Identification of tuberculosis cases by port health screening in Essex 1997–2003
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Abstract
Between 1997 and 2003 an annual average of 1867 new entrants seen at the port of arrival were notified to the communicable disease teams who now form the Essex Health Protection Unit. We examined the number of individuals who made contact with health services by linking port health and tuberculosis databases with combinations of surname, forename and date of birth the number of new entrants developing tuberculosis. We also searched paper records for all incidents of active tuberculosis in health and residential care workers. Eighteen individuals were in both port health and tuberculosis data sets; only one was identified by new entrant screening. In the same period there were 35 cases of active tuberculosis in health care workers, only one of whom had been screened on arrival in the United Kingdom, resulting in follow-up of 371 contacts. The new entrant screening programme in Essex should be stopped and resources diverted to improve follow-up of new entrants, especially those who are health care workers.

Keywords: new entrant, port health, tuberculosis

Introduction
Immigrants intending to stay in the United Kingdom for more than 6 months should be screened for tuberculosis at the port of entry. Following screening a Form Port 101 is issued by the Port Health Unit for those where medical examination and chest X-ray have been completed and the individual ‘appears to be in satisfactory health’. Form Port 102 is issued for those in whom a chest X-ray has not been carried out and Form Port 103 for those considered to have disease which ‘may endanger the public health’.

The study covered a period of major reorganisation in the NHS. Prior to the formation of Primary Care Organisations (PCO) Port Health Forms were sent to the health authority of residence of the new entrant. In Essex the Communicable Disease Teams of North and South Essex were responsible for recording notifications and initiating follow up as required. On 1 April 2003 this responsibility transferred to the Essex Health Protection Unit, acting on behalf of the Essex PCOs.

Over the same period a nurse-led TB contact tracing clinic was introduced in South Essex which increasingly improved data collection from 2002 onwards.

The requirement for screening places a considerable burden on local services in Essex. In addition investigation of local incidents of tuberculosis in health care workers from countries with a high incidence suggested that screening was not very effective. This study was undertaken to establish the outcome of new entrant screening in Essex.

Methods
Since 1997 all Port Health notifications in Essex have been logged on to two separate computerized databases, which were merged into a single database in 2000. Similarly, statutory tuberculosis notifications were logged on two surveillance systems, which were merged in the same year. Four of the five hospital microbiology laboratories in Essex also submit copies of positive microscopy and culture results to improve ascertainment.

When a port health notification is logged all new entrants or their parents, excluding college and university students, are sent a welcome letter by the local health protection unit (HPU). The letter has a reply slip for the GP to complete and return once the patient has registered. Students are referred directly to their student health service and are not followed up further by the HPU.

In the PCOs located in the former North Essex Health Authority area GPs are asked to examine patients for signs of tuberculosis and confirm the presence of a BCG scar. Only those new entrants without a BCG scar, in whom signs or symptoms suggest tuberculosis or who have a Form 103 are referred to a local respiratory physician.

In the former South Essex Health Authority area adults and children with a Form Port 101 are sent a welcome letter with a slip for the GP to indicate they have been registered. Those with a Form Port 102 or 3 are referred to a local TB contact tracing clinic for skin testing and chest X-ray as appropriate. Some children were also notified to the health visitors as a further safeguard to ensure registration with local health services.

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occurred. We examined outcomes for those who attended the clinic in more detail.

Any patients identified as having active tuberculosis by new entrant screening should also appear on the tuberculosis database. However, notifications made at different times by different health care workers and name changes by the new entrant following marriage may have resulted in discrepancies in the details for the same individual on the two databases. We therefore looked for matches in both data sets using surname alone, date of birth alone, forename alone and forename against surname and surname against forename. The last two searches were carried out because forenames and surnames of those with unfamiliar foreign names are sometimes transposed. Matching was carried out by importing port health and tuberculosis data sets into an MS-Access database and running the relevant queries. Any possible matches identified by the computer were then screened manually to see whether other characteristics including date of birth, address of residence in the United Kingdom or other names also matched.

The port health dataset included all notifications of port 101, 102 or 103 forms or their equivalent since 1 January 1997 until 31 December 2003. We excluded those individuals where the port health form had been sent to the wrong health authority, or where they had moved to a new address outside the area by the time contact was made. The tuberculosis dataset included all notifications from 1 January 1997 until end April 2004, to allow for those individuals arriving at the end of December 2003 time to be screened locally.

We also searched our written records by hand for incidents of tuberculosis involving health and residential care workers from 1997 until April 30 2004. We recorded whether the patient had been screened on arrival in the United Kingdom and the number of contacts followed up once the case had been identified.

**Results**

There were 11 200 port health notifications and 547 tuberculosis notifications in the relevant datasets which represents an annual average of 1867 and 88 respectively. Excluding students, and children notified to a health visitor, 2389/10 009 (24 per cent) of new entrants made contact with local health services either by registering with a GP or attending a chest clinic. 120 welcome letters were returned as ‘not known at this address’ or similar.

Since January 2002 208/352 (59 per cent) of adults referred to the South Essex TB contact tracing clinic attended a first appointment. However, many did not complete follow up. In the calendar year 2003 only 54/257 (21 per cent) of referrals did so. 184 children were referred to the clinic (excluding those referred directly to a health visitor), of whom 41 (22 per cent) attended at least once. No adult or child required chemoprophylaxis.

The matching process identified 18 individuals on both port health and tuberculosis databases. However, only one individual was identified with tuberculosis as a direct result of port health screening. The remaining 17 were identified at intervals of between two months and 6 years after entry to the United Kingdom (Figure 1). In one case a chest X-ray taken as part of a port health screen was reported as normal. Two months later the patient presented with active pulmonary tuberculosis.

Figure 1 shows the time from entry into the United Kingdom until notification of tuberculosis. We did not use date of onset of illness because this is often difficult to determine with any accuracy. For 12 patients onset of the current episode of illness was recorded as being within 3 months of notification, for three patients within 6 months and for the remainder there was no information. Twelve cases were notified within 24 months of entry to the United Kingdom and the remainder at 36–71 months after arrival. Eleven individuals were from Asia (including seven from India), the remainder were from Africa (including four from Zimbabwe).

During the study period the Essex Communicable Disease teams were notified of 24 cases of tuberculosis in hospital clinical staff and 11 cases in care assistants working in the community or in residential homes for the elderly. Thirty four (98 per cent) of these individuals were from countries with an incidence of tuberculosis of more than 50 per 100 000.1 Only one had had a new entrant screen, which revealed no signs of tuberculosis at the time. The individual was notified as a case of tuberculosis 2 years later. As a result of the identification of these cases 187 hospital patients and 30 hospital staff and 99 care home residents and 55 community car staff were screened for tuberculosis.

**Discussion**

Just under a quarter of those notified to Essex Health Protection Unit through the port health system are known to have attended a GP or chest clinic. It is possible that some GPs did not complete reply slips, however, the attendance and follow up rates at the South Essex chest clinic suggest that this is unlikely to account for much of the low rate of follow-up.
The pattern of infection in Figure 1 suggests the majority of new entrants to the United Kingdom who develop active tuberculosis do so more than 6 months after arrival. New entrant screening would not have identified them.

Screening might be useful in identifying those eligible for chemoprophylaxis. However, this does not appear to be the case from our data.

Many other European countries do not screen new entrants for tuberculosis. The value of new entrant screening in the United Kingdom has been questioned on multiple occasions. Methods to improve uptake have been suggested. However, improving follow-up rates would require the resources to re-send welcome letters and/or visit over 1800 people in Essex annually. This does not seem justified given that the majority of cases of active tuberculosis occur some time after entry to the United Kingdom. It is possible that some of those lost to follow up would be offered chemoprophylaxis, but it is unlikely from the information on those who are seen that many individuals would benefit.

On the basis of our findings we consider that follow-up of those with forms 101 and 102 should be abandoned. However, new entrants should continue to be sent a welcome letter to encourage them to register with local medical and dental services. PCOs with identifiable immigrant communities could divert the resources saved to improved liaison with and education for those most at risk. This could include a public and professional awareness campaign highlighting the need to seek medical advice if a cough or other symptoms suggestive of tuberculosis last more than 3 weeks.

We consider that although new entrant screening appears to produce a poor yield there should be more thorough ongoing occupational health surveillance of individuals from countries with a high incidence of tuberculosis working with vulnerable groups. Although the hospital staff with tuberculosis had a screening questionnaire at the time of employment this cannot detect infection in those individuals whose symptoms develop some months later. More frequent reviews in the first few years in post may assist early detection and reduce the number of patient contacts who need follow-up.

The care assistants were employed without a formal symptom check and delays in seeking medical attention after the onset of symptoms meant that some were infectious for several months at the time of presentation. Employers of care assistants should have contracts with an occupational health service to provide employment screening and periodic in-service symptom checks. Compliance with this recommendation could be monitored through the National Care Standards Commission.

Those working in hospitals should also be reviewed on at least an annual basis to minimize the likelihood of an infected worker remaining undetected for a long period. This is also an opportunity to remind employees to report any persistent cough or unresolving chest infection, fever or weight loss, even if they are under the care of a GP, so that the possibility of tuberculosis can be eliminated.

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References