NCD Media Training on Diabetes

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What is Diabetes?

- A life-long condition where there is a malfunction in production and use of insulin by the body
- Diabetes is characterized by high blood sugar (hyperglycemia)
- Diabetes arises when:
  - the body does **not produce enough** insulin or
  - body cells **do not respond** to the insulin that is produced (Insulin resistance) or
  - **both**

What is Insulin?

- A **hormone** produced from an organ called the **pancreas**

- Facilitates the uptake of glucose from blood stream into body cells

- Glucose converted into energy in the cells

Why Insulin is not Produced

- Destruction of insulin producing cells (Beta cells of the pancreas)
  - Auto-immune reactions – viral infections *e.g.* mumps
  - Injury & diseases of the pancreas
    - Alcohol
    - Gallstones
    - Cancer
    - Chemicals & drugs
  - Genetic reasons
  - Idiopathic

Causes of Insulin Resistance

- Obesity
- Pregnancy
- Drugs *e.g.* steroids
- Others *e.g.* stress

Classification of Diabetes Mellitus

- Type 1 diabetes (5-10% of diabetes cases)
- Type 2 diabetes (85-95% of diabetes cases)
- Pre-diabetes:
  - RBS ≥7.8mmol/L to <11.1mmol/L or
  - FBS >5.6mmol/L to < 6.9mmol/L
- Gestational Diabetes Mellitus (GDM)

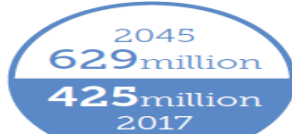# Number of people with diabetes worldwide and per region in 2017 and 2045 (20-79 years)
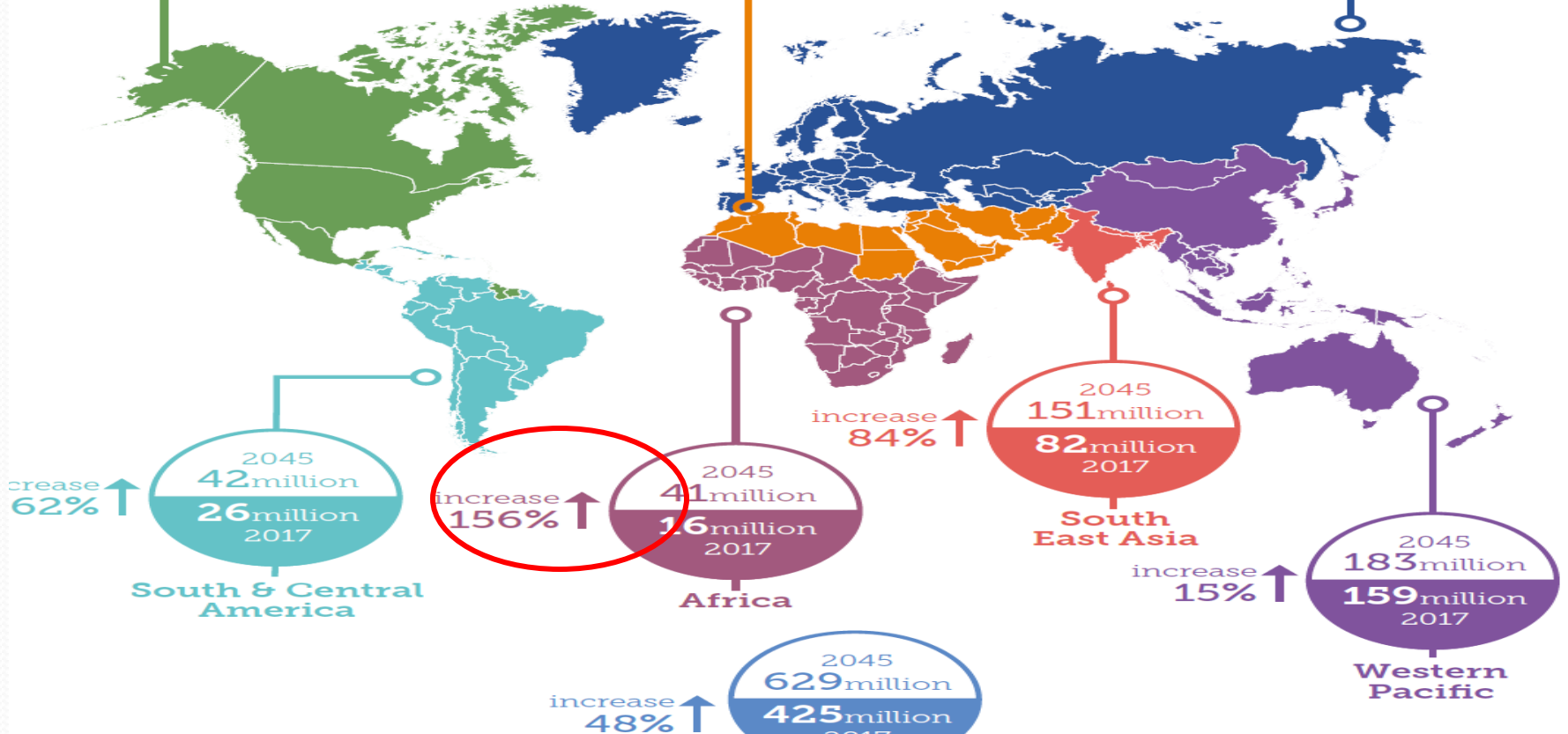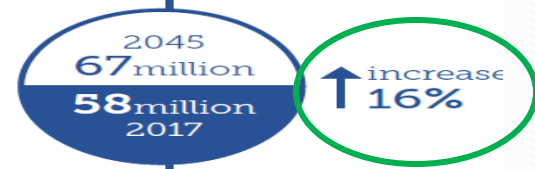
North America & Caribbean
2045
62 million
46 million 2017
increase 35%

Middle East & North Africa
2045
82 million
39 million 2017
increase 110%

Europe
2045
67 million
58 million 2017
increase 16%

South & Central America
2045
42 million
26 million 2017
increase 62%

Africa
2045
41 million
16 million 2017
increase 156%

South East Asia
2045
151 million
82 million 2017
increase 84%

Western Pacific
2045
183 million
159 million 2017
increase 15%

WORLD
2045
629 million
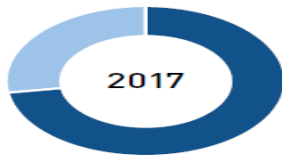425 million 2017
increase 48%
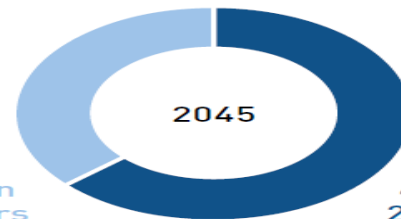
Diabetes by age (20-79 years)

2017

98 million
65-79 years

327 million
20-64 years

2045

191 million
65-79 years

438 million
20-64 years

Diabetes prevalence in Africa

Estimated prevalence according to IDF Atlas

2000	2017	2045
7.1 million	16 million	41 million

IDF Diabetes Atlas 5th Ed. 2011
Wild et al. Diabetes Care 2004:27(5):1047-1053

Prevalence of T2DM

... and the costs to society are high and escalating

Diabetes is a human and economic burden

every **7 SECONDS** 1 person dies from diabetes

77% of people with diabetes live in low- and middle-income countries

1 healthcare **in 9** IS SPENT ON DIABETES

4.9 million deaths per year

50% of deaths under 60 years of age
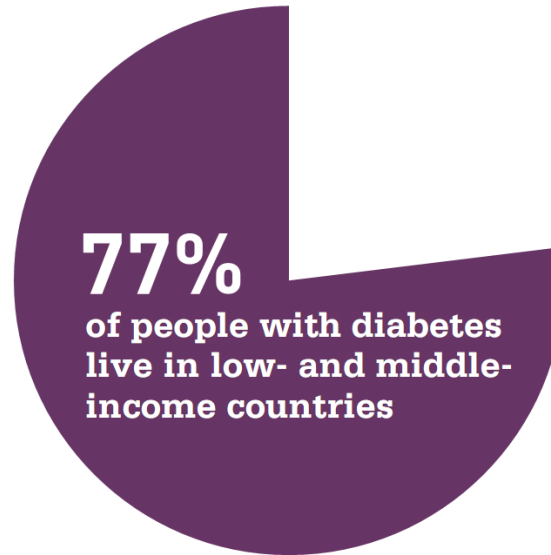
Intersects with all dimensions of **development**

US$727 billion

19% of worldwide healthcare expenditure

Cost of treating diabetes pushes many to poverty

Scientists say lack of care at nearest facility, long waiting times and high cost of medicines bad for the country.

By Gatonye Gathura
newsdesk@standardmedia.co.ke

The cost and quality of care in public hospitals is impoverishing many diabetic patients, a new study by the Kenya Medical Research Institute has shown.

Almost half of the studied patients reported poor services at the nearest hospital and had to incur higher transport costs to far-away facilities.
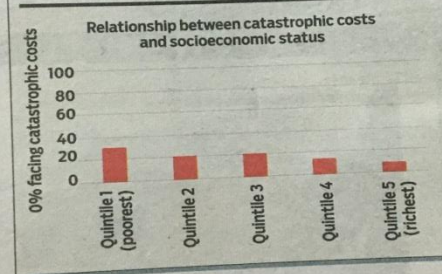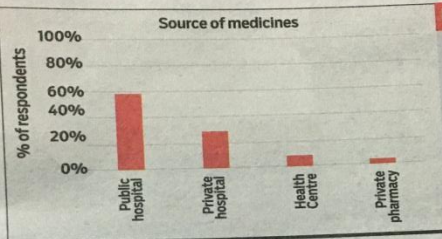
"48.9 per cent of study patients reported lack of medicines and diagnostic facilities as a reason for not visiting nearest facilities," says the study published last Thursday.

Scientists from Kemri and Moi University, Eldoret assessed the costs of treating diabetes patients at five public health facilities in Kilifi and Bungoma Counties.

The study appearing in The International Journal of Health Planning and Management involved 163 adult patients in the two counties.

"Kilifi and Bungoma counties were purposely selected to reflect a diverse set of demographic, socioeconomic and geographical settings," says the study.

The annual cost of treating diabetes in these facilities, the report says, was Sh53,907 for direct costs, which include medicines and hospital charg-

es. But that was not all, as the researchers also found patients incur about Sh23,174 more in indirect costs for transport, food and accommodation.

"Medicines accounted for 87.3 per cent of the total out-of-pocket costs while transport and food accounted for 10.4 per cent and 2.3 per cent respectively," says the report.

Additionally, more than half, 57.7 per cent, of diabetic patients were hypertensive, and were required to spend much more on treatment.

Overall, about two thirds - 68.1 per cent - of the patients

were not enrolled in any type of health insurance scheme.

The researchers say such medical expenses in a country with very high poverty levels are debilitating most of the affected families.

High cost

In this study 123 or 75.5 per cent of the patients had been pushed into poverty by the high direct and indirect cost of diabetes care, says the study.

"About 23 per cent of the patients had to borrow from friends or family, 30 per cent sold an asset and 36.8 per cent

used their savings to pay for the costs of diabetes care."

Much of the high cost was attributed to lack of care at the nearest facility, long waiting times and high cost of medicine.

A survey published last year by the German Development Agency, GIZ, showed the high cost of medicines in Kenya mainly caused by shadow middlemen and conniving civil servants.

For example, a tablet procured at Sh10 from a local manufacturer reaches a patient in public hospital at almost Sh

Source of medicines

Relationship between catastrophic costs and socioeconomic status

KEY FIGURES

Sh53,907
Annual cost of treatment per patient, which includes medicines and hospital charges

Sh23,174
Amount that patients incur in indirect costs for transport, food and accommodation.

Sh30
What a patient eventually pays for a tablet procured at Sh10 from a local manufacturer

57%
Percentage of diabetic patients who are hypertensive and spend much more

Prevalence of Diabetes

- IDF diabetes atlas estimated prevalence of diabetes to be 425million in 2017, and this is estimated to increase by 48% to 629 million in 2045.

- IDF atlas estimated the prevalence of diabetes in Kenya to be 2% in 2017.

- The Kenya stepwise survey for NCDs risk factors 2015 report found the prevalence of diabetes to be 2.2%.

Kenya step-wise survey for NCD's risk factors 2015 report

- Launched on   8/4/2016
- Survey conducted in 2015 all the counties in rural and urban areas.
- Ages 18 – 69 years.
- Women – 60% men – 40%.
- Sample size – 6,000 households.

Highlights:- Diabetes

- 87.8% of Kenyans had never had a blood sugar test

- 12.2% tested, about 2% had been informed that they had raised blood sugar or diabetes. (IDF atlas 2015 gives prevalence rate of 2.2% adults based on OGTT)

- Only 40% of Kenyans who had been informed that they had raised blood sugar were taking drugs(medications) prescribed by other health workers.

Highlights:- Hypertension

- 56% of Kenyans had never had their blood pressure measured by a health worker.
- 44% of those measured 9% had been informed that they had elevated blood pressure or Hypertension.
- Only 22% of those diagnosed with Hypertension were on medication by a health worker within past two weeks of the study.

Highlights:- Cholesterol

- 98% of Kenyans had never been screened for cholestrol levels.

- < 1% had been informed by the health worker that they had elevated blood cholestrol.

- Only 13% of those diagnosed with hypercholestrolaemia were currently on medications.

Highlights:- Obesity

- 27% of Kenyans are either overweight or obese. Women (38.5%), Men (17.5%).

The survey brought out the serious challenges we face in Kenya as health workers working in the Government, faith based and private sectors.

- Low awareness about NCD's amongst the public and healthcare workers especially at the base of the health care pyramid (dispensaries, health centres, rural private clinics and faith based clinics) where majority of Kenyans seek health care.

- Late diagnoses of the NCD's.

- Poor compliance to treatment

RISK FACTORS

- Obesity
- Physical inactivity
- Unhealthy diet
- Increasing age
- Family history of diabetes
- Ethnicity
- Gestational Diabetes
- Poor nutritional during pregnancy affecting the developing child

Changes leading to lifestyle related diseases

Demographic shifts

Sedentary lifestyle

Changing food habits

Socio-economic changes

Causes of obesity

Physical inactivity

Unhealthy diet and eating habits

Pregnancy

Lack of sleep

Certain medications

Common obesity symptoms

Snoring

Sleep apnea

Back or joints pain

Feeling out of breath

Depression

Excessive sweating

SYMPTOMS OF DIABETES

Diabetes: Complications
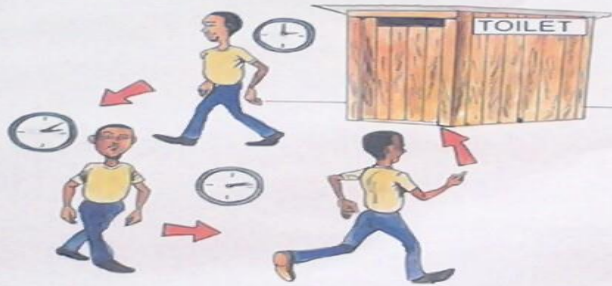
Macrovascular

Microvascular

Stroke

Heart disease and hypertension
2-4 X increased risk

Peripheral vascular disease

Foot problems

Diabetic eye disease (retinopathy and cataracts)
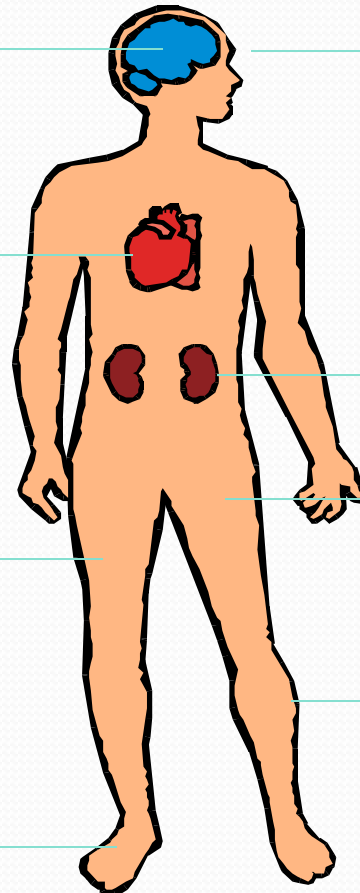
Renal disease

Erectile Dysfunction

Peripheral Neuropathy

Meltzer et al. CMAJ 1998;20(Suppl 8):S1-S29.

Diagnosis

- Diabetes:

-RBS >11.1 mmol/ l

-FBS > 7.0 mmol/l

-HbA1c >6.5%

- If the RBS is > 5.6 mmol/l and < 11.1 then do the FBS or OGTT

- OGTT- 75 g CHO in 250mls of water

Challenges in Diagnosis

- Availability of :- Glucometers

  - B.P. Machines

  - weighing scales, stadiometer,

  BMI charts.

  - HBA1c equipment

  - Cholesterol testing equipment

  - Uristrips etc

- Standardization of the HBA1c equipment.

Challenges in the education of the diabetes patients

- No structured education for the newly diagnosed diabetic patient in most Government, faith based and Private Clinics.

- No adequate diabetes educators.

- No adequate nutritionists.

Challenges in the therapeutic management of the Type 2 diabetic patient

- Only 1% of Kenyans access private medical insurance outside of NHIF. The private insurances have limitations in their outpatient cost limits.

- NHIF has limitations in:

    - who can access outpatient care.

    - where one can access the outpatient care.

- Most diabetic patients in Kenya access their care in Government hospitals and faith based hospitals that have limitations in the care they offer.

Overview of DM management

- Treatment regimens should be individualized.
- Set appropriate HBA_1C for each patient.

6 pillars of management

- Education
- Diet
- Exercises
- Blood glucose monitoring
- Treatment
- Clinician review.

Type 1DM

- Life time insulin therapy.
- Life style, modification – diet, exercise, manage stress.
- OGLA's - Metformin in the obese type 1 DM (reduces the insulin resistance caused by the obesity).

- SGLT-2 inhibitors.

Type 2 DM

- Life style modification - Diet
                                    - Exercise
                                    - Manage stress.
- OGLA's   - Metformin
                        - Sulpfonylureas.
                        - Glitazones
                        - DPP4 – I
                        - SGLT's
                        - Acarbose
                        - Meglitinides
- Insulin

Diabetes andCovid-19

- **Covid-19** (Corona Disease-2019) is caused by Corona SARS-Cov-2 (Severe acute respiratory syndrome coronavirus 2)

- The virus is closely related to 2 other coronaviruses – severe acute respiratory syndrome (SARS) Coronoavirus-1 – 2003 and the Middle East respiratory syndrome(MERS) Coronavirus-2012.

- Diabetes does not increase the risk of COVID-19 occuring (unlike in SARS & MERS). In a study in China of 1590 Chinese patients with Covid-19 the prevalence of diabetes was 8.2% which was similar to the prevalence of diabetes in China.

- Diabetes is a risk factor for hospitalization and mortality of Covid-19.

- In the same study if 1590 Chinese the prevalence of diabetes rose to 34.6% in patients with severe Covid.

Diabetes (type 2, type 1, Gestational and Prediabetes)

- All have high risk of severe Covid-19 infection with poor prognosis.
- The increase risk is due to age, sex and comorbidities – Hypertension, Cardiovascular disease, obesity, cerebrovascular disease, chronic kidney disease.
- Male patients have higher prevalence of Covid-19 and a more severe clinical course.
- Most diabetic Covid patients are 10 years older than other patients.
- Obesity predisposes to many ailments i.e. HT, DM, arthritis.
- Most diabetic patients are obese. Obesity is a risk factor to severe Covid.
- Severe abdominal obesity causes problems in mechanical respiration leading to poor ventilation of the lungs leading to increase risk of pneumonia and it decreases the oxygen saturation in blood obesity also increases the risk of asthma.

Covid-19 Kenya News brief – 22/7/2020

- One in three patients who died from Covid had hypertension and diabetes.
  - Hypertension – 17%
  - Diabetes Mellitus – 15%
  - Chronic lung disease – 10%
  - Cancer – 10%
  - H.I.V – 4%

Covid-19 news brief – 26/7/2020

- 16% of critically ill Covid-19 patients had diabetes mellitus.
- Diabetes mellitus and hypertension combined accounted for 47% of those who have died from pre-existing conditions.
- Diabetic Covid patients are twice likely to require I.C.U. admission than those not diabetic.

Advise given to the patients

- Prioritize – Basic public health principles
- Wash hands
- Avoid touching your face, cough/sneeze into elbow or handkerchief,
- Social distance
- Wear mask
- Avoid crowded places
- Work from home if possible.
- Rest, hydration , nutrition
- Physical activity (exercise indoors or in isolated areas)
- Regular blood sugar testing
- Regular blood pressure monitoring

- Manage stress
- If struggling with mental health issues consult the doctors/counsellor online or book an appointment.
- Stop smoking.
- Enjoy natural Vit D (sunshine)
- Ensure adequate supply of drugs and glucose strips.

If unwell – monitor blood sugar, temperature and breathing rate, presence of nausea or vomiting if present contact doctor and go to hospital.

Covid-19 has affected the diabetic patients. They are stressed about Covid-19.

- Worry they are at increased risk.
- Worry they will get severe Covid-19 and die.
- Worry about their poor control.
- Worry about lack of appropriate food, blood sugar testing, blood pressure testing, lack of exercise (indoors) not able to see their doctors/clinician diabetics nurse/nutritionist.
- Worry about lack of drugs they normally have.
- Worry about lack of finances.

References

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THANK YOU