The Major Death Causing Diseases in Ghana(A Case Study of Sekondi Takoradi Metropolis)

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Abstract:*This research is to investigated the major death causing diseases in Ghana using the Western Region as a case study with concentration in Sekondi- Takoradi . The studyanalysed the Top 10 diseases causes of mortality reported in all the hospitals in the metropolis. This data was presented on frequency tables,to give a general overview of the health situation in the region. It was revealed that these three diseases; malaria, skin and ulcers diseases and Diarrhoea were claiming a number of lives in the Sekondi-Takoradi during the period of study. The use of ANOVA indicated that there was a significant difference among diseases claiming more lives in the area of study. The Cause-Specific Death Ratios revealed that the leading causes of death, Malaria and Skin and Ulcers diseases were the most common.*

A trend analysis of these three diseases in excel revealed that, apart from future expected death cases of Diarrhoea decreasing; Malaria and Skin and Ulcers diseases will continue to increase throughout the forecasted 5 years period of study if nothing is being done about the situation.

Keywords:*Sekondi-Takoradi,malaria ,skin and ulcers,diarrhoea,ANOVA,Cause Specific Death Rati*o

1. INTRODUCTION

Every country has their own health issues in this paper the research is on specific health issues peculiar to Ghana .A recent report from the UN's World Health Organization reveals that the average life expectancy rate in Ghana, the overall life expectancy is 66 and out of it the man is 64 years with a rank of 143 and that of women is 68 years also with the rank of 145 as the year 2012.This shows that women on average live longer than men. Most of the reasons assigned to this span are diseases, accidents, suicide, war, famine and so forth.

In the year 2011, over thousand death cases was recorded in the Western Region of which about more than 50% died because of diseases and it related illness and almost majority of them are in their youthful age. These were even the cases reported to the hospitals.

Recent report in Central Region indicated that, 89 death cases due to pneumonia, diarrhoea diseases and meningitis are main causes of mortality which constitute more than 25% of total deaths of surveyed. The death toll from other related diseases in Eastern Region has risen to 19 with one thousand two hundred cases being recorded. Health officials have warned that the cases could increase if individuals do not take good care of themselves.

Health in Ghana includes the prevention, care and treatment of diseases .HIV/AIDS is within the country,but due to education it has been controlled to a certain extent,in addition poor sanitation and unsafe water supply is also affecting the health of the Ghanaian

Current statistical data on the cholera outbreak in Greater-Accra Region which affected most districts, recording 18,336 cases and 114 deaths in 16 districts, as compare to 2011, 4190 cases had been recorded, with 36 deaths. Thus, there has been an increase. This became known when the Chronicle visited some selected hospitals in Accra to find out the state of the epidemic. Health officials were worried the rainy season will fuel the spread of malaria, Diarrhoea and cholera. While Ghana has not pinpointed the source of the cholera bacterium, top health officials say poor sanitation systems, poor

food, unsafe drinking water and poor access to safe water, the breakdown of water, waste disposal systems and personal hygiene habits-including open defecation- are largely to blame for the epidemic, which they say is the worst in a decade. Authorities say it is time to crack down on open defecation, irregular rubbish collection and unhygienic food stands .

This discovery has provided me the impetus toinvestigate and discover some of the major death causes diseases in Ghana .

1.1 Objectives of the Study

The objective of this study can be elaborated as follows:

i. To predict the expected future death cases and how they can be reduced if possible.

ii. To calculate for the cause-specific death ratio.

iii. To compare causes of death from 2009 to 2014.

iv. To identify which of the diseases have the greatest impact on mortality

1.2 Hypothesis

H_0: The major death causing diseases do not hamper the growth of the population.

H_1: The major death causing diseases hamper the growth of the population

2. METHODOLOGY

After the collection of data,statistical methods are used to describe the data collected. The statistical package used to describe the data is SPSS(Statistical Package for Social Sciences).Inferential Statistics such as ANOVA(Analysis of Variance) and Time Series Analysis is employed .

The work compared the variance between groups receiving different treatments with the natural variance because of variations in each individualsresponse. One way Analysis of Variance is used because of one factor, treatment.

Time Series Analysis is used in the study to investigate the trend and make future projections. The Time Series Analysis is used because the different diseases and observations are independent. The data obtained is categorized into different time periods, that is the secular period which is the general or overall trend, seasonal variation ,the fluctuation in the data ,cyclical patterns ,that is fluctuations which repeat themselves.The Cause SpecificDeath ratio is determined

$(\frac{DC}{D} * 100, where\ DC\ is\ the\ number\ of\ de$aths resulting from a particular disease and D the total number of deaths)

3. RESULTS AND DISCUSSION

3.1 Priliminary Analysis

This section of the analysis graphically presents the data on tables and a brief discussion of the findings, and also the computation of the Cause-Specific Death Ratios of the diseases.

Table 1.*Top 10 Disease causing mortality at the Sekondi-Takoradi   region for 2010.*

	DISEASE/CONDITIONS	TOTAL CASES	PERCENTAGE(%) OF THE TOTAL
1	MALARIA	152485	41.7
2	OTHER ACUTE RESPIRATORY INFECTION	48598	11.7
3	SICK DISEASES & ULCERS	21692	5.1
4	DIARRHOEA DISEASES	19220	4.6
5	ACUTE EYE INFECTION	13520	3.3
6	RHEUMATISM %JOINT	8925	2.2
7	HYPERTENSION	7880	1.8
8	ANAEMIA	6151	1.7
9	INTESTINAL WORMS	5934	1.4
10	VAGINAL DISCHARGE	906	1.0
	ALL OTHER DISEASES	85073	25.5
	TOTAL CASES(2010)	**370384**	**100**

Source: field work, 2015

Out of the total number of 370384 cases recorded as shown from the above table, malaria, other Acute Respiration infection and Skin and Ulcers diseases were the major diseases which claimed a great number of lives in the region. Malaria which topped in the table claimed 152485 lives constituting41.7%. Acute Respiration infection ranked 2nd, which claimed 48598 lives and Skin and Ulcers diseases followed with 21692 deaths. The top 3 diseases claimed about 59% of the total deaths. The Intestinal Worms and Vaginal Discharge claimed the least number of lives in the catchment region with 5934 and 906 deaths each constituting almost 2% of the total deaths recorded.

Source,field work

Table2.*Top 10 disease causes of mortality at the Sekondi-Takoradi Metropolitan Assembly   catchment region for 2011*

Metropolitan Assembly catchment region for 2011.

	DISEASES/CONDITION	TOTAL CASES	PERCENTAGE(%) OF THE TOTAL
1	MALARIA	167316	41.0
2	OTHER ACUTE RESPIRATORY INFECTION	51225	12.5
3	SKIN DISEASES & ULCERS	18939	4.6
4	DIARRHEOEA DISEASES	15807	3.9
5	ACUTE EYE INFECTION	14980	3.7
6	ANAEMIA	11930	2.9
7	RHEUMATISM & JOINT PAINTS	11518	2.8
8	HYPERTENSION	5480	1.3
9	DENTAL CARIES	4049	1.0
10	ALL OTHER DISEASES	99713	24.4
	TOTAL CASES(2011)	408522	100

Source: field work, 2015

In 2011, malaria is still toping with the margin number of 16731 cases which represent 41.0% follow by the Other Acute Respiratory infection of 51225cases which represent 12.5% and a Skin and Ulcers diseases which also 18939 cases which represent 4.6%, claimed a total lives of 237480. This constituted 58% of the total deaths recorded in 2011.

And 4th place was diarrhoea which was 15807 cases recorded which constitute 3.9% whilst Hypertension and Dental Caries cases recorded the least number of deaths in the table on that

Table 3.*Top 10 Disease causes of mortality at the Sekondi-Takoradi Metropolitan Assembly catchment region for 2012.*

	DISEASES/CONDITION	T0TAL CASES	PERCENTAGE(%) OF THE TOTAL
1	MALARIA	254484	40.7
2	ACUTE RESPIRATORY TRACT INFECTION	66558	10.6
3	SKIN DISEASES & ULCERS	30897	4.9
4	DIARRHOEA DISEASES	21520	3.4
5	ANAEMIA	19307	3.1
6	RHEUMATISM & OTHER JOINT PAINS	18961	3.1
7	ACUTE EYE INFECTION	14436	2.3
8	INTESTINAL WORMS	14191	2.3
9	DENTAL CARIES	7692	1.2
10	ASTHMA	7523	1.2
	ALL OTHER DISEASES	170370	27.2
	TOTAL CASES(2012)	625939	100

Source: field work, 2015

In 2012, malaria maintained its position as in 2010 and 2011 with 254484 deaths cases recorded which was the year malaria kill most people as compare to the previous years. Acute respiratory tract infection jumped into it with maximum number of deaths cases of 66558 recorded which was not even among the top ten in the first two previous years,moved to the second position as compared to other diseases previous years, as Other Acute Respiratory Infection left the scene, Skill and Ulcers diseases maintained their position. The number of deaths recorded from Diarrhoea diseases was close

to twice as the number of deaths recorded from Dental Caries and Asthma. A total of 7692 and 7523 deaths were recorded whiles Rheumatism& other Joint pain and Anamia recorded the same percentage of deaths.

Source: field work, 2015

Table4. Top 10 Disease causes of mortality at the Sekondi-Takoradi Metropolitan Assembly catchment region for 2013

	DISEASES/CONDITION	T0TAL CASES	PERCENTAGE(%) OF THE TOTAL
1	Malaria	177,395	33.7
2	Acute Respiratory Tract Infections	55,729	10.6
3	Skin Diseases & Ulcers	25,874	4.9
4	Rheumatism & Other Joint Pains	17,711	3.4
5	Diarrhoea Diseases	17,646	3.4
6	Anaemia	16,435	3.1
7	Intestinal Worms	15,315	2.9
8	Acute Eye Infection	11,038	2.1
9	Hypertension	7,584	1.4
10	Dental Caries	7,245	1.4
	All Others diseases	171,402	32.6
	Total cases(2013)	526,360	100

Source: field work, 2015

From table 4 the top 10 Disease causes of mortality at the Sekondi-Takoradi Metropolitan Assemblythe situation in 2013 was not different as compared to 2012.Rheumatism & Other Joint PainsandDiarrhoea diseases maintained the 4th and 5th positions respectively with 17711 and 17646 deaths cases recordedeach with slight differences between them. As shown from the table above Malaria topped in the mortality table with continuing marginnumber of 177395 cases of deaths followed by Acute Respiratory Tract Infections with 55729 cases of deaths.Skin&Ulcersdiseases placed the 3rd position with 25874 cases of deaths. Hypertension and Dental Caries recorded the least number of deaths in the table.

Table5. Top 10 Disease causes of mortality at the Sekondi-Takoradi Metropolitan Assembly catchment region for 2014.

	DISEASES/CONDITION	T0TAL CASES	PERCENTAGE(%) OF THE TOTAL
1	MALARIA	137155	39.6
2	OTHER ACUTE RESPIRATORY INFECTION	44451	12.8
3	SICK DISEASES & ULCERS	10750	3.1
4	DIARRHOEA DISEASES	18370	5.3
5	ACUTE EYE INFECTION	22455	6.5
6	HYPERTENSION	4900	1.4
7	CHRONIC DISEASES	8739	2.5
8	DENTAL CARIES	2398	1.0
9	INTESTINAL WORMS	13996	4.0
10	RHEUMATISM %JOINT	14342	4.1
	ALL OTHER DISEASES	69165	19.9
	TOTAL CASES(2014)	346725	100

Source: field work, 2015

In 2014, Malaria still topped in the mortality table with 137155 deaths constituting 39.6%, Other Acute Respiratory Infection came back to 2nd position with 44452 number of deaths cases recored.. Acute Eye Infection with 22455 cases which constitute to 6.5% taken the 3rd position and Skin& Ulcers diseases dropped from fourth positions to the 7th position in the mortality table with 10750 deaths constituting 3.1% which declined with the number of cases, Dental Caries appeared at the bottom with 2398 cases of death with a percentage of 1.0 % at the top 10mortality table. However, this also indicates that the top 4 diseases claimed more than 64 % of the total deaths recorded in the years 2014.

3.1.1 Cause-Specific Death Ratio

Malaria

Cause-specific death ratio for malaria

Crude Death Rate (C DR) is rate is defined as the number of deaths from all causes in one calendar year per 1000 of the mid- year population; thus; C D R $=\frac{D}{P} * K(1)$

Where D=total number of death occurring during a calendar year (january1 to December 31)

P=mid- year total population(that is total population)

 K=   the radix, usually chosen as 1000.

From 2010, C D R $=\frac{152485}{370384} * 1000$

$\qquad =411.69$

From 2011, C D R $=\frac{167316}{408522} * 1000$

$\qquad =409.56$

From 2012, C D R $=\frac{254484}{625939} * 1000$

$\qquad =622.94$

From 2013, C D R $=\frac{177,395}{526,360} * 1000$

$\qquad =337.02$

From 2014, C D R $=\frac{137155}{346725} * 1000$

$\qquad = 395.57$

The crude-specific ratio for malaria for the period from 2010- 2014

CC$=\frac{(C1+C2+C3+C4+C5)}{n}$

CC$=\frac{(411.69+409.56+622.94+337.02+395.57)}{5}$

$\qquad =435.356$

There was an average of 435 deaths resulting from malaria per every 1000 death in the Sekondi-Takoradi Metropolitan Assembly   catchment region for 2010.

Diarrhoea

Cause-specific death ratio for dairrhoea

From 2010, C D R $=\frac{192205}{370384} * 1000$

$\qquad =51.89$

From 2011, C D R $=\frac{15807}{408522} * 1000$

$\qquad =38.69$

From 2012, C D R $=\frac{21520}{625939} * 1000$

$\qquad =34.38$

From 2013, C D R $=\frac{17646}{526360} * 1000$

$\qquad =33.52$

From 2014, C D R $=\frac{18370}{346725} * 1000$

$= 52.98$

The crude-specific ratio for diarrhoea for the period from 2010- 2014

CC$=\frac{(C1+C2+C3+C4+C5)}{n}$

CC$=\frac{(51.89+38.69+34.38+33.52+52.98)}{5}$

$=42.292$

There was an average of 42deaths resulting from diarrhoea per every 1000 death in the Sekondi-Takoradi Metropolitan Assembly   catchment region for 2010-2014.

Other acute respiratory infection

Cause-specific death ratio for other acute respiratory infection

From 2010, C D R $=\frac{48598}{370384} * 1000$

$=131.21$

From 2011, C D R $=\frac{51225}{408522} * 1000$

$=125.39$

From 2014, C D R $=\frac{44451}{346725} * 1000$

$= 128.20$

The crude-specific ratio for other acute respiratory infection for the period from 2010, 2011 and 2014

CC$=\frac{(C1+C2+C3+C4+C5)}{n}$

CC$=\frac{(131.21+125.39+128.20)}{3}$

$=128.27$

There was an average of 128 deaths resulting from other acute respiratory infection per every 1000 death in the Sekondi-Takoradi Metropolitan Assembly catchment region for 2010.

Skin and ulcers diseases

Cause-specific death ratio for Skin and ulcers diseases

From 2010, C D R $=\frac{21692}{370384} * 1000$

$=58.57$

From 2011, C D R $=\frac{18939}{408522} * 1000$

$=46.36$

From 2012, C D R $=\frac{30897}{625939} * 1000$

$=49.36$

From 2013, C D R $=\frac{25874}{526360} * 1000$

$=49.16$

From 2014, C D R $=\frac{10750}{346725} * 1000$

$$= 31.00$$

The crude-specific ratio for skin and ulcers diseases for the period from 2010- 2014

$$CC=\frac{(C1+C2+C3+C4+C5)}{n}$$

$$CC=\frac{(58.57+46.36+49.36+49.16+31.00)}{5}$$

$$=46.89$$

There was an average of 47 deaths resulting from skin and ulcers diseases per every 1000 death in the Sekondi-Takoradi Metropolitan Assembly catchment region for 2010.

3.2 Further Analysis

At this stage a data on time series analysis is presented to study thepattern of the trend of the diseases and project for 2015, 2016, 2017, 2018 and 2019 futureexpected death

Table6.*Trend analysis for malaria*

YEARS	MALARIA
2010	152485
2011	167316
2012	254484
2013	177395
2014	137155

Source: field work, 2015

Data Malaria

Length: 5

Missing number: 0

Fitted trend equation

$Y_t= 177767 + 2058.1*t$……………………………………………………equation. 3.3

Time	Malaria	Trend value	Detrendanalysis
2010	152485	179825.1	-27340.1
2011	167316	181883.2	-14567.2
2012	254484	183941.3	70542.7
2013	177395	185999.4	-8604.4
2014	137155	188057.5	-50902.5

FORECAST

PERIOD	FORECAST
2015	188057.5
2016	190115.6
2017	192173.7
2018	194231.8
2019	196289.9
2020	198348

Table 7.

| YEARS	MALARIA(ACTUAL)	FITS1(TREND)	RESI1 (DETREND)	FORE1 (FORECAST)
2010	152485	179825.1	-27340.1	188057.5
2011	167316	181883.2	-14567.2	190115.6
2012	254484	183941.3	70542.7	192173.7
2013	177395	185999.4	-8604.4	194231.8
2014	137155	188057.5	-50902.5	196289.9

Source: field work, 2015

The variable under consideration is the trend for malaria for the period under study as well as forecasted period for 5 years. The output above was obtained using a Minitab and the projection reveals a decline in the malaria cases for the forecasted period 1. That is the

Conditions remain unchanged. The value length (5) indicates the number of years under study. The fitted trend equation Y t = 177767 + 2058.1*t (2) was generated based on the actual

Malaria deaths cases recorded for the span period. The constant 177767 represents the

projected cases for 2010, constant 2058.1 indicates the rate at which malaria deaths projected cases decreases and the variable't' is the time or year. The trend values are the projected cases of Malaria. It is predicted that Malaria will increase throughout the forecasted 4 years period at a rate of 2058.1. The Malaria projected death cases would be cases 18443 for 2015, 18429 cases for 2016, 18415 cases for 2017, 18401 cases for 2018 18387 cases for 2019. Thedetrendvalues are the difference for which the projected values move away from the actual death cases.
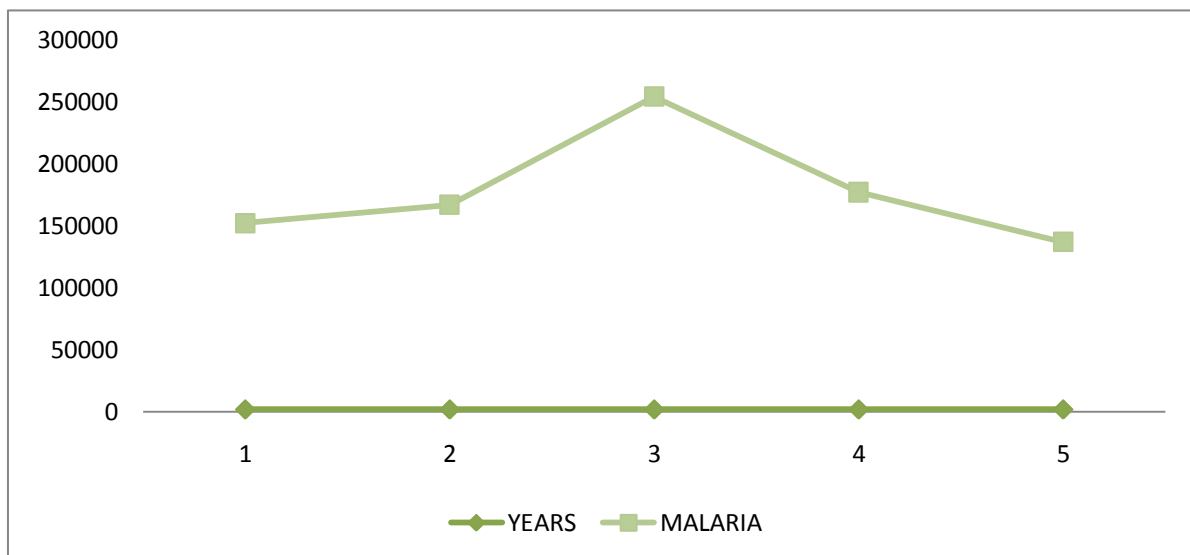
Source: field work, 2015

Fig 1.*A trend analysis plot for malaria*

The chart above shows the trend analysis plot for malaria in the Sekondi-Takoradi Metropolitan Assembly catchment region from 2010 until 2014. The black line represents the actual malaria death cases, the red line represents the fitted trend line and the green line represents the forecasts. Cases of malaria reduce from 152485 deaths in 2010, and increased in167316 deaths in 2011 but continuing inclined 254484 deaths in the year 2012 and reduce in 2013 and remained to decrease again in 2014 with a death cases of 137155.

Table 8.*trend analysis for skin and ulcer diseases*

YEARS	SKIN AND ULCERS DISEASES
2010	21692
2011	18939
2012	30897
2013	25897
2014	10750

Source: field work, 2015

Data :Skin and Uclers diseases

Length: 5

Missing number: 0

Fitted trend equation

Y_t= 21635 + 1492.6*t…………………………………………………………equation. (3)

Time	Skin and Ulcers	Trend value	Detrend analysis
2010	21692	23127.6	-1435.6
2011	18939	4620.2	14318.8
2012	30897	26112.084784.2	
2013	25897	27605.4	-1708.4
2014	10750	29098.0	-18348.0

FORECAST

PERIOD	FORECAST
2015	29098
2016	30590.6
2017	32083.2

201833575.8

201935068.4

202036561.0

Table 9.

YEAES	SKIN and UCLERS DISEAESES(ACTUAL)	FITS1(TREND)	RESI1 (DETREND)	FORE1 (FORECAST)
2010	21692	23127.6	-1435.6	30590.6
2011	18939	4620.2	14318.8	32083.2
2012	30897	26112.8	4784.2	33575.8
2013	25897	27605.4	-1708.4	35068.4
2014	10750	29098.0	-18348.0	36561.0

Source: field work, 2015

The variable under consideration is the trend for Skin and ulcers disease for the period under study as well as forecasted period for 4 years. The output above was obtained using a Minitab and the projection reveals a decline in the Skin and ulcers disease cases for the forecasted period if all things being equal. That is the conditions remain unchanged. The value length (5) indicates the number of years under study. The fitted trend equation Y t =21635+1492.6*t (3) was generated based on the actual Skin and ulcers disease death cases recorded for the span period. The constant 21635 represents the projected cases for 2010, constant 1492.6 indicates the rate at which Skin and ulcers disease deaths projected cases decreases and the variable't' is the time or year. The trend values are the projected cases of Skin and ulcers disease. It is predicted that Skin and ulcers disease will decrease throughout the forecasted 4 years period at a rate of 1492.6. The Skin and ulcers disease projected death cases would be 29098 cases for 2015, 30591 cases for 2016, 32083 case for 2017 and continue increases to 33576 in 2018, 35068 case for 2019 and 2020 with 36561 cases respectively recorded. The Detrend values are the differences for which the projected values are away from the actual death cases.
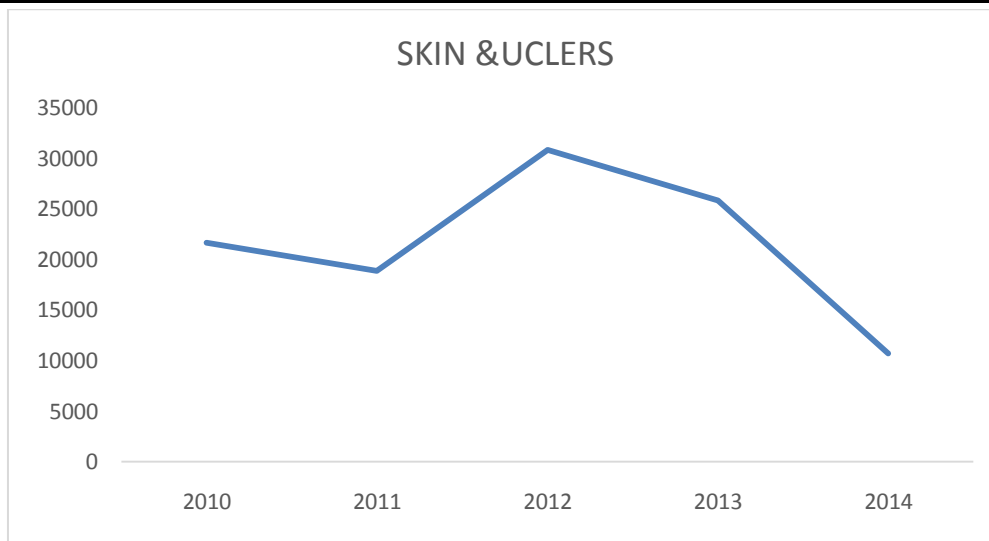
Fig 2.*A trend analysis plot for Skin and Ulcers diseases.*

Source:field work, 201

The chart above shows the trend analysis plot for Skin and ulcers disease in the Sekondi-Takoradi Metropolitan Assembly   catchment region from 2010 until 2014. The death cases of for Skin and ulcers disease increased from 21692 deaths in 2010, reduces to 18939 deaths in 2011and raise to 30897 deaths in 2012. It began to decrease in 2013 with 25897 deaths and finally topped up with 10750 deaths in 2014.

Table 10.*trend analysis for diarrhoea*

YEARS	DIARRHOEA
2010	19220
2011	15807
2012	21520
2013	17646
2014	18370

Source: field work, 2015

Data : Diarrhoea

Length: 5

Missing number: 0

Fitted trend equation

Y_t= 18512.5 – 13.9*t……………………………………………………equation. (4)

Time   Diarrhoea   Trend value   Detrend analysis

2010   19220   18498.6   721.4

2011   15807   18484.72677.6

2012   21520   18470.8 3049.2

2013   17646   18456.9 810.9

2014   18370   18443.0 -73

FORECAST

PERIOD   FORECAST

2015   18443.0

2016   18429.1

2017 18415.2

201818401.4

201918387.4

202018373.0

Table 11.

YEAES	DIARRHOEA(ACTUAL)	FITS1(TREND)	RESI1 (DETREND)	FORE1 (FORECAST)
2010	19220	18498.6	721.4	18429.1
2011	15807	18484.7	-2677.6	18415.2
2012	21520	18470.8	3049.2	18401.4
2013	17646	18456.9	-810.9	18387.4
2014	18370	18443.0	-73	18373.5

Source: field work, 2015

The variable under consideration is the trend for Diarrhoea for the period under study as well as forecasted period for 4 years. The output above was obtained using a Minitab and the projection reveals a decline in the Diarrhoea cases for the forecasted period if all things being equal. That is the conditions remain unchanged. The value length (5) indicates the number of years under study. The fitted trend equation $Y_t = 18512.5 - 13.9*t$ (4) was generated based on the actual Diarrhoea death cases recorded for the span period. The constant 18512.5represents the projected cases for 2010, constant -13.9 indicates the rate at which Diarrhoea deaths projected cases decreases and the variable 't' is the time or year. The trend values are the projected cases of Diarrhoea. It is predicted that Diarrhoea will decrease throughout the forecasted 4 years period at a rate of 1492.6. The Diarrhoea projected death cases would be 19220 cases for 2015, 15807 cases for 2016, 21520 case for 2017 anddecreases to 17646 in 2018and increases to 18370 case for 2019 respectively recorded. The Detrend values are the differences for which the projected values are away from the actual death cases.
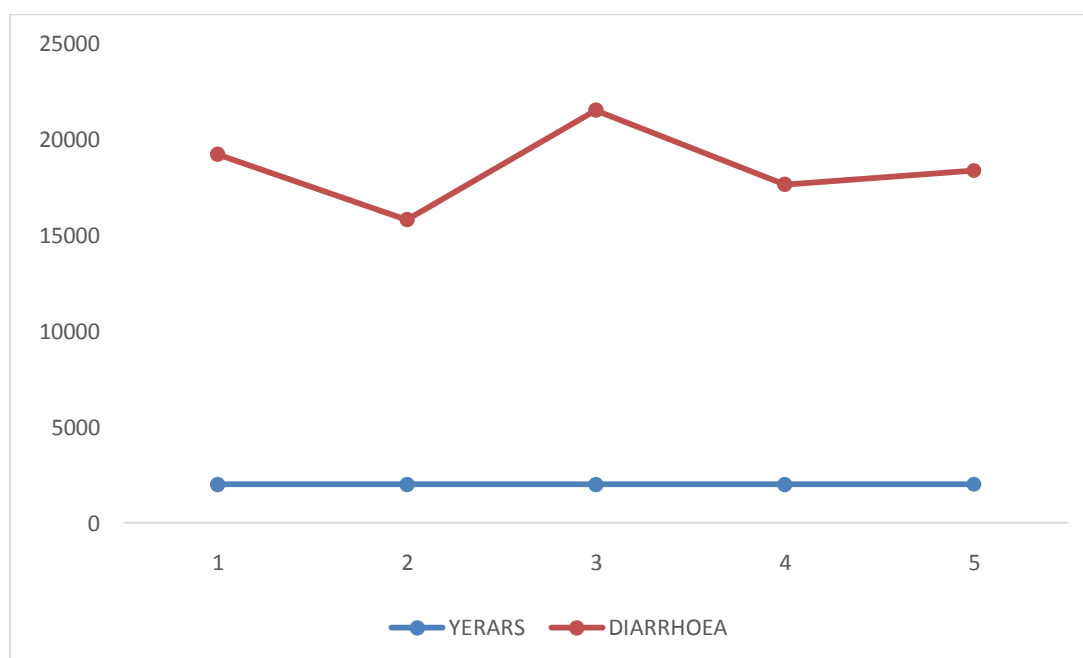

Fig 3.*A trend analysis plot for Diarrhoea*

Source: field work, 2015

The chart above shows the trend analysis plot for Skin and Ulcers disease in the Sekondi-Takoradi Metropolitan Assembly catchment region from 2010 to 2014. The death cases of for Diarrhoea increased from 19220 deaths in 2010, reduces to 15807 deaths in 2011and increases to 21520 deaths in 2012. It began to decrease in 2013 with 17646 deaths and finally increases again with 18370 deaths cases in 2014.

3.2.1The Analysis of Variance

The use of the Analysis of Variance is to solidify the already established truth and draw a conclusion that the major death causing diseases have an influence on the growth of the population.The analysis is as follows.

H_O: Major death causing diseases do not hamper the growth of the population.

H$_1$: Major death causing diseases hamper the growth of the population.

Since p-value (0.000) <) 05.0(we accept the alternatively hypothesis and conclude that there is enough evidence to support the claim that the major death causing disease hampers the growth of the population. The ANOVA summary table for this is shown in the table below.

SOURCE OF VARIATION	D F	SUM OF SQUARES(SS)	MEAN SQUARES	F	SIG.
FACTOR	14	1.562	1.116	23.739	0.000
ERROR	39	1.833	4.700		
TOTAL	53	1.745			

Source: field work, 2015

The output begins with the analysis of variance table. In the table the total sum of squares is broken down into two sources - the variation due to the factor (i.e. belonging to a particulargroup of people effect) and random variation due to the uniqueness of each individual. Each sum of squares has a certain number of degrees of freedom associated with it. They are used to calculate the mean sum of squares, then the F ratio and finally the P value of F. Here it is 0.000, and significant. This means that at least one of the means is significantly different from that of the control group which mean that the rest of them fall within the alternative hypothesis stated and impulse that Since p-value (0.000) <) 0.05(we accept the alternative hypothesis and conclude that the major death causing disease hampers the growth of the population

3.3 Discussion

The main aim of the research was to investigate into the major death causing diseases with regards to the trend and significant differences among the means of the recorded death cases and effectiveness of the measures taken to curb the causes of these diseases. This was done by using cause-specific death ratio, time series analysis and ANOVA based on these analysis a conclusion was reached. The study first took the cause-specific death ratios into consideration. The cause- specific death ratio revealed that on the average, 652 deaths resulted from every 1000deaths in the major death causing diseases throughout the five year period. Out of the 652deaths , 435 deaths each came from malaria and 128 deaths of other acute respiratory infection order. 47 deaths resulted from Skin and Ulcer diseases whiles 42 deaths were due to Diarrhoea. The cause-specific death ratio clearly shows that among the leading causes of death, malaria and other acute respiratory infection are most common killer diseases in theSekondi-Takoradi Metropolitan Assembly catchment region from 2010 to 2014.With regards to the analysis pertaining to time series. The study revealed that, both malaria and other acute respiratory infection demonstrates a firm upwards movement trend from2010 to 2014, but with of other skin and ulcers diseases it witnessed some sort of fluctuations as shown in fig 4.5. The study also revealed that from 2012 to 2013, majority of death cases were as a result of malaria. With regards to the trend of Skin and Ulcers diseases death cases, showed a downward trend as shown in fig 4.5. Although malaria is high among the population, it exhibits a steady downward trend throughout the five year period. The forecasted analysis also revealed that the future expected death cases of Malaria and Skin and Ulcers diseases will increase throughout the five year period at rates of 2058.1 and 1492.6 respectively, whiles diarrhoea will decrease throughout the forecasted years at a rate of 13.9. However, the study is also further supported with the analysis of variance. The findings from the analysis of variance support the assertion that, there is evidence that major death causing diseases affect the population. The proof of this will have serious implications on the general populace and development as a whole. From the analysis, the following can be said considering the data obtained as a result of the further analysis and questions asked whiles collecting the data. With regards to Skin and Ulcers disease, despite it affects the older people i.e. 65 and above, it does not have a significant influence on the active working force. This information was obtained as a result of probing questions asked whiles collecting the data. In the case of malaria most of the influence is on the younger populace which constitute the future workforce. However, for anaemia most of the influence is on the infants from the time of birth and most often, certain forms of anaemia are hereditary. As compared to diarrhoea, it is the middle-age group including older people who have reached their retirement. However, most are still able to work, since diarrhoea can be controlled. Despite the p-value indicates that the major death causing diseases hamper or affect the growth of the population. The one of which stands out significantly in my opinion is malaria, the reason being that it affects the younger population which constitute the future workforce of the nation.

4. CONCLUSION AND ACKNOWLEDGEMENTS

4.1 Conclusion

The conclusion drawn from investigating into the major death causing diseases in the Sekondi-Takoradi Metropolitan Assembly Catchment Region from reveals that:

- Malaria, Skin and Ulcers diseases, Diarrhoea and other Acute Respiratory infection death recorded cases claimed more lives.

- It can be concluded that the cause-specific death ratios based on the objective of study indicated that among the leading causes of death, Malaria, Skin and Ulcersdiseases, Diarrhoea and other Acute Respiratory infection were the most common.

- It can also be concluded both Malaria and Skin and Ulcers diseases demonstrated an upward trend whiles that of malaria exhibited a pattern of downward trend.

- Future expected death cases for malaria andSkin and Ulcers diseases will increase whilesthat of diarrhoea will decrease throughout the forecasted period of study. For a better conclusion to be realized, future studies may involve other institutions tocome to terms with the current situation .It is also necessary for the government to channel resources in this area to alleviate the trend of the disease.

There should be a campaign, in support by Ghanaian youth on malaria control programs as well as national alcohol and drug control programs. Major issues include lack of qualified and well equipped trained staff, limited availability of medications and insufficient financial resources. The Government and civil society must take a series of actions to review and develop health legislation and a comprehensive strategy and policy to promote the health care delivery service in the country. There must be; an improvement in the data capture on morbidity and mortality .Organize routine data management training for the staffs responsible for all recordsrelating to the health service. The ministry of health should collaborate with the food and drugs Board to monitor the quality of food and drugs imported at road check points.

i. Scientists revealed that, the body loses and replaces approximately 1.5 million skin cells every hour. It is very essential to bath frequently, at least twice daily. This helps to prevent skin infections. Sweats and oil secretions on the skin enable bacteria and fungi to breed easily.

ii. Fingernails should always be kept short and clean so that they do not provide breeding grounds for germs.

iii. The spaces between teeth where food particles are trapped provide convenient breedinggrounds for bacteria. Hence teeth should therefore be cleaned at least twice every day, in the morning and preferably in the evening after meal.

iv. Hairs must be cut down to avoid lice or be covered when preparing food. In addition to cleanliness, other factors which are important in promoting health include exercises, recreation and rest. Exercises make the muscles strong and help to get rid of metabolism as well as improving the action of glands and the nervous system. Recreation such as gardening, reading and playing games can remove any dullness, stress and mental tiredness resulting from every day's work. The best form of rest is sleep. Adults need eight hours sleep daily. A great deal of repair of worn-out tissues in the body and the building up of new ones takes place when the body rests. Other good personal habits include avoiding smoking and alcoholic drinks.

Moreover, there should be yearly promotions campaigns on vaccination and immunization program against communicable diseases by the government and the Ministry of Health (M H O).

The Ministry of Health in collaboration with the World Health Organization (WHO), if possible, there should be establishing law enforcement against cigarette smoking in public. Even though Ghana Statistical Service affirmed that there is a moderate relationship between anaemia status of mothers and children, it is important for expectant mothers to take their nutrition seriously during pregnancy.

REFERENCES

[1]. Johnson, G.B. (1998). The Living World. 2nd ed. McGraw-Hill Inc., Boston,USA.

[2]. Bowerman B.L. & O'Connell R.T. (1993). Forecasting and Time Series: AnApplied Approach, 3rd edition. Duxbury Press.

[3]. Alexander, Bahret, Chaves, Courts &D'Alesslo (1996). Silver Burdett Biology.Silver Burdett Company, Morristown, New Jersey, USA.

[4]. Bowerman, O'Connel&Orris (2004). Essentials of Business Statistics. McGraw-Hill Inc, Boston,USA.

[5]. Bluman G. Allan (2004). Elementary Statistics: A Step by Step Approach. 5th ed.McGraw-Hill Inc., USA.

[6]. Gould L. James (1992). Biological Science. 5th ed. Norton & Company, Inc., FifthAvenue, New York.

[7]. Oram F. Raymond (1986). Living Systems. Merrill Publishing CompanyColumbus, Ohio 43216.

[8]. Abbey, T.K., Alhassan, M.B., Ameyibor, K., Essiah, J.W., Fometu, E., Wiredu,M.B. (2008). Integrated Science For Senior High Schools: GAST 4th ed.Malaysia.

[9]. http://ghanadistricts.com/region/?r=5&sa=114accessedon 17th June, 2012.

[10]. Neuman, W. L. (2006), Social Research Methods; Qualitative and Quantitative Approaches. 6thed. New York: Pearson Education, Inc., p.312.

[11]. Ngulube, P. (2005), Research Procedures used by Master of information studies at the university of Nortel in the period 1952-2002, with special Reference to their Sampling Techniques and Survey Responses rate and Methodology Discourse.*TheInternational Information and Library Review*, p.127.

[12]. Whichmann B.A. and Hill I.D. 1982. Algorithm AS 183: An efficient and portable pseudo-random number generator. *Applied Statistics,*2, 188-190.

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