Introduction

The prevalence of tuberculosis is elevated in people living with a human immunodeficiency virus (HIV) infection and, in 2014, almost 400,000 HIV-infected people died from tuberculosis globally. Consequently, the World Health Organization (WHO) recommends systematic tuberculosis screening for people living with HIV. In Nepal, the National Tuberculosis Center struggles to screen these people even though it adapted its strategies on tuberculosis and HIV infection in 2009. A better way of reaching people living with HIV for tuberculosis screening and treatment would reduce the burden of disease and death. The Stop TB Partnership recommends that people from key populations affected by tuberculosis should be involved in tuberculosis care.

In Nepal, a nongovernmental organization established by and working with people living with HIV and people who use drugs – Naya Goreto – recruited volunteers among people living with HIV for tuberculosis screening of their peers. The project targeted 10 districts with large numbers of people living with HIV. The aims were to screen around 7050 people living with HIV and to ensure that those diagnosed with tuberculosis started treatment. In addition, it was hoped that the project would increase awareness of the importance of tuberculosis screening in people living with HIV among both those affected and health-care workers. In 2013, the 10 project districts accounted for 10,472 tuberculosis patients – 31% of the country’s total.

Local setting

In Nepal, HIV infection is a relatively small problem: the estimated prevalence in the adult population is 0.3%. However, the prevalence is much higher in certain groups, such as drug users, migrant workers and sex workers. In Kathmandu, the prevalence in injection-drug users is 6%. Among female and male sex workers, it is 2% and 9%, respectively. Many people living with HIV or in these high-risk groups are marginalized, stigmatized and experience discrimination. For 2013, WHO estimated that the number of incident, HIV-positive tuberculosis patients in Nepal was 1587. However, of the 33,834 new patients actually reported in the country, only 11% knew their HIV-infection status and only 65 tuberculosis patients were known to be HIV positive, which indicates that tuberculosis is often missed in people living with HIV.

Approach

In 2014, staff at Naya Goreto asked leaders of self-help groups for people living with HIV and drug users to act as volunteers for the tuberculosis screening project because they knew how to reach people living with HIV. Naya Goreto staff themselves are people living with HIV and former drug-users and are members of these networks and self-help groups. In addition, the organization has worked with some of these leaders in the past. For the intervention, Naya Goreto provided training for volunteers on tuberculosis screening and on how to reach out to HIV-infected people. A one-day training course was given in each district on: (i) the appropriate circumstances...
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for disclosing HIV-infection status; (ii) behavioural change techniques for use with self-help groups and individuals; (iii) maintaining confidentiality; (iv) ensuring the availability of, and access to, diagnostic services without fear of discrimination; and (v) referral for tuberculosis treatment and follow-up.

In collaboration with the National Tuberculosis Center, Naya Goreto developed a screening tool for tuberculosis. The criteria were: (i) a cough for 2 weeks; (ii) fever; (iii) loss of appetite; (iv) weight loss; and (v) no tuberculosis test within the last six months. People living with HIV were contacted by volunteers through existing networks and self-help groups. The volunteers applied the screening tool and encouraged people who met one or more of the five criteria to request further tuberculosis screening at HIV treatment centres or care homes for HIV-infected people. If necessary, Naya Goreto provided money for transport. For the few people who did not want to go to health facilities because of previous poor experiences with formal health-care services, volunteers carried out screening and collected sputum samples using specially provided containers at a place chosen by the individual being screened.

Tuberculosis tests were carried out in accordance with national guidelines: two sputum samples were examined by smear microscopy and a third underwent the rapid molecular diagnostic test GeneXpert® MTB/RIF (Cepheid Inc., Sunnyvale, United States of America). If necessary and available, a chest X-ray or fine-needle aspiration was carried out. Physicians diagnosed some tuberculosis patients clinically. Naya Goreto paid the diagnostic costs, which included a nominal fee for the hospital visit that all patients must pay, and fees for additional examinations. If a person was diagnosed with tuberculosis, a volunteer informed the person and arranged for him or her to attend the tuberculosis treatment facility of their choice. Thereafter, the volunteer tried to remain in contact with the patient and collect information on treatment outcomes.

Naya Goreto collected data on screening, the diagnostic tests carried out, tuberculosis diagnoses, the treatment given and the risk group of each individual who underwent tuberculosis testing. Project coordinators in each district collected information from volunteers and reported to the project manager in Kathmandu, who maintained a database on the test results, treatment and outcomes for all patients with tuberculosis. Participation in screening was voluntary and Naya Goreto obtained informed consent from all participants for use of their data.

### Table 1. Tuberculosis tests used to screen people living with HIV, Nepal, 2014–2015

| Test                                    | No. tested | No. who tested positive for tuberculosis |
|-----------------------------------------|------------|------------------------------------------|
| Sputum smear test only                  | 3932       | 106                                      |
| GeneXpert® MTB/RIF test only            | 1731       | 62                                       |
| Chest X-ray only                        | 42         | 8                                        |
| Sputum smear and GeneXpert® MTB/RIF tests | 236       | 49                                       |
| Sputum smear test and chest X-ray       | 18         | 4                                        |
| Chest X-ray and GeneXpert® MTB/RIF test | 20         | 0                                        |
| Sputum smear and GeneXpert® MTB/RIF tests and chest X-ray | 2 | 2 |
| Fine-needle aspiration only             | 17         | 13                                       |
| Fine-needle aspiration and chest X-ray  | 1          | 1                                        |
| Clinical diagnosis, including extrapolmonary tuberculosis | 47 | 42 |
| **Total**                               | **6046**   | **287**                                  |

**HIV:** human immunodeficiency virus.

### Box 1. Summary of main lessons learnt

- Using peer volunteers to contact people living with human immunodeficiency virus (HIV) for tuberculosis screening resulted in a high participation rate and the identification of tuberculosis patients.
- Detailed information on tuberculosis screening, the diagnostic tests carried out, the tuberculosis patients identified and their treatment could be obtained by training and monitoring peer volunteers.
- Follow-up during tuberculosis treatment may be difficult because people living with HIV move frequently.

### Relevant changes

The tuberculosis screening project was implemented between May 2014 and mid-September 2015. The 30 volunteers (21 male) screened 6642 people, of whom 5430 (82%) were living with HIV. In total, 6046 (91%) of the 6642 were tested for tuberculosis: 5402 were living with HIV; 331 were drug users, 170 were family members of tuberculosis patients, 138 were migrant workers and 5 were slum dwellers. Table 1 shows the tests performed and the results obtained. Overall, 287 tuberculosis patients (205 male and 240 HIV positive) were identified, 270 (94%) of whom started treatment. By the end of the project, the outcome of tuberculosis treatment was known for 178 patients: 39 (22%) successfully completed treatment, 15 (8%) died and 124 (70%) had transferred out of the intervention districts. The remaining 92 patients were still on treatment. The total cost of the project was US$ 132,596 for Naya Goreto’s expenditure and US$ 61,174 for diagnostic and transport costs, 20% for Naya Goreto’s expenditure and 12% for training volunteers.

### Lessons learnt

Box 1 summarizes the main lessons learnt from this project. The peer-led, active, tuberculosis case-finding intervention had several successes. First, within a short period the volunteers contacted many people living with HIV, a marginalized group subject to discrimination in Nepal. Second, many more HIV positive tuberculosis patients were identified than notified at a national level in 2013. Third, no major problem was encountered with using peer volunteers to reach this key population. Fourth, reports from volunteers indicated that some screening was still taking place after the project ended. Many people living with HIV in Nepal are former or current drug users and know each other through drug users’ networks. This familiarity contrib-
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Abstract

Objective Peer-led tuberculosis case-finding through comparison of presumptive tuberculosis was conducted in Nepal.

Methods Volunteers conducted systematic tuberculosis screening among residents of intervention districts. Further follow-up of these patients was not possible within the project and they may not all have continued treatment at a health-care facility. Many people living with HIV in Nepal move frequently from place to place because they face discrimination or are migrant workers. Efforts should be made in future interventions to ensure that these people finish tuberculosis treatment. Contacting peer volunteers at their destination to ensure follow-up may be one solution.

Lessons from the field

We thank Christina Mergenthaler, the project volunteers and everyone who agreed to screening.

Funding: The project was funded by a grant from the TB REACH programme, which is supported by Global Affairs Canada and which operates as part of the Stop TB Partnership.

Competing interests: Miranda Brouwer was the external reviewer for this project and worked with Naya Goreto staff on monitoring.

Melancholic affection of the Tuberculosis positive patients living with HIV, they may still present a barrier to the successful diagnosis and treatment of tuberculosis. Additional support, such as cash transfers to patients, may help. 11

A worrying observation was that 70% of people whose tuberculosis treatment outcomes could be assessed at the end of the project had moved out of the intervention districts. Further follow-up of these patients was not possible within the project and they may not all have continued treatment at a health-care facility. Many people living with HIV in Nepal move frequently from place to place because they face discrimination or are migrant workers. Efforts should be made in future interventions to ensure that these people finish tuberculosis treatment. Contacting peer volunteers at their destination to ensure follow-up may be one solution.

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Búsqueda de casos de tuberculosis activa dirigida por pares entre personas que viven con el VIH: lecciones de Nepal

Problema Las personas que viven infectadas con el virus de la inmunodeficiencia humana (VIH) son extremadamente vulnerables a la tuberculosis. En Nepal, el porcentaje de personas que viven con el VIH que inician tratamiento es bajo (94%), lo que dificulta la eliminación de esta enfermedad. Enfoque En Nepal, la organización no gubernamental Naya Goreto implementó un proyecto de exámenes de detección de tuberculosis dirigidos por pares en el cual personas que viven con el VIH se presentan voluntarias para ponerse en contacto con otras personas que viven con el VIH para dirigir su atención a los miembros de su grupo de alto riesgo. 

Resumen

Résultats de la tuberculose active par les pairs chez les personnes vivant avec le VIH: l’expérience du Népal

Problème Les personnes qui vivent avec le virus de l’immunodéficience humaine (VIH) courent un risque accru de contracter la tuberculose et devraient se soumettre à un dépistage régulier. Cependant, cela s’avère parfois difficile du fait de leur stigmatisation et de la discrimination à leur encontre.

Approche En Népal, l’organisation non gouvernementale Naya Goreto a mis en place un projet de dépistage de la tuberculose par les pairs, qui a consisté à ce que des personnes vivant avec le VIH se portent bénévoles pour contacter d’autres membres de cette population à haut risque. Les bénévoles ont suivi une courte formation, après laquelle ils ont tâché de contacter des personnes vivant avec le VIH par le biais de réseaux existants et de groupes d’entraide. Le dépistage de la tuberculose ainsi que les examens ont eu lieu conformément aux directives nationales.

Environnement local En Népal, la prévalence du VIH est de 0,3% dans la population générale mais elle est bien plus élevée (6%) chez les usagers de drogues injectables de Katmandou. À ce jour, le système de santé n’a pas réussi à organiser le dépistage systématique de la tuberculose chez les personnes vivant avec le VIH.

Changements significatifs De mai 2014 à mi-septembre 2015, 30 bénévoles ont examiné 6642 personnes dans 10 districts, parmi lesquelles 5430 (82%) vivaient avec le VIH. Sur ces 6642 personnes, 6046 (91%) ont été soumises à un test de la tuberculose et la maladie a été diagnostiquée chez 287 (4,3%) d’entre elles, dont 240 séropositives. Parmi les personnes atteintes de tuberculose, 270 (94%) ont commencé un traitement.

Leçons tirées Le recours à des pairs pour contacter des personnes vivant avec le VIH afin de dépister la tuberculose a permis d’obtenir un fort taux de participation et d’identifier un nombre considérable de patients séropositifs atteints de tuberculose. Le suivi pendant le traitement s’est révélé difficile dans ce groupe extrêmement mobile et nécessitera une attention accrue lors des interventions futures.

Resumen

Búsqueda de casos de tuberculosis activa dirigida por pares entre personas que viven con el VIH: lecciones de Nepal

Problema Las personas que viven infectadas con el virus de la inmunodeficiencia humana (VIH) tienen un alto riesgo de sufrir tuberculosis y deberían someterse a exámenes de detección con regularidad. No obstante, pueden resultar difíciles de alcanzar, pues están estigmatizadas y discriminadas.

Enfoque En Nepal, la organización no gubernamental NayaGoreto implementó un proyecto de exámenes de detección de tuberculosis dirigidos por pares en el cual personas que viven con el VIH se presentan voluntarias para ponerse en contacto con otras personas en esta población de alto riesgo. Los voluntarios realizaron un pequeño
curso de formación, tras el cual intentaron contactar con personas que viven con el VIH a través de redes existentes y grupos de autoayuda. Las exámenes y pruebas de detección de tuberculosis se realizaron según las directrices nacionales.

**Marco regional** En Nepal, la prevalencia de la infección por VIH es del 0,3% en la población general, pero es mucho mayor (del 6%) en Katmandú, donde la población consume drogas por vía intravenosa. Hasta la fecha, el sistema sanitario no ha sido capaz de implementar un examen de detección de tuberculosis sistemático en personas que viven con el VIH.

**Cambios importantes** Entre mayo de 2014 y mediados de septiembre de 2015, 30 voluntarios hicieron exámenes de detección a 6 642 personas de 10 distritos; 5 430 (82%) de estas personas vivían con el VIH. De las 6 642, 5 406 (82%) se sometieron a pruebas de tuberculosis y 287 (4,3%) fueron diagnosticadas con la enfermedad, 240 de las cuales eran positivas en VIH. De las personas afectadas por tuberculosis, 270 (94%) iniciaron un tratamiento.

**Lecciones aprendidas** Al utilizar pares para contactar con personas que viven con el VIH para someterlos a exámenes de detección de tuberculosis, se produjo una alta tasa de participación y se identificó una cantidad considerable de pacientes con tuberculosis y resultados positivos de VIH. El seguimiento durante el tratamiento fue complicado en este grupo altamente cambiante, por lo que es necesaria una mayor atención en futuras intervenciones.

### Referencias

1. Global tuberculosis report 2015. 20th ed. Geneva: World Health Organization; 2015. Available from: [http://www.who.int/tb/publications/global_report/en](http://www.who.int/tb/publications/global_report/en) [cited 2016 Sep 21].
2. WHO policy on collaborative TB/HIV activities – guidelines for national programmes and other stakeholders. Geneva: World Health Organization; 2012. Available from: [http://www.who.int/tb/publications/2012/tb_hiv_policy_9789241503006/en](http://www.who.int/tb/publications/2012/tb_hiv_policy_9789241503006/en) [cited 2016 Sep 21].
3. The global plan to stop TB 2011–2015. Geneva: Stop TB Partnership, 2011. Available from: [http://www.stoptb.org/assets/documents/global/plan/tb_globalplantostop2011-2015.pdf](http://www.stoptb.org/assets/documents/global/plan/tb_globalplantostop2011-2015.pdf) [cited 2016 Sep 21].
4. Global report. UNAIDS report on the global AIDS epidemic 2013. Geneva: Joint United Nations Programme on HIV/AIDS (UNAIDS); 2013. Available from: [http://www.who.int/hiv/pub/me/unaids_global_report/en](http://www.who.int/hiv/pub/me/unaids_global_report/en) [cited 2016 Sep 21].
5. The gap report. Geneva: Joint United Nations Programme on HIV/AIDS (UNAIDS); 2014. Available from: [http://www.unaids.org/en/resources/campaigns/2014/2014gapreport/gapreport](http://www.unaids.org/en/resources/campaigns/2014/2014gapreport/gapreport) [cited 2016 Sep 21].
6. Bam K, Thapa R, Newman MS, Bhatt LP, Bhutta ZK. Sexual behavior and condom use among seasonal Dalit migrant laborers to India from Far West, Nepal: a qualitative study. PLoS ONE. 2013;8(9):e74903. doi: [http://dx.doi.org/10.1371/journal.pone.0074903.PMID: 24040359](http://dx.doi.org/10.1371/journal.pone.0074903)
7. Wasti SP, Simkhada P, Randall J, Freeman JV, van Teijlingen E. Barriers to and facilitators of antiretroviral therapy adherence in Nepal: a qualitative study. J Health Popul Nutr. 2012 Dec;30(4):410–9. PMID: 23304907
8. Speaking out. Personal testimonies of rights violations experienced by people who use drugs in Nepal. Kathmandu and Amsterdam: National Association of People Living with HIV/AIDS in Nepal, Drug Users National Alliance & Global Network of People Living with HIV; 2016. Available from: [http://www.gnpplus.net/assets/wbb_file_updown/5416/Human%20Rights%20Count_KPLHIV_Nepal.pdf](http://www.gnpplus.net/assets/wbb_file_updown/5416/Human%20Rights%20Count_KPLHIV_Nepal.pdf) [cited 2016 Sep 21].
9. Tuberculosis database [Internet]. Geneva: World Health Organization; 2016 Available from: [http://www.who.int/tb/country/data/download/en](http://www.who.int/tb/country/data/download/en) [cited 2016 May 15].
10. Mukungo SM, Kaboru BB. Intensive TB case finding in unsafe settings: testing an outreach peer education intervention for increased TB case detection among displaced populations and host communities in South-Kivu Province, Democratic Republic of Congo. J Tuberc Res. 2014;2(4):160–7. doi: [http://dx.doi.org/10.4236/jtr.2014.24020](http://dx.doi.org/10.4236/jtr.2014.24020)
11. Wingfield T, Bocca D, Tovar MA, Huff D, Montoya R, Lewis JJ, et al. Designing and implementing a socioeconomic intervention to enhance TB control: operational evidence from the CRESIPT project in Peru. BMC Public Health. 2015;15(1):810. doi: [http://dx.doi.org/10.1186/s12889-015-2128-0.PMID: 26293238](http://dx.doi.org/10.1186/s12889-015-2128-0).