

Full Length Research Paper

Assessing tuberculosis preventive methods in the Somme department: Collaboration between the Tuberculosis Control Center and its partners

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Received 29 August, 2019; Accepted 7 October, 2019

Tuberculosis Control Center (TBCC) is responsible for prevention of the TB in France. The collaboration of this center with its partners has not yet been studied. All notified cases of TB and all of their contacts screened between 2007 and 2011 were retrospectively included. Communication between actors in tuberculosis control was analyzed. Of the 175 reported cases, the TBCC sent 85.1% of letters to the notifiers, their partners and the partners sent 74.9% of letters, $p < 0.001$ to the TBCC. A total of 4020 contacts of the 175 cases of TB have been identified by the TBCC. When the TBCC screened alone the contact, it sent 48.0% letters to its partners and when the partners did the screening alone, they sent 26.1% letters to the TBCC; $p < 0.0001$. When the TBCC and its partners had tested together the same contact, rates of mails exchange were high, the TBCC sent 53.3% letters to its partners and they did so in 48.9% ($p > 0.5$). Collaboration between the TBCC and its partners is not optimal. Strengthening communication between the TBCC and its partners in the Somme department is fundamental for an optimal collaboration in the fight against TB.

Key words: Tuberculosis/Prevention and control, partnership practice, France.

INTRODUCTION

With 10 million of new cases and 1.6 million deaths in 2017 (World Health Organization, 2018), tuberculosis (TB) is a global public health issue. One of the key actions defined in the "Stop TB Strategy" (World Health Organization, 2014) and in the second axis of the National Tuberculosis Plan (NTP) (Comité National D'élaboration du Programme de lutte Contre la Tuberculose Programme de Lutte Contre la Tuberculose

en France 2007-2009, 2007) is to ensure early screening of TB and latent TB infection (LTBI). According to the French Ministry of Solidarities and Health, this NTP would keep all its actuality now (Céline, 2017). This helps to department, the mean time between the mandatory notification of a TB case and the date set for the contact's screening better care for patients and contributes to break the disease's transmission chain. Early screening

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of TB cases and latent tuberculosis infections is carried out by an investigation around an index case of TB. However, in the Somme (system delay) are long (35.3 days) (Yanogo et al., 2016). What is the level of collaboration between the actors of the fight in this department?

The investigation is carried out by Tuberculosis Control Center (TBCC) and requires beforehand a mandatory reporting of the index cases to the authorities in charge of tuberculosis control, the Regional Health Office (RHO). Since 2006, any biologist, clinician or any other doctor informed of a case of TB must report it (immediate reporting to the TBCC and the RHO) as soon as possible (Groupe de Travail, 2006). In the Somme department, the RHO receives the mandatory reports and forwards them to TBCC, triggering thereby an investigation leading to the identification of the contacts of the cases of TB and to their screening.

Screening can be done by TBCC in its local or in the concerned structures when the number of contacts is important. It can be done by TBCC's partners, namely hospital doctors and liberals, occupational physicians, school doctors, pediatricians and people who are responsible for the communities.

For the investigation around a case of TB, the High Council of Public Hygiene of France (HCPHF) recommends a close cooperation between TBCC and his partners (Groupe de Travail, 2006). This collaboration contributed to improve the results in the fight against TB through the years (Caminero and Billo, 2003; Ahmed et al., 2009; Gidado and Ejembi, 2009; Khan et al., 2012; Pethani et al., 2015; Nwe et al., 2017).

In the Somme department, the level of collaboration between the actors acting against TB is unknown. In a thesis evaluating the acceptability of TB screening in this department, we noted a very low rate of complete screening (18.2%, unpublished data). The long mean time between the mandatory notification of a case of tuberculosis and the date set for the contact's screening (system delay) could be the result of an insufficient collaboration between the actors in TB control during screening. It was found that it is necessary to describe the collaboration between TBCC and its partners, hence enlightening the actors for the fight against TB. As workers of the TBCC and the University Hospital, Department of the Somme, this collaboration was evaluated in order to push the actors of the fight against TB to do better for more success.

The objective of this study is to evaluate the collaboration between TBCC and its partners in the prevention of TB over the year 2007-2011 in the Somme department.

METHODOLOGY

Type of study

This is a retrospective descriptive study of all notifiers of TB cases

and the physicians who screened contacts in the Somme department between January 1st 2007 and December 31st, 2011.

Population

It includes all notifiers of cases of TB that have been reported between January 1st, 2007 and December 31st, 2011 at the RHO for the TBCC of the Somme department; and all physicians who have screened contacts of these TB cases detected in the Somme department.

All notifiers of TB cases and all physicians who have screened and who were in the administrative list were included. Information concerning cases and their contacts within the framework of TB control was centralized to the TBCC of Amiens; this enabled us to have the whole population on only one site.

All cases reported for Atypical *Mycobacterium* infections or other diagnosis, all TB cases outside the Somme department and all contacts from other departments have been excluded.

Data collected

On each reporting of TB cases, function, place of exercise and the existence of traces of letters or other forms of communication from the notifier or TBCC were indicated. For each contact screened, we collected the type of physician (TBCC physician or partner) involved and the existence of communication between the TBCC physician and its partners around the screening.

The data were collected from the card of mandatory reporting, the patient's paper format medical files (survey cards, mails, copies of civil documents) and computerized files (DX CARE). Concerning mails, the nurse of TBCC kept the copies in the file paper of the patient, whether they come from the doctor of TBCC or the partner, computerized or not.

To minimize selection bias due to missing data, the collection was completed by telephone call to the patients or their general practitioner.

Statistical analysis

A descriptive analysis of the population of notifiers was conducted using SAS (9.3) (SAS stands for Statistical Analysis Software) and Excel. The assessment consisted of quantifying courier exchange between both parties. The rates of couriers sent by each actor were calculated. A McNemar test was used to compare these rates. For the interpretation of these tests, the threshold of significance retained was 5%.

RESULTS

From January 1st, 2007 to December 31st, 2011, a total of 190 reports of tuberculosis disease were received by the ARS. Fifteen of them were excluded as mentioned in the protocol, 8 from other departments, 4 from the Somme department for infection diagnosis through "*atypical*" *mycobacteria*, and 3 from other diagnoses. Notifiers of 175 cases were then analyzed. A total of 4620 people were recorded by the TBCC in the Somme department over the period of 2007 to 2011. As envisaged in the protocol, 600 individuals were excluded including 234 contacts from other departments, 89 spontaneous screening carried out on exposed students

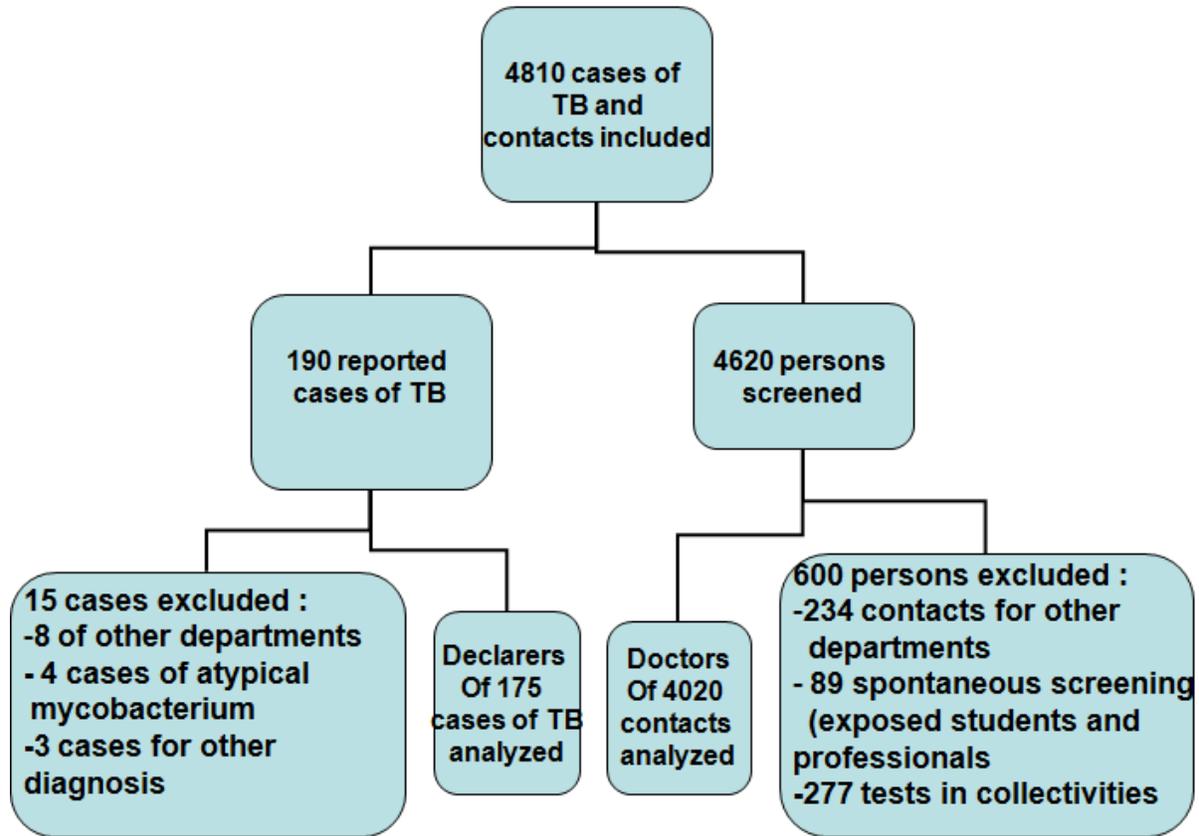


Figure 1. Flow diagram of the study population.

and professionals, and 277 tests organized in the joint halls. Physicians who have screened the 4020 contacts were analyzed (Figure 1).

Main services who reported TB cases in the Somme department 2007-2011

About 2/3 of the cases were reported by a doctor from the University Hospital Center (CHU) representing 64.6%. The proportion of reports out of the CHU was a bit above one third (35.4%). The reporting services were mainly pulmonary services CHU (29.7%), pulmonary services outside the CHU (20%), infectious diseases services CHU (13.1%), department of internal medicine CHU (5.7%), pediatric pulmonary services (5.7%), and the share of general practitioners accounted for 1.1% (Figure 2).

Communication between the TBCC and the notifiers on the cases of TB

Out of the 175 reported cases, TBCC sent 149 (85.1%) letters to the notifiers (Table 1); the latter in turn sent 131

letters (74.9%) to TBCC. A McNemar test showed that TBCC had sent more couriers than its partner (who is the notifier) ($p < 0.001$).

Communications between TBCC and its partners as part of the screening

In more than 2/3 of the cases (69.5%), screening was carried out at TBCC; in 1/4 of the cases, it was carried out by TBCC partners and in 4.8% of the cases by both.

Based on the number of mails per contacts tested (Table 2), TBCC, after testing, sent 48.0% (952/1983) mails to its partner. When it was the partner who carried out the screening, he sent 26.1% (495/1897) mails to TBCC. The comparison test of the two percentages showed that TBCC sent more mails than its partner ($p < 0.0000$).

For screening that was conducted jointly by both TBCC and its partners (Table 3), the proportions of mails sent were high; TBCC sent 53.3% of them (73/137) to its partners and the latter did so in 48.9% (67/137). A McNemar test showed that the difference between the number of mails sent by TBCC and those sent by its partner were not significant ($p > 0.5$).

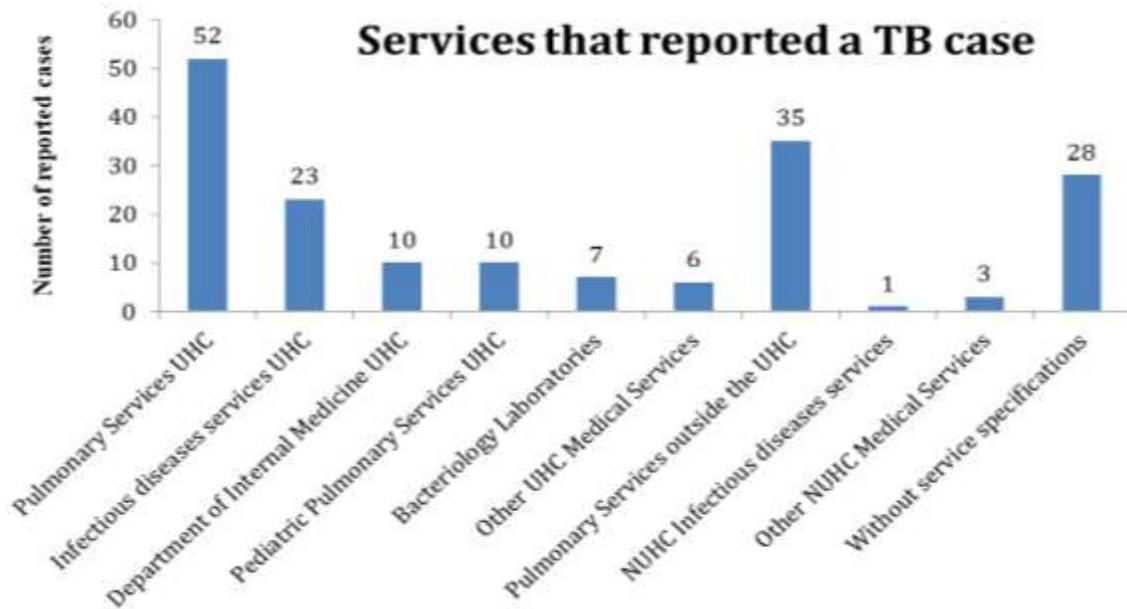


Figure 2. Main services who reported TB cases in the study population. UHC: University Hospital Centre; NUHC: Non-University Hospital Centre.

Table 1. Crossing between TBCC courier and the partner courier on the study population.

Parameter		Partner courier		Total (%)
		Yes	No	
TBCC courier	Yes	123	26	149 (85.1)
	No	8	18	26 (14.9)
Total (%)		131 (74.9)	44 (25.1)	175 (100)

Table 2. Number of mails sent by each actor when the screening of the contact of a TB case is performed by one actor in the study population.

Parameter		Frequency	Percentage	Total
TBCC	Courier	952	48	1983
	No courier	1031	52	
Partner	Courier	495	26.1	1897
	No courier	1402	73.9	

Table 3. Crossing TBCC courier and its partner courier when the contact was tested jointly by both in the study population.

Parameter		Partner courier		Total (%)
		Yes	No	
TBCC courier	Yes	38	35	73 (53.3)
	No	29	35	64 (46.7)
Total (%)		67 (48.9)	70 (51.1)	137 (100)

DISCUSSION

In this study, an assessment was conducted on close cooperation between TBCC and its partners recommended by the High Council of Public Hygiene of France 2006 (Groupe de Travail, 2006).

TBCC had sent more couriers than its partner, in the exchange around a case of TB. These couriers were not independent. Indeed, in most of the cases, the partner courier was a reply to the request from TBCC regarding the outcome of the treatment. In a quarter of the cases, the partner did not send the outcome of treatment to TBCC. In the cases where the partner had failed to do so, a track of any TBCC courier claiming it was not found. Note that this information allowed Myanmar NTP to have the treatment outcome of TB patients who were diagnosed and treated at private clinics (Thet Lwin et al., 2017).

The lack of TBCC mail mainly occurred in the first two years of the study period which corresponded to the beginning of reporting the outcome of treatment. The improvement of the communication over the next few years, with a change of staff, could correspond to the beginning of control over the new recommendations. Almost all matters of treatment were obtained, recalling the importance of hiring a staff with a public health profile in TBCC (Institut de Veille Sanitaire, 2004).

Twenty-six mails of TBCC claiming treatment outcome were not replied by partners; however, qualifying the treatment outcome of each patient in the opinion of the HCPHF 2006 is important for TB control. Indeed, the characteristics of people not having completed their treatment could be studied in order to recommend quality care improvements which is part of the prevention.

The exchange of courier between TBCC and its partners about a TB case showed that, when TBCC sent a mail to the notifier, the feedback from the notifier was better than when it did not. The notifier would not have been aware of the compulsory nature of the declaration of the result of treatment or he considered that this stage of the fight as secondary. We think that TBCC should have played its part of support in the fight through information, training and permanent reminder to its partners. TBCC could have developed and distributed, to its partners (lung specialist and infectiologists from the CHU, general practitioners, private physicians...), practical leaflets on clinical and public health aspects regarding TB.

In a review, Bell (2011) noted that all categories of TB care providers lacked comprehensive knowledge of national treatment guidelines, and procedures for referral, treatment monitoring, record keeping and case holding were not systematically implemented. However, there was a high degree of willingness to collaborate with national TB programs. Improved collaboration between NTPs and professional associations has been seen as an essential strategy in disseminating knowledge (Caminero,

2003a) and interventions among medical specialists and scientific societies to achieve better tuberculosis control (Caminero, 2003b). Krishnan et al. (2009) recognized that NTPs needed to implement innovative and supportive strategies to assist providers in translating knowledge into practice.

The public-private mixed partnership, essential component of the strategy stop TB, is a crucial component of TB control. Developed by WHO, this strategy calls upon the national programs of TB control to collaborate within a wide range of institutions, entities and individuals to make sure TB patients receive adapted care, as per the world standards of tuberculosis treatment. Applied in several countries with high TB incidence, the Public-Private Partnership contributed to significantly increase the rates of detection, treatment and monitoring of TB. This was an improvement of collaboration between the actors of the fight, quantified by reference, follow-up and the arrival of suspect cases of TB rate in Control Centers which increased each by about 50% (Caminero and Billo, 2003; Ahmed et al., 2009; Khan et al., 2012; Pethani et al., 2015).

In the same way, evaluation of the communication between TBCC and its partners in contacts screening showed this dependence. When the same contact was jointly tested by TBCC and its partner, communication was better than when it was unilaterally done. This highlighted that the partner made the same effort as TBCC regarding communication in screening. However, the ratios of mails exchange, in these cases or considering the exchanges around all contacts, remained low, showing a poor collaboration between the actors of TB control.

Based on the number of mails per contacts tested, TBCC, after testing, sent more mails to its partner than this later did when he carried out the screening.

A thesis assessing the communication between the general practitioners and the other actors of TB control in the department of the Aisne also highlighted poor feedback (9.1% by lung specialists and 12.1% by general practitioners) to TBCC (unpublished data). A personalized medical was suggested to improve the communication between the healthcare professionals because it facilitated information sharing among healthcare professionals, both in town and in hospitals (L'Assurance Maladie, 2014).

The general practitioners are the main partners of TBCC in screening. LTBI, TB prevention and cure strategies are frequent problems that general practitioners need to address clearly in countries with low incidence of TB. For Aadnanes et al. (2018), gaps in TB knowledge and awareness among general practitioners in Norway need to be addressed if general practitioners are to be more involved in TB management and prevention in the future.

This situation is also observed in high TB burden countries; private general practitioners were not always at

ease to admit the signs of tuberculosis, conduct the diagnosis, start the treatment or monitor the patient under treatment (Khan et al., 2003). Intervention studies showed positive results on this matter (Caminero and Billo, 2003; Ahmed et al., 2009; Khan et al., 2012; Pethani et al., 2015).

It was believed that improving communication between TBCC and its partners by training these partners is capital because it would contribute to get an optimal screening by allowing the contact to be reminded by both sides.

The installation of a monitoring and evaluation software for the survey recommended by the High Council of Public Hygiene of France (Groupe de Travail, 2006) would also be a fast tool for patient information sharing among actors fighting TB.

A continuing education of general practitioners would help maintain or establish knowledge on tuberculosis. Indeed those would not always be maintained because of the scarcity of their TB experiment (Khan et al., 2012).

As for this strategy, we think that on the level of the Somme department, the Public-Private Partnership can take the form of a continuing education going beyond the medical circle to cover care and all nonmedical partners of TBCC. In the long term, this system will improve collaboration between TBCC and its partners and can contribute to reduce the mandatory reporting of TB delay and also contact delay screening.

The main limitation of our study is that it is an observational and retrospective study. While it helps to know the degree of communication between TBCC and its partners, it still has limitations that are known. The study is monocentric; multicentric studies would help us check the quality of collaboration between the actors of TB control.

However, the study has some strength. First of its kind in the Somme department, this study enables us to know the levels of communication between TBCC and its various partners. This is a 5-year study and is in pre and post National Plan Tuberculosis. The Somme department is a zone with an average incidence. This enables us to assess the impact of the National TB Program in the Somme department, in terms of collaboration, and extrapolation, if not at the national level, in several areas of France. The large sample allows a strong power for the conducted tests.

Conclusion

The assessment of tuberculosis prevention methods in the Somme department does not reveal good performances; there is an obvious need for improvement in many areas.

Collaboration between TBCC and its partners is not perfect. Most often dependent on TBCC courier, the partner courier was missing when there was no request

from TBCC. The reinforcement of communication between TBCC and its partner in the Somme department needs to be improved because it is the central element of a good collaboration for a best fight against TB. It is recommended that the RHO make a note to all the actors reminding them of the key role of collaboration in this fight against TB.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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