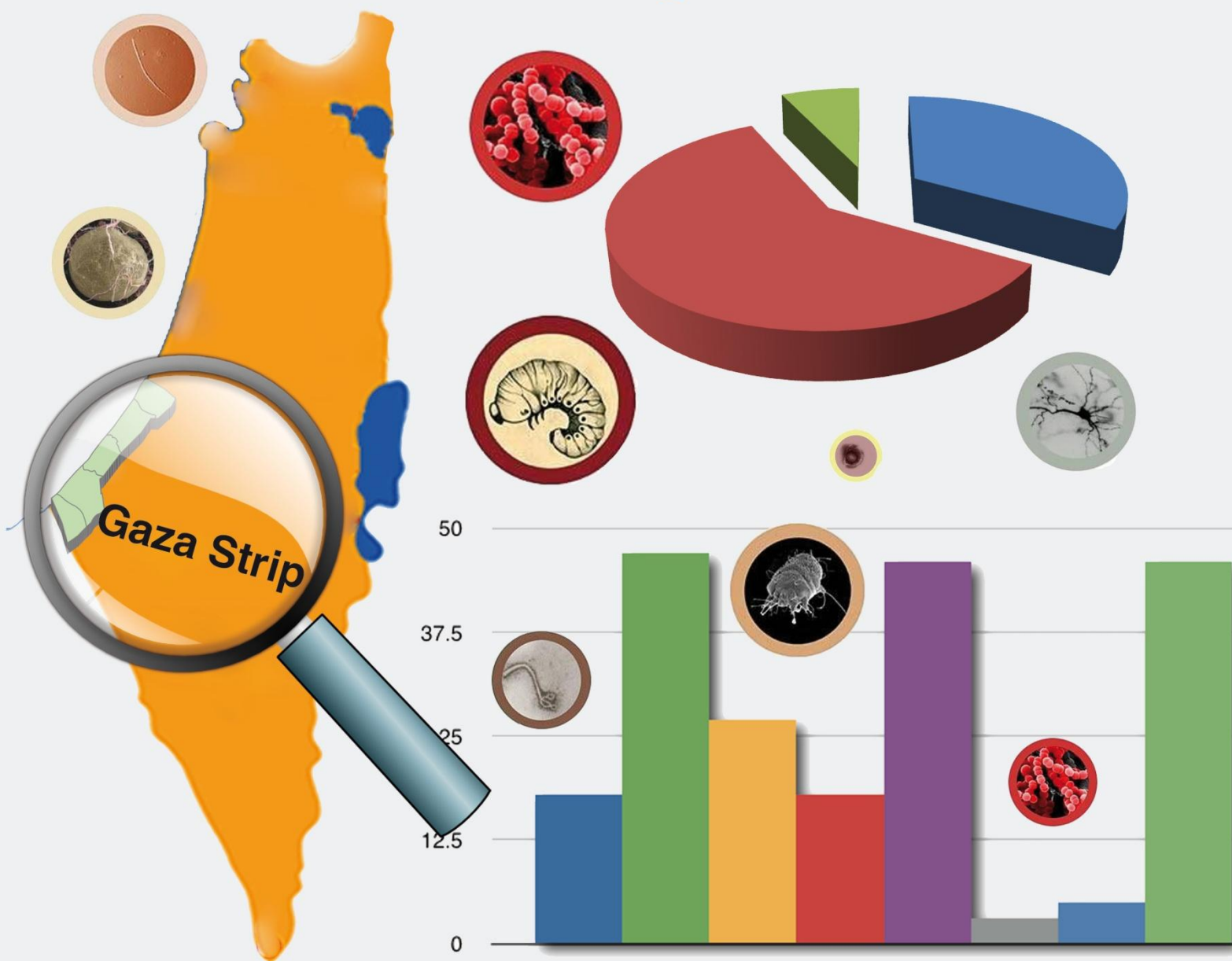


# Annual Report

## Communicable Diseases in Gaza Strip - 2012



General Directorate of Primary Health Care  
Preventive Medicine  
Epidemiology Department



# **Annual Epidemiological Report**

## **Gaza Strip, 2012**

### **Prepared by:**

Dr. Majdi Dheir

Dr. Nedal Ghuneim

Mr. Khaled Abu-Ali

### **Supervised by:**

Dr. Fouad El-Eisawi

## Palestine Map



## **Preface**

Despite the overall political difficulties and instability, the unjust siege, difficult living conditions of Gaza people, an increase of unemployment and poverty rate and frequent electrical interruption, the health system is still sustainable and uncollapsed and achieves improvements on the land. The ongoing health emergency situation in Gaza poses additional challenges on the health services added to the financial crises facing health system which constitute a threat for MOH and its health program.

At this time an epidemiological report is issued to reflect the accurate communicable disease situation. A comparison of reports reflects great scientific improvement and advances in surveillance system. Epidemiological data on disease frequency, pattern, causes and risk factors underpin public health and develop a sense of priorities that guide public health and health policy. The information of this report shed light on sensitive and important areas for the health system, providing basic statistical analysis to vital health indicators. This report shows an achievement and improvement of our health indicators over the last years which is supported by the reports from international organizations. No single case of acute poliomyelitis was reported since 1984 and Palestine was declared as free country from poliomyelitis since the year of 2006. No cases of cholera, diphtheria, measles, rabies, rubella or tetanus were reported during the year 2012. Maintenance of high level of immunization coverage about 99% or more and introducing new vaccines reflects the great success achieved by the health system. Hence we need all health professionals to have an epidemiology sense, to organize research and do actions.

I have the honor to present this annual report of the primary health care about communicable diseases 2012 and hope that this report will be an important reference contributing in support the decision makers in terms of planning and evaluation, will add an additional source about the health situation and will help in creation of an effective and suitable health care system.

This work is seen as a multidisciplinary and done in large teams. Thanks to our medical, health and administrative teams for this effort and diligent work.

We look forward to continue progress to achieve the main goal of MOH "Provide a comprehensive health services to Palestinian people to prevent morbidity and reduce mortality".

**General Director of PHC**

**Dr. Fouad El-Eisawi**

## Table of contents

Preface.....	III
Table of contents.....	IV
List of Graphs.....	VI
List of Tables.....	VII
List of Annexes.....	VIII
Acronyms And Abbreviations.....	IX
Foreword .....	XI
Acknowledgements .....	XII
Introduction.....	1
Sources of data .....	3
Health facilities participated in the notification.....	4
Morbidity of communicable diseases .....	6
Vaccine Preventable Diseases.....	7
Group A disease.....	10
Poliomyelitis and AFP .....	10
AIDS/HIV .....	12
Measles .....	14
Tetanus .....	15
Meningitis .....	16
Bacterial Meningitis: .....	16
Non Specific Meningitis .....	23
Diphtheria .....	25
Adverse events following immunization .....	25
Group B diseases .....	26
Brucellosis.....	26
Mumps.....	27
Pertussis .....	28
Rubella.....	28
Viral Hepatitis infection .....	28
Hepatitis A.....	29
Hepatitis B .....	29
Hepatitis C .....	31

Tuberculosis .....	32
Group C diseases .....	34
Diarrheal diseases .....	34
Diarrhea less than 3 years.....	35
Diarrhea more than 3 years.....	36
Bloody Diarrhea .....	37
Varicella (Chickenpox) .....	37
Conjunctivitis.....	38
Influenza and URTI .....	39
Ascariasis .....	40
Amebiasis.....	40
Giardiasis .....	41

## List of Graphs

Graph 1: Distribution of population by governorates in GS, 2012.....	2
Graph 2: Distribution of health facilities participation in notification of communicable diseases in GS, 2012 .....	4
Graph 3: Annual DTP3 immunization coverage in GS, 2002-2012 .....	10
Graph 4: Annual incidence rate per 100.000 of AFP in GS, years 2003-2012.....	11
Graph 5: Monthly tested blood samples for HIV from blood donors in GS, 2012.....	12
Graph 6: Annual new and cumulative HIV/AIDS reported cases in GS, 1987-2012 .....	13
Graph 7: Annual incidence rate per 100.000 of Neisseria Meningitides diseases in GS, years 2003-2012 .....	17
Graph 8: Distribution of Neisseria Meningitides diseases by type of disease in GS, 2012.....	18
Graph 9: Distribution of Neisseria Meningitides Diseases by age group in GS, 2012.....	18
Graph 10: Weekly reported cases of Neisseria Meningitides diseases in GS, 2012 .....	19
Graph 11: Geographical distribution of Neisseria Meningitides diseases per 100.000 population, 2012.....	19
Graph 12: Annual incidence rate per 100.000 of Hib meningitis in GS, years 2003-2012 .....	21
Graph 13: Annual incidence rate per 100.000 of Other Bacterial Meningitis in GS, years 2004-2012 .....	23
Graph 14: Monthly distribution of Other Bacterial Meningitis cases in GS, 2012 .....	23
Graph 15: Monthly distribution of Non-Specific Meningitis cases in GS, 2012 .....	24
Graph 16: Annual incidence rate per 100.000 of Non-Specific Meningitis in GS, years 2003-2012 .....	24
Graph 17: Annual reported cases of post-BCG lymphadenitis in GS, years 2003-2012 .....	26
Graph 18: Annual incidence rate per 100.000 of Brucellosis cases in GS, years 2003-2012 .....	27
Graph 19: Annual incidence rate per 100.000 of HAV in GS, years 2003-2012.....	29
Graph 20: Monthly tested samples for HBV among blood donors in GS, 2012.....	30
Graph 21: Annual incidence rate of HBV infection among blood donors in GS, years 2007-2012.....	30
Graph 22: Monthly reported cases of Hepatitis B carrier in GS, 2012.....	31
Graph 23: The incidence of HCV infection among blood donors in GS, 2012 .....	32
Graph 24: Monthly reported cases of HCV carrier in GS, 2012.....	32
Graph 25: Annual incidence rate per 100.000 of Tuberculosis in GS, years 2003-2012.....	34
Graph 26: Annual incidence rate of Diarrhea less than 3 years in GS, years 2003-2012 .....	35
Graph 27: Geographical distribution of Diarrhea less than three years in GS, 2012 .....	35
Graph 28: Annual incidence rate of Diarrhea more than 3 years in GS, years 2003-2012 .....	36
Graph 29: Geographical distribution of Diarrhea more than three years in GS, 2012 .....	36
Graph 30: Annual incidence of Bloody Diarrhea per 100.000 population in GS, years 2003-2012 .....	37
Graph 31: Annual incidence rate of Chicken Pox in GS, years 2003-2012.....	38
Graph 32: Annual incidence rate of Conjunctivitis in GS, years 2003-2012.....	39
Graph 33: Annual incidence rate of influenza and URTI in GS, years 2003-2012 .....	39
Graph 34: Monthly reported cases of influenza and URTI in GS, years 2009-2012 .....	40
Graph 35: Annual incidence rate of ascariasis in GS, years 2003-2012.....	40
Graph 36: Annual incidence rate of Amebiasis in GS, years 2003-2012.....	41
Graph 37: Annual incidence rate of Giardiasis in GS, years 2003-2012 .....	42

## List of Tables

Table 1: Percentage of notification by type of health providers in GS, 2012 .....	5
Table 2: National immunization schedule in GS, 2012 .....	8
Table 3: Annual immunization coverage for all vaccines in GS, years 2003-2012.....	9
Table 4: Polio immunization coverage in GS, 2012 .....	11
Table 5: Measles immunization coverage in GS, 2012 .....	15
Table 6: DTP immunization coverage in GS, 2012 .....	16
Table 7: Hib3 immunization coverage in GS, 2012.....	21
Table 8: PCV immunization coverage in GS, 2012.....	22
Table 9: Hepatitis B immunization coverage in GS, 2012 .....	31
Table 10: BCG immunization coverage in GS, 2012.....	33



**List of Annexes**

Annex 1: Distribution of reported cases by governorates, 2012 .....43

Annex 2: Weekly Epidemiological situation of Meningeococcal Disease in Gaza Strip, 2009-2012 .....45

Annex 3: Blood screening in Gaza strip, 2012-2011 .....46

## Acronyms And Abbreviations

AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
AIDS	Acquired immunodeficiency syndrome
BCG	Bacille Calmette and Guérin
BCP	Brucellosis Control Program
CFR	Case Fatality Rate
CRS	Congenital Rubella Syndrome
DT	Diphtheria-Tetanus
DTP	Diphtheria-Tetanus-Pertussis
ELISA	Enzyme-Linked Immunosorbent Assay
EMR	Eastern Mediterranean Region
EPI	Expanded Program of Immunization
GIVS	Global Immunization Vision and Strategy
GS	Gaza Strip
HAV	Hepatitis A Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
Hib	Haemophilus influenza type b
HIV	Human Immunodeficiency Virus
IPV	Injectable polio vaccine
MCV	Measles Containing Vaccine
MMR	Measles-Mumps-Rubella
MNT	Maternal and Neonatal Tetanus
MOH	Ministry Of Health
MOI	Ministry Of Interior
NGOs	Non-Governmental Organizations
PCV	Pneumococcal Conjugate Vaccine
PHC	Primary Health Care
PNA	Palestinian National Authority
PPD	Protein Precipitate Derived
SIAs	Supplementary Immunization Activities
STD	Sexual Transmitted Diseases
TB	Tuberculosis
Td	Tetanus-adult diphtheria

TOPV	Trivalent oral polio vaccine
TT	Tetanus Toxoid
UN	United Nations
UNDP	United nations for development program
UNICEF	United Nations International Children's Emergency Fund
UNRWA	United Nations Relief and Works Agency for Palestinian Refugees
URTI	Upper Respiratory Tract Infection
WB	West Bank
WHO	World Health Organization

## **Foreword**

We are pleased to present this annual epidemiological report as another accomplishment of the epidemiology department. During the year 2012, online epidemiological bulletin ([www.moh.gov.ps](http://www.moh.gov.ps); [www.moh.gov.ps/care](http://www.moh.gov.ps/care)) began publishing and already has covered topics with epidemiological importance. This report is a comprehensive report about the epidemiological situation of communicable diseases in Gaza strip and summarizes our prevention and control activities from January 1, 2012, through December 31, 2012. One of the epidemiology department goals is to provide a yearly summary of communicable diseases incidence and outbreaks report in order to understand, monitor and prevent diseases and other health related illnesses in Gaza strip.

The last annual epidemiological report was published in 2004, and much has changed since then. We hope that this report will be an informative accurate reference and will positively contribute in helping national and international organizations in identifying needs and following the health situation for additional support.

This publication can be obtained from the above mentioned web-sites. Please send any comments and feedback to the Epidemiology Department-Gaza;

Email: [epidept-phc@moh.gov.ps](mailto:epidept-phc@moh.gov.ps).

Published on July, 2012

## **Contributors team**

## **Acknowledgements**

We wish to thank all the following people for their contributions to the success of this report:

1. Dr. Amro El-Hoseini, Deputy general director of Primary Health Care,
2. All epidemiology departments staff,
3. Vaccination department staff,
4. General Directorate of Primary Health Care,
5. Public Relations and Media dept (PHC)
6. All health providers,
7. All health services staff working with their local and state partners
8. Gaza World Health Organization team,
9. Ministry of Interior (MOI).

We thank all those, who participate in data reporting for their invaluable contribution.

## Introduction

The Palestinian National Authority (PNA) territories consist of two geographically separated areas West Bank (WB) and Gaza Strip (GS). GS is a narrow zone of land bounded of the south by Egypt, on the west by the Mediterranean Sea, and on the east and north by the occupied territories in 1948. GS has a total area of 365 sq km with 46 kilometers long and 5–12 kilometers wide and constitute 6.1% of a total area of Palestinian territory land. The mid-year population of the year 2012 was 1.644.289 that represents about 38 percent of the total population in the Palestinian territories. GS is considered as one of the most overcrowded areas in the world with a population density of 4.504 inhabitants/sq.km.

Gaza strip consists of four cities, fourteen villages and eight refugees' camps and administratively divided into the following main five governorates:

**North-Gaza governorate** with an area of 61 sq. km, constitutes 16.7% of the total area of GS and 1.0% of the total Palestinian territory. The total number of population lived in North-Gaza governorate during 2012 was 322.124 individuals with 5280 inhabitants/sq.km.

**Gaza governorate** with an area of 74 sq. km, constitutes 20.3% of the total areas of GS and 1.2% of the total Palestinian territory. The total number of population lived in Gaza governorate during 2012 was 569.714 individuals with 7699 inhabitants/sq. km.

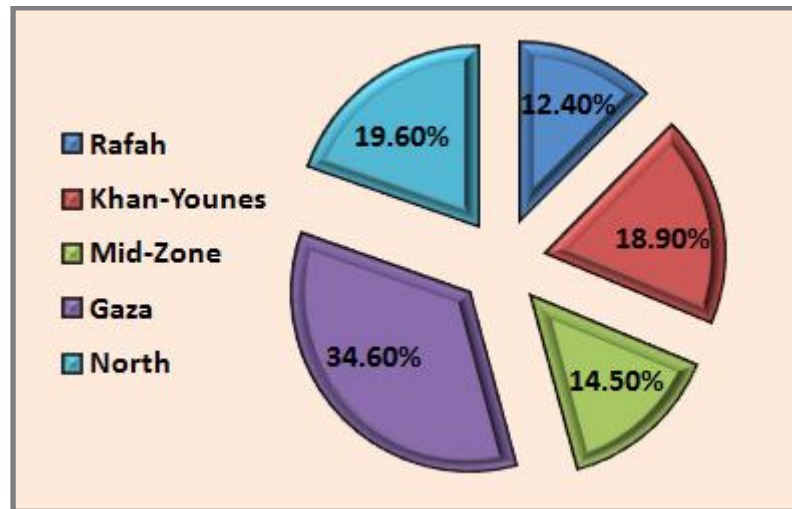
**Mid-Zone governorate** with an area of 58 sq. km, constitutes 15.9% of the total area of GS and 1.0% of the total Palestinian territory. The total number of population lived in Mid-Zone governorate during 2012 was 238.807 individuals with 4117 inhabitants/sq. km.

**Khan-Younes governorate** with an area of 108 sq. km, constitutes 29.6% of the total area of GS and 1.8% of the total Palestinian territory. The total number of population lived in Khan-Younes governorate during 2012 was 310.868 individuals with 2878 inhabitants/sq. km.

**Rafah governorate** with an area of 64 sq. km, constitutes 17.5% of the total area of GS and 1.1% of the total Palestinian territory. The total number of population lived in Rafah governorate during 2012 was 202.776 individuals with 3168 inhabitants/sq. km.

According to the distribution of the population by governorates during the year 2012 (graph 1), the most populated governorate was Gaza governorate with 34.6% of the total GS population followed by North-Gaza governorate with 19.6%. On the other hand, Rafah governorate had the lowest rate of population of 12.3%. The percentage of population under 15 years old was 44% of the total population in GS.

**Graph 1: Distribution of population by governorates in GS, 2012**



Gaza strip is a vital part of the Palestinian entity and identity and its place in the middle of the Palestinian territory makes it a prominent focus of global politics. In August, 2005 the Israel evacuated the occupied GS, including all existing Israeli settlements and all military installations which redeployed outside the GS. In reality, the Israeli unilateral disengagement imposed huge prison for the Palestinian people introduced by Israeli government. All these Israeli activities violate the United Nations (UN) human rights conventions and UN decisions. Since 2006, a strict siege was began on Gaza resulted in severe restriction of population movement, increased health risks and impede the delivery of health and social services. On 27 December 2008, Israeli army launched a devastating "War on Gaza" and lasted about 23 days resulted in some 1400 Palestinian martyrs, including some 300 children and large areas of GS had been razed to the ground, leaving many thousands homeless and the already dire economy in ruins. Economically, the Gaza Strip continues to be totally dependent on the Israeli Occupation State, which is considered as its primary trading partner. As a result, unemployment increased and people were induced to migrate for work and create conditions conducive to alcohol and drug use which have expanded rapidly in GS in recent years. Israeli policy of limiting the daily amount of fuel and electricity to Gaza has not only made healthcare unreliable and inadequate but

leaves entire health care centers without electricity for 8 to 12 hours per day. Drinking water and sewage systems are strongly affected, leaving an estimated 25-30% of Gazans without running water, while 40-50 million liters of untreated sewage floods into the sea each day.

At the same time, there are important areas of concern include poor coordination and implementation of policies and programs across geographic areas and between the governmental and nongovernmental (NGOs) sectors of the health system; many under-qualified health care providers; and weak systems for continuing education.

The above-mentioned factors make GS susceptible for frequent outbreaks of communicable diseases from time to time. So the Ministry of Health (MOH) realizes this fact and provides continuous support to epidemiology department in order to conduct more efforts to prevent and control communicable diseases. On other hand, this situation has led to adopt a changeable strategy according to the situation on the ground in order to guarantee the continuity of services.

Besides that, the health system of GS has many strengths. These include a relatively healthy population; a high societal value placed on health; many highly qualified, experienced health professionals and the presence of national plans for health system development; and a strong base of governmental and non-governmental institutions.

### **Sources of data**

After the establishment of PNA (1994), epidemiology department has been developed in Al-Rimal martyrs clinic and communicable diseases surveillance programs have been designed in order to monitor, prevent and control communicable diseases in GS. In 1996 a second center was opened in Khan-Younes governorate to serve southern governorates. Now five epidemiology centers are functioning in all governorates.

Data about communicable diseases are collected from all health providers and facilities participated in communicable diseases surveillance system. In Gaza Strip, we apply disease specific approach of communicable disease surveillance, which depends essentially on passive surveillance system from different health providers of health facilities. Reporting is very important for detecting any unusual increase of the disease to take



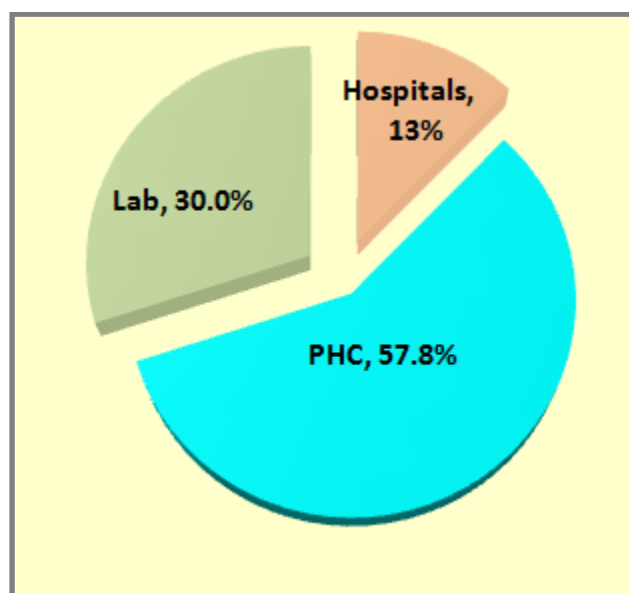
needed preventive measures. In spite of the significant gap between real and reported data from all providers, all received data are routinely analyzed and interpreted to be part of the (monthly, quarterly and annually) reports on communicable diseases to control and prevent communicable diseases and to help decision making.

### **Health facilities participated in the notification**

There are four health care providers (Governmental, United Nations Relief and Works Agency (UNRWA), NGO's and Private sector) in GS. The Governmental and UNRWA offer health services to the most population of GS. The NGO's and Private sector serve small part of the population so why we will include these providers under one item "NGO's".

During 2012, there was a total of 161 facilities participated in notification of communicable diseases from all health providers. The main source of data is received from primary health care (PHC) centers which constitute more than 57% from all participation (graph 2).

**Graph 2: Distribution of health facilities participation in notification of communicable diseases in GS, 2012**



Among these facilities, there were 16 out of 20 hospitals (12 governmental and 8 NGOs), 77 out of 92 PHC centers (61 governmental, 18 UNRWA and 13 NGOs) and 30 out of 49 laboratories (31 governmental and 18 NGOs) participated in the notification (table 1).

**Table 1: Percentage of notification by type of health providers in GS, 2012**

Type of Provider		Monthly Average received	Monthly Total expected	Percentage of notification
<b>Hospitals</b>	<b>Gov</b>	7	12	58%
	<b>NGOs</b>	3.3	8	41.3%
<b>PHC</b>	<b>Gov</b>	41.9	61	68.7%
	<b>UNRWA</b>	18	18	100%
	<b>NGOs</b>	1.5	13	11.5%
<b>Laboratories</b>	<b>Gov</b>	30.7	31	99%
	<b>NGOs</b>	0.08	18	0.4%

As shown on table 1, the notification from UNRWA facilities was very significant. The notification from NGOs (Laboratories and PHC) facilities was very poor (0.4% and 11.5% respectively). In fact, NGOs facilities serve a few quantity of people and more effort should be paid at this level for better notification. An average of 58% of governmental hospitals participated in the notification process. This average should be increased in order to improve reporting and notification.

The average monthly notification during the year 2012 was 63.6%. The participation was better during the first quarter and mainly during January where 72.7% off all participated health facilities participated in notification. The lowest month of notification was in March and November where only 59.1% off all participated health facilities participated in notification.

By the end of the year 2012, a total of 269.783 cases of notifiable diseases were reported to the epidemiology department in the five governorates with about 42% increase comparing with 2011 (189.473 cases). The majority of reported cases were from North governorate (36.6% of notifications) followed by Khan-Younes governorate (20.5%). The lowest notification was reported from Rafah governorate (8.1%). Approximately the same distribution was registered in the year 2011.

We are looking to improve the participation from health facilities in notification and reporting of communicable diseases through:

1. Increasing the awareness of the notification by all health providers,
2. Active collaboration between Epidemiology Department and health facilities,
3. Establishing the Feedback information from Epidemiology department to all health providers, who participated in notification of communicable diseases.

Communicable diseases and their related events in GS are divided into three groups according to their epidemiological importance (annex 1):

**Group A diseases:** Diseases of this group are of high importance so they must be immediately notified with accuracy due to the urgency of investigation and intervention. This group includes Acute Flaccid Paralysis (AFP), Acute Poliomyelitis, Human immunodeficiency virus / Acquired immunodeficiency syndrome (HIV/AIDS), Cholera, Diphtheria, Food poisoning, Measles, Rubella, Meningococcal diseases, Hemophilus Influenza b (Hib) Meningitis, Rabies, Tetanus and Adverse Events Following Immunization (AEFI).

**Group B diseases:** Diseases of this group are of the second highest of importance and must be notified within one week. It includes other Bacterial and Viral Meningitis, Brucellosis, Hepatitis (A, B and C), Lishmaniasis, Influenza A H1N1, Malaria, Mumps, Sexual Transmitted Diseases (STD), Shigellosis, Tuberculosis, Salmonellosis, Typhoid and Paratyphoid fever, and Whooping Cough.

**Group C diseases:** Diseases of this group are of low importance and monthly notification is needed. This group includes Animal Bites, Chicken Pox, Diarrhea, Upper respiratory Tract infection (URTI), Ascariasis, Amebiasis, Giardiasis, Strongyloidiasis, Enterobiasis, Trichuriasis, Hymenolepiasis, Toxoplasmosis and Leprosy.

### **Morbidity of communicable diseases**

Communicable diseases are one of the main causes of morbidity, mortality and disability in the world. While these diseases present a large threat for the well-being of humans, there are well-known interventions that are available for controlling and preventing them. The development and strengthening of national surveillance system is a key part of communicable disease prevention and control. The Palestinian health authority had succeeded in prevention and complete control of many communicable diseases, where

there are no registered cases of poliomyelitis, rabies, diphtheria, plague, leprosy, schistosomiasis or malaria had been reported in the last years. Other communicable diseases, such as meningococcal meningitis, HIV/AIDS, hepatitis, tuberculosis, diarrhea, pneumonia and parasitic infestation remain challenges. Improvement of regular notification, reporting, evaluation and intervention is needed for the success of their prevention and control. In spite of the amelioration of reporting system, we still have under reporting from some health providers. So the data presented in this report does not reflect the real situation of these diseases.

### **Vaccine Preventable Diseases**

Vaccination is one of the most important public health interventions. Their use had led to eradication of smallpox, partial eradication of polio, elimination of tetanus, partial elimination of measles and substantial reductions in the morbidity and mortality attributed to diphtheria and pertussis. The targets of the Global Immunization Vision and Strategy (GIVS) set by World health organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) call for all countries to be immunizing by 2010 at least 90% of their total child population under five years old, and at least 80% of children under five in every district throughout the country. Each country has its own policies as to which vaccines to use. Immunization program performance is now increasingly measured not only by immunization coverage rates, but also, and more important, by measuring the reduction in the incidence of expanded program of immunization (EPI) target diseases. Surveillance data are crucial in assessing whether disease eradication, elimination and reduction targets are being met and where resources should be targeted for maximum cost-effectiveness.

Palestinian MOH adopted a comprehensive EPI to prevent 11 vaccine-preventable diseases that occur mainly in infants and children (table 2). The strength of the Palestinian immunization program plays an important role in improving child health. The main target diseases for which vaccines are used are Tuberculosis (TB), Poliomyelitis (polio), Diphtheria-Tetanus- Pertussis (DTP), Measles-Mumps-Rubella (MMR) and congenital rubella syndrome, Hepatitis B, Haemophilus influenza type b (Hib) and Pneumococcal Conjugate Vaccine (PCV).

**Table 2: National immunization schedule in GS, 2012**

Age at vaccination	Type of vaccine
At birth	BCG, HB1
1 month	IPV1
2 months	DTP1, Hib1, HB2, IPV2, TOPV1, PCV1
4 months	DTP2, Hib2, HB3, TOPV2, PCV2
6 months	DTP3, Hib3, HB4, TOPV3
12 months	MMR1, PCV3
18 months	MMR2, TOPV4, DTP4
6 years	DT, TOPV5
12 years	Rubella for female
15 years	Td

Our target is that every child will receive a safe and effective vaccine for each childhood vaccine-preventable disease. So according to MOH policy, any infant from any governorate can receive his vaccine at any PHC center in any governorate. Table 2 shows the national immunization schedule for these diseases. In 2012, some changes in EPI program policy was adopted. By July 2012, a Pneumococcal Conjugate Vaccine (PCV) was introduced to the national schedule for all infants born from 1<sup>st</sup> January, 2012 and Penta vaccine (DTP+Hib+HB) was used making a change of the number of doses and time when the vaccine must be given.

Based on the reports received from immunization department, the average coverage rates exceeded 99% for all vaccines (table 3), which had clear impact on eradication, elimination or reduction in the incidence of vaccine preventable diseases.

Immunization coverage is used in order to monitor progress in achieving and maintaining high levels of immunization. According to table 3, the overall coverage for BCG during 2012 was 98.9%, for HB3 was 99.3%, for TOPV3 was 99.3%, for DTP3 was 99.5%, for Hib3 was 99.5%, for PCV2 was 99.5% and for MMR1 was 99%.

**Table 3: Annual immunization coverage for all vaccines in GS, years 2003-2012**

<b>Vaccine</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>BCG</b>	99.5%	100%	100%	100%	100%	100%	99.6%	100%	99%	98.9%
<b>HB3</b>	98.3%	97.9%	98.7%	97.9%	97.9%	98.9%	94.1%	98.9%	99%	99.3%
<b>TOPV3</b>	98.2%	98.3%	98.8%	98.5%	98.5%	98.7%	96.5%	100%	101.3%	99.5%
<b>DTP3</b>	97.7%	97.6%	97.8%	98.7%	98.7%	98.9%	99.1%	100%	101%	99.5%
<b>Hib3</b>	-	-	-	-	-	-	-	-	101%	99.5%
<b>PCV2</b>	-	-	-	-	-	-	-	-	-	99.5%
<b>MMR1</b>	97.2%	95.4%	95.1%	98.5%	98.5%	94.4%	98%	100%	98.2%	99%

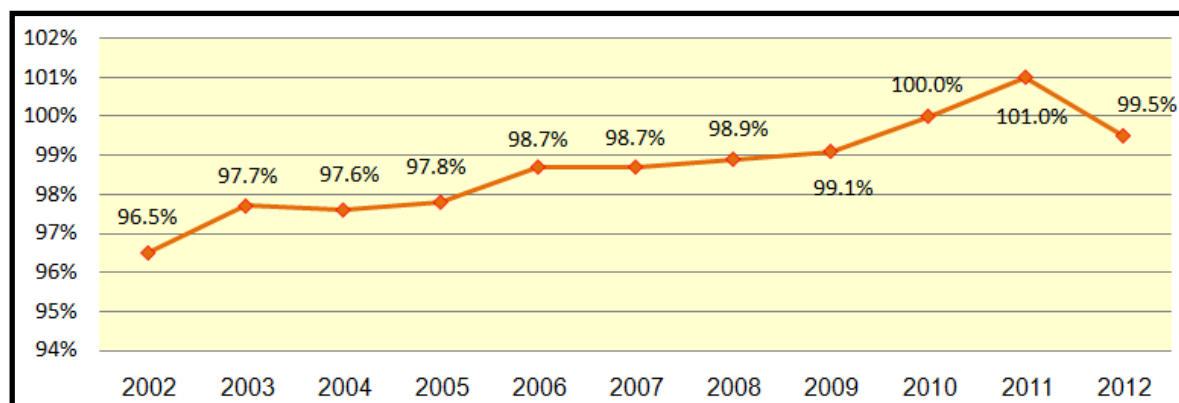
The continuous supply and distribution of vaccines is one of the pillars that allow this program to be one of the best health programs. This extraordinary achievement were accomplished because of a combination of different reasons like the availability of the vaccines throughout the year, efficient cold chain (including refrigerators powered by solar energy which located in each governorate), good appointment system, increase the awareness of Palestinians mothers regarding the importance of vaccines and continuous follow up of defaulters by the health centre staff.

In Gaza strip, all data about immunization coverage are timely and relatively easy to collect so the reporting of vaccine doses administered and coverage percentage are always accurate. By the end of the year 2012, the total number of newborns was 56967 and according to ministry of interior (MOI) civil affairs there are a lot of defaulters who register their infants after a long period from delivery (more than two years) and they constitute about 4.5% from the all newborns (about 2563 newborns) which must be added to the total number of newborns. In fact these infants in spite of lack of registration, received there immunization on time so they will be added to the total number of newborns bringing the total number of 59530 newborns. During this period a total of 982 infants were died.

During 2012, a total of 57885 infants received their vaccines which constitute 98.9% from the total population. By convention, the success of routine immunization programs has been measured by the coverage achieved with the third dose of DTP3 among children aged 6 months. DTP3 coverage serves as the primary indicator of an immunization program's performance and in Gaza strip during 2012 it was 99.5%.

According to graph 3, since the year of 2002 till 2012 there was a continuous improvement in immunization coverage.

**Graph 3: Annual DTP3 immunization coverage in GS, 2002-2012**



In spite of the War on Gaza on 2009; restriction of the movement of people and goods; the isolation policy of the Gaza strip; the increasing poverty rate, high unemployment rate and socio-economic hardship etc.; the immunization coverage was not affected but still growing and was closed to about 100%.

### **Group A disease**

By analyzing the reported data of diseases of this group we realize that no cases of acute poliomyelitis, cholera, diphtheria, measles, rabies, rubella or tetanus were reported during year 2012 (Annex 1).

### **Poliomyelitis and AFP**

The WHO adopted a resolution to eradicate poliomyelitis from the world by 2015. The pillars of polio eradication are routine immunization, supplementary immunization, targeted “mopping-up” campaigns, surveillance for AFP and environmental surveillance. PNA adopted these pillars. In Gaza Strip, there was a high coverage of poliomyelitis vaccination closed to 100% (2 doses of IPV at ages 1 and 2 months in addition to 5 doses of TOPV at ages 2,4,6,18 months and 6 years); national immunization days were conducted targeting children under five years of age for three consecutive years (regardless of previous immunization status); mopping up campaigns were carried out as needed; active surveillance of AFP are implemented; no cases of polio were reported since 1984 and testing sewage for the presence of poliovirus are conducted. So in the year 2006, the

regional committee for the Eastern Mediterranean Region (EMR) of the WHO certify that Palestine is free from poliomyelitis.

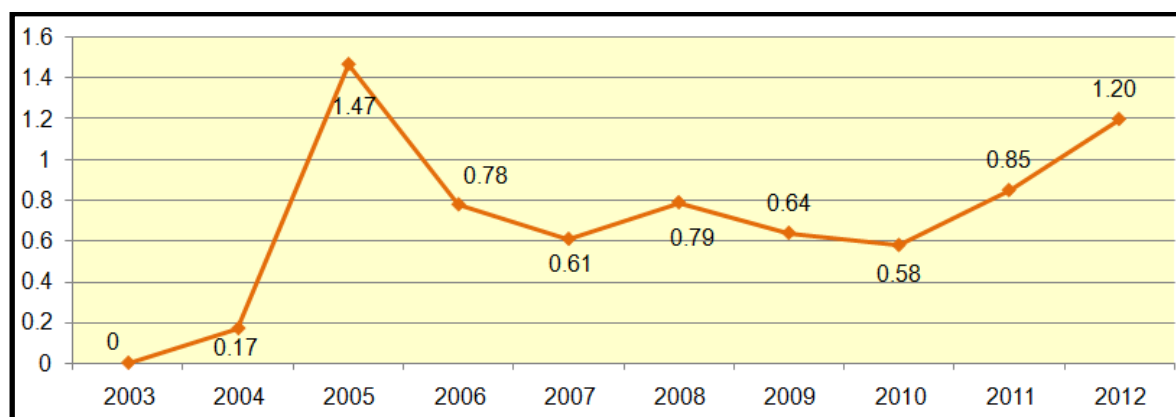
**Table 4: Polio immunization coverage in GS, 2012**

Type of vaccine	Vaccinated and registered	Total
<b>IPV1</b>	Total vaccinated	58600
	Total registered population	58735
	Coverage	99.8%
<b>TOPV3</b>	Total vaccinated	58798
	Total registered population	59112
	Coverage	99.5%

As seen on table 4, the total number of children received IPV1 vaccine was 58600 children constituting a coverage of about 99.8% from the total number of children, while the total number of children received TOPV3 vaccine was 58798 children constituting a coverage of about 99.5% from the total number of children.

According to WHO estimation, the incidence rate for AFP must be at least one case for every 100.000 children under 15 years. As shown on graph 4 during the year of 2012, an improvement of reported cases (9 cases) were reported in GS with an incidence rate of 1.2 per 100,000 children under 15 years in comparison to the year 2011 where the incidence rate was 0.85 (6 cases) per 100.000 population and to the year 2010 where the incidence rate was 0.58 (4 cases) per 100.000 population.

**Graph 4: Annual incidence rate per 100.000 of AFP in GS, years 2003-2012**





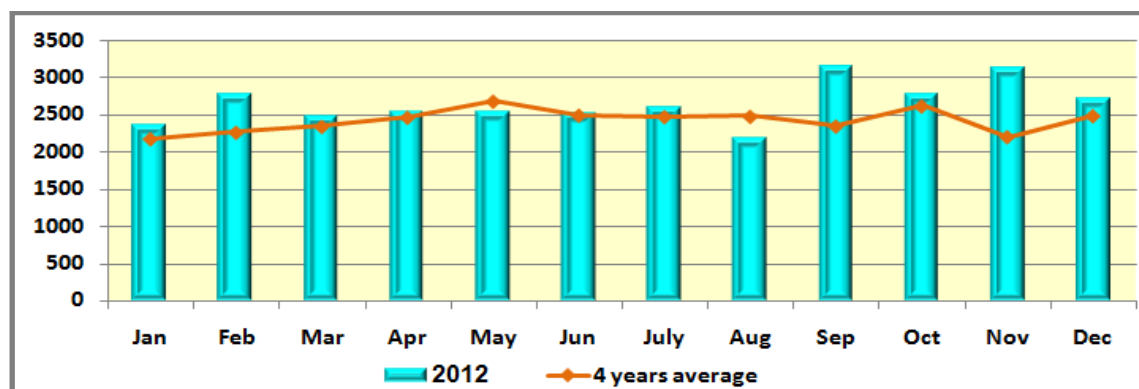
The registered cases in the year 2012 were reported mainly in Gaza (5 cases), Khan-Younes (3 cases) and one case in Mid-Zone governorates while no cases were reported from Rafah and North governorates. All these cases were free of Poliomyelitis. An improvement of AFP surveillance is needed through strengthening cooperation between epidemiology department and all health providers.

## AIDS/HIV

The global HIV pandemic continues to remain a serious public health problem in spite of the advances in fighting this disease. According to recent reports, the number of HIV/AIDS patients has risen to surprising levels in Arab and Islamic countries over the last few years.

In Palestine, HIV screening was started in 1987 for blood donors. In 1996 screening was extended to include pre-employment investigation, university student, drug addicts, prostitutes, TB patients and close HIV contacts. Provisional testing of samples for HIV/AIDS is carried out using Enzyme-Linked Immunosorbent Assay (ELISA) test. Samples with ELISA positive results are confirmed using Western Blot test (Annex 3).

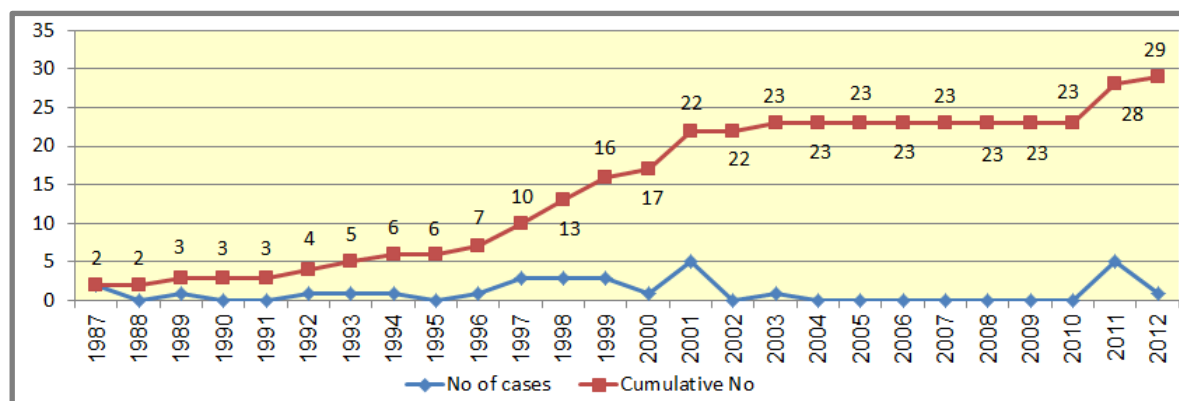
**Graph 5: Monthly tested blood samples for HIV from blood donors in GS, 2012**



In 2012, a total of 42,126 blood samples were tested for HIV (Annex 3). Among these samples, 31,709 (75.3%) were tested from blood donors (graph 5) and no positive samples were registered among them. Among the rest samples tested from different patient, only one case was positive with an overall incidence of 0.01%. In 2011, a total of 45,516 blood samples were tested for HIV. Among these samples, about 66% were tested from blood donors and the rest were for different patients where 5 positive samples were registered. Although HIV infection is reported in most countries in the world, Gaza as other Arabic

regions reports low incidence rate of HIV/AIDS. Since the year of 2004 till 2010, no cases of HIV/AIDS were reported in Gaza strip.

**Graph 6: Annual new and cumulative HIV/AIDS reported cases in GS, 1987-2012**



As seen on graph 6, the cumulative reported cases in Gaza Strip from 1987 till 2012 was 29 cases. From these cases 21 cases (72.4%) were male and 13 cases (48.2%) were married. The majority of cases 17 (58.6%) were from Gaza governorate. The main route of transmission 16 cases (55.1%) was heterosexual. At the date of diagnosis, 17 (58.6%) cases were diagnosed as having first stage (asymptomatic) according to WHO classification and 10 (35.7%) cases as having AIDS stage (severe). The majority of cases 22 (75.8%) were in their productive age. The majority of cases 19 (65.5%) were died due to lack of treatment.

During the year of 2012 only one case was reported with an incidence rate of 0.06/100.000 population while five cases were reported in the year 2011 with an incidence of 0.31/100.000 population. Now in Gaza Strip, there are a total of nine cases living with HIV/AIDS with a prevalence of 0.54/100.000 population. According to national adopted treatment protocol, seven of them are under treatment and two are un-eligible for treatment. Of these 9cases only 4 (44.4%) are male, 5 (55.5%) cases are married and 4 (44.4%) cases from Gaza governorate. The majority of infections 77.7% were transmitted through heterosexual route. Only 2 infections were attributed to maternal to child transmission. The majority of these cases 5 (55.5%) were diagnosed during the year of 2011. In GS since the introduction of treatment in the year 2010, the case fatality rate is zero%.

It is important to note that, given the strong “taboos surrounding the discourse on HIV”, the real mode of transmission is not likely to be documented in many instances. There are strong limitations about what patients living with HIV can tell us, so these data do not reflect the real transmission route.

## **Measles**

The WHO Regional Committee for the Eastern Mediterranean passed a resolution to eliminate measles based on the following strategy:

1. Strengthening routine infant immunization and achieving >90% coverage of first dose of a measles containing vaccine (MCV1) in all districts.
2. Conducting catch-up supplementary immunization activities for all susceptible age groups.
3. Achieving high coverage (>90%) with a second dose of measles vaccine either through:
  1. supplementary immunization activities every 3 to 4 years or
  2. inclusion of a 2<sup>nd</sup> measles dose in the EPI schedule
  3. Strengthening surveillance for measles
  4. Optimal case management for children with measles

Before the introduction of measles vaccine at age of 9 months in 1980, the disease was endemic in Palestine. In 1985, a second-dose incorporated with mumps and rubella vaccine as a combined vaccine (MMR) was added at 15 months. By the year 2009, the schedule of measles vaccine was changed to 12 and 18 months using MMR and by November 2011, the nine month measles dose was stopped.

In GS the current implemented strategy for elimination of Measles has led to a dramatic decline in measles cases in the last 30 years and no confirmed cases were reported in the last ten years. So GS is considered by WHO to be in the phase of eliminating this disease as the WHO criteria are fulfilled. High immunization coverage (more than 98%) is sustained with two-vaccine doses (since 1985), added to the different national campaigns conducted at different times.

**Table 5: Measles immunization coverage in GS, 2012**

Type of vaccine	Vaccinated and registered	Total
<b>MMR1</b>	Total vaccinated	57936
	Total registered population	58548
	Coverage	99%
<b>MMR2</b>	Total vaccinated	58378
	Total registered population	58893
	Coverage	99.1%

As seen on table 5, the total number of children received MMR1 vaccine were 57936 children constituting a coverage of about 99% from the total number of children, while the total number of children received MMR2 vaccine were 58378 (with a coverage of 99.1%).

### **Tetanus**

Tetanus is an acute, often fatal disease caused by the spore-forming bacterium *Clostridium tetani*. Tetanus is almost entirely preventable through immunization. The WHO recommended strategies for achieving Maternal and Neonatal Tetanus (MNT) elimination include:

1. Strengthening routine immunization of pregnant women with tetanus toxoid vaccine (TT)
2. TT Supplementary Immunization Activities (SIAs) in selected high risk areas, targeting women of child bearing age with 3 properly-spaced doses of TT
3. Promotion of clean deliveries
4. Reliable NT surveillance

In Palestine, TT was introduced in the immunization schedule since 1957. It is incorporated with diphtheria and pertussis as a combined vaccine (DTP). Primary vaccination with the DTP series consists of a four-doses, administered at ages 2, 4, 6 and 18 months. A fifth dose incorporating with diphtheria (DT) is given for children aged 6 years to confer continued protection against disease during the first year of schooling. And a sixth dose incorporating with adult diphtheria (Td) vaccine is given for children aged 15

years which prolonged the protection for at least 10 years. Since 1<sup>st</sup> June 2012, vaccine against Tetanus was included in Penta vaccine.

In GS, all WHO recommended strategies have been implemented: almost all deliveries were at public health institutions in hygienic circumstances; a high immunization coverage (more than 99%) against tetanus among infants is reached; six-dose vaccination policy is implemented according to EPI protocol and MNT elimination has been achieved. Since the last several years neither cases of NT nor MT were reported in GS.

**Table 6: DTP immunization coverage in GS, 2012**

Type of vaccine	Vaccinated and registered	Total
<b>DTP3</b>	Total vaccinated	58798
	Total registered population	59112
	Coverage	99.5%

Table 6 shows that the total number of children received DTP3 vaccine was 58798 children constituting a coverage of 99.5% from the total number of children.

## **Meningitis**

Meningitis is an infection that involves the membranes overlying the brain and spinal cord (meninges) and the causative agents vary greatly among the different age groups. Meningitis has a high prevalence in developing countries, with associated mortality and risk of severe residual neurological problems. There are several different causes of meningitis like bacteria, virus or fungus infection.

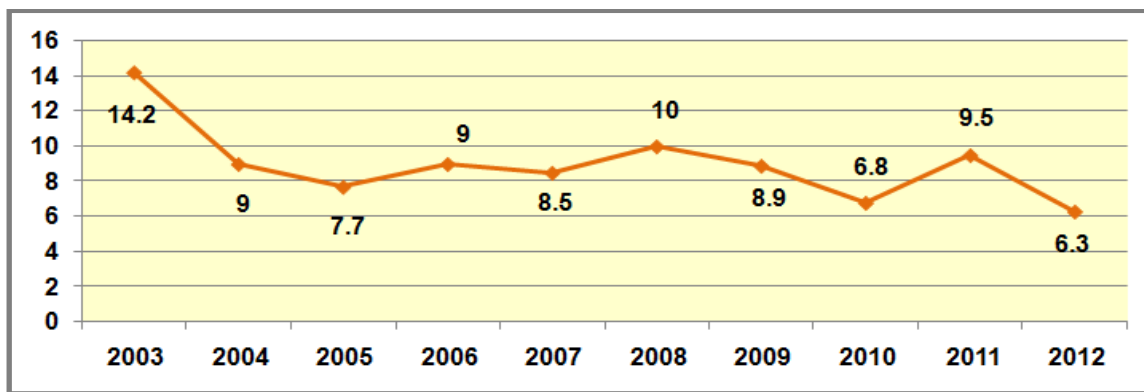
### **Bacterial Meningitis:**

Bacterial meningitis is an important serious illness worldwide; it can be caused by a range of different bacteria: *Neisseria Meningitides*, *Haemophilus influenza* type b, *Streptococcus pneumoniae* and others.

### ***Neisseria Meningitides Diseases:***

Diseases caused by *Neisseria Meningitides* are considered as life threatening illnesses and involve many organs causing meningitis and septicemia. These types should always be viewed as a medical emergency. These diseases remain a priority concern types because of the fatality they cause.

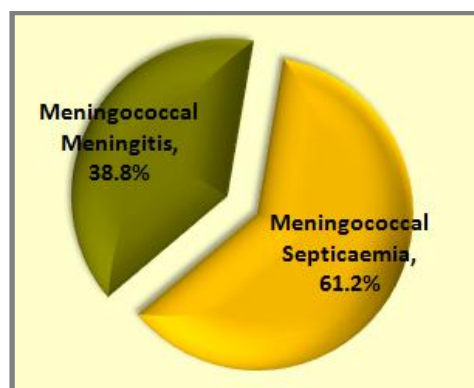
**Graph 7: Annual incidence rate per 100.000 of *Neisseria Meningitides* diseases in GS, years 2003-2012**



As seen on graph 7, the yearly incidence of *Neisseria Meningitides* diseases in 2003 was 14.2 per 100.000 and in years 2004-2011 fluctuated between 6.8 to 10 per 100.000 population.

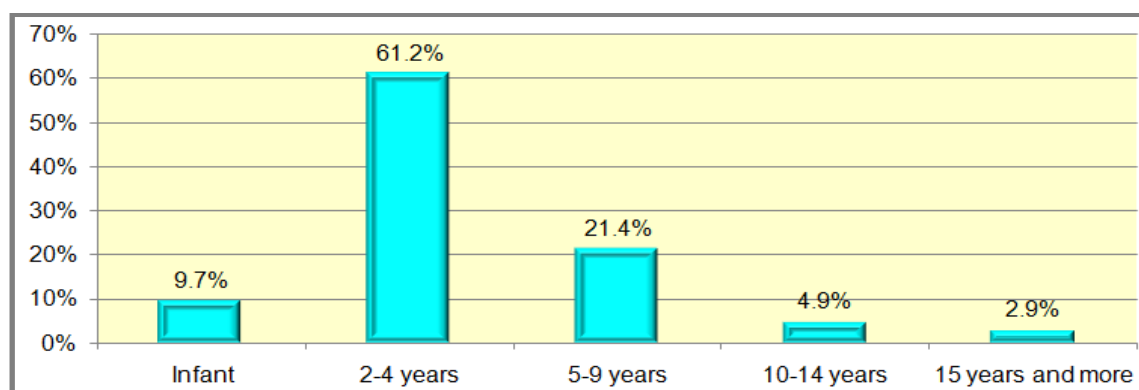
In GS these diseases are endemic with seasonal and governorate variations. In the year 2012, a total of 103 cases of *Neisseria Meningitides* diseases were reported with an incidence of 6.3 per 100.000 population. According to the type of clinical manifestation 63 cases (out of 103) were diagnosed as Meningococcal Septicemia and 40 cases as Meningococcal Meningitis (graph 8).

**Graph 8: Distribution of Neisseria Meningitides diseases by type of disease in GS, 2012**



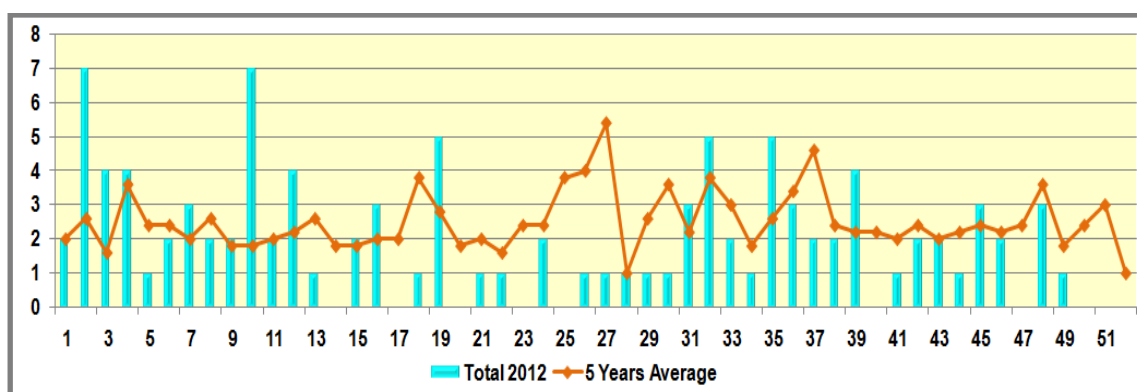
There was a male predominance 56 cases (54.4%) than female. Age distribution showed that, it occurred mainly among children aged 2-4 years (Graph 9) where 61.2% were reported followed by infants (9.7%).

**Graph 9: Distribution of Neisseria Meningitides Diseases by age group in GS, 2012**



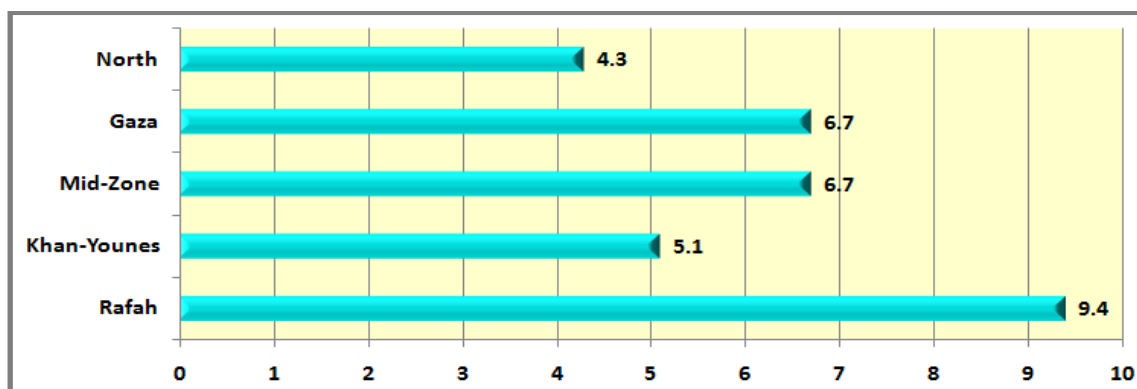
As shown on graph 10, according to weekly reported cases an increase of reported cases was observed in winter weeks while a decrease was observed in spring weeks. Comparing to the five years average, the increase of reported cases was noticed in the late spring and summer.

**Graph 10: Weekly reported cases of Neisseria Meningitides diseases in GS, 2012**



According to the geographical distribution as shown in graph 11, the highest incidence rate of reported cases was in Rafah governorate (9.4/100.000 population) followed by Gaza and Mid-Zone Governorates (6.7/100.000 population). In Khan-Younes governorate the incidence rate was 5.14/100.000 population and in North governorate it was 4.3/100.000 population.

**Graph 11: Geographical distribution of Neisseria Meningitides diseases per 100.000 population, 2012**



In 2010 and 2011, a total of 104 and 151 cases of Neisseria Meningitides diseases were reported with an incidence of 6.8 and 9.5/100.000 population respectively.

During 2012, the case fatality rate (CFR) among all cases was 23.3%. The highest case fatality rate reported among children 2-4 years old. During the year 2011, the CFR was 16.5%.



### ***Meningococcal meningitis***

During 2012, a total of 40 cases (38.8% from all Neisseria Meningitides diseases cases) were reported with an incidence of 2.4 per 100.000. Among these cases 27 (67.5%) cases were male. The majority of cases were among children aged 2-4 years (52.5%) and was reported in Gaza governorate (14 cases constitute 35%) followed by Khan-Younes and Rafah governorates (8 cases constitute 20%). Among these patients, only one died with a CFR of 2.5%. For some cases, serogrouping was done and showed only serogroup B.

During 2010 and 2011, a total of 29 and 36 cases were reported with an incidence of 1.9 and 2.3/100.000 respectively. The CFR during 2010 and 2011 was zero.

### ***Meningococcal Septicemia***

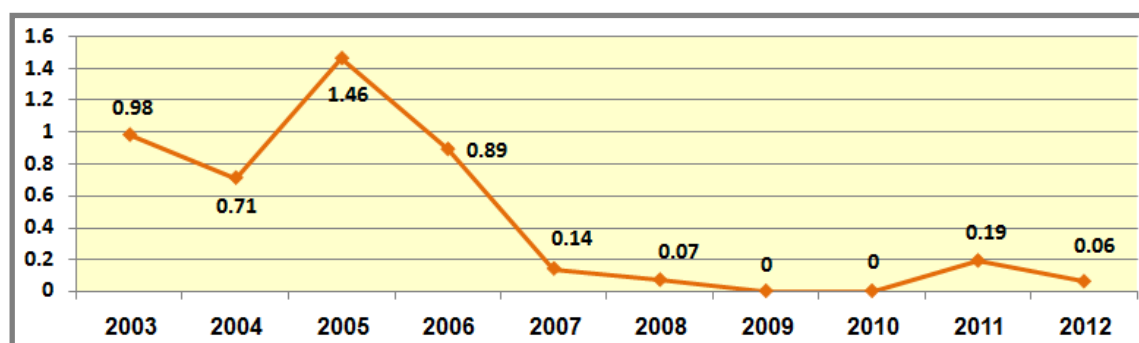
During 2012, a total of 63 cases (61.2% from Neisseria Meningitides diseases cases) were reported with an incidence of 3.8 per 100.000. The majority of cases 34 (54%) were female and in Gaza governorate 24 cases were reported (38%) followed by Rafah and North governorates where 11 cases were reported (17.4%). 23 cases were died with a case fatality rate of 36.5%.

During 2010 and 2011, a total of 75 and 115 cases were reported with an incidence of 4.9 and 7.2/100.000 respectively. About 27 cases were died in 2010 and 22 cases in 2011 with a CFR of 36 and 19.1% respectively.

### **Haemophilus influenza Type b meningitis (Hib)**

Haemophilus influenza type b bacteria is a cause of bacterial infections that are often severe, particularly among infants. This bacteria can cause several diseases such as meningitis, pneumonia and others. Since the introduction of conjugate Hib vaccine in the routine immunization schedule in 2007 (three doses at 2, 4 and 6 months), Hib meningitis registered cases dramatically decreased and had nearly been eliminated. Since June 2012, vaccine against Hib was included in Penta vaccine.

**Graph 12: Annual incidence rate per 100.000 of Hib meningitis in GS, years 2003-2012**



As seen on graph 12, only one case was reported in GS in 2012 with an incidence of 0.06 per 100.000 population while in the year 2011 three cases were reported (0.19 per 100.000). In 2007, two cases were reported but in 2008 only one case was reported in Gaza governorate. In 2009 and 2010, no cases were reported.

**Table 7: Hib3 immunization coverage in GS, 2012**

Type of vaccine	Vaccinated and registered	Total
Hib3	Total vaccinated	58798
	Total registered population	59112
	Coverage	99.5%

Table 7 shows that in 2012 a total of 58798 infants were vaccinated with a total coverage with Hib3 vaccine of 99.5%.

### **Pneumococcal Disease**

Pneumococcal disease is a disease caused by *Streptococcus pneumonia*, constitute a public health problem. This bacteria is commonly found in the nose and throat of healthy people without causing disease. It can cause a variety of diseases mainly meningitis and pneumonia. This year, a Pneumococcal vaccine that protects against different forms of pneumococcal diseases was introduced in the EPI schedule. All infants born on 1<sup>st</sup> January 2012 received a series of three doses of PCV at ages of 2, 4 and 12 months.

During 2012, a total of 15 cases of *Streptococcus pneumonia* were reported with an incidence of 0.91 per 100000 population. During 2010 and 2011, a total of 38 and 24 cases were reported with an incidence of 2.48 and 1.51 per 100.000 population respectively.

**Table 8: PCV immunization coverage in GS, 2012**

Type of vaccine	Vaccinated and registered	Total
<b>PCV1</b>	Total vaccinated	47872
	Total registered population	48134
	Coverage	99.5%
<b>PCV2</b>	Total vaccinated	37632
	Total registered population	37822
	Coverage	99.5%

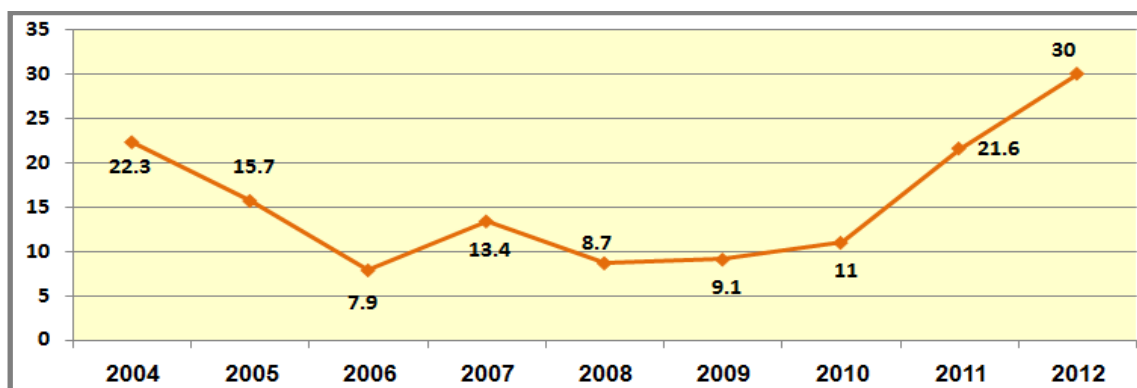
As seen on table 8, the total number of children received PCV1 vaccine were 47872 children constituting a coverage of about 99.5% from the total number of children, while the total number of children received PCV2 vaccine were 37632 (with a coverage of 99.5%).

### **Other Bacterial Meningitis**

Other bacterial meningitis are caused by variety of bacterial infection including mainly gram-negative rods (especially *Escherichia coli*) and gram-positive rods. During 2012, a total of 493 cases were reported with an incidence rate of 30 per 100.000 population. According to adopted case definition of bacterial Meningitis there is no specific diagnosis of the cases according to causative agent.

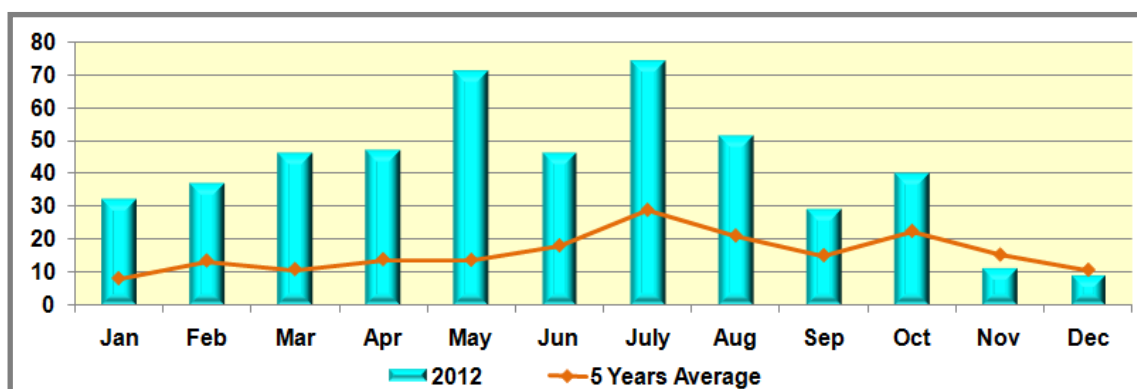
As shown on the graph 13, a significant continuous increase of other bacterial meningitis was reported in the years 2011 and 2012 in comparison with the previous years. During 2011 and 2012, a total of 343 and 493 cases were reported with an incidence of 21.6 and 29.9 per 100.000 population respectively. During the period 2006-2010 the incidence rate ranged between 7.9 and 13.4. The majority of reported cases were not confirmed by laboratory which is strongly recommended.

**Graph 13: Annual incidence rate per 100.000 of Other Bacterial Meningitis in GS, years 2004-2012**



It is observed that the increased incidence was reported since the beginning of the year and the highest registered cases was in July where 74 cases were registered but by the end of the year it decreased (graph 14).

**Graph 14: Monthly distribution of Other Bacterial Meningitis cases in GS, 2012**



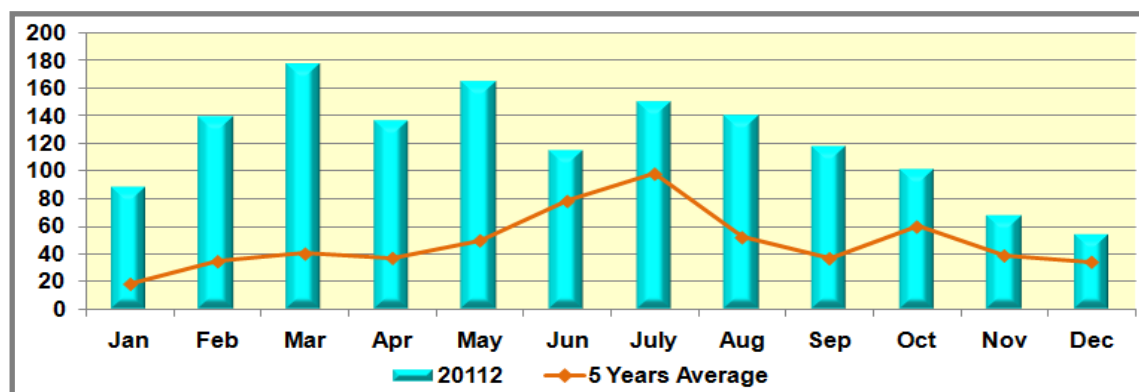
As we don't have a diagnostic technology to differentiate the causes of the disease, the increased number of reported cases in the year 2012 could be attributed to the real increase of this disease, or to the improvement of notification of communicable diseases.

### **Non Specific Meningitis**

One of the most important causes of non-specific meningitis is viral (aseptic) meningitis which is serious but rarely fatal disease. In Palestine, non-specific meningitis is considered as one of the endemic diseases with some seasonal variation.

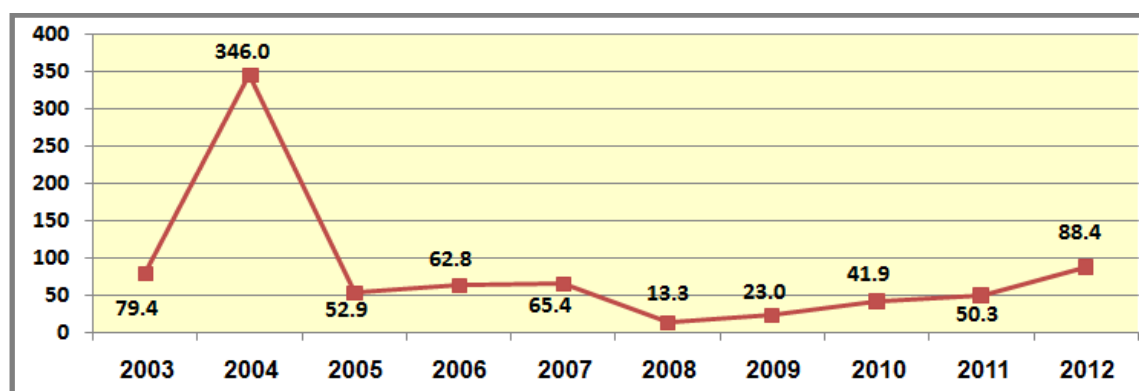
During 2012, there was a notable increase in reported cases of viral meningitis where 1453 cases were reported with an incidence rate of 88.4 per 100,000 population compared with 799 cases in 2011 with an incidence rate of 50.3 per 100,000 population and 643 cases in 2010 with an incidence of 41.8 per 100,000 population.

**Graph 15: Monthly distribution of Non-Specific Meningitis cases in GS, 2012**



It is observed that the registered increase was in all months of the year compared to five years average registered cases. The highest number of reported cases was in March where 178 cases were reported while the lowest number was reported in December where 54 cases were reported (graph 15).

**Graph 16: Annual incidence rate per 100.000 of Non-Specific Meningitis in GS, years 2003-2012**



As seen on graph (16), during the period 2005-2012 the incidence ranged between 13.3 and 88.4. In 2004 an outbreak of Non-Specific meningitis was reported where a total of 4375 cases were registered with an incidence rate of 346 per 100.000 population. The majority of reported cases were not confirmed by laboratory which is strongly recommended.

The highest incidence of reported cases were in Mid-Zone (247.1/100.000) followed by Gaza governorate (138.6/100000). North and Khan-Younes governorates registered very low incidence (18.3 and 4.5/100000 respectively). In Rafah governorate, no cases were reported because all notified cases were included in Khan-Younes cases report.

## **Rabies**

Rabies is an acute infection of the nervous system caused by rabies virus which is usually transmitted by bites from infected animals. After recognition of a rabies exposure, rabies can be prevented with initiation of appropriate steps including active and passive immunization. After a human is bitten by a known animal, the animal should be captured, confined, and observed for a period of at least 10 days. If an animal escapes after an exposure, it should be considered as infected animals unless proved otherwise and rabies prophylaxis should be initiated using a regimen of four doses of rabies given on days 0, 3, 7, and 14. Since many years no cases of rabies were reported in GS.

## **Diphtheria**

Diphtheria was one of the most common causes of illness and death among children. Since the introduction and widespread use of vaccines containing diphtheria toxoid beginning in the 1957 with an infant EPI program, diphtheria has been well controlled. In Palestine, the available diphtheria vaccine is combined with tetanus toxoids and pertussis (DTP). Primary vaccination with the DTP series consists of a four-doses, administered at ages 2, 4, 6 and 18 months. A fifth dose incorporating with tetanus toxoid (DT) is given for children aged 6 years to maintain a continued protection against disease during the primary years of schooling. And a sixth dose having adult diphtheria incorporating with tetanus toxoid (dT) vaccine is given for children aged 15 years. Since June 2012, vaccine against Diphtheria was included in Penta vaccine.

Table 6 shows that a total of 58798 children received DTP3 vaccine with a total coverage of 99.5%.

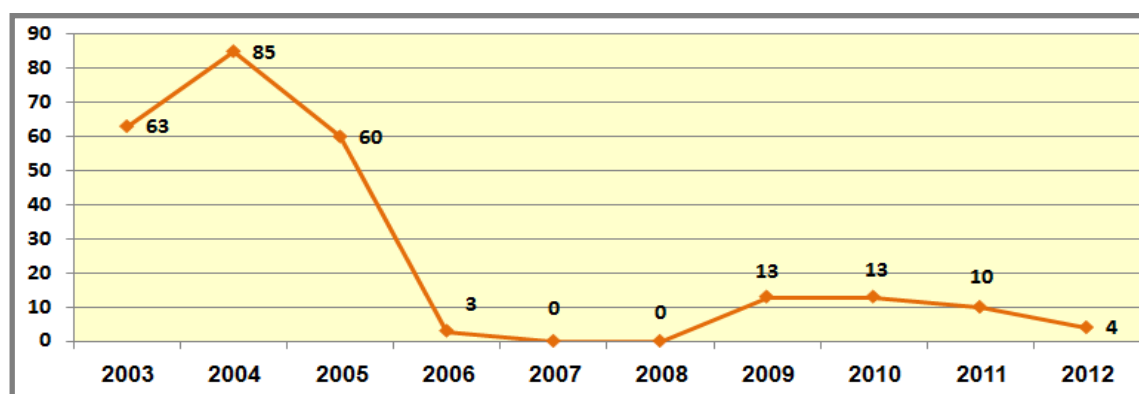
## **Adverse events following immunization**

AEFI are defined as medical incidence that take place after an immunization and is believed to be caused by the immunization within four weeks of a vaccine administration.

The main AEFI are divided into local adverse events (injection site abscess, lymphadenitis and sever local reaction) and general adverse events (Fever, vaccine associated paralytic poliomyelitis, encephalitis, meningitis, allergic reaction, anaphylactic shock). In the last years only post Bacille Calmette and Guerin (BCG) axillary lymphadenitis cases were reported.

In the year 2012 only 4 cases of post-BCG lymphadenitis were reported (graph 17) while in the year 2011 a total of 10 cases were reported. The significant decrease of reported post-BCG lymphadenitis since 2006 could be explained by using high quality of BCG vaccine and highly qualified health care providers.

**Graph 17: Annual reported cases of post-BCG lymphadenitis in GS, years 2003-2012**



No case of other AEFI were reported in the last years which means that there was a serious under reporting of AEFI which needs more efforts in the future to convince the health providers to report other types of vaccine adverse events.

### **Group B diseases**

An obvious decrease of reported cases of group B diseases was registered in the last years. This decrease was due to adoption of special programs for controlling of some diseases (brucellosis and Tuberculosis) and adoption of other preventive activities (mumps, pertussis, rubella and hepatitis B vaccines).

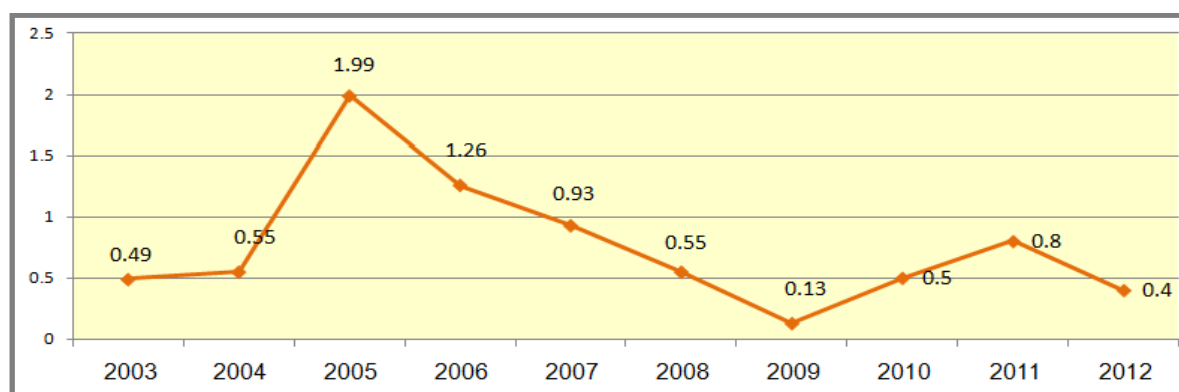
### **Brucellosis**

Brucellosis is an endemic disease worldwide, especially in developing countries. As zoonotic diseases it cannot be adequately controlled only by monitoring the disease in

human populations. In Palestine, the disease is contagious of domestic animals. In 1998, PNA adopted the Brucellosis Control Program (BCP) in cooperation with WHO and UNDP. The BCP focused on animal health through comprehensive animal testing, vaccination and depopulation of affected animals and human health by focusing on good management of cases and health education for at risk population. As a result of this strategy, control and near-elimination of the disease in animals was achieved till now.

During 2012, a total of 7 cases of brucellosis were reported in GS with an incidence of 0.4/100000 population. 4 cases (57%) were reported in North governorate and 3 cases (43%) were reported in Rafah governorate.

**Graph 18: Annual incidence rate per 100.000 of Brucellosis cases in GS, years 2003-2012**



In Gaza strip since 2005, a continuous decline of reported cases was noticed (graph 18). The incidence rate in the year 2005 was 1.99/100.000 population decreased to 0.13/100.000 population in 2009. In 2010 and 2011, the incidence increased from 0.5 to 0.8/100.000 population. The increase of incidence could be explained by the poor control on the tunnels with Egypt as many un-tested animals could be entered to Gaza strip.

## Mumps

Mumps is a viral illness caused by a paramyxovirus of the genus Rubulavirus. As a part of prevention and control activities of this illness, mumps vaccine was introduced in Palestine in 1985 using the combined MMR at age of 15 months. In 2009, children effectively began receiving two doses of mumps vaccine because of the implementation of a two-dose measles vaccination policy using the combined MMR vaccine at age of 18 months.



Table 5 shows that a total of 57936 children received MMR1 vaccine with a total coverage of 99% while the total number of children received MMR2 vaccine were 58378 with a total coverage of 99.1%.

During the year of 2012, no cases were confirmed among 60 suspected cases due to the lack of confirmatory test reagents and also in the year 2011, a total of 54 cases were reported as suspected cases with no confirmation.

### **Pertussis**

Pertussis, a cough illness commonly known as whooping cough, is caused by the bacterium *Bordetella pertussis*. Severe disease is infrequent in healthy, vaccinated persons. In Palestine, the pertussis vaccines available is combined with DTP. Primary vaccination with the DTP series consists of a four-doses, administered at ages 2, 4, 6 and 18 months. Since March 2012, vaccine against Pertussis was included in Penta vaccine.

In Gaza strip, there are no reported cases of pertussis since more than 10 years which reflect the good effect of high immunization coverage on controlling this disease. During 2012, the immunization coverage for DTP1 was more than 98.9%, for DTP2 was 99.9%, for DTP3 (table 6) was 99.5% and for DTP4 was about 99.1%.

### **Rubella**

Rubella is a viral illness caused by a togavirus of the genus *Rubivirus*. In 1985, live attenuated rubella vaccines were used in Palestine. The goal of the rubella vaccination program was to prevent congenital infections, including congenital rubella syndrome (CRS). Live attenuated rubella virus vaccine is combined with MMR, recommended for infants 12 months of age. In 2009, a second dose of combined MMR vaccine was recommended at 18 months. Sixth grade girls in the Gaza Strip received Rubella vaccine. So, since many years no confirmed cases of Rubella or CRS were reported. During 2012, the total MMR1 coverage was 99% and MMR2 was 99.1% (table 5).

### **Viral Hepatitis infection**

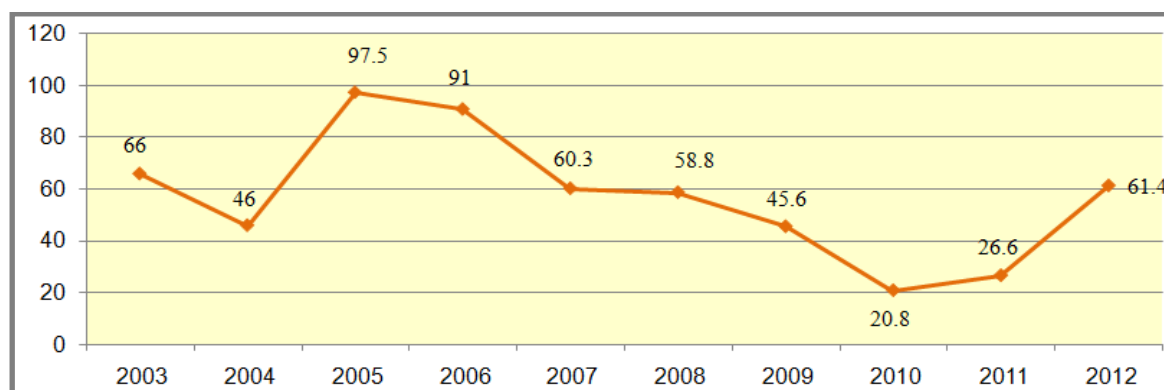
Viral hepatitis is one of the most serious health problem worldwide, with some variation from one type to another and from country to another. It caused by several viruses that

differ in clinical presentation, risk of chronicity, transmission, and means of prevention. In Palestine the most common are hepatitis A, hepatitis B and hepatitis C.

## Hepatitis A

Hepatitis A is considered one of the most common diseases and the leading cause of acute viral hepatitis worldwide. The majority of hepatitis A virus (HAV) infection still takes place in early childhood, where it is asymptomatic, self-limiting and leaves life-long immunity. Palestine as one of developing countries is still endemic for hepatitis A. Since the year 2005, a noticeable decrease of incidence per 100.000 population was reported with an incidence of 97.5 per 100,000 population decreased to 20.8 per 100,000 in the year 2010 (graph 19). During the last two years an increase of reported cases was reported and the incidence increased to 26.6 and 61.4 respectively.

**Graph 19: Annual incidence rate per 100.000 of HAV in GS, years 2003-2012**

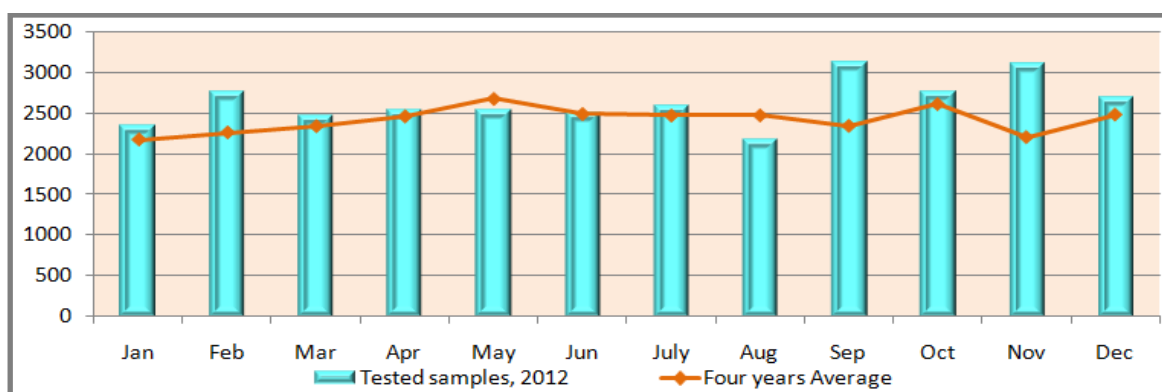


During the year 2012, a total of 1010 cases were reported with an incidence of 61.4 per 100.000 population. The highest incidence was reported in North governorate (86/100000) while the lowest incidence (36.7/100000) was reported in Gaza governorate. This noticeable increase could be explained by the bad infrastructure in the governorates with bad personal hygiene.

## Hepatitis B

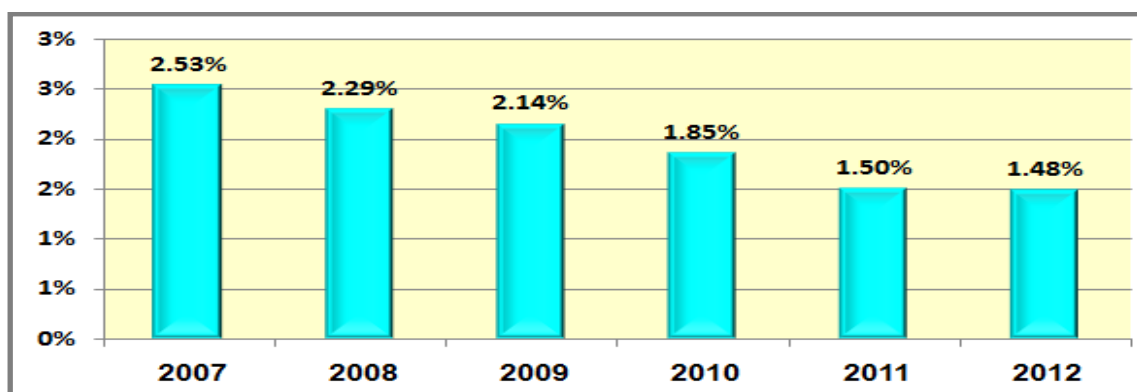
Hepatitis B is caused by infection with the hepatitis B virus (HBV), a virus of the family hepadnaviridae. HBV infection is a major public health problem in the Middle East. According to WHO classification, Palestine is considered as intermediate endemic area of hepatitis B.

**Graph 20: Monthly tested samples for HBV among blood donors in GS, 2012**



Among blood donors (Annex 3), a total of 31709 blood samples were tested for hepatitis B and 472 samples were positive with an incidence of 1.5% (graph 20).

**Graph 21: Annual incidence rate of HBV infection among blood donors in GS, years 2007-2012**



As seen on graph 21, the incidence of HBV infection among blood donors decreasing since 2007 to 2012 from 2.53% to 1.48%.

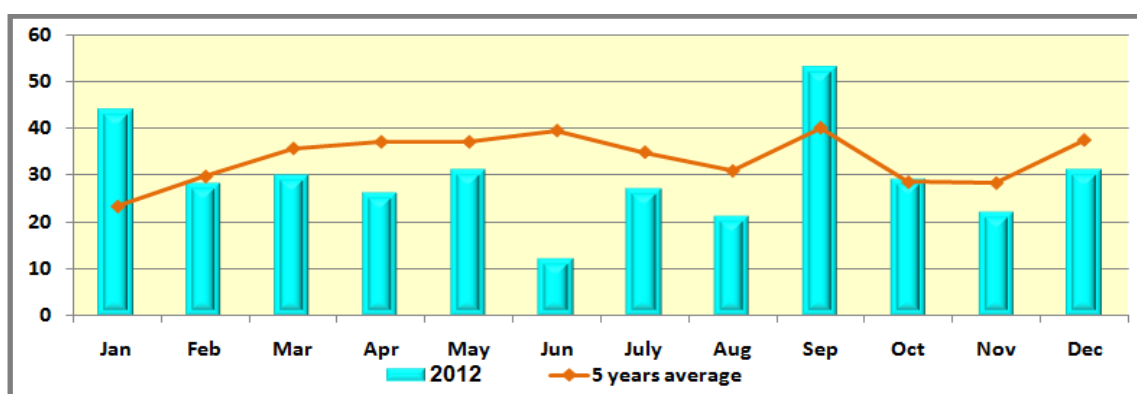
Vaccination is the most important tool for hepatitis B prevention, and Hepatitis B vaccine is fully integrated into the national immunization program for children under 1 year of age since 1993 with high coverage rate of 99%. Primary vaccination with the Hepatitis B series consists of a three-doses; the first dose is administered at birth; the second dose at the age of one month and the third dose at six months. Since June 2012, vaccine against Hepatitis B was included in Penta vaccine. During 2012, some changes of hepatitis B vaccine was implemented. The first dose is given at birth as a single dose and then three doses included in Penta vaccine are given at ages 2, 4 and 6 months.

**Table 9: Hepatitis B immunization coverage in GS, 2012**

Type of vaccine	Vaccinated and registered	Total
<b>Hep B3</b>	Total vaccinated	58789
	Total registered population	59163
	Coverage	99.3%

Use of hepatitis B vaccine is assessed through population coverage with the third dose of the vaccine (HepB3). Table 9 shows that a total of 58789 children were vaccinated with a total coverage with Hep3 vaccine of 99.3%.

**Graph 22: Monthly reported cases of Hepatitis B carrier in GS, 2012**

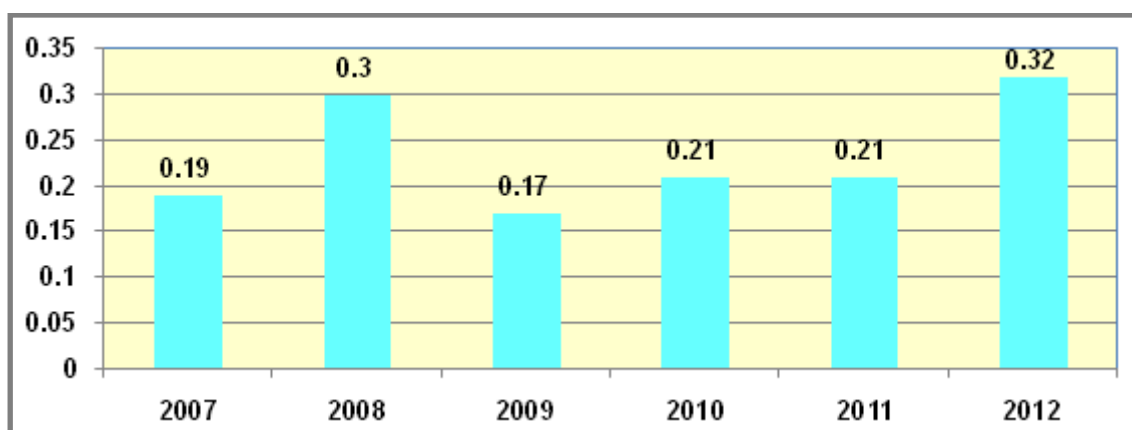


In 2012, a total of 354 cases of hepatitis B carrier were reported to the epidemiology department with an incidence of 21.5/100.000 population (graph 22). About 32.8% of cases were reported in North governorate and 31.6% of cases were reported in Gaza governorate. In 2011, a total of 375 cases were reported with an incidence of 23.6/100.000 population. About 35% of all reported cases were reported in Gaza governorate followed by North governorate (33%).

## Hepatitis C

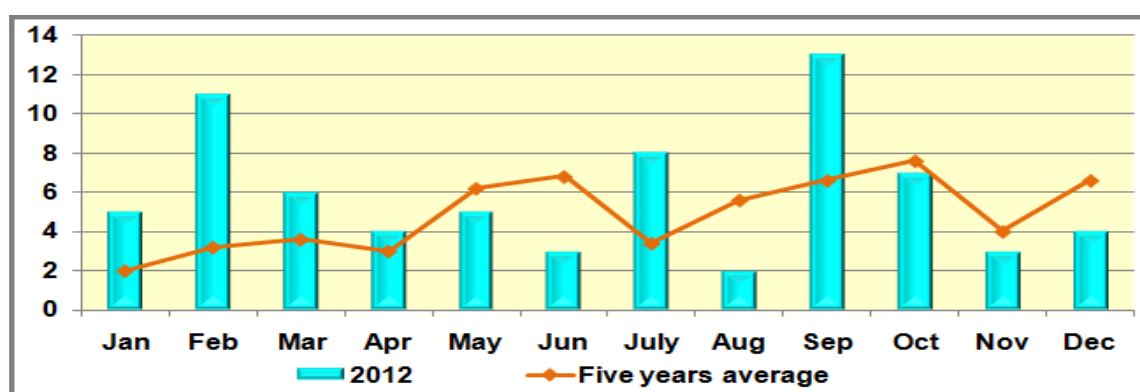
The hepatitis C virus (HCV) is the major cause of the disease formerly known as non-A non-B post transfusion hepatitis. HCV is a single stranded RNA virus, is a member of the family Flaviviridae. Surveillance of hepatitis C in Palestine started in 1994, but it needs more national attention.

**Graph 23: The incidence of HCV infection among blood donors in GS, 2012**



Among blood donors (Annex 3), a total of 31709 blood samples were tested for anti-hepatitis C and 102 samples were positive with an incidence of 0.32% (graph 23). This incidence is not representative as not all Anti-HCV positive samples in fact are infected.

**Graph 24: Monthly reported cases of HCV carrier in GS, 2012**



In 2012, a total of 71 new cases were reported to epidemiology department having positive anti-HCV with an incidence of 4.3/100.000 population (graph 24). About 52% of cases were reported in North governorate followed by Gaza governorate with 16.9% of cases.

## Tuberculosis

Tuberculosis (TB) is an infectious disease caused mainly by *Mycobacterium tuberculosis*. Tuberculosis can affect most organs in the body, but the lung is the main organ affected. In spite of major advances in diagnosis, treatment and prevention of TB the disease still constitutes a major health problem throughout the world.

The current coverage level for BCG is a good indicator of an immunization program's ability to reach newborns. The BCG vaccine is one of the most widely used of all current vaccines and it is a part of the national childhood immunization program. BCG, which is currently the only available TB vaccine, provides protection against TB meningitis and the disseminated form of the disease in infants and young children. In Palestine, BCG vaccine was introduced into the EPI in 1957 and is given to all infants as soon as possible after birth.

**Table 10: BCG immunization coverage in GS, 2012**

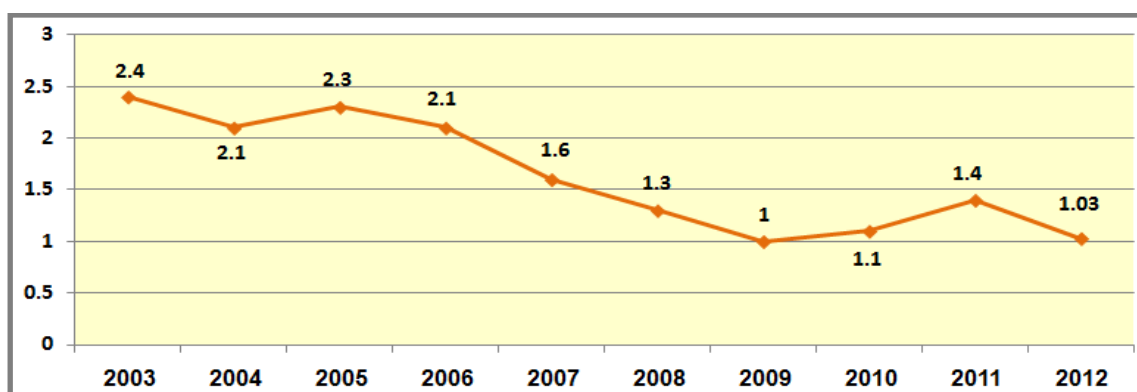
Type of vaccine	Vaccinated and registered	Total
<b>BCG</b>	Total vaccinated	57885
	Total registered population	58548
	Coverage	98.9%

Table 10 shows that a total of 57885 children were vaccinated with a total coverage with BCG vaccine of 98.9%.

During 2012, a total of 17 cases of tuberculosis were reported in Gaza strip with an incidence of 1.03 per 100.000 population. Among them 12 cases (70.6%) were pulmonary TB with an incidence of 0.73 per 100.000 population. The incidence of extra-pulmonary TB was 0.3 per 100.000 population. The incidence of TB was more among males (94%) with a male: female ratio of 16:1. The majority of pulmonary TB cases were smear positive (91.7%). About one half of cases (47%) were in Khan-Younes governorate followed by North governorate (23.5%).

Palestine is a low TB burden country with a low estimated incidence rate by WHO of 14 per 100,000 population. In 2012, the treatment success rate was high (94%), while the case detection rate was low (26%).

**Graph 25: Annual incidence rate per 100.000 of Tuberculosis in GS, years 2003-2012**



As seen in graph 25, the incidence rate of TB decreased dramatically from 2.4 per 100.000 in 2003 to 1 per 100.000 in 2009. This decrease of incidence could be explained by real decrease as Palestine considered as a low burden country or by under-diagnosis and under-reporting from health providers. Since 2009 till 2011, there was a mild increase of incidence (from 1 to 1.4 per 100.000 population). And during this year the incidence is around 1/100000 population.

### **Group C diseases**

Some of diseases of this group registered a mild increase of incidence (different types of diarrhea and amebiasis) and other diseases remain under expected trend (varicella, pneumonia, guardiasis and ascariasis).

### **Diarrheal diseases**

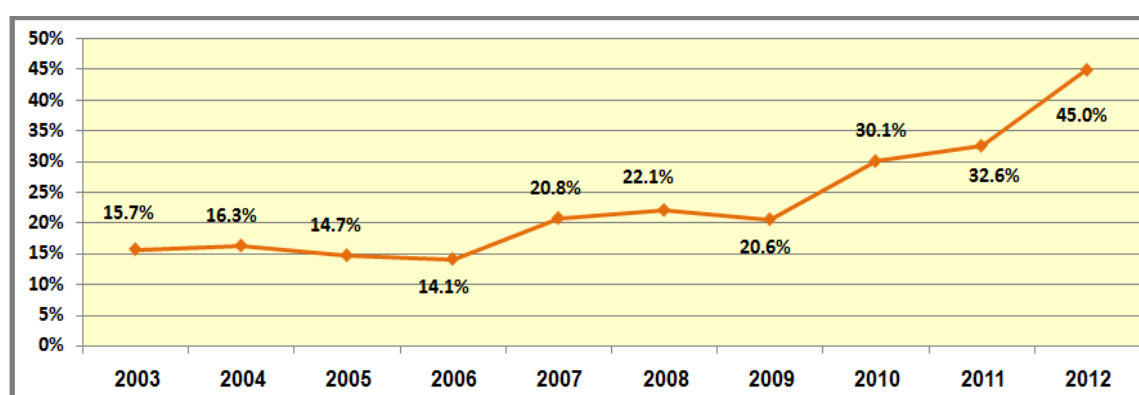
Diarrhea is a common problem that generally lasts for few days. In Gaza strip, acute diarrhea is one of the most common childhood illnesses and the main cause of outpatient visits and hospitalizations. Globally, the average of diarrhea among children under 3 years of age reaches one to three episodes annually and acute diarrhea accounts for almost 10% of all childhood hospital admissions. The high incidence of diarrheal disease in some governorates often linked to contaminated food, poor water quantity and quality and due to bad sanitation and hygiene. The most effective control measures to prevent diarrhea are maximizing access to sanitation, safe water, safe food supplies, and improving personal hygiene practices.

According to surveillance system classification, diarrhea is classified into diarrhea less than 3 years, diarrhea more than 3 years and bloody diarrhea.

### Diarrhea less than 3 years

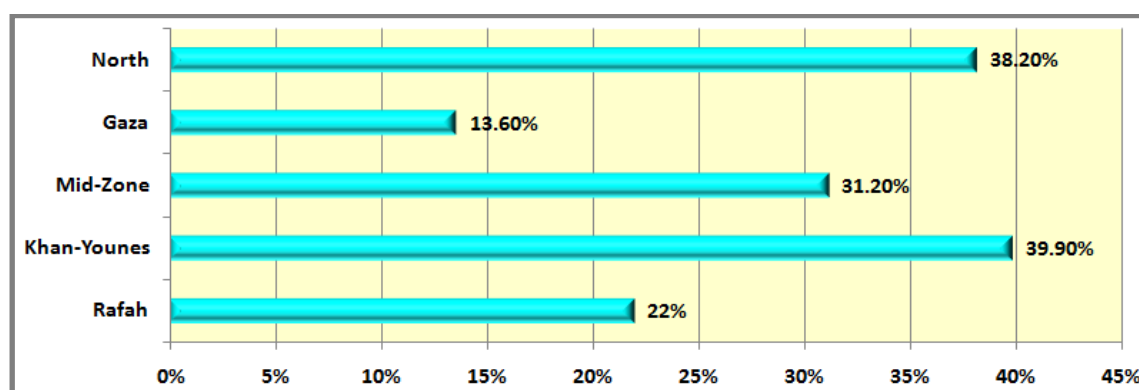
In Gaza strip, a total of 64830 cases of diarrhea among children less than three years old were reported in the year of 2012 with an incidence of 45%. Since the year of 2006, there are a continuous increase in incidence which could be due to deterioration of infrastructure (graph 26).

**Graph 26: Annual incidence rate of Diarrhea less than 3 years in GS, years 2003-2012**



As shown on graph 27, the highest incidence (39.9%) of reported cases was in Khan-Younes governorate followed by North governorate with an incidence of 38.2%.

**Graph 27: Geographical distribution of Diarrhea less than three years in GS, 2012**



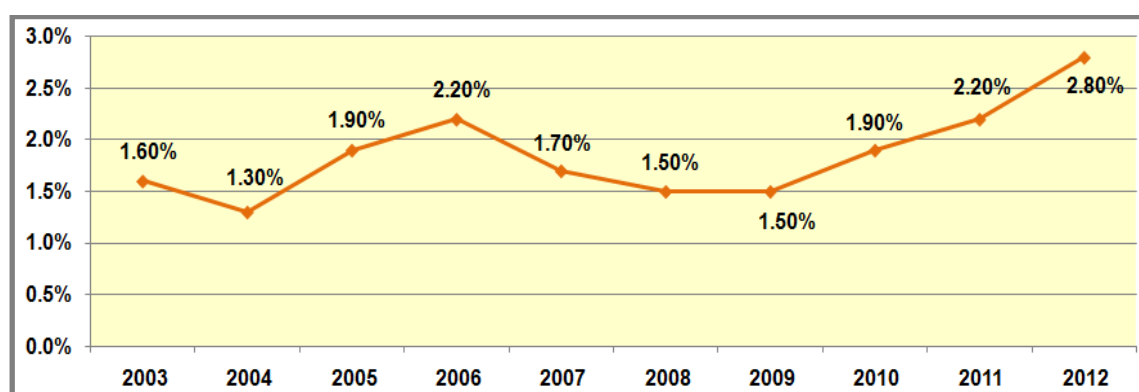
In 2011, a total of 51667 cases were reported with an incidence of 32.6%. The highest incidence (29.5%) of reported cases was in Khan-Younes governorate followed by Mid-Zone governorate with an incidence of 25%.



### Diarrhea more than 3 years

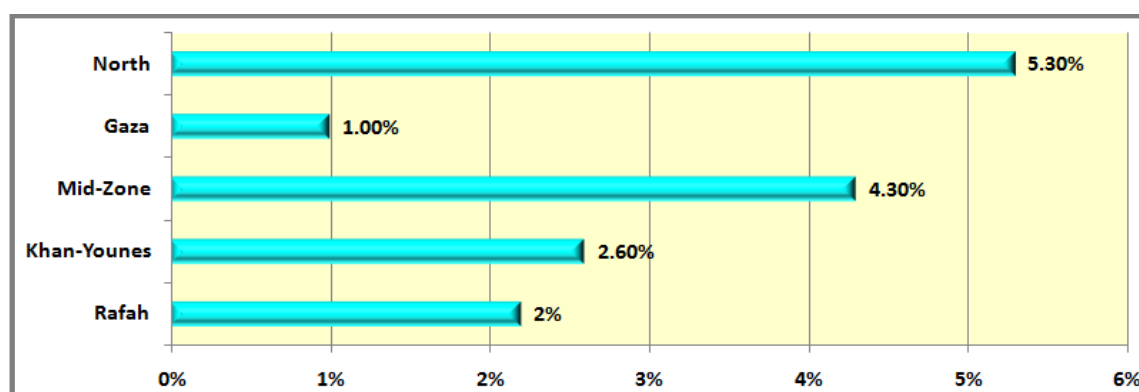
As seen on graph 28, there was a consecutive increase of the incidence rate of reported cases of diarrhea among children more than three years old since 2009. A total of 39390 cases were reported during 2012 with an incidence of 2.8% while in 2011 a total of 30037 cases were reported with an incidence rate of 2.2%.

**Graph 28: Annual incidence rate of Diarrhea more than 3 years in GS, years 2003-2012**



As shown on graph 29, the highest incidence (5.3%) of reported cases was in North governorate followed by Mid-Zone governorate with an incidence of 4.3%.

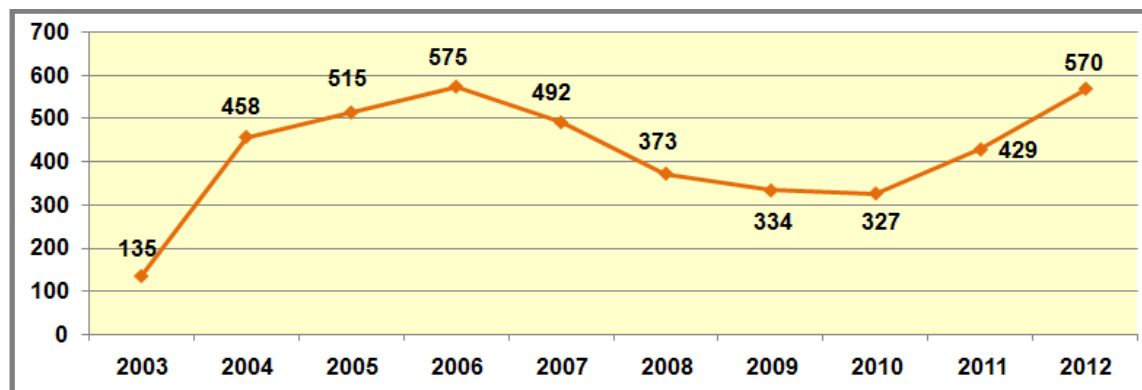
**Graph 29: Geographical distribution of Diarrhea more than three years in GS, 2012**



## Bloody Diarrhea

Bloody diarrhea is a potentially critical condition in which there is blood mixed with loose watery stools.

**Graph 30: Annual incidence of Bloody Diarrhea per 100.000 population in GS, years 2003-2012**



As seen on graph 30, there was an obvious increase of reported cases of bloody diarrhea in the year 2012 where a total of 9384 cases were reported with an incidence of 570/100.000. From the year 2006 to 2010, there were a continuous decrease of reported cases.

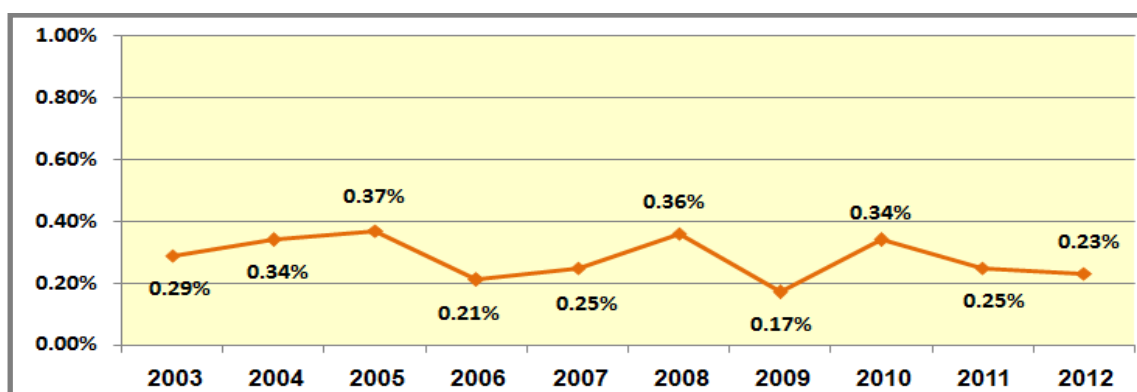
More than 34% of notified cases were reported in Mid-Zone governorate followed by North governorate were 33% of cases were reported. This distribution reflects the bad sanitation situation in these governorates.

In 2011, a total of 6826 cases were reported with an incidence of 429/100.000 population. More than 32% of cases were reported in Mid-Zone governorate followed by North governorate were 28% of cases were reported.

## Varicella (Chickenpox)

An illness caused by varicella-zoster virus. This disease is considered of low importance in Palestine and to be notified monthly.

**Graph 31: Annual incidence rate of Chicken Pox in GS, years 2003-2012**



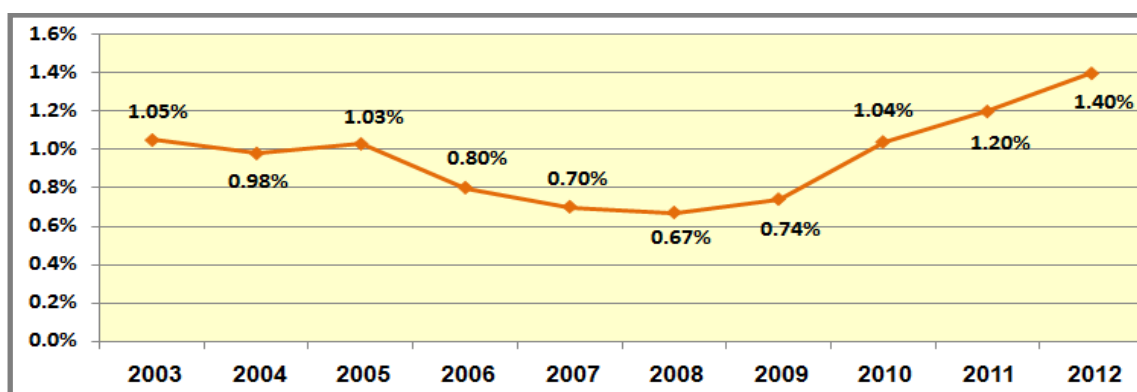
During 2012, a total of 3819 cases were reported with an incidence of 0.23%. As seen on graph 31, the annual incidence is fluctuating with some variation from year to year but this fluctuation does not have an epidemiological importance.

### **Conjunctivitis**

Conjunctivitis is an inflammation of the conjunctiva that can arise from a number of causes, with viral, bacterial and allergic being the commonest. Viral conjunctivitis is highly contagious and can cause epidemics in communities. Transmission is through direct or indirect contact with infected individuals. Seasonal allergic conjunctivitis occurs mainly in spring and summer. Conjunctivitis is an endemic disease in Palestine and to be notified monthly.

As seen on graph 32, it was observed that there was a gradually obvious increase of the incidence in the last five years from 0.67% in the year 2008 to 1.4% in the year 2012. The increased incidence was noticed mainly in Khan-Younes and North governorates due to improvement of notification.

**Graph 32: Annual incidence rate of Conjunctivitis in GS, years 2003-2012**

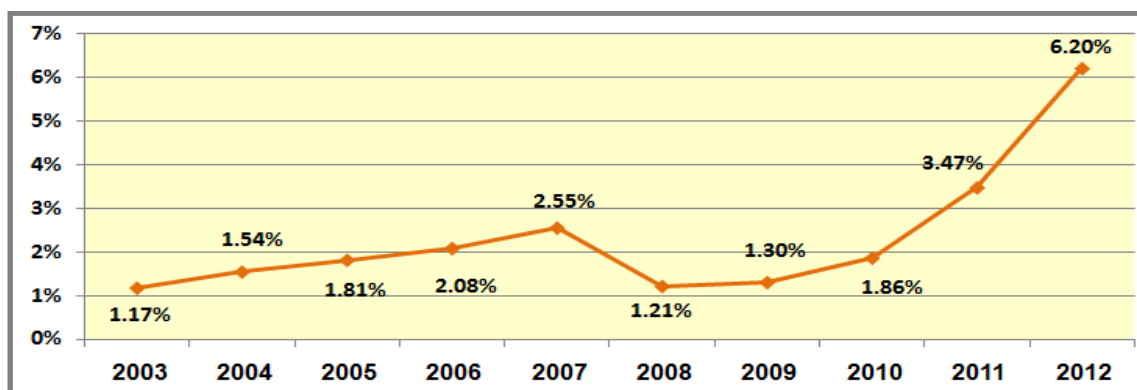


## **Influenza and URTI**

Influenza is a viral infection mainly caused by influenza group A viruses which is endemic in Palestine. It is diagnosed as a clinical syndrome. Seasonally Influenza vaccine is available in Palestine which is given to risky population.

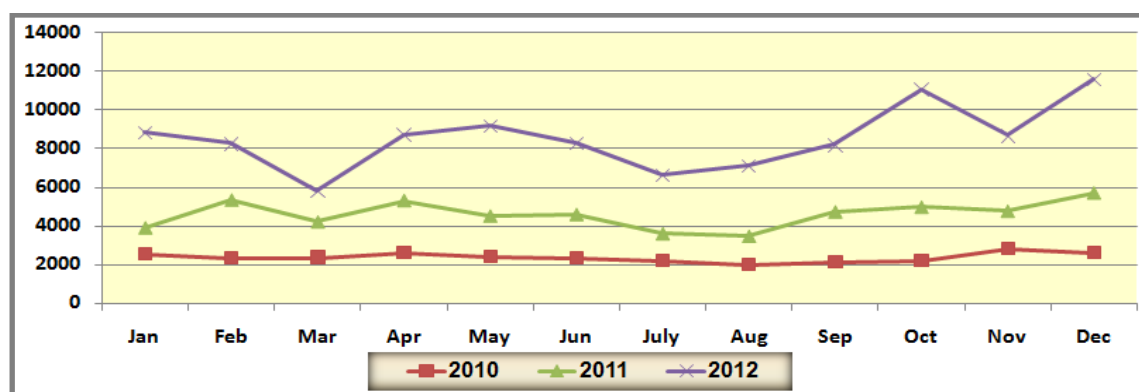
URTIs are the illnesses caused by an acute infection which involves the upper respiratory tract. URTIs are the commonest acute problem dealt with in primary care caused by viruses or bacteria. URTIs range from mild self-limited to life-threatening illnesses.

**Graph 33: Annual incidence rate of influenza and URTI in GS, years 2003-2012**



As seen on graph 33, the observed obvious increase in incidence since 2008 (1.21%) till 2010 (1.86%) could be attributed to the improvement of notification. During the year 2011, the incidence was increased to 3.47% and to 6.2% during 2012 because of the modification policy, that not only influenza like syndrome cases were notified on monthly bases but also all URTI cases under the name of URTI (graph 34).

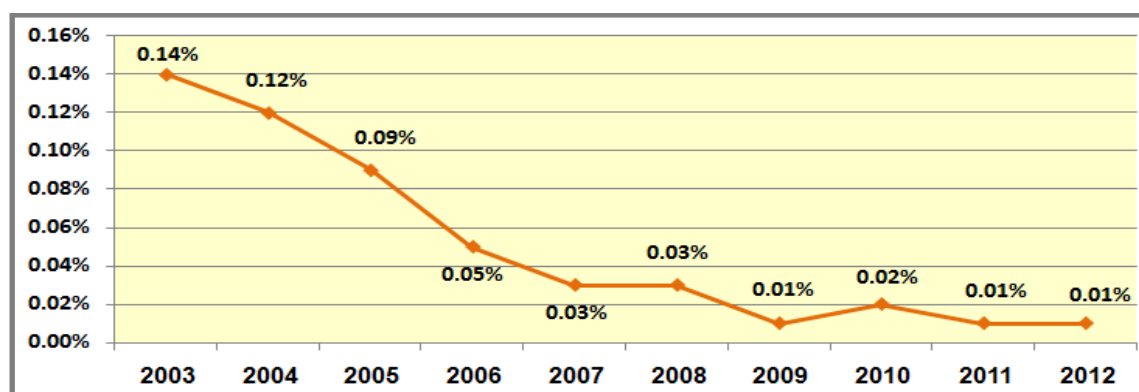
**Graph 34: Monthly reported cases of influenza and URTI in GS, years 2009-2012**



## Ascariasis

Ascariasis is a human disease known as soil-transmitted helminthes caused by *Ascaris lumbricoides* and *Ascaris suum*. Ascariasis is an endemic disease in Palestine.

**Graph 35: Annual incidence rate of ascariasis in GS, years 2003-2012**



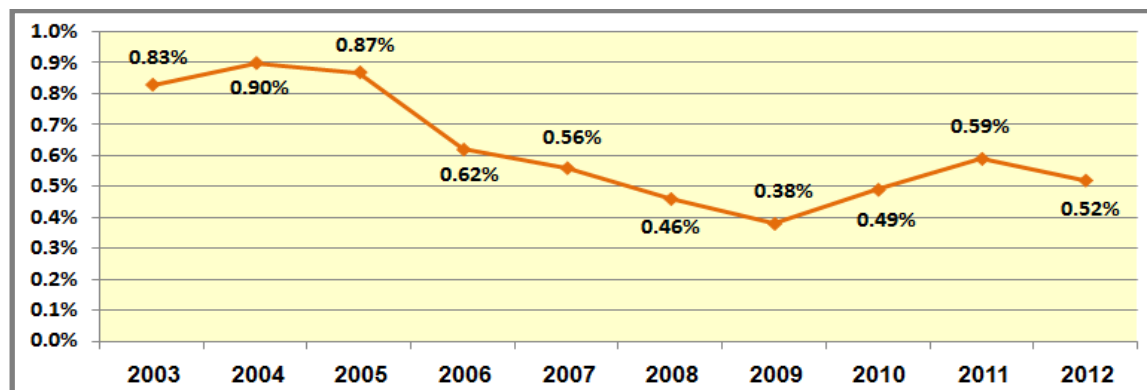
During the year of 2012, a total of 186 cases were reported with an incidence of 0.01%. As seen on graph 35, there are continuous decrease of reported incidence since the year 2003 till 2012. The reported incidence was 0.14% in 2003 declined to 0.01% in 2012.

## Amebiasis

Amebiasis is an infection of the intestine (but there are extra-intestinal forms) caused by a protozoa called *Entamoeba histolytica*. In Palestine, the disease is endemic and confirmed cases were reported from the laboratories.

During the year 2012, a total of 8582 cases were reported with an incidence of 0.52%. This incidence represents a decrease in comparison to the last year 2011 (0.59%) but shows an increase in comparison with the last previous years (0.38% in the year 2009 and 0.49 in the years 2010) and it shows a decreasing trend since 2003 (graph 36). This incidence represent only the laboratory confirmed cases and could not reflect the real situation because the disease is treated empirically.

**Graph 36: Annual incidence rate of Amebiasis in GS, years 2003-2012**

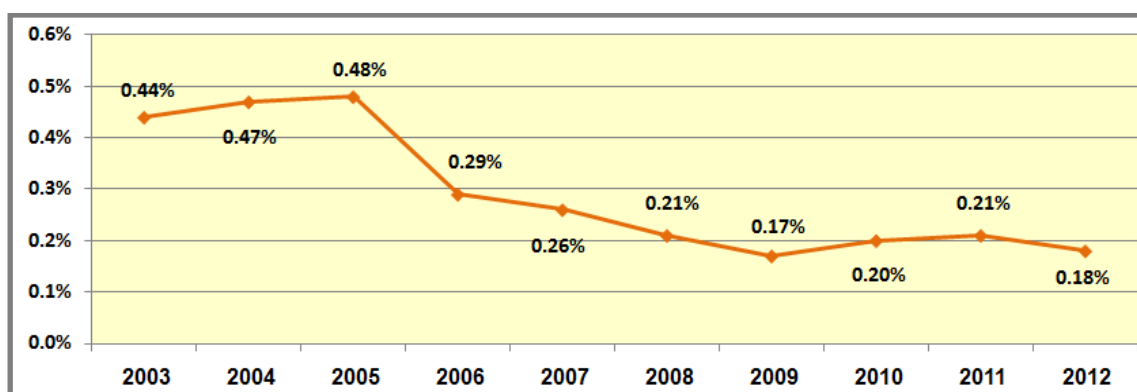


## Giardiasis

Giardiasis is an infection of the small intestine caused by a protozoa called *Giardia lamblia* which lives in the duodenum and jejunum. In Palestine, the disease is endemic and confirmed cases were reported from the laboratories.

During the year 2012, a total of 2977 cases were reported with an incidence of 0.18%. This incidence represents a mild decrease in comparison with the last year 2011 where the incidence was 0.21% and it shows a decreasing trend since 2003 (graph 37). As a part of diarrheal diseases, this increase could be due to poor infrastructure. This incidence represent only the laboratory confirmed cases and could not reflect the real situation because the disease is treated empirically.

**Graph 37: Annual incidence rate of Giardiasis in GS, years 2003-2012**



Other diseases including parasitic infestation were registered during 2012 with low incidence and low epidemiological importance.

## Annexes

### Annex 1: Distribution of reported cases by governorates, 2012

	North Gaza	Gaza	Mid-Zone	Khan-Younes	Rafah	Total		
						2012	2011	2010
Group A								
AFP	0	5	1	3	0	9	6	4
AIDS/HIV	0	0	0	1	0	1	5	0
Cholera	0	0	0	0	0	0	0	0
Diphtheria	0	0	0	0	0	0	0	0
Measles	0	0	0	0	0	0	0	0
Meningococcal Disease	15	38	15	16	19	103	151	104
HI Meningitis	0	1	0	0	0	1	3	0
Bacterial Meningitis	113	304	14	62	0	493	343	169
Non Spesific Meningitis	59	790	590	14	0	1453	799	643
Vaccin Adverse Events	0	2	1	0	1	4	10	13
Food poisoning	92	0	0	0	0	92	10	105
Influenzae H1N1	0	0	0	0	0	0	33	36
Group B								
Brusellosis	4	0	0	0	3	7	13	8
hepatitis A	277	209	161	240	123	1010	423	319
Hepatitis B	116	112	24	47	55	354	375	407
Hepatitis C	37	12	1	10	11	71	71	64
Malaria	0	0	0	0	0	0	0	0
Mumps	19	13	3	21	4	60	91	89
Rubella	0	0	0	0	0	0	0	0
Salmonellosis	1	1	0	0	0	2	17	4
Septiceamia	194	286	3	0	0	483	350	333
Shigellosis	0	9	0	0	0	9	17	30
TB Pulmonary	1	2	0	7	0	12	13	7
TB Extrapulmonary	3	1	0	0	2	4	10	10
Typhoid Fever	22	7	0	136	0	166	169	249
Typhus Fever (ox19)	6	20	0	202	1	228	185	415
Whooping Cough	0	0	0	0	0	0	0	0
Chemical Poisoning	0	0	0	64	0	64	133	141
Group C								
Animal Bite	69	59	31	51	43	253	330	388
Chicken Box	750	389	872	1663	145	3819	4030	5220
Conjunctivitis	6847	3695	4486	7477	795	23300	19253	16032
Diarrhea <3 years	17973	11306	10883	18104	6564	64830	51667	45259
Diarrhea >3 years	14587	5152	8705	7013	3935	39392	30037	24501
Bloody Diarrhea	3127	943	3219	1560	535	9384	6826	5018
Influenzae	48131	14412	15736	16478	7529	102286	55098	28488
Pediculosis	0	0	0	0	0	0	0	0
Pneumonia	4382	3379	974	935	88	9758	6158	4582
Scabies	0	0	271	0	0	271	0	31



Laboratory								
Ascaris	76	56	33	6	15	186	192	232
Hymen. Nana	13	26	10	3	11	63	86	65
Tricuris Trich.	1	0	17	0	4	22	13	12
Entrobiasis	7	8	5	3	8	31	83	57
Strongoloid	2	0	0	0	1	3	7	8
Entam.His	1286	4347	662	1121	1166	8582	9445	7514
Giardia lambia	590	1106	236	288	757	2977	3311	3050
Screening								
HBsAg test	3049	23725	2856	14271	2911	46812	48695	45954
HBsAg test +ve	56	528	54	305	67	1010	1294	1178
HCV test	2861	21815	2720	13103	2693	43192	40100	41961
HCV test +ve	30	280	10	79	11	410	335	349
HIV test	1854	20071	2122	11929	1930	37906	40538	40643
HIV test +ve	0	0	0	0	0	0	0	0

## Annex 2: Weekly Epidemiological situation of Meningeococcal Disease in Gaza Strip, 2009-2012

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	Total	
Total 2009	1	1	0	1	4	3	2	4	2	3	4	6	5	2	3	3	1	3	1	0	0	0	4	2	5	5	5	0	2	3	2	4	4	1	4	1	4	4	3	1	2	2	6	5	0	2	5	2	1	3	2	0	133	
Total 2010	2	0	0	3	2	3	3	3	2	4	1	1	0	0	2	3	2	4	0	1	2	1	3	4	7	3	3	2	2	0	0	0	0	3	4	1	1	2	2	1	2	4	1	4	1	2	1	3	2	1	5	0	103	
Total 2011	3	3	6	3	0	2	2	3	2	0	2	2	6	4	1	2	2	4	6	0	1	2	1	1	4	1	5	1	4	8	4	8	2	3	3	5	9	1	1	1	0	3	1	3	6	4	2	3	3	2	2	4	151	
Total 2012	2	7	4	4	1	2	3	2	2	7	2	4	1	0	2	3	0	1	5	0	1	1	0	2	0	1	1	1	1	1	1	3	5	2	1	5	3	2	2	4	0	1	2	2	1	3	2	0	3	1	0	0	0	103

### Annex 3: Blood screening in Gaza strip, 2012-2011

Blood screening in Gaza Strip, 2012-2011												
	HBsAg				HCV				HIV			
	Blood Bank		Laboratory		Blood Bank		Laboratory		Blood Bank		laboratory	
	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011
<b>Total Number Of Examined Samples</b>	31709	30127	19913	22494	31709	30127	16360	14226	31709	30127	12626	15389
<b>Number of +ve sample</b>	472	453	614	652	102	65	329	263	0	0	1	5
<b>% of +ve samples</b>	1.48%	1.5%	3.08%	2.9%	0.32%	0.22%	1.2%	1.8%	0%	0%	0%	0.03%

For more information, contact:

Epidemiology Department  
Al-Rimal Martyrs Clinic  
AlWehdast.  
Palestine-Gaza  
Telefax: 00 972 8 2837550

E-mail: [epidept-phc@moh.gov.ps](mailto:epidept-phc@moh.gov.ps)