

An exploration of NHS staff views on tuberculosis service delivery in Scottish NHS boards

Leah Mtui¹ William Spence^{2*}

1. Pastoral Activities and Services for People with AIDS, PO Box 70225, PASADA, Dar es Salaam

2. Institute of Health and Wellbeing, University of Glasgow, 1 Lilybank Gardens, Glasgow, G12 8RZ, UK. Email: william.spence@glasgow.ac.uk

*Corresponding author

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Abstract

Tuberculosis (TB) is a bacterial disease and major worldwide killer with an increased UK incidence rate. This study aimed to explore the views of National Health Service (NHS) staff on TB service delivery models of care in NHS boards across Scotland. Eighteen semi-structured interviews were conducted with 13 nurse specialists and five consultants in public health medicine (CPHM) across five Scottish NHS boards. Five main themes emerged and findings showed that: directly observed treatment (DOT) was provided only to patients assessed to be at high risk of poor treatment adherence; contact tracing was conducted by participating NHS boards but screening at ports was thought to be weak; all NHS boards implemented TB awareness campaigns for TB health professionals; three NHS boards conducted team meetings that monitored TB patient progress; participants believed that TB funding should be increased; contact tracing was routinely conducted by TB nurses. Improved TB screening at airports was recommended and a need for TB health education for high risk groups was identified.

Introduction

Tuberculosis (TB) is a notifiable infectious epidemic disease that each year causes illness in more than nine million people worldwide (Rylance et al, 2010) and the death of 1.4 million (World Health Organization (WHO), 2011). TB challenges global health security, and its control depends largely on early identification and timely management (Pillay and Clarke, 2003).

While TB notifications are falling across the globe – death rate dropped 41% between 1990 and 2011 – some nations are experiencing a rise in incidence rate (WHO, 2010), and in low burden regions such as Europe, an increase in case notification in some countries is raising concern (Hollo et al, 2011). Over the past 20 years the UK has

experienced an increase in cases and in 2009 Scotland saw an 8.8% increase on 2008 prevalence (Scottish Government, 2011). The disease affects mostly non UK-born individuals, and one in 10 of those diagnosed face significant social problems, e.g. homelessness, drug or alcohol dependence, or a history of imprisonment (Health Protection Agency (HPA), 2010).

Local variation in Scotland's TB incidence is similar to that found in other UK countries (Abubakar et al, 2008; Crofts et al, 2008). The Glasgow area – Scotland's largest conurbation – accounted for 48.2% (235) of reported cases (Table 1) and across the UK most cases are similarly concentrated in urban centres; London accounts for 38% of all cases with a rate of 44.4 per 100,000 population (HPA, 2010).

Key priorities for TB management in Scotland relate to the management of active cases, improving treatment adherence, new entrant screening and BCG vaccination (Health Protection Scotland (HPS), 2009). Contact tracing and screening is offered to all close relatives of infectious individuals (Jackson et al, 2009). Although there are effective interventions in tackling TB resurgence in the UK, the views of frontline staff on control and management are seldom heard.

Study aims and rationale

Studying views on models of TB service delivery has potential to identify what is working well and what could be done to improve services (Crofts et al, 2008).

The aim of this study was to explore the views and experiences of NHS board TB nurses and consultants in public health medicine (CPHMs) in relation to models of TB service delivery employed in their respective NHS boards. Their views and experiences relating to ensuring treatment adherence through directly observed treatment (DOT) and staff participation in infection control – contact tracing, screening, education – formed the study objectives.

Qualitative methods employing semi-structured interviewing were used to seek perceptions and experiences of health workers relating to their respective service delivery models. Study benefits anticipated

Table 1. TB notification by Scottish NHS board area 2005–2009

NHS board	2005	2006	2007	2008	2009
Ayrshire and Arran	6	13	13	8	9
Borders	1	7	3	5	6
Dumfries and Galloway	5	4	6	4	8
Fife	15	13	7	11	11
Forth Valley	4	4	19	10	9
Grampian	23	36	41	38	52
Greater Glasgow and Clyde	161*	132	191	213	235
Highland	11	9	8	12	17
Lanarkshire	25	51	27	31	43
Lothian	75	55	72	85	78
Orkney	0	0	0	0	0
Shetland	1	0	0	0	0
Tayside	7	11	22	25	19
Western Isles	1	0	1	3	0
Totals	365	381	410	445	487

*Data for Greater Glasgow only (Adapted from McLeod et al., 2012).

Table 2. Participant employment details

Job title	No of work years in TB services				No. of participants
	0–4	5–9	10–14	>15	
TB specialist nurse	1	4	0	1	6
Health protection specialist nurse	2	0	0	0	2
Respiratory specialist nurse	2	1	2	0	5
Consultants in public health medicine	3	1	1	0	5

included the identification of variations in models of service delivery, practice strengths and weaknesses, and sharing of service delivery model experience across NHS boards.

Methods

Recruitment

In Scotland the operational responsibility for health protection services lies primarily with 14 NHS boards. This qualitative study was conducted in five NHS boards, selected on the basis of convenience (Green and Thorogood, 2010). Participants were employed in urban, semi-urban and rural areas enabling a wide range of service delivery circumstances to be included (Davies, 2007).

A non-random sampling technique was used in recruitment, as representativeness and generalisability are not pressing issues in qualitative research (Bowling, 2009). Potential study participants were identified by Health Protection Scotland (HPS). From the identified population of six respiratory nurse specialists, six TB nurse specialists and two health protection specialist nurses, 13 nurses were recruited. The same procedure was adopted in the recruitment of five CPHMs from the selected boards. Permission to communicate with participants was granted by the research and development offices of respective NHS boards. No incentives were promised or given for participation and all but one of those invited participated (Table 2).

The interview schedule was piloted with one CPHM, two specialist TB nurses and one postgraduate student, and the sequence of

questions was revised. None of the pilot group was included in the study. Ethical approval was granted by the University of Glasgow and written consent was taken from all participants.

Data collection

Face-to-face semi-structured individual interviews were conducted in participants' offices during working hours. All interviews were recorded and field notes were taken after each interview to enhance interpretation and analysis of transcriptions (Silverman, 2010). On average interviews lasted 38 minutes (range between 15–85 minutes).

Data analysis

Interviews were transcribed and a thematic approach to analysis was adopted that included familiarisation with data and field notes and analysis in the question pathway followed by initial coding of identified categories. Codes were developed inductively from the data and organised into themes and then reviewed and compared between transcripts to reflect nuances of the data. Atlas.ti (2008) software was used in coding and organising the data. Data were collected and analysed by the first author and coding overseen by the second author with good inter-rater reliability evident. Verbatims and other low inference descriptors were used in the reporting and a reflexive approach was adopted that controlled potential bias from the first author's background in TB care. Neither author had any connection to NHS

Table 3. Study themes

Theme	Category
1. Responsibilities in TB services	Nurses' responsibilities Consultants in public health medicine's (CPHM) responsibilities
2. DOT service delivery	Patient assessment for directly observed treatment (DOT) Monitoring patients on DOT Challenges in DOT services
3. Prevention and infection control	Contact tracing activity: Identification of contacts Challenges in contact tracing Screening activity
4. Health education for TB	Health education for high risk groups Health education for health professionals
5. Monitoring of TB services	Nurse and CPHM liaison Multidisciplinary team meetings

boards, services nor participants before the study and participants were enthusiastic to discuss their respective services.

Results

Five main themes emerged from the collected data (Table 3).

Direct quotations will be used here to highlight the content of each theme.

Responsibilities in TB services

Nurses' responsibilities. All nurses reported a variety of responsibilities in TB management including their role in supporting patients throughout treatment until completion, identifying close contacts of index cases and initiating screening of these. Eight were participating in BCG vaccination.

'Organising contact screening ... seeing the patients through from the point of diagnosis towards the end of treatment ... provide BCG vaccinations, and screening of other clients.' (Nurse 11)

Six nurses reported that TB was one of their many remits and therefore most of their TB work was of a reactive nature. They reported that in the first two months of a patient's diagnosis they would spend much time monitoring treatment, building rapport, and performing contact tracing. Generally, nurses felt that they were at the centre of the TB service and had a sole responsibility following diagnosis.

'... we are kind of lead for TB ... follow patients through the medication, make sure they comply and they turn up into the clinic, and make sure they have clinic appointment, and also in the public health do this through screening.' (Nurse 1)

CPHMs' responsibilities. No consultants reported involvement in direct clinical management of TB patients, but all were responsible for surveillance of TB services in respective NHS boards. They supervised specialist nurses undertaking contact tracing and ensured follow up of cases. Screening of immigrants was one responsibility identified and CPHMs liaised with general practitioners (GPs) to ensure immigrants were registered and screened for TB. Ensuring that contact tracing is undertaken is part of the CPHM remit and one reported facilitating the division of contact tracing workload between specialist nurses and health protection nurses.

DOT service delivery

Patient assessment for DOT. Twelve nurses reported prioritising patients with significant social problems for DOT services and four reported that low staffing levels had contributed to DOT prioritisation. They reported using a risk assessment tool and participants reported that patients with chaotic lifestyles, typically homeless people and people with drug and/or alcohol problems, were prioritised for DOT due to anticipated poor treatment adherence. Three participants reported using an intuitive assessment of likely poor DOT adherence when assessing for this.

'...it's just a gut feeling ... that they will not comply ... if they are not scared of diagnosis ... you wonder do they realise the seriousness, they have to take the medicines.' (Nurse 4)

Monitoring patients on DOT. Eleven nurses reported involvement in providing DOT during their years in TB services and eight reported caring for patients undergoing DOT at the time of interview. They reported occasionally devoting a whole day to DOT and described this as a significantly time consuming activity. In three areas, nurses reported that delivery of DOT also provided support in coping with the treatment and assistance in accessing social care. Four NHS boards used independent pharmacists to deliver DOT to patients with drug misuse problems but their requirement for payment posed a threat to this service. One participant reported successful use of GP practices in delivering DOT.

Challenges in DOT services. The main challenges in delivering DOT were the: lengthy time for travel, duration of visits, and number in receipt of DOT.

'At one point last year we had 10 patients on DOT in a week. So we were seeing 10 patients on a Monday morning, the same 10 on a Wednesday morning, and again on a Friday morning.' (Nurse 1)

Participants from one board reported that alcohol and drugs were frequent problems for DOT patients and that they had experienced threats from people known to patients while visiting. Three participants reported delivering DOT on streets and in public bars to homeless patients, offering incentives in some situations to promote adherence.

'We topped up her mobile phone by the end of each week' (Nurse 1)

Two participants from one NHS board reported problematic treatment adherence particularly with the immigrant population where fears of deportation were evident.

One participant observed that the Home Office was mainly interested in ensuring that the initial two week treatment phase was completed while TB services sought to ensure that the overall treatment was completed to prevent drug resistance.

Participants employed several approaches to ensure challenges did not prevent provision of DOT. Some took safety precautions when visiting homes presenting personal risk of violence and four reported visiting in pairs where the patient's environment was assessed as threatening. In circumstances where there was a significant public health risk or when situations were considered to be threatening, the CPHM became involved and public health legislation applied.

Prevention and infection control

Contact tracing activity: identification of contacts. Twelve participants reported that identification of contacts would ideally begin after the diagnosis was confirmed.

'... who lives in the house, and who are the vulnerable people in the house? I am looking for the young, the children ... maybe somebody who has got another health problem ... maybe in their immune system.' (Nurse 2)

After the initial interview, contacts were identified and invited to attend the clinic for TB screening, to be given information on TB and followed-up if required. Children were referred to the paediatric team and 'seen within the week' (Nurse 9). Nurses reported that the process of obtaining valid and reliable information from affected individuals would sometimes be a lengthy one dependent on the building of trust.

'We often find that this is a big advantage of having continuous exposure to patients over the period of their treatment ... they tell us, 'Well you know ... you were asking at the beginning ... there is somebody whom I have been seeing ... I would like him or her not to know.' (Nurse 6)

When the contact tracing activity involved large groups of people such as industry or schools, CPHMs were involved in screening activity.

Challenges in contact tracing. Patients with chaotic lifestyles frequently provided unreliable information for tracing contacts, with poor recall of details and sobriquet use making tracing lengthy.

'...some people are harder to reach ... homeless people, people with drug addictions and alcohol ... when trying to screen their contacts it's quite difficult ... people with chaotic life ... sometimes they do not know their contacts.' (CPHM 1)

Participants from four NHS boards reported stigma as a challenge to contact tracing in minority ethnic groups and elderly Caucasians. Five participants felt the need for further secretarial support in sending invitation letters to contacts as this impinged on clinical time.

Screening activity. Participants reported referral from the port health authority of individuals with inconclusive X-ray results or those not screened on entry. All CPHMs expressed concern about the 'partial', 'patchy' and 'unlikely to be successful' screening policy for new entrants. One consultant felt the active involvement of community health partnerships (CHPs) – a health board committee that develops local community health services in partnership with local authority partners – in screening new entrants would be an effective approach.

'I want the CHPs to take more responsibility for delivering that service, and try to identify at least a dedicated nurse within each CHP.' (CPHM 2)

Health education for TB

Health education for high risk groups. Twelve nurses directly involved in the delivery of TB services reported a very poor awareness of TB and its symptoms among patients and contacts in all NHS boards.

'We are bringing people into the clinic, or we are seeing them at home ... we are talking about TB ... giving them leaflets.' (Nurse 8)

On raising TB awareness to high risk groups one participant felt that stigma was a concern among some minority ethnic groups.

'They will not come ... they would not want to know ... because of the stigma ... if you asked anyone in the [ethnic minority population] about the history of TB in the family they will say "no" ... they probably have ... but they will not turn out for it.' (Nurse 4)

Interestingly, others reported managing to reach out to high-risk groups and deliver health education.

'There is a local radio station that goes out to [an ethnic minority population] and we were invited to talk about TB.' (Nurse 11)

However, it was thought the process might be a sign of discrimination – 'targeting them just because they are' (Nurse 11) an ethnic minority population. Another participant reported working in collaboration with other local programmes dealing with high risk groups to raise TB awareness, e.g. community mental health teams.

Health education for health professionals. Six participants felt there was a requirement to raise awareness about TB among health professional colleagues. They reported delays of case detection from GP practices, and receiving many calls enquiring about TB.

'...where we have a high number of TB ... the TB services team delivered education sessions at lunch time for nurses and the GPs came along as well.' (CPHM 4)

Monitoring of TB services

Nurse and CPHM liaison. Twelve participants reported regular formal meetings between nurses and CPHMs to discuss the provision of TB services.

'Every six weeks we have a meeting with CPHM and TB nurses ... to discuss new cases or any other management issues ... the cases we will discuss with CPHM will be contact tracing cases. If there are index cases who worked in the bakery ... we will talk to them with [CPHM] because we will need a secretary to ... send out letters etc.' (Nurse 3)

In some areas, participants reported no regular formal meetings but these occurred when an acute issue arose, e.g. outbreak situation.

Multidisciplinary team meetings. TB monitoring group meetings were differentiated from the multidisciplinary team (MDT) meetings that addressed case review and clinical management. Differing perceptions of MDT meetings existed among participants. In one area, MDT meetings were perceived as TB review meetings with TB staff, laboratory staff, infectious disease consultants and the paediatrician in attendance. In another the clinical meeting was perceived as the MDT meeting. There was no indication that social services or community

organisations were involved in MDT meetings. Thirteen participants reported that GPs were not involved but some saw them as an opportunity to review TB services by involving all board area stakeholders.

Discussion

Responsibilities in TB services

Nurses have been recognised as the cornerstone in the delivery of many health activities in the clinical management of patients through treatment support, and through infection control activity (Liaschenko, 2002). Here all perceived themselves as the central element of TB services in NHS boards including support of patients until treatment completion. Nurses' contribution to patients' care has been shown to increase significantly the number of patients completing TB treatment as well as being cost effective (King et al, 2009).

Identifying people exposed to TB infection, evaluating and treating them is the goal of contact tracing and all nurses here had responsibility for contact tracing, although previously as few as 86% were found to be involved (Hamlet, 2001). Despite this, the extent of nurses' involvement in TB care varied and depended on TB prevalence and services' geographical location (Balasegaram et al, 2008). Nurses in low prevalence areas may have other responsibilities in respiratory health and TB work may not be afforded the highest priority, although this risks the diminishment of TB related skills (Laycock et al, 2009).

It was clear that CPHM participants believed their responsibilities extended to leading TB services in NHS boards and TB control e.g. planning, coordination, monitoring, and resourcing. Similar responsibilities were found in more than 75% of TB leadership roles (Laycock et al, 2009). TB leads did not report establishing relationships with local organisations as part of their core responsibilities although the Public Health etc. (Scotland) Act 2008 required them to link with existing local agencies in protecting the health of the public. That medical CPHMs retained the strategic role and nurses retained operational responsibility in TB care reflects traditional role demarcation between these professions, the gendered nature of caring, and the domination of nursing by medicine. Participants did not share their thoughts on this or nurses' more strategic involvement.

DOT service delivery

Participants reported the quick and effective flow of information regarding TB cases following identification, consistent with TB guidelines (NICE, 2006; Health Protection Network, 2009; Government of Scotland, 2008). DOT plays a key role in determining the overall success or failure of TB control programmes, and influences the equity and accessibility of care during treatment (Noyes and Popay, 2007). Key groups here were afforded high priority for DOT and a shortage of human resources here contributed to its rationing through prioritisation. Staff shortages in DOT delivery have been found elsewhere in the UK, where as few as half of those eligible have received it (Hemming et al, 2009). To reach DOT prioritisation decisions, treatment risk adherence tools were used here, classifying risks for adherence as low, medium, or high, with those at higher risk offered DOT. Tool use has been shown to be effective in identifying patients: with no need for DOT, in need of close supervision, and for whom DOT was essential (Dart et al, 2009).

Prevention and infection control

The follow up of those at risk of TB through contact with a diagnosed individual is valuable in infection control (Cook et al, 2008; Morán-Mendoza et al, 2010). The first approach reported here involved the public health team and nurse specialists who provided an ad-hoc contact-tracing activity, requiring significant staffing. A second and less costly approach involved respiratory and TB nurses only, where every TB patient was examined and interviewed for close contacts and a focused investigation conducted on contacts at risk.

The comparison of these two approaches across quality measures – efficacy, effectiveness, efficiency, optimality, acceptability, legitimacy, equity (Donabedian, 1990) – is recommended.

Participants here reported that securing accurate and reliable information from patients could be a lengthy process and this is supported by the findings of Duthie et al (2008). Associated fear, stigma, and shame can contribute to the extension of this process (Kulane et al, 2010). Priority for contact tracing was reported here to be given to close contacts of smear-positive individuals, especially with vulnerable groups including children, who have previously been found to have a risk of up to 4.8% of developing TB following contact with such individuals (Rubilar et al, 1995).

Screening of new immigrants is an effective way to control infection in countries with low TB prevalence, although it is complex to accomplish following entry to the country (Hogan et al, 2005). Participants here wished for improved new entrant screening and many expressed concern about the existing system particularly at airports in Glasgow and Edinburgh. Challenge in registering immigrants with local GPs where they could be screened for TB were found and related delays have been found elsewhere (Cooke et al, 2007). An analysis and review of new entrant screening policy and related procedures at Scotland's international airports – including an audit of the practice of officials involved – are recommended.

Health education for TB

Fairly traditional approaches to health education were used here. The provision of educational programmes – on TB awareness with health workers and high-risk groups – may almost double the rate of TB detection and diagnosis compared to where these are not offered (Griffiths et al, 2007). This suggests the need for larger scale educational interventions, strategically focused on groups/populations at risk. The extent of TB related community action (WHO, 1986) was not explicit here and a study of the nature and scope of this is recommended.

Monitoring of TB services

Participants from just two NHS boards reported regular meetings with respective CPHMs and specialist nurses on TB public health activities. Three of the five NHS boards here had regular MDT meetings termed 'TB review meetings' or 'TB clinical meetings' and such working is supported by the Government of Scotland (2011) in TB detection. Also, strategic TB group meetings or TB monitoring groups addressed local TB trends and challenges and in one NHS board such a meeting was combined with an MDT meeting on a biannual basis. A broad range of stakeholders here participated in such meetings, e.g. TB nurses, respiratory and paediatric physicians and primary health care practitioners.

Conclusion

Nurses were clearly the core practitioners of TB services and CPHMs intervened to support them when a large number of contacts were involved. This demarcation of roles is more consistent with a hierarchical rather than a meritorious professional and/or organisational structure. Scope for increased flexibility in roles should be explored to ensure that those with in-depth operational knowledge may advance to strategic work. Monitored treatments here posed a significant strain on the workload of nurses and low strategic prioritisation of TB services is not uncommon. A more detailed appraisal of the costs and benefits of these services is recommended. A clearer picture of screening activity at Glasgow and Edinburgh international airports should be established. TB stigma was clearly a barrier to service take-up and the study of stigma experience in relevant ethnic minority communities is recommended. Participants from only one NHS board here offered TB

education awareness programmes that targeted minority risk groups, but all participating boards offered these programmes to health professionals. The effectiveness of educating minority risk groups is not clear and establishment of this through research effort is recommended. The study found that only three NHS boards offered MDT meetings which were viewed as clinical meetings for TB case reviews and infection control, i.e. screening and contact tracing. MDT meetings were supported here and by widening membership early detection may be improved further. No GPs were here involved routinely in these meetings and the study of the barriers and facilitating factors related to their attendance would be a recommended first step in improving this.

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Declaration of conflicting interests

The author(s) declare that there is no conflict of interest

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