

CHAPTER III

OBJECTIVES, HYPOTHESES AND METHODOLOGY

3.1 OBJECTIVES OF THE STUDY

This research in medical social geography aims at examining the impact of industrial environment on human health and to understand the implications of industrial development on the spatial distribution of health patterns. The following objectives were therefore defined for the different categories of industries:

1. To examine the nature of health hazards in different categories of industries.
2. To identify the factors affecting the health of workers in different categories of industries;
3. To examine the nature and magnitude of health problems associated with different categories of industries, and identifying the main hazards within an industrial category.

3.2 HYPOTHESES

1. Type of industry determines the type of health problems.
2. Total length of exposure of worker in industry will have a positive correlation with health problems.
3. Age is positively correlated with level of health problem.

4. Extent of occupational adjustment is strongly related to health .
5. Higher the degree of stress of the worker, greater is the occupational health hazard.

3.3 VARIABLES UNDER STUDY

The following are the variables under the study:


1. Age
2. Work experience
3. Exposure to the environment
4. Type of industry
5. Health problems
6. Stress
7. Temperament
8. Adjustment
9. Socio-economic conditions including income, literacy, living conditions, health facilities.

3.4 RESEARCH DESIGN

This study is explorative - descriptive in nature to probe into various effects on the health of the workers brought about by the type of their work environment.

3.5 THE STUDY AREA

The present study is confined to the industries situated



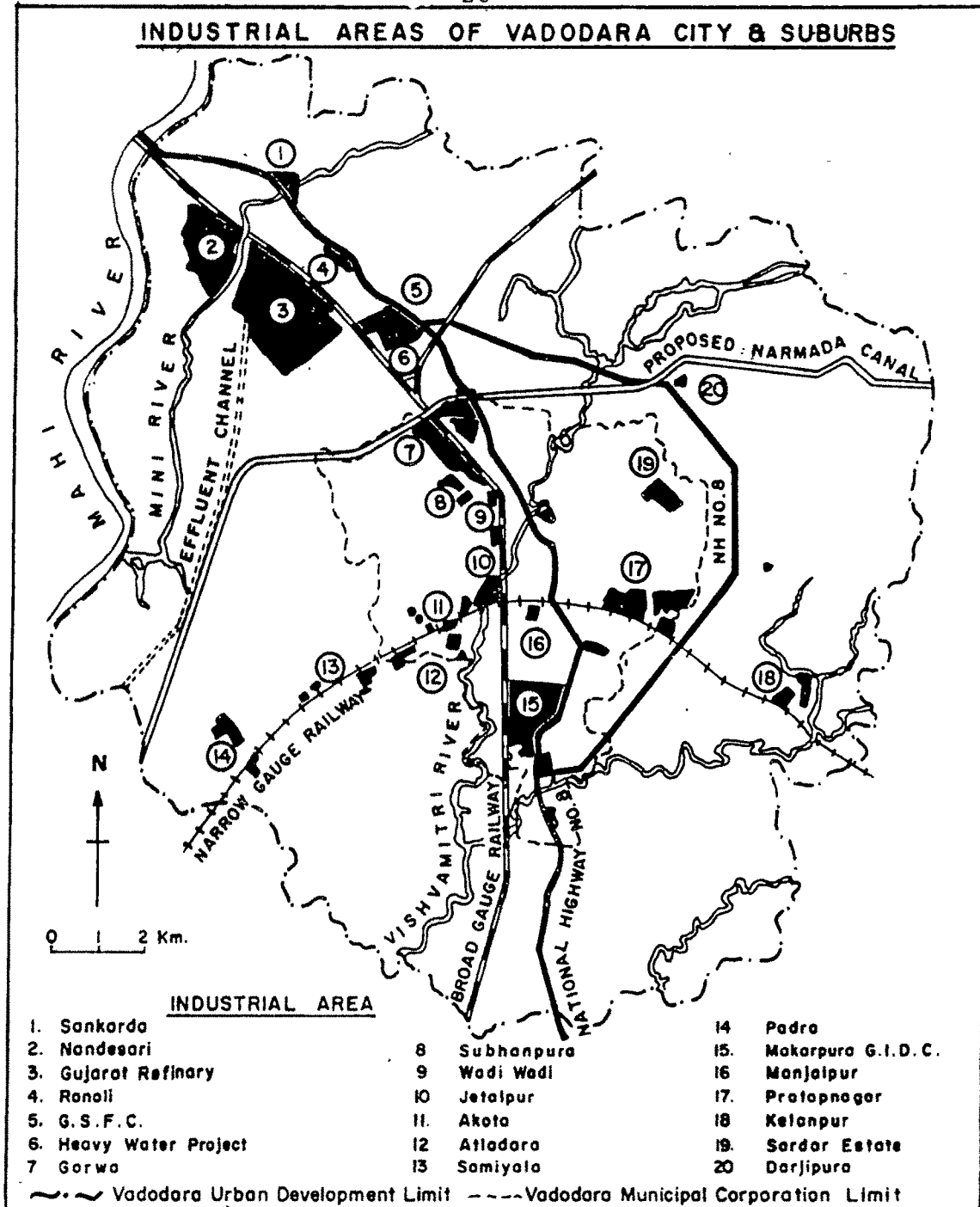


Fig. 3.1

within the Vadodara urban Area. The industrial city of Vadodara houses many types of industries. The total industrial employment in Vadodara urban area is given in (Table 3.1). Vadodara is a fast developing city, with industrial areas like Nandesari, Makarpura, Pratapnagar, Ajwa, Gorwa surrounding the main city (Fig.3.1). To get a fairly comprehensive view of the industrial scenario of Vadodara city, the following types of industries were chosen for the study (Fig.3.2):

TABLE 3.1
INDUSTRIAL EMPLOYMENT IN VADODARA URBAN AREA

Industrial Category	Workers Employed	
	Number	%
1. Chemical	8800	33.47
2. Heavy Engineering	5000	19.02
3. Pharmaceutical	3200	12.16
4. Textile	3000	11.41
5. Fertilizer	3600	13.68
6. Paints	1600	6.08
7. Glass	1100	4.19
Total	26300	100

(N.B.: These figures are as per the records of Factory Inspector's Office, Vadodara. They do not include construction

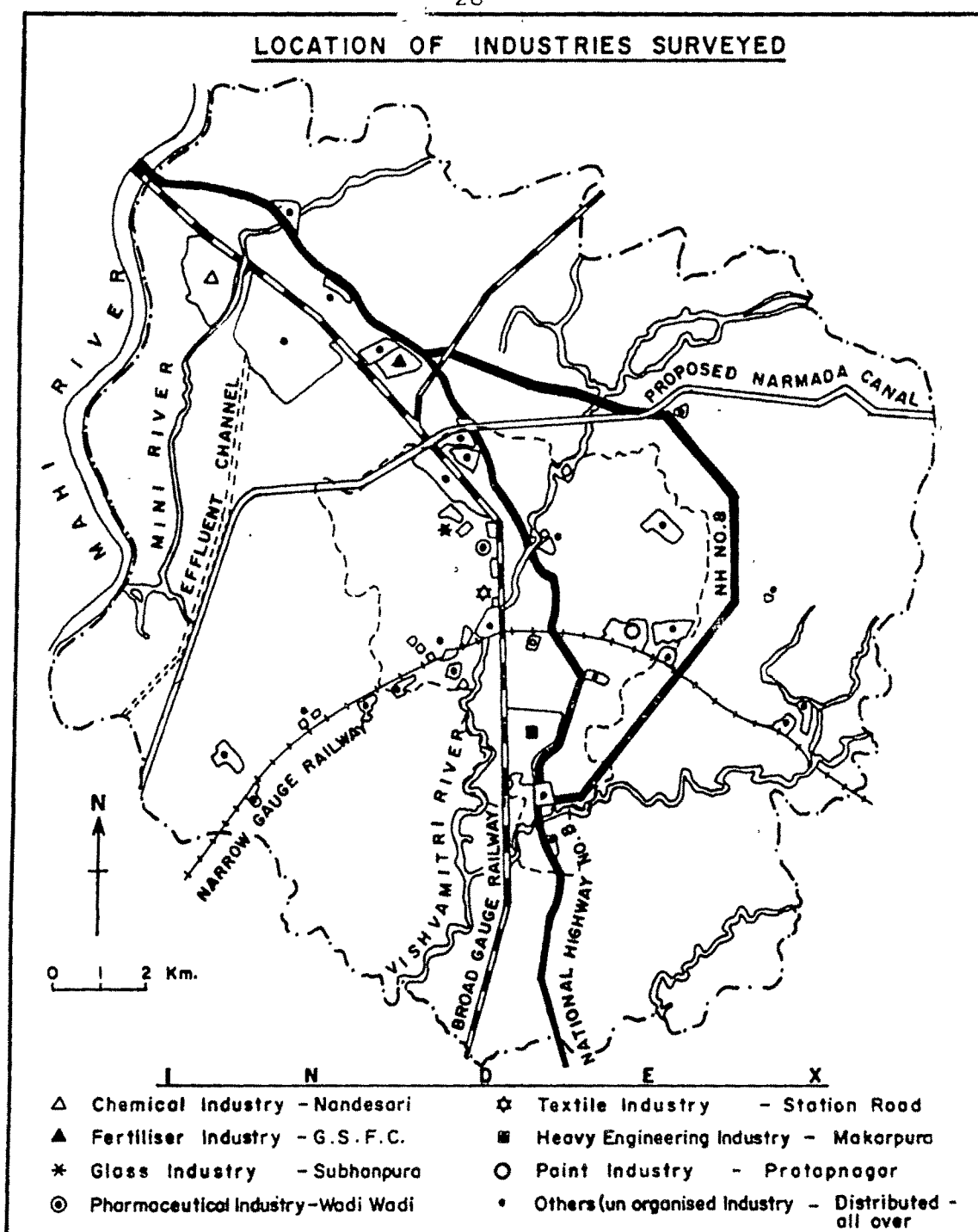


Fig.3.2

workers and small scale industries which do not fall under Factory Act)

1. Chemical Industry
2. Heavy Engineering Industry
3. Paint Industry
4. Fertilizer Industry
5. Textile Industry
6. Glass Industry
7. Pharmaceutical Industry
8. Other Industries (unorganised sector).

All the industries selected have played their part in the history of the city and some new ones like fertilizers, chemicals have their definite role in shaping the future of the city. The technological advances in the production procedure and an advancement in the list of products have increased the hazards both for the environment and the human beings in the environment. The city is virtually sitting on the verge of a catastrophe. The greatest harm and damage done is the 'chemicalisation' in the industrial area of Nandesari. The landscape at many places is dotted with dumps and heaps of chemical wastes and there are many a rivulet of contaminated waste water, the river Mini being a prominent example. The air is stale and polluted. Smoke, dust and fumes are constantly thrown out by the imposing chimneys. The workers in the industry have to take a lot more. It is not just the chemical agents or dust and fumes that play around

Distribution of the sample by Type of Industry

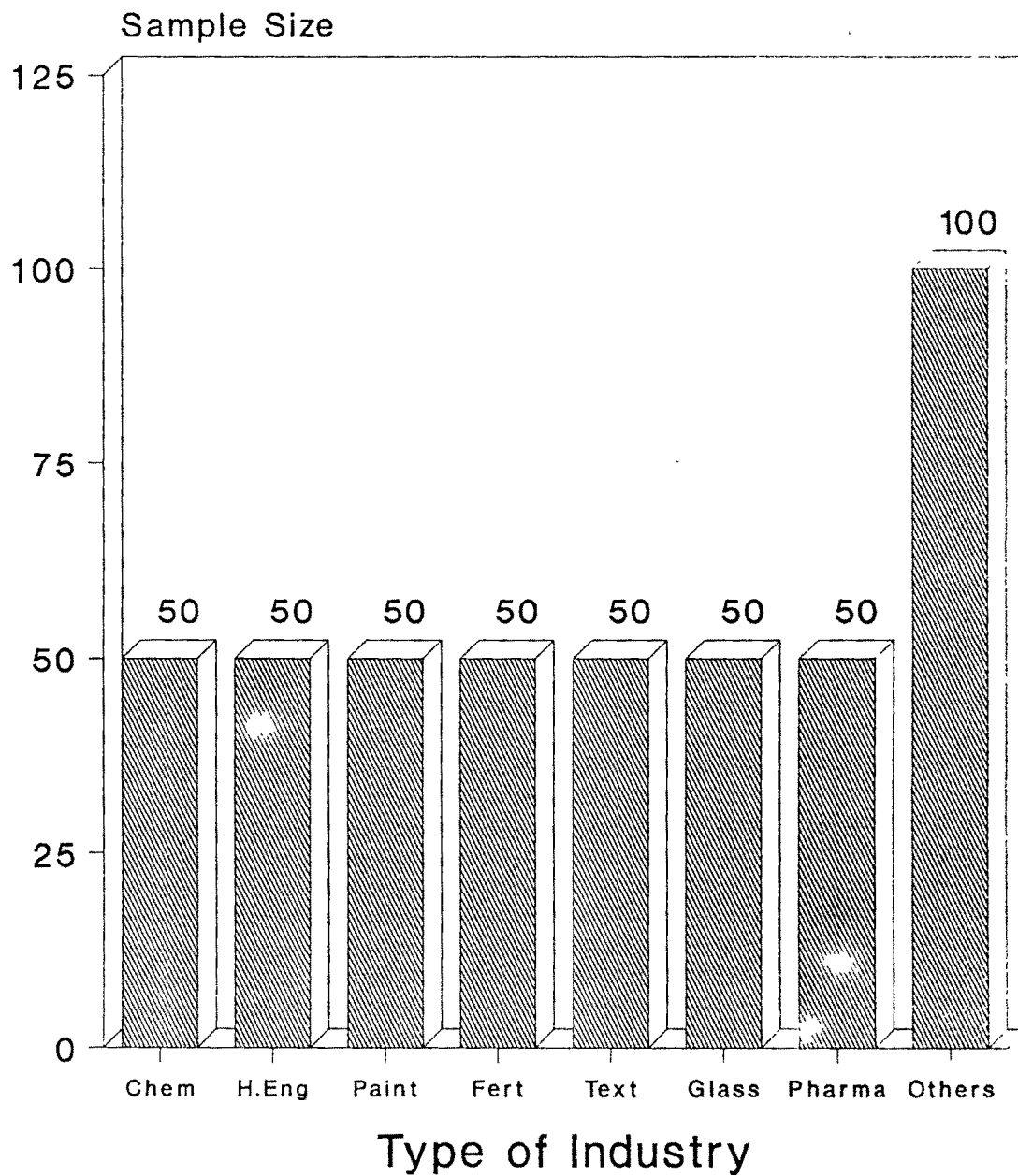


Fig.3.3(a)

with the workers but it is a host of factors that are operating in unison on the health of the workers.

Thus, to identify the health problems of industrial workers a study was conducted in the above mentioned industries of Vadodara City. All the industries are well known and recognised for their products. The names of the industries are not revealed in this study in order to maintain confidentiality of the information.

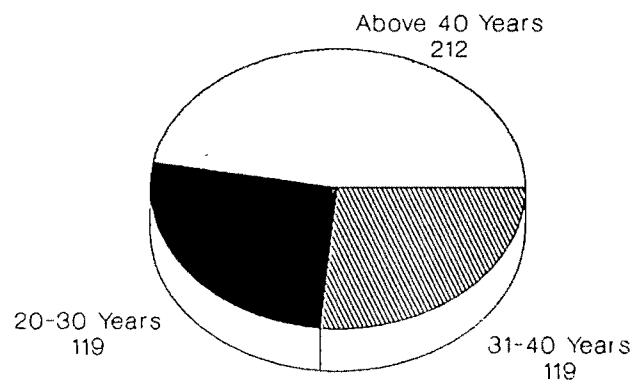
3.6 UNIVERSE OF STUDY

The study is conducted to assess the effect on health of the workers in different types of industries of Vadodara city. These industries were chosen with the intention of giving the study a coverage embracing varied working conditions and exposure to different types of causative agents bringing about ill-health.

3.7 SAMPLE OF THE STUDY

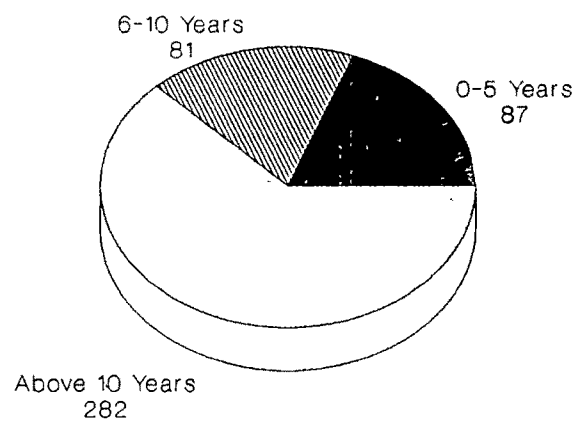
A total of four hundred and fifty (450) male respondents were chosen who worked in various industrial environments. Thus fifty respondents were randomly selected from seven different categories of industries and a sample of 100 respondents from unorganised sector were taken for the study with age and exposure (Fig.3.3). Another 100 respondents were randomly selected from the slums adjoining

Distribution of the sample by Age



(b)

Distribution of the sample by Exposure



(c)

Fig.3.3

the factories where the workers were interviewed.

3.8 TOOLS FOR DATA COLLECTION

The tools for data collection consisted of an interview schedule. The schedule consisted of following parts:

- Health status
- Stress
- Occupational Adjustment
- Temperament
- Socio-economic background

3.8.1 Health status

The first part of the interview schedule tries to assess the health status of the respondents. This is divided into two sections consisting of twelve areas which are as follows:

Section I: Ergonomic problems

This section tries to assess the problem on a five point scale for the following areas:

1. Back
2. Neck
3. Shoulder
4. Hand/Arm
5. Feet/Leg/Thigh

Ergonomics is the physiological link between the worker and his environment. This would have an effect on the workers'

body and the relative increase of discomfort in various parts of the body and will indicate the effect of varied working conditions and exposure to different types of agents which bring about health related problems.

Section II : Systemic problems:

Various systems investigated are as follows:

1. Respiratory system
2. Cardiovascular system
3. Central nervous system
4. Gastro intestinal system
5. Eye
6. Ear, Nose and Throat (ENT)
7. Skin

The suffering of the body parts, viz., back, neck, shoulders, hand/arm, and feet/leg/thigh, or other system disorders are characterised by various symptoms. For example, the suffering due to respiratory system are characterised by coughing, breathlessness, chest tightness; the suffering due to back problem are characterised by severe pain in back etc. Thus, to evaluate suffering a detailed interview schedule was prepared in consultation with the doctors. (Common but prominent symptoms of disorders were listed and the respondents were asked to respond to the question on a five point scale.)

3.8.2. Temperament Areas:

Temperament is a stable aspect of the character of an individual often regarded as biologically rooted and also providing the fundamental disposition through interaction with the environment to produce a personality. An individual is often characterised by his temperament and there are various components or types of temperament. Thus, second part of the schedule contains seven areas. They are as follows:

1. Active
2. Impulsive
3. Dominant
4. Emotional
5. Sociable
6. Reflective
7. Nervous

3.8.3. Stress

The third part involves the tool for assessing the stress level of the respondents.

The term stress has a wide ⁰/₇ annotation, use and meaning. It has been used to mean a stimulus (for example, being exposed to a stressful situation), a response (for example, behaving in a particular manner). There has been a tendency to view stress as a single event or response when, in fact, it may comprise a number of such events and responses. Stress is a normal counterpart of living and working and reaction to it is important. Excessive stress over a period of time has

been a major source of energy depletion and a major factor in development and/or maintenance of some diseases. High stress can produce changes in the cardio-vascular system and in neuro-endocrine responses. Thus, stress is an important determinant for the employee's functioning and his health.

The questions were so designed that they spoke of a particular stressful situation. A five point scale was used to give the worker more choice and thus a chance to express himself more correctly.

3.8.4. Occupational Adjustment:

It is shown in terms of satisfaction or dissatisfaction in work environment. To determine this in the inventory form following factors are included; selection of the occupation and their job satisfaction; adjustment to work patterns, pay scales, the opportunity for self-actualization and productability. The responses were recorded on five point scale.

For the non-workers residing near the factories, only the first part of the questionnaire related to health status, was utilised.

3.9 PLAN FOR THE ANALYSIS OF DATA

1. Primary information collected is analysed by using descriptive statistics. All such information has been

translated in the form of frequency distribution tables.

2. Respondents of all industries are divided into two groups, viz., suffering or non-suffering in health areas.
3. Health areas have been associated with exposure, age and type of work.
4. F-Test has been computed to determine whether the type of industry has any association with health hazards or not.
5. Stress, occupational adjustment and temperament have been examined in association with exposure, age and type of work.

3.10 PROBLEMS OF DATA

It may be mentioned at the outset that this study has been hampered due to the inadequacies and the non-availability of data. Some of the problems encountered and the resultant drawbacks of the study are as follows:

1. The study was originally planned to collect data on occupational diseases from the E.S.I.S. and other hospitals. However, it was found that no cases of occupational diseases are registered at either the E.S.I.S. hospital or elsewhere. Besides, the cases registered do not mention the occupation of the patients. So no authentic information could be available from these sources.
2. The management of various industries were unwilling to provide information regarding health problems and health hazards encountered by their employees. So this vital

source of information could not be tapped.

3. No information regarding the air, water or noise pollution resulting from the different industries could be obtained. Attempts to analyse the quality of air and water around factories by professional agencies did not succeed due to the enormous expenditure that would be involved. Besides, there was no guarantee that such an analysis could pinpoint the source of pollution.
4. Although many workers complained of ailments which may have been some serious occupational diseases, the present researcher could not persuade any medical practitioner to examine these cases and diagnose the disease. This is because there is reluctance on the part of doctors to certify cases of occupational diseases as the employers would be forced to pay compensation.