

**STRATEGIES FOR THE EARLY DETECTION OF LEPROSY CONTACTS
IN SOUTH ETHIOPIA**

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KEBEDE TEFERA BETRU

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Supervisor: Prof Thuledi Makua

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DECLARATION

Name: **KEBEDE TEFERA BETRU**

Student number: **64083055**

Degree: **Doctor of Public Health**

Title: STRATEGIES FOR THE EARLY DETECTION OF LEPROSY CONTACTS, IN SOUTH ETHIOPIA

I declare that the above dissertation/thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.



SIGNATURE

June 2022

DATE

DEDICATION

I dedicate this research report to my beloved wife Selamawit Berihun and my mother Ejigayehu Wolde.

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STRATEGIES FOR THE EARLY DETECTION OF LEPROSY CONTACTS IN SOUTH ETHIOPIA

STUDENT NUMBER: 64083055

STUDENT: KEBEDE TEFERA BETRU

DEGREE: DOCTOR OF PUBLIC HEALTH

DEPARTMENT: HEALTH STUDIES

SUPERVISOR: PROFESSOR THULEDI MAKUA

ABSTRACT

Nationally the existence of leprosy type grade II disability at the time of diagnosis suggests a subtly delayed diagnosis. The goal of this study was to determine the primary factor influencing the Leprosy Prevention and Control Programme's plan to develop user-friendly strategies for effectively implementing the activities of the early detection of leprosy cases among contacts of index patients in the Sidama region of southern Ethiopia. The goals were to investigate and describe the perspectives and experiences of health professionals regarding their involvement in early leprosy case detection, to describe and critically analyse the causes of the difficulties that professionals face in leprosy early detection, to evaluate the current state of the health system's early leprosy case detection implementation and to develop user-friendly strategies to enhance existing ones of early leprosy case detection among individuals who have contact with index patients.

The study employed a qualitative, descriptive and phenomenological explorative research design to answer the research questions. By the use of non-probability purposive sampling, research participants were identified. During the study, in-depth interviews were conducted to gather information regarding the experiences of health workers (medical doctors, public health officers, clinical nurses, health extension workers, health centre heads and regional and woreda district health office technical and programme experts). To analyse the qualitative data, inductive thematic analysis techniques were used. For analysis, ATLAS.ti 8 software was used. The data transcription, coding, display,

reduction (theme) and interpretation of the discovered results were the processes undertaken for the analysis.

The findings of the study revealed that leprosy prevention and control programmes are still problematic. The current national leprosy strategy use does not facilitate production of effective leprosy prevention programs because strategy does not address all of the crucial components of effective early detection activities. Themes that emerged from the data gleaned from the health workers included: wrong beliefs about leprosy disease in the community, delay in seeking early healthcare, the practice of the early detection of leprosy cases and challenges experienced and observed during the implementation of leprosy strategies. Based on the discovered results, leprosy prevention and control programme strategies were created. Overall, the analysis of the data revealed five themes. As a result, the researcher used the findings of the study to create strategies to improve the early detection of leprosy cases among the contacts of index patients. The strategies include implementing and strengthening effective community awareness-building efforts, maintaining expertise in leprosy, strengthening comprehensive leprosy training for health workers, carrying out efficient and thorough contact tracing, enhancing monitoring, supervision, assessment and surveillance, boosting managerial skills, lobbying political commitment, motivating healthcare workers and reducing stigmatisation.

KEY CONCEPTS

Leprosy; contact tracing; early detection; healthcare worker; strategy; Grade II disability

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LIST OF ABBREVIATIONS

AFB	Acid-fast bacillus
AHRI	Armauer Hansen Research Institute
BCC	Behaviour Change Communication
BCG	Bacillus Calmette-Guerin
BL	Borderline lepromatous
BT	Borderline tuberculoid
CBR	Community-based rehabilitation
CDC	Centres for Disease Control and Prevention
CM	Case management
CSA	Central Statistics Agency
CSO	Chief Strategy officer
FDREMoH	Federal Democratic Republic of Ethiopia Ministry of Health
G1D	Grade 1 disability
G2D	Grade 2 disability
GLRA	German Leprosy Relief Association
GPZL	Global Partnership for Zero Leprosy
HAD	Health Development Army
HEW	Health extension worker
HHC	Household contact
HIMS	Health information management system
HSTP	Health Sector Transformation Plan
IEC	Information, education and communication

IGA	Income generating activity
ILEP	International Federation of Anti-Leprosy Associations
LL	Lepromatous leprosy
LPEP	Leprosy post-exposure prophylaxis
LR	Leprosy reaction
MB	Multibacilliary
MDT	Multidrug therapy
MoH	Ministry of Health
NGO	Non-governmental organisation
NTD	Neglected tropical disease
OPD	Outpatient department
PAL	People affected by leprosy
PB	Paucibacillary
PHC	Primary healthcare
PY	Person-year
RFT	Released from treatment
RHB	Regional Health Bureau
SDR	Single dose rifampicin
SER	Socio-economic rehabilitation
SNNPR	Southern Nations, Nationalities and Peoples' Region
SOP	Standard operating procedure
TB	Tuberculosis
TT	Tuberculoid

UNISA	University of South Africa
WHA	World Health Assembly
WHO	World Health Organization

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Leprosy is a bacterial – mycobacterium leprae (M. leprae) – disease that affects predominantly the skin and the peripheral nerve system, with resulting deformities and disability. Today, leprosy is mainly restricted to tropical and subtropical areas. The consequences of deformity and disability may lead to stigma and discrimination. Inhaling droplets containing the causative agent is the primary method of disease transmission for leprosy – albeit the manner of transmission is still poorly understood. Delays in diagnosis and case management account for a large portion of malformations. Early detection of leprosy in patients and treatment compliance with multidrug therapy (MDT) are the basic prevention and control techniques for leprosy diseases.

Despite leprosy having been eliminated as a public health issue (defined as achieving a point prevalence of less than 1 per 10,000 population) globally in 2000 and nationally in the majority of countries by 2005 and even though the number of cases was drastically reduced, leprosy cases are still being reported daily around the world. As the World Health Organization (WHO) estimated, over 200,000 new leprosy cases were reported in 2016. Based on the observed number of cases in different countries and with the WHO's endorsement and guidance, the early detection, diagnosis and treatment of leprosy are essential for reducing the burden of cases worldwide (WHO 2018a:1).

Programmes for leprosy prevention and control can improve the quality of life for leprosy patients. The stigma and the route of transmission of leprosy are affected by how a community views the disease. Additionally, participation in advocacy programmes by leprosy patients, community leaders, religious figures, health educators and traditional healers is necessary to disseminate accurate knowledge about the disease in a lasting way to prevent leprosy transmissions (Singh, Singh & Mahato 2019:16).

1.2 BACKGROUND INFORMATION

Leprosy is a public health issue because of its severe clinical presentations, tendency to result in physical disability and socio-economic effects. It is a chronic, infectious and contagious disease caused by the *M. leprae* bacterium. Clinical signs and symptoms may appear within six months to 20 years after exposure to the infection and they primarily affect the skin and peripheral nerves, impairing movement and sensory perception. Grade I (G1D) or Grade II disabilities (G2D) – ranging from minor skin lesions to peripheral nerve, ocular, bone and even vital organ damage – may result from these effects. Leprosy symptoms and signs primarily depend on the patient's immune system. Disabilities and deformities result in their having significant physical effects as well as psychological, social and economic issues. It also has a significant impact on their daily tasks and social interaction (Domple, Harnalihar, Wadde, Gadekar & Dhande 2017:482).

The majority of leprosy cases, according to a recent WHO report (WHO 2018a:1), are found in tropical and subtropical areas. Leprosy disorders are frequently stigmatised, particularly when deformities and disabilities appear. Due to the host's immune response, 95% of patients who were exposed to *M. leprae* do not develop the disease; this has a significant impact on the progression and treatment of the disease (WHO 2018a:1).

A total of 202,185 new cases were discovered worldwide in 2019 according to a WHO report (WHO 2020a:419). Thirteen nations (Bangladesh, the Democratic Republic of the Congo, Ethiopia, Madagascar, Mozambique, Myanmar, Nepal, Nigeria, Philippines, Somalia, South Sudan, Sri Lanka and the United Republic of Tanzania) each reported between 1,000 and 10,000 instances while Brazil, India and Indonesia each reported more than 10,000 cases. A total of 78,625 cases, or 38.9% of the newly diagnosed patients, were female. Around the world, 10,813 new cases (5.3%) of G2D impairment were found, of which 370 were identified in children in 2019. In one way or another, the prevalence of juvenile cases demonstrates that leprosy has been continuously transmitted within communities (WHO 2020a:419).

According to the Federal Democratic Republic of Ethiopia Ministry of Health (FDREMoH), 1,970 new cases of leprosy were documented in 2015 (2018:133). According to the number of skin lesions, 85% of the patients had MB leprosy; 14.2% of newly diagnosed leprosy cases were in youngsters and 31% of those cases were female. Within the same reporting period, 10.6% of newly diagnosed cases of leprosy had G2Ds. For MB and PB,

respectively, the rates of treatment adherence and completion were 86% and 71% (FDREMoH 2018:133).

Even though the prevalence of leprosy has significantly decreased as a result of the deployment of MDT, there are still ongoing occurrences of new cases being discovered and transmission is occurring in select highland areas of Ethiopia. One of the most significant markers of late detection in healthcare facilities, according to 2019, reported a total of 3426 leprosy cases. Among the total registered cases 2957 (86.3%) were new and 368 (10.7%) were registered as relapse. Among the new cases 67.5% was MB 15.1% children and 13.9% with Grade II disability (FDREMoH 2021a:190).

1.3 RESEARCH PROBLEM

Recent mapping of research in Ethiopia revealed that 93 woredas (districts) have a significant prevalence of leprosy. Annually, the number of new cases of leprosy has been consistent for more than ten years, according to the report's ongoing examination (ARHI 2017:20). These methods cause the report to understate the true point or interval prevalence of the current numbers since all cases are typically reported through passive case detection.

The disease trend in the country has remained relatively consistent over the past 20 years despite leprosy's removal as a national public health concern and even though it is now increasingly restricted to a small number of pocket sites. According to the NLCP, since 2013, worrying patterns have been observed in G2D and child proportions.

At the time of diagnosis, Grade II impairment affected 14% of newly diagnosed leprosy cases, which is too high. This could be brought on by a lack of healthcare-seeking behaviour or a misinterpretation of disease signs and symptoms. The most frequent causes of delayed diagnosis at the community level include poverty, stigma, traditional beliefs, ignorance, unaffordable transport and other costs (FDREMoH 2017a:22-24).

Additionally, obstacles to the early diagnosis of leprosy cases are caused by problems with the health system, such as difficulty accessing medical facilities, ignorance, missed diagnoses and treatments, public and private settings and weak referral links. The significant incidence of childhood and MB leprosy in recent case reports attests to the ongoing community transmission of infections. At all levels of the health system, the

current state of leprosy preventive and control initiatives receives much too little attention and concern (FDREMoH 2017a:22-24).

One of the best ways to prevent and control the disease is to use this knowledge regularly or as part of a campaign to look at the household contacts (HHCs) of all newly diagnosed and relapsed leprosy cases. This allows for early diagnosis and treatment and helps to prevent the effects of deformities and disabilities. Early identification is essential to prevent the infection from spreading further and to lessen the risk that the patient would have a lasting impairment and deformity (Smith & Aerts 2015:126; Anchieta, Da Costa, Campos, Vieira, Mota, Neto, De Souza & Guimares 2019:11;).

As various studies have shown, the actual number of leprosy cases in endemic nations is unknown (Salgado, Barreto, Da Silva, Frade & Spencer 2016:778), although it is believed to be six- to eightfold greater than the current number of new cases recorded (Barbieri, Sales, Hacker, Nery, Duppre, Machado, Moraes & Sarno 2016:6). This is primarily due to the limited ability of general healthcare professionals to diagnose and treat leprosy cases as per national or international standards (basically a clinical approach).

The main goal of every nation's Leprosy Prevention and Control Programme (LCP) is to stop disability and deformity through the management of nerve function activities. This can be addressed by health professionals through early diagnosis and the prompt start of MDT treatment, community awareness raising, contact tracing and other methods (Abeje, Negera, Kebede, Hailu, Hassen, Lema, Yamuah, Shiguti, Fenta, Negasa, Beyene, Bobosha & Aseffa 2016:2).

Early diagnosis and appropriate treatment are the crucial components of any LCP. However, as studies have shown, it can be difficult for health workers to implement diagnostic, treatment and early detection programmes effectively due to a lack of knowledge and skills regarding leprosy signs and symptoms, lack of awareness, stigmatisation of patients, a lack of motivation and poor interactions between health services and communities. These issues could result in a delay in the diagnosis and treatment of leprosy. This can substantially maintain the continuity of infection transmission and disability events (Abeje et al 2016:5)

According to the WHO recommendations, the best way to stop a disease's spread and avoid disability and deformity is by early detection (WHO 2020a:419). Through the number

of disabilities among newly discovered cases and the effects of transmission reduction, the influence of the early detection approach is monitored and evaluated. To adopt early case detection methods, it is necessary to improve strategies, develop new instruments that promote early diagnosis, increase community awareness and improve the ability of health personnel to effectively identify and treat leprosy cases and manage their sequelae (Smith et al 2015:4).

Among communicable diseases, leprosy is the leading cause of permanent physical disability .Annually; around 3000-4000 new cases have been reported and registered for treatment in Ethiopia, with no reduction in incidence in the past 20 years. More than 10% of the reported new cases present with disability grade 2 (FDREMoH. 2017b).

According to Federal Democratic Republic of Ethiopia Ministry of Health report (2020b:190) the number of leprosy cases detected in 2018/19 was higher than the number detected in the last two years. A total of 3,426 new leprosy cases were detected in 2018/19. Among the total registered cases 2957 (86.3%) were new and 368 (10.7%) were registered as relapse. Among the new cases 67.5% was MB 15.1% children and 13.9% with grade 2 disabilities FMOH. Even if availability of leprosy treatment, the disease still causes disability in many people.

Leprosy is still endemic in the Bursa woreda, Sidama Region. Currently, according to the Sidama Regional Health Bureau's 2018 midterm performance evaluation, in the Sidama region, 83 new cases of leprosy that had developed G2D were identified. (South Region Health Bureau Report: 2018).

Many factors contribute to the challenges experienced with health professionals to delay early detection of leprosy cases. Generally Leprosy preventive programs acknowledge early case detection, timely treatment, decreased disability and leprosy transmissibility. However, the researcher believes that the current leprosy strategy use do not facilitate production of effective leprosy prevention programs since prevention programs do not address all of the crucial components of effective early detection activities and will not contribute to eliminate the levels of leprosy infection and disabilities. The problem is that the current early detection strategies are not effective in ensuring that all leprosy cases and contacts.

Considering the barriers or challenges of early detection of leprosy cases from the perspective of health professionals it is important to develop user-friendly strategies to enhance existing ones.

1.4 DEFINITION OF CONCEPTS

Leprosy case: A patient having one or more of the following: (i) hypo-pigmented skin lesion with definite loss of sensation; (ii) Impairment or involvement of the peripheral nerve as demonstrated by a) definite loss of sensation or b) weakness of hands/feet or face or c) autonomic function disorders such as anhidrosis (dry skin); or d) presence of visible deformities; (iii) signs of the disease with demonstrated presence of bacilli in slit-skin smear or histopathological confirmation; AND in need of leprosy treatment as decided by a clinician (WHO: 2020d:X)

Index case: Any person diagnosed with leprosy for the first time(WHO: 2020d:X).

Early detection is evidenced by prevent the occurrence of irreversible nerve damage and disability through passive active screening.

Contact: a person having close proximity to a leprosy patient for a prolonged duration. Such persons are considered “exposed” to leprosy and may or may not have been infected. “Prolonged duration” is typically defined as having been in contact with an untreated patient for 20 hours per week for at least three months in a year, e.g. family members, neighbours, friends, school children in same class; co-workers in same office, etc. (WHO: 2020d:X).

Contact Tracing : A systematic process to identify previously undiagnosed cases of Leprosy among the contacts of an index case.

Delay in detection : evidenced by the relatively high proportion of new cases with G2D

Grade II disability: Visible damage or disability is noted.

1.5 THEORETICAL FOUNDATIONS OF THE STUDY

1.5.1 Research paradigm

The constructivism paradigm was used in this study to explore and describe the perspectives and experiences of health workers who provide and coordinate leprosy prevention initiatives with an open-ended inquiry through research questions. This paradigm is applied when a researcher wants to investigate study participants' opinions and first-hand accounts of particular phenomena, in this case, opinions and experience of leprosy preventive initiatives. By posing more open-ended questions and probing throughout the discussion with the study subjects, the paradigm enables the researcher to delve deeper into understanding the meaning attached to particular types of experiences (Creswell & Creswell 2018:46).

1.5.2 Conceptual framework

A theoretical framework is defined as the use of existing theories (theoretical) while a conceptual framework is defined as being derived from related concepts (conceptual). A conceptual framework is “based on the concepts constructed by the investigator aimed at encouraging the development of a theory” (Adom, Adu-Agyem & Hussein 2018:440).

In this study, the views of the participants and the issues gathered during data collection categories and themes to emerge, the researcher conceptualized them (a preconceived conceptual framework was not used) (Trolley, Ulin, Mack, Robinson & Succop 2016:145).

The study was qualitative, exploratory, descriptive, and contextual in style, in keeping with phenomenological design. To conduct in-depth interview observations with the goal of developing a conceptual meaning, the researcher had to go into the participants' actual environment—their natural habitat—where the occurrence of interest was occurring. At this early stage, the goal was to better understand the phenomenon (the difficulties in identifying leprosy cases among contacts of leprosy patients, the researcher spent time observing the lived experiences of health workers), not necessarily to make predictions. With the use of this interface, the researcher was able to investigate the phenomenon's prominent characteristics in-depth (Polit and Beck 2018:283).

With this design the interest was to learn more about the phenomenon within the context of the participants' own world. To understand the lived experiences of health professionals' challenges in early detection of leprosy cases among contacts of leprosy

patients, the researcher spent time with health professional informants at Bursa Woreda, Sidama Region conducting in-depth interviews in order to gather data. A phenomenological approach in the health sciences will ask: What is the essence of the experiences of being diagnosed, being sick, being a patient, being dependent, being hospitalized, recovering, or dying?(Polit and Beck 2018:95). These provide conceptualized them or frameworks that could be used by policymakers and health professionals to interventions relevant to the lived experiences of the participants and consequently maintain or improve the leprosy prevention and control program in Ethiopia.

In this phenomenological qualitative research, the development of strategies, as in this study, was the result of the conceptualisation of concepts after the data collection. Thus, from the qualitative study and identified themes that served to conceptualise the data, the conceptual framework was developed.

1.6 PURPOSE

The purpose of the study was to explore the bottlenecks in the early detection of leprosy cases in Bursa woreda, Sidama region, south Ethiopia as a basis for developing strategies to improve the early detection of leprosy cases among contacts of index patients in Bursa woreda, Sidama region, south Ethiopia.

1.7 OBJECTIVES

Four objectives were formulated.

- To explore and describe healthcare workers' understanding and experience during early leprosy case detection involvement in the Sidama region.
- To describe and critically analyse reasons for leprosy early detection challenges faced by health workers in the Sidama region.
- To assess the healthcare system's experiences in the provision of the early detection of leprosy cases in the Sidama region.
- To develop user-friendly strategies to enhance existing ones that would contribute to improving the early detection of leprosy cases in contacts of index patients in the Sidama region.

1.8 RESEARCH QUESTIONS

Incisive questions were required to establish the early detection challenges in identifying leprosy in the contacts of index cases in the Sidama zone in south Ethiopia. A question that the health workers were asked was as follows: What are the challenges you face in the early detection of leprosy? All follow-up questions were dependent on, but not limited to, the participants' responses and how they addressed the study objectives.

1.9 METHODOLOGY

1.9.1 Research paradigm

A research paradigm refers to the perspectives or worldview through which an investigator understands the world; it is a school of thought, the supposition of a worldview. Paradigms are lenses through which the world is seen or viewed, a type of window frame through which the complexities of the real worldview can be observed (Creamer 2018:94; Creswell & Plano Clark 2018:66). A worldview is defined as a

perspective that is firmly held or, more broadly, a viewpoint of the world that informs both inquiry and activity (Polit & Beck 2018:39, Rossman & Rallis 2017:88).

By posing various questions and probing throughout the discussion with the study population, a paradigm or worldview allows the researcher to explain in detail and build a shared understanding of the interpretation that is given to particular types of events (Creswell & Creswell 2018:46). This acknowledges the value of subjectivity for researchers. In this study, a phenomenological research design which is qualitative, exploratory, descriptive and contextual paradigm was used to explore the barriers to early leprosy case detection as a basis for generating solutions to improve early leprosy case detection by improving the performance (knowledge and skills) of health workers in leprosy preventive control programmes.

1.9.2 Research design

1.9.2.1 Design in time and place

For the most part, research design offers lessons on how to use efficient data collecting methods without unwarranted resource use (Kothari & Garg 2019:30). When employing a phenomenological study approach, one can investigate the significance of actual lived experiences in real-world circumstances. Evaluating the study participants' knowledge and behaviour regarding the issue under investigation is crucial. It is crucial to understand the study participants' perspectives on the research phenomenon (Yin 2016:70).

A qualitative exploratory research method was used in this study. When there are few or no prior studies to which to refer or upon which to rely to anticipate an outcome, an exploratory study design is typically used (McIntosh-Scott, Mason, Mason-Whitehead & Coyle 2016:23; Polit & Beck 2017:463). It is used to thoroughly analyse the phenomenon and other elements.

Important to the research design is the setting. The research was conducted in Bursa woreda, Sidama region, south Ethiopia.

1.9.2.2 Population

All health workers (health centre Head chief executive officers (CEO), district health office TB/ Leprosy experts, Regional Health Bureau level TB/ Leprosy experts, health centre OPD Health workers, health centre TB/ Leprosy focal, Community health extension workers) in Bursa woreda, Sidama region, south Ethiopia.

1.9.2.3 Sampling

1.9.2.3.1 Sampling technique

Purposive sampling is an appropriate choice for this investigation. The approach of purposive sampling was used to choose participants for the study depending on their goals (Bazeley 2015:49). Participants were chosen based on their involvement in leprosy preventive and control activities at their places of employment.

1.9.2.3.2 Sample size

The sample size was determined based on data saturation.

1.9.2.3.4 Inclusion criteria

Inclusion criteria specify the characteristics that a prospective participant must have to be considered eligible for a study (Polit & Beck 2018:552). In this study the following inclusion criterion was set:

- All health workers who were likely to be sufficiently knowledgeable and have experience in leprosy case management and programmes.
- Health professionals who had training on leprosy.

1.9.2.3.5 Exclusion criteria

Exclusion criteria specify characteristics that a population does not have (Polit & Beck 2018:548). In this study, the following exclusion criteria were set:

- Health workers who were not sufficiently knowledgeable and who had not experienced leprosy case management and programmes.
- Health professionals who had not training on leprosy

1.10 DATA COLLECTION

1.10.1 Data management

Data management practices in qualitative research are typically reductionist; they reduce the volume of data so that it is easier to manage (Polit & Beck 2018:535). Gray, Grove and Sutherland (2017:406) claim that "(t)to learn more about the perspectives and

experiences of study participants, in-depth interviews are recommended over other techniques of data collecting. The response rate using this method is higher than using other data collection methods and it is also referred to as a flexible data gathering method".

Incisive unstructured interview questions were asked first to obtain the necessary data; the researcher asked one crucial question before investigating others in response to each study participant's answer. Data collection methods included field notes and voice recorders.

Interviews with participants were held in private locations to ensure confidentiality and privacy. The researcher employed codes rather than explicit identification to preserve participant confidentiality.

While managing the data, Bazeley's (2015:63) seven stages for handling qualitative databases were followed. The stages of data management are the following:

Accuracy: The researcher verifies the data consistency, quality and accuracy before starting the main analysis. Qualitative study data were collected from all health workers employed in LCPs in Bursa woreda, Sidama region, south Ethiopia.

Maintain copy: The researcher availed of different information storage backup systems for transcribed and other data. These were updated daily as data preparation and analysis proceeded. Filed notes were also kept as a data backup system.

Arrangement: Based on the date and time of their collection, the filed notes and voice-recorded data were placed in a well-ordered system and kept properly for future reference.

Organisation: For use in data analysis, the researcher organised the narrative content that was gathered into transcribed Word documents. To categorise various topics and sub-themes, the researcher gathered related concepts in one place. The information was organised by the researcher into topics and sub-themes that were important for addressing the research questions.

Labelling: The researcher correctly stored the voice-recorded interviews and field notes in a safe location that was only accessible to the researcher and supervisor for future use.

The participants were appropriately labelled so that the researcher could quickly recognise them while their responses were being recorded during the interviews.

Cataloguing: All interview documents in the computer file were kept in alphabetical order and protected by the researcher's personal password. From the first interview to the last, all field notes were kept chronologically in a secure place.

Missing data and safe storage: All whole voice-recorded information, important interview rough work for transcription, typed transcriptions and field notes were kept in a secure place. Only the researcher and supervisor are allowed access for future reference.

1.10.2 Explication of data

Most of the time, qualitative research data analysis starts during the initial data collection period (Marshall & Rossman 2016:208). Data collections and interpretations were applied at the same time by using ATLAS.ti 8 software.

The method of data analysis was first applied through appropriate listening to the voice recorders and watchfully checking the field notes that were taken during the data collection period. For the aim of presenting the findings of the study, the collected data were transcribed and divided into themes using an adaptation of Colaizzi's (1978) seven steps for analysing qualitative data, as mentioned in Bazeley (2015:63). The seven steps are the following:

Acquiring a sense of each transcript: Beginning with the first transcript, the researcher attentively read and reread each one to get a feel of the overall substance of the study. To avoid tainting the results, the researcher set aside any previous notions regarding the phenomenon under examination.

Extracting significant statements: From the data from each transcript, the researcher chose the significant statements that were prominent to the phenomenon under research. The researcher meticulously documented these statements on a separate sheet, noting the pages and line numbers of the statements.

Formulating meanings: The researcher then carefully crafted interpretations of the relevant statements. As each underlying interpretation reflected an in-depth explanation of the concepts, it was coded in a separate sub-theme. To retain the coherence of

descriptions, the researcher then critically compared the formulated interpretation with the original meanings.

Theme clusters: In this step, the researcher combined all of the formulated interpretations into sub-themes, each of which exhibited a distinct trait of the cluster of themes. Then, all developed meanings associated with each theme cluster were coded to include that cluster of meanings. The aggregates of theme clusters that illustrate a specific angle on an issue were then blended to create various kinds of themes.

Exhaustive description: An exhaustive explanation of the phenomena was created using all the findings of the study. The concerns that were resolved were also described. A thorough account of the phenomenon included all the emerging themes. The whole structure of the phenomenon of leprosy prevention and control was extracted after unifying all of the themes of the study.

Statement of identification: The primary structural components of the phenomenon were thoroughly explained in this step. The researcher's results were scrutinised to see if they were redundant, misrepresented or overused; if any were, they were removed from the general framework of the phenomenon.

Participant verification: The research participants eagerly anticipated member checking, in which the data analysis was sent back to participants for evaluation, validation and remarks to verify the study findings

1.11 RIGOUR IN QUALITATIVE RESEARCH

In a qualitative study, trustworthiness must be established. Five kinds of trustworthiness apply in a qualitative study.

1.11.1 Credibility

Credibility is the basis of any claim to judging the trustworthiness of qualitative research criteria. It demonstrates how confident and precise the findings of the qualitative study are when viewed from the perspectives of the participants of the study, the researcher and readers or evaluators (Creswell & Creswell 2018:274; Polit & Beck 2018:415). Credibility is the accurate interpretation of the real-world applications of the results (Fain 2015:249).

To increase the credibility of the qualitative study, the researcher applied different sources to conclude what constitutes the truth. Therefore, the researcher repeatedly interviewed participants until new data were not forthcoming.

1.11.2 Dependability

Dependability is another criterion for checking the trustworthiness of qualitative research. It demonstrates the reliability of information throughout time and environments, as well as the consistency of data over time and conditions (Brink, Van der Walt & Van Rensburg 2018:159; Polit & Beck 2018:416). Reliability can be evaluated by an outsider with no prior knowledge of the researcher or the study (Creswell & Poth 2018:342).

To enhance the dependability of this research, the researcher undertook an inquiry audit. The collected data were scrutinised against the available support data during this procedure. The research inquiry and the supporting documents were made available to an external auditor (supervisor) who carried out the audit.

1.11.3 Conformability

The capacity of data to be accurate, relevant or meaningfully consistent is known as conformability. Instead of reflecting the researcher's biases or preconceptions, the data were gathered to represent the participants' voices (Brink, Van der Walt & Van Rensburg 2018:159; Polit & Beck 2018:416). By allowing other researchers to see the audit trail before the trial began, the researcher was able to increase conformability. Before starting the trial, the researcher was required to make any necessary corrections that were discovered by the other researchers.

1.11.4 Transferability

The capability to apply the findings of the study to other people or circumstances is what transferability is. Instead of characterising observations in the particular context in which they occur, the researcher's initial objective was to define observations (Polit & Beck 2018:424).

To improve transferability, the researcher used thick description, which was rich and thorough in the explanations and discussion of the concepts under investigation. Through this, other researchers can relate to or use the results of this study in other similar research settings or contexts.

1.11.5 Authenticity

For authenticity, the researcher ensured that the information collected portrayed the true and genuine ideas, attitudes, life experiences and perceptions of the participants by spending quality time during data collection till theoretic saturation was reached, directing interviews towards problems identified and familiarising himself with the raw data collected as it was analysed (Polit & Beck 2018:416).

1.12 ETHICAL CONSIDERATIONS

Both the UNISA Ethical Review Committee and the Hawassa University Health Research Ethics Review Committee accepted this study. Permission was required from the Sidama Regional State Health Bureau and the Bursa Woreda Health Office. Subsequently, a similar discussion was held with the Bursa Health Centre Head. Informing study participants of their option to leave the trial without jeopardising their future was also important. To preserve the participants' privacy, data records were retained in a secure location.

1.13 SIGNIFICANCE

The findings of the study will inspire recommendations for enhancing health personnel's expertise in leprosy early detection. The findings will also suggest developing methods for early leprosy case detection among the contacts of index patients. Grade II impairment and deformity can be avoided with early identification. Early identification and intervention can stop the spread of the disease, reduce stigma, ensure recovery, produce a more productive workforce with a declining dependency ratio and maintain the nation's economic resources. Therefore, based on identified gaps, the suggested solutions can enhance the early detection of leprosy cases among contacts of index patients. The results of this study will provide broad background data to other researchers so that they can research a bigger target group.

1.14 SCOPE AND LIMITATIONS

This study focused on health workers in Bursa woreda, Sidama region, south Ethiopia only. This limited the findings from being generalised to the whole country. Another limitation was that the generalizability of the findings was hindered by the small sample used which was determined by saturation.

1.15 CONCLUSION

This chapter briefly introduced the study and described the problem statement, objectives, research questions, methodology, study design, data collection method, data analysis and data quality assurance. The following chapter presents the literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter explains the topic of research profoundly by providing information about the existing evidence-based scientific research on leprosy and the existing strategies for LCPs. A variety of previous literature related to research topics, methodologies and so on are evaluated. Emphasis is placed on the worldwide, national and local areas of the leprosy burden, leprosy prevention and control strategies, the success and limitation/challenges of the programmes for leprosy prevention and control and the major factors affecting LCPs.

2.2 DESCRIPTION OF THE LITERATURE REVIEW

A systematic, reproducible and clear method of identifying, assessing and synthesising the body of material already produced by all researchers, academics and healthcare professionals is known as a literature review (Booth, Papaioannov & Sutton 2016). A literature review is the logical presentation of written materials that make arguments based on a thorough knowledge of the state-of-the-art of a study topic. A strong thesis can thus be developed to respond to the research questions (Machi & McEvoy 2016:28).

Based on theoretical and empirical sources, the goal of a literature review is to construct an image of what is properly known and what is not properly known about a specific subject (Grove, Burns & Gray 2015:15). According to Leavy (2017:124), the literature review in qualitative research approaches gives valuable in-depth explanations of the meaning and meaning-making methods of people's subjective perception of experiences. It enables researchers to better comprehend study subjects and explore how people interpret the contexts of their own life as a whole.

A literature review is a summary of books, journal articles and other significant publications that describes the historical development and current state of knowledge connected to the subject of study (Creswell 2015:81). The first steps in the research journey were to identify the most pertinent works of literature. Documenting how the study contributes to the body of knowledge is the goal of the literature review.

The literature review informs researchers about research studies that have been undertaken and supports the researcher by outlining several models that are crucial to the emphasis of the study. Booth, Papaioannou and Sutton (2016:11) state that it shows whether the identified results are comparable with several different research studies and if any incompatibility in the results is valuable; by giving additional awareness and enlightenment any conflicts can be mitigated.

The strengths and shortcomings of a study are carefully evaluated in a research criticism. A good critique objectively identifies areas of adequacy and inadequacy. key critiquing questions that have broad applicability to qualitative studies. Following Polit and Beck's recommended checklist criteria, the researcher chooses a literature review (2017: 122).

Checklist of review criteria

1. Is the review thorough—does it include all of the major studies on the topic? Does it include recent research? Are studies from other related disciplines included, if appropriate?
2. Does the review rely on appropriate materials (e.g., mainly on primary source research articles)?
3. Is the review merely a summary of existing work, or does it critically appraise and compare key studies? Does the review identify important gaps in the literature?
4. Is the review well organized? Is the development of ideas clear?
5. Does the review use appropriate language, suggesting the tentativeness of prior findings? Is the review objective? Does the author paraphrase, or is there an over reliance on quotes from original sources?
6. If the review is part of a research report for a new study, does the review support the need for the study?
7. If it is a review designed to summarize evidence for clinical practice, does the review draw reasonable conclusions about practice implications?

The five components of literature reviews are the following:

- Sort out key terminologies that are related to the research study.
- Locate different types of databases that can be used as sources of literature for sorting a topic.
- Choose the literature that is interrelated to the study research problem.
- Arrange the selected literature by dividing it into broad sub-themes.
- Report the summaries of literature reviews that were applied in the study research.

2.2.1 Purpose of the literature review

Booth, Papaioannou and Sutton (2016:14) categorise the purpose of literature reviews as follows:

- To set each piece of work in the perspective of how it adds to the understanding of the subject being studied.
- To explain the connections between each work and the others being considered.
- To find novel interpretations and fill in any gaps in earlier research.
- To find and settle discrepancies among once seemingly incompatible studies.
- To determine what has already been addressed by other researchers to avoid needlessly duplicating their work.
- To serve as a guide for future research.
- To identify the author's unique contribution to the body of literature.

2.2.2 Approach of the literature review in this study

Leprosy, contact tracing, early detection, delay detection, G2D and strategy are the key terms used in this literature review. They were searched from the following sources:

- Known scientific journals articles that are peer-reviewed
- Recent academic edited books
- Professional associations' articles and journals
- Governmental website sources
- Computerised databases such as PubMed, EMBASE, Cochrane Library, PubMed Central (PMC), Research GATE, Scopus, Google Scholar and UpToDate

- Using websites such as:
 - A. <https://libguides.unisa.ac.za/Health-Studies>
 - B. <https://www.academia.edu/>
 - C. <https://ecu.au.libguides.com/>
 - D. <https://libguides.consortiumlibrary/>
 - E. [https:// www.sciencedirect.com/](https://www.sciencedirect.com/)
 - F. <https://link.springer.com/>

In this study, the researcher used key terms with “AND” and “OR” (Boolean operators), applied independently or in a combined manner, for searching for sources.

2.2.3 Steps applied in the literature review

Step One: Select important literature for the study

To disclose the experiences described the literature from all the sources with information pertinent to the topic under investigation was read repeatedly. The various sources – books, journals, theses, dissertations, reports and conference materials – were examined to find anything useful. Finding models that are pertinent to the topic and learning about how other research projects have been conducted helps the investigator (Creswell 2015:81; Creswell & Creswell 2018:70; Machi & McEvoy 2016:145).

Step Two: Arrange the selected articles in order of relevancy

The key concepts in a text are easily discernible by skimming. The question as to whether the work should be included or excluded from the study is the question that is asked while scanning for potential information to include in the study. What in this work is valuable if it is included (Machi & McEvoy 2016:155)? When there has been minimal prior research on the topic and research challenge, qualitative research is the most effective method for understanding concepts and phenomena.

Step Three: Read and analyse the chosen articles in-depth

Giving meaning to any meaningful phrases comes after they have been discovered. In this stage, the reviewer created meaning by compiling repetitive, comparable facts into the main themes.

Step Four: Evaluation of the papers under consideration

Requesting information on the literature's strengths and weaknesses and its significance in addressing the researcher's query is important. To form a comprehensive picture, the ideas that had been developed previously were compiled in a summary. The reviewer maintained constant touch with the sources to verify the material (Polit & Beck 2018:261). Through the use of themes, techniques that would improve health professionals' knowledge and expertise in leprosy early detection to help increase the rate of early detection were highlighted.

Step Five: Arranging the material

Based on topical and methodological considerations, the literature was organised (Creswell 2015:81).

Step Six: Knowledge gap identification

The completion of the literature evaluations with a synopsis of the key themes and an explanation of how the researcher's unique study adds to the literature and fills a thematic gap is the final step (Creswell & Creswell 2018:70).

2.2.4 Types of literature reviews

2.2.4.1 *Thematic review*

By organising the research study around the research issue, the researcher used a thematic review in this study. The published research on the subject was compiled via a thematic literature review.

2.2.4.2 *Methodological review*

A methodological review was also undertaken in this study. Generally, such a review provides information on the structure of the content and methodology of the articles. Once the articles are clear based on the content and methodologies related to the topic in the study, the researcher can evaluate and analyse the articles to identify the gaps in the

existing knowledge. These methods enable the researcher to understand all approaches in the articles that the authors used.

2.2.5 Organising the literature review

2.2.5.1 *Thematic review*

A review of the relevant literature was organised by the researcher. The published research on the subject was completed by literary thematic analyses. To better grasp the context of the study, the researcher chose a subjective review; it also gives the researcher resource quotes. Based on the topic covered, the researcher grouped the sources into topics.

2.2.5.2 *Methodology review*

A methodological review considers the procedures an author employs for conducting a study. Methodological articles give researchers enough data to assess the applicability of the approach and the viability of the particular research subject to be investigated (American Psychological Association 2020:29). The researcher conducted a systematic review in addition to a thematic review to analyse the methodological underpinnings of the paragraphs. The relationship between the research design, data collection, data analysis and the article's ethical concerns was confirmed by the researcher.

2.3 IDENTIFICATION OF THE LITERATURE RELEVANT TO THE STUDY

2.3.1 Literature mapping

A method for organising the works that will be part of the literature review is mapping – examining how each chosen piece contributes to the topic statement. Key terms and core concepts make up the topic statement. The descriptors on bibliographic entry cards are these concepts and words. According to Machi and McEvoy (2016), mapping enables the organisation of data collected into a pattern from which analysis can be derived. Creswell and Creswell (2018) state that mapping the literature makes it easier to organise

information from various researchers regarding the topic – in this study, the difficulties of early leprosy detection.

The information gathered from the scan must be visualised and skimmed to address the topic statement. A map is thus created during the literature search. After that, content is generated, and maps written to organise the information. The literature was mapped as per Machi and McEvoy's (2016:157) analysis:

- To develop core idea maps, central topics from literature searches were used as the basis. The data was mapped according to each theme.
- Compare the topic statement to the core maps to ensure the completeness of the information gathered by the scan and skim of the literature.
- Reorganise the data by the author to document theory knowledge and citations.
- Review the maps.

Machi and McEvoy (2016:158) separate mapping into two categories: mapping produced from keywords in research topics and mapping by the author to identify key subject matter specialists. Concept mapping is employed in this study as a well-established method of forming links between authors and their publications (Figure 2.1). The title of the study appears in the inner circle on the literature map; the literature searches are presented in each circle around it.

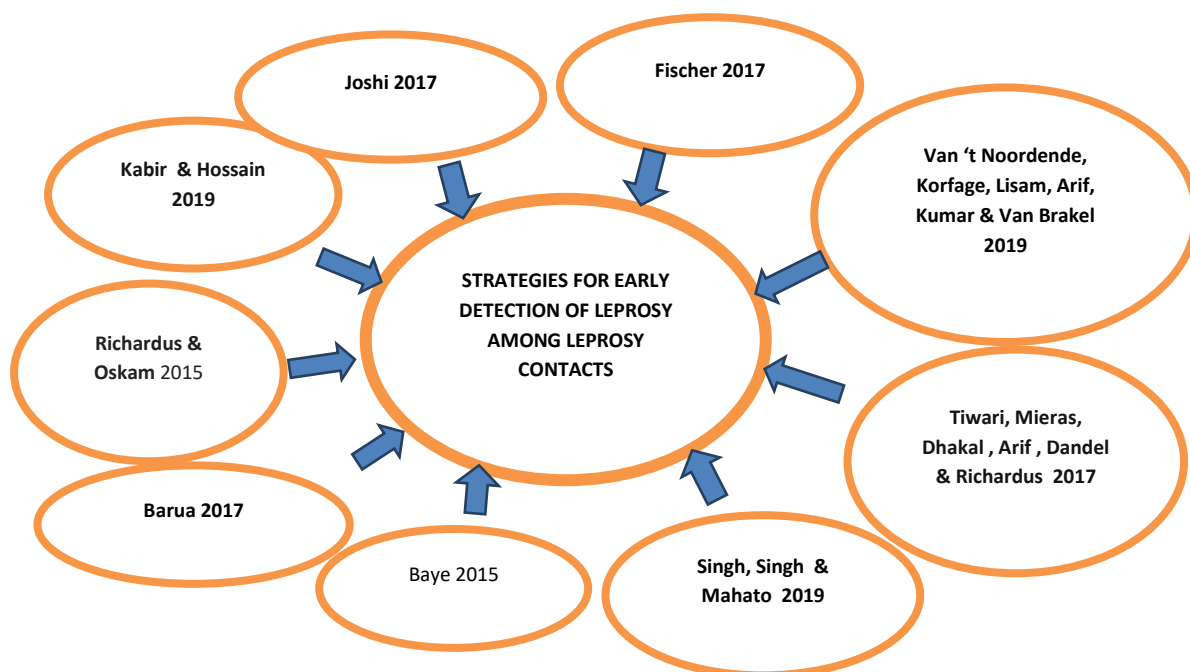


Figure 2.1 Literature search map

2.4 ARRANGING THE SELECTED ARTICLES IN ORDER OF RELEVANCY

2.4.1 What was the article about?

The researcher discovered that the paper had the data needed for the present investigation. The difficulties and methods for early leprosy detection are the information available for the current investigation. Are studies pointing out any factors that slow down the early identification of leprosy cases? What did the leprosy study hope to achieve?

2.4.2 Finding relevant article

2.4.2.1 Primary sources

Topics obtained 'first hand' from sources that are as close as feasible to the information or idea being investigated constitutes the main source. Finding new information about the most recent status of the study that has been published in journals was the goal of the primary sources. Worksheets, transcripts or other information from participants or eyewitnesses to the event in question are examples of primary sources. The most popular sources so far have been factual research reports that have been published in scholarly journals, theoretical articles, novels that have already been published, reviews of literary works, government regulations, factual reports and reports on professional procedures and standards (Galvan & Galvan 2017:3).

2.4.2.2 *Secondary sources*

Galvan and Galvan (2017:3) state that summaries of research in textbooks, popular magazines and newspapers, as well as on television and radio, are often secondary sources, providing only a few details on the method used to obtain results. In addition, secondary sources are often incomplete and sometimes erroneous, and their purpose is to attract the attention of ordinary readers rather than engaging in scholarly estimation and analysis.

2.4.2.3 *Verification of sources*

Original research reports from academic journals were used in this study. The primary sources are original since they are the first published research reports. Therefore, they are the primary source of information, detailing the method used in research and providing in-depth descriptions and discussions (Galvan & Galvan 2017:3).

To represent the journals, scientific reviewers choose for publication only the best scientific publications. Peer review is essential to an article's credibility in the scientific community. Since they have been through a more thorough review procedure, publications from academic, peer-reviewed and cited journals are more reliable than those from popular or for-profit journals. Additionally, they have a large number of citations (Rochitte & Mesquita 2018:107).

Academic/scholarly sources were identified by these points:

- Contain bibliographies or reference lists and sources cited
- Written for a specialised, academic audience
- Use terminology or jargon of the discipline
- Often lengthy articles
- Little or no advertising
- Only necessary graphics
- List of review board members (for the journal, not for each article)
- Author and review board credentials and affiliations are given.

The credibility of a journal may be assessed by examining several key factors such as the following:

- Where is it indexed?
- What is its publishing history?
- Is it peer-reviewed?
- What is its impact factor?

2.5 ELICITATION OF LITERATURE ARTICLES RELEVANT TO THE TOPIC

2.5.1 Literature articles relevant to leprosy

In the past, leprosy was a widespread illness in China, Egypt and India. The illness was first mentioned in writing around 600 BCE. Victims have frequently been cast aside by their families and communities throughout history. Leprosy is often referred to as Hansen's illness in medicine because, in 1873, Dr G.H. Armauer Hansen discovered that leprosy is primarily spread by coughing and sneezing. The majority of the time, it involves prolonged contact with an infectious but untreated person.

Leprosy's method of dissemination is still poorly understood by scientists. The sickness does not necessarily exist even when many people are exposed to germs. Leprosy is resistant in almost 95% of the world's population. MDT, which combines the three antibiotics rifampicin, clofazimine and dapsone, can treat leprosy. The course of treatment may last anywhere from six months to a year and occasionally longer. After roughly a week of MDT, people are no longer contagious (American Leprosy Missions 2021:1; Desikan & Pandya 2017:3; Neglected Tropical Disease NGO Network 2021:1; WHO 2018a:8).

Small red, black or pale skin spots may be the first indications. The patches may start to feel numb and get hairy. They frequently show up on the hands, feet or back. Numbness in the fingers or toes may occasionally be the only symptom. If untreated, numbness and paralysis of the tiny muscles in the hands might result, which can cause ringing in the fingers and thumb. Leg sensation cannot be communicated when leprosy affects the nerves in the legs. Unexpected wounds and infections can potentially harm the legs.

The inability to blink caused by facial nerve injury can result in dehydration, ulcers and blindness. The nose eventually falls off as a result of internal harm and scarring caused by bacteria that invade the nasal mucosa. Leprosy can result in disability, deformity and blindness if it is not treated (America Leprosy Mission 2021:1; Suneetha, Rao & Jain 2017:165). Delays in case findings are one of the factors contributing to leprosy patients' disabilities.

2.5.1.1 *Epidemiology of leprosy in a global context*

The first international study on the spread of the disease was published in 1966, even though the WHO's Leprosy Expert Committee first convened in Rio de Janeiro, Brazil, in 1953. Despite being fully aware that this number is likely understated, the WHO at the time believed there were 10,786,000 leprosy cases worldwide (Reibel , Cambau , & Aubry 2015 :384).

Leprosy is curable and the most effective treatment removes impairment. Since 1995, all patients have had free access to MDT, a straightforward but powerful treatment for all varieties of leprosy. Leprosy prevalence has dramatically decreased with the development of MDT, falling from 5.2 million cases in 1985 to 214,783 cases by the end of 2016 (WHO 2020a:427). It is still a significant issue for public health in many poor nations. The WHO defines the elimination of leprosy as having a prevalence of less than one person per 10,000 people. Elimination at the sub-national level remains a challenge, although this objective was accomplished globally in 2000 and the majority of countries in 2005 (Al Awaidy 2017:1; WHO 2020a:417).

More than 120 nations still experience leprosy, which is now classified as a neglected tropical disease (NTD). More than 200,000 new cases are reported each year. Additionally, compared to other viral diseases, it is more disabling. Leprosy isolation still prevents people from being accepted and treated unfairly. With 22.7 million people, there were 177,175 leprosy cases as of the end of 2019; 202,185 new cases or 25.9 new cases per million people were found worldwide.

The existence of G2D at the time of diagnosis suggests a subtly delayed diagnosis, possibly as a result of inadequate community care and comprehension of the early symptoms. In 2019, 10,813 new cases were reported with G2D globally. Five nations – India, the Philippines, Somalia, Sri Lanka and the Republic of Tanzania – have recorded fewer G2D instances in 2019 than in prior years, while Brazil, Ethiopia, Nepal, Nigeria

and South Sudan have reported more cases. The majority of nations have been gathering data on G2D about fresh children's difficulties. Around the world, 10,443 adults and 370 new G2D cases were recorded. Internationally, G2D patients made up 5.3% of all new cases in 2019 (WHO 2020a:417-426).

Leprosy prevalence had previously been estimated to affect 10,000 persons, new diagnoses occur in 100,000 population and G2D is prevalent in 1 million population. The 'million individuals' in this study should be used as the denominator for all rates, according to professional advice (millions of children in the case of the child leprosy rate). For the population-based rates and trends in rates for the past 5–10 years described in this report, the United Nations Department of Economic and Social Affairs' population data served as the basis (WHO 2020a:418).

Children's problems suggest a continuous distribution in the neighbourhood and will be attentively watched as a result. During 2019, 14,981 new cases (15 years) out of 202,185 cases (7.4%) were discovered in children. The screening rate for children was 7.8 per million by the end of 2019. By 2030, it is anticipated that this number will drop to 0.8 million children – as reported in *Ending the neglect to attain the sustainable development goals: A road map for neglected tropical diseases 2021-2030* (WHO 2020a:421; WHO 2020c:15).

The WHO has historically used the absolute number of new cases as a proxy for disease burden when classifying nations. The following indicators are used to calculate the coordinated results to inform the most recent Global Leprosy Strategy classification to provide a more precise assessment of the burden of leprosy at the national and regional levels: prevalence, case detection, case detection rate, percentage of children among newly diagnosed cases (a proxy for ongoing transmission) and percentage of G2D among newly diagnosed cases (a proxy for delayed case finding and, consequently, ongoing transmission).

2.5.1.2 *Leprosy in the African region*

Forty per cent of the worldwide burden of NTDs is carried by the WHO's Africa region. All 20 NTDs, except for Chagas disease, are widespread in the region. An extended special project started in 2016 and is in charge of five preventive chemotherapy NTDs. The Leprosy Programme is part of the Regional NTD Programme for Case Management (CM)

NTDs. Leprosy (21,744 instances) was one of the most prevalent CM-NTDs in the region in 2017 (WHO 2018b:12).

Africa accounts for 9 % of global leprosy prevalence and new case detection with a worrying number of new cases having significant disability at diagnosis. Public stigma has also contributed to the persistence of segregated settlements for leprosy sufferers, long after cure. The presentation of leprosy in sub-Saharan Africa is as elsewhere, varying between two polar states of tuberculoid and lepromatous leprosy and modified by complications including acute reactions (Quao & Amankrah-Otabir 2016:113).

Frequently focus on the top three leprosy-endemic nations in the world — India, Brazil, and Indonesia – but if Africa were a single country, it would be as important as Brazil and Indonesia. Many of the barriers to effective leprosy control are more visible in Africa due to its larger land size and worse infrastructure. (Saunderson 2022:179).

In the year 2020, 246 million people in Africa received treatment for NDT's, while 352 million people did not receive treatment. These diseases are most commonly found in tropical areas. Although most cases of NTDs are not fatal, these diseases can cause severe disfigurement and disabilities. Leprosy has all but been eliminated as a public health problem, with only the Comoros yet to achieve the elimination goal in one of its three islands(Trolli 2020)

Leprosy control activities are now suffering from reduced attention on both global and subregional scales, and the knowledge of front-line health care workers regarding leprosy is dwindling. With leprosy likely to remain with us for the foreseeable future, more research and political will are required to sustain the gains and possibly accelerate us to true elimination ((Quao & Amankrah-Otabir 2016:113).

2.5.1.3 *Epidemiology of leprosy in Ethiopia*

Since 1950, leprosy has been recognised as a public health issue in Ethiopia. Since then, the MoH has launched leprosy control initiatives with assistance from the German Leprosy and Relief Association (GLRA). Leprosy was declared to be no longer a public health concern in Ethiopia in 1999, however, it is still present in less than one in 10,000 people.

The middle and south-east highlands contain the four main areas (93 woredas) where the disease has so far spread: Oromia, Amhara, Sidama and SNNPR. In 2016, 3,076

new cases were reported. Of these 14% of new patients have G2D; 12% of them were youngsters, indicating ongoing diffusion in the community (AHRI 2017:20; Baye 2015:31; WHO 2017a:17).

According to the FDREMoH (2017a:24), in 2015–16, there were 3,200 new cases, of which 86.3% were MB, 11.7% were children under the age of 15 and 3.6% were impaired students in the second grade at the time of diagnosis. The high prevalence of MB leprosy and childhood malnutrition among newly diagnosed cases currently points to ongoing transmission.

The percentage of patients with Grade II leprosy (13.6%) was high at the time of diagnosis. Poor medical care, which might be postponed until the disease worsens and interferes with daily activities, is also to blame for this. Lack of understanding, traditional beliefs (such as that leprosy is impossible or hereditary, a punishment for having a 'poor family name', a 'curse of God', etc.) and fear of stigma are the main causes of the delay in diagnosis. Early diagnosis is also hampered by problems with the health system, such as skipped testing (particularly in private settings), incomplete referrals and poverty (i.e., inadequate transportation and patient costs). Leprosy is becoming more common in the community, but prevention and control efforts are not being given the attention they need at all levels of government. To guarantee prompt diagnosis and leprosy treatment, this disease necessitates focused efforts, including addressing stigma and low awareness.

In Ethiopia, between 3,000 and 4,000 new cases are reported each year; throughout the past 20 years, there has been no decrease in this number. Leprosy frequency was 19.8 per 10,000 people in 1983 and was at 0.3 in 2016. Since the implementation of MDT, 126,592 new cases have been reported and 149,592 patients have received treatment, according to the national programme. Over the previous ten years, new leprosy cases have consistently been reported (FDREMoH 2017b:22).

People do not choose to sit next to those who have leprosy on public transit because of the negative attitude the community has about the condition. The injured are not given a dish of food to share. For fear of being shunned in their home village, leprosy patients relocate to faraway villages to finish their schooling. Leprosy-afflicted family members are not chosen for marriage and comparable unfavourable views are seen in the workplace.

In Ethiopia, fear of physical deformity and infirmity is a well-known source of stigma. There is a widespread misconception that the illness is incurable. As a result, the neighborhood

remains isolated. Fetha Nagast (Ethiopia Old law), a customary code passed down from the king's reign, presents a humane perspective on the incapacitating illness. Fetha Nagast (Ethiopia Old law), also permits the divorce of a leprosy woman from a healthy husband by offering her a dress or money. There are other rules in the nation, such as the prohibition on leprosy patients serving as priests. Similarly, having leprosy prevents one from serving as a judge since it may scare off many potential witnesses even if proclamation 568/2007, addressing the right to employment for people with disabilities, is still in effect, it was issued by the Ethiopian government(WHO 2017a:17).

The TB control programme collaborates with the leprosy programme. The right to hire people with impairments is protected by the Ethiopian government proclamation 568/2007 (WHO 2017a:17). In Ethiopia, NTDs are a significant public health issue. After Nigeria and the Democratic Republic of the Congo, Ethiopia has the greatest number of NTDs. Leprosy and other NTDs are predicted to have the greatest impact in Ethiopia (Amenu, Getachew, Bekele, Defar, Tadesse, Teklie, Gelibo, Assefa & Kebede 2017:379).

If more accurate diagnostic methods are employed, the real rate of leprosy may be greater than the existing average (0.7 per 10,000 persons), except for the prevalence of leprosy that is currently being treated. Additionally, research from Bangladesh, Indonesia, home-based studies and India demonstrates that the prevalence of leprosy is 2.5 to 9 times higher than that reported (Baye 2015:40).

A high prevalence of disability is present in more than half of the people with the same condition. Leprosy cases that have just been reported are also important. G2D exceeds the permitted percentage by a wide margin (less than 10%). This suggests that steps must be taken to find cases quickly to stop disabilities. The study found that neurological and sensory impairment, persistent discomfort and delayed diagnosis are risk factors. As a result, it is critical to assess the diagnostic system and case investigation methodology immediately. Additionally, it is critical to first evaluate the diagnostic suspicion of first-line peripheral healthcare providers and to educate them about the symptoms and signs of leprosy among healthcare providers in the area and the general public (Shumet, Demissie & Bekele 2015:319).

Children with leprosy are invisible and many instances go unreported. The alarming data on childhood leprosy-related abnormalities show that the healthcare system is unable to control leprosy and safeguard children from the illness (WHO 2020a:426).

In 2014, 3,758 new cases with 482 children and 384 patients having G2Ds were recorded and the incidences of new cases or more than ten years, leprosy in Ethiopia has been consistent year after year (AHRI 2017:20). In 2015, 3,970 new cases of leprosy in total were reported in Ethiopia (with 85% MB). Children and women made up 14.2% and 31%, respectively, of new leprosy patients. Over the same reporting period, 10.6% of newly diagnosed leprosy patients had Grade II impairment. The research claims that child health issues are still prevalent in Ethiopia. The number of newly reported instances is significant since it shows whether an infection is present in the neighbourhood. In terms of treatment completion, MB had an 86% rate while PB had a 71% rate (FDREMoH 2017a:2, 2018:133).

Real leprosy among individuals under the age of 15 has been recognised as the country's highest incidence of paediatric leprosy. Ethiopia has not been able to demonstrate appreciable drops in proportion to leprosy control markers, except for medical success. For instance, the nation will not be able to meet its aim of lowering the number of disabled people any time soon. Large numbers of individuals will continue to live with disabilities in the nation as long as specialised disability prevention therapies, such as early intervention programmes, are not created (Baye 2015:40-41).

The distribution as shown in the study, which is 59.6%, indicates a delay in diagnosis compared to the national aim of less than 1% for G2D by 2020 and the substantial load of leprosy among patients after treatment is finished demonstrates that there is still a lack of care. Many individuals experience a variety of neurological and vision issues, including vision loss and neuropathic ulcers (Abdela, Diro, Zewdu, Berhe, Yeshaneh, Tamirat, Tweya, Timire & Van Griensven 2020:14).

The incidence of leprosy has been progressively dropping in Ethiopia since treatment began but, despite this, it continues to be difficult for the country's health system and the local population to effectively control and prevent leprosy. Ethiopia has not received enough attention or thorough research (Sori 2019:2). One of the main factors in avoiding and controlling leprosy and its complications is to raise patient and community knowledge of the disease.

An efficient leprosy control programme and the prevention of disabilities and disabilities depend on providers having a thorough understanding of leprosy kinds, symptoms, treatment options, issue management and drug use (Kabir & Hossain 2019:6). In many different ways, healthcare professionals can support disadvantaged individuals and those

with leprosy to lead normal lives. According to a study conducted in Ethiopia, health professionals' knowledge, attitude and diagnosis of leprosy scores were 86.36%, 10.1% and 18%, respectively. This study demonstrates how little most medical professionals understand about leprosy, the leprosy reaction (LR) and how to treat its symptoms. Many people were unable to examine their muscles and senses. This could be a factor in Ethiopia's relatively high rate of G2Ds (14%) (Abeje et al 2016:122).

Acute immune reactions, a leading cause of nerve damage and disability, frequently worsen leprosy. Leprosy and associated immunological reactions require early detection, diagnosis and treatment if permanent nerve and ocular damage is to be avoided. Leprosy must be diagnosed and treated as soon as possible to not only stop the spread of the disease but also to lessen its negative social and physical effects. Despite being one of the oldest diseases, leprosy is still identified in about 200,000 new cases each year worldwide (Government of West Australia 2019:9; WHO 2018c:445).

Sadly, leprosy continues to carry a stigma that results in delayed diagnosis, treatment and disability due to deformity and stigma. Early-stage leprosy patients are typically doubtful of the diagnosis, but they may be reluctant to seek counselling and medical assistance out of fear of being rejected by their community (Franco-Paredes & Rodriguez-Morales 2016:1-2; Singh, Singh & Mahato 2019:3).

Among HHCs, the incidence of leprosy was 364 per 100,000 PY (person-year) (53/14553 PY), which is higher than the 0.28 PY per 100,000 population PY averaged throughout the Yunnan, Guizhou, Sichuan and Hunan provinces. During this follow-up period, these data show that HHCs have a 1,300-fold greater incidence of leprosy than the general population (Le, Haiqin, Danfeng, Ying, Wenyue, Jun, Li, Tiejun, Limei, Jie, De, Yong, Yangying, Hao, Yanfei, Bin, Maeda, Duthie, Meiwen, Hpongsheng, Liangbin, Guocheng, Baoxi & Heng 2018:10).

To facilitate drug therapy, anticipate leprosy response and ensure social support, case management is a crucial component of treatment. Leprosy can be prevented by identifying and keeping track of links, which helps with the early diagnosis of secondary cases and provides access to chemoprophylaxis when necessary (Government of West Australia 2019:9).

Participants who consulted a traditional healer and those who feared social isolation were the two main causes of patient delays. Everyone has a tenfold probability of experiencing

it before seeking medical attention. They are a very small portion of the participants, nevertheless. Since they did not believe their symptoms were serious, many more participants were delayed. When compared to those who believe their symptoms are severe, these are three times more likely to wait before seeking medical attention. In Brazil, 12.5% of participants claimed to have leprosy that was not actually theirs (Henry, GalAn, Teasdale, Prado, Amar, Rays, Roberts, Siqueira, De Wildt, Virmond & Das 2016:9).

MB leprosy, patient over three months delay, HCP delays of more than one-month, daily labourer and people at the age of > 60 are the main causes of disability among adult leprosy patients with G2D/G1D. Among people with disabilities, the median total delay was 14 months. More than three-month patient delays should be viewed as a sign of subpar information, education and communication (IEC) entrance into the community (Srinivas, Muthuvel, Lal, Vaikundanathan, Schwienhorst-Stich & Kasang 2019:10).

There may be detrimental physical, psychological, economic and social effects from delayed diagnosis and treatment. As damage, persecution and even the intentional killing of victims go hand in hand with sadness, hashish and apathy, the social reaction to leprosy patients and their families is a significant cause for concern. Stigma, which harms the dignity and conduct of those who have leprosy, results from this (Sori 2019:4).

Leprosy stigma exists on three different levels: among patients (self-perceived stigma), among family and throughout society. Many leprosy patients experience isolation which has an impact on their daily lives, including their activities, relationships, marriage, jobs, pastimes and social and religious pursuits. Leprosy will be challenging to eradicate as a public health issue and the incidence of the disease may rise if the stigma associated with it does not diminish (Sardana & Khurana 2020:1; Tosepu, Gunawan, Effendy & Fadmi 2018:30).

The report on the Global Leprosy Strategy 2021–2030 from the regular meeting with international leprosy programme managers, partners and affected people from 26 to 30 October 2020 indicated that, using a population-centred paradigm, Ethiopia conducted an external end-term tuberculosis/leprosy programme evaluation and stakeholders' analysis (WHO 2020b:5). The following difficulties and gaps were found:

- Stagnation in the number of leprosy patients over the past two decades.

- Since 2013, the gap between new issues and childhood leprosy in G2D has been increasing.
- Lack of adequate financial support for leprosy services.
- CVD-19 is having a negative impact on leprosy control.
- Poor health-seeking behaviour.
- Poor contact-tracing activity and lack of prophylaxis.
- Inadequate capacity of healthcare providers to diagnose, manage and follow up leprosy and its complications.
- Poor documentation on leprosy cases, disabilities due to leprosy and contact tracing in the routine health information system.
- High rate of retreatment cases due to treatment interruptions and misclassification or misdiagnosis.

2.5.2 Literature articles relevant to the transmission of leprosy

2.5.2.1 *Articles relevant to transmission to people in general*

Leprosy is among the oldest diseases that humans have ever encountered. Unfortunately, no reliable vaccine has yet been discovered to prevent clinical leprosy and knowledge of the disease's mode(s) of transmission, the immune response, nerve damage and responses are still incomplete. A pathogen that can only be grown in vivo in experimental animals, *M. leprae* is an obligate intracellular pathogen that has never been grown in a lab setting. Although it is likely considerably more complicated than previously thought, it is generally accepted that *M. leprae* spreads from person to person through respiratory droplets, which are then followed by the emergence of a localised primary lesion that resembles tuberculosis.

Transcutaneous transmission, on the other hand, is considered to be a potential route of infection after direct skin contact with untreated, ulcerated, multibacillary lepromatous nodules. The studies that were included were categorised by the method of transmission, which included (i) human-to-human aerosol or direct contact; (ii) direct inoculation (such as an injury); and (iii) transmission to humans from environmental or zoonotic reservoirs,

as well as by insects (Bratschi, Steinmann, Wickenden & Gillis 2015:144; Fischer 2017:804; Ploemacher, Faber, Menke, Rutten & Pieters 2020:20).

It is believed that several risk factors for *M. leprae* transmission have been established at this point, including close contact with an infected person who has a high bacterial burden. Lepromatous leprosy patients are thought to be the most contagious in this situation. A person is deemed a contact if they spend more than 20 hours per week close to an index leprosy patient. Depending on the degree and length of contact, being a contact with a leprosy patient raises your risk of getting the illness. Only 5% to 20% of contacts of an untreated case may exhibit clinical leprosy symptoms. The patient's genetically determined immune state in response to the virus determines the course of the disease (Bratschi et al 2015:144; Fischer 2017:804).

According to recent research, household members of leprosy patients are at significant risk of contracting the disease when *M. leprae* is present. HHCs are more likely to develop leprosy due to a combination of greater exposure to infected patients. Greater exposure risk exists for residents of areas where leprosy is endemic. PB contacts are 2–3 times more likely than the general population to contract the illness, whereas MB interactions are 5–10 times more likely. As a result, contact tracing not only leads to the discovery of additional cases but also has several unintended benefits, including early diagnosis and a lower risk of transmission (Pedrosa, Dias, Galban, Leturiondo, Palheta, Santos, Moraes & Talhari 2018:2).

Using PubMed and Scopus as sources, a comprehensive review of leprosy transmission study data was conducted. Publications were between January 1, 1945, and July 1, 2019. Uncertainty exists over the *M. leprae* transmission routes. There is strong evidence that those who live close to leprosy patients run a higher risk of contracting the disease, most likely through the inhalation of infectious aerosols from coughing and sneezing but also possibly through direct contact. Yet, this systematic study emphasises that there are other ways outside human-to-human transmission to get leprosy (Ploemacher et al 2020:17-20).

Leprosy's latent or variable incubation time is exceptionally long. It could be a few weeks or possibly 20 years. However, it is believed that the disease takes 5–7 years on average to incubate. A PB leprosy patient might have a shorter incubation period. Leprosy transmission is not well known since it is difficult to pinpoint when and how the disease was acquired due to the lengthy incubation period (Joshi 2017:40).

2.5.2.2 *Articles relevant to transmission to healthcare workers in particular*

Healthcare professionals can assist leprosy victims and susceptible individuals in many ways to help them lead normal lives. Patients with untreated MB infections are likely the main conduits for the spread of *M. leprae*. It is believed that several risk factors for *M. leprae* transmission have been established at this point, including close contact with an infected person who has a high bacterial burden. Lepromatous leprosy patients are thought to be the most contagious in this situation. The unique immunocompetence of an infected person, in addition to exposure, influences whether clinical illness will progress after transmission. Chemoprophylaxis with a single dose of rifampicin (SDR) administered to contacts of leprosy patients is one strategy that may help manage the disease. SDR is successful in lowering the risk of leprosy among contacts, according to numerous studies.

Leprosy patients must follow treatment instructions. Injury avoidance is a top objective. The occupational health nurse should look for ulcers on the hands and feet. Since these patients might not feel pain, they should be advised to prevent accidents and report any injuries or accidents to the occupational health centre. Peripheral neuropathy puts these workers in danger of falling for the damage to their peripheral nervous system is irreversible.

Consultations in occupational and physical therapy may be required. Occupational therapists can deal with equipment for eating and bathing as well as grip strength. Gait and balance training may be discussed with physical therapists. An infectious disease specialist, as well as an ophthalmologist for eye care, must monitor the personnel involved. For peripheral neuropathy, pain treatment may be required (Lurati 2017:286).

2.5.3 *Literature articles relevant to leprosy control strategies*

Leprosy control relies on treating the patient, a potential source of infection, to break the chain of transmission. This secondary preventive strategy calls for the identification and treatment of all cases in the community. The key component of leprosy control, which is determined by the number or rate of new leprosy cases with apparent deformities or G2Ds, is the early detection of patients before nerve impairment sets in G2D cases. The degree of community awareness and an individual's receptiveness to sickness determine how quickly someone reports for consultation, diagnosis or treatment.

The WHO recommends MDT for the early detection and timely treatment of all new cases of leprosy to avoid nerve damage and disability. Additionally, an early diagnosis offers chances to slow or stop further transmission. Despite this, numerous recent reports from throughout the globe demonstrate that leprosy is still frequently detected in people too late (Srinivas et al 2019:2).

The cornerstone of leprosy control remains breaking the transmission cycle. Therefore, the most important aspect of the effectiveness of leprosy control in the diagnosis of all cases in the community and the treatment of patients with MDT is before the infection spreads to the healthy. One of the WHO's main responsibilities is to provide technical assistance and since the 1950s, WHO has led debates, research and consultations to define leprosy control plans globally and assisted the creation of strategies for various country programmes. The development of international leprosy strategies shows how pertinent technical advances have adjusted to the epidemiology of the disease. Before the development of dapsonе in the early 1950s, leprosy control relied on patient isolation to restrict the infection.

Dapsonе monotherapy has improved disease control for more than 30 years, giving many patients who need treatment hope. Early in the 1980s, MDT was introduced as a result of the identification of dapsonе resistance. In addition to being strong, MDT has significantly shortened the length of treatment and has significantly decreased prevalence. A resolution to eradicate leprosy as a public health issue by the year 2000 was adopted by the 44th World Health Assembly (WHA) in May 1991 in recognition of the success of leprosy programmes around the world with less than one case per 10,000 persons has been established as the threshold for the elimination of leprosy as a public health issue (Barua 2017:51).

A health worker's sufficient understanding of and practical training in leprosy are crucial to the success of any programme for the treatment and control of leprosy within the framework of general healthcare services at the primary healthcare level. Late leprosy detection is linked to misdiagnosis, insufficient or erroneous awareness of the condition, as well as unfavourable attitudes toward the disease among those who are affected and medical professionals. To improve techniques for early case detection in leprosy, it appears necessary to improve understanding and perception of the disease and reduce stigma (Van 't Noordende, Korfage, Lisam, Arif, Kumar & Van Brakel 2019:12-13).

According to WHO's (2016a) strategic plan to control leprosy, the Global Leprosy Strategy 2016–2020 focused on the following:

1. Strengthen government ownership, coordination and partnership
 - Ensuring political commitment and adequate resources for leprosy programmes.
 - Contributing to universal health coverage with a special focus on children, women and underserved populations including migrants and displaced people.
 - Promoting partnerships with state and non-state actors and promoting intersectoral collaboration and partnerships at the international level and within countries.
 - Facilitating and conducting basic and operational research in all aspects of leprosy and maximising the evidence base to inform policies, strategies and activities.
 - Strengthening surveillance and health information systems for programme monitoring and evaluation (including geographical information systems).
2. Stop leprosy and its complications
 - Strengthening patient and community awareness of leprosy.
 - Promoting early case detection through active case finding (e.g., campaigns) in areas of higher endemicity and contact management.
 - Ensuring prompt start and adherence to treatment, including working towards improved treatment regimens.
 - Improving prevention and management of disabilities.
 - Strengthening surveillance for antimicrobial resistance including laboratory network.
 - Promoting innovative approaches for training, referrals and sustaining expertise in leprosy such as eHealth.

- Promoting interventions for the prevention of infection and disease.
3. Stop discrimination and promote inclusion
- Promoting societal inclusion through addressing all forms of discrimination and stigma.
 - Empowering persons affected by leprosy and strengthening their capacity to participate actively in leprosy services.
 - Involving communities in actions for improvement of leprosy services.
 - Promoting coalition-building among persons affected by leprosy and encouraging the integration of these coalitions and or their members with other community-based organisations.
 - Promoting access to social and financial support services, e.g. to facilitate income generation for persons affected by leprosy and their families.
 - Supporting community-based rehabilitation for people with leprosy-related disabilities.
 - Working towards abolishing discriminatory laws and promoting policies facilitating inclusion.

Data were analysed to see how well the aims were being met internationally and domestically since 2019 was the penultimate year of the strategy period (WHO 2020a:426). There were 370 new child instances of G2D discovered globally, which corresponds to "zero G2D cases among new child cases". Seventy-five per cent of new child cases of G2D (277) were found in five countries – Brazil, the Democratic Republic of the Congo, Ethiopia, India and Indonesia. Of the 123 nations that reported on G2D cases among children, 96 (78%) had attained the target. The goal is to reduce the global new G2D case rate to one case per million people by the end of 2020. The rate of new G2D case detection at the end of 2019 was 1.36 per million people.

Despite having less of an influence on the number of new cases, MDT has decreased the number of cases receiving treatment. The WHO guidelines for the diagnosis, treatment and prevention of leprosy recommend interventions such as post-exposure prophylaxis

(PEP) with SDR, in addition to strengthened case detection and efficient contact tracing, to address the too slow decline in the number of new cases in all countries.

The *Ending the neglect to attain the sustainable development goals - A road map for neglected tropical diseases 2021–2030* document informs the draft Global Leprosy Strategy for the years 2021 through 2030 (WHO 2020a). Leprosy eradication by 2030 is the aim, with the following objectives: 120 nations will have no autochthonous cases, around 63,000 fewer new cases will be reported, 0.12 new instances of G2D will be reported for every million people and 0.77 new cases of G2D will be reported for every million children.

In accordance with the NTD road map 2030, the WHO assists nations in developing national strategic plans to achieve the goals of the Global Leprosy Strategy 2021–2030. The WHO recommends that national programmes begin PEP using SDR so that the curve for new case identification can be promptly bent, even though achieving these targets may be challenging with the available case detection and treatment capabilities (WHO 2020a:428). Table 2.1 lists the articles and the journals relevant to leprosy.

Table 2.1 Literature articles relevant to leprosy

ARTICLE	JOURNAL
<ul style="list-style-type: none"> Review on the burden of leprosy in Ethiopia 	<ul style="list-style-type: none"> <i>Journal of Tropical Diseases</i> 2019, 7(2). https://doi.org/10.4172/2329-891X.1000297
<ul style="list-style-type: none"> Factors contributing to the delay in diagnosis and continued transmission of leprosy in Brazil – An explorative, quantitative, questionnaire-based study 	<ul style="list-style-type: none"> <i>PLoS Neglected Tropical Diseases</i> 2016 10(3): e0004542. https://doi.org/10.1371/journal.pntd.0004542

ARTICLE	JOURNAL
<ul style="list-style-type: none"> • Factors associated with the delay of diagnosis of leprosy in north-eastern Colombia: A quantitative analysis 	<ul style="list-style-type: none"> • <i>Tropical Medicine and International Health</i> 2018, 23(2):193-198.
<ul style="list-style-type: none"> • Predicting the impact of household contact and mass chemoprophylaxis on future new leprosy cases in South Tarawa, Kiribati: A modelling study 	<ul style="list-style-type: none"> • <i>PLoS Neglected Tropical Diseases</i> 2019 13(9):e0007646. https://doi.org/10.1371/journal.pntd.0007646
<ul style="list-style-type: none"> • Trends of the leprosy control indicators in Benin from 2006 to 2018 	<ul style="list-style-type: none"> • <i>BMC Public Health</i> 2020 10:1254. https://doi.org/10.1186/s12889-020-09341-w
<ul style="list-style-type: none"> • Socio-economic determinants of leprosy new case detection in the 100 million Brazilian cohorts: A population-based linkage study 	<ul style="list-style-type: none"> • <i>Lancet Global Health</i> 2019, 7:e1226–36.
<ul style="list-style-type: none"> • Assessment of knowledge and attitude of community on leprosy patients in Kuyera Town, West Arsi Zone, Oromia Region Southeast Ethiopia 	<ul style="list-style-type: none"> • <i>Hereditary Genetics</i> 2015, 5:1. https://doi.org/10.4172/2161-1041.1000156
<ul style="list-style-type: none"> • Performance of general health workers in leprosy control activities at public health facilities in Amhara and Oromia States, Ethiopia 	<ul style="list-style-type: none"> • <i>BMC Health Services Research</i> 2016 16:122. https://doi.org/10.1186/s12913-016-1329-2

Ethiopia's leprosy control strategy

A primary healthcare unit (a network of a health centre and five health posts), primary hospitals and specialised referral hospitals make up the three levels of the Ethiopian national health system. Health posts provide family-level preventive and promotion services, family planning services, prenatal care and community-based treatment for HIV, TB, malaria and other illnesses. Suspected leprosy patients are sent to health centres by health posts. Health centres are the primary medical facility for starting MDT and providing follow-up care for leprosy patients (FDREMoH 2015a:102).

According to the FDREMoH (2017a:44), Ethiopia implements efforts and actions for leprosy control and prevention strategies. The main premise of leprosy control is based on the timely detection of new cases and the provision of appropriate chemotherapy with MDT. The primary objectives of Ethiopia's leprosy control programme are to further reduce disease load and mitigate its effects.

Strategic targets:

- Decreasing leprosy prevalence rate from 0.3/10,000 to < 0.1/10,000 population by 2020/21.
- Reduce the proportion of new leprosy cases with disability Grade II from 13.6% to < 1% by 2020/21.
- Increase leprosy treatment completion rate from 86.5% to 95% by 2020/21.

Initiative 1: Improve programmatic management and coordination of leprosy control**Major activities:**

- Assignment of national leprosy control focal person.
- Develop and launch a national road map for the final phase of leprosy elimination.
- Sensitisation of programme managers on the national road map for leprosy elimination.
- Leprosy epidemiologic and service mapping.

Initiative 2: Improve community demand for quality leprosy services**Major activities:**

- Prepare and communicate leprosy-specific messages using different channels.
- Prepare and disseminate leprosy patient information kits.
- Produce and disseminate video material demonstrating leprosy case finding and management for health facilities in high-burden areas.
- Provide leprosy-specific orientations for health extension workers (HEWs) from leprosy hot-spot areas.
- Commemorate World Leprosy Day.

- Engage chief strategy officers (CSOs) and local anti-leprosy associations in leprosy care and treatment.
- Awareness creation campaigns in high leprosy burden woredas.
- School community awareness on leprosy using school mini media in high-burden settings.

Initiative 3: Expand and improve access to quality leprosy services

Major activities:

- Expand patient referral care hospitals and referral systems in hot-spot areas.
- Strengthen leprosy physical rehabilitation centres.
- Identify and establish a sub-referral centre at each leprosy high burden woreda.
- Provide in-service training for health workers from referral and sub-referral health facilities.
- Orientation for primary school teachers on leprosy screening.

Initiative 4: Provide client-centred integrated TB services.

Major activities:

- Develop, print and distribute packages of leprosy programmatic materials and care provider tools.
- Implement universal screening of all HHCs of leprosy cases.
- Implement annual screening of HHCs of released from treatment (RFT) cases.
- Produce and disseminate audio-visual material on leprosy case finding and management for health facilities in high-burden/hot-spot areas.
- Strengthen routine household contact screening for all index leprosy cases, including investigation of 'incident' contacts of a child with leprosy.

- Implement school-based child screening for leprosy in a hot-spot area.
- Involve HEWs and the health development army (HDA) in the identification and referral of presumptive leprosy cases.
- Community-based screening in hot-spot areas.

Initiative 5: Improve human resource development on leprosy
Major activities:

- Update leprosy training materials and in-service basic leprosy training for general health workers.
- In-service training for health workers from referral and sub-referral health facilities.
- Training lab professionals on skin AFBs.
- Expansion of leprosy training in (leprosy) referral centre.

Initiative 6: Improve financial and resource mobilisation
Major activities:

- Advocacy of higher officials to give attention to leprosy service.
- Budget allocation by the regional and central government.
- Encourage and support the involvement of partners (internal and external).

Initiative 7: Improve physical and socio-economic rehabilitation and stigma reduction for persons affected by leprosy

Major activities:

- Expand physical rehabilitation centres in hot-spot areas for leprosy patients with disability.
- Support income generating activities (IGAs) for eligible leprosy-affected individuals.
- Procurement and supply of physical rehabilitation leprosy services.
- Strengthen prevention of disability from leprosy.

Initiative 8: Strengthen leprosy pharmaceuticals and other supply distribution systems

Major activities:

- Design and implement an effective distribution system for leprosy drugs and supplies.
- Conduct annual leprosy pharmaceuticals and supplies quantification.
- Procure an adequate supply of anti-leprosy medicines.

Initiative 9: Improve leprosy data flow through health management information systems (HMISs) implementation

Major activities:

- Print and distribute packages of leprosy recording and reporting tools, including household contact registers.
- Strengthen monitoring leprosy control implementation at health facilities.
- Establish an active surveillance system.
- Conduct leprosy review meetings in hot-spot zones and midterm review of leprosy strategic plan.
- Incorporate leprosy contact screening indicator in updated HMIS.
- Monitor annual analysis of district-level leprosy burden through HMIS data.
- Translate research conducted by Armauer Hansen Research Institute (AHRI).

2.5.3.1 ***Expanding care, strengthening prevention and intensifying research***

A key objective of treatment and care is to avoid lasting nerve injury and disability. If leprosy is not treated, it can cause a variety of clinical symptoms, including deformity and impairment. Leprosy management expertise across diverse service providers has improved as a result of health system strengthening. To maintain the provision of high-quality healthcare services for those affected by leprosy and to reduce the disease burden, the number of new cases detected, disability, stigma and discrimination, including

social and economic disadvantage, service providers must be knowledgeable about the different types of leprosy, cardinal signs for diagnosis, treatment regimens and drug use for the diagnosed cases (Kabir & Hossain 2019:6).

When a patient has MB leprosy, contact surveys for the disease should not only include HHCs but also neighbours and consanguineous relatives. Generally speaking, a contact survey entails either a home visit by medical personnel or an invitation to the contacts of a new patient to visit a clinic. When conducted consistently in a control area, a contact survey is an effective intervention and is likely to reduce the spread of *M. leprae* (Richardus & Oskam 2015).

The percentage of newly diagnosed patients with G2D is a crucial metric in determining the effectiveness of a leprosy control campaign. Less than one case of G2D per million people is the aim for global leprosy programmes by the year 2020. Effective education techniques are needed to increase community members at risk of leprosy and health personnel's awareness of the disease.

Early leprosy case detection and MDT therapy effectively halt *M. leprae* growth. When impairments like anaesthesia, weakness and loss of sweating are found, they may already be too advanced to be treated with prednisolone or other treatments. In 20% to 30% of acute instances, the impairments might just be resistant to treatment. When self-care practices are backed by access to the right medical, surgical and rehabilitation services, the secondary effects of these impairments can be avoided.

A crucial tactic continues to be preventing illness exposure. It can be dealt with by raising health staff members' levels of education, modifying the environment and, when necessary, administering chemoprophylaxis to contacts. The population that is most at risk for leprosy needs to be known to health personnel. In Australia, family and HHCs of leprosy cases that are currently active are included, as are the Aboriginal and immigrant communities (Northern Territory Centre for Disease Control 2018:52-56). Leprosy control experts believe that advocacy to enhance housing quality, ventilation, water supply, nutrition and relieve overcrowding, particularly in areas with relatively high incidence, is essential.

Prioritising research should be done in accordance with its potential impact and the possibility of producing game-changing, practical and efficient technologies. At the same time, operational research that boosts programmatic capability is required to guarantee

that these new technological advancements are usable and scalable at the national and sub-national levels. This research should also inform integration with and the strengthening of national public health and health systems.

To support, fund and facilitate high-quality leprosy research, research capacity must be built in endemic nations and the translation of research findings into policy and practice must be facilitated. The Leprosy Research Initiative (LRI) was introduced during the International Leprosy Congress in 2013. The LRI has five research priorities: early leprosy detection; prevention, early detection and effective treatment of nerve function impairment (NFI) and reactions; integration of leprosy patients into society; prevention of disability activities and their integration into national programmes and integrated wound and limb care programmes; and testing methods and tools to stop the spread and incidence of leprosy, including expanding the reach of effective treatments (WHO 2016a:14).

Priority research areas identified by the Global Partnership for Zero Leprosy (GPZL) include (i) diagnostics; (ii) mapping, digital technology and innovation, (iii) disability, (iv) epidemiological modelling and business case, (v) implementation research, (vi) stigma, (vii) PEP transmission and (viii) vaccines (Steinmann, Dusenbury, Addiss, Mirza & Smith 2020:3).

The categories of zero transmission, zero disability and zero discrimination were used to identify 15 research goals. As a unique area of study, the mental health of leprosy victims was chosen. These results help create a new inclusive agenda for leprosy, making them useful for more than just the LRI. They may also help other organisations, most notably the GPZL, to develop research agendas (Khazai, Van Brakel, Essink, Gillis, Kasang, Kuipers, Saunderson, Scollard & Veldhuijzen 2020:13).

2.5.3.2 *Eliciting systemic support and engaging stakeholders*

Leprosy programmes have received support from partner organisations in many nations and networks of afflicted individuals also conduct interventions, create global and national policies and strategies and push for better access to social benefits, entitlements and welfare for leprosy patients.

Leprosy control and eradication are ultimately the duty of each nation's governmental authority. Partners and other stakeholders can contribute to the maintenance and improvement of political commitment. Nearly all nations have seen a decrease in leprosy-

related activity since the announcement of leprosy elimination. The increased global rate of patients who were incapacitated at the time of diagnosis may have been caused by late detection as well as a lack of funding. One cause of the delay is the loss of knowledge, but another is the absence of structured participation by the private sector, particularly the crucial informal and for-profit private sectors in Asia and Africa (WHO 2016c:7-13).

Collaboration has always been essential in the struggle against leprosy. The WHO and national and international NGOs and institutions, such as The Nippon Foundation (TNF) and the Sasakawa Memorial Health Foundation (SMHF), play a crucial supportive role in conjunction with national governments. A few non-International Federation of Anti-Leprosy Associations (ILEP) NGOs that provide aid around the globe include ANESVAD, Effect Hope and the Pacific Leprosy Foundation. Among the present active NGOs, members of ILEP also play a key role. Through at least 2020, Novartis has committed to continuing to provide medications without charge.

As the programme's owner, the MoH, in particular, should coordinate national and international donor funding for the country. An essential precondition for the programme activities to be conducted regularly and universally across the nation is good donor coordination (WHO 2016a:7-13).

2.5.3.3 *Elevating leadership and widening ownership*

Continuous supplies of MDT and rifampicin for PEP, active leadership by national programmes, the meaningful involvement of leprosy patients, collaborative efforts by all GPZL and WHO members and progress toward the goals must be maintained. The programme is owned by the government, in particular, the MoH, who should coordinate national and international donor support for the nation. A consistent and uniform application of programme activities across the nation depends on effective donor coordination.

In the post-eradication era, government commitment is essential to offer financial certainty and policy support for promoting the early identification of leprosy. To lessen suspicion and promote engagement from all relevant medical professionals, comprehensive approaches are also required. These include health promotion, employee training, reward-offering and symptom observation. A strong referral centre is also necessary to reliably confirm or rule out the diagnosis of leprosy (Chu, Liu, Huai, Chen, Han, Chen & Zhang 2020:10).

The Global Leprosy Strategy 2016–2020, titled *Accelerating toward a leprosy-free world*, was released in April 2016. Initiative-taking, ensuring responsibility and promoting diversity are the cornerstones of the strategy. Leprosy eradication and the prevention of its consequences are its three main pillars, along with battling prejudice and promoting inclusiveness. All national initiatives support the global strategy, which has three main goals: (i) eliminating all countries with leprosy-related discrimination laws; (ii) reducing the number of new cases of leprosy with G2D to fewer than one case per million people; and (iii) reaching zero G2D among children diagnosed with leprosy (WHO 2016b:9).

The cornerstones of leprosy control continue to be early detection and comprehensive MDT treatment. Incorporating the strategy into other disease control programmes, improving monitoring of the leprosy programme, particularly at the sub-national level, including leprosy patients and taking action to end discrimination against leprosy patients and their families are among the key processes that have been identified for implementing the global strategy. To improve their understanding of corporate and community needs and procedures, potential leaders must be identified and given the chance to engage in workshops and training programmes.

G2D measures the community's level of health-seeking behaviour and awareness of early leprosy symptoms, as well as the ability of the health system to diagnose and cure leprosy at an early stage (i.e., before disabilities develop). Leprosy-related disease burden is tracked using data on newly diagnosed G2D cases (WHO 2016c:412).

Chemoprophylaxis with SDR significantly reduces the chance of getting leprosy in people who are in close contact with leprosy patients. In close collaboration with the health ministries of eight countries—India, Nepal, Indonesia, Myanmar, Sri Lanka, Tanzania, Brazil and Cambodia—the Leprosy Post-Exposure Prophylaxis (LPEP) programme was established. Activities for LPEP started in 2014 and went on for three years.

The purpose of LPEP was to analyse the impact on the new case detection rate, as determined by strengthened surveillance and reporting systems, as well as its applicability in various regular programme settings. The software's three key components are contact tracking, screening and SDR administration. It is meant to complement and be included in the national leprosy control activities rather than operate vertically. Additionally, promoting human resources, training and programme oversight aims to improve the overall healthcare system (Tiwari, Mieras, Dhakal, Arif, Dandel & Richardus 2017:2).

2.5.4 Literature articles relevant to the early detection of leprosy among leprosy contacts

Data were received from all 23 countries with global priorities in 2018. These nations reported 199,400 new cases during the reporting year, making up 96% of all new cases worldwide. This decrease from 2017's number of new cases is attributable to active case identification initiatives. A national programme evaluates the level of disability at the time of diagnosis and reports the number of new G2D cases, which indicates early case detection. Indirectly, it offers details about additional elements that affect case detection, such as community leprosy knowledge, the ability of medical personnel to spot early signs and symptoms and, to some extent, the calibre of leprosy services. In 2018, 11,323 new leprosy cases were diagnosed with G2D across the globe (WHO 2019:392).

The main methods for controlling leprosy continue to be early detection and quick MDT for all new cases. As the problems of leprosy depend on how quickly the disease is detected and treated, early detection is essential to minimise the physical and social effects of the condition (WHO 2017b:501; Van 't Noordende et al 2019:2). It is obvious that early diagnosis considerably lowers the risk of nerve impairment, but a crucial difficulty is how to efficiently accomplish early leprosy diagnosis so that the WHO's G2D rate of new cases is influenced (Li, Yang, Wang, Liu, Liu & Cross 2016:24).

Household connections of leprosy patients may be at higher risk for contracting the disease, particularly if there are older contacts or MB cases already present. Breaking the chain of transmission and preventing patients' disabilities require a precise early diagnosis and treatment (WHO 2020a:1-2).

New cases continue to be found, often in youngsters under the age of 15. With 16,979 children diagnosed and 238 children with Grade II impairments, children made up 8.1% of new cases worldwide in 2017 (WHO 2018c:453). The diagnosis of a fresh case in children and teenagers demonstrates ongoing transmission. It also reveals the rate of disease transmission, which is directly proportional to the percentage of infection sources (MB forms) that are untreated and the effectiveness of the control initiatives (Joshi 2017:37).

Contacts of individuals with leprosy who have recently received a diagnosis are more likely to contract the disease and can be categorised based on their proximity to the index patient physically or socially (e.g., blood relative, household member, neighbour). According to the WHO (2020d:1-20), a longitudinal study in the Karonga district of Malawi

found that people who live with HHCs of MB leprosy patients have a five- to eightfold higher risk of contracting the disease than people who do not live in such homes, while the risk was almost double for people who live with HHCs of PB cases.

Leprosy was prevalent among HHCs at 636.3 per 100,000 people (95% confidence interval [CI], 594.4–681.1 per 100,000 people) overall and 521.9 per 100,000 people (95% CI, 166.3–584.1 per 100,000 people) among children under the age of 15. In general, 97.3% of cases were attributable to exposure within the home and 99.0% of those instances involved children under the age of 15. The incidence among HHCs of patients with MB leprosy was roughly 60% higher than that among HHCs of patients with PB leprosy, with similar associations over time, suggesting that the risk associated with living closer to a primary leprosy case may outweigh the individual-level risk (Teixeira, Pescarini, Alves, Nery, Sanchez, Teles, Ichihara, Ramond, Smeeth, Penna, Rodrigues, Brickley, Penna, Barreto & Silva 2020:643).

Since 1997, the prevalence of the disease has been less than 1/10000 in Colombia (Romero-Montoya, Beltran-Alzate & Cardona-Castro 2017:1). Leprosy incidence, however, has remained steady with 400 to 500 new cases recorded yearly; MB leprosy accounts for 70% of these cases and 10% of them result in Grade II impairment. As a result, leprosy transmission is still a problem and those who live with leprosy patients' HHCs are at a very high risk of getting the disease themselves and experiencing its long-term repercussions. It is proof that leprosy is still being transmitted in a nation where the disease has been essentially eradicated.

A cross-sectional study that evaluated the spread of leprosy among family groups revealed that 22 (4.1%) of the 543 HHCs had IgM anti-PGL-I positive antibody titres, indicating infection. In 18 (16%) HHCs, PCR of DNA recovered from nasal swabs revealed *M. leprae*, indicating the existence of carriers. The HHCs had two fresh leprosy cases. One family group contained three leprosy cases, two of which were MB. The *M. leprae* genotype of these two strains agreed at nine markers, demonstrating that these people have the same *M. leprae* strain infecting them, suggesting familiar transmission. In addition to being a high-risk group for *M. leprae* infection, leprosy patients' HHCs can also function as *M. leprae* carriers, which make them sources of infection and transmission. Based on the findings, the follow-up of HHCs is an effective method for detecting leprosy early and observing its spread (Romero-Montoya et al 2017:1-2).

According to Barbieri et al (2016), the actual number of leprosy cases in endemic nations is unclear but it is generally believed to be six- to eightfold greater than the reported number of new cases. This issue appears to be related to general healthcare professionals' limited ability to diagnose leprosy, which is mostly predicated on the recognition of clinical signs and symptoms. There is no laboratory test available right now that can identify all clinical types of leprosy. The majority of PB patients cannot be identified by bacilloscopic testing, even though it has a high specificity and is effective in confirming diagnoses in MB patients (Bernardes-Filho, Paula, Leite , Abi-Rached, Vernal ., Silva , Barreto, Spencer , Frade 2017:822).

Although > 95% of lepromatous patients (polar and borderline lepromatous) have positive results from the enzyme-linked immunosorbent assay (ELISA) test to detect anti-PGL-I IgM titre, only 20% to 40% of tuberculoid patients (polar and borderline tuberculoid) have positive results or are negative and caution should be taken before drawing any conclusions about being positive since it is known that 90% of tuberculoid patients have negative results. According to research (Barreto, Bisanzio, Frade, Moraes ,Gobbo , Guimarães, Silva, Vazquez-Prokopec , Spencer , Kitron & Salgado 2015:527; Penna, Penna, Iglesias, Natal & Rodrigues 2016:7), seropositive HHCs of leprosy patients are three times more likely to get leprosy than seronegative ones.

If not treated promptly, leprosy-related nerve damage (leprosy responses) can lead to disability. Therefore, patients must receive prompt referrals for the right care. There is a correlation between high rates of disability at presentation and late reporting to contemporary (biomedical) health institutions, according to several research conducted in various African nations. These conclusions are supported by pilot research, which demonstrates that local practitioners have limited expertise in leprosy diagnosis and that many of them treat patients using their own medical systems, such as homoeopathy or Ayurveda.

Only one of the 29 practitioners in the research who were interviewed was using MDT, while six were sending patients to hospitals. This study emphasises the need to collaborate with regional practitioners to encourage early referral to specialised facilities where patients can be evaluated and given the correct care (Naaz, Mohanty, Bansal, Kumar & Gupta 2017:2)

2.6 CLASSIFICATION OF LEPROSY

Leprosy epidemiology is also described using the classification system for the disease. According to the WHO classification, leprosy patients are categorized depending on the number of leprosy skin lesions and nerve involvement. The classification also helps on choosing the treatment regimen and predicts the future risk of complication: 1. Paucibacillary (PB) Leprosy (a) One to five leprosy skin lesions, (b) Only one nerve trunk enlarged 2. Multibacillary (MB) Leprosy (a) Six or more skin lesions, (b) Less than six skin lesions, which have a positive slit skin, smear result or if there is involvement (enlargement) of more than one nerve. Additionally, leprosy patients that are difficult to categorize should be considered multi-bacillary cases and handled as such. Pure neural leprosy patients should also be categorized and managed as MB cases. (FDREMoH 2020b :195).

2.7 DETERMINANTS OF LEPROSY

Leprosy is described at length in Joshi's (2017:33-44) discussion of the disease.

2.7.1 Agent

Armauer Hansen discovered *M. leprae* as the leprosy-causing microorganism in 1873. It is an obligate intracellular pathogen that mostly affects macrophages and Schwann cells, but it can also infect other organs like the eye and testis and grows in muscles and vascular endothelium. Leprosy is less frequently a direct cause of death than tuberculosis, which is similarly caused by infection with a mycobacterium (*M. tuberculosis*). Instead, deformity and disability – which have a huge social and economic impact – are the most frequent severe effects of leprosy due to the infectious agent's preference for skin and peripheral nerves.

On microscopic examination, *M. leprae* is a gram-positive, acid-fast, straight or slightly curved rod-shaped bacillus that is seen in clumps or bundles. One bacillus divides into two every 12 to 14 days due to its slow growth. They exist both extracellularly and intracellularly, do not create poisons and prefer Schwann cells and reticuloendothelial system cells. Relapse may result from their being dormant in diverse body tissues and places.

By boiling and autoclaving, the organism is destroyed. It is unknown how sensitive it is to dryness, air, cold, water and disinfectants. Depending on the surrounding conditions, *M. leprae* can endure outside a human body for up to 45 days. The epidermis, peripheral nerves, upper respiratory tract and testes are some examples of colder tissues where *M. leprae* can grow most effectively, sparing more heated regions. Earlobe, face and buttock skin all contain significant amounts of these. The amount of bacteria is more abundant in instances of leprosy.

2.7.2 Host factors

There have been several antigens found in *M. leprae* but the most important one is the phenolic glycolipid (PGL-1) found by serological assays. Experimental animals such as the nude mouse and nine-banded armadillo have successfully transmitted *M. leprae*. By injecting them into the mouse foot pad, *M. leprae* can be cultivated experimentally. Its ability to grow in artificial media has not yet been demonstrated. Although the bacillus's normal life period in the human body is unknown, patients have continued to be segregated from them even after being released from therapy for 10 years (Domple et al 2017:482; Joshi 2017:38).

2.7.2.1 Age

Leprosy can strike at any age, but it is most frequently diagnosed in people between the ages of 20 and 30. In areas where the disease is endemic, childhood is when it usually strikes. In low-endemic locations, adults or people later in life may contract the virus. Epidemiologically speaking, an increase in the proportion of juvenile leprosy cases in the population is significant since it shows that the illness is still being actively transmitted in the neighbourhood. The elder age group is more frequently affected when disease transmission decreases.

The age distribution for lepromatous cases often demonstrates that the disease develops more slowly than in non-lepromatous instances. The epidemiological and clinical profile of a hyperendemic region of the Brazilian Amazon (Oliveira, Dos Reis, Margalho, Lopes, Da Silva, De Moraes & Xavier 2019:6), confirmed that there was a predominance of males in the 60 to 69-year age bracket and a predominance of the MB operational classification. The fact that the elderly in the state of Para and Brazil are primarily in the 60 to 69-year age bracket and that these younger elders, who normally have more social contact, are

more susceptible to getting leprosy, can be used to explain the prevalence in this age group (Oliveira et al 2019:6).

2.7.2.2 Gender

Both sexes can get leprosy. The proportion of G2D in men was noticeably higher than in women and the same scenario was seen in non-ethnic areas. However, there was no difference in the proportion of G2D between men and women in the ethnic communities, indicating that the disability status for women in those places was worse and comparable to that for males. More attention should be placed on the disability issue of female patients in ethnic communities.

Through passive detection techniques (dermatological clinic, self-reporting and reporting by others), men were significantly more frequently identified than women. The contact examination group and the other groups' male/female ratios were significantly different from each other (Liu, Yu, Ning & Wang 2081:6).

2.7.2.3 Migration

Leprosy cases have risen in urban regions recently as a result of population migration from rural to urban settings. Undoubtedly, the increased migratory flow from regions where leprosy is still endemic will affect the prevalence of leprosy in the United States (Aslam, Peraza, Mekaiei, Castro & Casanas 2019:3).

The urban slums share certain geographic and societal traits with other metropolitan areas. The slums' population density is extremely high (10,000–15,000 per sq. km), the majority of the residents are migrants from far-off villages, the living conditions are subpar, and breathing space is severely restricted (8 to 10 or even more people share a room) and other amenities are severely limited. At home and work, the surroundings are very similar and frequently both settings are the same (Joshi 2017:37).

There are two major types of leprosy transportation: (i) two-way traffic to and from villages and slums and (ii) one-way traffic from slums to middle-class communities with denser populations and differing living circumstances. The majority of home helpers and house cleaners employed in middle-class metropolitan areas are from slums populated by migratory people from the villages (Joshi 2017:37).

2.7.2.4 Household and other contacts

Contact status is the most reliable and extensively researched risk factor for leprosy development. Leprosy risk was directly correlated with intensity and physical separation from an index lepromatous leprosy case. Longitudinal research in the Karonga district of Malawi discovered that people who live in the same home as an MB leprosy patient have a five- to eightfold higher risk of contracting the disease (WHO 2020e:3)

2.7.2.5 Immunity

The disease's occurrence is influenced by a person's immune condition and vulnerability. A large percentage of leprosy's early lesions heal on their own. Such self-healing wounds imply a developed immune system. Resistance to *M. leprae* infection is brought on through cell-mediated immunity. Few people (approximately 1%) who are exposed to a virus end up getting sick. Immune system development is also influenced by subclinical illnesses. Additionally, infections with other mycobacteria in the same family seem to be a plausible source of some immunity.

There is no evidence to support the idea that those with leprosy are more prone to get tuberculosis and vice versa. But there is solid proof that the BCG vaccine can offer some leprosy defence. BCG delivers significant but variable amounts of protection (Cuevas & Cardenas 2021:4) . Leprosy is similar to tuberculosis in that infection typically does not result in clinical disease and when it does, the host's immune system responds to the infecting organism in many ways that inflict damage that is greater than that caused by the infecting organism (Joshi 2017:38).

According to Jin, Ahn and An (2018:1), the vast gene loss and inactivation, also known as gene degradation, is the most conspicuous aspect of the *M. leprae* genome. These features of the *M. leprae* genome can account for the organism's sluggish development and inability to replicate in artificial media. The human genes PARK2 and PACRG are linked to a higher risk of contracting leprosy or more severe forms of the disease. The immune system of the host influences how leprosy manifests clinically.

In lepromatous (LL) leprosy, the converse is seen, whereas the response to tuberculoid (TT) leprosy is characterised by strong cell-mediated immunity and poor humoral immunity. In an immunological setting, leprosy can be more precisely categorised as indeterminate (I), TT, borderline tuberculoid (BT), mid-borderline (BB), borderline lepromatous (BL) and LL based on skin abnormalities, motor and sensory alterations and

biopsy findings. Additionally, *M. leprae* invades and persists inside dendritic cells, Schwann cells and macrophages. Interleukin 2 (IL-2) and interferon-gamma (IFN- γ) are significantly more prevalent in TT lesions than in LL lesions, which are characterised by IL-4, IL-5 and IL-10.

The wide clinical spectrum seen in patients who develop leprosy serves as an illustration of the importance of the host's response to infection. At one end of the spectrum is tuberculoid leprosy, which has localised lesions, a Th1 CD4+ cytokine profile (IL2, IFN-), robust cell-mediated immunity and a small number of bacteria. Lepromatous leprosy, at the other end of the spectrum, is characterised by a deficiency in cell-mediated immunity, Th2 CD4+response (IL4 and IL5), a robust humoral response, diffuse progressive illness and high bacilli counts. Therefore, it may be said that lepromatous individuals show the least resistance, while tuberculoid patients show the greatest. This is not to argue that the pathophysiology linked to the more resilient pole is always milder; robust Th1 responses in the tuberculoid pole can cause quick and severe nerve injury (Joshi 2017:38).

2.7.2.6 Genetic factors and susceptibility

Low infectivity and significant morbidity characterise leprosy as a disease. Few persons who are exposed to an infection show clinical symptoms of the illness. This is why the role of genetic variables in leprosy has been carefully researched and taken into consideration for a very long time. Associating with the nation's socio-economic development, general genes play a role in the host's response to mycobacterial antigens (Li, Shakya, Long, Shen & Kuang 2021:8).

The understanding of the pathophysiology of the illness and the molecular basis of leprosy susceptibility has greatly benefited from genetic investigations. It is interesting to note that genome-wide, hypothesis-free research has uncovered previously unknown immune-related genes like PARK2 and, more recently, LACC1. However, little is known about how uncommon variants affect disease pathways and causative variants that could account for the main impacts of genes have not yet been identified (Cambri & Mira 2018:6)

HLA class II alleles, particularly HLA-DRB1 alleles, have repeatedly been proven to be significant genetic factors determining susceptibility to various kinds of leprosy. HLA-DRB1 and HLA-DQA1 alleles, as well as specific HLA-DR1 amino acids, were recently

identified in the Chinese population as independent protective factors for leprosy (Gzara, Dallmann-Sauer, Orlova, Van Thuc, Thai, Fava, Bihoreau, Boland, Abel, Alcaïs, Schurr & Cobat 2020:9).

2.7.2.7 Familial clustering

Leprosy has been observed to occur more frequently in specific community clusters, particularly family clusters. The exposure to environmental elements such as the local mycobacterial flora and other environmental conditions that all members of the community are exposed to can be used to explain the community clusters. But when it comes to family clusters, it can be challenging to determine whether it is a result of comparable environmental factors, close familial (genetic) resemblance, close contact with a family member who is affected or a combination of all three. Additionally, research has demonstrated that families with a lepromatous patient are more likely to detect familial cases of leprosy than families without one (Joshi 2017:39; WHO 2020d:1)

2.7.2.8 Nutrition

One prevalent trait of low-income households is malnutrition. This element might have a close connection to leprosy (Nyamogoba, Mbutia & Mulambalah 2019:47). Leprosy prevalence has decreased globally because of intense control initiatives but some of the world's poorest regions continue to see new instances of this deadly disease. The illness is therefore also referred to as a disease of poverty. It is crucial to understand which characteristics of poverty contribute to disease transmission and the development of clinical symptoms to be able to control the disease.

A study conducted in Bangladesh discovered that the only socio-economic element that was found to be connected to leprosy sickness and not poverty as such was a recent time of food deprivation. Malnutrition is known to reduce immunity and increase susceptibility to infectious illnesses. The development of the clinical manifestations of leprosy, as a result of malnutrition, which is a result of poverty, was found to be significantly linked.

Leprosy was strongly correlated with food spending. Poor-income households have limited resources for food purchases, which results in a low intake of very nutrient-dense non-rice foods including meat, fish, milk, eggs, fruits and vegetables. Clinical leprosy may have developed due to dietary deficiencies that these foods give, which could lead to a compromised immune response (Wagenaar, Van Muiden, Alam, Bowers, Hossain, Kispotta & Richardus 2015:13).

2.7.2.9 Socio-economic factors

As a social disease, leprosy is frequently linked to aspects of poverty, like overcrowding, low income, illiteracy, poor personal cleanliness, inadequate ventilation etc. which encourage the spread of the illness. People from any socio-economic group, though, could be impacted. Fear of leprosy, guilt, stigma and discrimination due to the disease in the community, as well as incorrect preconceptions about leprosy, cause people to conceal the illness and delay seeking treatment, which encourages the spread of the disease and results in the development of abnormalities. Leprosy is still regarded by people at all levels of society as being highly contagious and incurable, even though there is a wealth of scientific evidence on it (Joshi 2017:39; Li et al 2021:8).

People continue to associate leprosy with severe hand and foot deformities that could have been corrected with regular physiotherapy and early diagnosis and treatment with MDT. A low socio-economic profile, slow case detection and lack of quick referral services to general healthcare facilities are factors that affect the extent of the deformities (Li et al 2021:5)

A higher source of transmission can be found in nations like India, Brazil, Indonesia, Chad, Myanmar and Ethiopia due to their higher reservoirs of infection. This can be ascribed to an increase in the number of people living in one family, poor hygiene and sanitation, inadequate food and water supplies, weak educational systems and a lack of awareness of the country's socio-economic growth (Li et al 2021:8).

2.7.3 Environmental factors

The mycobacterium thrives better in humid environments. The bacilli can survive in moist soil at room temperature for about 46 days and around 9 days in dried nasal secretions. As a result, humid conditions enhance the probability of transmission.

2.7.4 Transmission

2.7.4.1 Source of infection

The sole natural host of *M. leprae* is man and leprosy cases that are left untreated are the only known sources of infection. Comparing PB and MB cases, the latter is a more significant source of infection. On the other hand, it is important to consider that any active leprosy cases could be infection sources. The fact that *leprae* infections can be found in chimpanzees, mangabey monkeys and armadillos in the wild is now widely known.

Leprosy in wild animals, however, poses the least danger to humans and is not a major concern.

2.7.4.2 Portal of exit

The upper respiratory tract, the skin and the nose all expel the bacteria. The main escape point for *M. leprae* from a susceptible person's body is through the respiratory tract, particularly the nose. When a person with a positive bacteriological test sneezes, millions of bacilli are released from the nasal mucosa. Particularly when there are nasal ulcers, a significant amount of bacteria is expelled from the nose. Most bacteria are kept in the skin of patients; they are seldom ever shed from healthy skin. Sweat ducts, sweat glands, sebaceous glands and hair follicles all harbour large populations of lepra bacilli. On the other hand, ulcers and broken skin in lepromatous instances might release bacteria. Even in untreated patients, just a small percentage (less than 3%) of these fleeing bacilli are still alive (Joshi 2017:40).

2.7.4.3 Portal of entry

The main entrance point for the lepra bacilli is through the respiratory pathway. It is impossible to completely rule out the chance of infection entering through skin, particularly damaged skin.

2.7.4.4 Mode of transmission

Leprosy can spread in several ways, but the precise contribution of each mode is still not known with certainty. The following are the primary transmission routes:

- *Nasal droplet infection:* Nasal droplet infection is the primary method of transmitting leprosy bacilli from person to person.
- *Physical contact:* Skin-to-skin contact can also, but less frequently, spread the illness. The possibility that leprosy can be spread through indirect contact cannot be completely ruled out since leprosy bacilli can persist in favourable environmental circumstances for a considerable amount of time.
- *In-utero transmission:* Leprosy has been found in early infants, according to accounts of in-utero transmission. About 50 leprosy patients under the age of one were documented with the majority having BT illness and ambiguous leprosy. The study had mothers who had clinical leprosy or a history of the disease, indicating that

about 50% of the mothers had a subclinical infection. If the infection occurred after birth in any of these cases or if it did so in utero, it is possible that the disease manifested itself very quickly after a very brief incubation period. An increased proportion of 3 to 24-month-old infants born to lepromatous mothers had high levels of IgG and IgM antibodies to *M. leprae* (Joshi 2017:40; WHO 2020a:1)

In human placenta and cord blood from armadillos and humans, *M. leprae* has occasionally been found. Despite all the evidence pointing to the uterine transmission of infection, children born to mothers who have lepromatous leprosy and are untreated are only extremely infrequently afflicted.

- *Transmission through ingestion (breast milk):* The potential that leprosy could be spread by consuming infected milk has always been raised in the past. This hypothesis was also raised by the discovery of *M. leprae* in the breast milk of mothers with lepromatous leprosy. Study revealed leprosy bacilli in the milk-excreting epithelial linings of lactating mammary glands. They also predicted that a baby would absorb about 2 million leprosy bacilli from a feed of 4 oz. Despite all of these data, the truth remains that there is still no conclusive proof that (i) breast milk containing living leprosy bacilli works as a source of infection and (ii) such infected breast milk causes a child to develop a protective immune response (Joshi 2017:40).
- *Inoculation following trauma:* Leprosy development has been connected to several reported cases of trauma of various kinds. After thorn pricks, tattoos, vaccinations, roadside injuries, wound dressings in leprosy hospitals, dog bites and injuries received by surgeons when operating on lepromatous leprosy patients, leprosy lesions have been seen to develop. This alone is sufficient to know that the development of leprosy lesions was related to the site of trauma and that the trauma sites served as the entry points for leprosy bacilli, even though it may be challenging to demonstrate the presence of *M. leprae* over the objects or instruments involved in producing trauma in the instances mentioned (Joshi 2017:40).

2.7.5 Incubation period

Leprosy has a variable and exceptionally extended incubation or latent period. It could range from a few weeks to over 20 years. The disease is thought to take an average of 5–7 years to incubate. The incubation period for a PB leprosy patient may be shorter (Joshi 2017:40; WHO 2021:20).

2.7.6 Diagnosis

Most frequently, clinical signs and symptoms are used to make a leprosy diagnosis. After a brief amount of training, any healthcare professional may easily observe and elicit them. Individuals with these concerns typically visit the health centre on their own.

At least one of the following three cardinal signs must be present to diagnose leprosy in modern medicine: (i) a definite loss of sensation in a pale (hypopigmented) or reddish skin patch; (ii) a thickened or enlarged peripheral nerve with a loss of sensation and/or weakness of the muscles supplied by that nerve; or (iii) the presence of AFB in a slit-skin smear. Technical know-how is necessary to take the slit-skin smear, cure it, stain it and read the results. Slit-skin smears are solely positive in MB leprosy (i.e., every positive slit-skin smear, regardless of the number of patches and/or nerve involvement, is categorised as MB).

The hardest leprosy cases to diagnose are those in the early clinical stages and milder varieties (PB leprosy). Low accuracy is seen for PB leprosy in the ELISA and lateral flow assays. Even while PCR-based techniques using tissue samples have higher sensitivity and specificity than ELISA and lateral flow assays, they would be challenging to use in most field situations. There is currently no commercially accessible PCR test and PCR assays need technical and laboratory know-how. They also lack standardisation. Studies show limited sensitivity for PCR-based assays employing urine and blood samples, even though they may be less intrusive alternatives to skin smears and pathological inspection of tissue (WHO 2020a:15).

The most common method for determining whether someone has leprosy is based on the presence of acid-fast bacilli (AFBs) in skin smears or biopsies, characteristic skin lesions (hypoanesthetic hypopigmented or reddish) and clinical indications of peripheral nerve oedema. Paucibacillary (PB) leprosy (between two and five lesions) and multibacillary (MB) leprosy (six or more lesions) are the two types of leprosy that patients incur. Patients are frequently divided for care based on the number of skin lesions. The duration of

treatment, which entails a three-drug regimen, is determined by the classification of the condition (Government of West Australia 2019:9).

In the absence of an immediately clear alternate diagnosis, a person who exhibits skin lesions or symptoms suggestive of nerve damage but in whom the cardinal indicators are lacking or ambiguous should be referred to as a 'suspect case'. These people need to be educated on the basics of leprosy and encouraged to visit the centre if their symptoms last longer than six months or get worse at any point. Suspect cases may also be forwarded to referral clinics with greater diagnostic tools.

2.7.7 Relapses

In the surveillance system, cases of leprosy recurrence in patients who were thought to be healed can mistakenly be attributed to causes other than fresh infections. Relapses are a sign of treatment failure, which is typically brought on by insufficient dosage, length of treatment and irregular drug consumption. Although it is challenging to prove with the technologies available in the national programmes, reinfection is another potential reason for relapse. Additionally, despite only being mentioned seldom in recent memory, the threat posed by medication resistance cannot be discounted. More relapses are being recorded globally and more nations have started to report recurrence cases. In 2012, 105 nations reported a total of 3,427 relapses. In all national programmes of different nations, it would be helpful to regularly evaluate relapse instances concerning treatment completion and medication resistance (Gonçalves, Fernandes Belone, Rosa & Laporta 2019:7; Joshi 2017:38).

Relapsing leprosy patients run the risk of passing the leprosy bacilli to others. In just 47 countries, treatment completion rates of > 85% were reported. In addition, 1,897 relapses were recorded in 54 countries. Even though there are still problems with recurrence diagnosis, things have improved – maybe due to more reporting. Leprosy relapse rates appear to be minimal, at around 1% over 5 to 10 years (Rajkumar, Purushothaman, Ponnaiah, Shanmugasundaram, Padma, Meena, Vadivoo & Mehendale 2021:8; WHO 2021:10)

2.7.8 Treatments

Leprosy is successfully treated with MDT. Relapse is uncommon if the entire course of treatment has been followed carefully but ongoing watchfulness is necessary given the new reports of isolated cases of drug resistance-related relapses. Fortunately, the use of

a combination of medications has prevented the development of drug resistance in leprosy, making it generally possible to treat recurrence cases successfully with the same medication regimen, MDT.

Rifampicin and dapsone are currently indicated as the MDT for PB leprosy for six months, while rifampicin, clofazimine and dapsone are currently suggested as the MDT for MB leprosy for 12 months. At the point of use, MDT is given out in blister packs with separate packets for adults and children. This medication is given away for free as a donation by a pharmaceutical company to the National Leprosy Programme by the WHO. The protocols provide for categorising all leprosy patients as either PB or MB, with additional distinctions made between adults and children. A typical 6-months course of PB-MDT is administered to a person if it is determined to treat them as a PB recurrence. The typical course of treatment for MB relapses is a 12-month MB-MDT. Clarithromycin, minocycline or a quinolone (ofloxacin, levofloxacin or moxifloxacin) with clofazimine daily for six months, then clofazimine plus one of the second-line medications daily for an additional 18 months, is advised for leprosy patients who are resistant to rifampicin (WHO 2016a:27; WHO 2018a:17).

2.8 CHALLENGES OF PEOPLE AFFECTED BY LEPROSY

2.8.1 Leprosy reaction

The primary causes of leprosy-related disability, LR_s are acute nerve-destructive inflammatory events that affect the course of *M. leprae* infection. It is an immune reaction to bacteria. The injury that occurs from LR_s is what causes the majority of the issues associated with leprosy. The onset of sudden swelling-related symptoms and signs in a leprosy patient's lesions is known as an LR. Clinically, skin lesions include redness, swelling and occasionally pain. Nerves may enlarge, hurt or become tender. This might have catastrophic repercussions, such as permanent nerve injury, impairment or incapacity. Therefore, crucial activities include early detection and comprehensive reaction management (Luo, Kiriya, Tanigawa, Kawashima, Nakamura, Ishii & Suzuki 2021:2; WHO 2020e:2).

2.8.2 Physical deformity and disability

Especially if the disease is detected too late, leprosy can frequently damage nerves and result in abnormalities. Unfortunately, the damage that frequently affects the hands or feet – these are the leprosy scars – cannot be repaired with medications. Many aspects of a person's life are impacted by leprosy. The most visible consequence is the development of physical impairments that make it challenging to conduct daily activities. This could lower their standing and cause psychosocial issues for them (Giri, Bhagat, Baviskar & Ali 2017:38).

Having a disability could happen to anyone with leprosy at any time. Degeneration of the peripheral nerves that feed the eyes, hands and/or feet is the primary cause of disability and deformity, either directly or indirectly. Therefore, it is the responsibility of every member of the healthcare team that works with leprosy patients to protect nerve functioning and stop progressive deformity and impairment in those situations where there was already some irreparable disability at the time of diagnosis (FDREMoH 2018:157; WHO 2020e:1).

2.8.3 Psychological challenges

A mental health issue affects more than 30% of leprosy patients, which highlights the significance of mental healthcare services in leprosy. Women, those with lower levels of education, people from lower socio-economic classes and people who have leprosy-related disabilities of any kind are more likely to have depression and/or anxiety symptoms than other groups (Govindasamy, Jacob, Solomon & Darlong 2021:10). They are compelled to live in ashrams, mandirs (temples) and leprosy homes since those who have this condition are shunned by their neighbours and families.

These issues mean that people with Hansen's illness are at significant risk of developing psychological disorders. Compared to the overall population, these patients have a higher prevalence of psychiatric illnesses. The high percentage of suicide attempts reveals how patients view the psychological condition brought on by leprosy. Leprosy patients go through a wide range of emotional reactions. After receiving a leprosy diagnosis, grief seems to be the first and most common reaction that patients display. When the morbidity persists for an extended period, it may be possible to determine the prevalence of psychiatric diseases (Sharma, Joshi & Kumar 2017:182).

2.8.4 Social challenges

Regardless of the differences in religion and culture between different nations, leprosy has traditionally been connected to sin, impurity and being rejected by God as a result. It has also frequently been thought of as a hereditary condition. People who have leprosy receive negative reactions from others because of their unique looks, feelings of inferiority and a lack of drive and social marginalisation as a result of stigma (Lusli, Zweekhorst, Miranda-Galarza, Peters, Cummings, Seda & Irwanto 2015:4).

2.8.5 Quality of life

Leprosy has an impact on family life daily, but it also places significant limits on patients as a consequence of their fear of social stigma. Patients with leprosy used to be required to leave their homes. Those who stay with their families frequently face criticism and may receive little to no assistance from their communities. The increased burden of sickness is likely to have an impact on the quality of life of those affected by the disease in a nation where poverty, illiteracy and unsanitary environmental conditions are prevalent (Joshi 2017:331; WHO 2017a).

2.8.6 Stigma and discrimination

Leprosy and the stigma associated with it have a profound impact on patients' lives, negatively influencing every aspect of their lives, including marriage, relationships with others, jobs, leisure time activities and involvement in religious and social organisations. According to Singh et al (2019:11), stigma against those who have leprosy is a multifaceted issue with a variety of root causes, including external manifestations like deformities and impairments, religious beliefs that view the illness as a punishment for sin, traditional beliefs that view it as a curse and hereditary, the fear of transmission and the association between leprosy and people who were seen as being less than others in every way.

The stigma associated with leprosy has many cross-cultural commonalities. Leprosy was thought to be brought on by sin. As evidenced by the investigations of Alubo in Nigeria, Burathoki in Nepal and Idawani in Indonesia, this idea has persisted up to the current day. They demonstrated how leprosy was viewed in communities as a divine punishment. Leprosy patients in Thailand continue to face stigma from both medical professionals and their neighbours. Nurse assistants have rejected and refused to treat certain ulcers of leprosy patients, which has delayed diagnosis and led to poor treatment compliance

(Dako-Gyeke, Asampong & Oduro 2017:61; Sillo, Lomax, De Wildt, Da Silva Fonseca, Galan & Prado 2016:380; Singh et al 2019:3).

2.8.7 The impact of leprosy on marriage

One of the diseases that are currently vilified the most is leprosy. Every aspect of life is significantly impacted by leprosy, including the psychological toll it takes on a person, social interactions, marriage and job. These effects differ and depend heavily on a given culture and group (Marahatta, Amatya, Adhikari, Giri, Lama, Kaehler, Rijal, Marahatta & Adhikari 2018:1).

Leprosy stigma can be a significant burden that has an impact on many aspects of a person's life, including romantic relationships. Regardless of their disease or disability status, many women face marital issues and/or sexual assault. Additionally, strong evidence that leprosy may have a variety of effects on married women's marital and sexual relationships was discovered. This included important issues like having no sexual activity at all out of fear of spreading the disease, feeling more distant from loved ones and sleeping in a separate bed from a spouse during treatment, which could last up to a whole year. Even after receiving treatment, husbands continue to abandon or mistreat their wives (Van 't Noordende, Van Brakel, Banstola & Dhakal 2016:7).

2.8.8 Economic challenges

The ability to generate cash and find a job has an impact on a leprosy patient's wellbeing and sense of self-worth. Leprosy-related unemployment can have a long-term financial impact in societies where a person's worth is determined by their capacity to sustain dependents (Dako-Gyeke et al 2017:72). Another major issue with leprosy is a structural deviation from the norm or deformity, which has negative socio-economic and psychological effects on leprosy patients and their families.

2.9 CONCLUSION

This chapter conducted a review of the pertinent literature on early leprosy case detection. It included an emphasis on Ethiopia's health system and initiatives for TB/leprosy services as well as the definition of early leprosy case detection. The difficulties with early detection of leprosy cases in Ethiopia and the role the early detection of leprosy patients has in

reducing deformities and the manner of transmission were discussed. Additionally, the factors related to the use of TB/leprosy services as well as the priority interventions for the early detection of leprosy cases were described.

The next chapter will describe the research methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter intends to comprehensively explain the purpose of the study designs and methods used to achieve the goal and to answer the questions of the study. The main purpose of this study was to develop a strategy for more effective early detection of leprosy cases among contacts of leprosy patients in Bursa woreda, Sidama region. This chapter describes the basics of the survey, survey design, survey population, sampling and sampling design, survey tools, pilot surveys, data collection procedures and data analysis. It also presents the reliability and ethical considerations associated with the study.

3.2 RESEARCH APPROACH

3.2.1 Qualitative approach

The qualitative research method was considered appropriate for this research. According to Walliman (2018:111), qualitative data provide useful information, such as people's judgements, feelings, attitudes and feelings, that cannot be reduced to numbers. By verbal interaction, aggregated data is acquired, and analysis, interpretation and findings may be shared with research participants and all interested organisations.

Denzin and Lincoln (2018:45) state that qualitative approaches and comprehensions include many realities socially constructed by individuals and groups. Therefore, qualitative research presupposes an emphasis on naturalistic and interpretive methods for dealing with a wide range of levels in the world. The individuals involved subjectively create and shape reality based on the exposed person; they develop and connect meaning to their understanding. The result is a great deal of truth about the situation in which the event exists (Polit & Beck 2018:42; Rossman & Rallis 2017:44).

For this reason, information about humans derived from a purely objective point of view does not clarify sufficient requirements compared to a qualitative approach. Researchers

need to go beyond their goals by exploring subjective views of the existing situation of inquiry (Merriam & Tisdell 2016:23). This approach was implemented to give the researcher the flexibility to adapt to design changes under required conditions.

This study specialises in exploring the early detection of leprosy through engaging with participants who have experienced the phenomenon and aims to create a complex account of their experiences of and challenges in the early detection and management of leprosy. The descriptive phenomenological approach was adopted by using a guide for research purposes. Phenomenology focuses on participants' remarks rather than model development.

The researcher also wanted to limit the study to within the context of the participants' leprosy control and not skip that boundary. This considered the participants' own social and cultural background in which the survey was to be conducted, as well as the types of health problems they generally manage in health facilities. In truth, many beliefs have influenced the researcher to commit to each participant's opinion, understanding that different opinions about the work life of leprosy control can be extracted from the participants. Polit and Beck (2017:463) believe that the value of knowledge in a subjective sense is supported by the fact that it represents the different opinions of human beings where the same purposefully understood experiences by the people concerned in a particular context can be interpreted differently.

3.3 RESEARCH DESIGN

In this study a qualitative exploratory phenomenological design was used. The purpose of this study was to explore and describe the experiences of Health professionals challenges in the program of leprosy prevention especially early detection of leprosy cases among contact of index cases .

When there are few or no prior studies to which to refer or upon which to rely to anticipate an outcome, an exploratory study design is typically used (McIntosh-Scott, Mason, Mason-Whitehead & Coyle 2016:23; Polit & Beck 2017:463). It is used to thoroughly analyse the phenomenon and other elements.

Every research study, implicitly or explicitly, has a design. According to Gray, Grove and Sutherland (2017:52), a research design is a general strategy for implementing studies to answer specific research questions. McIntosh-Scott et al (2016:23) define a study design as a road map to follow to answer the research questions the researcher intended.

The application of a study design depends on the nature of the study problem being studied, the researcher's design experience and the subject of the study (Creswell & Creswell 2018:49). Study design is also described as a plan to conduct research to answer research questions. A study design is a method or guide developed by a researcher to show how a study proceeds to answer the questions of the study (Polit & Beck 2018:210).

According to Yin (2016:83), a research design is a logical study design that addresses the questions raised in the study, the data collected for the resolution of the questions, the data collection strategies and the data analysis plan of the study that show that the purpose of the study has been achieved. The design of the study shows the research activities in time and space and ensures effective data collection by efficiently setting goals (Kothari & Garg 2019:30).

According to Yin (2016:20), phenomenological qualitative design studies are as credible as possible, especially if participants can express themselves in their own words, emphasise life experiences as interpretive or interpretive analysis and explore and explain research objectives. Answers to event and survey questions are based on the views of participants assigned to a particular event.

Identifying the management or control of challenges by examining the attitudes and experiences of healthcare professionals in the management and control of leprosy and identifying the preconditions for leprosy were the main purposes of this study and produced the initial understanding of the phenomenon. At the healthcare level, links are expected to be created to develop appropriate strategies for improving leprosy prevention activities.

3.3.1 Exploratory research design

Exploratory research seeks to understand the root cause of a problem. As explained by Creswell and Creswell (2018:162) and Polit and Beck (2018:47), if information about the area of the topic under investigation is limited, researchers may conduct exploratory qualitative investigations to investigate the nature of the phenomenon under investigation and evaluate various factors associated with the phenomenon. The main purpose of this reveals how the phenomenon manifests itself before explaining it.

During the study, the researcher read and collected articles from previous studies to investigate his findings on the challenge of the early detection of leprosy cases in contacts with index leprosy cases. However, the researcher decided to look at his personal experiences with the participants as the literature did not comprehensively address the challenges of the early detection of leprosy.

In the context of leprosy case management and the challenges of the early detection of leprosy cases among contacts with leprosy cases, the participants were interrogated on strategies within their work context through unstructured individual in-depth interviews. The findings supported the researcher's desire to develop user-friendly strategies to enhance existing ones that would improve and produce a more effective early detection of leprosy cases.

3.3.2 Descriptive research design

A descriptive study design is about discovering and portraying thoughts in real-life situations or in situations, problems, phenomena and problems under investigation – the how, who, what, where and when of circumstances and occasions that happened. The purpose is to explain what is prevalent by asking questions about situations and opportunities (Babbie 2016:91; Polit & Beck 2017:304; Walliman 2018:26).

According to Bloomberg and Volpe (2018:93) and Burns and Grove (2017:86), qualitative research focuses on answering the questions of what and why and is a preferred way to explain various aspects of the subject under study. It is a method of understanding the opinions and attitudes of the researchers on a particular subject under investigation.

Such a framework was used in this study to enable a research approach involving each participant's description of leprosy case management and the challenges of the early detection of leprosy cases among contacts with leprosy cases. The strategies the participants use, and their acceptably wise recommendations would strengthen the design of leprosy control procedures to develop an effective strategy for the early detection of leprosy cases.

In the course of data collection, the researcher urged participants to provide a complete account of their experiences associated with leprosy case management and the early

detection of leprosy. After obtaining answers to a few questions, the researcher asked follow-up questions to allow participants to further explain their thoughts and feelings.

3.4 RESEARCH METHOD

In this study, the methods used to explore and describe healthcare workers' understanding and experience during early leprosy case detection involvement, to describe and critically analyse reasons for leprosy early detection challenges faced by health workers, and to assess the healthcare system's experiences in the provision of the early detection of leprosy cases in the Sidama region.

Kothari and Garg (2019:6) and Yin (2016:3) state that in understanding how people are resilient to their real world in the natural environment, qualitative research allows for in-depth exploration to reveal the richness of context and complexity that is built into people's lives in a multicultural context. Rossman and Rallis (2017:98) indicate that statistics show that in-depth interviews or extended observations or some combination of both is a normal human-face interaction that can reveal findings.

Part of the research methodology in the study contains the detailed process taken to collect data. It usually begins with a course description, a data collection tool, data analysis techniques and other administrative procedures used in the research (Creswell & Creswell 2018:40; Walliman 2018:53). Therefore, this part of the study provides an overview of how the researcher managed technical, procedural and administratively to continue the research towards results.

In this study, the research approach was guided by the research objectives. Identification of relevant resources such as population and research environment, sampling, data collection and analysis of data were used in this study activity. Throughout the process, the data collected were accurate and reflected the reality of the participants' conditions in the early detection of cases of leprosy. Research information was requested from medical professionals at the target medical facilities in a general environment where participants usually collect experience in day-to-day work. Data collection was based on methods that could provide reliable results.

3.5 STUDY AREA SETTING

Ethiopia is located in the north-eastern part of Africa, also known as the Horn of Africa. It is bordered by Sudan and South Sudan on the west, Eritrea and Djibouti on the north-east, Somalia on the east and south-east and Kenya on the south. Ethiopia lies between the Equator and Tropic of Cancer, between the 30° N and 150° N latitude and 330° E and 480° E longitude. The country occupies an area of 1.1 million km² and water bodies occupy 7,444 km².

Ethiopia is a country with rich geographical diversity that includes rugged mountains, flat-topped plateaus, deep gorges and river valleys. Over the ages, erosion, volcanic eruptions and tectonic movements have contributed to the nation's diverse topography. More than half of the geographic area of the country lies 1,500 m above sea level. The highest altitude is at Ras Dashen (4,620 m above sea level) and the lowest altitude is at Danakil (Dallol) Depression (148 m below sea level) (FDREMoH 2021a:15).

According to the FDREMoH (2021:15), as indicated by the Central Statistics Agency (2013), population projections for Ethiopia from the 2007–2037 estimation, will see the population reach about 101 million in 2020. Ethiopia is the second most populous country in Africa and ranks 12th in the world.

Ethiopia is home to various ethnicities with more than 80 different spoken languages. The country is characterised by rapid population growth (2.6%), a young age structure, a high dependency ratio and a high rural-urban differential. Ethiopia has a high total fertility rate of 4.6 births per woman (2.3 in urban areas and 5.2 in rural areas) and a corresponding crude birth rate of 32 per 1,000 in 2016. The average household size is 4.6. By 2024, the population is projected to reach 109.5 million (Central Statistics Agency 2013) and will reach 122.3 million by 2030. Children under the age of 15 years and individuals in the age group of 15–65 years account for 47% and 49% of the population, respectively. Only 4% of the population is above the age of 65 years. The sex ratio between males and females is almost equal and women of reproductive age constitute about 23% of the population. Nearly 80% of the population lives in rural areas and mainly depends on subsistence agriculture.

This study was conducted in Sidama regional state in southern Ethiopia (Figure 3.1). The region is located between 6°14' and 7°18' N and 37°92' and 39°14' E with altitudes ranging from 1,200 m to 3,211 m and is one of the largest and most densely populated

areas of southern Ethiopia with 533 persons/km². Sidama regional state is one of the 10 regions in Ethiopia and is located 275 km south of Addis Ababa, the capital of the country.

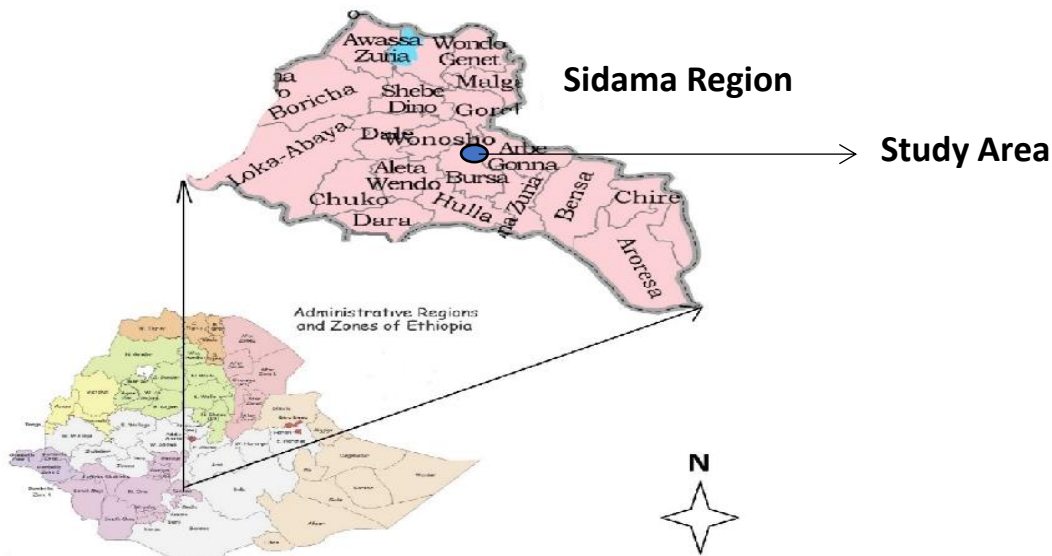


Figure 3.1 Position of Bursa woreda on the Sidama region map

The Sidama region consists of six town administrations and 30 districts with an overall 576 kebeles (lowest administrative units in Ethiopia with approximately 1,000 households). Based on the Ethiopian Population Census Report 2007 estimates, the overall population of the region in 2020 reached 5,493,516. The native Sidama language is spoken by 95% of the population. More than 84% of the population is protestant in their religion and the traditional religion followers constitute almost 3% of the total population (Central Statistical Agency: 2019.)

The Sidama regional state has 5,806 health professionals of diverse disciplines overall, 624 health posts, 127 health centres, two general hospitals, 13 primary hospitals and 1 comprehensive and specialised hospital owned by the government. There are also 32 private medium and six non-governmental organisation (NGO) clinics and 73 private drug stores. The physical health service coverage of the region was 90.3%. Hawassa city is the capital city of the Sidama regional state.

This study was conducted in Bursa woreda. Bursa is the name of one of the woredas in Ethiopia's Sidama region. Bursa's neighbours are Hulla in the south, Aleta Wendo in the west, Wensho in the north-west, Arbegona in the north-east and Bona Zuria in the south-east.

According to the CSA's 2007 Census, Bursa woreda has a total population of 103,631 of which 51,731 are males and 51,900 are women; 2,304 people (2.22% of the population) live in cities; 88.63% indicated that they were Protestants, 6.25% practised traditional faiths, 1.18% were Catholic and 1.77% were Muslims (Central Statistical Agency. 2019).

In the Bursa woreda in 2020, there were 22 public health facilities (3 health centres and 19 health posts). Farming is a traditional activity, even though it is a significant economic sector in the region. False bananas, barley, khat, coffee, broad beans, grains and livestock are the principal crops farmed in the region. Unimproved drinking water sources, poor sanitation and recurrent droughts in the area, which result in a high burden of infectious diseases – including leprosy, were the main health issues in the study area, according to a report by the woreda's Health Bureau Statistics (Areru, Dangisso & Lindtjörn 2020:2; Bursa Administration; Yoseph, Tamiso & Ejeso 2021:3).

3.6 POPULATION AND SAMPLING

3.6.1 Source population and study population

A population is a group of people about whom a researcher wants to draw conclusions. The entire number of the items that are the subject of the study is referred to as the study population. A population is defined as a group of people, things or phenomena about which researchers are interested in learning more (Brink et al 2018:116; Burns & Grove 2017:516; Polit & Beck 2017:365; Walliman 2018:144). Population elements are the specific people, things or phenomena that make up the population.

The population varies depending on the sort of study and a researcher's desire to understand the stated challenges of the objectives (Babbie 2017:202). All those who fit the requirements for the research are referred to as the target population. The portion of the population to which the researcher has reasonable access is known as the target population (Burns & Grove 2017:516).

In this study the population consisted of health care workers(health centre Head chief executive officers (CEO), district health office TB/ Leprosy experts, Regional Health Bureau level TB/ Leprosy experts, health centre OPD Health workers, health centre TB/ Leprosy focal, Community health extension workers) providing Leprosy Prevention and Control Program in the selected area. The researcher obtained staff lists at the study

Region Health Bureau and purposively selected the participants from the lists. Purposive sampling was used to select participants who could provide information-rich data (Merriam & Tisdell 2016:96). The researcher selected 23 health workers providing Leprosy Prevention and Control Program as participants (Polit & Beck 2017:705). Due to information saturation, a total of 12 individuals were interviewed in this study.

3.6.1.1 Study population

All health workers (health centre Head chief executive officers (CEO), district health office TB/ Leprosy experts, Regional Health Bureau level TB/ Leprosy experts, health centre OPD Health workers, health centre TB/ Leprosy focal, Community health extension workers) at the selected and accessible health facilities who were likely to be sufficiently knowledgeable and who had had experience in the management of leprosy cases and programmes by virtue of being able to meet the selection and inclusion criteria set by the researcher were the study subjects.

3.6.2 Inclusion and exclusion criteria

3.6.2.1 Inclusion criteria

Inclusion criteria specify the characteristics that a prospective participant must have to be considered eligible for a study (Polit & Beck 2018:552). In this study the following inclusion criterion was set:

- All health workers who were likely to be sufficiently knowledgeable and have experience in leprosy case management and programmes.
- Health professionals who had training on leprosy

3.6.2.2 Exclusion criteria

Exclusion criteria specify characteristics that a population does not have (Polit & Beck 2018:548). In this study, the following exclusion criteria were set:

- Health workers who were not sufficiently knowledgeable and who had not experienced leprosy case management and programmes.
- Health professionals who had not training on leprosy
- Health workers who were unwilling to participate in the study.

The researcher was likely to receive the necessary information from the target group regarding the difficulties in early leprosy case detection and problems they ran into while working at medical facilities (health centres and health posts). Depending on the saturation of the information, the projected target population from the targeted healthcare facilities was determined.

3.7 SAMPLING METHOD

The sampling method in qualitative research approach is to select cases that will most advantage the study (Polit, & Beck, 2017: 696). Creswell and Creswell (2018:185) reveal qualitative sampling as intentionally selecting study subjects that will help the investigator best in understanding the issue and the investigation enquiry.

The present study used a non-random sampling method. A purposive sampling method was used to select health centre Head chief executive officers (CEO), district health office TB/ Leprosy experts, Regional Health Bureau level TB/ Leprosy experts, health centre OPD Health workers, health centre TB/ Leprosy focal, Community health extension workers. The population from which the sample was drawn was chosen based on their unique qualities that would enable the researcher to answer the research questions necessary to meet the needs of the study (Bazeley 2015:49; Etikan, Musa & Alkassim 2016:2). Individuals having experience in the research issue of interest made up these study subjects. The selection of the sample was based in part on the features of the health professionals who had sufficient training and experience in working with leprosy patients.

3.7.1 Sample size

Calculating sample size in qualitative research is not subject to any specific rules or standards. Thus in qualitative research, the sample size is typically determined until the data are saturated and no new information is revealed (Polit, & Beck, 2017:702). The number of study participants is known as the sample size and, according to Creswell and Poth (2018:478) and Polit and Beck (2018:243), the size of the study participants is determined by the information needs of the research and guided by the principles of data saturation – the researcher stops sampling when no new information is revealed.

No strict guidelines for sample size exist in qualitative research; instead, it is determined by the researcher's interests, the objectives of the study, his or her assessment of the

people who will be able to provide information on the phenomenon being studied, the veracity of the data gathered and the amount of time and other resources that can be allocated to the project (Brink 2016:143). When conducting a qualitative study, the researcher rarely has prior information on the larger population or group from which the sample must be drawn (Polit & Beck 2017:497).

According to Corbin and Strauss (2015:157) and Flick (2018:381), the decision to stop collecting additional samples for the study depends on the saturation of the data. This means that the selection of additional samples for the study comes to an end if a researcher determines that the data provide no new insights into the phenomenon being studied. This works well in exploratory studies when the goal is to examine opinions and concerns about the research topics from the perspectives of the study participants. To answer the research questions, exploratory methods were used in this study.

Several variables affect the ideal sample size needed to reach data saturation. To quantify data saturation, one must consider the breadth of the research questions, the data quality, the features of participants' experiences, longitudinal data collecting, the type of sampling approach used and the style of qualitative inquiry (Corbin & Strauss 2015:157; Polit & Beck 2018:293).

The researcher moved back and forth during the data collecting process, comparing the data constantly to determine when data saturation had been reached and whether additional data collection and/or analysis was not required in light of the previously gathered and/or analysed data. Saturation is described by Morse (2015:587) as "the most often cited assurance of qualitative consistency supplied by authors". Hammarberg, Kirkman and Lacey (2016:500) contend that data saturation can be avoided by minimising the usage of one's own perspective while gathering data for the study. The data saturation of this study was identified through ongoing data comparison.

According to Polit and Beck (2018:293), phenomenologists frequently favour participant samples of 10 or fewer, with a focus on those who have first-hand knowledge of the phenomenon and can describe what it is like to have experienced it. The pioneer Morse (2015) recommended at least six interviews for phenomenological studies and 30–50 interviews for ethnographic studies and grounded theory studies. Creswell and Poth (2018:128) have continued this approach by referencing Polkinghorne's advice that researchers speak with 5–25 people who have all encountered the phenomenon.

As a result, the amount of information available throughout the data collecting period was a factor in determining the sample size for this study.

3.7.2 Pilot study

Pilot studies are small-scale trials of a research interview or observation (Walliman 2018:286). The major goal of doing a pilot study is to perfect the data collecting instruments so that study participants will have no trouble answering questions and that the data collection will go without a hitch. Before completing the actual data collection, pilot studies are crucial to make sure that the interview questions can elicit meaningful information so that adjustments may be made (Burns & Grove 2017:109).

Focus groups, in-depth interviews and one-on-one interviews can all be used as pilot tests (Salazar, Crosby & DiClemente 2015:388). Pilot studies are crucial for the researcher to evaluate the interview or focus group instructions on study participants similar to those in the actual study (Trolley et al 2016:123) . A pilot study allows the researcher to determine whether the data acquired will meet the research objectives by ensuring the examination of the number of individuals who are accessible and the acceptance and practicality of the study techniques.

One district health office, one health centre and one health post that were not among the chosen study sites for the actual research were used for the pilot study. From the corresponding health posts and health centre offices, medical physicians, health officers, nurses and HEWs were chosen. Through this exercise, the researcher became more comfortable with the data capturing tools, such as the audiotape recorder, and was able to better estimate the time needed to conduct the interviews as well as enhance the interview guides and questions.

3.7.3 Findings from piloting

The researcher discovered that the participants had a clear understanding of the questions, the audiotape was in good working order and the information could be retrieved and transcribed with ease.

3.8 DATA COLLECTION

3.8.1 Data collection approaches, methods and processes

The process of acquiring information from numerous data sources is known as data collection (Plano Clark & Creswell 2015:337). Transcripts of the digital audio recording of the in-depth interviews and field notes served as the data sources of the study (Gray, Grove & Sutherland 2017:268). The goal of qualitative research is to gain a thorough grasp of the study issue by gathering data from a small number of individuals. In a qualitative study, participants are typically chosen on purpose to obtain in-depth information on the study that is being examined. When conducting qualitative research, study questions for particular variables are not predetermined. As fresh concepts and understandings are discovered during the data gathering, questions could be expanded or added (Plano Clark & Creswell 2015:64)

According to Creswell and Creswell (2018:124), one method of gathering data entails speaking with people who have first-hand knowledge of the occurrence. Interviewing is referred to as “a basic type of human action in which language is used between two human beings in the pursuit of cooperative inquiry” (Gray, Grove & Sutherland 2017:379).

Before any data were gathered, participants were given and had to sign informed consent forms. The individuals' preferred language was used during the interviews. To protect the participant's privacy and confidentiality, the interviews were held in a private space. To further maintain confidentiality, code names were used rather than real names.

3.8.1.1 Individual in-depth interviews

Individual, face-to-face (in-depth), unstructured interviews were used to gather the data. Unstructured interviews frequently begin with a wide, open question about the topic of the study, with the participant's comments influencing the questions that follow (Creswell 2015:213). When researching sensitive, taboo and culture-related topics, unstructured interviews are the best means of gathering data.

An in-depth interview is described as an intellectual dialogue between a researcher and a respondent to generate information about participants' feelings, opinions, values, attitudes and beliefs regarding their own experiences by allowing participants to talk freely about their lives (Trolley et al 2016:41a). An interview is a good way to gather rich and detailed information about participants' lives (Brinkmann & Kvale 2015:4; Rossman &

Rallis 2017:304). It is also a good way to create knowledge that was built during the interaction between the interviewer and the interviewee and is well suited to understanding conditions. This approach aims to delve deeper and, if necessary, clarify issues.

Face-to-face interviews with one participant at a time were conducted by the researcher acting as the interviewer. Interviews with the participants continued until no further data could be gathered due to data saturation (Flick 2018:381). In this study, a traditional individual interview with one main question was used. In this example, the experiences of working in leprosy control at health facilities were especially helpful for addressing the broad issue. In response to the information provided by the participants, probing questions were employed. The nuances of leprosy control efforts were better understood as a result of these in-depth interviews. This method of collecting data allowed the researcher to examine each person's beliefs, experiences and personal details (Plano Clark & Creswell 2015:339).

The researcher actively engaged the participants throughout the interviews by focusing all of his attention on them, which helped to gain more understanding of leprosy control. The 'human instrument' for data collection was the researcher. To minimise potential errors and capture non-verbal cues, such as hesitation and pauses, the interviews were transcribed verbatim after being tape recorded with the interviewees' consent. The audiotapes allowed the researcher to frequently review the data for confirmation when reviewing later (Bryman & Edward 2018:97). Interviewers must ensure that participants understand their roles while being non-judgemental, empathetic and open to other viewpoints.

A preliminary interview is a qualitative, in-depth, unstructured interview in which the interviewer looks for areas or subjects that are important to the participants and the investigator looks for cues as to which areas should be investigated and which should be left out (Bell & Waters 2018:218). Additionally, Creswell and Poth (2018:128), with reference to Moustakas, endorse that participants are asked the following two broad, general questions: 'What are your personal experiences with the phenomenon?' and 'What environments or circumstances have usually shaped or affected your perceptions of the phenomenon?'. Other open-ended questions could also be posed but these two in particular concentrate attention on acquiring information that will help create a textual and

structural description of the experiences and, eventually, help reveal the common experiences of the participants.

The researcher set up the data collection using a form he created. The form was divided into two sections; the first asked for demographic data on the participants and the second asked them to write about their personal experiences with leprosy control efforts. The required demographic data was based on the professional qualifications of the participants, including their professional sub-theme and years of experience.

As a result, the researcher posed the following question to the participants: What is your experience with leprosy control activities, specifically with regard to the early detection of leprosy among contacts of leprosy cases and what are the most typical difficult issues with leprosy control strategies? By asking follow-up questions, seeking clarification and restating or paraphrasing the participants' opinions and sentiments to show understanding, probing was used to gather more details and, where necessary, to clarify answers. The researcher's desire to comprehend the participants' experiences to develop methods to improve the regulating systems associated with their issues served as the inspiration for this approach to participant interviewing.

These kinds of interviews are consequently free-flowing and permit some degree of flexibility between the interviewer and the interviewee (Brink et al 2016:158). The level of in-depth investigation was raised through probing and follow-up questions. As they demonstrated the researcher's sincere interest in comprehending the participants' personal accounts of events, they improved the connection between the researcher and the participants. In addition to taking field notes, the researcher also used a voice recorder to get information that might have been missed and to allow the researcher to ask the same questions to other participants (Flick 2018:365). The interviews were held in locations that were easily accessible to participants.

3.9 DATA ANALYSIS

The vast amount of data that was gathered had to be summarised, and coded and the results presented in a way that communicated the key conclusions of the analysis (Creswell & Poth 2018:248). The objective of the qualitative data analysis was to structure, give meaning to and extract meaning from the data to share with others through novel insights that were gleaned about the state of the human condition (Polit & Beck 2017:742). In the present study, data analysis explains how the researcher found pertinent themes, came to comprehend them and produced meaning from the data.

Qualitative data, which can include quotes, transcripts, observations, field notes and excerpts from documents such as images and newspaper articles, are the result of data sources (participants, documents organisations, electronic media and events) (Burns & Grove 2017:427; Creswell & Creswell 2018:194). The transcripts and extended field notes obtained from study participants served as the qualitative data. Before the conclusion of the data gathering, the data analysis was started (Polit & Beck 2017:742).

After the conclusion of each interview, the researcher listened to the audio files and reviewed the expanded field notes and transcripts which were then available for use. This aided the researcher to make the required adjustments and improvements for the following interviews. The expanded field notes, audio recordings and transcripts were the primary sources of qualitative data that were generated and used for analysis in the current study. The research assistants enhanced the field notes by transcribing the audiotape recordings of the in-depth interviews and preparing the transcripts for analysis. As a result, extended field notes and the transcriptions of the audiotape recordings were used to create the interview transcripts.

The Amharic transcripts were directly translated into English by the researcher. A co-worker of the researcher, who is fluent in both English and Amharic, verified that the English and Amharic transcripts were consistent. As the researcher read the Amharic transcripts and their English versions often during the process, he became familiar with the concepts through his involvement in the translation and his part in the interview transcription.

The approach used in the current study was inductive thematic analysis. A bottom-up approach was used to build patterns, sub-themes and themes to organise abstract units of information so that the themes that emerged in this analysis were firmly grounded in

the data (Creswell & Creswell 2018:181). Inductive thematic analysis uses little to no predetermined theory, structure or framework to analyse data.

A data reduction and analysis technique known as thematic analysis involves coding, categorising, summarising and reconstructing qualitative data to identify the fundamental ideas included in the data. Writing a word that represents a sub-theme in the margins is known as 'coding' which is the formal depiction of analytical thought (Rossman & Rallis 2017:461).

The thematic analysis made it easier to find patterns in the qualitative data and described those patterns as well as the overall structure that linked them (Vaismoradi, Jones, Turunen & Snelgrove 2016:101). To gain fresh insights from the study, the researcher analysed the information already available and, when necessary, obtained additional data. As the researcher interacted with the data, patterns, sub-themes and themes were revealed. The ATLAS.ti 8 qualitative data analysis programme was used to conduct the qualitative data analysis.

Creswell and Creswell (2018:192) used computer software designed for the analysis of qualitative data to assist with their annotation, coding, sorting and other required manipulation of data as well as to store a record of all those actions. In particular, the researcher chose the ATLAS.ti 8 qualitative data analysis software because of its potent capacity to analyse large amounts of textual data. An interview of 45–60 minutes was conducted with each of the participants.

3.9.1 Steps in data analysis

3.9.1.1 Phase I data analysis

During the interview at the research location, Phase I of the data analysis was conducted. Preliminary data analysis comprises analysing the data as they are gathered during interviews. To document the interview, the researcher carried a tape recorder. The researcher dissected the participant-provided descriptions into meaning-laden phrases that were crucial to the construction of the phenomenon under study.

Steps in data analysis

This study followed the six steps of the inductive thematic data analysis technique that describe data in rich detail through identifying, analysing and reporting themes within the data following a bottom-up approach. The steps are transcription, clustering similar data,

and coding, developing themes, defining and naming themes and producing the report. The phases described in the inductive thematic analysis are just a guide for the analysis and there is no hard and fast rule to follow one step from the other. Going back and forth in the phases is also a possibility depending on the need (Polit & Beck 2018:392)

Step 1: Familiarising yourself with your data

The first step in the analysis of qualitative data is to immerse oneself into the data through reading and rereading the transcripts and the filed notes. This step starts from the very first day of data collection. The researcher benefits by familiarizing themselves with the transcripts' content and the ideas concealed within the text. Additionally, it enabled the researcher to assess the data's quality and determine whether they were adequate for an empirical analysis. If there are issues with the data being collected, the questions and the way the questions are asked can be adjusted as needed. In addition, during this phase, the researcher conceptualised ideas about the kinds of categories and themes to emerge (Trolley et al 2016:145). Polit and Beck (2018:392) also stated that a thorough reading of the transcripts and the filed notes is the primary step of qualitative data analysis which will help the researcher to try to understand the depth and the breadth of the data collected.

Step 2: Generating initial codes

Line by line examination of the transcripts is required for coding in order to identify concepts and assign words or phrases to them. These words or phrases can be directly taken from the text which is called in Atlas.ti coding, or it is directly based on the data. These initial codes can also be revised or modified over the period of analysis (Walliman 2018:194). Similarly, a code is also described as a word or short phrase that summarises or captures the main essence of the transcripts (Saldana & Omasta 2017: 181)

Step 3: Searching for themes

Thematic analysis starts in Phase 3 when all data have been initially coded and collated, and the researcher has obtained a long list of the different codes you have identified across your data set. During the development of themes, other subthemes can emerge. Those sub-themes which cannot be collated into one big theme could become a different theme.

Step 4: Reviewing themes

This stage starts once we finish producing the initial themes. Themes will be revised here to make sure that the codes described under each theme actually fits in that specific theme. On this stage, big themes can be divided to make two or more themes. Additional sub-themes can also be developed within a theme. Codes which are identified not fit in that theme will be placed in other suitable themes or they can form sub-themes and theme by themselves. On this stage, all themes will also be revised to make sure that they actually represent the data set. If not, recoding and redeveloping of themes will follow. Once we finish reviewing the themes and sure about the themes represent the data set, Phase 5 will commence (Saldana & Omasta 2017:319).

Step 5: Defining and naming themes

On this stage the themes developed are described on what each of them is about and what aspects of the data each captures. This stage also requires going back to the collated data to make sure that they can be fit in within the theme. In the end, the themes can be refined to tell the readers concisely on what they are bout (Saldana & Omasta 2017:319).

Step 6: Producing the report

This stage focuses on writing the story of the data set contained in each theme in a plausible way without losing track on the actual meaning of the data. To support the story the data convey, enough excerpts should also be reported to support the analysis. On this write up phase, the researcher also describes his argument about the findings in relation to the research objective and give meaning and interpretation to the collated codes in each theme (Sparkes & Smith 2018:126).

3.9.1.2 Phase II data analysis

Phase II involved the creation of tactics to enhance early leprosy case detection before the onset of Grade II impairments and deformities and to stop the method of transmission. The empirical data that were gathered and examined during Phase I served as the foundation for the formulation of the strategies. The analysis and synthesis of the Phase I data led to the development of the present main objective of the study which was the creation of a strategy to increase early leprosy case detection.

The perceptions and experiences regarding the management of leprosy cases, difficulties encountered with currently employed strategies and suggested strategies to improve the

early detection of leprosy cases explored in Phase I included a variety of suggestions and recommendations which were eventually categorised into themes. This made it possible for the researcher to identify and define the goals and parameters of the strategies. The topics found in this study were used to construct draft strategies.

Draft strategies were created, complete with strategy declarations and justifications for their existence. The draft strategies were condensed made operational and developed into transitory plans before being presented to a panel of managers and health professionals for review and validation. Before they were finalised, the transitory techniques were validated by knowledgeable health professionals and managers. Some of the first participants in Phase I as well as other experts heard the researcher's presentation of the tactic. Following advice on the verified temporary strategies, the final plan was created.

3.10 MEASURES FOR ENSURING TRUSTWORTHINESS

The degree to which the findings of a study can be regarded as valuable indicates the rigour of qualitative research. The researcher used the framework for trustworthiness in qualitative research developed by Lincoln and Guba to establish trustworthiness (Polit & Beck 2018:415; Saldana & Omasta 2017:367). The credibility of the study was established by observing the criteria for dependability, confirmability and transferability. The internal validity, reliability, objectivity and external validity of the research are positivists' four trustworthiness criteria, and these four criteria are similar to those of positivism (Polit & Beck 2018:415).

3.10.1 Credibility

Credibility is the cornerstone of any assertion that the qualitative research evaluation standards are reliable. Credibility is the degree to which the qualitative researcher is convinced that the findings of the study are true from the perspectives of the participants, the researcher and the readers/evaluators (Creswell & Creswell 2018:274). For findings to be considered credible, they must accurately reflect actual experiences (Fain 2015:249). This was accomplished in this study using a variety of activities requiring sustained engagement.

The long-term involvement of the researcher in the study region and sufficient contact with the participants enabled a deeper understanding of their culture, language and perspectives. Additionally, it assisted him in gathering sufficient data up until the point where additional information could no longer be obtained (Brink et al 2018:111; Creswell & Polit 2018:340; Mandal 2018:529; Polit & Beck 2018:418; Yin 2016:86). This approach is supported by Creswell and Creswell (2018:275), who claim that sustained interaction between the researcher and the study subjects gives the researcher an excellent opportunity to comprehend and characterise the phenomenon under inquiry and so ensure the credibility of the study. In this study, the researcher interviewed the study participants for a sufficient amount of time in the study area until no other information could be gleaned from the interviews.

To make the results more reliable, the researcher conducted regular face-to-face sessions for peer debriefing. One method of guaranteeing the quality of qualitative research is peer debriefing. The researcher's findings were examined by a researcher with more expertise in qualitative research techniques (Creswell & Poth 2018:343; Polit & Beck 2018:422). The expert was given a draft report by the lead researcher outlining the data that had been collected, sub-themes and themes; the interpretations of the report were discussed with the expert during in-person meetings.

The peer debriefing encouraged enhancing accuracy of the account and for objective assessment of the study, thus the researcher to delve deeper into the data to fully comprehend the participants' viewpoints and address methodological problems. The first aim was to obtain a feedback of a critical review from a neutral opinion regarding the researcher's method selected to collect data and its relevance to achieve the purpose of the study (to know whether the method was seen as capable of accommodating the unpredictable situations. The second aim was to have the transcripts checked if they did not contain obvious errors, and that codes matched well with the sections of data for which they were assigned (an independent coder participated in data analysis with valuable input). Well experienced in qualitative research methods were reviewed the findings of the researcher (Polit, & Beck, 2018:422; Creswell, and Poth, 2018:343). It also helped the researcher to keep any bias out of the study. Involving a peer debriefing to analyse and discuss the study and raise doubts about it, say Polit and Beck (2018:422), improves the veracity and authenticity of the narrative. Peer debriefing and review are used to enhance accuracy of the account and for objective assessment of the study.

To avoid bias and any incorrect interpretation of the data in the current study, the researcher discussed the findings with colleagues from universities who had experience in conducting qualitative research. An independent coder participated in data analysis with valuable input. The researcher also presented the findings and interpretations of the data to colleagues who are experts in the field of study, revealing aspects of the study that had previously not been revealed. All required actions were performed based on their comments. The developed strategies were sent to five external experts in the program for validation

3.10.2 Dependability

One of the factors for determining whether qualitative research can be trusted is dependability. This defines reliability as the continuity of information across time and environments as well as the constancy of data throughout time and circumstances (Hammarberg et al 2016:500; Polit & Beck 2018:416). Once credibility has been established, the requirement for dependability is satisfied. Reliability can be evaluated by a third party that is not familiar with the researcher or the study (Creswell & Poth 2018:342; Mandal 2018:529).

To increase the dependability of the data, data were gathered from reliable sources. Participants in this study who were health professionals took part in in-depth interviews. The reader has the opportunity to fully grasp the rigour of the research techniques suggested by Flick (2018:187) since the data from this instrument were provided in detail.

3.10.3 Confirmability

In qualitative research, the researcher is acknowledged as having a central role in establishing the research questions, interpreting the data and directing the research process. Confirmability is a qualitative researcher's similar concern with the accuracy, significance, meaning and relevance of the data (Brink et al 2018 159; Polit & Beck 2018 116). It also refers to the degree of confidence that the findings relate to the participants' narratives, and it can also be achieved through an audit trail in which an independent reviewer is invited to verify the research process and interpretation of data as consistent with the literature.

Researchers must demonstrate that the findings of a study are directly related to its conclusions in ways that can be duplicated as a whole to attain confirmability (Moon,

Brewer, Januchowski-Hartley, Adams & Blackman 2016:2). Based on the findings of the study, conclusions were drawn. In this study, the researcher remained true to the ethical and scholarly requirements, keeping field notes, audiotape recordings, codes and themes in a secure location long after the research was published.

3.10.4 Transferability

The last component of qualitative trustworthiness is transferability. Researchers describe the locations and the environment of their research in great detail in qualitative studies. This makes sure that readers are given enough information about the context of the study so they may decide for themselves whether the findings apply to other research contexts or not (Mandal 2018:529).

Generalizability is not a concern of qualitative research (Polit & Beck 2018:426) but rather the relevance of the findings to various contexts and settings as well as the accurate portrayal of the participants and environment are emphasised. A thick description is described as a rich, point-by-point, thorough and intensive portrayal of the research backdrop, the study participants and the events and experiences discovered during the inquiry (Creswell & Creswell 2018:200); Creswell & Poth 2018:343).

Hammarberg et al (2016:500) claim that, in qualitative investigations, larger sample sizes may not always imply increased transferability. The quality of the data is more important than the sample size. This is because having too much data may prevent accurate analysis. In qualitative research, sample sizes are typically modest. In qualitative approaches, saturation is frequently used to signal when the sample size has been reached.

To ensure that readers fully comprehend this study and can draw their own conclusions on the transferability of the findings, every technique was described in-depth.

3.11 ETHICAL CONSIDERATIONS

The main goal of the ethics review is to safeguard all parties – participants, institutions, funders and researchers – participating in the research for as long as possible, including during the dissemination process. Integrity in research is closely related. A researcher must carefully evaluate various ethical considerations that may come up during the planning, execution and reporting of any research inquiry involving human participants (Smith, Morrow & Ross 2015:99).

Daily ethical values frequently direct researchers in decisions regarding what to research, how to conduct research and with whom to conduct research. Moral criteria in ethical standards are defined as recommendations for controlling interactions with people and obtaining ethical approval from professional or academic groups before beginning the actual data collection (Polit & Beck 2018:416). According to Bryman and Edward (2018:66), ethics include the worries, conundrums and disagreements that result from conducting research in a morally acceptable manner.

Researchers have a responsibility to watch out for the rights of study subjects to maximise the benefits of their work and reduce any negative effects. To uphold clients' rights, participants need to be treated with kindness and respect and other standards necessary to protect human participants need to be implemented (Burns & Grove 2017:111). Human volunteers were used in the current study. To minimise injury to the subjects, the researcher used the ethical guidelines and concepts proposed by Burns and Grove (2017:111) and Johnson and Christensen (2018:384). The rights of both institutions and participants were upheld.

3.11.1 Permission to conduct the study

The institutional review boards at Hawassa University College of Medicine and Health Sciences and the UNISA Department of Health Studies Higher Degrees Committee both granted their approval for the study (Annexures 2 and 1). Bursa woreda's health department received a letter of support from the Sidama Regional Health Bureau (Annexure 3). The Bursa woreda health department subsequently composed a letter endorsing the district health facility of choice (Annexure 4). The study was finally permitted to be conducted in the chosen health centre and health posts by the district health facility directors and administrators of the health posts. The letters of support and certifications of ethical clearance are appended to the current study.

3.11.2 Informed consent

Consent that has been informed is the cornerstone of ethical research practices. The participants were informed about the permission form in compliance with the ethical guidelines of the study. This is so that the researcher maintains a level of moral responsibility for the subjects and does not abuse any of the information obtained (Bell & Waters 2018:172; Johnson & Christensen 2018:386).

To obtain informed consent, a researcher must tell the participants of the research study, ensure that they understand and refrain from coercing them into participating against their will. Additionally, informed consent upholds individuals' autonomy (Resnik 2018:115). If the participants of the study felt uncomfortable participating, they were free to leave at any time (Polit & Beck 2018:139). The researcher maintained the study participants' rights, as well as their privacy and sensitivities after they had signed the consent form.

3.11.3 Privacy and confidentiality

The researchers' obligation to maintain the privacy and confidentiality of all information generated and data collected is another of the cornerstones of research ethics initiatives. Bryman and Edward (2018:61) contend that anonymity and confidentiality prevent the disclosure of a participant's privacy. Ideally, participants should have faith that whatever information they share with others will be kept entirely confidential (Polit & Beck 2018:137).

To maintain confidentiality, only the researcher should know the participants' identities (Johnson & Christensen 2018:407). Participants no longer have to worry about their anonymity in the study as a result (Resnik 2018:149). To maintain participant confidentiality, all participant names and addresses were removed from the data collection tools. The information submitted by the participants was kept private and solely used for the investigation. Participants were identified only by codes and audiotape recorders.

The information gathered was held in the highest confidence and was not disclosed to anybody else. After the interviews, the researcher listened to the recordings to determine whether there had been any potential agreement violations. After the study was over, audiocassette tapes were deleted. To protect privacy, only demographic data that was aggregated was reported.

3.11.4 Protection from harm

Researchers must firmly demonstrate that their research subjects are protected from any risk of physical or psychological harm (Bryman & Edward 2018:62). Researchers must take every precaution to anticipate and guard against any consequences that might harm or distress research subjects. The researcher in this study ensured that participants were protected by addressing issues like the freedom to leave the study at any time and assuring them that they would not suffer any harm.

3.12 CONCLUSION

This chapter covered the research design of the study, data collection and analytic procedures, data reliability and ethical issues. The leprosy control activities were explored and described through the use of an explorative and descriptive qualitative study design. Health experts with experience in leprosy control operations participated in the study. In-depth interviews were used to collect the material. The inductive thematic analysis approach was used to examine the data and the ATLAS.ti 8 application was used for the qualitative data analysis. The chapter also covered the steps taken to ensure the objectivity of the research and the use of ethical principles.

CHAPTER 4

EXPLOITATION OF DATA, PRESENTATION AND INTERPRETATION

4.1 INTRODUCTION

This chapter offers the research findings from in-depth discussions with healthcare professionals about their perspectives on early leprosy case detection and related difficulties. Up until the point of data saturation, data were gathered until information became redundant. The goal of the study was to create methods for improving the early identification of leprosy cases. The biographical details of the healthcare professionals are provided first and then the themes and categories that emerged are presented. These themes and categories are then supported by extracts from the verbatim transcriptions of the responses of the participants of health workers who were likely to be sufficiently knowledgeable and have experience in leprosy case management and programmes.

4.2 DATA MANAGEMENT AND ANALYSIS

To investigate and characterise health workers' perspectives and experiences regarding early leprosy case detection and the difficulties experienced by them in the Sidama region, the study used an inductive theme data analysis approach. Twelve in-depth interviews with healthcare professionals working at various levels of the health system were included in the analysis. All of the Amharic-language interviews were transcribed by a skilled translator and the transcriptions were then thoroughly checked by the researcher and a public health expert while they listened to the original audio content. The field notes gathered were also considered with each transcript.

After giving each transcript careful thought and reading them once to familiarise himself with the topics they contained, the researcher went over each transcript and inductively assigned codes to different text segments. All facets of data administration and coding were facilitated by the use of the ATLAS.ti 8 qualitative data analysis software.

Some codes were developed based on an individual's subjective evaluation of the most comprehensive descriptor of the notion present in the transcripts. Additionally, a public

health expert with expertise in qualitative research techniques was provided access to the transcripts to independently develop codes and sub-themes and spot emergent themes. A consensus conference between the researcher and the public health expert resulted in comparisons, revisions and the use of the selected themes and sub-themes as the research findings of this study.

4.3 RESEARCH FINDINGS

All relevant levels of the health system – including the community level, the facility level, the district health office, the regional health bureau and others – provided participants for this study. Everybody was qualified, barring the community-level health professional and all had degrees or higher. Most of the participants had worked on initiatives connected to leprosy for more than five years. The majority of participants at the time of the interview either oversaw a leprosy-related office or directed initiatives to combat leprosy and tuberculosis. Table 4.1 presents the biographical information of the participants in the study.

Table 4.1 Biographical information of participants in the study

Participant code	Age	Sex	Professional sub-theme	Position	Length of experience in years in TB/Leprosy
P1	38	M	Masters in Public Health	South Region Global Fund TB-Leprosy Officer	12
P2	46	M	Masters in Public Health	Sidama Region Health Bureau TB/Leprosy Dept. Head	Over 15
P3	43	F	Masters in Epidemiology	South Region Health Bureau TB/Leprosy Officer	9
P4	50	F	Masters in Public Health	South Region Health Bureau TB/Leprosy Dept. Head	14
P5	29	M	Health Officer	Bursa District Health Office CDC Dept. Head	8

Participant code	Age	Sex	Professional sub-theme	Position	Length of experience in years in TB/Leprosy
P6	31	M	Health Officer	Bursa District Health Office CDC officer	7
P7	37	M	Health Officer	Bursa Health Centre Head	6
P8	40	M	Health Officer	Bureau TB/Leprosy Dept. Head	8
P9	33	F	Health Extension Worker	Health Post Community Health worker	6
P10	37	F	Health Extension Worker	Health Post Community Health worker	7
P11	27	F	Medical Doctor	Bursa Health Centre OPD	3
P12	39	M	Health Officer	Bursa Health Centre OPD	5

4.3.1 Themes

Based on the health professionals' descriptions of their experiences in the early detection of leprosy cases in health facilities, data acquired from the participants were summarised into five topics. The 23 informational sub-themes that were discussed by the participants made up the topics. Based on the participants' descriptions of the situation, the data were categorised into the reasons why early leprosy case detection is delayed and the difficulties of working in leprosy control programmes. Table 4.2 lists the themes and the related sub-themes that emerged.

Table 4.2 Schematic presentation of themes and sub-themes

Theme	Sub-themes
4.3.1.1 Existing wrong beliefs about leprosy disease in the community	4.3.1.1.1 Leprosy as a punishment from God
	4.3.1.1.2 Leprosy as a hereditary disease
	4.3.1.1.3 Leprosy labelled as a wound, ' <i>anatamoo</i> '
	4.3.1.1.4 Leprosy as incurable and involves costly care
	4.3.1.1.5 Leprosy as lifelong transmission
4.3.1.2 Delay in seeking early healthcare behaviour	4.3.1.2.1 Lack of early symptoms awareness among community
	4.3.1.2.2 Lack of health professional clinical knowledge and practice in leprosy cases
	4.3.1.2.3 Leprosy and its social effect
4.3.1.3 Existing practice of the early detection of leprosy cases	4.3.1.3.1 Health facility early detection of leprosy cases
	4.3.1.3.2 Lack of community-level detection of leprosy
4.3.1.4 Challenges experienced and observed during the implementation of leprosy strategies	4.3.1.4.1 Lack of the existence of practice-oriented training
	4.3.1.4.2 Integration of TB and leprosy training
	4.3.1.4.3 Lack of focus or other competing health priorities
	4.3.1.4.4 Inadequate supportive supervision of health facilities

Theme	Sub-themes
	4.3.1.4.5 Multiple tasks for health workers
	4.3.1.4.6 Poor coordination and communication
	4.3.1.4.7 Lack of motivation in health workers
	4.3.1.4.8 Disruption in treatment
	4.3.1.4.9 Importance of training related to leprosy outlined
4.3.1.5 Strategies suggested for overcoming challenges experienced during the implementation of the leprosy programme	4.3.1.5.1 Importance of the early detection of leprosy cases must be emphasised among contacts with index patients
	4.3.1.5.2 Initiation of awareness campaigns
	4.3.1.5.3 Financial support
	4.3.1.5.4 Continuous supervision and monitoring

4.3.1.1 Existing wrong beliefs about leprosy disease in the community

The participants all understood that the bacteria leprae is what causes leprosy, a disease that affects the nervous system, skin, eyes and muscles of the body. As a result, the patient can become disfigured. The participants asserted that the tardy diagnosis of the disease is one of the major factors contributing to the development of deformity (G2Ds).

All participants recognise that the problem of leprosy is getting worse as time passes. Leprosy is seen by the participants as a disease that will always be a public health issue. Participants reported disturbing trends in adult and paediatric leprosy diagnoses, as well as an increase in G II disability cases. It was made worse by socio-demographic factors and beliefs.

4.3.1.1.1 Leprosy as a punishment from God

Participants reported that the community believe leprosy to be a curse for wrongdoings that is passed from parents to their offspring and as a punishment from God for sins committed. In light of that, the community usually prefer going to spiritual places and trying other traditional means

... the community see leprosy as a punishment from God for their sins or for bad deeds at that moment they committed to resulting in seeking for spiritual solutions. This causes irreversible damage of the body because most the time patients came to health facilities after severe and irreversible damage has happened to their body. [P11]

Since the community consider it as a punishment from God, they might go to spiritual places and use holy water ... as I said before, those who think that it is God's punishment stay at home and use ineffective interventions. Therefore, the main thing is what the sick person believes about leprosy and also the community stigma attached to those affected can be huge. [P1]

4.3.1.1.2 Leprosy as a hereditary disease

Another sub-theme that emerged relates to the belief that leprosy is a hereditary disease that passes from generation to generation. A district officer reported the following:

There are still people who see leprosy as a hereditary disease ... one does not tell the other as a result of fear of possible consequences to the next generation like no one will marry from that family assuming whole generation are infected ... We educate the community that leprosy is not a hereditary disease. However, some will not accept that. Those people discriminate leprosy patient on all social events. [P5]

4.3.1.1.3 Leprosy labelled as a wound, 'anatomoo'

Although many shared the idea that the community has a low awareness of the early symptoms of leprosy, other participants explained that the community do recognise the later symptoms and call them by their local name. Also, when there is a history of leprosy within the family or if the disease starts to cause disability, people recognise it. A community-level health worker explained:

When changes start to show in the nails and skin, the community calls it 'anatomoo' [literal meaning is wound] ... So the community identifies leprosy when a person is no longer able to carry out his daily activities. [P9]

4.3.1.1.4 Leprosy as incurable and involves costly care

All participants agreed that many are unaware that the disease has a cure for free.

.... by the way many are not even aware that there are drugs to take and get healed without paying a penny. We had chatted with lately diagnosed clients who told us that they did not know it is curable for free. [P8]

4.3.1.1.5 Leprosy as lifelong transmission

The other awareness-related issues explored relate to the transmission of leprosy. Participants reported that people believe that leprosy transmission is lifelong whether it is treated or untreated. One key participant shared real experience saying

I always talk about an event that surprised me. As a professional, I know that a cured leprosy patient does not transmit the disease. There was a leprosy patient who took complete treatment and was cured from it. Years later he died from another ill condition. The community declined to arrange funeral ceremony of him. His family had a very harsh and agonising time ... at the end, we arranged and buried him ... Unless a person breathes, the disease cannot pass from one to another. A dead body cannot breathe! It is wrong to worry and panic about acquiring the disease from a dead body, indeed it is an irrational and wrong belief. It shows how unaware our communities are ... I commonly share this experience at various sessions. [P1]

4.3.1.2 Delay in seeking early healthcare behaviour

Participants were asked about the level of awareness about leprosy both among the community and health providers. All participants explained that there is a lack of awareness in the general community as well as among most healthcare providers, including tertiary level professionals. G2D is indicative of a delay in the detection of leprosy.

4.3.1.2.1 Lack of early symptoms awareness among community

Interviewed participants reported that early health-seeking practices are low and that that hampered timely intervention and the prevention of leprosy-related complications. Participants agreed that clients come to the health facility when G2Ds are evident. Key participants stated that delaying the seeking of early care was caused by ignorance of

the early symptoms of leprosy and ignorance of the availability of free treatment. Furthermore, ignorance, the absence of pain and being unconcerned are other contributors to the delay in seeking care.

The community feels that they have a disease when the disease progress to advanced stage. They come here when they have a wound. They do not come at early stage. Although patients come for healthcare, they did not expect leprosy. They said that they had a skin spot which was red, tender and swollen. They did not come to health facility early. I would say they have low level of leprosy-related healthcare-seeking behaviour. [P8]

Another participant concurred with this idea, saying

As the manifestations are not severe at early stage, the patients have delayed healthcare-seeking behaviour. The patients stay at home for prolonged time in the early phase. At the early time, it is not painful. As you know, our communities go to the health facility when the disease is advanced and affects their daily living. Mostly, that might lead to late diagnosis and Grade II disabilities ... G II is caused by delayed health-seeking behaviour. [P4]

Another participant said:

... delay to seek care before the diagnosis was made, many patients moving from one healthcare service to another when they did not get better after treatment due to misdiagnoses made. [P6]

A key participant stated:

The main problem is related to the communities' lack of knowledge on the symptoms of the leprosy, its complications, benefits of early seeking and consequence of delayed seeking. Secondly, the community should know that the disease is treatable. As I said before, those who think that it is God's punishment stays at home and use ineffective interventions. Therefore, the main thing is knowledge. [P8]

4.3.1.2.2 Lack of health professional clinical knowledge and practice in leprosy cases

The participants noted a lack of clinical knowledge on leprosy among healthcare providers. In most cases, healthcare providers attend outpatient departments with little or no knowledge of leprosy cases in general. Concerning the early detection of leprosy, most of the participants mentioned that they had misdiagnosed and mistreated cases. Consequently, such a knowledge and skill gap created an inability to detect the early signs and symptoms of leprosy cases. These conditions can lead to a delay in the initiation of treatment, increasing the risk of disability (deformity) and prolonging the risk of infection transmission in the population.

Some of the participants also said that they received integrated TB/leprosy training that lasted for a few days (three to five days). During this training, TB took almost all the time of training and leprosy training was given as an afterthought during part of a day or on half of the final day of the training without considering practical experiential learning.

Disabilities, complications and the continuation of disease transmission are all issues that are impacted by delays in the care and service delivery in medical facilities.

... high-level graduates like the health officers and those who have BSc degrees do not know the manifestations so in the early times they just treat with fungal medications. How do we expect the community to have awareness when they [health professionals] don't have knowledge about leprosy? [P4]

A participant from the Bursa TB/leprosy unit expressed his discomfort with the way of training.

Most the time, health professionals who are assigned to work in OPD and TB/leprosy clinic, get one day or may not took a training of leprosy, so we do not know well what we are going to work with leprosy cases even the trainings were without practical experiential learning. [P8]

A participant from the South Regional Health Bureau explained that preventing nerve damage and impairment by early detection and quick MDT treatment of all new cases of leprosy remain the primary methods for controlling the disease. Additionally, an early diagnosis offers the chance to slow or stop further transmission.

About 95% of leprosy cases can be detected with observable sign and symptoms. However, specialists working in tertiary facilities are referring suspected cases to dermatology centres at national level. You can imagine how knowledgeable could lower-level health professionals could be existing. [P4]

Another participant from the woreda health office said:

Patients who are seen at a health facility who are suspected to have leprosy are not properly assessed or promptly referred. [P10]

Other participants relate to the lack of awareness and skills of healthcare providers, saying

Last year, we requested health professionals to perform physical examination of the family members of leprosy patients who are on follow-up for the last four to five years. They did not do it properly. The case detection problem is mainly related to the lack of awareness about leprosy symptoms and diagnosis. Secondly, health professional does not have equal knowledge. While doing physical examination of clients, health professionals may not consider a lesion as an indicator of leprosy because their focus is on doing inspection so they will only do inspection and ignore further investigation of any lesions they see. So, the case detection activity is poor as a result of awareness-related problem and health professionals focused on the momentary impression and inspection, not on the long history taking approaches. [P2]

Another participant agreed with this viewpoint and stated that inadequate training and excessive levels of professional turnover both in and out of facilities were factors that contributed to the late discovery.

... as I have said before, they might misdiagnose the case because of lack of continuous capacity-building activities ... high-level graduates like the health officers and those who have BSc degree do not know the manifestations so in the early times they just treat with fungal medications. [P1]

Another participant explained that delay relates to looking to other options for treatment.

... I believe that delayed health-seeking behaviour relates to painless lesions or early manifestation. Since the early manifestations are not severe, patients might use other home remedies ... They also might go to spiritual places and use holy water. This might occur. [P2]

4.3.1.2.3 Leprosy and its social effect

Social stigma and discrimination are extremely attached to the leprosy disease. All the participants responded that leprosy is a disease highly associated with stigma and that stigma leads to delays in seeking care. Leprosy patients become isolated from almost all social occasions that are highly valued in the community. Leprosy stigma and discrimination are brought on by misunderstandings about the disease and spread to one's own family, friends, peers and the community as well as to other locations including churches, schools, markets, workplaces and social events such as weddings and funeral ceremonies.

One key participant said:

The community call it 'a wound' if we interpret it directly. If a person is known as a leprosy client then he does not attend funerals or goes to mourn, won't be engaged in social issues, people don't go together, people don't eat or drink together, his children don't play with other children. That is worst things can happen to anyone so that is why they don't early or sometime lately go to health facility. And we all know what happens if they don't get treatment, such as an infected wound that smells bad, physical deformities on their hands, legs, mouths, eyes, noses and bones, as well as physical disabilities in their legs, hands and eyes, which cause them to withdraw from social interaction and be stigmatised if others find out. These are the major justifications for avoiding medical facilities. [P8]

Another participant stressed that self-isolation is also a common problem that could lead to delays in seeking care.

Most patients conceal their symptoms or deny the diagnosis and delay in seeking treatment ... Mostly people exchange idea in villages so if someone

who knows the symptoms of leprosy and could tell others about what he saw therefore those is possible symptoms hide themselves even they hide the wounds in their extremities due to fear of social rejection. [P9]

A participant from the MoH related the delay in seeking care to a lack of accountability.

We have to create a system that could help us to make sure that everyone working in the health system to take responsibility and be accountable ... for example, if a leprosy client comes with any form of wound or disability then we have to ask the community health worker and the district leprosy focal why this happens. So unless we create a way to make lower-level professionals responsible for what happens to the community we cannot eliminate leprosy as a public threat. [P3]

Other participants expressed a different view, saying that failure is the onus of higher administration.

... it is our gap. We do not encourage health extension workers to identify cases. We do not mobilise them. Therefore, patients who come for care at advanced stage ... so patients come when wounds have odour and make them unable to do daily activities. [P8]

To minimise shame and to stop their families from becoming apparent in their communities, nearly all leprosy patients are compelled to keep their illness a secret from their family members. Sometimes, communities avoid taking part in early case detection activities since they believe that health professionals are unreliable and that doing so will cause them to face social stigma. [P2]

4.3.1.3 Existing practice of early detection of leprosy cases

The qualitative study also revealed that the detection practice at both community and facility levels ranges from very low to non-existent. They expressed that community-level practice is non-existent due to a lack of trained professionals and less attention being given to leprosy prevention.

4.3.1.3.1 Health facility early detection of leprosy cases

Participants reported that primary health facility level detection is very simple as clients come at late stages where symptoms are crystal clear.

For the health professionals, there are manuals to use at health centre but clients come at late stage at G II at which detection is very simple but there is no early detection practice being done by lower-level health facility professionals ... Let alone leprosy, TB screening has even been forgotten which is expected to be done to every client attending OPD. The professionals [lower level] do not carefully look at it that is why we are seeing clients go to hospital, be diagnosed with TB and leprosy and come to health centre for only follow-up treatment. [P6]

A leprosy focal person from a health facility explained that facilities and community-level detection are doing less than leprosy-cured client associations formed by NGOs a long time ago. He reported his real experience, saying

Last time, there was one case with nodules, the case was not diagnosed either by the health extension worker in the community or by health professionals here. An association member brought him here ... I have provided the care and consulted the doctor. It was diagnosed as leprosy. Currently, he is in a good progress ... they counsel one other on various issues including medication adherence. [P7]

4.3.1.3.2 Lack of community-level detection of leprosy

Concerning community-level leprosy detection, participants expressed that it was barely different from the facility practice. A participant said that there is less detection rate in the community due to a lack of priority for leprosy, saying

Although we encourage health extension workers [community health worker expected to detect leprosy at community level] to send case to the health facility. Now, the attention is low ... due to that, we might miss cases. Since the health extension workers programme is not strengthened, we cannot identify cases easily. I believe that there are high number of cases exist in the community. However, the number of newly detected case is low. It might relate to low level of case detection. [P7]

Other key participants shared this idea and mentioned poor awareness as a reason for the low rate of detection in the community.

The case detection is poor. Even at the hot-spot areas, the case detection is very poor. The community based one to five structures and health development army does not enforce early arrival to the health facility while the patient has early manifestations like lesion. Poor awareness creation contributes to the case detection gap. [P2]

A former TB/leprosy focal person of the district expressed how the activity has been overlooked after a project phased out and how leprosy boomed thereafter, saying

Since Challenge TB project phased out, there is no meeting, no discussion, no review meeting and also no community-level activity with regard to leprosy. It is supposed to be our duty to work on ... People are going to hospitals for other ill health condition then get leprosy diagnosis. Leprosy has become a biggest threat here. [P5]

The general public still views leprosy as a serious illness that should be avoided and does not think it can be cured.

4.3.1.4 Challenges experienced and observed during the implementation of leprosy strategies

The conversations with the participants made clear that numerous obstacles limit the implementation of leprosy solutions and put the health and safety of leprosy cases at risk. Participants believed they were falling short of their objectives in terms of early leprosy case detection and providing proper medical care due to these difficulties. Key participants explained several challenges and provided suggestions to all levels of health administration.

4.3.1.4.1 Lack of the existence of practice-oriented training

All participants believed that theoretical knowledge was good but needed to be strengthened by practical experiential learning. This exposition relates to the integration and implementation of theory and practice for deep engagement in the learning process.

... during training, we were never allocated in the leprosy centre to be able to practice the implementation of assessment of leprosy cases and

managements. So ... the training programme has a practical gap which health professional needed to fill. [P12]

4.3.1.4.2 Integration of TB and leprosy training

Participants agreed that integrating TB and leprosy training is not advised due to a lack of fair time allocation, the trainer's lack of experience with interdisciplinary planning and implicitly limited familiarity with the specific practices, the absence of some good practice examples and the scarcity of efficient models from the current practice of leprosy management.

Leprosy-based training is part of comprehensive tuberculosis training. Leprosy-related training is provided at the final day. The trainees do not acquire the required knowledge though it requires a practical training. First, they should learn about the lesion identification using real cases or videos. Physical diagnosis needs a one-day practical training. For instance, they should learn about assessment of nerve enlargement sample taking from a lesion. Therefore, the training that is integrated with tuberculosis training is ineffective ... Health providers should take the training especially; it should be provided for those involved in the diagnosis of patients ... Likewise, pre-service training should address leprosy. All health professionals should learn about leprosy client. Therefore, training should be provided for every health professional. [P1]

4.3.1.4.3 Lack of focus or other competing health priorities

A key participant reported that lack of focus or other competing health priorities is one of the key challenges in controlling leprosy.

It is all related to focus given. No attention is given to leprosy at all quarters of government. For example, are we seeing awareness creation of leprosy TV or radio? No, but it has spread in the community. Since TB REACH project phase out, it has been dropped out. There has to be a responsible and supporting body; there is urgent need to find supporting body like NGOs as before. If things go this way it will be worse than COVID-19. [P6]

Another participant shared the above idea and said:

There are certain diseases that cause fear. For instance, when measles occur, posters are posted everywhere. On the other hand, low attention is given for leprosy. As for leprosy, we are not working at the kebele [community] and health facility level. People come for care by themselves. Health professionals should create awareness on the severity of the disease. I have seen a case with a family history of leprosy. Therefore, the community should know that it might be transmitted by contact with the case. The health professionals should also know this. Therefore, health professionals who are treating skin infection case should always suspect leprosy. [P8]

Another participant held this belief:

I think leprosy control programme is less important than any other programme that is why a reduced amount of attention given for leprosy control programmes. [P5]

4.3.1.4.4 Inadequate supportive supervision of health facilities

All participants believed that the regional/zonal/woreda health bureau conducted supportive supervision at health facilities (hospitals, health centres and rural health posts) to enhance the health practitioners' ability to provide healthcare services. However, for a variety of reasons, this supporting supervision was not conducted regularly. Regional/zonal and woreda health bureaus did not monitor regular basic supervision at different levels of the health sector to strengthen the identified gaps. A Bursa head said:

As a general rule, we must visit the health post once a week. However, as the result of various tasks, a lack of personnel and supplies (a motorcycle), we travel on an irregular basis and are unable to perform the policy's recommended level of monitoring. [P8]

The head of the health centre shared his experience in supervision and monitoring.

We know to perform the supervision and monitoring. But there is no continuous supervision and monitoring as well as no specific budget allocation. [P7]

Some participants held the opinion that the evaluation procedure is poor since TB/leprosy units have not received adequate input.

... In order for the TB/leprosy units in hospitals, health centres and health posts to understand the status of leprosy incidence in the community and avoid not taking it seriously, they need to get periodic feedback. [P11]

4.3.1.4.5 Multiple tasks for health workers

Several tasks for health workers may cause a decreased emphasis on the services of leprosy such as prevention of disability and transmission. A regional leprosy focal person explained that facilities and community-level detection of leprosy cases are doing less.

The TB/leprosy focal health personnel, in addition to their main tasks, they have other different health facility assignments, responsibilities so these overburden works may lead to less attention for the services. [P2]

A participant emphasised the workloads of HEWs rather than their duty commitment as reasons for poor performance.

... Most the time health extension workers busy of other activities in the community such as tax collection and so on ... to implement 16 health packages through the community level with two health extension workers, it is too challenging. [P3]

Another participant explained that poor integration among sectors was a challenge.

... Bureaucracy and weakness in inter-section coordination causes overburden works. These may lead to less attention for the services of leprosy control programme. Generally, these were made unsuccessful in case management and cases finding. [P4]

The detrimental effect of limited resources, specifically human and material resources, on the execution of services was cited as another challenge.

... there is shortage of staff against many important duties at health facilities, these may lead to less attention at essential areas of the strategies ... these may follow low performance. [P12]

4.3.1.4.6 *Poor coordination and communications*

According to one member, coordination and communication within healthcare facilities are poor.

TB/leprosy coordinating officer has a weak communication with health extension workers those works in community health. They can't give timely feedback. [P2]

With respect to proper intra-section collaboration and inter-section coordinating engagement, we don't have a strong working relationship among us. [P11]

4.3.1.4.7 *Lack of motivation in health workers*

Participants agree that appropriate motivation in the health sector can enhance the performance of the health system; however, appropriate motivation was not consistently practised for a variety of reasons. Employees who lack the proper motivation may be unable to cooperate appropriately and effectively. Several explanations have been offered in this regard.

Mostly focal personnel are discouraged from identifying patients by the prolonged treatment follow-up period, contact tracing without allowances and potential for contracting disease. [P8]

4.3.1.4.8 *Disruption in treatment*

A facility head mentioned that one of the challenges they face relates to clients on treatment who stop taking the drugs when they feel healthy. In some instances, an interruption in the medication supply chain leads to missed doses. The interviewee also expressed concern that clients' support needs go beyond medication; they need mental health and financial support.

Many come at stage one or two, but the main problem is that some patients miss the follow-up when they feel healthy and again they come back when they feel ill ... The other though we face medication shortage rarely; it could lead patients to miss dose they supposed to take ... Those clients who missed doses return when their condition worsens. Some patients are geriatrics and have mental problems. I know a female and male old patient with this problem.

Those patients try to find a support using various means rather than focusing on the treatment of the disease. Some may seek for money support. [P7]

Distance and transportation costs to leprosy treatment facilities represented another major challenge as a medical doctor explained:

Most of the time leprosy-affected people to be economically dependent or weak is that the stigma attached to the disease, due to this reason delayed of early treatments, interruption of monthly refill drugs and follow-up or appointment are affected most the time. [P11]

4.3.1.4.9 Importance of training related to leprosy outlined

Almost all participants' findings under suggestions for improving the health workers' performance in respect of knowledge and skills for leprosy prevention control and management indicated that they should be receiving regular and updated training.

... If once health professional have inadequate knowledge and skills for leprosy prevention, control and management, this may lead to missed early case detection of new leprosy cases and appropriate dealing with leprosy so ... strongly recommend that all health professionals should receive training with the trainers have relevant working experience in the field within the following areas clinical features and diagnosis of leprosy, grading of disability, classification and treatment, algorithms for managing persons with leprosy in a clinical setting, screening of contacts (household/close contacts, community contacts), self-care with practical attachments of clinical area ... [7]

... Regular refresher training for healthcare professionals is necessary to keep their knowledge and abilities current and to ensure that patients receive high-quality care and the community ... especially focuses on pre-treatment counselling, chemoprophylaxis, extent of contact tracing, disability prevention and medical rehabilitation, leprosy reaction and management, management of MDT side effects, treatment in special conditions, referral of leprosy patients for special care, counselling of the index patients, counselling of contacts, complications of leprosy and their management, supporting with audio-visual aids. [11]

One of the key factors in the early detection and prevention of leprosy, especially in the areas of mode of transmission, sign and symptom, prevention control and management, stigma and treatment supporter, is increasing community-based leprosy prevention and care awareness through meetings, community mobilisation activities and trainings. [2]

4.3.1.5 Strategies suggested overcoming challenges experienced during the implementation of leprosy programmes

Practical-based in-service training should be given to all practitioners even those who are doing integrated services. It is essential to improve their knowledge and practice and ultimately ensure successful leprosy programme implementation.

A community-level health worker stressed the importance of providing training to all health providers, saying

... it [improving early detection] requires knowledge. If I got adequate knowledge about leprosy, I could easily identify the case in the community. Some health extension workers took training, but I did not. So training required to improve early detection practice. [P10]

Other participants explained:

... training should be supported with videos or leprosy clinical settings. All health providers should be trained or integrate leprosy training in pre-service education and recommended it to be a stand-alone training. [P12]

Other participants supported this view.

Training should include short field trip to the village or leprosy treatment (rehabilitation) centre to practice with real patients. [P11]

4.3.1.5.1 Importance of early detection of leprosy cases must be emphasised among contacts with index patients

A key participant recommended changing the detection practice from passive to active but also stressed the importance of community-based awareness creation and giving focus to the programme.

We should change the passive to active. On providing training, we suggested school-based screening that it should be done once in three months. It might involve active detection by examination of every student in one room. Similarly, community-based awareness creation is critical. We cannot screen the whole community at the same time. We should support the community in reporting cases when they see symptoms like lesions and sense loss. It is also necessary to strengthen the one to five structures and the health development army ... Furthermore, the attention given to the programme is low. There is no special support from the government and NGOs. Previously, NGOs used to provide support but not now. Low level of attention provided for the programme should change. [P2]

4.3.1.5.2 Initiation of awareness campaigns

A health professional viewed awareness campaigns as beneficial to achieve early detection of leprosy cases in communities before people developed G II disabilities and social issues through a community-oriented approach and social mobilisation. The health education and awareness campaigns presented by health teams and NGOs contribute positively to these initiatives. Community engagement and participation are two of the strategies to prevent deformity and transmission. These approaches lead to moving to preventive care rather than curative.

4.3.1.5.3 Community leaders' involvement

Key participants strongly recommended the involvement of community leaders to motivate the people to participate in early case detection activities and come forward for screening.

... community leaders should be involved in motivating the people of the community since the community are more attached with them. [P4]

4.3.1.5.4 Financial support

One of the key participants recommended that the government pay for the travel costs of patients and even for other expenses. The primary cause of the delay was the referral of patients from health posts to health centres and from health centres to government hospitals for additional investigation. This could result in higher costs due to the cost of transportation and other activities.

Some people can't go to health facility since they won't have enough money to take transport and go to the higher level of health facilities, so government can make some arrangements for their travel. [P9]

4.3.1.5.5 Continued supervision and monitoring

The supervision and monitoring component must be strengthened for quality control and the sustainability of the programme

Strengthens connections within the integrated system, focuses on problem identification and resolution and aids in the efficient use of resources, creation of cooperative groups while fostering high standards, all of which contribute to the promotion of quality at all levels of the health system. [P1]

4.4 CONCLUSION

The findings of the study conducted in south Ethiopia of the key variables influencing the early detection of leprosy cases were presented and discussed in this chapter. Participants and the interviewer had a lengthy conversation. Participants were able to discuss experiences that were significant to the leprosy control programme because of their extensive involvement in the TB and leprosy control programme.

Participants shared their stories under five different topics and expressed a passion for the programme to control leprosy although they acknowledged the many difficulties they faced. These difficulties included incorrect assumptions about the leprosy disease, a delay in seeking early medical attention, current methods of early identification of leprosy cases and challenges in implementing leprosy strategies. Finally, participant-suggested solutions were proposed.

CHAPTER 5

DISCUSSION OF THE STUDY FINDINGS

5.1 INTRODUCTION AND OVERVIEW

The previous chapter identified the main challenge as the presence of leprosy control concerns. This chapter addresses this finding in light of other studies, books and papers pertinent to the topic. By studying the pertinent literature, this chapter examines and explores the ideas that have arisen. The study used thematic qualitative data analysis approaches and a qualitative study design. Before strategies to address the challenge are formulated, this chapter explores and evaluates the viewpoints and experiences of healthcare professionals with knowledge of leprosy control services or programmes.

A review of the literature indicates that the bulk of the issues are pervasive in areas where leprosy is common. The predictors or environmental factors of the region concerned may affect the extent of the discrepancies. Based on the findings of this study, solutions will be developed and presented for review and validation by trained health experts.

5.2 EXISTING WRONG BELIEFS ABOUT LEPROSY DISEASE IN THE COMMUNITY

Since all participants agree that the leprosy problem is worsening, this theme focused on the false assumptions people have about the leprosy condition in the community. Leprosy is seen by the participants as a disease that will always be a public health issue. Participants reported disturbing trends in adult and paediatric leprosy diagnoses, as well as an increase in G II disability cases. It was made worse by socio-demographic factors and beliefs.

5.2.1 Leprosy as a punishment from God

Participants in the current survey stated that the community views leprosy as a curse or an act of wickedness that is passed from parents to their children as well as a consequence of sins committed. Given this, the community typically prefers visiting spiritual locations and tries various ineffectual solutions.

According to a study by Marahatta et al (2018:7), the majority of healthcare professionals have directly observed how society views people who have leprosy. Society believes that leprosy is brought on by the wrath of gods and goddesses. The disfigurement of the damaged organ brought on by leprosy complications makes it difficult for the affected person to live with their family and engage in social activities. Because of all the restrictions in society, the afflicted do not want to join in community life. They live a solitary existence. An individual with a G2D fervently believes that it is a 'punishment' (Muthuvel, Govindarajulu, Isaakidis, Shewade, Rokade, Singh & Kamble 2017:9).

A study conducted in Ethiopia found that over half of those polled believed leprosy was a genetic disorder, a curse from God or a result of sin being punished (Urgesa, Bobosha, Seyoum, Geda, Weldegebreal, Mihret, Howe, Kaba & Aseffa 2020:1074). This unfavourable stigma, according to Hidayat, Irawati and Waluyo (2020:1468), is based on the idea that leprosy is a cursed illness from God that can never be cured. People continue to think that those who previously had leprosy still do. Few participants believe that leprosy results from eating specific types of food or from malnutrition, is caused by natural forces or is a punishment for misdeeds (Tabah, Nsagha, Bissek, Njamnshi, Njih, Pluschke & Njamnshi 2018:7).

The community believes that leprosy helps people understand why pain is a useful 'gift', a survival strategy to alert us of danger in this cursed world. Nyamogoba et al (2019:41) dubbed the study of the brand 'The Gift of Pain'. Without sorrow and agony, all people could be like lepers, unable to understand that something is seriously wrong, and that God's healing is required.

5.2.2 Leprosy as a hereditary disease

Participants in the current survey said that the majority of communities think leprosy is an inherited illness that is passed down from parents to children. According to a district official, there are still people who believe that leprosy is an inherited condition. People are afraid to share their experiences for fear of what would happen to the following generation, such as no one marrying into that family if the entire generation is afflicted. The majority of patients in Ethiopia thought leprosy was inherited.

According to a study, there are still many myths about medicine from the late 19th century, including the notion that leprosy is an incurable, extremely contagious and touch-transmitted disease (Deps & Cruz 2020:2). According to a study done in Ethiopia, a

sizeable majority of respondents still think leprosy is a hereditary disease (Tesema & Beriso 2015:3; Urgesa et al 2020:1074). A sizeable majority of participants from the Mbonge and Ekondotiti health districts stated that leprosy is inherited or results from a union with a family where leprosy is present or has been (Tabah et al 2018:7).

Leprosy is thought to be inherited and incurable in Thailand as the community frequently witnessed multiple cases of the disease in a single family; therefore, villagers were forbidden from allowing their children to marry leprosy persons (Kaehler, Adhikar, Raut, Marahatta & Chapman 2020:2).

5.2.3 Leprosy labelled as a wound, 'anatamoo'

Although many shared the idea that the community has a low awareness of the early symptoms of leprosy, other participants explained that the community recognises late symptoms and calls them by their local name – 'anatamoo'. Also, if there is a history of leprosy within the family or if the disease starts to cause disability, people recognise it.

In the eyes of the public, leprosy is an incurable, genetic disease that causes debilitating wounds that are filthy, oozy and smell awful. The unfavourable attitudes of their communities towards them could lower leprosy patients' quality of life and prevent them from receiving medical care (Tesema & Beriso 2015:1).

5.2.4 Leprosy as incurable and involves costly care

All participants agreed that many people are unaware that the disease has a cure for free. They perceive that leprosy is incurable and the treatments are also costly.

Leprosy is perceived as an incurable and crippling disease in the rural community, according to Singh and Kumar's (2017:4) study in India. The majority of them also believe that it is a type of retribution for bad activities or actions conducted at some point in the past or present. As old as the sickness is, it is the issue brought on by the idea that it is incurable that is most disconcerting.

One of the oldest illnesses afflicting humans is leprosy. It is false to say that leprosy is an incurable disease, although it has long been stigmatised and thought to be incurable. Leprosy can be completely healed with no lasting problems if the affected person reports promptly and completes the necessary MDT (Gautam & Gautam 2018:256; Price 2017:66). The good news is that free antibiotic treatment can cure leprosy sickness.

Although drug treatment is free, access to healthcare in rural areas are frequently coupled with travel expenses and wage loss were described as barrier. There may also be additional costs related to health care, such as hospital stays, prosthetics, orthotics, and protective footwear. Many people can be discouraged from doing so by the costs involved in using services. As a result, it's possible that they'll develop secondary disorders that will make the symptoms of their impairment worse (Paul , Kumar & Siva : 2021:76).

5.2.5 Leprosy as lifelong transmission

The other awareness-related issues explored relate to the transmission of leprosy. Participants reported that people believe that leprosy transmission is lifelong whether it is treated or untreated.

Leprosy can be completely cured with MDT. Rifampicin, dapson and clofazimine are the three medications that all leprosy patients must take as part of MDT for a total of six months for PB leprosy and 12 months for MB leprosy. People with leprosy are no longer contagious after just a few doses of MDT but to fully recover from their illness, they must take all the antibiotics as directed by medical professionals. Leprosy stops being contagious in 98% of cases after being identified and treated with MDT. To reduce transmission and avoid disability, early diagnosis and appropriate treatment are essential.

The use of SDR as a preventive treatment for adult and child contacts of leprosy patients results in a 57% reduction in leprosy risk after two years and a 30% reduction after five to six years, after ruling out leprosy and tuberculosis (TB) disease and in the absence of other contraindications (Lockwood, Butlin & Penna 2021:99; WHO 2018a: xiii)

5.3 DELAYS IN SEEKING EARLY HEALTHCARE BEHAVIOUR

One of the queries posed to the participants was the level of leprosy awareness among the general public and medical professionals. Everyone who took part in the discussions stressed the lack of awareness that exists among the general population as well as the majority of healthcare professionals, including those with tertiary degrees. A G2D represents a delayed leprosy discovery.

5.3.1 Lack of early symptoms awareness in community

Participants interviewed experienced that early health-seeking practices are low and that that hampered timely intervention and the prevention of leprosy-related complications. Participants agreed that clients usually only come to a health facility with G2Ds.

Low rates of early health-seeking behaviours prevent quick intervention and the prevention of leprosy-related problems since awareness and communication about leprosy are lacking. Participants concurred that patients should go to the G-II medical centre. The number of G2Ds at the time of diagnosis directly indicates the failure to make an early diagnosis and acts as a gauge for the low level of community IEC penetration.

According to Danturty, Manchala and Jairaj (2016:13530), the population surveyed has very little understanding of leprosy's presenting symptoms, such as patches, nodules, loss of sensation and abnormalities. The methods of leprosy transmission were unknown to 72%. Few individuals were aware that leprosy can spread through contact with infected skin or the air. The cause of leprosy was unknown to 56% of respondents. Only 8% of people were aware that bacteria cause leprosy. The majority of those studied do not know that leprosy is curable. Similar findings from other studies show that none of the patients examined was aware of the typical early symptoms of the disease. Studies have demonstrated that a substantial number of patients have obvious malformations as a result of the delayed recognition of leprosy signs.

Both at the patient and healthcare professional levels, diagnosis is delayed and considerably increases the impairment in adult leprosy patients. The majority of surveyed patients were unaware that the symptoms they were experiencing were leprosy-related and many of them thought the symptoms would go away on their own because they thought they were afflicted with something else (Muthuvel et al 2017:9; Subedi & Engelbrektsson 2018:14). It seems like many patients are still unaware of leprosy symptoms. Nearly half of the participants in the Brazil study delayed visiting a doctor as they did not believe their symptoms were significant. Three times as many people were likely to wait longer before seeing a doctor compared to people who did think their symptoms were important. Leprosy still places a heavy burden on people with disabilities.

Less than one newly diagnosed G2D leprosy case per million people was the target set by the WHO's Global Leprosy Strategy 2016–2020 but this target was not attained (WHO 2016a:406). The median and mean times for leprosy case identification range from 12 to

36 and 20 to 50 months, respectively. A G2D rate of between 5.6% and 43.2% was observed. The longer the wait, the more frequent and severe the condition, according to a linear association between the proportion of G2Ds and the delayed case detection rate.

Healthcare-seeking behaviour was the main factor linked to delayed case discovery. Delay in case identification was associated with older age, male gender, lower perception of disease symptoms, MB leprosy and a lack of education. Living in a rural location, working daily labour, particularly agricultural labour, and being jobless were the most prevalent socio-economic characteristics linked to delayed case detection (Dharmawan, Fuady, Korfage & Richardus 2021:11).

The use of medical services and delayed detection were linked in 14 of the 15 research that looked at this association (92.3%). First-point-of-care visits to pharmacies, private healthcare facilities, conventional or alternative medicine suppliers, as well as inaction following the start of symptoms, were found to be statistically significant risk factors for detection delay. According to qualitative research, several patients considered visiting the doctor and spending time and money there to be 'a waste'. However, going to a conventional healer for therapy delayed the discovery of the case (Dharmawan et al 2021:5).

Similar numbers of people from low-income households who contract leprosy first turn to self-medication or traditional healers before finally seeking out professional medical care. Leprosy symptoms frequently do not cause pain, so they are not always seen to be physical health issues. This gives people another excuse to put off getting medical attention, claiming that it would be a waste of time and money (Ali, Islam, Rahman, Hossen, Islam, Sheema, Javed & Akhtar 2015:360; Muthuvel et al 2017:9)

5.3.2 Lack of health professional clinical knowledge and practice in leprosy cases

The interviewees identified a shortage of clinical expertise in leprosy among healthcare professionals. Healthcare professionals frequently visit the outpatient section without much or any expertise in leprosy cases in general. Most of the participants said that they had misdiagnosed and improperly treated instances when it came to leprosy early detection. As a result, there was a lack of ability to recognise early leprosy patients and their signs and symptoms. These problems can cause treatment delays, raise the chance of impairment (deformity) and extend the population's exposure to infection risk.

Some of the participants also reported receiving integrated TB/leprosy training that lasted for a few days (three to five days). During this training, TB took almost all the time of training and leprosy training was given as an afterthought during part of a day or on half of the final day of the training without considering practical experiential learning.

Understanding leprosy patients' treatment, quality of life, mental health and participation in leprosy control activities at public health institutions all benefit from the performance and attitudes of healthcare professionals towards them. The early detection of leprosy cases continues to be a top priority in the management system. The emergence of immunologically induced neurological problems, which can cause irreparable nerve damage and incapacity and disrupt the transmission mode, can be avoided by diagnosing the illness earlier.

In Ethiopia, leprosy control efforts are incorporated into general healthcare services; however, general healthcare professionals' understanding of leprosy diagnosis, management and treatment was found to be inadequate. The study revealed that most healthcare professionals had little understanding of how to recognise leprosy's early signs and symptoms, as well as how to treat them. Most healthcare professionals were unable to voluntarily assess patients' muscles and sensations. It could be a factor in Ethiopia's comparatively high percentage of G2Ds.

Additionally, it was discovered that a sizeable majority of healthcare professionals had a negative attitude towards suspected leprosy sufferers. Leprosy patients can be discouraged from self-reporting at public health facilities as a result. While their skin and nerve lesions deteriorate, they would rather visit sacramental baths and see conventional healers than remain in their homes (Abeje et al 2016:6; Franco-Paredes & Rodriguez-Morales 2016:8; Post, Brandsma, Wagenaar, Alam, Shetty, Husain, Rosita, Prakoeswa, Shah & Tamang 2021:30).

5.3.3 Leprosy and its social effect

The social stigma and discrimination associated with the leprosy disease are very strong. According to everyone who participated in the survey, leprosy is an illness that is strongly stigmatised. Negative social, economic, psychological and medical effects could result from delayed diagnosis and treatment. Since it causes a lasting disability and social stigma, leprosy has been a problem in public health for many years.

Leprosy management and improved outcomes depend on early case detection and treatment. Affected individuals are regarded negatively by society and stigmatised as a result of their deformity, disabilities and odd leprosy symptoms. Social rejection, exile and isolation are inevitable. A patient will put off receiving a diagnosis and engaging in follow-up care even though they suspect they have leprosy out of fear of ridicule. The delay in starting therapy and the start of complications due to the condition's concealment and delayed diagnosis have the potential to reduce the sufferer's quality of life even after treatment (Ogban, Iwuafor, Emanghe, Ushie, Ndueso, Ejemot-Nwadiaro, Otei & Osuchukwu 2020:2).

The most pressing issue is the prevalence of deformity because the social responses to people with leprosy-related deformities and their families are frequently tragic, callous and uncaring, accompanied by offence, expulsion and even the purposeful murdering of victims. This can result in stigma, which is detrimental to the dignity and conduct of leprosy patients (Sori 2019:4).

Leprosy patients get separated from nearly all social gatherings that are highly valued in society as a result of the stigma and delay in seeking help. Due to misinformation, leprosy patients are subjected to stigma and discrimination in a variety of settings – churches, schools, markets and places of employment. They are also prohibited from sitting next to, shaking hands with, sharing or purchasing food from others, using public transportation and attending social events such as weddings and funerals. Additionally, community members are unwilling to let their children play with leprosy victims' children. Family members marrying leprosy patients draw criticism. The most frequent social and societal element linked to the delay in discovery was stigma (Danturty et al 2016:13530; Dharmawan et al 2021:2; Marahatta et al 2018:2).

According to Sori (2019:4), leprosy settlements in Ethiopia are home to more than ten thousand leprosy-affected societies, together with their families and relatives. With a 7% to 14% disability rate, thousands of newly diagnosed cases are added each year. As a result, a sizeable number of people who have developed disabilities are compelled to live with the stigma and experience-related economic difficulties. Similar study showed that a substantial correlation between the delay and the fear of isolation was found in a quantitative investigation. Longer patient delays were strongly correlated with fear of isolation, suggesting that communal isolation still occurs in Brazil (Henry et al 2016:9).

Price's (2017) research indicates that studies from across the globe continue to show the disparity between the proportion of diagnosed male and female patients with leprosy. His research also shows the fact that women are more likely to seek treatment later in life. Due to their gender, potential disabilities and the stigma that these disorders may bring about in society, women may be at a threefold disadvantage when it comes to health difficulties.

Misconception about the disease can considerably decrease women's prospects of marriage since potential spouses may turn them down over worries that they might have leprosy-positive offspring, a finding that is unrelated to male experience. Women with leprosy are detected with the disease later than men for a variety of reasons, including the stigma associated with it, which comes from the greater community and increases self-stigma, low status and economic dependence and probable gender insensitivity to services.

The CDC (2021) highlighted that girls and women who have Hansen's disease suffer the additional problem of gender and social prejudice, which may also cause a delay in the diagnosis of the disease. In some nations, it is allowed to legally divorce a spouse only because they have an illness. Unfortunately, this might render a lot of mothers homeless, penniless and unable to take care of their children.

5.4 EXISTING PRACTICE OF EARLY DETECTION OF LEPROSY CASES

This qualitative study revealed that the detection practice at both community and facility levels ranges from very low to non-existent. The participants expressed that community-level practice is non-existent due to a lack of trained professionals and less attention being given to leprosy prevention.

5.4.1 Health facility early detection of leprosy cases

According to the WHO's recommendations (2021a:14), early detection should be used to lessen the frequency of new active cases in neighbourhoods. Physicians and nurses must become more vigilant in screening, treating and reporting leprosy cases if they are to succeed in eliminating the disease.

According to the study, the average time it took to diagnose leprosy was 33.5 months. Remarkably, 70% of the patients claimed that their condition had been incorrectly identified and treated at first. Fungal skin conditions and skin allergies were the most frequently reported incorrect diagnoses. These errors failed to identify patients who were first misclassified, leading to a much longer diagnostic delay (Gomez, Rivera, Vidal, Bilbao, Kasang, Parisi, Schwienhorst-Stich and Puchner 2018:196).

Many leprosy sufferers put off receiving proper care since they thought they had another condition instead of leprosy. The primary cause of the delayed diagnosis was misdiagnosis by private practitioners. The utilisation of conventional medicine, self-treatment and traditional healers' influence were other factors. A few individuals reported that their first diagnosis at the government health centre was inaccurate, which added to the delay (Subedi & Engelbrektsson 2018:14). Leprosy's polymorphic nature and the fact that most medical professionals are unaware of its clinical signs are two factors that contribute to misdiagnosis (Boushab, Fall-Malick & Basco 2018:3).

Similar to earlier studies, in Brazil, it was discovered that patient reports of misdiagnosis were frequently associated with prolonged health system delays and diseases like rheumatism and skin allergies (Henry et al 2016:9). The decentralisation of leprosy care may be to blame for this potential lack of clinical suspicion. In addition, patients who presented to a doctor with an insensitive skin lesion were diagnosed more quickly than those who did not have this symptom. A quicker diagnosis was associated with more clinical examinations by medical professionals (to diagnose leprosy). These factors work together to explain 44.5% of the variation in the delays in the health system. These concerns could reduce the time taken for the medical system to diagnose leprosy (Henry et al 2016:9).

5.4.2 Lack of community-level detection of leprosy

Leprosy contact tracing is the cornerstone of active surveillance and a crucial strategy for the early identification of new cases. It also aids in halting transmission by eliminating potential infection sources. The increase in the number of newly detected cases in several countries is attributed to operational factors rather than an actual increase in incidence because many cases that had been concealed for a long time were discovered as a result of active case detection campaigns (including contact examination) in many countries (WHO 2020d:1).

A longitudinal study in the Karonga district of Malawi found that people who live with HHCs of MB leprosy patients have a five- to eightfold increased risk of developing the disease compared to people who do not live in such dwellings; however, the risk of developing leprosy in HHCs of PB leprosy patients is lower. HHCs had a higher risk of developing leprosy, according to a survey conducted in Sri Lanka's Puttalam region (odds ratio: 6.69; p-value 0.001). A study conducted in Bangladesh concluded that a contact examination should be completed as soon as an index case is found. Studies from the Comoros and Bangladesh indicated that contact screenings be expanded to include neighbours since they revealed a higher risk of leprosy among contacts outside of households(WHO 2020e:2) .

Leprosy in children is a sign of active community transmission (Gvi, Kuppuswamy, Srinivas & Keloji 2021:131). No matter whether the infection is hereditary or not, close contact may be the source. A neighbourhood's childhood leprosy cases amply illustrate the severity of the undiagnosed adult leprosy problem, as well as its abnormalities, active transmission and impacts on both the patient and the community. Out of 5,760 contacts, 114 new cases were discovered through door-to-door surveys (2.0% prevalence). The two years prior had seen the discovery of 39 additional instances. Living within 25 metres of index cases statistically increased the likelihood of having leprosy significantly (Ortuno-Gutierrez, Baco, Braet, Younoussa, Mzembaba, Salim, Amidy, Grillone, DeJong, Richardus & Hasker 2019:4).

5.5 CHALLENGES EXPERIENCED AND OBSERVED DURING THE IMPLEMENTATION OF LEPROSY STRATEGIES

5.5.1 Lack of the existence of practice-oriented training

Theoretical knowledge, in the opinion of all participants, needed to be supplemented by real-world experiential learning. This explanation pertains to the integration of theory and practice that must be put into use for full participation in the learning process. There is a shortage of such capability among competent leprosy control healthcare personnel at outlying health centres.

According to research by Abeje et al. (2016:6), the amount of training, in-service training and prior experience with leprosy work are all related to how well health workers perform in their jobs. The fact that almost 86% of healthcare workers had low-level knowledge

could be attributed to the lack of focus on official training, the lack of practice that followed it and the fact that there were not many leprosy patients available for practice at each site; this, however, needs more confirmation.

According to Van 'T Noordende et al (2019:13), healthcare professionals who have had leprosy training and have access to reference materials on the disease demonstrated greater knowledge and skill. As a result, there should be standard leprosy training for all healthcare professionals and frequent refresher courses in leprosy-endemic regions. These educational strategies will enhance procedures for leprosy early case detection, enhancing the effectiveness of the National Leprosy Eradication Programme.

5.5.2 Integration of TB and leprosy training

The absence of some good practice examples and the lack of efficient models from the current practice of leprosy management were all areas where the participants agreed that the integration of TB and leprosy training is not advised. Other points of the agreement included the trainers' lack of experience with interdisciplinary planning and, implicitly, relatively superficial knowledge of the specific practice.

On a national basis, the disability grade of 10.9% of newly diagnosed leprosy cases in Ethiopia was unclear. This suggests that a large proportion of leprosy patients received inadequate care. The findings of the study regarding the usefulness of an unidentified disability, however, were not unexpected in a nation like Ethiopia where programmes are integrated, and staff members lack the training, time or motivation to test for and record physical impairments in newly diagnosed leprosy cases these may be interrelated with government committeemen, lack of knowledge, misconceptions and cultural and religious issues, social stigma and discrimination, misdiagnosed and improperly treated, lack of contact tracing, poor community involvements are among the reasons that affect the early utilizations of LCPs (Baye 2015:41).

In Ethiopia the disability grade of 10.9% of new cases of leprosy was unknown nationally. This can indicate a significant proportion of leprosy patients had received inappropriate health care services. However, in a country like Ethiopia where programs are integrated and staffs have little training, time or inclination to test for and record physical impairments in new cases of leprosy, the finding of this study regarding the value of unknown disability was not beyond the expected these may be interrelated with government committeemen, lack of knowledge, misconceptions and cultural and religious issues, social stigma and

discrimination , misdiagnosed and improperly treated, lack of contact tracing, poor community involvements are among the reasons that affect the early utilizations of LCPs (Baye 2015:41).

5.5.3 Lack of focus or other competing health priorities

One of the key participants listed a lack of concentration or other competing health goals as major difficulties in controlling leprosy. Early leprosy detection and halting the associated deformities, impairments and the illness's spread are all hampered by negative attitudes and emotions related to the condition.

Health-related experiences are never given enough consideration, resulting in inadequate therapy (Van 'T Noordende et al. 2016). Although leprosy control programmes are part of general healthcare in Ethiopia, it was discovered that general healthcare staff members lacked the necessary knowledge and skills for leprosy diagnosis, administration and treatment. As a result of the majority of them focusing on treating other illnesses and being uninspired to learn more about leprosy, the general health staff at district and zonal hospitals lack high levels of experience (Abeje et al 2016:5).

5.5.4 Inadequate supportive supervision of health facilities

All participants agree that supportive supervision was undertaken at health facilities (hospitals, health centres and health posts) by the regional/zonal/woreda health bureaus to enhance the services offered by health professionals. However, for a variety of reasons, this supporting supervision was not conducted regularly.

Leprosy control programmes are not given enough attention – an issue in the fight against it. According to the FDREMoH (2017b:3), high endemic states tend to be underdeveloped and under populated. Similar findings were found in another study, which found that the influence of the implementation degree of the effects observed, by component, was convergent and divergent between some indicators, particularly among the unsatisfactory: low proportion of contacts examined, treatment dropout, limited standardisation of patient care flow and insufficient resolution of issues with management support (De Souza, Vanderlei & De Frias 2017:5).

5.5.5 Multiple tasks for health workers

Health staff may place less attention on leprosy services such as transmission and disability prevention due to the variety of activities in which they are involved. The regional leprosy focal person noted that fewer cases of leprosy are being detected at the facility and community levels.

The assignment of various jobs at healthcare institutions as a result of a lack of healthcare staff may result in patients receiving less attention due to overload. Due to a shortage of health workers, moving from one job to another negatively impacts the previous position held in that facility (Elive, Cumber & Landis 2016:11).

A complete physical examination of the patient is necessary for the diagnosis. Unfortunately, the lack of auxiliary medical staff prevents such thorough physical examinations. This dilemma is made worse by the inability of the general health system's professionals to identify the disease in the patient's early stages when there is no obvious deformity (Pandey 2015:46). In Kiribati, the lack of staff poses a problem to Kiribati's leprosy initiatives and has an impact on the planning and execution of activities (Rimon 2021:7). It can be difficult to complete tasks within a given time frame because a single health professional is responsible for a variety of tasks.

5.5.6 Poor coordination and communications

One participant felt that there was poor collaboration and communication within the healthcare industry. Health-related factors that are experienced are seldom given attention, resulting in inadequate therapy (Van 'T Noordende et al. 2016).

Low attention to leprosy control initiatives is a concern in the fight against leprosy. According to the FDREMoH (2017b:3), high endemic states usually have subpar administration and a dearth of educated people. Similar findings from another study show that some indicators, especially those that were unsatisfactory – a low proportion of contacts examined, treatment dropout, a limited standardisation of patient care flow and insufficient resolution of management support issues – were influenced by the degree of implementation of the effects observed by component (De Souza et al 2017:5).

5.5.7 Lack of motivation in health workers

Participants held the opinion that appropriate motivation in the healthcare industry can improve the performance of the health system, but the appropriate motivation was not

consistently practised for a variety of reasons. Employees who lack the proper motivation may be unable to work together effectively. Employee happiness, which includes improved healthcare, is directly tied to employee motivation, which is often seen as the reason why employees behave as they do in pursuit of reaching personal and organisational goals. Both involve behavioural, emotional and cognitive processes.

According to Elive et al (2016:11), a study done in India found that while concerns exist about the performance and incentives of the private sector, low job satisfaction among public sector employees is clear from the highest reported absence rates.

Low employee morale can compromise the standard of services provided and discourage employees from pursuing their careers. Work performance is significantly influenced by motivation. Both internal and external influences motivate healthcare professionals. Therefore, understanding important non-financial and financial motivators are important for effective work performance among healthy employees.

Motivated employees are better equipped to perform their jobs with the required care because they are psychologically and physically stable and socially aware. Motivation is important for organisational effectiveness. It is excellent to be motivated; if managers and administrators understand what motivates individuals to do well at work, resources will be directed to obtain the most from them (Aduo-Adjei, Emmanuel & Forster 2016:50; Legesse, Deme, Yesuf & Ejigu 2018:53).

5.5.8 Disruption in treatment

As one participant noted, one of the difficulties they have is getting treatment-seeking clients to not stop using pharmaceuticals when they feel well. In some cases, interruptions in the medication supply chain also cause patients to miss doses. The participant voiced concern over the fact that clients' assistance requirements transcend beyond medication, requiring both financial and mental health services. Long distances make it difficult for many people to reach medical facilities, which increases the cost of transportation and may cause many afflicted people to forgo treatment altogether.

Poor adherence has detrimental implications such as incomplete healing, ongoing infection sources, the spread of new susceptible and antibiotic-resistant strains and the possibility of developing disability or deformity. The lowest dosage (MDT0-9), according to the Brazilian MoH, would be linked to a higher chance of recurrence in a shorter period

(under 5 years). The majority of those who underwent the MDT0-9 and MDT10-19 regimens showed this connection. However, a higher dose (i.e., MDT30+) can reduce the likelihood of a recurrence. This was associated with a longer interval between the end of therapy and recurrence for MDT20-29 and MDT30+. These findings are believed to be the outcome of a therapeutic insufficiency mechanism for patients who were misdiagnosed as having PB leprosy, such as those in the MDT0-9 group, which ultimately led to insufficient treatment and disease recurrence (Gonçalves et al 2019:8).

Poor caregiver support and a lack of understanding of the condition were significant modifiable risk factors for treatment defaulting. The percentage of patients who stop their therapy has increased and as a result, the percentage of successful cures has fallen. By looking at the results, it is feasible to see how deficient health services are, particularly when it comes to the clinical aspects that contribute to treatment abolition and the low cure rate.

Leprosy is actively transmitted by MB patients with the most severe disease types (borderline and lepromatous) who are also the most prone to stop receiving treatment. Less likely to be cured are MB patients with a Grade II physical disability. As a result, the importance of providing these patients with a more systematic follow-up is highlighted, with a focus on maintaining the bond's integrity and concretising it as a primary care principle. A lower defaulter rate would be made possible by health workers regularly following up and educating patients and their caregivers (Liyanage, Arnold & Wijesinghe 2021:257; Siqueira, Celestino & Silva 2021:12).

5.5.9 Importance of training related to leprosy outlined

The majority of participants concluded that frequent, up-to-date training provided to health workers would improve their performance in terms of their knowledge and abilities for leprosy prevention, control and management.

According to the Oman MoH (Al Awaidy 2017:7), regular training sessions are held for staff members at primary healthcare (PHC) and dermatology clinic levels to ensure that

they have a uniform understanding of how to suspect and diagnose leprosy cases as well as to remind them of the necessity of promptly reporting leprosy cases. All PHC physicians receive communications from communicable diseases units regularly encouraging them to report leprosy patients promptly and without delay. Regular technical supervision and knowledge updates are also made (Al Awaidy 2017:7).

Leprosy management, comprising diagnosis, treatment and management, is a part of general healthcare in Ethiopia, although it has been observed that the personnel's knowledge and skill levels are insufficient. This study showed that the majority of medical professionals had enough knowledge about leprosy's early signs, reactions and treatment but the majority of them were unable to assess muscles freely or sensibly. This may account for the high prevalence of G2Ds in Ethiopia, where they make up 14% of all disabilities. Leprosy health education and ongoing training should be focused at the pre-service and in-service levels to support the development of health workers' skills, knowledge and attitudes (Abeje et al 2016:6).

The researcher perceived the concepts of the study through several points of view explorations.

The prevalence of leprosy in Ethiopia has declined across time but the emerging of new cases is still challenged the national health sector .Delay in diagnosis and treatment can have adverse physical, psychological, economic and social effects. Patient disability and deformity will result because of the persistent nerve damage and this is a lifetime problem and need to be prevented

One of the most persuading elements that affect a community's health-seeking behaviours' and determines their attitudes toward persons affected by the disease are misconceptions about the cause of leprosy.

Leprosy was still perceived to be feared and concealed because of potential discrimination, even within the communities

A lack of knowledge, misconceptions and cultural and religious issues are among the factors that affect the early utilisation of LCPs. These challenges should be addressed through social media and other communication channels as well as interpersonal communication to improve communities' awareness of LCPs. Increased community awareness plays a vital role in promoting and increasing the utilisation of healthcare services.

Early diagnosis and prompt treatment are the best defenses against the spread of leprosy and the support of disability prevention. All contacts with leprosy are routinely monitored. Leprosy clinics must have a schedule for contact tracing work. Both active and passive contact searches are used in the tactics. The number of newly diagnosed cases of G2D is one measure of an LCP's quality. The adoption of the contact-tracing program is practical and cost-effective, especially in high-risk populations.

Currently, leprosy knowledge and skills are essential, and training is required to acquire them. For the effectiveness of leprosy programs, the performance of health professionals in leprosy cases, and communication with patients, additional training and support are imperative. Supportive healthcare, overcoming stigma, avoiding negative emotions, and self-care should all be covered in the training program. Diverse training methods should be used, including classroom instruction, workshops, and on-the-job training.

The identification of early leprosy cases will be significantly enhanced if health care professionals' leprosy knowledge and expertise are improved. One of the most crucial skills for healthcare practitioners is the capacity to suspect and diagnose leprosy patients. Misdiagnosis, particularly in the general health services, is the main cause of delayed case discovery from the perspective of the health services. As a result, general practitioners, particularly those working in primary healthcare, must acquire training to identify cases as soon as feasible.

Combining leprosy training with TB to address the LCP's problems is ineffective. Leprosy prevention and control require ongoing training and access to current information alone. Health practitioners should be knowledgeable about current leprosy management techniques. The early case detection of leprosy could be helped by the training or retraining of these various types of healthcare professionals. Where appropriate and available, new tools utilizing e-learning and health literacy promotion initiatives should also be utilized.

Stigma, a significant issue in programs for the prevention and control of leprosy, seriously hinders the success of case diagnosis and treatment. Because of the disease's latent effects, leprosy victims usually experience severe stigma. When leprosy symptoms first appear, patients frequently try to conceal their illness in an effort to avoid being singled out for discrimination. Leprosy sufferers are compelled to reside in leprosy neighbourhoods and are denied access to public services when communities react unfavourably to the disease. These symptoms negatively affect the affected individuals

and their families on a physical, mental, and socioeconomic level. Female leprosy sufferers are more severely affected; they have far fewer odds of getting married or having children.

Access to healthcare facilities must be made better by the LCP. Managers and health professionals ought to have an LCP, understand their roles and responsibilities, and be knowledgeable about the relevant regulations, norms, and standards. Health personnel' LCP performance should improve as a result of the degree of assistance in medical facilities. The improved use of monitoring and evaluation indicators—support control audit feedback—should be emphasized in order to increase the caliber and thoroughness of LCPs and to offer additional help. Regarding the caliber of program services, quality assurance guidelines and regional requirements must be followed.

Without giving them any additional tasks, let the leprosy focal person focus solely on programs for leprosy prevention and control.

Regular program monitoring includes field visits by supervisory officers, monthly/quarterly process progress reports, and meetings at the district, regional, and central levels to examine the program. Monitoring is a means to guarantee support and direction so that workers may complete their work effectively and efficiently. To achieve this, the supervisor needs to be aware of what falls under the purview of the competent and subordinate employees. The supervisor must be able to spot issues that hinder the completion of various duties and fix them. This must be accomplished by assessing employee performance, making use of review information during site visits, and going over monthly reports and meetings.

Policymakers should be advocated for a political commitment to early case detection of leprosy. Early case detection should be a priority for the entire LCP, according to leprosy policy. Through good explanation and communication, adequate political and financial backing from the government is vital.

Motivation as a healthcare strategy is the driving force for advancement and progress in all aspects of healthcare delivery. Internal motivation tactics are thought to vary in order to achieve peak performance. The quality of leprosy preventive and control services can suffer from a lack of motivation among healthcare personnel. Creating an encouraging atmosphere by strengthening health-care standards and procedures and prioritizing

healthcare demands will increase professional performance and focus more on leprosy prevention and control.

Managers value what encourages people to work efficiently; inputs are used to get the best out of personnel. Internal and external factors motivate health care workers. The strategy's strategic goals are to use formal techniques to promote health professionals' engagement in their obligations and incentive to improve the quality of service they deliver.

5.6 CONCLUSION

The findings of the study were compared to those of other works of literature in this chapter. The interviewer and participants conversed at length. Participants could discuss experiences that were extremely important in leprosy control programmes because of their extensive experience in TB and leprosy control programmes.

Participants spoke about their experiences related to the five topics, expressing a desire for the programme to control leprosy despite the difficulties they were facing. The issues that were discussed included incorrect community perceptions of the leprosy disease, a delay in seeking early medical attention, current methods for identifying leprosy patients early on and difficulties in putting leprosy prevention initiatives into effect. Introducing strategies will be covered in the following chapter.

CHAPTER 6

STRATEGIES FOR EARLY DETECTION OF LEPROSY AMONG LEPROSY CONTACTS

6.1 INTRODUCTION

The methods for enhancing the leprosy preventive and control programme in southern Ethiopia are described in this chapter. Based on the results of the current study, pertinent elements of the evaluated literature and the researcher's understanding, the strategies were developed in an educated manner. Each topic that results from the researcher's insights is addressed with the appropriate articles and tactics. The procedure of verifying strategies and the dissemination plan is described at the end of the chapter.

6.2 PURPOSE OF THE DEVELOPED STRATEGIES

The goal of the strategies is to aid in the early detection of leprosy cases in the southern region of Ethiopia. The MoH, the regional health bureau and the woreda's health office are spearheading specialised efforts to identify and track the LCP. Health professionals, communities and policymakers are all participating.

6.3 METHODOLOGY OF STRATEGIES DEVELOPMENT

According to Clayton (2019), the strategic management process has five stages: achieving the goal, identifying issues, identifying potential problems or strategies for solving problems, developing strategies and implementing and evaluating those strategies. The researcher collected quality information about the health professionals' experience and understanding of the system, as well as the challenges they face and their recommendations for solving the problems and improving the LCP.

The outcomes of the study and thorough literature analysis were integrated with all the suggestions and remarks made by the key informants. The researcher then subdivided the source codes from the main informants, reduced the codes to a theme and finally

established strategic priorities and key strategic interventions. The researcher outlined strategies for focusing on the effectiveness of LCPs in terms of improving the knowledge, attitudes, skills, commitment, motivation, control and patient health and the quality of healthcare, family and community awareness and contact tracing.

The WHO's Global Leprosy Strategy 2021–2030 (WHO 2021) focuses on interrupting transmission and achieving zero autochthonous cases. It should be noted that the strategic focus areas and interventions developed by the researcher are in line with the five-year Health Sector Transformation Plan II (HSTP II) from 2020/21–2024/2025 (FDREMoH 2021a). Draft strategies were chosen by a group of public health experts to ensure their efficacy in the Ethiopian setting and reach an agreement on their content. With the assistance of the healthcare experts in the research locations, the strategies were prepared.

6.4 SCOPE OF PROPOSED STRATEGIES

The Federal MoH, woreda health bureaus, zonal health departments, regional health bureaus and localities will all apply the suggested solutions. They are made to help the LCP by supporting its implementation, monitoring and evaluation. The targeted initiatives target health organisations, managers and policymakers, as well as patients, neighbourhoods and households of index case families.

6.5 OBJECTIVES OF THE STRATEGY

The overall goal of the strategy is to prevent LCPs through the following activities:

- Improving the services of health facilities with trained, supported and motivated health professionals.
- Improving early detection and follow-up and improving treatment with MDT or PEP (SDR).
- Improving individual and communities' awareness and minimising stigmatisation.

- Improving the health system programmes and continuous monitoring and supervision.

Figure 6.1 presents the framework of the themes and strategies that were developed.



Figure 6.1 Framework of themes for strategy development

For effective and efficient health system operation, health facilities must have trained supportive and motivated health professionals. The utilisation and efficiency of leprosy prevention and system control programmes must be improved. Multidisciplinary collaboration and teamwork are also vital, as is the presence of a highly skilled focal health professional.

Health facilities must be staffed with qualified, encouraged and motivated healthcare professionals for the health system to operate effectively and efficiently. To increase the utilisation and effectiveness of the LCP of the system, it is imperative to have motivated staff, multidisciplinary collaboration and teamwork and the availability of highly responsible, well-equipped, knowledgeable and skilled leprosy focal health professionals.

6.6 STRATEGIES FOR EARLY DETECTION OF LEPROSY CASES AMONG LEPROSY CONTACTS

Each of the following strategies is based on different themes and consists of logic and actions. At the root, the purpose is to target health workers and family relationships with health professionals. For each identified strategy, actions based on the data from the review were discussed and formulated.

Strategy 1: Implement and strengthen effective awareness creation in communities

Rationale

A lack of knowledge, misconceptions and cultural and religious issues are among the factors that affect the early utilisation of LCPs. These challenges should be addressed through social media and other communication channels as well as interpersonal communication to improve communities' awareness of LCPs. Increased community awareness plays a vital role in promoting and increasing the utilisation of healthcare services. The process of empowering people to exert more control over and improve their health is known as health promotion (WHO 2020d:6).

What is the origin of the disease and why should the community know? Leprosy is not a curse, is not brought on by malevolent spirits and should not be considered forbidden. The public should be told that leprosy is not contagious through food or utensils. It is important to inform them about the initial warning signs and symptoms of the disease as well as the fact that it is curable following a totally free, efficient and secure course of therapy.

The public must be informed that disabilities in leprosy sufferers can be prevented, and that discrimination is not justified. Nearly all early leprosy identification relies on voluntary reporting, thus, understanding the signs, causes, dissemination, treatment and cure is essential. At the community level, the government should work in partnership with various NGOs to prevent and control leprosy.

Actions

The following points are relevant to Strategy 1:

- Let the public know about the services of LCPs.

- Make the public aware of leprosy-related IEC/BCC materials (posters, flyers, brochures, magazines etc.).
- Provide interpersonal communication training for service providers for effective communication.
- Involve religious leaders/community leaders to create awareness about leprosy.
- Provide quality advice on patients and HHCs to service providers in LCPs.
- Raise community awareness and encourage the participation of community members in promoting self-reporting and removing negative perceptions about the disease.
- Promote leprosy awareness campaigns by using media conferencing, outdoor media, rural media and advocacy meetings.
- Service providers should work with local organisations to identify models for people with leprosy.
- Strengthen partnerships with the private sector and NGOs to promote health awareness.
- Set up frequent meetings with health extension staff to talk about how community leaders may encourage effective leprosy prevention and control behaviours.
- Issue interactive play/awareness messages at school to increase interest in leprosy disease awareness.
- Distribute IEC materials (leaflets, posters, videos, stickers) on leprosy symptoms, effects and self-care to village health committees.
- Provide training on leprosy knowledge and skills to village health committees in each woreda.
- Encourage village health committees to conduct school and community disease awareness programmes.

- Train community leprosy treatment supporters.

Strategy 2: Sustain expertise in leprosy by focusing on strengthening comprehensive leprosy training for health workers

Rationale

If the knowledge and skills of general practitioners of leprosy are improved, the identification of early leprosy cases will be greatly improved. The ability to suspect and diagnose leprosy patients is a very important skill for health professionals. Misdiagnosis is the main factor contributing to delayed case detection from the health services' side, especially misdiagnosis in the general health services. As a result, general health practitioners must receive training to recognise cases as soon as possible, especially at the primary healthcare level.

It is ineffective to solve the LCP's issues by combining training with tuberculosis. Training and up-to-date information on leprosy prevention and control are essential tools to prevent leprosy. Health professionals need to be familiar with the latest leprosy management strategies. Training or retraining of these diverse groups of health workers could contribute to the early case detection of leprosy. New tools utilising e-learning and health literacy promotion activities, wherever relevant and available, should also be exploited

Leprosy skills and knowledge are crucial at this time and training is needed to acquire these. Additional training and support are essential for the quality of leprosy programmes, health professionals' performance in leprosy cases and liaison with patients. The training curriculum should include supportive healthcare, coping with stigma, avoiding negative emotions and self-care. The modes of training should be diverse, such as training courses, workshops and on-the-job training.

To address any problems that LCPs may have, health workers should receive training that will help them gain the knowledge and confidence they need. The sub-woreda administration should continue to provide clinical counselling and support monitoring to managers and health professionals to implement effective LCPs. Regular training of leprosy health professionals in health facilities should always be provided. Clinical counselling and supportive care should also continue to be part of a stronger health system training or retraining of the diverse groups of health workers to contribute to the early case detection of leprosy.

The LCP must be effective in improving access to healthcare facilities. Managers and health professionals should have an LCP and have a clear role and responsibility and knowledge of policies, protocols and guidelines. The level of support in health facilities should increase the performance of LCPs by health professionals. Emphasis should be placed on the better use of monitoring and evaluation indicators – support control audit feedback – to improve the quality and comprehensive coverage of LCPs and to provide further support. Quality assurance policies and local standards must be adhered to regarding the quality of programme services.

Actions

The following steps are relevant to Strategy 2:

- Improve and control leprosy management by training, developing and equipping health professionals.
- Training of dermatologists should focus on comprehensive leprosy clinical knowledge, such as diagnosis, differentiated diagnosis, treatment, management of LR and drug side effects and include how to suspect and refer leprosy patients to referral units.
- Monitor training and workshops by updating health workers' LCP information and knowledge about current leprosy prevention and control.
- Provide counselling services at facilities and ensure regular staff reviews for work performed; use patient satisfaction to encourage staff during visits.
- Make available public posters and leaflets on leprosy at health facilities for health workers.
- Train healthcare providers in institutional settings such as prisons.
- Upgrade health workers to improve their skills in providing quality LCPs by providing opportunities for staff to grow in other sub-district clusters.
- Regarding early case detection, training should aim to improve leprosy health workers' competence to confirm suspected patients,

plan and manage case detection activities and provide supervision at a lower level.

- Allow health workers to raise concerns and challenges at their monthly meetings.
- Allow the leprosy focal person to work only on programs related to leprosy prevention and control without assigning them any additional responsibilities.
- On-the-job training, with leprosy case demonstrations, should be applied. In addition, updated information about leprosy should be conveyed to dermatologists through presentations at dermatology academic conferences, such as the annual meeting of dermatologists.
- Experienced dermatologists could also participate in the training of general health workers regarding the clinical knowledge of leprosy.
- Improve and enhance performance by supporting health professionals based on professional development and LCP services.
- Strengthen psychological support and encouragement for health professionals in cognitive courses on the provision of leprosy prevention and control.
- Health professionals must have strong interpersonal and counselling abilities to counsel clients and contacts (family members, neighbours and social contacts).
- Develop a relationship of trust with customers by fostering their admirable behavioural traits.
- Provide workshops and training for health professionals and leprosy patients on ongoing LCPs to increase their knowledge and enable leprosy prevention and control to effectively address programme-related issues.
- Become accustomed to LCPs continuously as new knowledge is obtained.

- Actively attend and participate in LCP training as an expression of the need to obtain more LCP-related skills and knowledge by continuing professional development.
- Attend specialised leprosy training in leprosy clinics to learn about the challenging conditions and treatments of the disease.
- Participate in specialised leprosy training in leprosy clinics to gain practical knowledge on difficult conditions and the treatment of leprosy.
- By designing an education-based healthcare programme, specific goals and outcomes can result in better training and leprosy prevention and control services.
- Standardise and strengthen training programmes and integrate counselling systems in sub-districts.
- Implement the ongoing training of health professionals on disease prevention and control programmes to prevent disability.
- Enable managers through up-to-date LCP-related information to help them qualify and manage efficiently.
- Collaborate with several disciplinary team members to highlight the importance and cooperation of each healthcare worker in providing services for the LCP.
- Disseminate information and encourage compliance.
- Public and private health centres and hospitals complete a report of any suspected leprosy disease and refer patients to an infectious disease or dermatology clinic.

Strategy 3: Conduct effective and comprehensive contact tracing

Rationale

The distribution of *M. leprae* is considered to be through the nasal fluid or the skin. The risk of leprosy infection in patients varies according to the 'proximity' of the relationship (bedroom, family and neighbours, social), the type of index (MB/PB) and the age of the

contact. For the purposes of contact tracing, anyone who had contact with an untreated index case for at least 20 hours per week for at least three months during the past one year is regarded as a contact (WHO 2020d: 16). Contact infection is typically thought to originate from the index case.

The best defence against leprosy transmission and the support of disability prevention is early diagnosis and timely treatment. All leprosy contacts are routinely observed. There must be a schedule for contact-tracing work at leprosy clinics. The strategies involve active and passive contact searches. One of the indicators of the quality of an LCP is the extent of the newly diagnosed cases of G2D. Particularly in high-risk populations, the contact-tracing programme application is useful and economical. Leprosy is to be eradicated globally by 2030; this will be achieved when 120 nations report no new cases, a 70% annual decrease in new cases, a 90% decrease in new cases per million children and a 90% reduction in G2D cases (WHO 2021:12).

HHCs are described by the WHO (2020d: 16) as "a family residing in a residence or using the same kitchen as an index container". In addition to family members, these also include domestic assistants, co-workers and other accommodations of a like nature. Family members who live elsewhere should not be regarded as contacts. A person residing within a data centre is typically regarded as a neighbour of the contact if they are within 100 metres of their home. Due to geographical proximity, these people are more likely to be exposed and/or infected. For practical reasons, the programme can describe neighbourhood relationships between residents of 5 to 10 homes around the index house (depending on local housing density).

People who have a long-term relationship with the index and are not classified as family or neighbours are social contacts. These could be close friends, family members or co-workers at a job (factory or office), students and teachers at a school or people who frequent the same recreation area (such as a sports club). Therefore, strengthening household contact tracing of both MB and PB patients and contact examination of people who live in a house directly neighbouring MB patients should be applied in areas.

Action

The following steps are relevant to Strategy 3:

- Healthcare providers and policymakers in the leprosy programme should pay more attention to the contact tracing of all leprosy patients.
- Train health workers, especially during home visits, on how to conduct contact tracing and how to maintain confidentiality.
- All health professionals should be trained to monitor the family relationships of leprosy patients and follow-up leprosy screening, documentation and record.
- Village health committee members can arrange for the examination of contacts for new cases with minimum cost and minimal external support.
- Leprosy sufferers are crucial in locating and identifying those in need of assistance.
- During the examination, the index case should get counselling and be made aware of the facts surrounding the illness, the danger of infection, the treatment, prevention and care for those with disabilities.
- Before starting to filter contacts, they should be kept confidential, and a verbal agreement should be acquired.
- Family relationship monitoring and appropriate health education should be strongly strengthened and should be extended to all indicators – patient contacts, including relatives.
- HHCs of MB index cases should be considered for chemoprophylaxis in addition to immunisation with the BCG vaccine.
- Contact tracing must be required to join local health services, the National Leprosy Programme and other disease control programmes.
- Health professionals must follow programme guidelines and keep accurate records; financial incentives can be an effective way to maintain participation.

- Develop an incentive system for patients bringing contacts for screening (incentive scheme for families bringing all contacts for contact examination).
- Family and persons with close social relationships with the index should be identified and examined for leprosy symptoms.
- Inform leprosy sufferers to go to health facilities to report for evaluation.
- The results should be recorded in the local records and the Central Leprosy Database.
- New cases should be referred to the TB /leprosy department.
- Family relations of all new cases must be reviewed annually for up to 5 years after the completion of the MDT of index cases.
- If an index case is a child, a recent infection is indicated, and a wider community investigation should be considered.
- Pay special attention to children and women; introduce the periodic screening and facilitate diagnosis and care.
- The Leprosy Elimination Campaign through intensive case finding should detect new cases and 'mop up' hidden backlog cases in communities to increase awareness among the general population and mobilise and train rural community HEWs.
- Encourage individuals to be evaluated early by involving people with leprosy.
- Teach patients who are at risk of disability how to take care of themselves.
- Promote the early identification and prompt treatment of reactions.

Strategy 4: Strengthen proper monitoring, supervision, evaluation and surveillance

Rationale

Leprosy prevention and management heavily rely on monitoring and evaluation but there are still gaps in these areas. The regular programme is monitored by monthly/quarterly process progress reports, field visits by supervisory officers and programme review meetings at central, regional and district levels. Monitoring is a way to ensure support and guidance to enable employees to perform their work efficiently and effectively. To this end, the supervisor must be aware of the responsibilities of the competent and subordinate staff. The supervisor must be able to identify and correct problems that interfere with the performance of various tasks. This must be done by looking at staff performance, using review details during field visits and reviewing monthly meetings and reports.

The National Leprosy Programme aims to identify priorities, MDT prompt treatment and the prevention of disability among patients. All of these activities are continuously collected and summarised into a quarterly progress report. Some indicators have been created from these reports and are used to evaluate progress. This process helps to determine if activities are being conducted according to the plan and to take immediate corrective action when defects occur. However, there are still gaps in these areas.

The strategic objectives outlined in the use of strategies in this regard are to ensure the implementation of a check and balance system to evaluate healthcare facilities and professionals in accordance with the quality standards of the healthcare system. The performance and dedication of health services as well as the adherence to the standards of healthcare services are among them and there is a need to hold healthcare institutions and experts more accountable.

Action

The following steps are relevant to Strategy 4:

- Strengthen field supervision.
- Ensure periodic LCP evaluations.
- Use maps, tables, charts, graphs, photographs and pie diagrams as tracking tools.
- Strengthen surveillance systems.

- Verify the accuracy of the reports, complete all cases and submit them on time.
- Confirm and complete the records and reports, make regular updates and check the discrepancy between records and reports.
- Calculate, evaluate and interpret indicators, including comparisons to earlier reports and other indicators.
- Ensure the availability, quality and expiry date of drug stockpiles.
- Develop an effective surveillance methods workshop.
- Provide transport facilities.
- Exercise field supervision by a checklist at the team leader and regional level.
- Hold evaluation meetings at all levels.
- Implement an improved check and balance system to monitor the activities of all healthcare institutions and professionals.
- Use leprosy patients' experiences to pinpoint areas in the public health system that need improvement before, during and after treatment.
- Observe programme performance and results at different levels to respond to all stakeholders and implementers.
- Check the quality of information at the central and peripheral levels in accordance with the MoH/WHO policy.
- Strengthen leprosy monitoring at the human resource development level to evaluate the effectiveness of the intensified case-finding strategy used in each group and make decisions for the next plan.
- Consider process indicators only for the most important tasks.
- Establish estimations on leprosy/G2D incidence to measure if leprosy G2D indicators are on track with the SDG/HSTP II and leprosy/G2D impact targets.

- Provide much-needed regular support, incentives, education and follow-up to volunteer communities.

Strategy 5: Enhance political commitment and managerial capacities at all levels (MoH, regional, zonal, lower-level districts, health facilities)

Rationale

Leprosy is an 'unfinished issue' in Ethiopia and still needs continuous attention from the government to play a unique role in providing political and financial support for leprosy control programmes; however, government support for leprosy control has declined significantly. Advocacy for political commitment to the early case detection of leprosy should be conducted among policymakers. Leprosy policy should make early case detection a priority for the entire LCP. It is critical to get adequate political and financial support from the government through proper explanation and communication.

Additional treatment expenditures might also be incurred, such as those related to hospital stays or the cost of prosthetics, orthotics, or protective footwear. Due to these expenses, many individuals can decide against using services. Due to this, individuals can acquire secondary conditions, which would worsen the effects of their impairment; thus government should encourage leprosy rehabilitation programmes to make their services available to other people with disabilities.

Relevant policies can facilitate early case detection. These should include policies about the health education of the public concerning leprosy, welfare of leprosy health staff, training of health workers, leprosy courses in medical universities and cooperation with international and national partners. Community leprosy treatment must ensure that supporters receive the intended benefit at a specific location to prevent 'falls. Therefore, continuous advocacy for political commitment at each level of government, especially at the local level, is crucial for the whole of leprosy control.

Action

The following steps are relevant to Strategy 5:

- Strengthen staff capacity building in the overall health system and participate in field activities related to leprosy and community-based rehabilitation.

- Provide adequate human resources in every district for leprosy control activities.
- Collaborate with private for-profit health sectors to increase the role of leprosy services.
- Engage in lobbying, communication and social mobilisation to promote institutional structure involvement and policy improvements for screening lepers during home contact.
- Develop a national rehabilitation strategic plan.
- Strengthen public relations efforts with non-profits and private health facilities.
- Give incentives to local governments and community volunteers according to their performance in leprosy control activities.
- Strengthen the capacity of the MoH monitoring and evaluation unit for the effective application and coordination of all stakeholders.
- Encourage village health committees in high endemic villages to conduct school and community leprosy awareness programmes.
- Encourage members of the village health committee to examine contacts of newly identified leprosy cases.
- Commit to the implementation of chemoprophylaxis to protect contacts and break transmission.
- Increase opportunities for people with leprosy to participate in the decision-making bodies of financial institutions.
- Systematic stigma-reduction strategies should be designed appropriately from the individual level to the government level.
- Acknowledge that people participate in policy making and planning, have expertise with the distinctive social and medical components of the condition and are familiar with local culture, tradition, belief and language.

- Provide budgetary support (meals, travel expenses and post-treatment appointments) to patients with leprosy.
- Establish, implement and support self-care and self-help groups for people with leprosy and disability.
- Empower patients to prevent disability by providing training on self-care.
- Strengthen referral hospitals (efficiency, quality service) and install proper referral mechanisms.
- Make sure to maintain both central and peripheral levels of medical and non-medical equipment.
- Initiate incentive schemes for defaulters returning to treatment.
- Prepare and distribute audio-visual materials demonstrating the detection and management of leprosy on a laptop computer or tablet.
- Develop rehabilitation clinical protocols, procedures and national standards for assistive technology.
- Support the provision of auxiliary products at rehabilitation centres or health facilities.
- Strengthen existing physiotherapy units and encourage the establishment of new units in health centres or primary hospitals.
- Promote the continuous professional development of rehabilitation professionals.
- Improve access to underserved, marginalised and vulnerable leprosy services.
- Create a framework for implementing health extension initiatives, university and college curricula and leprosy case finding and HHC monitoring procedures.
- Encourage active case searching for leprosy pockets in all age groups and sexes.

- Strengthen pre-service training in clinical and programme management to prevent and control leprosy.
- Provide health workers with leprosy prevention and control support equipment and pocket guidance.
- In addition to providing information in all leprosy programmes, include at least one other isolation reduction strategy.
- Empower former patients to improve the standard of leprosy care and encourage their capacity to back amendments to the law, policy and practice as needed.
- Involve more persons with disabilities in the creation, execution and oversight of all social protection plans.
- Strengthen the distribution of leprosy drugs and other supplies.
- Provide disability prevention and treatment, clothing, supportive drugs and microcellular rubber (MCR) shoes to lepers.
- Ensure continued political commitment and support by mobilising influential people.
- Engage schools in leprosy prevention and control.
- Elementary school teachers should be equipped to screen for leprosy.
- Involve media professionals and public relations officers in leprosy prevention and information provision.
- Check for funding mobilisation from national and international sources.
- Verify that general information, education and IEC are available and that they are used to deal with the specific fears and beliefs connected to learning about leprosy as well as to provide factual information.

- Offer workshops on socio-economic development that help people learn how to improve their lives and gain confidence.
- Develop an SMS reminder system for patients who are missing doses.
- Promote sustained leprosy prevention and control research financing innovatively.
- Increase access to high-sensitive diagnosis techniques.
- Install telemedicine for advice to treat complex cases.
- Develop a web-based portal so that people affected by leprosy can post details.
- Plan and action strategic capacity-building initiatives to increase the human resources available for leprosy health research.
- Develop an online web-based health information management service (HIMS) for leprosy.
- Establish a web-based patient management system for each leprosy clinic and integrate it with the HIMS.
- Develop a GPS app-based mapping system for leprosy patients (with a complete geographical information system for leprosy).
- Develop and maintain a comprehensive database (include follow-up of patients/defaulters' details/GPS locations).
- Implement a training database.
- Establish a research forum for leprosy at the national level and conduct an annual research symposium.

Strategy 6: Enhance motivational strategies for healthcare employees

Rationale

Motivation is a key measure of employee performance. Motivation as a healthcare strategy is the engine for growth and development in all areas of healthcare delivery. It is

believed that motivation strategies change internally to achieve maximum performance. Lack of motivation among healthcare providers can affect the quality of leprosy prevention and control services. Creating an encouraging environment by improving the standards and practices followed in health organisations and prioritising healthcare needs will improve the performance of professionals and focus more on leprosy prevention and control.

Motivation is closely linked to work satisfaction and includes improved leprosy prevention and control. Combining cognitive, emotional and behavioural processes with employee motivation determines how employees generally behave towards individual and organisational goals. The level of motivation affects the outcomes for health workers (Elive, Cumber & Landis 2016:8).

Managers appreciate what motivates employees to work effectively; inputs are used to get the most out of staff. Health workers are motivated by internal and external factors. The strategic goals set for using this strategy are to follow formal approaches to improve the participation of health professionals in their responsibilities and to improve their motivation to improve the quality of service they provide.

Action

The following steps are relevant to Strategy 6:

- Encourage and motivate health workers providing leprosy prevention and treatment programmes by appreciating the services they provide to alleviate leprosy.
- Establish performance-based recognition and payment for each health professional.
- Recognise, encourage and promote healthcare professionals.
- By upholding and supporting health professionals in their standing, government guarantees and credit facilities for the purchase of assets such as houses, and cars can be provided fairly and transparently.

- Provide mentored supervision for facilities, ensure regular staff evaluation for work well done and use patient satisfaction to encourage staff during visits.
- Based on performance, continual education for health professionals should be required.
- Grant benefits to practice rather than the profession. For example, any health worker working in a leprosy prevention and control unit must receive an emergency grant (risk allowance).
- Encourage and appreciate the expertise of health workers' excellence in providing quality LCP services and provide opportunities for their colleagues in other health sub-district clusters.
- Health institutions should develop motivational tips to encourage health professionals to put in extra effort on the job.

Strategy 7: Strategies for reducing leprosy stigma

Rationale

The success of case diagnosis and treatment is significantly hampered by stigma which is a major problem in initiatives for the prevention and control of leprosy. Leprosy patients frequently endure significant stigma because of the disease's passive effects. Often, to avoid discrimination, patients try to hide their illness without seeking medical attention as soon as they see the symptoms of leprosy. When communities respond negatively to leprosy, sufferers are forced to live in leprosy areas and are refused participation in public services. These manifestations have a negative physical, mental and socio-economic impact on sufferers and their families. Leprosy patients who are female are more adversely impacted; their chances of getting married or having children are significantly lowered.

Health education, community involvement and social integration are all stigma-reduction measures that help people feel more accepted in society. The IEC aims to raise public awareness of leprosy, reduce stigma and encourage people with leprosy to apply to the health department before reaching adulthood. People with leprosy play an important role

in leprosy services, especially in advocacy, awareness raising and inclusion. Rehabilitation allows patients to regain their self-esteem.

The stigma associated with leprosy among those who have it and other health issues is gradually decreasing thanks to leprosy services and the general healthcare system.

Action

The following steps are relevant to Strategy 7:

- Encourage socio-economic rehabilitation (SER) in self-help groups.
- Ensure equal opportunities for work, training, education, housing benefits and shelter.
- Provide group counselling to help people with leprosy cope with their illness and avoid stigma and discrimination.
- Address the fundamental needs of victims by promoting engagement with community-based rehabilitation (CBR) which aims to increase the quality of life for those who are disabled and their families.
- Health professionals must maintain a positive attitude to leprosy.
- Lessen stigma and discrimination in neighbourhoods by encouraging the participation of religious and community leaders.
- Appoint brand ambassadors for leprosy.
- Strengthen ongoing community mobilisation programmes to raise awareness of leprosy and gender-based violence and to reduce stigma and discrimination against vulnerable women in particular.
- Organise art competitions for school children to increase awareness.
- Display videos addressing stigma in public and private TV media.
- Ensure the availability of IEC materials on stigma prevention.
- Display IEC materials in public areas in each village and not just inside hospitals.

- Place advertisement videos on public LED screens to prevent stigma and discrimination.
- Launch inter- and intra-sectors awareness programmes on stigma.
- Develop curricula incorporating leprosy stigma awareness.
- Incorporate awareness of leprosy in in-service training.
- Provide hands-on training in counselling to relevant staff.
- Develop a counselling guide and flashcards.
- Develop and publish a code of ethics for public health staff.
- Prepare training materials for counselling.
- Initiate community self-help groups to assist people affected by leprosy (PALs).
- Promote appropriate income generation activities for PALs.
- Train providers of medical and social services on the rights of PAL groups as well as on stigmatisation.

6.7 VALIDATION OF THE STRATEGIES

The goal of strategy recognition is to make sure that the strategies are acceptable and of a quality that can be achieved. A group of medical experts was tasked with reviewing and certifying the temporary measures mentioned in section 6.3. The accreditation team was specifically chosen so that the study would involve experts.

The process of strategy verification aids in increasing the accuracy of strategies. Five informed and skilled healthcare professionals (Table 6.1) were requested to assess the techniques and rank them using predetermined standards. A professor at Hawassa University who specialises in TB and leprosy, a field epidemiology programme coordinator, two regional health bureaus TB and leprosy programme coordinators and a non-government TB and leprosy programme coordinator were the experts involved in the recognition of the strategies.

Table 6.1 Expert evaluators' information

No.	Qualification	Occupation	Professional Experience
1	PhD in Epidemiology	Professor of Hawassa University, expert TB and leprosy	More than 10yrs
2	MPH in Field Epidemiology	South Ethiopia Field Epidemiology programme coordinator	More than 15yrs
3	MPH	Sidama Region Health Bureau TB and leprosy programme coordinator	More than 15yrs
4	MSc	SNNPR Region Health Bureau TB and leprosy programme coordinator	More than 20yrs
5	MPH	NGO TB and leprosy project coordinator	More than 10yrs

With five evaluation options – strong disagreement, disagreement, neither agreement nor disagreement, agreement and strong agreement – a Likert scale was employed. The key was sent to reviewers who were instructed to use it to assess, score and indicate whether each method met the requirements for that strategy. The reviewers were requested to submit written comments and criticism on each tactic as required.

6.8 CONCLUSION

All reviewers responded. Strategic results provided by individual reviewers were consistent, but some differences were noted. The total score for each strategy was 50. Researchers found that a score of 40 or higher represented an 80% acceptable level, which is acceptable for improving the early detection of leprosy patients. No strategy scored less than 40 points. After scoring, special reviews were made in areas where the reviewers thought the strategy points should be improved.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

Determining the effects of early detection and follow-up services on the growth of early detection and monitoring services in southern Ethiopia was the goal of this study. The insights and experiences of health professionals were examined. The study used descriptive, exploratory and qualitative research designs to gather data. This chapter offers recommendations formulated from the conclusions of the study.

7.1.1 Research design and methods

Descriptive design was employed by the researcher to further the investigation. The findings of the study and interpretation were based on the designs and methodologies that were chosen to create the theoretical framework. The chosen design depends on the presence of knowledge and how it might be acquired depending on the researcher's personal philosophical stance.

A non-probability purposive sampling technique was used to compile a list of medical experts who could supply the needed data. The task required participants to talk about their time spent working in a leprosy control programme. Data analysis highlighted the difficulties in diagnosing leprosy cases and locating contacts for the leprosy control programme.

Early leprosy case detection and contact screening were persistently observed throughout the investigation. Leprosy symptoms frequently only necessitate waiting for contacts to visit a hospital when they first show. Leprosy case detection between contacts has long been poorly implemented. How well community-based health professionals and those working in healthcare facilities performed early leprosy detection and monitoring to overcome this gap was examined.

7.1.2 Aim of the study

The overall goal was to improve the early detection of leprosy in southern Ethiopia.

The objectives of this study were to:

- To explore and describe healthcare workers' understanding and experience during early leprosy case detection involvement in the Sidama region.
- To describe and critically analyse reasons for leprosy early detection challenges faced by health workers in the Sidama region.
- To assess the healthcare system's experiences in the provision of the early detection of leprosy cases in the Sidama region.
- To develop user-friendly strategies to enhance existing ones that would contribute towards improving the early detection of leprosy cases in contacts of index patients in the Sidama region.

7.2 CONCLUSIONS

The research findings were summarised in terms of the study objectives.

7.2.1 Examination and articulation of the perspectives and experiences of health workers

To provide patients with prompt care and to avoid and control leprosy that can be identified by medical facilities, early detection and treatment of the disease are priorities. Leprosy spreads when the diagnosis is postponed, leaving patients without care for an extended period.

Communities have a false belief that leprosy is an incurable disease, that it is spread by parents cursing or getting angry with their children or that it is a punishment from God for a person's misdeeds. These views have remained over the years despite advances in scientific knowledge and treatments in the treatment and reduction of the disease's transmission. As a result, the stigma and unfavourable attitudes towards the condition have increased. People with leprosy are also victims of the community's misconceptions about the disease and themselves. This prevents them from going to health facilities and

makes them follow traditional methods. These reasons are the causes of the early delays in their seeking medical attention and having the diagnosis delayed. They have been the major obstacle to controlling leprosy.

The use of traditional medicines not only slows down the search for health but also provides enough time for the infection to spread to healthy people. Community-based health professionals have supported the community by shifting the health system to the community level. However, healthcare facilities have not skilfully used the capacity of catchment community health workers or involved them in the counselling, referral, tracking and feedback of leprosy patients due to their limited knowledge and skills in initial screening, contact tracing and counselling.

The health-seeking behaviours of leprosy patients and various delays, both patient and health system delays, can have serious consequences, such as disability, isolation, complications and the further spread of the disease. Unaccounted for cases represent a severe threat to leprosy control; added to the social burden are infection and the increased pressure of the spread of the disease. Leprosy diagnosis demands cutting-edge methods to increase case diagnosis, early diagnosis and awareness and the ability of medical personnel to recognise, treat and manage leprosy and its sequelae.

The public's strong negative perception of leprosy harms interpersonal connections, the moral identity of those who have the disease and leprosy control initiatives. Most study participants suggested that patients, close contacts, community members and health professionals had poor knowledge, attitudes and practices about the causes, mode of transmission, signs and symptoms, prophylaxis and treatment of leprosy; these led to traditional medicine being used by communities. This not only delayed health-seeking behaviours but also affected programme control strategies by giving sufferers time to spread the infection in the community. Possessing the required level of knowledge and a positive attitude will help patients and communities to receive timely assistance from appropriate health facilities.

7.2.2 Description of reasons for early detection challenges

Leprosy cases with a delayed diagnosis are linked to misdiagnosis, insufficient or erroneous information and a lack of the services of qualified medical personnel. The lack of timely knowledge by health professionals has led to additional health problems leading to physical disability and deformity. The study found that because health professionals in

the study area lack experience and expertise in treating leprosy, they are less confident in their ability to diagnose and treat the disease which increases the risk of misdiagnosis, the use of inappropriate drugs and incorrect care.

Delayed diagnosis and inadequate treatment have also been facilitated by private health professionals. This is as they have had negligible contact with the disease through theoretical and practical sessions in the field of education and training regarding the disease. To make early case results more effective, the calibre of suspect investigations and HHC investigations must be raised. This can be achieved through professional training and strong supervision. Leprosy training should focus on leprosy by ensuring rapid diagnosis, treatment, contact surveillance and prevention methods. In addition, health education should focus on treating suspected leprosy cases that are more valuable without disabilities in urban and rural health facilities. General dermatology clinics should be required to participate in case notification in the revised health policy.

The stigma attached to leprosy has a profound effect on sufferers. The effects of stigma are especially dangerous when they affect people's access to and quality of healthcare. People who experience discrimination and prejudice are more likely to report frustration, which is related to reports of delays in seeking help and ultimately increases the duration and incidence of untreated leprosy cases.

According to this study, patients are discouraged from seeking treatment because they are afraid of being left out due to the negative stigma associated with leprosy in communities and the association between a late diagnosis of leprosy and a lack of knowledge of the early signs of the disease. Unfortunately, the stigma is also associated with disability, deformity and disfigurement. The stigma associated with leprosy has increased, been maintained and caused patients to feel isolated, ashamed, embarrassed, undervalued, unsatisfied with their appearance and psychotic. Disorders are said to saturate as a result of personal repercussions brought on by stigma and a decline in quality of life.

Societal conditions, reduction in marriage opportunities, limitation of social participation, low employment and job opportunities and the denial of leadership roles are cited as the consequences of exclusion. People at high risk of leprosy live in poor living conditions with inadequate clean water and sanitation, poor hygiene and inadequate diet. All of this contributes to late diagnosis and treatment.

Locals are ashamed if they have leprosy in their family and the community refuses to interact with leprosy patients or allow their children to play with leprosy youngsters. The reason for avoiding leprosy patients is the fear of their disability and deformity and the fear that the patients will transmit the disease to their communities. People with leprosy, including their families and relatives, live in slums where they are stigmatised by fear, social injustice and extreme poverty. In addition to medical and economic conditions, isolation also contributes to the burden of the disease.

Treatment that is administered in a timely and effective manner eliminates limitations and abnormalities that negatively impact a person's social and professional life and are to blame for the stigma and discrimination attached to the illness. The negative perception of leprosy patients in communities is probably not dwindling as a result of the lack of understanding of the disease, lack of awareness about its causes, infection and prevention, as well as ignorance of its symptoms and indicators. Engaging in intensive IEC activities on the early signs of leprosy, its therapeutic efficacy and messages to support leprosy patients not to be afraid of leprosy is the need of the hour.

Additionally, a leprosy advocacy programme should be devised to enlighten area health professionals, traditional healers with a long history in rural areas, the local media and leprosy patients about the disease. Additionally, training on empowering should be held for those with leprosy, including the unaffected population, as these can later aid in rousing others. Additionally, more public access to IEC resources is required.

7.2.3 Description of the existing practice of early detection

In general, passive case detection was applied primarily in the study setting area as the source of data. Leprosy risk rises near leprosy patients. Leprosy should ideally be diagnosed and treated as soon as symptoms appear which will significantly lower the rate at which new cases are discovered. The cornerstones of the fight against leprosy are early case detection, diagnosis and prompt MDT treatment.

The majority of survey participants believed that because of insufficient commitment and a lack of awareness of the significance of contact screening and leprosy investigation, the index and family contacts' motivation to present to community HEWs and medical institutions was too weak. Index patients and their home contacts believe that treating just the index case is sufficient. They acknowledge that treating leprosy patients is

sufficient to manage the disease and that most populations were not aware that leprosy may spread through contact with patients.

Health professionals lacked the dedication and drive necessary to investigate (screen) household and community connections, raise awareness and alter attitudes, inform and consult patients and household and community contacts and monitor and evaluate health facilities on time. Due to heavy workloads, poor adherence to recommendations (strategies), lack of job training or refreshment and insufficient TB/leprosy training for health workers, and only one health worker per health centre received this training.

The contacts of people with Hansen's disease should undergo a full physical examination annually for five years after the last contact with an infectious case. Exposure to patients with a newly diagnosed leprosy case increases the risk of infection and the index can be characterised by physical or social distance from the patient (e.g., blood relatives, household members and neighbours). Leprosy prevention and control are most effectively achieved through early diagnosis, treatment, BCG newborn vaccination and SDR prophylaxis for home and community contacts. Additionally, it is important to emphasise the value of leprosy early diagnosis through population health promotion and ongoing leprosy education for healthcare professionals.

Participants reported that in most cases there was a lack of clinical knowledge and skills on leprosy among healthcare providers. Healthcare providers generally join TB/leprosy staff without any knowledge of the disease. Participants also said that they received TB/leprosy training that only lasted for a few days with leprosy training limited to, at the most, one day without any practical training. Most staff are not trained in leprosy management and follow-up, even if the trained health workers in leprosy control face frequent rotation and transfers. Commonly, they worked in a TB/leprosy clinic or unit for less than a year.

Most people in TB/leprosy healthcare are involved in other activities and have other responsibilities. These workloads can result in incomplete information, such as leprosy patients' addresses on the leprosy record, making it difficult to find leprosy contacts. Additional difficulties influencing the health sector workforce include low educational standards, a lack of enthusiasm for training, a lack of technical assistance, a lack of incentives, the high exchange rate of health professionals, particularly in the public sector, as part of human resource management and lack of employee motivation and satisfaction. The execution of leprosy control measures is hampered by all of these

difficulties. These negative effects, therefore, show that the actions of the Ethiopian health system need to be improved.

In public health institutions, leprosy preventive and control techniques face similar programme coordination issues which must be addressed. Due to a lack of coordination among units, the level of awareness and use of services, the calibre of case investigation and management, the capacity of implementers, epidemiological monitoring, communication and coordination, routine monitoring and evaluation do not work optimally. This delays the detection of leprosy cases and continues the transmission of the disease. As participants explained, patients who were diagnosed as leprosy patients or suspects were not immediately followed up. Participants also noted that some healthcare workers did not contact all the relatives of leprosy patients.

Health facilities should be treated as holistic systems to address the existing systemic shortcomings. Health facilities and health professionals are responsible for the use of services, quality of case investigation and treatment, enforcement capacity, epidemiological monitoring, communication and coordination and regular monitoring and evaluation. Other challenges mentioned by participants were that the sustainability of leprosy transmission and the risk of reinfection associated with delays in anti-leprosy treatment by defaulters and prolonged treatment time were all associated risk factors. Furthermore, the side effects of medications and poor follow-up of patients and their contacts or relationships were also associated with risk.

Efforts must be made to fix the current unbalanced system. Health institutions and health professionals are accountable for the utilisation of services, the accuracy of case detection and management, the capability of implementers, epidemic surveillance, communication and coordination and routine monitoring and evaluation.

Another risk is the distance from the health facility. Distance to a health facility is related to transportation costs and travel distance and these could contribute to system barriers or delays in managing leprosy cases and household contact tracing activities. More or less all leprosy patients are of low socio-economic status and experience financial instability. Days lost from work because of illness and resultant job loss result in poor housing and living conditions, food insecurity and malnutrition, financial and cultural problems and contribute to delays in diagnosis. This delay leads to the worsening of the disease and its persistence. The effects of ill health exacerbate poverty for sick and affected families. The government, the MoH, other stakeholders and partner

organisations must provide adequate financial support to implement leprosy prevention and control strategies.

One of the hallmarks of good governance in healthcare systems is the development of access to health services for individuals. Supervising is critical to improving access to healthcare and improving healthcare performance for health monitoring and evaluation, as well as creating opportunities for professionals to improve healthcare delivery. One of the indicators of the good management of healthcare systems is the progressiveness with which individuals can access healthcare. Mostly, it is influenced by supportive supervision. Supervising professionals is critical for healthcare accessibility and for improving health worker performance to enhance health outcomes for health monitoring and evaluation. It is also an opportunity for professionals to improve healthcare service delivery.

According to the study, one of the recurrent problems from the interviews that adversely affect the effectiveness of the LCP of health facilities and health workers is insufficient to no support supervision. As they pointed out, ignorance may be one of the contributing elements to the subpar support oversight, along with insufficient budget and a lack of transportation facilities. When combined with auditing and giving staff feedback, supportive supervision consistently enhances the performance of health professionals. Ongoing support monitoring and training will enable the MoH to achieve leprosy prevention and control strategies to enhance the quality of case management among health professionals and the health system.

7.2.4 Development of a strategy to improve the early detection of leprosy

7.2.4.1 Strategy development summary

The goal of the strategy was to make recommendations on ways to improve the implementation of LCPs. A superior strategy based on themes and literature was devised by the researcher. This interim strategy was reviewed and put into action to develop seven strategies. The strategy was presented to experts in the sector for the evaluation and confirmation of the final strategic inputs.

7.2.4.2 Final strategies

The most recent strategies were based on the agreement of programme professionals for leprosy prevention and control. After confirmation, the researcher discussed the final

strategies with the study supervisor and the following final strategies were approved and recommended:

Strategy 1: Implement and strengthen effective awareness creation in communities.

Strategy 2: Sustain expertise in leprosy by focusing on strengthening comprehensive leprosy training for health workers.

Strategy 3: Conduct effective and comprehensive contact tracing.

Strategy 4: Strengthen proper monitoring, supervision, evaluation and surveillance.

Strategy 5: Develop political commitment and leadership skills at the MoH, regional health bureau, zonal health office, woreda health office and healthcare facilities.

Strategy 6: Enhance motivational strategies for healthcare employees.

Strategy 7: Implement strategies for reducing leprosy stigma.

7.3 RECOMMENDATIONS

The following suggestions were made by the researcher for the leprosy screening plan. Policymakers, researchers, healthcare workers and other health experts will find the advice helpful. The recommendations are based on the conclusions of the study regarding the difficulties and requirements of leprosy prevention and control.

7.3.1 Recommendations for policymakers and managers of healthcare services

- National, regional, zonal and woreda policymakers and health bureaus must continue to play a significant role in ensuring and improving leprosy prevention and control strategies in public and private health facilities.
- MoH/RHB should focus on household contact-tracing approaches for community-based leprosy patients and be regarded as an important performance indicator. Contact detection and special interventions such as chemoprophylaxis SDR, once given, are possible, acceptable and cost-effective and reduce the risk of leprosy and its spread.
- The LCP should consider establishing a non-financial transport system that enables leprosy patients and contacts to visit a TB/leprosy clinic for services.
- The implementation of the proposed strategy through the provision of guidance, training, supportive oversight, monitoring and evaluation of its effectiveness must be supported.
- The community's role in facilitating training, emphasising the importance of community prevention in transmission, leprosy treatment and the reduction of stigma and discrimination must be strengthened.
- Health policymakers and leaders should implement regular leprosy prevention and control supportive monitoring and evaluation programmes followed by periodic performance review meetings coordinated by the woreda health offices with the presence of responsible bodies to evaluate the general performance of leprosy prevention and control strategies (management of leprosy cases, early detection and contact tracing).
- The planning, monitoring and evaluation system of the LCP must be strengthened in public and private health facilities and a regular review of the plan and performance of the LCP must follow.

7.3.2 Recommendations for health facility

- As a significant component of leprosy knowledge for medical care is through the use of public health billboards, posters and pamphlets, these must be made available.

- Allow the leprosy focal person to work only on programs related to leprosy prevention and control without assigning them any additional responsibilities. .
- The in-service training of healthcare workers must be prioritised.
- Regular and focused monitoring of leprosy activities to improve the competency and case management skills of healthcare workers and community HEWs must be undertaken.
- Integrated leprosy treatment services need to build and strengthen the capacity of the health organisation to provide psychological support, mental healthcare and social support to leprosy patients.
- Maintain regular support with a checklist to guide community health expansion and provide feedback on site that can be used as input for planning effective LCPs and develop a follow-up joint action plan for each visit.
- Ongoing patient education by a healthcare worker at the service delivery point during treatment refill must be monitored.
- Develop an action plan to improve the coverage service based on the MoH and the WHO 2035 strategies.
- The local administration and community representatives must engage in the planning, implementation and monitoring process of leprosy programmes.
- Develop a CBR district plan in line with national policy/planning.
- Introduce locally based techniques to train people with disabilities and their families by developing skills and knowledge.
- Keep adequate stocks of drugs for MDT.

7.3.3 Recommendations for health workers

- Health workers must follow the guidelines, manuals and standard operating procedures (SOPs) while implementing leprosy case management and contact-tracing programmes.
- Identify new (index) cases.

- Wherever possible by using GPS coordinates, record important information such as addresses, phone numbers and other details of index patients and contacts.
- Health education must be given to contacts about the index case, the need for contact screening, the fundamentals of transmission, the possibility that leprosy will spread to others and the need for medical evaluation, treatment and follow-up.
- Visit contacts at home, consult, obtain consent and focus on the initial sign/clinical appearance of leprosy.
- Conduct an annual leprosy screening of contacts at their homes and health facilities for the next 5 years.
- Administer a single dose for contacts in health facilities and homes or at a community facility (blanket approach).
- Work closely with community HEWs to expedite contact-tracing activities.

7.3.4 Recommendations for community involvement

- Introduce LCPs through the media in different languages.
- Prepare and distribute leprosy-related IEC/BCC materials (posters, flyers, brochures, magazines etc.) to the public.
- Raise community awareness and encourage the participation of community members to promote self-reporting and remove negative perceptions about the disease.
- Provide interpersonal communication training for service providers for effective communication.
- Family members of any leprosy patient should be encouraged to be screened for leprosy and given appropriate (preventive) treatment.
- Policymakers, community leaders, patients and their families must increase the importance of the LCP.

7.3.5 Recommendations for stigma and discrimination elimination

- Set a positive example and develop a fresh frame of reference to replace archaic ideas and customs – crucial for both the leper and society.
- Work with all involved or affected by leprosy, identifying and changing negative thoughts, beliefs and practices.
- Give people the chance to share experiences, think creatively and pick up new skills.
- Work in partnership to reduce or eliminate discriminatory laws.
- Partnerships that promote equal rights and opportunities for men and women should receive more attention.
- Grant the opportunity of including families and individuals with disabilities in decision-making processes.

7.3.6 Recommendations for training to strengthen workforce capacity and capability

- Provide secure, high-quality care, the required academic credentials, effective instruction and ongoing professional growth.
- Leprosy prevention and control training should be addressed or cascaded independently (not integrated with TB).
- Aim in-service training at enhancing skills to provide the health system with competent healthcare providers or retrain existing health professionals.
- Use practical training techniques, such as learning from case discussions, practical simulations and reflecting on real-life examples.
- Healthcare professionals must participate in specialised leprosy clinics to develop skills on how to manage challenging cases, leprosy complications and the rehabilitation of leprosy patients.

7.3.7 Recommendations for education

- The standard of continuous education and training in the health sciences is one area that needs improvement. As a crucial first step in raising the standard of medical education, the current health science recruitment procedure and culture of health science education schools need to be substantially modified. Complete resourcing of health science education colleges is necessary for this.
- For students studying health sciences to obtain a complete understanding of the subject, the curriculum should strive for a balanced concentration. A mechanism for continuing professional development must be established in conjunction with the future renewal of licences for healthcare professionals.

7.4 IMPLEMENTATION OF THE PROPOSED STRATEGIES

The development of techniques to enhance leprosy prevention and control was the ultimate objective of the study. The problem areas identified in the study were considered when the strategies were developed. Implementing the suggested strategies to solve the issues and obstacles is therefore strongly advised to achieve the WHO's Leprosy Strategy by 2035.

7.5 RECOMMENDATIONS FOR FURTHER RESEARCH

The results of this study provide many opportunities for future research. Further research can be explored in the following ways:

1. Systematically investigate leprosy cases in a large sample size to enable a thorough understanding of the disease.
2. Identify and map the infection and disease.
3. Research strategies (effectiveness, feasibility, impact) to improve the quality of leprosy services.

7.6 CONTRIBUTIONS OF THE STUDY

The health workers' experiences were explored, described and contextualised. Some of the findings of the study are not new and have been well-known issues for some time. Despite this fact, the issues continue to exist. Thus, the present study calls for efforts and interventions to address these challenges.

The present study contributed greatly to informing and providing an understanding of the good and bad experiences of managing an LCP, the reasons for the delay in the early detection of leprosy cases, the skills of health workers, motivation, contact tracing and community involvement. The findings of the study eventually led to new strategies that will improve LCPs in the health system.

7.7 LIMITATIONS

The following are the limitations of the study:

- Data were collected through in-depth interviews. A structured interview questionnaire could have revealed different results to enrich the findings of the study.
- Only healthcare workers participated in the study; neither patients nor the community was addressed due to budgetary constraints. The effects of this limitation were reduced by the literature review.
- Criticism of qualitative research in general, especially regarding the small sample size, interpretation and bias, is often expressed. However, the researcher believes that the rich description of the sample, the data collection methods and the process of the analysis demonstrate the transparent nature of the research.
- The study's findings may be applicable to contexts with comparable characteristics, even if no one from the community or the patients' side was present to discuss the challenges.

7.8 CONCLUSION

Leprosy is a bacterial disease (*mycobacterium leprae*) that mostly affects the peripheral nervous system and the skin, leading to deformities and incapacity. Leprosy is now largely controlled in tropical and subtropical regions. Leprosy cases are thought to be more common in Ethiopia than in certain other sub-Saharan African nations.

The purpose of this study was to identify the main factors that affect the capacities of LCPs to develop user-friendly strategies to enhance existing ones to implement the activities of the early detection of leprosy cases among contacts of index patients in the

Sidama region of the southern part of Ethiopia effectively. The objectives were to explore and describe health workers' views and experiences on early leprosy case detection involvement, to describe and critically analyse the reasons for leprosy early detection challenges faced by health workers, to assess the current health system's implementation of the early detection of leprosy cases and formulate strategies to improve the early detection of leprosy cases in contacts of index patients.

The study employed a qualitative, descriptive and phenomenological explorative research design to answer the research questions. Using non-probability purposive sampling, potential research participants were identified. The researcher conducted in-depth interviews to gather information regarding the experiences of the health workers (medical doctors, public health officers, clinical nurses, HEWs, health centre heads and regional and woreda district health office technical and programme experts).

The findings of the study revealed that LCPs are still problematic. Themes that emerged from the health workers' data included wrong beliefs about leprosy disease in the community, delay in seeking early healthcare behaviour, the practice of the early detection of leprosy cases and challenges experienced and observed during the implementation of leprosy strategies.

Based on the discovered results, leprosy preventive and control programme strategies were created. Overall, the analysis of the data revealed five themes. As a result, the researcher used the findings of the study to create strategies to improve the early detection of leprosy cases among the contacts of index patients. These strategies included implementing and strengthening effective community awareness-building efforts, maintaining expertise in leprosy care, strengthening comprehensive leprosy training for health workers, carrying out efficient and thorough contact tracing, enhancing adequate monitoring, supervision, assessment and surveillance, boosting managerial skills, political commitment, healthcare worker employee motivation and leprosy stigma-reduction measures. The effective implementation of these strategies will achieve zero autochthonous cases and comply with the WHO's Leprosy Strategy by 2035.

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ANNEXURES



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