Effect of educational outreach to nurses on tuberculosis case detection and primary care of respiratory illness: pragmatic cluster randomised controlled trial

Lara R Fairall, Merrick Zwarenstein, Eric D Bateman, Max Bachmann, Carl Lombard, Bosielo P Majara, Gina Joubert, Rene G English, Angeni Bheekie, Dingie van Rensburg, Pat Mayers, Annatjie C Peters and Ronald D Chapman

BMJ 2005;331:750-754
doi:10.1136/bmj.331.7519.750

Updated information and services can be found at:
http://bmj.com/cgi/content/full/331/7519/750

These include:

Data supplement
"The guideline and desk blotter are"
http://bmj.com/cgi/content/full/331/7519/750/DC1

References
This article cites 17 articles, 6 of which can be accessed free at:
http://bmj.com/cgi/content/full/331/7519/750#BIBL

2 online articles that cite this article can be accessed at:
http://bmj.com/cgi/content/full/331/7519/750#otherarticles

Rapid responses
You can respond to this article at:
http://bmj.com/cgi/eletter-submit/331/7519/750

Email alerting service
Receive free email alerts when new articles cite this article - sign up in the box at the top right corner of the article

Topic collections
Articles on similar topics can be found in the following collections

Global health (1608 articles)
Health Services Research (585 articles)
Tuberculosis (257 articles)
Asthma (1180 articles)
Other respiratory infections (579 articles)

Correction
A correction has been published for this article. The contents of the correction have been appended to the original article in this reprint. The correction is available online at:
http://bmj.com/cgi/content/full/331/7525/1120

Notes

To order reprints of this article go to:
http://www.bmjjournals.com/cgi/reprintform

To subscribe to BMJ go to:
http://bmj.bmjjournals.com/subscriptions/subscribe.shtml
Primary care

Effect of educational outreach to nurses on tuberculosis case detection and primary care of respiratory illness: pragmatic cluster randomised controlled trial


Abstract

**Objectives** To develop and implement an educational outreach programme for the integrated case management of priority respiratory diseases (practical approach to lung health in South Africa; PALSA) and to evaluate its effects on respiratory care and detection of tuberculosis among adults attending primary care clinics.

**Design** Pragmatic cluster randomised controlled trial, with clinics as the unit of randomisation.

**Setting** 40 primary care clinics, staffed by nurse practitioners, in the Free State province, South Africa.

**Participants** 1999 patients aged 15 or over with cough or difficult breathing (1000 in intervention clinics, 999 in control clinics).

**Intervention** Between two and six educational outreach sessions delivered to nurse practitioners by usual trainers from the health department. The emphasis was on key messages drawn from the customised clinical practice guideline for the outreach programme, with illustrative support materials.

**Main outcome measures** Sputum screening for tuberculosis, tuberculosis case detection, inhaled corticosteroid prescriptions for obstructive lung disease, and antibiotic prescriptions for respiratory tract infections.

**Results** All clinics and almost all patients (92.8%, 1856/1999) completed the trial. Although sputum testing for tuberculosis was similar between the groups (22.6% in outreach group v 19.3% in control group; odds ratio 1.22, 95% confidence interval 0.83 to 1.80), the case detection of tuberculosis was higher in the outreach group (6.4% v 3.8%; 1.72, 1.04 to 2.85). Prescriptions for inhaled corticosteroids were also higher (13.7% v 7.7%; 1.90, 1.14 to 3.18) but the number of antibiotic prescriptions was similar (39.7% v 39.4%; 1.01, 0.74 to 1.38).

**Conclusions** Combining educational outreach with integrated case management provides a promising model for improving quality of care and control of priority respiratory diseases, without extra staff, in resource poor settings.

**Trial registration** Current controlled trials ISRCTN13438073.

**Introduction**

Tuberculosis, driven largely by the HIV/AIDS epidemic, is a growing problem in lower and middle income countries, including South Africa. The World Health Organization estimates that about two thirds of people with tuberculosis are never diagnosed as having the disease and so cannot benefit from treatment, leaving the epidemic unchecked despite increasing global coverage by treatment programmes.

Improved passive case detection is fundamental to the control of the tuberculosis epidemic and depends on alert clinicians identifying tuberculosis in patients seeking primary care for respiratory symptoms. In South Africa such patients account for one third of ambulatory visits and usually receive initial care from a nurse practitioner at a public sector clinic. Among these patients, asthma is undertreated, antibiotics are overprescribed, and tuberculosis is underdiagnosed.

The DOTS Expansion Working Group considers the lack of trained staff to be the most important constraint on the control of tuberculosis. We recognised that knowledge translation strategies, increasingly used to close gaps between evidence and practice in the developed world, might improve quality of care in South Africa within existing constraints on human resources. We developed a syndromic case management intervention for respiratory illness in adults and implemented it in the Free State province, South Africa, using educational outreach visits to nurse practitioners in primary care clinics by specially trained nurse supervisors.

**Methods**

We used a pragmatic cluster randomised design for our trial. Pragmatic trials evaluate the effects of health service interventions under the human, financial, and...
The unit of randomisation was the clinic, although we collected outcome data from individual patients.

**Intervention**

Educational outreach (non-commercial, short, face to face, in-service interactive education by a trusted outsider) is an effective strategy for promoting evidence based choices among physicians (median improvement 6%, range –4% to 17%).\(^\text{15} \text{14}\) We selected this model (box) over off-site education because it was sustainable, drawing on and expanding the educational role of existing supervisory staff, and because it minimised disruption in understaffed front line facilities.

We developed an algorithmic guideline using symptoms and simple signs for the diagnosis and management of respiratory diseases in adults, including tuberculosis, asthma and chronic obstructive pulmonary disease, acute upper and lower respiratory tract infections, and opportunistic infections in patients with HIV. We collaborated with front line clinicians and managers to ensure local applicability and consistency with national tuberculosis policies\(^\text{46}\) and essential drugs lists.\(^\text{47}\)

We incorporated key messages from the guideline (fig 1 and see bmj.com) into a colourful, illustrated flip chart for use by the nurse trainers during educational outreach visits, and into a desk blotter (see bmj.com) for the nurse practitioners whom they trained. These were tested in pilot sites and adapted before implementation.

Eight senior nurses running the tuberculosis programme attended a five day workshop on the techniques of interactive educational outreach and the clinical content of the guidelines, especially the key messages. They were to deliver three or four educational outreach sessions, each lasting one to three hours to all clinical staff, in groups, in each of their intervention clinics over a three month period.

The Free State department of health permitted nurse practitioners in intervention clinics to newly prescribe inhaled corticosteroids for asthma (with review by a physician within one month), short course oral corticosteroids for exacerbations of obstructive lung disease, and cotrimoxazole prophylaxis for symptomatic HIV infection. The nurses had long been permitted to renew physician initiated prescriptions.

---

**Components of the practical approach to lung health in South Africa (PALS) intervention**

- A median of two educational outreach sessions to groups of primary care nurse practitioners delivered by trained nurse supervisors
- Expanded prescribing provisions for nurse practitioners to include inhaled corticosteroids for asthma, short course oral corticosteroids for exacerbations of obstructive lung disease, and cotrimoxazole prophylaxis for symptomatic HIV infection
- Illustrated support materials for outreach sessions: flip chart for nurse trainers and desk blotters (incorporating key messages) for the nurse practitioners they trained
- Locally tailored, evidence based, brief (22 pages), symptom and sign based guideline on common respiratory conditions in adults (tuberculosis, TB/HIV coinfection, respiratory tract infections, and obstructive lung disease)

---

**Respiratory Syndrome**

**Tuberculosis**

- **TB/HIV co-infection**
  - Coughing > 2 weeks → Send sputa for TB.
  - Test for HIV because TB is common in HIV patients. Cotrimoxazole prophylaxis delays symptoms and prolongs healthy life in HIV patients.

**Lower Respiratory Tract Infection (LRTI)**

- Diagnose LRTI in patients with cough plus difficult breathing and/or pain on coughing/breathing and/or fever. If severe refer: if new or purulent sputum prescribe amoxicillin for 7 days and follow-up in one week.

**Upper Respiratory Tract Infection (URTI)**

- Diagnose URTI in patients with blocked or runny noses and/or sore throats and/or mild fever but no difficult breathing and no chest pain.

**Obstructive Lung Disease**

- (Asthma and COPD – Chronic Obstructive Pulmonary Disease)

  - Prescribe symptomatic treatments only.
  - Diagnose asthma in patients with recurrent wheeze, difficult breathing and cough.
  - Prescribe inhaled corticosteroids.
  - Diagnose COPD in patients with persistent wheeze, difficult breathing and cough (and a history of smoking).
  - Prescribe bronchodilators.
  - People are more likely to stop smoking if advised to do so by a health professional and smoking makes all lung conditions worse so tell your patients to quit today!

**Smoking Cessation**

- Control clinics received no new training. Usual off-site training, received by fewer than 5% of staff each year, continued in both groups.

---

**Participants and randomisation**

The estimated prevalence of HIV among people attending antenatal clinics in impoverished communities of the Free State, predominantly in rural areas with high rates of tuberculosis and HIV (tuberculosis notification rate (all cases) 494/100 000 in 2002),\(^\text{16}\) was 30.1% in 2003.\(^\text{17}\) On a typical day around 200 people attend one of these clinics; about one third of these are children. A clinic is staffed by a median of nine nurses, some of whom see only children or pregnant women. Problem cases are referred to doctors who visit weekly.

On the basis of total annual attendances, we included in our study the 40 largest eligible primary care clinics. Randomisation was stratified by district. Clinics were ranked by size and allocated to intervention or control arms using a random number table in blocks of four. Allocation was carried out by a trial statistician before intervention or patient recruitment.

---

**Patient recruitment**

In each clinic waiting room a trained fieldworker screened all adult patients, independent of the nurse practitioners, for cough or difficult breathing on presentation or within the past six months. Patients aged 15 years or over who answered yes to either query and who were willing to take part in the study, were invited to meet the research team after their consultation with the nurse. Fieldworkers then obtained written consent and interviewed patients with any one of the following: difficult breathing on the day of interview or during the past six months; current cough for seven days or more; recurrent cough in the past six months; and current cough with a temperature above 38°C or a respiratory rate of 30 breaths per minute or more. We excluded patients who had been urgently referred elsewhere by
Randomised to usual care (n=20)

Primary care clinics in Free State (n=236)

Primary care clinics (n=200)

Clinics randomised (n=40)

Randomised intervention (n=20)

Patient enrolment:
- Screened (n=1006)
- Refused consent (n=0)
- Eligible (n=1000)

Follow-up:
- Clinics (n=20)
- Patients (n=930)
- Lost to follow-up (n=7000)
- Died (n=22)
- Admitted to hospital or too ill for interview (n=2)
- Unable to trace (n=46)

Follow-up:
- Clinics (n=20)
- Patients (n=926)
- Lost to follow-up (n=73)
- Died (n=26)
- Admitted to hospital or too ill for interview (n=3)
- Unable to trace (n=44)

Clinics excluded (n=36):
- Circulation of staff (n=25)
- Piloting of materials (n=11)

Fig 2 Trial profile

Clinical excluding (n=36):
- Piloting of materials (n=11)
- Circulation of staff (n=25)

Primary care clinics (n=200)

Primary care clinics in Free State (n=236)

Clinics randomised (n=40)

Randomised intervention (n=20)

Randomised to usual care (n=20)

Follow-up:
- Clinics (n=20)
- Patients (n=930)
- Lost to follow-up (n=7000)
- Died (n=22)
- Admitted to hospital or too ill for interview (n=2)
- Unable to trace (n=46)

Follow-up:
- Clinics (n=20)
- Patients (n=926)
- Lost to follow-up (n=73)
- Died (n=26)
- Admitted to hospital or too ill for interview (n=3)
- Unable to trace (n=44)

Results

All 40 clinics completed the trial (fig 2). The characteristics of the patients at enrolment were similar between the groups (table 1).

Table 1 Characteristics of patients and clinics allocated to an educational outreach programme (practical approach to lung health in South Africa) or no new training (control group).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Outreach group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinics</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Median total no of adult attendances a quarter</td>
<td>12,749</td>
<td>12,935</td>
</tr>
<tr>
<td>Median no of nurses per clinic</td>
<td>9</td>
<td>8.5</td>
</tr>
<tr>
<td>Tuberculosis treatment service available</td>
<td>19 (95)</td>
<td>20 (100)</td>
</tr>
<tr>
<td>24 hour emergency service available</td>
<td>4 (20)</td>
<td>2 (10)</td>
</tr>
<tr>
<td>Median distance (km) from local referral hospital</td>
<td>7.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Patients</td>
<td>1000</td>
<td>999</td>
</tr>
<tr>
<td>Women</td>
<td>643 (64.3)</td>
<td>660 (66.1)</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>44.9</td>
<td>44.2</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never attended school</td>
<td>169 (17.0)</td>
<td>154 (15.4)</td>
</tr>
<tr>
<td>Attended primary school only</td>
<td>464 (46.6)</td>
<td>433 (43.4)</td>
</tr>
<tr>
<td>Attended secondary school</td>
<td>383 (38.4)</td>
<td>419 (41.1)</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>155 (15.9)</td>
<td>269 (26.9)</td>
</tr>
<tr>
<td>Unemployed without welfare</td>
<td>569 (57.2)</td>
<td>557 (56.0)</td>
</tr>
<tr>
<td>Receiving welfare</td>
<td>271 (27.2)</td>
<td>230 (23.1)</td>
</tr>
<tr>
<td>Smoking history</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>164 (16.5)</td>
<td>193 (19.4)</td>
</tr>
<tr>
<td>Past</td>
<td>313 (31.4)</td>
<td>360 (36.1)</td>
</tr>
<tr>
<td>Never</td>
<td>519 (52.1)</td>
<td>504 (50.6)</td>
</tr>
<tr>
<td>Mean pack year history (smokers only)</td>
<td>8.9</td>
<td>8.3</td>
</tr>
</tbody>
</table>
Of the 2000 patients enrolled, 1999 completed the initial interview and one refused consent; 1856 (92.8%) were re-interviewed at four months. Forty eight patients (2.4%) were reported by their families to have died. The groups had similar mortality (intervention, 22/1000; control, 26/999; odds ratio 0.84, 95% confidence interval 0.46 to 1.53).

Training intensity fell short of the targets. Nurses in intervention clinics received a median of two educational outreach visits (range 0-4 visits).

### Outcome measures

#### Tuberculosis

Sputum screening for tuberculosis was higher among patients in the intervention arm but not significantly so (odds ratio 1.22, 0.83 to 1.80; table 2). During the three months of the study period 57 new cases of tuberculosis were diagnosed in intervention clinics compared with 34 in control clinics (odds ratio 1.72, 1.04 to 2.85). The groups had similar numbers of patients diagnosed as having tuberculosis before outreach started (intervention clinics, 108; control clinics, 109).

#### Obstructive lung disease

Almost twice as many prescriptions were filled out for inhaled corticosteroids in the intervention group than in the control group (13.7%, 117/915 vs 7.7%, 77/999; odds ratio 1.90, 1.14 to 3.18; table 2). At enrolment 164 patients in the intervention group and 193 patients in the control group reported that they were current smokers. The groups had similar rates for counselling on smoking cessation (68.3%, 112/164 vs 65.8%, 127/193 in controls) and smoking cessation for the period between interviews (12.2%, 20/164 vs 10.4%, 20/193).

#### Antibiotic prescriptions

The prescription rates of antibiotics commonly used for respiratory indications did not differ between the groups (odds ratio 1.01, 0.74 to 1.38; table 2).

#### HIV/AIDS

The groups were similar for voluntary counselling and testing (9.7%, 97/1000 vs 7.3%, 73/999 in controls) and for prescriptions for co-trimoxazole among patients with a diagnosis of tuberculosis during the study (7.8%, 13/167 vs 7.5%, 11/147 in controls).

### Referral

A higher proportion of severely ill patients in the intervention group were referred to a doctor than in the control group (10.5%, 27/257 vs 4.8%, 8/166; odds ratio 2.59, 1.06 to 6.19).

### Discussion

An educational outreach intervention on syndromic management of respiratory diseases in adults improved the case detection of tuberculosis and the treatment of asthma by nurse practitioners working in typical South African primary care clinics. In this pragmatic trial, the intervention was a “black box” and the relative contributions of the various elements of this multifaceted intervention cannot be distinguished. Although trainers reported using almost all of their visit time for education, they were also middle managers and may, in passing, have provided some managerial support.

Clinic and patient follow-up were exceptionally high, enhancing the internal validity of our trial. The cluster randomised design was accounted for in the analysis. Follow-up was short (only four months); longer term effects could be diluted by the turnover of staff and could decline with time. Emerging studies, however, suggest that evidence based education strategies may trigger long term change in practice.12 21

Appropriateness of care improved across several of the most important conditions: the effect of the intervention on tuberculosis case detection was higher than expected. By contrast, the effect on sputum collection was small. This suggests that the intervention improved clinical selection of cases for sputum sampling.

Inhaled corticosteroid prescribing for asthma also increased, which may be appropriate given that these drugs are known to be underprescribed in South Africa. A post hoc analysis also suggested that these prescriptions were clinically appropriate, in that response to β-agonists was more often reported by patients who were prescribed inhaled corticosteroids in the intervention group than in their equivalent controls (85%, 117/137 vs 73%, 56/77), suggesting that the treated disease was asthma.

The lack of change in antibiotic prescribing may well be appropriate for this severe case mix; only 4.8% of the sample reported symptoms consistent with uncomplicated upper respiratory tract infection, lower than in comparable surveys. In patients with predefined markers of severe disease, referral to physicians was higher in the intervention group.

The number of patients receiving voluntary counselling and testing remained unchanged. Nurses may have seen little point in this practice at a time before antiretroviral treatment was made available in South Africa.22 Repeated central drug shortages prevented the intervention from achieving increases in prescribing of co-trimoxazole prophylaxis. The failure to increase advice on smoking cessation may reflect light smoking at low prevalence (table 1) and thus the low salience of this issue for nurse practitioners dealing with patients with acute severe infectious disease.

### Table 2 Trial outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No (%) in outreach group</th>
<th>No (%) in control group</th>
<th>Odds ratio (95% CI)</th>
<th>P value</th>
<th>Intraclass correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sputum screening for tuberculosis</td>
<td>225/1000 (22.4)</td>
<td>191/999 (19.3)</td>
<td>1.22 (0.83 to 1.80)</td>
<td>0.33</td>
<td>0.049</td>
</tr>
<tr>
<td>Tuberculosis case detection</td>
<td>45/892* (5.6)</td>
<td>34/892* (3.8)</td>
<td>1.72 (1.04 to 2.85)</td>
<td>0.04</td>
<td>0.007</td>
</tr>
<tr>
<td>Prescriptions for inhaled corticosteroids</td>
<td>123/1000 (12.3)</td>
<td>77/999 (7.7)</td>
<td>1.90 (1.14 to 3.18)</td>
<td>0.006</td>
<td>0.019</td>
</tr>
<tr>
<td>Prescriptions for antibiotics</td>
<td>391/1000 (39.2)</td>
<td>394/999 (39.4)</td>
<td>1.01 (0.74 to 1.38)</td>
<td>0.95</td>
<td>0.042</td>
</tr>
</tbody>
</table>

* Denominator limited to all patients who had not been diagnosed as having tuberculosis before educational outreach started.
The intervention was carried out in small towns and rural primary care clinics in a poor province with a high rate of tuberculosis and HIV infection. It was delivered by existing staff, and was effective despite the low number of educational contacts, reportedly due to difficulties accommodating visits in clinic schedules.

Our trial was a collaboration between evaluation and research services for tuberculosis and HIV/AIDS, implementing it widely. We suggest that in other low and middle income countries where non-physicians provide primary care, equipping middle managers as outreach trainers is feasible within existing constraints on staff and could improve quality of care.

We thank our PALSA nurse trainers from the Free State Department of Health: Leona Smith, Annette Exley, Sandra Korkie, Tébogo Motshibi, Francis Mackay, Mariana Thirtle, and Elizabeth Bolofo; fieldwork supervisors Mariëtte van Rensburg and Gloria Gogo from the Centre for Health Systems Research and Development, University of the Free State, for coordination of patient recruitment and interviews; Ineke Buskens for data checking and cleaning; and Sonja van der Fourie from the Medical Research Council for data capture; Clive Seebregts from the Biomedical Informatics Research Division, Medical Research Council, for data collection support, database design, and collation; Chrismara Güttler and Amanda Fourie from the Medical Research Council for data capture; Sonja Botha for data checking and cleaning; and Sonja van der Merwe and Annette Furter from the Free State Department of Health for logistical assistance in setting up pilot sessions and retrieving routine data. For crucial early support and guidance we thank Victor Lythakanye and Mosina Shuping from the Free State Department of Health, European Union funded collaborations Afro-Implement and PRACTIHC (pragmatic randomised controlled trials in health care) for technical support; Refiloe Matji formerly of the South African National tuberculosis control programme; Robert Scherpheir formerly of Practical Approach to Lung Health at WHO; Salah-Edline Ottmani of Practical Approach to Lung Health; Louis Niessen from Erasmus University; and Andy Oxman from the Department of Health Services Research, Norwegian directorate for health and social welfare.

Contributors: MZ conceived the project and designed the first protocol, EDB and RGE led development of the guideline, LRF, RGE, AB, ACP, PM, MZ, and RDC contributed to the development and implementation of the intervention. MZ, LRF, MB, and EDB established links with policymakers. LRF, CL, MB, EDB, BPM, MZ, and GJ contributed to the final protocol and design of the questionnaire. DvR, LRF, and BPM oversaw data collection. CL led the analysis with LRF, LRF, CL, MB, MZ, and EDB interpreted the data. LRF, MZ, and BPM prepared the first draft of this paper, and all authors contributed to the final version. MZ and LRF are guarantors.

Funding: This research was completed with the aid of a research grant from the International Development Research Centre, Canada and the Medical Research Council, South Africa. The research was completed independent of the funders. Additional funding was provided by the Free State Department of Health and the University of Cape Town Lung Institute.

Competing interests: None declared.

Ethical approval: The study was approved by the research ethics committee of the Faculty of Health Sciences, University of the Free State. The Free State Department of Health gave permission for the trial.

7 Stempel DA, Roberts CS, Stanford RH. Treatment patterns in the months prior to and after asthma-related emergency department visit. Chest 2004;125:75-80.
What is already known on this topic

Secondhand smoke has adverse effects on health, including respiratory health. Smoke-free policies are associated with decreased exposure in the hospitality sector and possibly a rapid improvement in respiratory health in bar workers, though the size of these effects relative to underlying trends is unknown.

What this study adds

After the introduction of comprehensive smoke-free workplace legislation in the Republic of Ireland, exposure to secondhand smoke and respiratory symptoms declined in non-smoking bar staff.

The reductions were significantly higher than the unanticipated reductions observed in the control region.

The small number not followed up differed from the overall group but because of the paired design, this does not compromise study validity. Although the numbers enrolled from Northern Ireland were small, they were sufficient to detect significant changes.

Implications of findings

The smoke-free workplace law in the Republic of Ireland seems to have provided protection for one of the most heavily exposed occupational groups. The increase in support for the law in the Republic since its introduction, even among smokers, underpins its increase in support for the law in the Republic since its introduction, even among smokers, underpins its effectiveness. These findings have implications for legislators in other countries currently considering smoke-free workplace legislation.

We thank Mandate for their support, especially John Douglas and Sandra Browne; Sangrethra N Kalimathu, Meemakshi Uppel, Katherine O'Mahony, Micheal Breen, Mairead Ma hen, Michael Keogh, Mairead McAlone, Michael Kogler, Maire Galvin, and Damian Gavin for help with interviews; Paul Blanc and Mark Eiser for advice and for allowing us to use their questionnaire; Luke Clancy, Michele Agnew, and Pat Goodman for contributing to study design and planning, for the Dublin ethics committee protocol, and for use of respiratory laboratory premises at St James's Hospital; Alan Smith for comments on study design; Geoffrey Fong for his assistance and support; and Aishbe Mealy and Deirdre Handy for typing and editing assistance. We especially thank the bar staff and bar owners who participated in the interviews.

Contributors: See bmj.com.

Funding: Office of Tobacco Control through the Research Institute for a Tobacco Free Society. The National Cancer Institute of the United States (R01 CA90955); Irish Cancer Society; Irish Heart Foundation; Health Service Executive, Western Area, and Western Investing for Health Partnership (Northern Ireland); Mandate Trade Union provided two prizes for a draw.

Competing interests: SA is a member of the Board of the Irish Office of Tobacco Control (unpaid position). JF is chairman of the Irish Research Institute for a Tobacco Free Society. Ethical approval: Research ethics committee of the Faculty of Public Health Medicine, Royal College of Physicians of Ireland; the St James's Hospital and Federated Dublin Voluntary Hospitals joint research ethics committee; the clinical research ethics committee of the Cork Teaching Hospitals; and the healthcare committee and senior management team of the Western Health and Social Services Board and the Western Investing for Health Partnership.

8 Farrelly ML, Nonnemaker JM, Chou R, Hylan H, Peterson KK, Bauer UE. Changes in hospitality workers’ exposure to secondhand smoke following the implementation of New York’s smoke-free laws. Tob Control 2005;14:2256-41.
doi 10.1136/bmj.38636.499225.55

Corrections and clarifications

Effect of educational outreach to nurses on tubercoliosis case detection and primary care of respiratory illness: pragmatic cluster randomised controlled trial

In this Primary Care paper by Laura R Fairall and colleagues (BMJ 2005;331:750-4, 1 Oct) we inadvertently misspelt the name of one of the authors, Pat Mayers (not Myers). This has now been corrected online. A process error in the editorial office led to the figure seriously overstating the number of patients lost to follow-up in the intervention group: 70 (not 7000) patients were lost. Additionally, the authors have sent us a fuller acknowledgment for two of the contributors, Robert Scherpber and Salah-Eddine Otnami (http://bmj.bmjournals.com/cgi/content/full/331/7519/750/DC2).

Cervical cancer, human papillomavirus, and vaccination

We wrongly made a last minute change to the title of the box in this editorial by Catherine M Lowndes and O Noel Gill (BMJ 2005;331:915-6, 22 Oct). The title should have remained as agreed with the authors, as “Some important questions for a programme for HPV vaccination” (not “Questions before starting an HPV vaccination programme”—as many of the questions listed would be impossible to answer before the vaccine is introduced). For more discussion on this, see rapid responses accompanying the editorial (http://bmj.bmjournals.com/cgi/content/full/331/7522/915).