

CHAPTER 1

Introduction and background

1.1 INTRODUCTION

Tuberculosis (TB) was declared a global emergency in 1993. In the same year, TB was declared a priority health issue in South Africa by the national Minister of Health (Balt, Edgington, Lotter, Preller & Uys 1998:1). According to the South African Department of Health (DOH) (2004:4), 80,0% of the global TB burden is found in only 22 countries, including South Africa.

According to Morgans Thiim, President of the Danish National Association of Lung Diseases, children in TB-endemic countries face a similar TB epidemic to that which threatened the lives of their grandparents (World Health Organization (WHO) 2002:2). According to Khan and Starke (1995:1), TB has re-emerged as a major worldwide public health challenge with an increasing incidence amongst children.

In specimens from sputum induction, Zar, Hanslo, Apolles, Swingler and Hussey (2005:130) found that 50,0% of children who were sputum culture positive were also smear positive. This is a very important reason to find and treat children as they could be contributing to the transmission of TB.

There has been a relatively low childhood TB notification rate in Mpumalanga province, South Africa. The ability of the primary health care (PHC) nurse to correctly diagnose TB in children in Mpumalanga province is not known and may be an important factor contributing to the low childhood TB notification rate.

1.2 BACKGROUND TO THE PROBLEM

The National TB Directorate alerted the Mpumalanga Communicable Diseases Control Co-ordinators (CDCCs) at a CDCC meeting in December 2002 that TB case finding amongst children in Mpumalanga province was much lower than expected. In order to adequately deal with this concern, it was necessary to confirm this observation and explore possible underlying factors. The ability of the PHC nurse to diagnose TB in children was identified as a possible contributory factor.

The lack of a definitive diagnostic tool for paediatric TB is a limiting factor for ascertaining the actual size of the TB problem in children (Chintu, Bhat, Luo, Raviglione, Diwan, Du Pont & Zumla 1993:502). Harries, Maher, Raviglione, Chaulet, Nunn, Van Praag and Crofton (1996:62) maintain that if the diagnosis of TB in children is considered easy, TB is probably being over-diagnosed, as diagnosis of TB in children is usually difficult. Osborne (1995:369) indicates that TB in children is a growing problem with important health implications. The global magnitude and incidence, morbidity and mortality of childhood TB remain unclear due to the diagnostic challenges.

TB managers around the world are generally clear about strategies to tackle TB in adults. Most reports of positive achievement in the battle against TB refer to adults. Even in countries with well-developed TB programmes, TB in children is a clouded and often poorly managed issue (Baez 2000:10). Although the international TB control strategy focuses on active pulmonary TB, it does not address children and adolescents as vulnerable sub-groups (WHO 2001:22).

Pneumonia, TB, diarrhoeal diseases, malaria, measles and HIV/AIDS are the six deadly diseases that account for more than half of all premature deaths in children and young adults (WHO 1999:1). According to Webber (1998:181), TB is a particular problem in developing countries. Van Rheenen (2002:435) emphasises that the major chronic illnesses in children in sub-Saharan Africa are TB, HIV and malnutrition. The diagnosis of TB in children is difficult, especially in

developing countries with limited resources (Van Beekhuizen 1998:155). Osborne (1995:369) points out that paediatric TB notifications, “particularly in developing countries, may underestimate true incidence because of diagnostic constraints, poor reporting and notification systems”.

Between 2001 and 2003 the proportion of TB patients that were children in Mpumalanga was consistently less than the national proportion (see table 1.1). This led to considerable concern in the DOH that children with TB were not being diagnosed in Mpumalanga.

Table 1.1 TB in children in Mpumalanga and South Africa, 2001-2003

	2001			-2003					
	1-2003	2001-2003	All	NewSm	+ve %	0-14 yr	s#	0-1	
001-2002	03		All	NewSm	+ve %	0-14 yr	s#	0-1	
s# All NewSm+ve	% 0-1	4 yr	s# 0-	14 yrs	All	NewSm+ve % 0-1	4 yr	s# 0-	

yrs Mpumala

n

ga 4 296 2,0 86 4 102 1,7 70 4 222 1,7 72 South Africa 83 808 2,5 2 1

22 98 800 5,3 5 248 116 107 3,6 4 188 DOH (2004:1-4) Children represented only a small percentage of the total TB patients in Mpumalanga from 2001 to 2003 comparison to their contribution to the total p

o

population (see table 1.2). The situation was similar in the Gert Siba

nde district where this study was conducted (see tabl

e 1.3). **Table 1.2 Children as a proportion of to**

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popu	lation and children diagnosed	ed with TB as a proportion	of all TB patients diagnosed	ed in Mpumalanga, South Africa, 200	1-2003 YEAR TOTAL TB PATI	ENTS ALL AGES TOTAL TB PATIENTS 0	<5 YRS % OF 0-5 YRS TB
IENTS	% OF	0-<5	YRS	OF T	OTAL	POPU	LA-T
TOTAL	5-<15	YRS	TB	PATIE	NTS	% 5-<	15 Y
F TOT	AL POP	ULA-	TION	% 5-	<15	YRS T	B PA

E

NTS 2001 7

1

75 345 4,8 11,2 208 23,9 2,8 2002 8 047 355 4,4 11,1 252 23,7 3,1

total TB patients Gert Sibande district, Mpumalanga, 2001-2003

YEAR	TOTAL TB PATIENTS ALL AGES	TOTAL TB PATIENTS 0-<5 YRS	% OF 0-<5 YRS TB PATIENTS	% OF 0-<5 YRS OF TOTAL POPULATION	TOTAL 5-<15 YRS TB PATIENTS	% 5-<15 YRS OF TOTAL POPULATION	% 5-<15 YRS TB PATIENTS
2001	2 162	79	3,6	5,6	19	12,0	0,8
2002	2 665	71	2,6	5,6	72	12,0	2,7
2003	3 078	125	4,0	5,6	90	12,0	2,9

DOH (2004:1-4)

Of the five provinces using the electronic TB register in South Africa in 2002, Mpumalanga had the lowest proportion of TB cases among children <15 years of age (DOH 2004:1-4) (see table 1.4). This was also the case amongst the six provinces using the electronic TB register in 2003 (see table 1.5).

Table 1.4 Proportion of all registered TB cases that were children 0-<5 and 5-<15 years of age per province, South Africa 2002

Province	0-<5 years	5-<15 years	Total
KwaZulu-Natal	8,2	5,7	13,9
Gauteng	11,3	3,7	15
North West	5,2	4,3	9,5
Western Cape	12,5	6,2	18,7
Mpumalanga	4,4	3,1	7,5

DOH (2004:1-4)

Table 1.5 Proportion of all registered TB cases that were children 0-<5 and 5-<15 years of age per province, South Africa 2003

Province	0-<5 years	5-<15 years	Total
KwaZulu-Natal	8,4	5,9	14,3
Gauteng	7,6	3,9	11,5
North West	5,9	4,1	10,0
Western Cape	12,3	5,9	18,2
Mpumalanga	4,6	3,3	7,7
Free State	6,3	4,0	10,3

DOH (2004:1-4)

These epidemiological findings demand attention, particularly in the light of the

South African Government's commitment to the United Nations Convention on the Rights of the Child (De Villiers 1995:27). An important consideration is whether Mpumalanga's nurses have the ability to diagnose TB in children.

The PHC nurse is usually the first contact for the sick child within the formal health service, hence PHC nurses must maintain a high index of suspicion for TB. In many countries nurses are the main providers of PHC services (WHO 2003:3). Although children are often referred to hospitals and doctors for definitive diagnosis, diagnosis will not occur if PHC nurses are not alert to the possibility of TB and adopt a correct approach to diagnosis and management (Baez 2000:10). It is thus essential that PHC nurses have a rational approach to the challenging task of diagnosing TB in children.

According to Baez (2003:1), children with TB frequently have contact with the health system but succumb due to their TB without it being diagnosed. Baez adds that this might be the result of medical and hospital-orientated approaches to TB diagnosis in children, and a limited culture of continuous care for children.

The new South African PHC nurse-driven system demands that first-line nurses be equipped to suspect, diagnose, confirm the diagnosis and treat TB in children (Baez 2003:1).

The ability of PHC nurses to correctly diagnose TB in children in Mpumalanga is not known and may be an important contributory factor in the low reported childhood TB notification rate.

1.3 RATIONALE FOR THE STUDY

This study sought to examine and come to grips with the following issues:

- 1 The low diagnostic/notification rate of TB in children in Mpumalanga.
- 2 The ability of PHC nurses to correctly diagnose TB in children in

Mpumalanga.

- 3 The need to provide PHC nurses with a rational and correct approach to the difficult task of diagnosing TB in children.
- 4 The level of knowledge regarding the diagnosis of TB in children.
- 1 The availability of guidelines for the diagnosis of TB in children.
- 2 The need for a plan of action regarding the diagnosis of TB in children.

1.4 SIGNIFICANCE OF THE STUDY

The findings of this study could have major policy and training implications for PHC nurses in Mpumalanga with resulting improvements in the level of care of children with TB. These findings could also lead to more complete notification of TB in children and earlier diagnosis and treatment that would interrupt transmission.

1.5 AIM OF THE STUDY

The researcher wished to determine factors affecting the ability of PHC nurses to diagnose TB in children in the Gert Sibande district, Mpumalanga. Accordingly, the objectives of the study were to

- 1 determine the knowledge of the PHC nurses in the Gert Sibande district, Mpumalanga regarding diagnosis of TB in children
- 2 establish whether the PHC setting is equipped to allow diagnosis of TB in children
- 3 evaluate the completeness of TB child contact screening of confirmed TB smear positive adult cases
- 4 determine the need for a plan for PHC nurses in Mpumalanga for improved diagnosis of TB in children

1.6 STATEMENT OF THE PROBLEM

The PHC nurse is the first contact in the formal health system for the sick child

who is infected with TB. The ability and knowledge of the PHC nurse to effectively diagnose TB in children is a concern since there is a low childhood notification rate in Mpumalanga.

The research problem led to the following questions:

- 1 Do PHC nurses have adequate knowledge to effectively diagnose TB in children in the Gert Sibande district, Mpumalanga?
- 2 Is the PHC setting in the Gert Sibande district, Mpumalanga equipped for diagnosing TB in children?
- 3 How complete is screening for TB child contacts of confirmed smear positive adult TB cases?
- 4 Is a specific plan of action for diagnosing TB in children by PHC nurses in Mpumalanga necessary?

1.7 DEFINITIONS

The following terms are used as defined below:

- 1 **Child.** *Collins English Dictionary* (1991:281) defines a child as "a boy or girl between birth and puberty; a baby or infant". In this study, it refers to any child aged 0 to 14 years.
- 1 **Adult.** *Collins English Dictionary* (1991:20) defines adult as "a person who has attained maturity; a grownup". In this study, any person over 14 years of age is classified as an adult.
- 2 **Case of tuberculosis.** Donald, Fourie and Grange (1999:27) define a person in whom tuberculosis has been confirmed bacteriologically, histologically and/or cytologically or in whom a pleural effusion responded satisfactorily to

anti-tuberculosis treatment as a case of TB. Donald et al (1999:27) state further that a child “under the age of 5 years with a strongly positive Mantoux test, together with a satisfactory constellation of symptoms and signs, is also considered a case of tuberculosis”. *Collins English Dictionary* (1991:1654) defines tuberculosis as “a communicable disease caused by infection with the tubercle bacillus, most frequently affecting the lungs (pulmonary tuberculosis). Also called: consumption, phthisis.”

- 3 **Case finding** is the identification and prompt treatment of sputum smear positive patients who are the main source of new infections (Donald et al 1999:38).
- 1 **Factor.** *Collins English Dictionary* (1991:553) defines a factor as “an element or cause that contributes to a result”.
- 4 **Influencing.** *Collins English Dictionary* (1991:794) defines influence as “to persuade or induce; to have an effect upon (actions, events, etc.); affect”.
- 5 **Ability.** *Collins English Dictionary* (1991:3) defines ability as “possession of the qualities required to do something; necessary skill, competence, or power”.
- 6 **PHC nurse** refers to any registered nurse working in a provincial government clinic, mobile clinic or community health centre (CHC) in Mpumalanga.
- 7 **Government PHC setting** refers to any provincial government permanent clinic, mobile clinic or CHC in Gert Sibande district, Mpumalanga.
- 8 **Diagnose.** *Collins English Dictionary* (1991:434) defines diagnose as “to determine or distinguish by diagnosis; to examine (a person or thing), as for a disease” and diagnosis as “the identification of diseases from the examination of symptoms; an opinion or conclusion so reached”.

- 9 **Notification.** *Collins English Dictionary* (1991:1068) defines notification as “the act of notifying; a formal announcement” and notify as “to inform; tell”.
- 10 **Contact.** Donald et al (1999:27) describe a contact as a person “living in the same room or house, or sleeping within 5 metres of a person with TB or working daily in the same room”. *Collins English Dictionary* (1991:345) defines a contact as “any person who has been exposed to a contagious disease”.
- 11 **Suspected case** refers to a person with symptoms suggestive of TB, namely productive cough plus any two of the following: weight loss, loss of appetite, shortness of breath, chest pain, lassitude or night sweats, or a radiographical picture suggestive of TB (Donald et al 1999:27). *Collins English Dictionary* (1991:250) defines case as “a single instance, occurrence, or example of something; a specific condition or state of affairs; a person attended or served by a doctor, social worker, solicitor, etc; patient or client”.
- 12 **Screening.** *Collins English Dictionary* (1991:1391) defines screen as “to examine for the presence of a disease”.
- 13 **Smear positive sputum** refers to laboratory detection of *Mycobacterium tuberculosis* in the sputum of a patient (Balt et al 1998:23).
- 14 **Smear positive case** refers to a pulmonary TB case with at least two sputum smears positive for AFB (acid-fast bacilli) or one sputum smear positive for AFB and chest x-ray abnormalities consistent with active TB (Harries et al 1996:27).
- 15 **Infectious pool** refers to those actively excreting *Mycobacterium tuberculosis* (MTB) and thus able to infect others (Donald et al 1999:28).
- 16 **Treatment interrupter** refers to a diagnosed patient who has not attended

therapy for two months or longer over the whole treatment period (Donald et al 1999:28).

17 **Incidence** refers to the number of new cases of a condition in a defined population during a specific period. In this case new TB cases diagnosed during the course of one year (Donald et al 1999:27).

18 **Point prevalence** refers to the proportion of all existing cases meeting specific criteria in a population at a specific time. In this context, TB cases meeting specific diagnostic criteria, present at a given time in a defined population (Donald et al 1999:27).

1.8 ASSUMPTIONS

The study was based on the following assumptions:

- 1 PHC nurses in Mpumalanga do not have the necessary knowledge to diagnose TB in children.
- 2 The PHC setting in Mpumalanga is not adequately equipped to support the diagnosis of TB in children.
 - Screening for TB contacts of confirmed smear positive adult TB cases in Mpumalanga is deficient and incomplete.
 - A plan of action is necessary to assist PHC nurses in Mpumalanga to effectively diagnose TB in children.

1.9 RESEARCH DESIGN

A research design is the researcher's overall plan for obtaining answers to research questions or testing a research hypothesis (Burns & Grove 2003:195).

A quantitative, descriptive study was conducted to determine the effect of specific nursing interventions on a specific clinical problem and to generate knowledge that could directly influence and improve clinical practice (Burns & Grove 1997:40). Data were analysed statistically and results were obtained that could be verified and thus not be regarded as mere speculation (De Villiers 2003:1). Within-method triangulation was used because it strengthens the research results and contributes to theory and knowledge development (Burns & Grove 1997:245).

1.10 SCOPE AND LIMITATIONS OF THE STUDY

The researcher visited 63 out of the possible 67 government facilities over a 13-working day period. Only 62 of the facilities could be included in the study. One professional nurse was on long leave, two were on study leave and at one facility there was no professional nurse and only two new auxiliary nurses who had started working at the facility on the day of the researcher's visit.

1.11 OUTLINE OF THE STUDY

Chapter 1 introduces the problem to be studied and the background.

Chapter 2 discusses the literature review undertaken by the researcher for the study.

Chapter 3 describes the research methodology.

Chapter 4 discusses the data analysis and the findings.

Chapter 5 concludes the study, briefly describes its limitations and makes recommendations for practice and further research.

1.12 CONCLUSION

The new South African PHC nurse driven system demands that PHC nurses be able to diagnose TB in children (Baez 2003:1). Relatively low notification rates in Mpumalanga province raised concern that PHC nurses may not be adequately equipped to diagnose TB in children. As the ability of the PHC nurse to correctly diagnose TB in children was not known, the researcher conducted the current study to establish the ability of PHC nurses to correctly diagnose TB in children. This chapter outlined the background to the problem, the rationale for and aims of the study, and defined terms used in the study.

Chapter 2 discusses the literature review undertaken by the researcher.