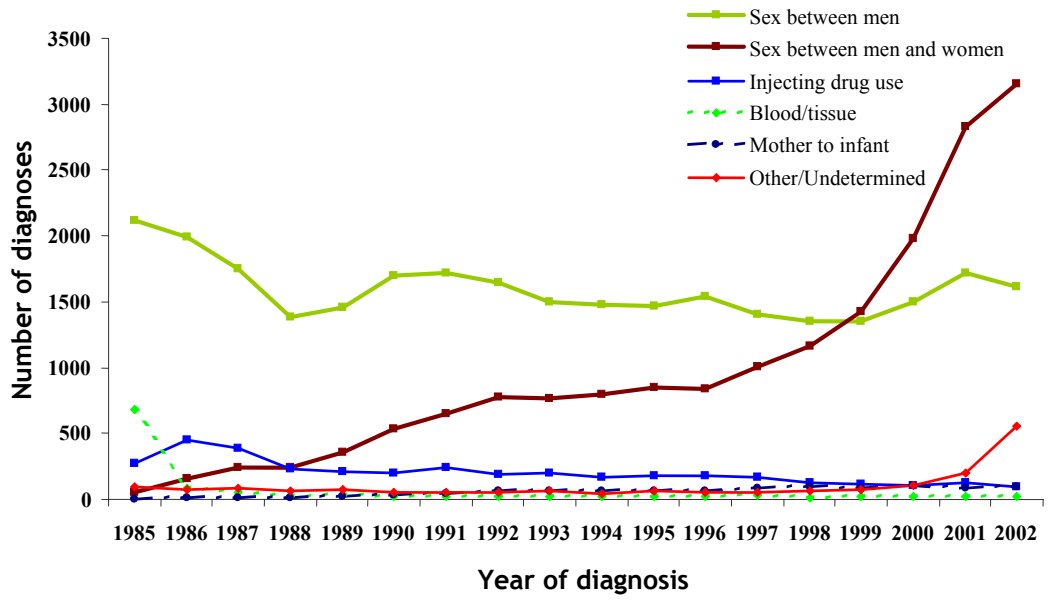
[8] Reactivation refers to the 'activation' of disease from latent disease. In contrast to the development of disease shortly after inhalation of TB bacteria, reactivation takes place years later and is related to exposure years later. This partly explains high rates of TB in the elderly Indian population: in past decades whilst living in India infection rates were high.

in Dutch-born individuals can be expected to be the result of transmission from a foreign-born source case (van Wolleswinkel *et al* 2002)

HIV

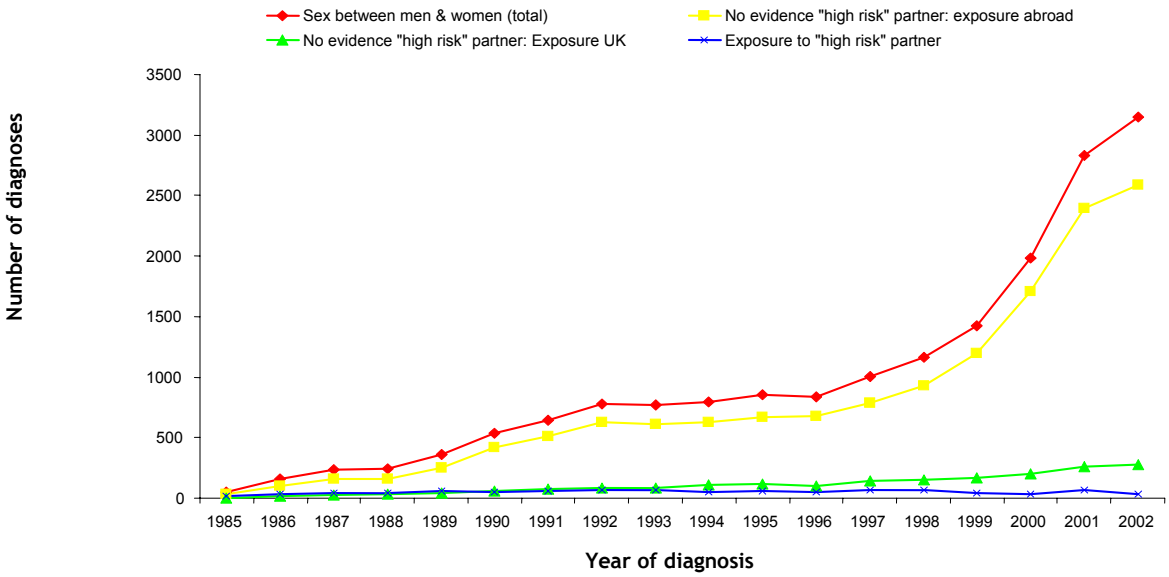
In 2002, there were estimated to be 42 million people living with HIV/AIDS globally. 38.6 million were adults aged 15 to 49, of which 50 per cent were women, and 3.2 million were children under the age of 15. Five million new infections of HIV and 3.1 million deaths due to HIV/AIDS occurred globally in 2002 (UNAIDS 2002).

Figure 6: Number of new HIV diagnoses by year of diagnosis and probable route of exposure (HPA and Scottish Centre for Infection and Environmental Health July 2003)



At the end of 2001 it was estimated that 41,200 adults were living with HIV in the UK (Communicable Disease Surveillance Centre 2002). Over the past decade, whilst the number of people living with HIV has increased, the proportion that is gay men has fallen, and the proportion infected through heterosexual sex has increased (Figure 6). In 2001, 36 per cent of newly diagnosed individuals are thought to have acquired their infection heterosexually. Of new diagnoses of heterosexually-acquired HIV, most is acquired abroad (Figure 7) – 71 per cent of new diagnoses is in people from Africa or who had acquired their infection there. In the past three years marked increases in the number of individuals from southern and eastern Africa (notably Zimbabwe, Zambia, South Africa, and with a less marked rise, Uganda) have been notified. Indeed, Zimbabwe alone accounted for the site where almost half of new infections acquired in Africa originated in 2002.

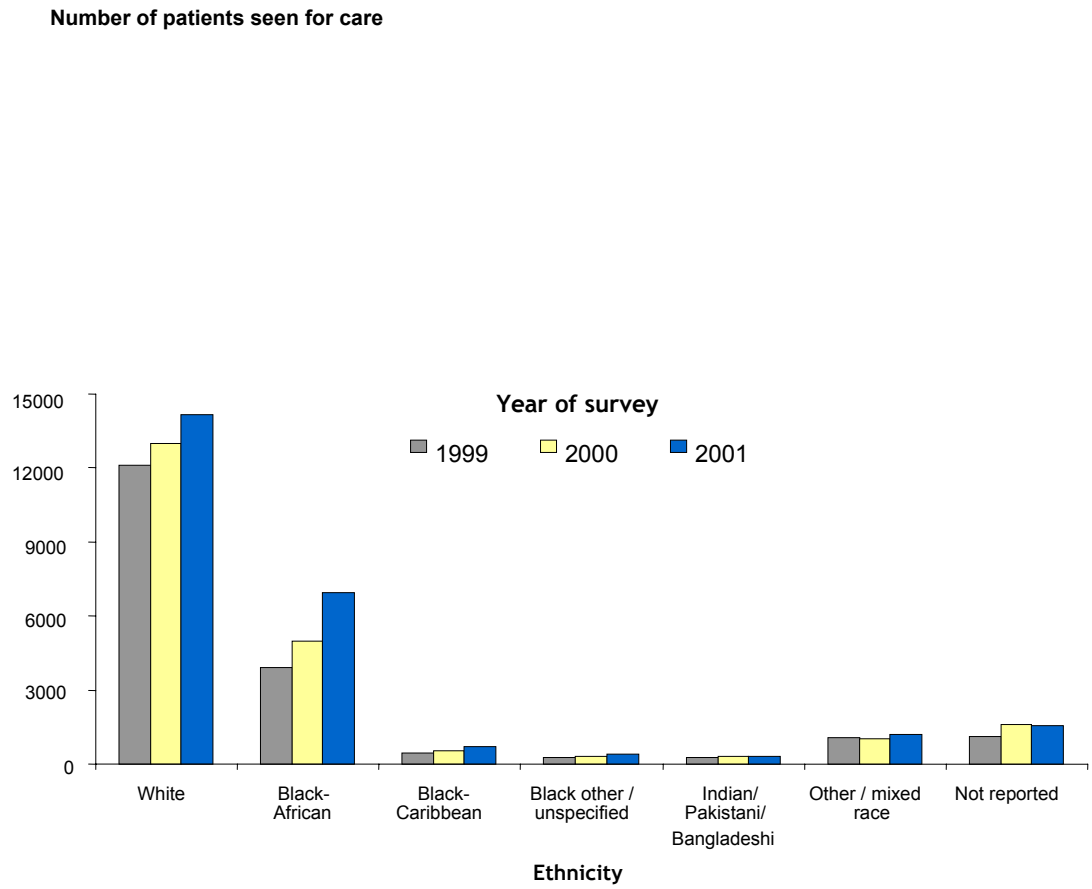
Figure 7: Heterosexually acquired infection by sub-category of heterosexual exposure (HPA and Scottish Centre for Infection and Environmental Health July 2003)



The epidemics of HIV unfolding in other parts of the world, notably India and eastern Europe, which have traditionally had links with the UK, are so far having little impact in the UK. However, new diagnoses in black Caribbean people are increasing (Figure 8).

From these data it is clear that immigrant-associated HIV is increasing and that most is heterosexually acquired abroad before coming to medical attention in the UK. Moreover, notifications of HIV underestimate the magnitude of the problem because many people infected with HIV have not been tested. By the end of 2001, for example, 11,200 people were thought to be living in the UK with heterosexually acquired HIV but it has been estimated that a further 8,300 had yet to be diagnosed. A recent survey conducted by the National AIDS Trust showed, for example, that more than 70 per cent of HIV-positive immigrants are unaware or their serostatus at the time of their arrival (which largely discredits suggestions that a principle motivation for immigration of those with HIV is health care provision)(Weatherburn *et al*, 2003)

Figure 8: Number of prevalent diagnosed HIV infected patients seen for care by ethnicity (HPA and Scottish Centre for Infection and Environmental Health July 2003)



Whilst it is clear that much HIV infection is acquired abroad, there is also some evidence of heterosexual transmission in the UK which is linked to immigrant-associated HIV. Of the 2,046 cumulative total HIV-infected individuals notified who are thought to acquired HIV in the UK, in 944 infection is thought to have been from someone originating from outside Europe, whilst in 542 (or a third of those in whom details were known) exposure in the UK originated from a partner from within Europe. All ethnic groups may be at risk of acquiring HIV through heterosexual sex in the UK. For example, in a London-based study, it has been estimated that 9 per cent of heterosexually acquired HIV in black Africans was probably acquired in the UK and might, therefore, have been preventable through UK-based initiatives (Paine *et al* 1997). With rising rates of other sexually transmitted diseases both signifying increased unsafe sexual activity and potentially facilitating the spread of HIV, rates of sexual transmission of HIV in the UK, both linked and unlinked to immigrant-associated HIV, are likely to climb.

Behavioural change is necessary to curb this rise. In relation to immigrant communities, in a recent study of sexual behaviour among London's migrant African communities, a substantial proportion of people reported new sexual partners in the past year. Moreover, many migrants returned frequently to their home countries and had new sexual partners there. Furthermore, HIV testing amongst those interviewed remained largely associated with an individual's history of sexually transmitted diseases or their self-perceived risk (Fenton *et al* 2002). This probably results in an underestimate of the real

risk and means that many of those infected remain unaware of their status. Such hidden populations of people infected with HIV may pose a particular public health challenge in terms of preventing transmission. A further study from London showed that whilst 45 per cent of white HIV-positive attendees at an HIV care centre suspected they were positive, only 28 per cent of black Africans did (Erwin *et al* 2002). Of note, a substantial proportion of black Africans expressed concern over entitlements to care and this may have played a part in their being tested and seeking care.

Effective policies?

A few public health principles

Before looking at the evidence for the effectiveness of conditional screening and detention, a brief description of some important public health principles should inform understanding.

The question of accuracy of the tool used to detect disease (or sometimes latent infection in the case of tuberculosis) is critical. Screening tests usually indicate a high or low probability of disease only, not the definitive presence of the disease, and misclassifications are inevitable. An example best illustrates the reasons for this.

Chest X-rays are the principle initial tool used to screen for tuberculosis at ports of entry(Ormerod *et al* 2000). This approach is meant to be supported by local activities where immigrants subsequently reside that include a 'health status interview' and tuberculin testing in those who have not been previously vaccinated with BCG.[9]

Chest X-rays as tools for detecting tuberculosis have changed little, and much of our understanding dates from when research into their use was conducted through mass screening programmes in the 1940s and 1950s. Chest X-ray is the screening tool that is widely advocated to help determine whether an individual has active tuberculosis (Pinet 2001; Ormerod *et al* 2000).

In order to understand whether X-rays might be useful as screening tools we need to understand three principles of public health: sensitivity, specificity and positive predictive value. Sensitivity is the probability that with the disease will test positive with the test. Specificity is the probability that an individual will test negative if the disease is absent. How good the test is at telling us a person has the disease, also known as the Positive Predictive Value. This is understood as the probability that an individual actually has the disease if they test positive, and is dependent upon the sensitivity and specificity of the screening test and also the prevalence (or proportion of the population) that has disease.

Clearly an ideal screening test would have high sensitivity and specificity so that there would be very few false positives or negatives. Yet we know, from studies conducted in the 1940s and 1950s, that chest X-rays are not 100 per cent sensitive (that is, as a screening tool they do not enable 100 per cent of people with tuberculosis of the lungs to be correctly identified; some people with disease are missed). Neither are chest X-rays 100 per cent specific; that is, those without disease might be classified as having disease through screening. The same can be said, to different degrees, for all screening tools. These issues have important implications. Moreover, suggestions that technological developments may have improved radiological approaches as screening tools may be erroneous. Whilst developments in fluorography and digital imaging may have improved resolution and offer

[9] Tuberculin testing is a means to determine previous exposure to tuberculosis. It does not differentiate active from latent infection. The test is administered and needs to be read a few days later and therefore, there are significant logistical issues around its role in screening mobile populations. It is an unreliable test if people have previously had BCG. As a tool for screening there are substantial issues around the tests sensitivity and specificity, and hence predictive value (see, for example, Toman 1981).

potential benefits to the individual patients, improvements in resolution may impact on the sensitivity and specificity of these tools in comparison to traditional X-rays that potentially increase the number of false positive results.

If we assume that the sensitivity (the proportion of true cases picked up) of X-ray screening for tuberculosis is 75 per cent and their specificity (the number of true negative cases picked up) is 99 per cent, figures that approximate those in the research literature (see, for example, Toman 1981), then we can calculate the probability that an individual for whom the screening test is positive actually has the disease. This is dependent upon the prevalence of disease, that is, the number of people at any one time with disease in the population to be screened. These issues can be illustrated through a couple of hypothetical illustrative scenarios (Table 3).

Scenario 1

If a screening tool such as chest X-ray is used to screen immigrants from, say, Zimbabwe which has a prevalence rate of tuberculosis of about 600/100,000, then we can calculate the number of cases of disease expected, the number truly identified, and the number with disease who might be missed. So, if 10,000 immigrants from Zimbabwe are screened, we would expect 60 of these to have disease. But of these 60, only 45 (75 per cent) will have been identified through screening. Moreover, of those 9,940 without disease, about 100 (1 per cent) will have been classified as having disease. So, through X-ray screening, only 45 of 145 (31 per cent) individuals identified as having tuberculosis actually have it, the positive predictive value. This means that 69 per cent of people classified as having the disease (false positives) will not, in fact, have it.

In people from countries with lower prevalence rates of tuberculosis the number of false-positives climbs.

Scenario 2

The prevalence of 40/100,000 is the ‘arbitrary but reasonable level above which tuberculosis may be considered “common”’ (Ormerod *et al* 2000) and the prevalence rate at which screening in the UK is currently advocated.

If screening people when the prevalence of disease is, say 40/100,000 (rather than the 600/100,000 of Zimbabwe) then, if 10,000 immigrants from this theoretical country were screened, the number of people with disease would be expected to be 4. Of these, only 3 (75 per cent) would be identified. But of those 9,996 people without disease, 1 per cent would be classified as having disease: 100 people. So the proportion of false-positives climbs to an astonishing 97 per cent.

Table 3: Screening reliability: hypothetical scenarios

	Theoretical population with prevalence rate of 600/100,000 10,000 immigrants screened	**Theoretical population with prevalence rate of 40/100,000** 10,000 immigrants screened
Expected number of cases of disease	60	4
Number of cases of TB detected through X-ray screening	45	3
Number of cases of TB missed through X-ray screening	15	1
Number of people without TB, but classified as having TB	100	100
Proportion of people identified with TB who actually have it	31%	3%

Linked to the prevalence of disease in any given population we can estimate how many people, on average, we need to screen to detect one person with disease. In the example of a Zimbabwean population we would expect to have to screen about 165 individuals to detect one case of tuberculosis. In our theoretical population with a prevalence of disease of 40/100,000 we would need to screen 2,500 individuals to detect one case. In 2002, there were just over 7,500 asylum applications from Zimbabwe and, on these figures, perhaps 45 cases of tuberculosis would be identified.

A further public health issue that is worth reflecting on is that tools used for screening may be interpreted by different experts differently and by the same expert differently on separate occasions. For example, in interpreting the same X-rays experts come to different conclusions from those they arrived at before in about 20 per cent of cases (Toman 1979). This may explain why, in screening asylum seekers in the UK, initial interpretations of chest X-rays meant that tuberculosis was considered to be a possible diagnosis on review by a different clinician in as many cases that were determined through the initial screening procedure – that is, as many cases of tuberculosis may have been missed despite being screened as were detected (Callister *et al* 2002).

All of these public health principles may have important implications in determining the effectiveness of screening programmes, and they inform our reflections on the merits of screening immigrants for tuberculosis in particular.

For HIV the issue is, in some ways, clearer. Antibody tests are both highly specific and sensitive, and now can be rapidly conducted (Meless *et al* 2002). This means that, even in low prevalence populations the results are (with the support of confirmatory tests) highly reliable. With confirmatory tests sensitivity and specificity approach 100 per cent meaning that problems associated with false positive results (and false negative results too) are much less problematic.

However, one issue that is a potential problem is that a period exists after infection before antibodies develop reliably. And most screening tests detect HIV-antibodies. So it is possible for an individual to be infected yet screening results to be negative if exposure was recent, within the past three months, though recently developed tests offer the potential that early infection can also be reliably detected (Rawal *et al* 2003).

Does screening immigrants on entry detect those with the condition?

Tuberculosis

For tuberculosis screening immigrants and asylum seekers for tuberculosis is an internationally widespread policy. Those originating from high prevalence countries are at greater risk of tuberculosis. But the evidence also suggests that such people are at substantial risk of developing active disease in the immediate years after entry to the new country.

One key problem, as noted above, is that the tools used for screening are by no means perfect, and many false-positives will result (with both personal and financial costs incurred) as well as false negatives. However, the number of false positives declines (and the efficiency of any screening procedure will increase) if those targeted come from high prevalence areas.

A further challenge is that screening for tuberculosis in immigrants, if it is to be a 'one-off' exercise, may not detect disease in those who travel frequently back to their country of origin. In the United States, for example, whilst 22 per cent of immigrants with tuberculosis originate from Mexico many of these individuals are likely to move back and forth across the border potentially resulting in repeated exposures (Centers for Disease Control and Prevention 1998; Menzies 2000). A somewhat similar situation may exist for those from the Indian sub-continent residing in the UK. A single screening/preventive treatment episode may not solve the tuberculosis problem in immigrants from the Indian sub-continent. This may explain why in Los Angeles most tuberculosis in Mexican-born persons occurs in long-term residents while most tuberculosis cases in the Filipino and Vietnamese populations occur in persons who have been in the United States less than five years (Centers for Disease Control and Prevention 1995; Binkin *et al* 1996).

HIV

In principle, quality controlled laboratory support for screening immigrants for HIV should reliably detect all those infected who are beyond the 'window' period. But, as with tuberculosis, there are a number of practical issues that demand attention. For example, if screening tests are the responsibility of the potential immigrant, then the reliability of screening tests, particularly if paid for by the potential immigrant, are likely to be questionable. If immigration is conditional upon a negative result, few will pay for a positive result.

A further issue relates to the targeting of screening. If screening is applied to populations from countries that have prevalence rates above a certain threshold then immigrants from areas that have a low prevalence rate may not be detected. A number of underlying assumptions underpin the notion that this might be an effective policy.

The first is that immigrants from a country have a prevalence rate of infection that is similar to that from the 'donor' country. This may well not be the case. Those seeking asylum, for example, may well have higher than expected prevalence rates. Other new arrivals may, on the other hand, have lower rates – the 'healthy immigrant' effect (perhaps the reason for low rates of tuberculosis in, for example, asylum seekers from the middle East). Changes in migration patterns, dependent on a variety of factors internationally, result in different populations with different health care needs migrating. Screening programmes set up to detect infection in those from high prevalence countries one year, may, the next, be responding to people migrating from countries with very low prevalence rates (and vice versa).

A second assumption is that populations that are able to move freely do not pose a public health threat. The free movements of people from within the European Union and from countries within next year's expanded Union may not be subjected to screening. Yet the future eastern border of the EU will be to countries that have the most rapidly escalating epidemics of HIV in the world, notably Russia, Belarus, and Ukraine. Outbreaks in populations in the new EU that have resulted from transmission from these neighbouring countries to the east have been reported (Ustina *et al* 2001). And the population movements that may result from EU enlargement are ill-understood (Dustmann *et al* 2003; Stone 2003).

A third assumption relates to undocumented immigration, and transient workforces. In public health terms screening programmes that result in these populations being neglected in terms of detection of health problems and in health service provision may result in a sense of public health security that is erroneous. Both these populations may be unlikely to be screened in practice. Moreover, if determination of a positive status excludes an individual then such a screening policy may have the perverse effect of creating incentives to avoid legal routes of entry and pursue undocumented routes or falsification of supporting documentation.

Finally, and of critical importance when considering the design and focus of a screening programme, is any notion that screening procedures should focus upon asylum seeker populations. According to the Health Protection Agency, most asylum seekers are not infected with HIV, and most new HIV diagnoses are not made in asylum seekers.[10] Whilst immigration is therefore influencing the epidemiological picture of HIV in the UK, conflating HIV and asylum is erroneous and may be counterproductive.

Will screening assist in achieving the desired public health objective?

Tuberculosis

If the desired objective is to protect public health then the jury is still out. At present, there remains little evidence that screening immigrants for active tuberculosis protects public health if ready access to diagnostic and treatment facilities are available. Ideally, evidence should be derived from robust clinical trials and subjected to the criteria by which the National Screening Committee assesses other screening programmes. But research evidence, including that derived from clinical trials, is not feasible and may be politically (and ethically) unacceptable. An approach that is being supported by

10 Personal communication from Dr Katy Sinka, Health Protection Agency, 15th October 2003

the Department of Health, therefore, is to examine the transmission dynamics of interventions through a systematic review of the literature, evaluation of systems in place in other countries, and modelling of transmission dynamics in order to attempt to determine the impact of a range of interventions on tuberculosis rates in the UK. This work is ongoing and is due to finish in Spring 2004.

At the heart of the debate on screening is whether delays in accessing care by immigrants and asylum seekers can be reduced by early detection and whether this will result in reduced transmission. Whilst the answer to this question remains elusive, what is clear is that access to health services by immigrants is problematic. But in regard to tuberculosis, evidence at least from London, shows that delays in diagnosis of tuberculosis were more likely in white patients, possibly because clinical suspicion of the disease was lower by their clinicians (Rodger *et al* 2003). Others have suggested that tracing contacts of those who have disease in order to identify other cases and offer preventive measures[11] to those at risk might be a more effective strategy than new entrant screening (Underwood *et al* 2003). Under one screening programme only three cases of tuberculosis were identified in screening 2,855 new entrants. The authors concluded that 'the considerable resources required for screening new entrants would be better spent on ensuring that all new entrants have rapid and easy access to primary care for assessment of all health needs, with a fast track referral system to local chest clinics for patients with suspected tuberculosis' (Whitfield *et al* 2003).

Immigrants and asylum seekers suffer from a range of health problems, some of which are communicable diseases, but many of which are not. Screening may offer immigrants and asylum seekers a means to provide for, and assist access to, health services readily. If this is the purpose then it might make sense to offer screening as part of an integrated primary care resource – something along the lines of a 'welcome health check' – rather than as a stand-alone policy.

HIV

If the evidence-base regarding the public health benefits of screening immigrants for tuberculosis is somewhat unclear, then the evidence-base suggesting public health benefits from screening for HIV are even scantier. Even if a screening programme reliably detects all immigrants and asylum seekers there remain major questions over the public health benefits that might be gained. Screening only confers a public health benefit if effective action follows. There are a number of issues to consider here.

First, what actions might follow a positive diagnosis? Refusing entry to immigrants infected with HIV may reduce the national burden of disease, ensuing treatment costs, and future transmission. Such a policy does little to address global burdens of disease, and may stigmatise those infected with HIV further, both in the UK and abroad, with unknown knock-on effects. Those for whom conditional screening would (or should) not apply, such as those seeking asylum, may merely be stigmatised. Second, under international law, those seeking asylum should be offered shelter and restricting asylum seekers' access on the grounds of HIV status would breach the 1951 UN Convention on the Status of Refugees. However, asylum seekers infected with HIV may still pose a public health threat: should HIV-positive asylum seekers be isolated from the rest of the host population? On what basis: that they pose a public health threat simply because they are HIV positive, or that they *may* behave in

[11] Treatment of those who are latently infected effectively prevents the later development of disease.

a way that puts others at risk? Does the risk arise because of status or as a consequence of behaviour? Third, unlike tuberculosis, those who are infected with HIV do not pose a threat merely because they are infected, they must actively participate in actions that lead to transmission. For how long should they be detained? For as long as they remain potentially infectious, that is, for life, or until the state is assured that their future behaviour will not put others at risk? And finally, if asylum seekers are refused entry, they in effect become stateless. Where should their ultimate destination be, and how should that be determined?

For immigrants other than those seeking asylum the arguments in favour of conditional screening revolve largely around issues of cost as well as public health control. That is the costs that may need to be shouldered by the recipient country in admitting those infected with HIV. The costs in treatment, for example, may be considerable. But as a proportion of health spending the sums are relatively small. Of the total NHS budget, approximately 1 per cent is spent on HIV prevention, treatment and care, a total of £335 million. If we imagine that this budget is divided in proportion to the origins of infection, then about one quarter of one per cent the NHS budget might be spent on people who acquired their HIV abroad. This at a time when perhaps the single greatest international public health challenge is HIV.

Moreover, consideration needs to be made of the economic contribution migrants may make if circumstances allow, including those infected with HIV. Under the European Convention on Human Rights, asylum seekers cannot be legally denied the right to seek asylum based on a positive HIV test result. But those immigrating for economic purposes can. A policy that excludes those who wish to migrate and contribute both socially and economically to the host nation but who are infected with HIV (and not claiming asylum) is politically challenging. Whilst such policies may receive popular support, the moral, legal, and economic arguments are by no means simple.

Ideally, the purpose of screening, in addition to offering public health benefits, offers individuals benefits. Any screening should be linked to treatment and follow-up care. Those identified with HIV infection should be able to benefit, and providing these benefits will demand resources. But as well as costs, there may be public health benefits to be gained. Those who are aware of their HIV status may modify their behaviour through practising safer sex, or stop sharing needles if they are injecting drug users. In addition to treatment prolonging life, and reducing morbidity, treatment also reduces the likely development of other communicable diseases such as tuberculosis. Moreover, treatment also probably reduces an individual's infectiousness (Cohen *et al* 2002). Yet for the individual and public health benefits to accrue from care and treatment those infected need to be first identified, second encouraged to modify their behaviour, and third, follow clinical advice. Is this best achieved under a voluntary system or with coercive measures?

Recognising some of these issues and others, in 1987 experts convened by the WHO's Global Programme on AIDS, concluded that screening of international travellers was likely to be ineffective and impractical. They argued that, 'rather than screening of international travellers, resources must be applied to preventing HIV transmission among each population, based on information and education, and with the support of health and social services.'(WHO 1987). The reasons put forward in 1987 remain convincing today.

Will conditional screening enhance public health?

Tuberculosis

Few studies have addressed the potential impact of conditional or compulsory screening for tuberculosis. Tan *et al* (2001), in a systematic review, suggested that strict guidelines on screening of non-immigrant visitors at frontiers 'used as exclusionary measures can actually worsen the epidemic'. It was hypothesized that this may occur because of the potential diversion of funds from high-risk populations to low-risk populations.

The only study (from Libya) to attempt to determine systematically the impact of screening legislation addressed the issue of drug resistance development. This suggested that the percentage of patients presenting with resistant strains fell more dramatically after the introduction of legislation to screen all foreign and local workers for tuberculosis. But other factors, such as the introduction of strict control of anti-tuberculosis drugs, were introduced at the same time and so it is difficult to make conclusions about what the real impact of screening legislation was (Khalil and Sathianathan 1978).

Coercive measures may be counterproductive. For example, ethnographic interviews with people at high risk for tuberculosis and show that such individuals are likely to be discouraged from, or delay, seeking care because of fears over the coercive nature of some legislation (Asch *et al* 1998; Asch, Leake and Gelberg 1994; Curtis *et al* 1994). By creating a situation where people to delay seeking care the period of infectiousness is extended and transmission to others may result unnecessarily.

HIV

The isolation, quarantine, or detention of people with HIV has received considerable attention over the past two decades, but little evidence of public health benefit has been documented. Most research and debate has been around the political, legal and ethical justification of such an approach (or lack of it). The reason for this lack of evidence is two fold. First, evidence based policy is not simply an extension of evidence-based medicine: it is qualitatively different. In referring to this Black (2001:275) suggests that, '[r]esearch is considered less as problem-solving than as a process of argument or debate to create concern and set the agenda'. Indeed, this paper seeks to stimulate and contribute to this debate. But evidence to support policy-making in this area is also scarce because the quantitative tools used by epidemiologists and public health specialists are inadequate to address many of the questions. For example, randomised controlled trials of a coercive intervention are ethically and morally unacceptable; observational studies are, by and large, not feasible given the infrequent use of such tools (in the case of detention) or the blanket use of such tools (such as in screening policy). Furthermore, access by researchers to individuals detained (or their records) is fraught with ethical, legislative and administrative hurdles. In attempting to derive informed public health policy regarding the use of legal sanctions and coercive public health measures we are often left with intuition, supposition, and inference from settings where policies such as conditional screening have been adopted.

In advancing the notion that some degree of coercion is necessary to detect HIV infection in some populations there is an assumption that more than willingness on the part of people who are HIV-positive is needed to prevent the virus being transmitted to others and that by coercively testing

people this will facilitate a change in their behaviour. To my knowledge, there is no evidence to support this contention. This is not to suggest that voluntary testing, freely available and targeted towards populations at higher risk if necessary, should not be wholeheartedly supported. It should, but any coercive element introduced may prove counterproductive, because it may stigmatise those who are infected, discourage individuals from being tested, and hinder those who are infected from seeking care because of concerns about other sanctions being imposed. By inference, it is likely that pre-entry screening for migrants would have the same consequences and there is no evidence from any other countries which have pre-entry screening for HIV that it does not. Indeed in many of the countries that have migrant pre-entry screening for HIV rates of infection and transmission are higher (not lower) than they are in the UK.

Other issues raised by the use of coercion raise substantial ethical difficulties. For example, in testing people without their informed consent, then fundamental medical principles are being ignored. If the individual cannot refuse to be tested then informed consent has no meaning. Furthermore, where consent is not required then becoming 'informed' (through pre- and post-test counselling) is likely to be poor, not least because a fundamental principle in the clinician-patient relationship, that of trust, has been damaged. Counselling is also likely to be perfunctory when large numbers of people are being processed. Experience suggests that where coercive testing for HIV is practiced (whether formally or informally) then confidentiality is seldom little more than theoretical.

Coercive measures, it could be argued, tend to instil in some sections of society a sense of security that is not justified, whilst instilling in other sections a fear of the authorities. If a coercive approach to screening for HIV is adopted one fear might be that the burden of responsibility in behaviour change falls on those identified as infected, and might imply that those not infected need not change their behaviour. Furthermore, those not identified may erroneously believe they are not infected and not modify their behaviour. All of these issues raise important concerns where the doctor-patient relationship is concerned and raise fundamental questions about whether physicians and other health care professionals should be expected to provide services in a system that offers uncertain individual and public health benefit and is coercive in nature.

Implications for policy

Transmission basics

- Transmission of tuberculosis is through contact with infectious people with disease of the respiratory tract. After treatment is initiated patients generally become non-infectious within a few weeks.

- Transmission of HIV is through transfer of bodily fluids. Treatment may reduce infectiousness but does not eradicate risk. Prevention of spread is dependent upon behaviour change.

Epidemiological picture

- The UK is witnessing increases in immigrant-associated tuberculosis and HIV and these are important public health challenges.

- Changes in the epidemiological trends of these diseases in the UK are closely linked to global epidemiological trends.

- Increases in multi-drug resistant tuberculosis (MDRTB) both globally and in the UK have profound implications, not least because of the cost of treating cases rises substantially.

- Africans are the most severely affected migrant community for HIV and tuberculosis.

- HIV-associated tuberculosis affects substantial numbers of people, particularly in London, and the clinical picture may be very different from that seen in those not infected with HIV.

- There is probably a substantial population of people with HIV infection in the UK unaware of their status, potentially posing a substantial public health challenge.

- HIV-infected black Africans are more likely to be unsuspecting of their HIV status than white HIV-positive people.

Screening policy, practice and performance

- The purpose of screening may be two-fold:

    - to identify individuals who may benefit from health care and so offer them care;

    - to protect the public health by identifying individuals who may pose a threat so that the threat can be controlled and the public protected.

- Voluntary screening of immigrants for tuberculosis is national policy and is a widely advanced policy in many countries but the evidence base in support of this is weak. In the UK screening has, in practice, focused on asylum seekers.

- In practice, screening immigrants to the UK is erratic.

- Few data exist, but indications are that few asylum seekers offered screening 'abscond'.

- Conditional screening of immigrants for HIV is not current national UK policy. Voluntary confidential testing is widely available through the GUM services.

- Screening tests for tuberculosis lack reliability, and substantial numbers of false positives result particularly in populations with low prevalence.

- 'One-off' screening exercises may not detect disease in those who travel frequently back to their country of origin.

- There is little evidence that immigrants delay seeking care for tuberculosis.

- There is little evidence that the host population is at substantial risk from immigrant-associated tuberculosis.

- Screening tests for HIV are reliable but a brief window period following infection may lead to false negative results in some.

- If screening tests are the responsibility of the potential immigrant, then such tests are likely to be unreliable for all of the reasons outlined in this paper, including the non-reliability of screening for TB and the potential stigma associated with testing for HIV. In addition pre-entry testing raises profound ethical and moral issues, the implications of which this paper has not specifically addressed.

- Screening programmes may result in some populations such as undocumented immigrants and transient workers being neglected in terms of detection of health problems, and in health service provision and may result in a sense of public health security that is erroneous.

- Screening have may have the perverse effect of creating incentives to avoid legal routes of entry and pursue undocumented routes or falsification of supporting documentation.

- Evidence is lacking regarding the benefits and drawbacks of introducing pre-screening for tuberculosis and HIV to support public health in the UK. It is important that policy makers considering pre-entry health screening recognise that the data on the links between pre-entry screening and transmission and infection rates in countries of migration is scarce. The factors that contribute to increased or decreased rates of infectious diseases are complex and evidence to prove conclusively whether pre-entry screening impacts negatively or positively on overall rates of infection is lacking.

- Voluntary health screening may offer immigrants and asylum seekers a means to provide for, and assist access to, health services.

Coercion to enhance public health protection?

- There is little evidence to support the use of coercion in screening.

- Coercive measures may be counterproductive by discouraging people from seeking care and potentially remaining infectious for longer.

- Ethical arguments over the past two decades over HIV screening favour a voluntary approach over a compulsory one. Significant ethical questions remain surrounding the issue of coercion in HIV control.

- Professional conduct by health care providers may be compromised if the benefits of coercive measures are not clearly demonstrable.

- If a decision is taken to focus pre-screening health checks on migrants from high-risk countries, this would mean that nationals from certain countries were effectively being discriminated against, particularly if this then meant that they could automatically be refused entry to the UK. In addition, asylum and European Convention law renders illegal the exclusion of asylum seekers based upon their communicable disease status.

- United Nations institutions have argued consistently against the use of coercive measures for HIV.

- Public health has a long tradition of resorting to coercive practices, with little evidence to suggest public health benefit.

Recommendations

1. Since the first gay men in San Francisco and New York were diagnosed with a mysterious new ailment (later termed AIDS), Britain's formal public health policies have been internationally lauded as humane. The position was taken early in the pandemic to protect human rights and provide care and succour to those in society most marginalised and stigmatised. The public health policies developed in response to AIDS have also been rational, coherent, and, as time has shown, effective. This reputation should not be neglected nor compromised through ill thought-out coercive screening policies that conflate public health challenges with immigration policy.

2. Policy options that contravene the European Convention and UN conventions should not be pursued. Given that DFID has berated the governments of other countries for not adhering to the standards set out in such conventions, it would be inconsistent and potentially politically damaging for the UK government to advocate such policies and introduce coercive screening measures for asylum seekers on entry to the UK.

3. For compulsory health screening to be fully effective in diagnosing infection, the government would need to introduce compulsory health screening for all tourists, visitors and students coming to the UK and for all returning British citizens travelling outside of the country. The alternative is to introduce pre-entry screening for permanent migrants to the UK in high-risk countries. This is likely to be enormously expensive because of the associated infrastructural and recurring costs not least because of the large number of countries where such systems would be needed and the changing nature of the global epidemiological picture of both diseases such that screening systems will need to be constantly re-focusing. Moreover, as highlighted in this paper, substantial issues surround determinations of what 'threshold' of disease prevalence in a country should dictate any country's pre-screening system and the large numbers of migrants from lower prevalence countries likely to be still at risk of infection. In the context of the evidence in this paper which indicates that screening for TB on entry (or pre-entry) is largely ineffective and that for HIV it raises considerable ethical and legal issues, any decision to adopt a pre-screening requirement must be based on evidence which supports such an approach and which robustly shows that there are clear public health benefits. At the current time it is not clear that this evidence exists.

4. There is a danger that limited compulsory health screening – for example, of individuals claiming asylum at ports of entry to the UK– would not detect infection in others (both non-port applicants and other migrant populations) and might lead to a false sense of security that the problem of immigrant-related disease had been controlled.

5. Moreover, evidence suggests that inclusive policies work best and that exclusionary policies that risk alienating and stigmatising those who have tested positive may be counterproductive. Medical experts believe compulsory screening would not only be ineffective but would cause those who know they are infected to go underground. If anything, this would merely increase the risk of infection spreading. Coercive policies should therefore be rejected.

6. The public health challenge of immigrant-associated tuberculosis should be met through provision of primary care services integrated with broader social support. These services should provide for the range of health needs that recent immigrants (including other communicable diseases, mental

illness, non-communicable diseases). Models of good practice already exist and these should be built upon.

7. Immigrants and asylum seekers suffer from a range of health problems, some of which are communicable diseases, but many of which are not. Screening may offer immigrants and asylum seekers a means to provide for, and assist access to, health services readily. If this is the purpose then it is most appropriate to offer screening as part of an integrated primary care resource – something along the lines of a 'welcome health check' – rather than as a stand-alone policy.

8. The priorities for tuberculosis control should remain prompt diagnosis and treatment of cases. This should be done by supporting effectively current community-based services. Screening programmes should not be expanded until the evidence base supports this.

9. Screening programmes should, where possible, be subjected to the criteria set down by the National Screening Committee. Where this is not practicable, then screening programmes should still be referred to this committee for consideration and evidence in support of such programmes robustly critiqued. Where evidence is needed to inform policy this should be commissioned in the normal way and decisions deferred until such research is completed and reviewed.

10. The government should support policies which encourage HIV testing for the purpose of ensuring more effective access to treatment and to enhance prevention efforts. To meet the public health challenge of immigrant-associated HIV policies should encourage (rather than force) those who are at risk of infection to be tested, and all, including those who are infected, to modify their behaviour to ensure transmission does not occur. Programmes that focus specifically and sensitively on populations at higher risk are needed.

11. The evidence base to support the use of detention as a tool in the public health armamentarium is limited. Policies that advocate detention for public health reasons should therefore be rejected.

12. HIV and tuberculosis are global health challenges. National control will, ultimately, be dependent upon how effectively those global challenges are met. The UK should enhance its support internationally by working at the national, European and international level to channel increased resources to health system development in developing countries and increasing long-term support for initiatives such as the Global Health Fund.

13. In regard to public health and immigration policy it is unclear how the Cabinet Office, Department of Health, Home Office, and the Department for International Development are addressing the issues raised in this paper. A coherent and joined-up policy is needed which draws upon research commissioned by each of these departments. Such an approach will be vital in addressing the actual and perceived public health concerns associated with globalisation and the increased movement of people between countries, and for ensuring that any measures which are introduced are based on the evidence, including costs and benefits, of screening and are not knee-jerk reactions to the ill-considered and unworkable demands of the anti-immigration lobby.

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Annex 1
List of participants at the seminar held on 8th October 2003

Derek Bodell	National AIDS Trust
Dr Angela Burnett	John Scott Health Centre, Hackney
Dr Richard Coker (speaker)	London School of Hygiene & Tropical Medicine
Sarah Corlett	Commission for Racial Equality (CRE)
David Coulthread	National AIDS Trust (NAT)
Dr Heaven Crawley (chair)	ippr
Dr Peter Davies	TB Alert / Liverpool NHS Trust
Dr Francis Drobniewski	King's College Hospital, Dulwich
Don Flynn	Joint Council for the Welfare of Immigrants (JCWI)
Edwige Fortier	All-Party Parliamentary Group on AIDS
Neil Gerrard MP	Chair, All-Party Parliamentary Group on AIDS
Dr Evan Harris MP	Liberal Democrat Health Spokesman
Dr Helen Hogan	General Practitioner
Simon James	Cabinet Office
Prof Mark Johnson	Mary Seacole Research Centre CEEHD, De Montfort University
Dr Jane Jones	Health Protection Agency (HPA)
Martin Kirk	Terrence Higgins Trust
Kat Lorenz	Refugee Action
Ruth Lowbury	Medical Foundation for AIDS & Sexual Health
Mike Mahony	Immigration and Nationality Policy Directorate
Emily Miles	No.10 Policy Directorate
Helen Murshali	Refugee Council
Lisa Power	Terrence Higgins Trust
Dr Susan Rowlands	Immigration Law Practitioners' Association (ILPA)
Dr Katy Sinka	Health Protection Agency (HPA)
Sarah Spencer	ippr
Simon Taylor	UNHCR