PUBLIC HEALTH CONCERN FOR CHRONIC NON-COMMUNICABLE DISEASES SURPASSES ANXIETY OVER MOST INFECTIONS

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PROFESSORIAL INAUGURAL LECTURE

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1996	West African Post-Graduate Medical College **FWACP** (Community Health) by Examination
1997	London School of Hygiene and Tropical Medicine **DLSHTM** Award
1981	Royal College of Physicians, London **DTM & H**, by Examination
1978-1979	M.Sc. (Community Health), London School of Hygiene and Tropical Medicine, University of London
1968-1974	MBBS, Ahmadu Bello University, Zaria
1966-1968	HSC, Government Secondary School, Kano
1960-1965	WAEC, Division One, Government Second School, Kano
1957-1959	City Senior Primary School, Kano. Primary V11 Certificate
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WORKING EXPERIENCE SINCE FIRST DEGREE

Professor of Community Medicine, Bayero University, Kano	October, 2003?
Senior Lecturer, Community Medicine, Bayero University, Kano	1995-2005
Honorary Consultant, Aminu Kano Teaching Hospital, Kano	1994

Associate Lecturer, Community Medicine, Bayero University, Kano	1986-2005
Medical Director, Interior Hospital, Kano	1985-1995
Commissioner, Ministry of Land and Physical Planning, Kano State	1982-1983
Executive Secretary, Health Services Management Board, Kano State	1979-1982
Consultant, Public Health, Ministry of Health, Kano	1981-1983
Senior Registrar 1, Public Health, Ministry of Health, Kano	1980
Senior Registrar 11, Public Health, Ministry of Health, Kano	1979
Medical Officer, Ministry of Health, Kano	1976-1978

Professor Mohammed Kabir is a Professor of Community Medicine, Bayero University, Kano. He was at various times the Executive Secretary of Kano State Health Services Management Board, Commissioner of Land and Physical Planning and Member of Kano State Executive Council. After his services with Kano state Government, Professor Kabir started work at his private medical hospital, and in 1986 when the Bayero medical school was established, he began teaching on part time basis and became the first Head of Community Medicine Department of the University. In 1994, he took up appointment as a full member of staff with Bayero University. In 1996 he became the Dean of the Faculty of Medicine and obtained the Fellowship of the West African College of Physicians in the same year. After serving as Head of department for 19 years, he became the first Coordinator of the CHO Training Programme of Aminu Kano Teaching Hospital. He later enrolled for a remote location PhD programme in Public Health with the University of Sheffield in 2012 and was appointed a Visiting Professor of the same University of Sheffield in June 2015. Professor Kabir has taught Principles of Epidemiology, Control of Communicable and Non-Communicable Diseases and Research Methodology to undergraduate and post graduate students. He has trained and supervised a number of Fellows of the West African College of Physicians and he had been an Examiner of the College final examinations. He was External Examiner to Ahmadu Bello University, Zaria and University of Jos. He was a Member of the MDCN Accreditation Team to College of Medicine Lagos, Madona University, Port Harcourt, and Igbinedion University, Okada. Professor Kabir also served as a Member of Kano State Council on Prerogative of Mercy, Member of Council of National Agency for Food and Drug Administration and Control and Member, Kano State Emirate Council Security Committee. Professor Kabir is a Fellow of Royal College of Tropical Medicine and Hygiene, London, and Member of the Nigeria Medical Association, Medical and Dental Consultants of Nigeria and Association of Public Health Physicians of Nigeria. Professor has to his credit three Technical Reports, thirty three articles in local and international peer reviewed journals, authored eight 'basic facts' series of text books on epidemiology, biostatistics, demography, health management and a text titled Multiple Choice Questions in Community Medicine – an academic and research interest that forms the thrust of this Inaugural Lecture.

INTRODUCTION

The topic of this lecture presupposes comparison of Public Health importance of two groups of diseases one of which is Communicable (infectious) diseases whose occurrence has been recorded throughout history and the other Non-communicable (non-infectious or chronic) diseases whose public health concern became evident only in the last few decades, and most of which are associated with economic development and were, no wonder, referred to as diseases of the rich.

The Federal Ministry of health in Nigeria inaugurated an Expert Committee on Non-communicable diseases only in 1988 to advise the Ministry on the control of 5 of these diseases most of which were then noted to be prevalent in Nigeria.

In the year 1972, two years before I graduated from ABU Medical School, I recall THREE fundamental principles we were taught in the Department of Internal Medicine:-

1. If you know Syphilis, you know Medicine
2. If you know Typhoid, you know Medicine
3. If you want to practice Medicine in Africa, you must have Chloramphenicol and Chloroquine

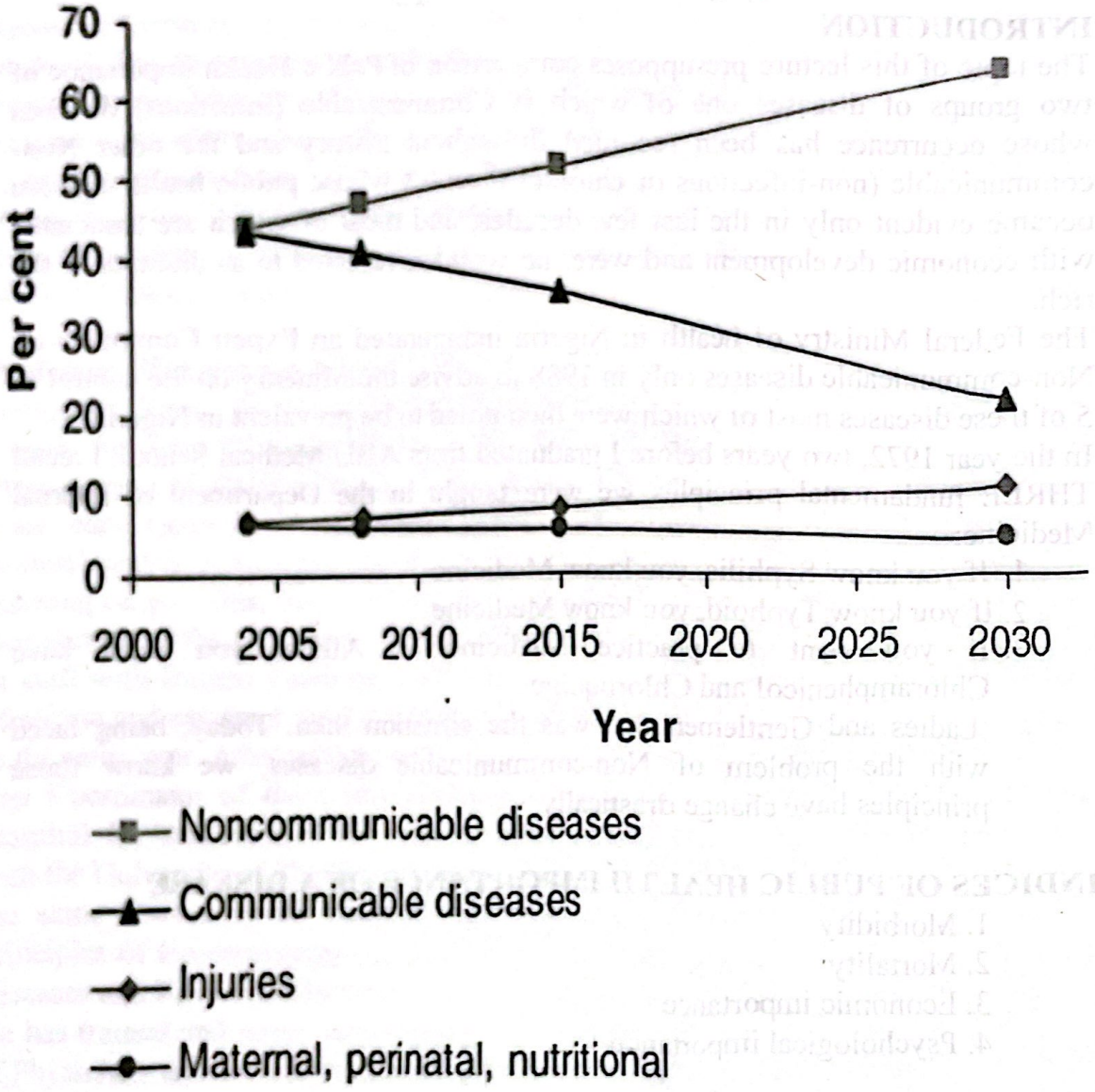
Ladies and Gentlemen that was the situation then. Today, being faced with the problem of Non-communicable diseases, we know those principles have change drastically.

INDICES OF PUBLIC HEALTH IMPORTANCE OF A DISEASE

1. Morbidity
2. Mortality
3. Economic importance
4. Psychological importance

- **NON-COMMUNICABLE DISEASES – BASIC FACTS**
- Non-communicable disease(NCDs) are non-transferrable
- Thus No specific agent
- Prolonged exposure to Physical and Chemical factors and in some cases biological agents are ASSOCIATED with NCDs
- Risk factors of NCDs: Modifiable, Non-modifiable (Genetic, Behavioral, and Environmental)
- Main types of NCDs: CVS DISEASES, RESPIRATORY DISEASES, CANCER, DIABETES MELLITUS
- NCDs kill 38 million persons each year world-wide
- Of these deaths 28 million occur in LMICs

* Certain trends in Mortality and disease burden due to Non-communicable and Communicable diseases respectively has been observed over a couple of decades



Estimated proportions of age-standardized mortality rates are cause in SSA. SSA mortality estimates were standardized to the WHO World Standard Population.

Source: WHO. Global Burden of Disease, Projections of mortality and burden of disease, 2002-2030

Explaining the graph

In Sub-Saharan Africa

- From 2000 – 2030 Mortality and burden of Non-Communicable Disease increased from 40% to about 70%
- From 2000 – 2030 Mortality and burden of Communicable Disease decreased from 40% to <20%
- From 2000 – 2030 Mortality due to injuries increased from 5% t0 10%
- From 2000 – 2030 Mortality due to Maternal, Perinatal and Nutritional disorders decreased from about 5% to about 2%
- These changes are brought about by a phenomena referred to as EPIDEMIOLOGIC TRANSITION

Epidemiologic transition is a change in disease pattern brought about globally by

1. DEMOGRAPHIC CHANGES
2. EFFECTS OF ECOLOGICAL CHANGES
3. CHANGES IN LIFESTYLE

DEMOGRAPHIC TRANSITION

Demographic transition results in decrease in **fertility** and rate of **child death**. Decrease in death rate is brought about by **general socio-economic development** and the advancement of medical care [1].

The result is increased longevity of people such that we ultimately have to reckon with the health problem of the elderly.

In underdeveloped countries though, decline in fertility rate has not been as slow as the decline in death rate such that the population's growth has continued to increase at a startling pace [1].

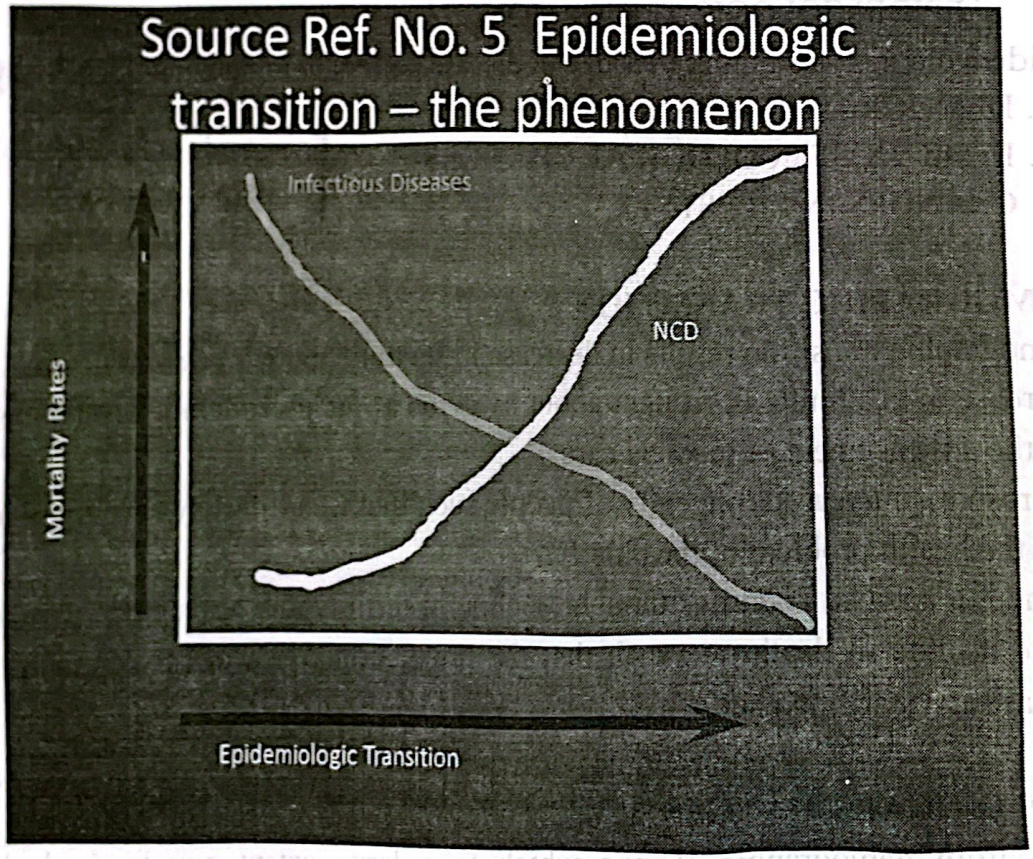
ECOLOGICAL CHANGES

Apart from demographic change which to a large extent reveals the health problem of the older people, ecological changes also bring about changing order of disease. Manufacturing activity, urbanization, and the extensive utilization of automobiles have enlarged the occurrence of occupational diseases, respiratory problems linked to pollution and road traffic accidents.

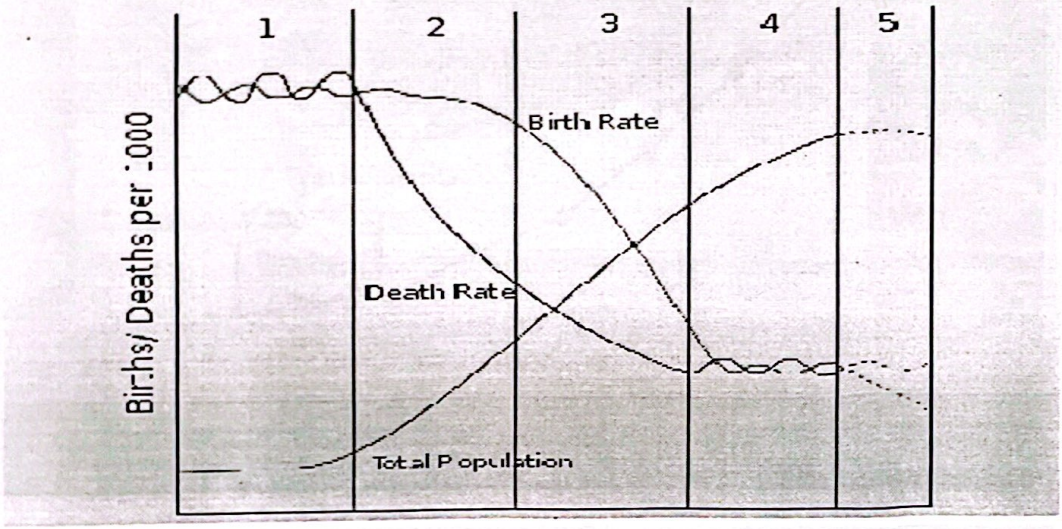
CHANGES IN LIFE STYLE

Changes in life style such as changes food intake, a life of inactivity, smoking and alcoholism and abuse of drugs have advanced the risk of ischaemic heart disease, stroke and other diseases linked to changes in life-style [2]

* In recent times, underdeveloped countries including Nigeria are going through significant epidemiological transition with major increase in burden of injuries and non-communicable disease. These include high blood pressure and diabetes as well as other diseases such as malignancies and trauma conditions as a result of vehicular and industrial accidents [3]

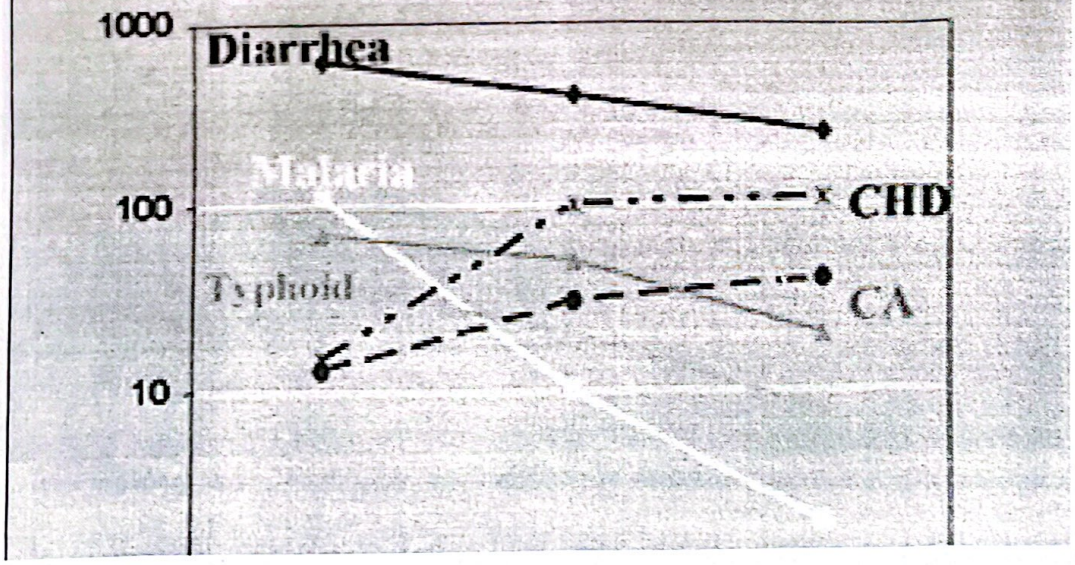


Epidemiologic transition in Mexico

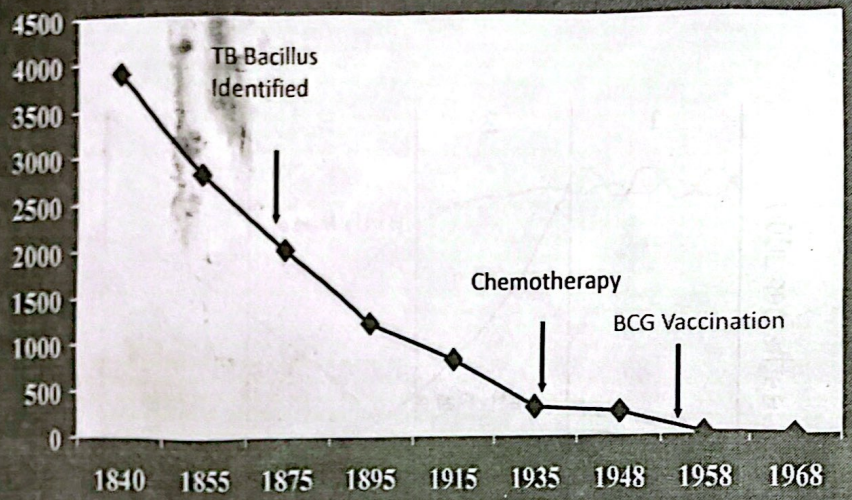


Source Ref. No. 7

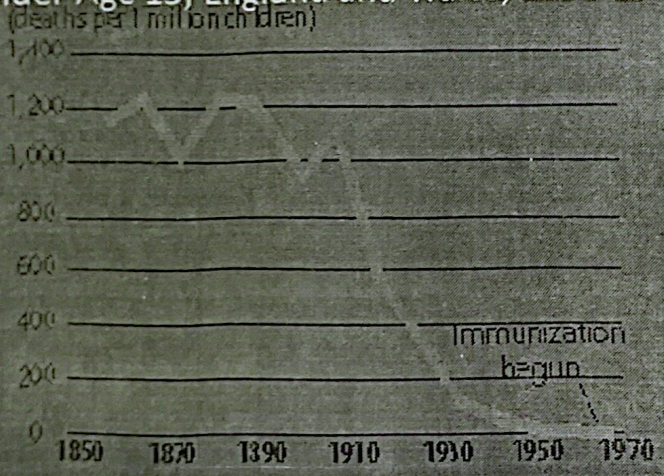
Epidemiologic Transition, Mexico
Decline in Communicable, Rise of NCDs

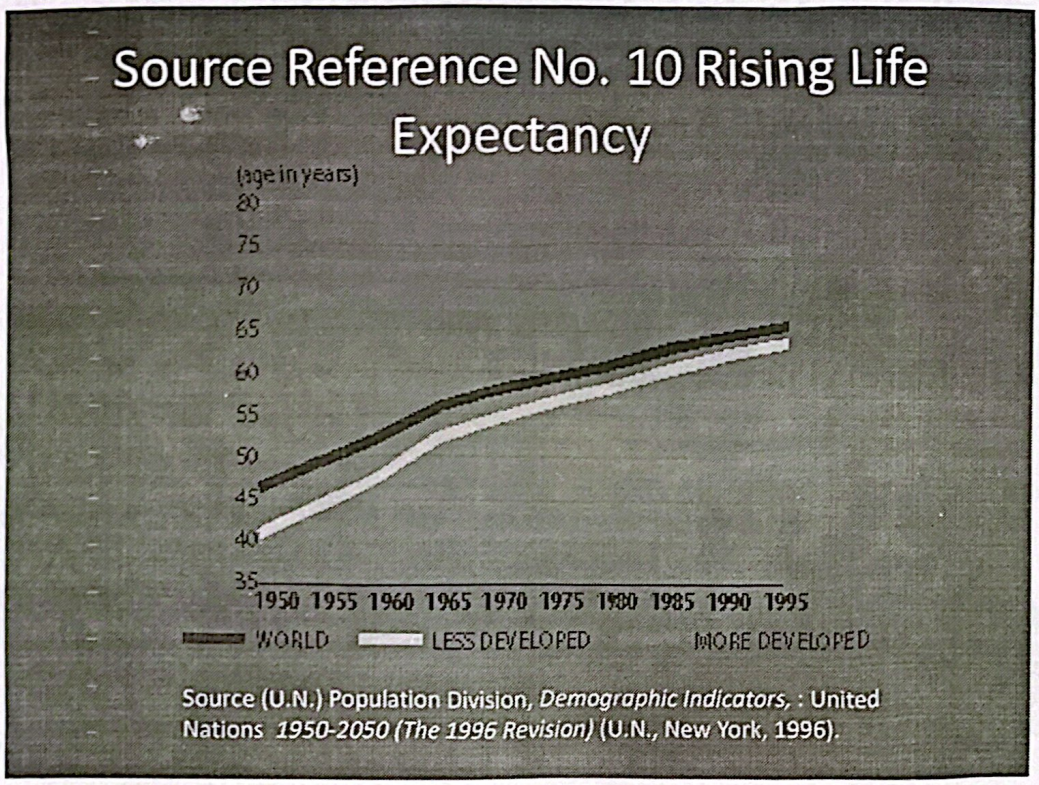


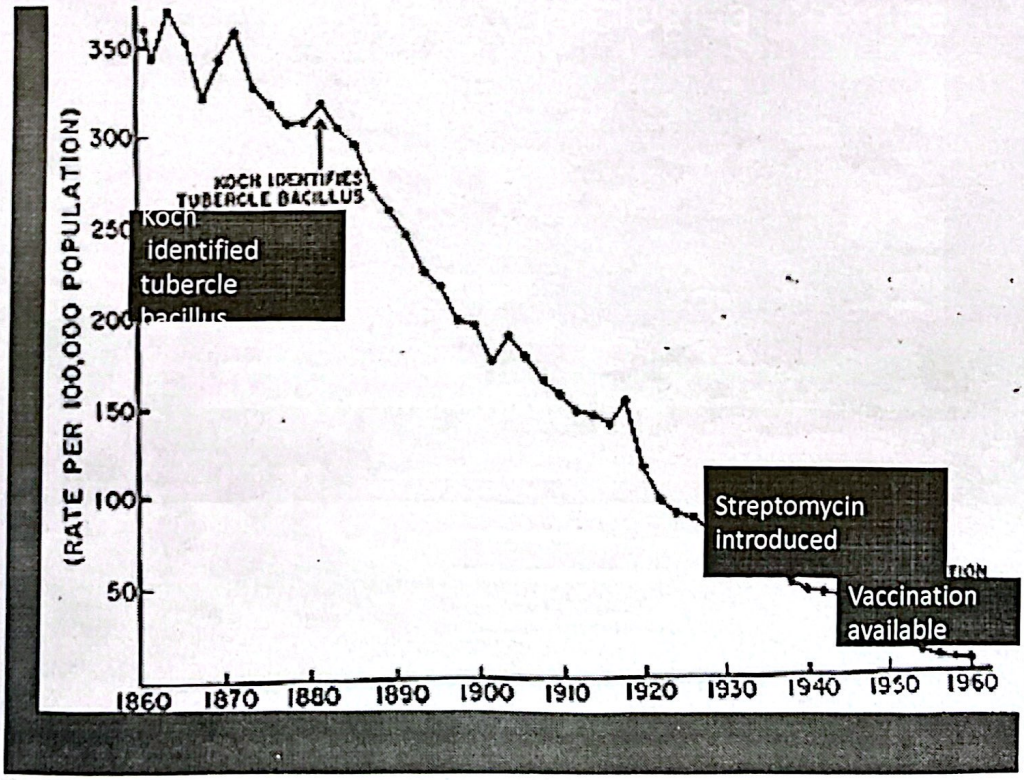
Source Ref. No. 8 Death rate for TB England & Wales



Source Ref. No. 9 Death Rates for Measles in Children Under Age 15, England and Wales, 1850-1970



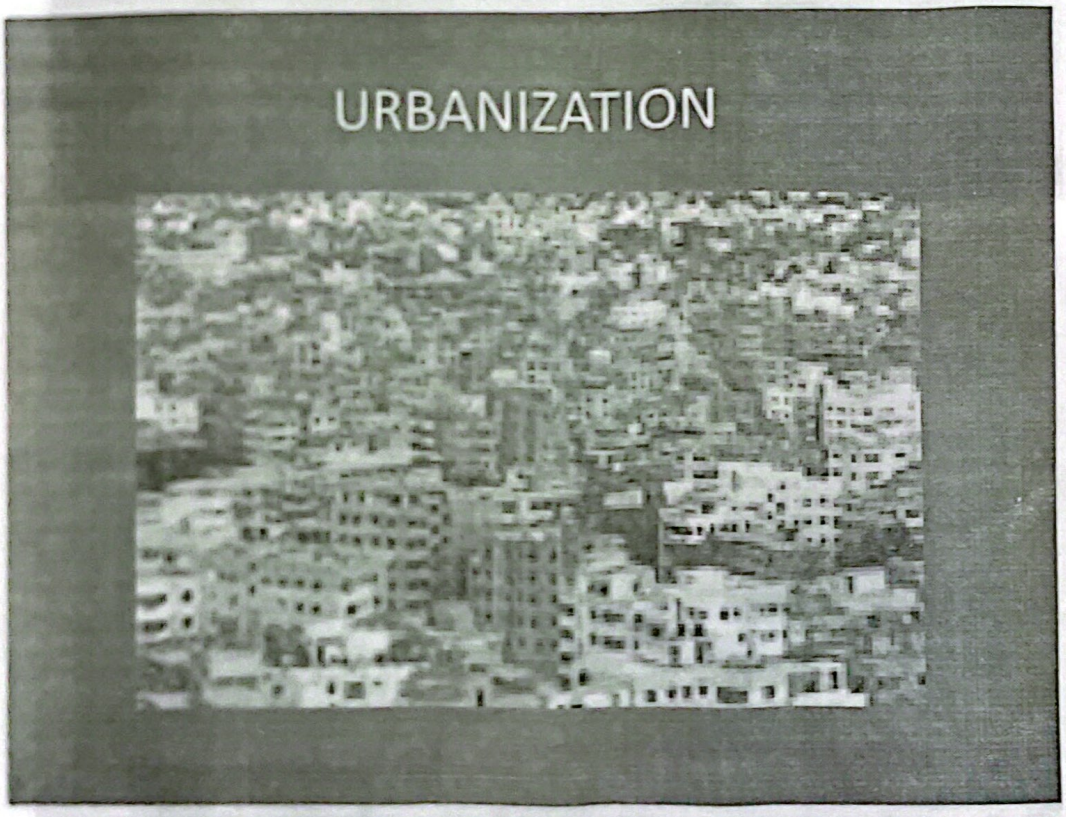




Ref. No. 11Mortality rate due to PTB in USA 1860 – 1960

RISK FACTORS OF NON-COMMUNICABLE DISEASES ILLUSTRATED

- Demographic change – Urbanization
- Ecological change – Air pollution
- Ecological change – Use of motor vehicles
- Change in Life style – Diet
- Change in Life style – Cigarette Smoking
- Change in Life Style – Sedentary Life style
- Change in Life style – Substance abuse
- Change in Life Style – Alcoholism



Source Ref. No. 12
Ecological changes, air-pollution

Source Ref. No. 13 Ecological change

Source Ref. No. 15 Change in lifestyle,

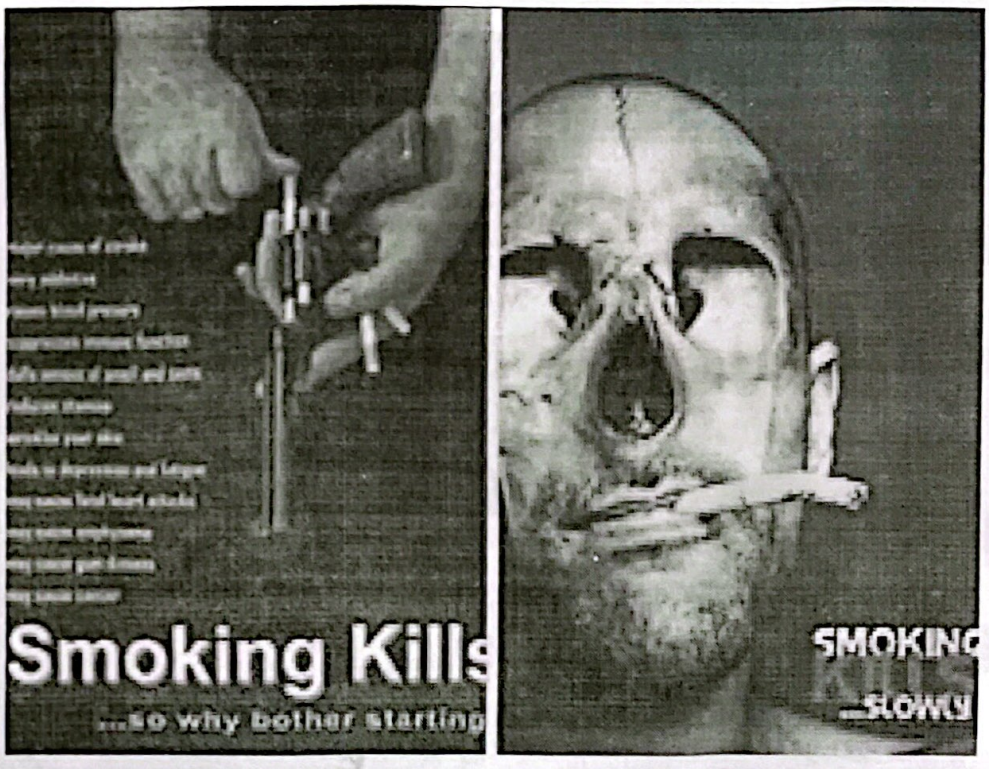
Source Ref. No 16, Fast Foods

The first McDonald's franchised outside of California by Ray Kroc in 1954. The restaurant is in a suburb of Chicago and began the growth of the chain and its effects on agriculture.

Source Ref. No.18
Consequence of Lifestyle changes

- Obesity

Source Ref. No.19. Consequence of Life style changes - Childhood Obesity



Source Ref. No. 21 warning on changes in lifestyle, [Antismoking campaign from Riyadh]

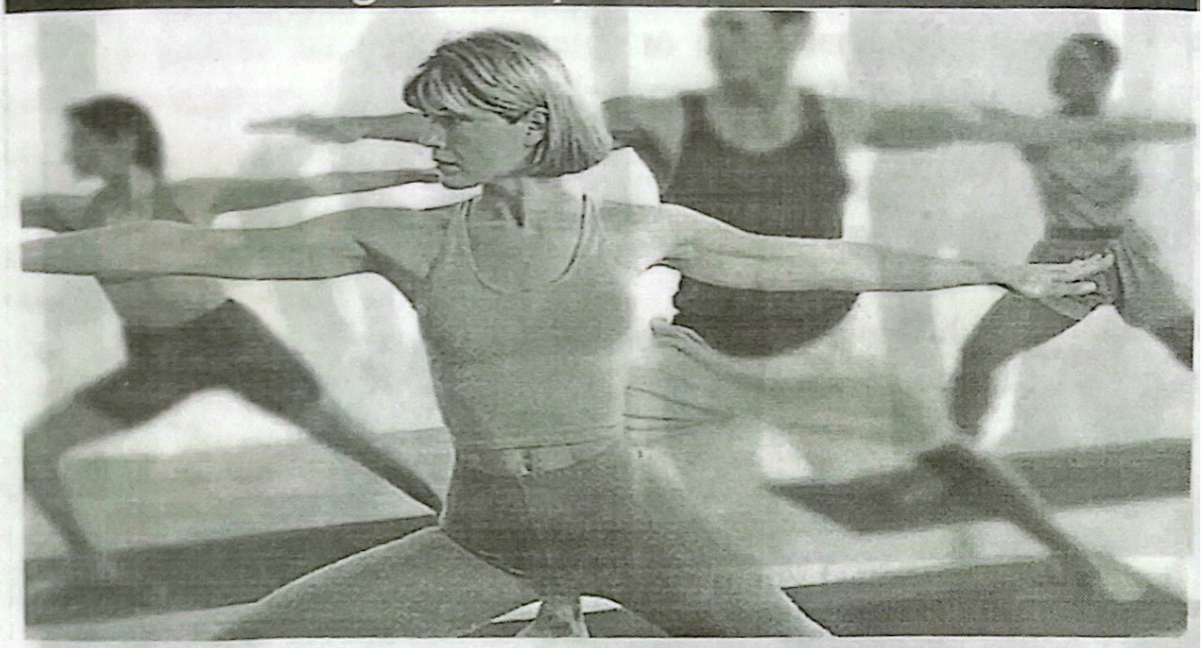
Source Ref. No. 21 Changes in lifestyle, Antismoking campaign from Riyadh

Source Ref. No. 22 warning on lifestyle changes [Anti-smoking campaign]

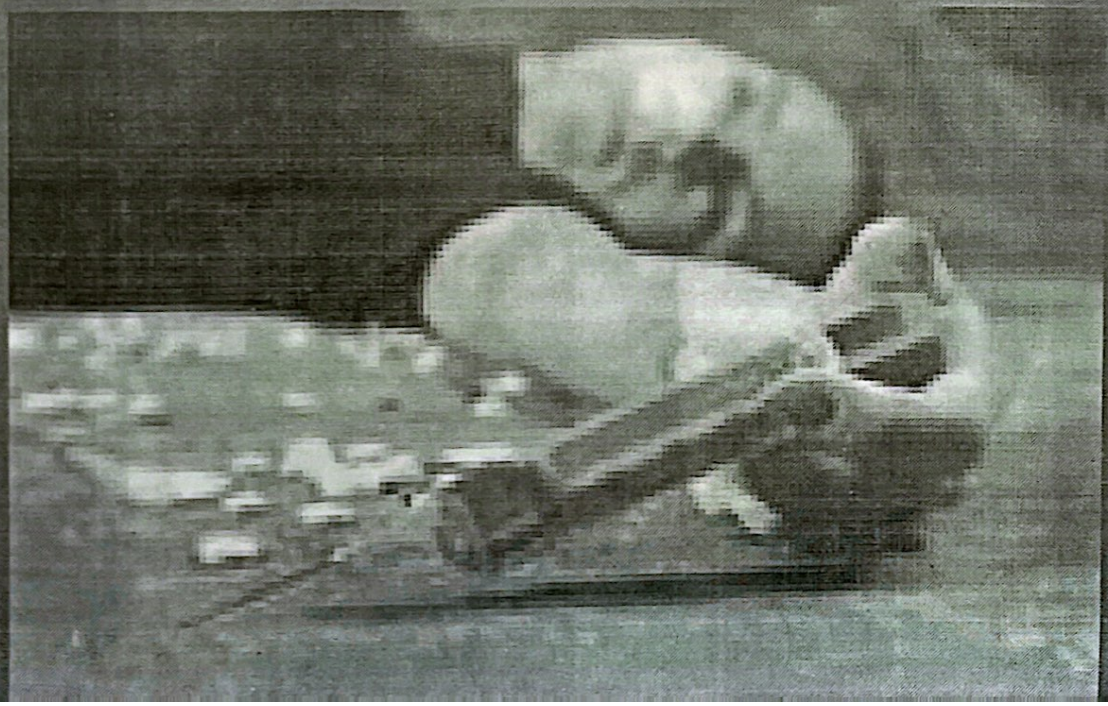
- Stop smoking

Source Ref. No. 23 Lifestyle changes – Avoid sedentary life

- Exercise is good for your health



Source Ref. No. 24 warning on life style changes [Do not abuse drugs]



Source Ref. 25 Warning on Life style changes [Avoid Alcoholism]

Ref. Source 26 [Avoid Alcoholism]

PRINCIPLES OF EPIDEMIOLOGY OF NON-COMMUNICABLE DISEASES

Non-communicable diseases are diseases that have no specific causative agent and are not transferred from a reservoir to a susceptible host

The diseases arise due to protracted exposure to causative factors. Repeated exposure depends on personal behavior and environmental situations. **Risk factors** such as a person's particular attitude and habits, hereditary factors and factors related to one's territorial conditions are believed to increase the chances of having certain non-infectious diseases. Significant statistical relationship has also been demonstrated with some biological agents as being associated with certain non-communicable disease. Such biological agents include the human papilloma virus which is implicated in cancer of the cervix.

In non-infectious disease **HOST factors** cannot be elucidated in terms of passive or active immunity, but instead in terms of hereditary factors, communal, comportment and cognitive factors etc.

- Thus in NCDs the following hold:
- a) Varied exposures i.e. exposure not to only one factor
- b) Various causality i.e. disease arises from many factors
- c) Varied outcomes i.e. exposure leads to more than one outcome
- d) Extended latency period – this brings about problem of assessing relative exposure to outcome

The following exemplify different Non-infectious diseases:- diabetes mellitus, hypertension , ischaemic heart disease, cancers, osteoarthritis, mental illnesses, sickle cell anaemia, G6PD deficiency and wounds and fractures.

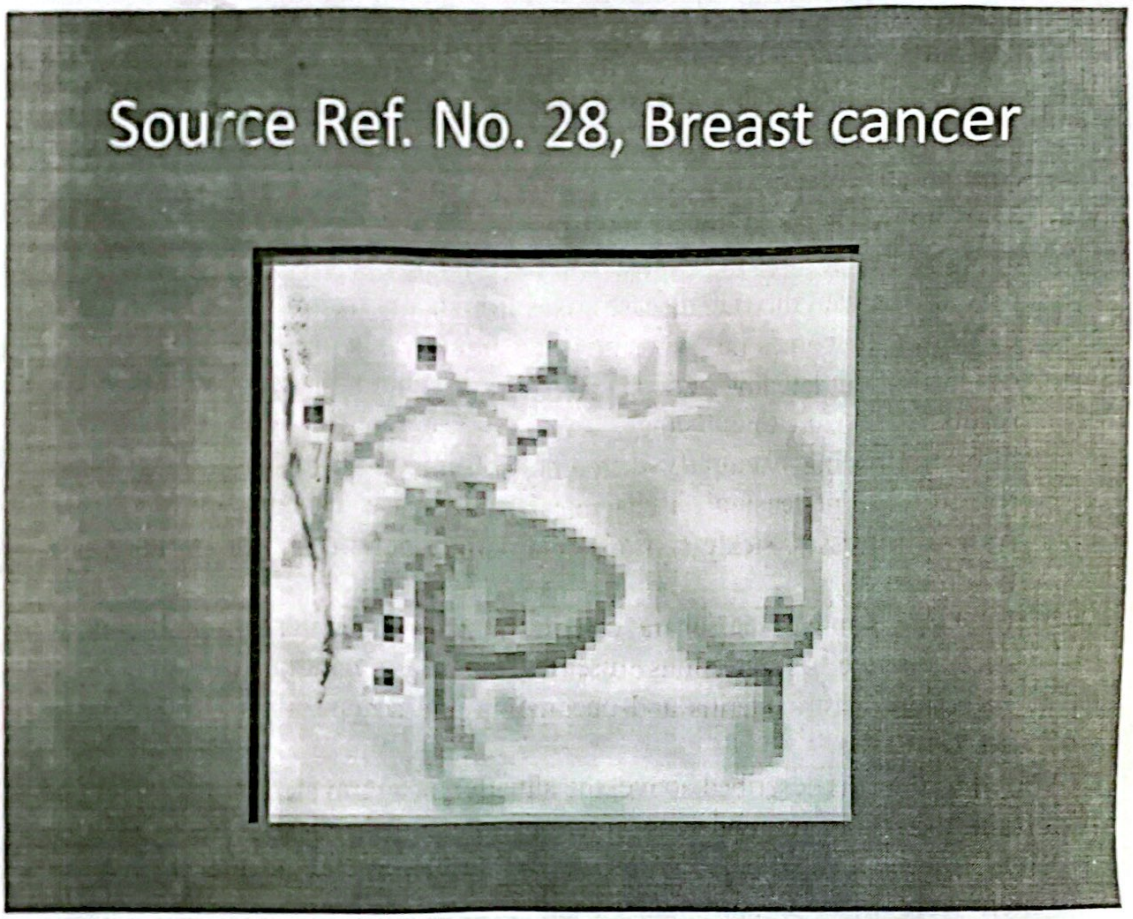
In Africa south of the Sahara, certain countries encounter two problems: 1) of presence of infectious diseases such as malaria, meningococcal infection, gastroenteritis and pneumonia and 2) and a rapid increase of NCDs [3] .

Added to what is described above, the situation is aggravated by the advent of certain infections referred to as 'emerging infections'. These include: HIV AIDS, Lassa fever, Ebola, SARS, Avian. Influenza, Swine Flu and MERS which were hitherto unrecognized and the 're-emerging infections' which were earlier brought under control e.g. Malaria, Yellow fever, whooping cough, diphtheria, and measles [3].

SOME NON-COMMUNICABLE DISEASES ILLUSTRATED

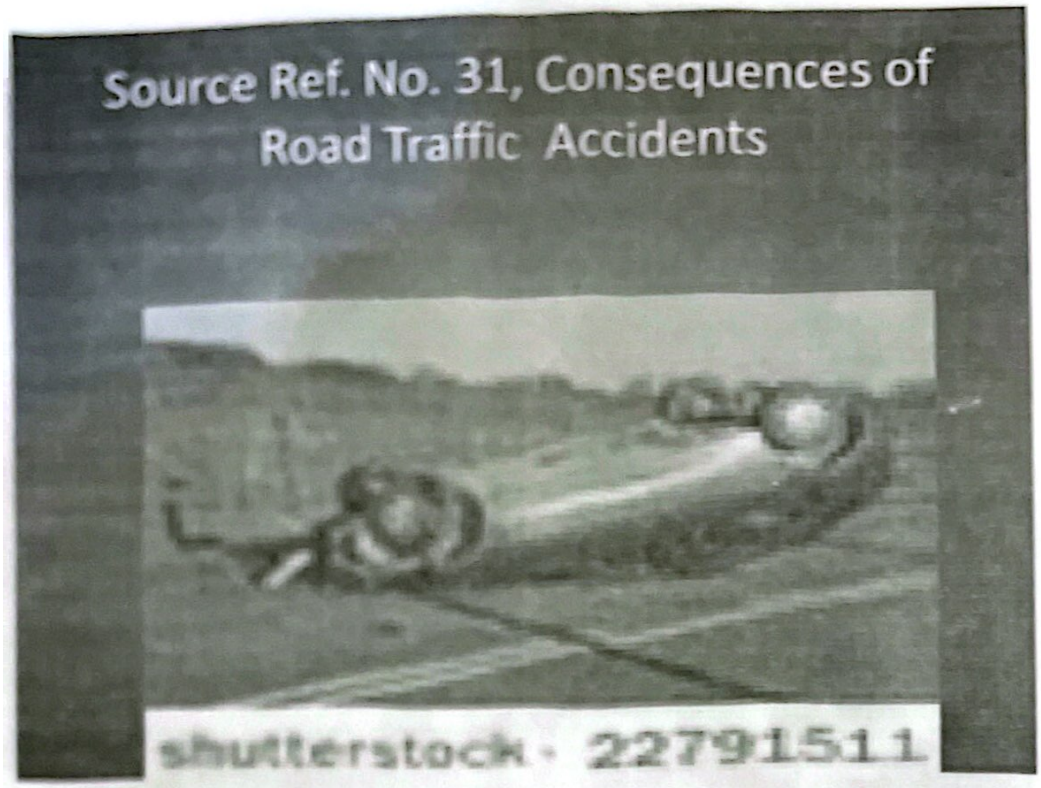
1. Breast cancer
2. Lung cancer
3. Mental illness
4. Consequences of Road traffic accidents

5. Consequences of Industrial accidents
6. Hypertension
7. Coronary Heart Disease
8. Diabetes Mellitus
9. Sickle Cell Anaemia
10. G6PD Deficiency



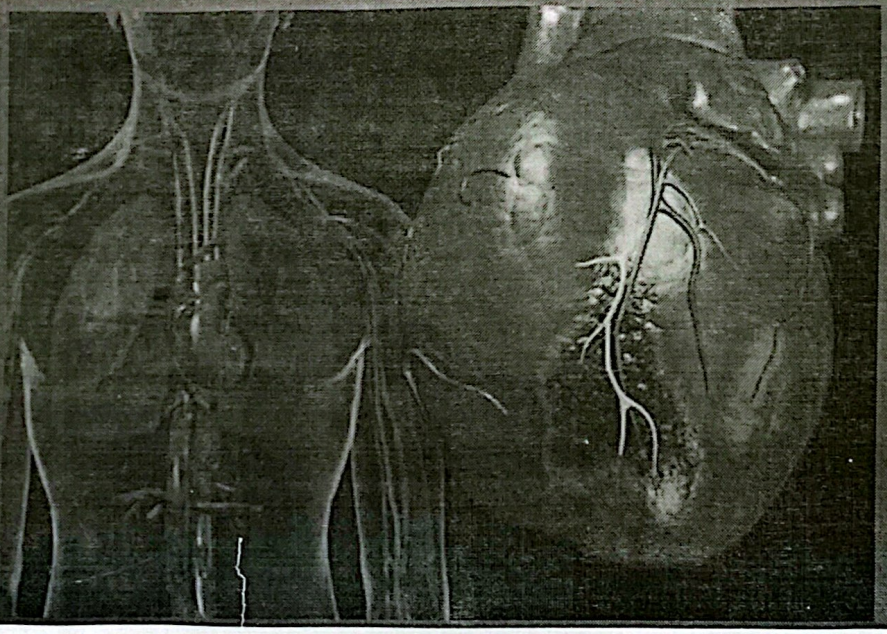
Source Ref. No. 29, Lung cancer

Source Ref. No. 30, Mental illness



Source Ref. No. 33, Hypertension

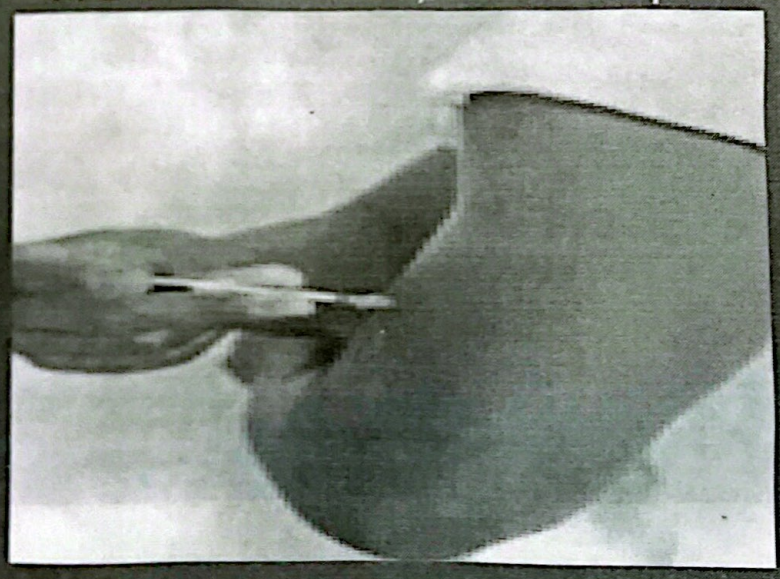
Source Ref. No. 36, Coronary heart disease ***



Diabetes Mellitus - Types

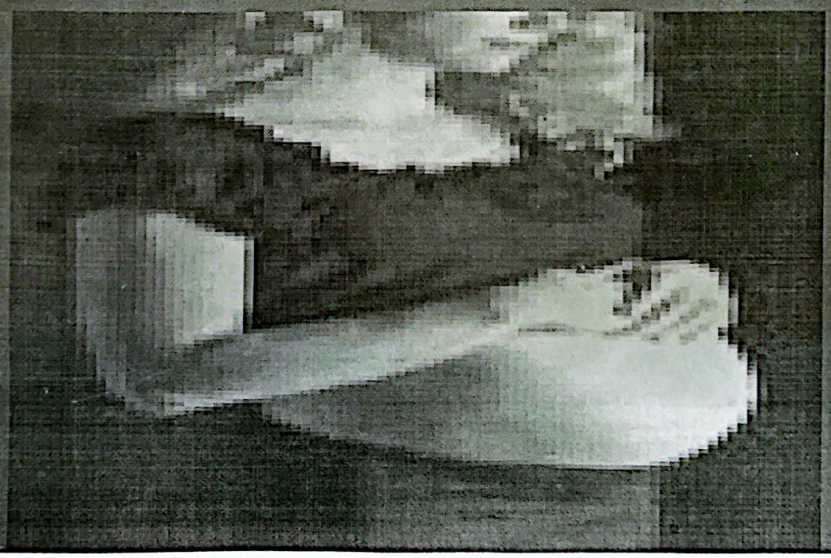
- The main types of Diabetes in Nigeria are:-
- Insulin-dependent diabetes mellitus (IDDM) – Type 1
- Non-Insulin dependent diabetes mellitus (NIDDM) – Type 2
- Malnutrition-related diabetes mellitus (MRDM) which is of two kinds:
  - Fibrocalculous pancreatic diabetes
  - Protein deficient pancreatic diabetes
- Gestational diabetes
- Secondary diabetes – Secondary to chronic liver disease, pancreatic tumours, drugs such as steroids and rarely other endocrine diseases.

Source Ref. No. 37, Insulin-dependent



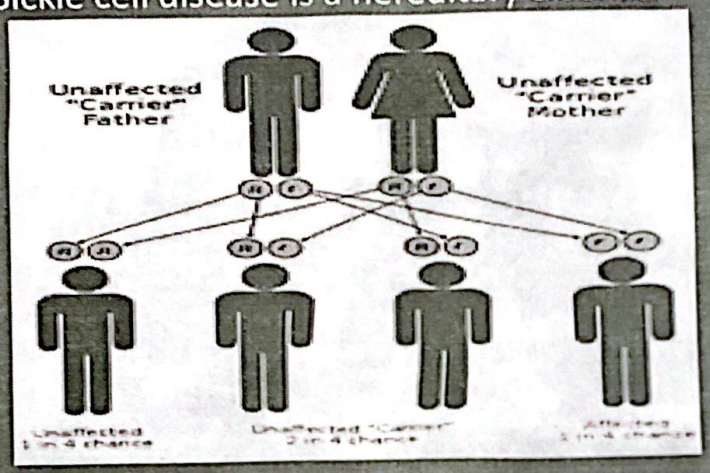
Source Ref. No. 38 Diabetes mellitus type 2

Source Ref. 39 Gestational Diabetes



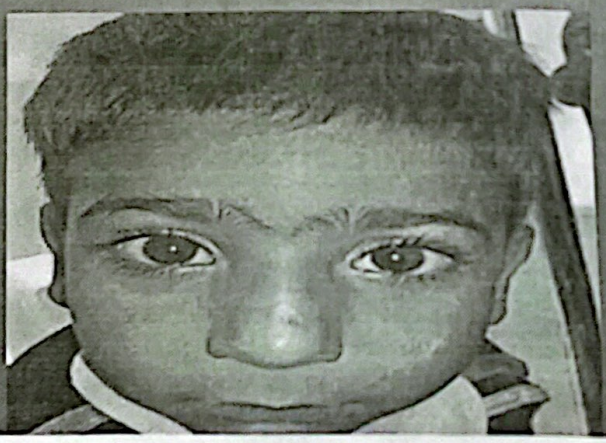
Source Ref. No. 40 Sickle cell anaemia, Source:sicklecelldisease.blogspot.com

- Sickle cell disease is a hereditary disorder



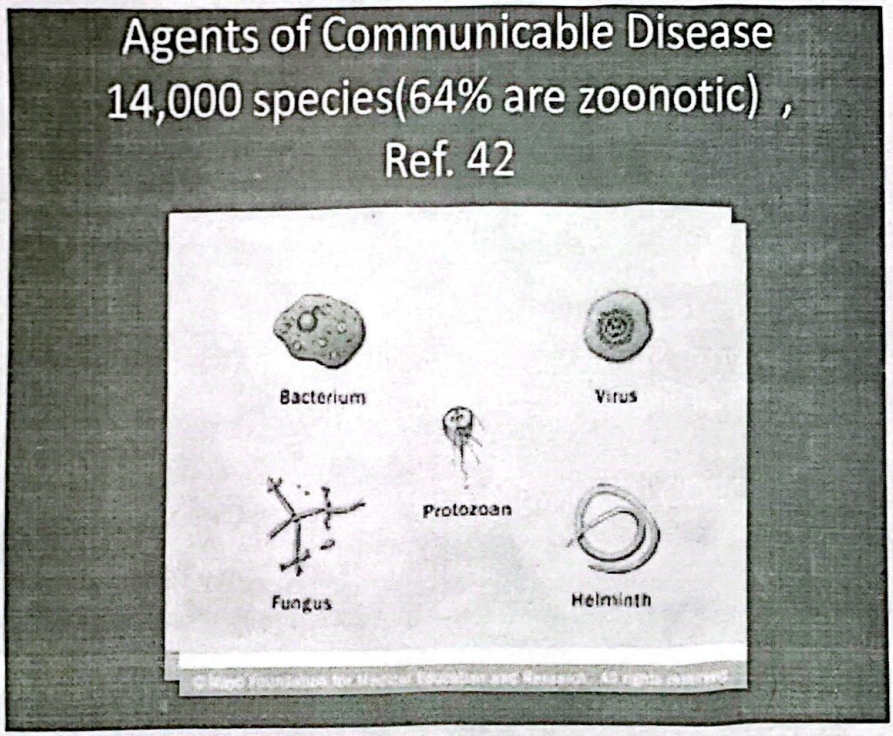
Source Ref. No. 41, (G6PD)deficiency,

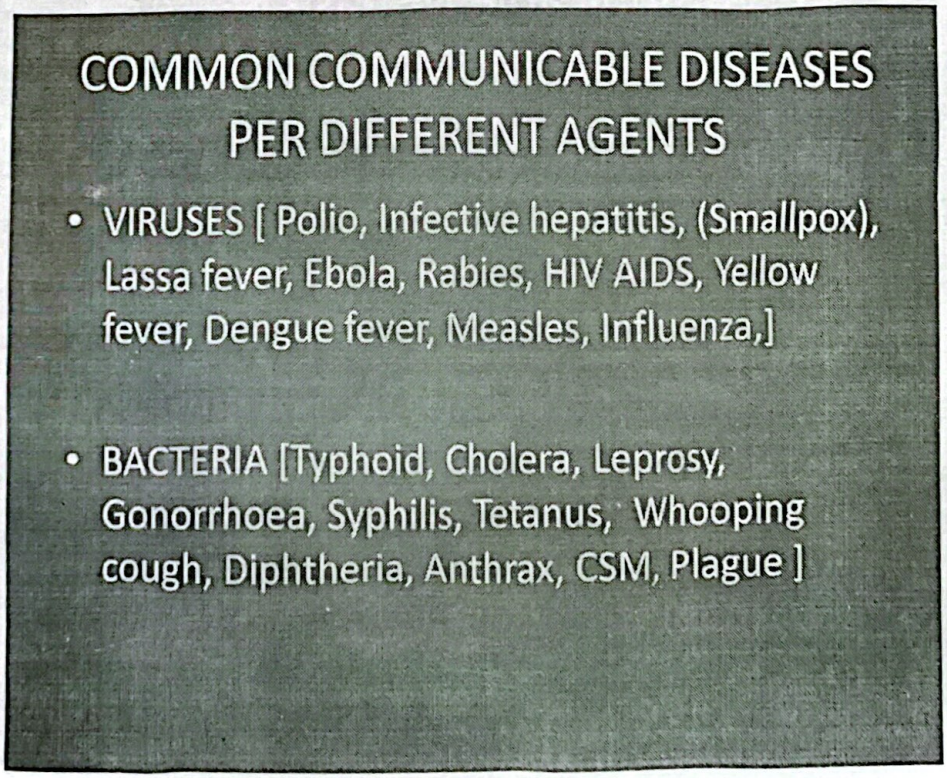
- A 4-year old boy diagnosed with G6PD deficiency showing jaundice in the sclera



COMMUNICABLE DISEASES

Communicable diseases are diseases that are caused by specific infectious agents or their products and which arise when the agent or its product is transmitted from a reservoir to a susceptible host either directly or indirectly.





COMMON COMMUNICABLE DISEASES PER DIFFERENT AGENTS

- PROTOZOA [Giardiasis, Amoebiasis, Toxoplasmosis, Trichomoniasis, Malaria, Trypanosomiasis, Leishmaniasis]
- FUNGI [Candidiasis, Ringworm, Tinea versicolor]
- HELMINTHS [Guinea worm, Hydatid disease, Hookworm, Strongylodiasis, Schistosomiasis, Bancroftian Filariasis, Onchocerciasis,
- ARTHROPOD [Scabies]

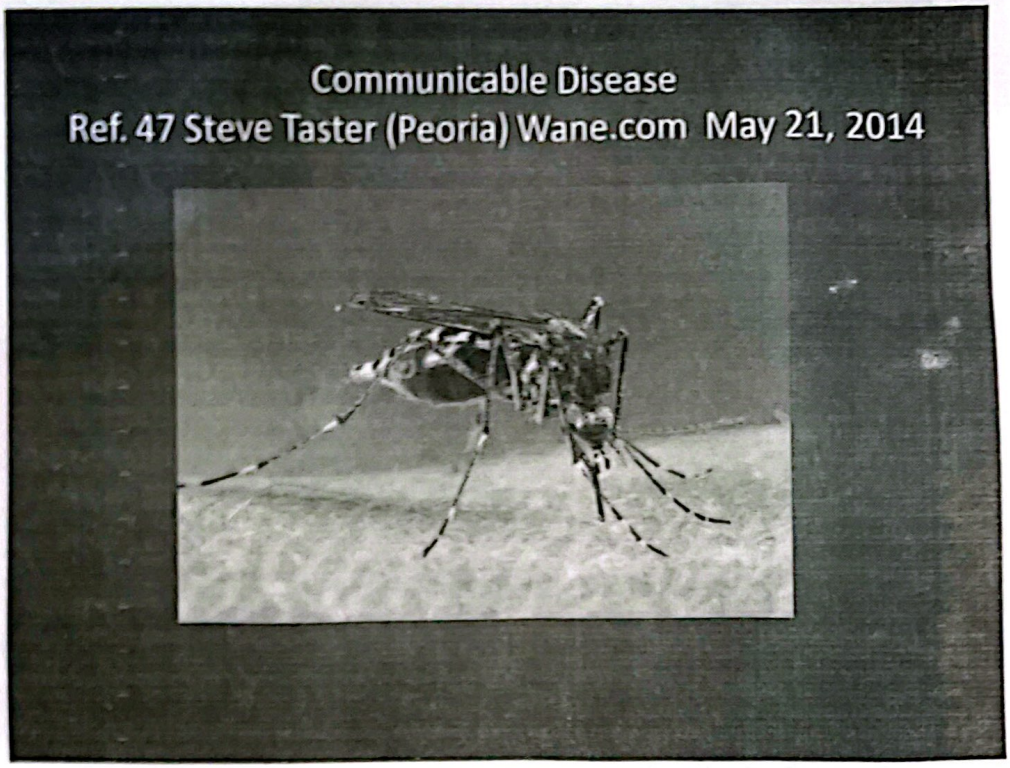
Communicable Disease Ref. 43 WebMD Feb. 10, 2014

- Whooping Cough

Communicable Disease Ref. 44
Diarrhoeal Disease Control Programme,
CDD/822 Original

- Diarrhoea

Communicable Diseases
Ref. 45 STD Emedicine health March 9, 2015
Ref. 46 Skin MedicinecineNet.com March 9 2015.



EMERGING AND RE-EMERGING INFECTIONS

1. HIV AIDS
2. Ebola
3. Lassa Fever
4. Sub-acute Respiratory Syndrome [SARS]
5. Lassa fever
6. Sub-acute Respiratory Syndrome [SARS]
7. Avian Influenza [Bird Flu]
8. Middle East Respiratory Syndrome [MERS]
9. Tuberculosis
10. Poliomyelitis
11. Measles
12. Tetanus
13. Diphtheria
14. Pertussis
15. Yellow Fever
16. Cholera

COMMUNICABLE AND NON-COMMUNICABLE DISEASES COMPARED

1. For communicable disease, agents are specific infectious agents (viruses, Rickettsia, bacteria, protozoa, fungi Helminths and arthropods). Many of which are sensitive to antibiotics
2. There are no known specific single aetiologic agent in Non-communicable disease. Agents are mainly physical, chemical or genetic
3. Multiple exposures i.e. exposure not only to one agent bring about Non-communicable disease
4. Multiple exposure brings about multiple outcomes in non-communicable disease
5. Course of disease is usually short with communicable disease unlike non-communicable diseases which generally have long course
6. Modes of transmission of communicable diseases are known, hence prevention of disease is possible
7. Non-specific and specific immune factors can be shown to prevent communicable diseases
8. Prevention of communicable diseases through immunization and chemoprophylaxis is available for many communicable diseases. Only a handful of cases of Guinea worm remain and a few dozens of Polio remain in Pakistan, Afghanistan & Nigeria
9. Surveillance is easier with communicable disease since incidence of morbidity and mortality are recorded
10. Behaviour modification to prevent Non-communicable disease is mostly difficult
11. Cancers are usually terminal conditions especially in under-developed countries
12. Latency period is usually very long in non-communicable diseases leading to problem of assessing relative exposure to outcome whereas incubation period (at times useful for treatment) is short in infections
13. Diagnosis is usually easier with communicable diseases
14. Treatment is usually for a shorter time with communicable disease and thus cost of treatment is usually cheaper compared to non-communicable diseases a number of which require surgical treatment
15. Where communicable disease has animal reservoir, it can be eliminated to stop transmission of infectious agents

16. Emerging infections (i.e. new, and previously non- existent) can cause much anxiety, but with appropriate measures their burden tends to lessen within a reasonable period e.g. HIV. A vaccine with reported 100% efficacy has been developed for Ebola.
7. Source of a communicable disease can be traced; this is important in disease prevention
18. Isolation and quarantine are important in controlling communicable disease, these will not be needed in NCDs
19. Personal hygiene and vector control are important in preventing communicable diseases but not for NCDs
20. NCDs are by far leading causes of death world-wide representing 63% of all annual deaths.[WHO 10 facts on Non-communicable diseases] [42]

CONCLUSIONS AND RECOMMENDATIONS

- In the last couple of decades the under-developed countries have witnessed important changes to do with changes in disease pattern and frequencies. The changes are largely due to socio-economic transformations in these regions plus changes in technology. As infectious diseases, lack of good nutrition and obstetric problems are being conquered, non-communicable diseases are becoming prominent health problems.
- Addressing Non-communicable diseases and injuries is not something low and middle-income countries can leave for the future. These conditions already account for a substantial share of the disease burden in most countries and are likely to increase further. [48]
- In the last 3 decades (1988 – 2015) since Nigeria realized the need to institute control measures for non-communicable diseases, nothing much has been done to implement policies that will achieve desired results. Thus the following recommendations are hereby made:-

1. In order to effectively control the health burden of non-communicable diseases, studies must be undertaken to identify risk factors associated with these conditions and evolving strategies for their effective control.
2. There are risk factors known to require change in behaviour of susceptible hosts such as smoking and excessive alcohol consumption. In such cases rigorous health education campaigns and legislation, if need be, should be mounted.

3. Encourage implementing a range of measures to encourage individuals to maintain healthy weight, participating in daily exercise and consuming healthy diet.

   [A healthy diet is that which replaces saturated fats with unsaturated fats, that eliminates trans-fatty acids and increases consumption of fruits, vegetables, legumes, whole grains, and nuts; limits the intake of free sugars but especially from sugar based beverages; and limits salt intake from any source and ensure salt is iodized, while for physical activity, it is at least 30 minutes of regular, moderate-intensity physical activity on most days throughout a person's life] [49]
4. Health education on No-communicable diseases should hold in schools, work places, the mass media, health facilities etc.
5. Additional facilities for the diagnosis of Non-communicable diseases should be provided in hospitals and other health facilities. Health education on early diagnosis and prompt treatment are very important steps in the management of diseases
6. Once a diagnosis of an illness is made time should not be wasted in referring a patient to facilities which are better equipped in handling the conditions diagnosed. It is sad that even in situations where patients can be referred to some other countries for treatment (Medical Tourism), such referrals are only made when it is too late to offer any remedy
7. Disease notification which until now is only done mostly for communicable diseases should be expanded to include Non-communicable diseases
8. Specific health actions for control of Non-communicable diseases should be instituted at all states and local governments of this country
9. Training of health manpower specifically for the control of Non-communicable diseases must receive required attention
10. More traffic control agencies to check traffic offences should be established in all states of the federation so as to minimize road traffic accidents resulting in injuries11. Mobile courts should be established to try traffic offenders
12. Sale of medicines especially psychotropic preparations in the open market must be stopped forthwith
13. Measures should be taken to educate the public on acceptability of programmes instituted for the control of Non-communicable diseases

14. Genetic counseling units should be established to cater for control of hereditary diseases
15. It is also necessary to cultivate sufficient political will and provide enough funds all targeted at control of Non-communicable diseases
16. Further research on the Epidemiology and control of Non-communicable diseases must be undertaken
17. Governments at all levels as well as NGOs must contribute to tackle Non-communicable diseases. Laudable programmes such as poverty alleviation and education improvement must be pursued with the required attention.

To succeed in this endeavour is not easy, but given the right type of efforts and commitment, considerable success can be achieved

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2. Professor Garba Dahuwa Azare, B.A. (Ed), M.Ed, PhD, PDRS, Department of Education, **Basic Concerns: Revitalizing Nigeria's Primary Education in the New Millennium**, June 24, 2000.
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4. Professor Majekodunmi Oladije Fatope, B.Sc, PhD, Department of Chemistry, **Natural Products Science: Looking Back and Looking Forward**. July 07, 2001.
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6. Professor Isa Hashim, MPA, MPA, PhD, LLB, Department of Political Science, **Planning and Budget Implementation in the Health Sector**. March 20, 2004.
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10. Professor Muhammad Sani Sule, B.Sc., PhD, Department of Biochemistry, **Enzymology and Radiation Biology in the Understanding of Biochemistry**, March 23, 2013.
11. Professor Essiet Unanaowo Essiet, B.Sc, PhD, Faculty of Agriculture, **Agricultural Sustainability in the Drylands of Nigeria: Realities and Prospects,** Wednesday, May 22, 2013.
12. Professor Aliyu Kamal, B.A., Grad. Certificate in Education, M.A., M.Sc, PhD, Department of English Studies, **The Islamic Novel Style and Structure**, Wednesday, March 05, 2014.

13. Professor Abdu Ahmed Manga, B.Sc, M.Sc, PhD, Faculty of Agriculture, **Horticulture as a Penacea for Food Insecurity and Unemployment**, Wednesday, April 09, 2014.
14. Professor Sai'du Muhammad Gusau, B.A., M.A., PhD, Department of Nigerian Languages, **Wakar Baka Bahaushiya – The Hausa Oral Songs**, Monday, May 26, 2014.
15. Professor Abdalla Uba Adamu, D. Phil, Department of Mass Education, **Imperialism from Bellow: Media Contra-Flows and Emergence of Metro-Sexual Hausa Visual Culture**, July 09, 2014.
16. Professor Ghaji Abubakar Badawi, BLS, MLS, PhD, Department of Library and Information Sciences, **The Role of Public Libraries as Centers of Information to Disadvantaged Groups: A 2004-2014 Study of the Information Needs of Gada Prostitutes in Dawakin Kudu Local Government Area of Kano State**, July 29, 2015.