

Causes of Children Death in Emergency Room at Al-Sabin Hospital _Sana'a

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Abstract: Information about the distribution of causes of child mortality should be periodically updated because the causes can be different from time to another. We report the latest estimates of causes of child mortality in 2012. The main objective of this study is to determine the main causes of death in pediatric emergency room and evaluate of pediatric emergency room at Al-Sabin hospital- Sana'a. Yemen.

Methods: A retrospective study of 300 children aged 0-15 years, who died in the hospital within a 2 months period. This study was carried out at emergency pediatric room at Al-Sabin hospital- Sana'a Yemen, between July 2012 and August 2012. Children who were admitted to the pediatric emergency room and died in it were included in this study. Data were collected from patient's files, hospital register and death certificate to ascertain the cause of death and their percentage.

Results: Out of 300 admissions to the pediatric emergency room, 185 (61.7%) were males and 115 (38.3%) were females (Mean is (1.3) and standard deviation is (0.48) .there were 49 children deaths (16.3%). Deaths were higher among those <5 years of age. The most common causes of deaths in the pediatric emergency room were chest infections (5.3%) followed by malnutrition (3.7%), dehydration (3.7%), unknown causes (1.0%), complicated cases (1.0%), gastroenteritis (0.7%), family uncared (0.7%) and E.R uncared 0.3%.

Conclusions: Child survival strategies should direct resources toward the leading causes of child mortality, with attention focusing on infectious causes. We will need accelerated reduction for the most common causes of death, notably pneumonia and malnutrition complications. Continued efforts to gather high-quality data and enhance estimation methods are essential for the improvement of future estimates.

The percentage of deaths on admission among children is more than it was previously,. The majority of the causes of death is chest infection and it should be preventable. Efforts to further reduce the mortality should be directed at prevention and early treatment

Keywords: child mortality, Child survival strategies, complicated cases.

1. INTRODUCTION

The emergency department of the most important sections in the hospitals, which can receive different situations ranging from the serious infectious to non-serious cases

Where the study of the United Nations "Children's" The infant mortality up to (102) death of the (1000) live births in Yemen, pointing out that this ratio makes Yemen ranked (46) of the (129) State-infested .The phenomenon of the death of infants under the age of five in the world.

The study - prepared by the Organization, "UNICEF" to study the situation of children in the world in 2007: Yemen is the third country in the Arab world after Somalia and Iraq suffer from high rates of infant mortality, and that the rate of (225 125 102) deaths from all (1000) live births.

The recently released United Nations Children's Fund (UNICEF) in its newly released half of the world, including Yemen, do not achieve sufficient progress towards the fourth goal of the Millennium Development Goals, which aims to reduce the general mortality rate for children under the age of five by two thirds during the period from 1990 to 2015.

The report is Yemen in rank 41 in terms of mortality rate of children under the age of five and up to 100 deaths per 1000 live births, while the mortality rate of babies under the age of one year to 75 per thousand.

It should be noted that about 84,000 children under the age of five die each year in Yemen, which is equivalent to 250 children a day.

And UNICEF issued a report annually on the status of children in the world, a report issued this year in January 22 under the title of "survival of the children alive".

Background:

The death of a child under any circumstances is tragic and devastating. It changes the lives of all those involved who grieve for a life that has ended prematurely. In the immediate aftermath of death there is a great deal of confusion and disbelief. Parents are left struggling with over whelming emotions and searching for explanations for such a tragedy. Because it is so charged with emotion, this is a time when the skill of caring professionals in the emergency department (ED) can make a difference. This technical report provides support for professionals when they are faced with the difficult task of performing professionally and with compassion at the time of the death of a child.

Children who die and their families are a diverse group. No single policy, plan, or approach can address all the situations and circumstances of death. However, based on the fact that injury is the leading cause of death in children, it is inevitable that many deaths will involve emergency medical services (EMS) systems. An analysis of 1997 national mortality data showed that 16% of deaths in children <19 years old occurred in outpatient hospital sites, primarily the ED, and another 5% were declared dead on arrival at a hospital.¹ The frequently sudden, unexpected nature of a child's death in the ED is an important confounding factor, because even the relatively brief nature of the family's interaction with health care providers can have a profound and enduring impact.

The leading causes of death in children:-

- 1) Cardiac death Although pediatric cardiomyopathy is one of the leading causes of cardiac death in children, an explanation for why it occurs remains unknown.
- 2) SIDS frequency United States In 2004, 2,246 deaths were certified as sudden infant death syndrome (SIDS), accounting for 8% of infant deaths. Approximately 60-70% of SIDS deaths occur in males. Approximately 80% of SIDS deaths occur in infants younger than 5 months, with a peak incidence in infants aged 2-4 months. Only 1% of deaths occur in neonates. The remainder of deaths are noted after the sixth month of life.
- 3) Immunologic disease (i.e. HIV).
- 4) Obesity or dietary deficiencies.

Other causes:-

- 1) the potential risk for side effects that outweighs the potential benefits.”
- 2) Despite high coverage for childhood vaccination, pertussis causes substantial morbidity and mortality in US children, Especially among infants.
- 3) Tylenol No. 3 Risk
Up to 19,000 babies born every year in Canada could be at risk from breastfeeding if their mothers use Tylenol No.3 to manage post-delivery pain.
- 4) Maternal infection with herpes simplex is serious and potentially life-threatening to infants.
- 5) Mortality rates from child abuse are highest in infancy and are often due to abusive head trauma.
- 6) Emergency Department Overcrowding and Outcomes of Children with Sepsis
- 7) Complication of un treated illness as for pertussis , this was a retrospective case-control study of hospitalized infants 0-6 months old with confirmed pertussis from 2005 to 2009.
- 8) Skin and soft tissue infections are a common reason that children present to the emergency department.
- 9) The most common ED diagnoses were fever, upper respiratory infection, asthma, otitis media, and viral syndromes

The information on pediatric condition in Yemen is scarce and has not been reported before. The objective of this study was to determine the main causes of death in pediatric emergency room at al-Sabin hospital – Sana'a over two months period.

2. LITERATURE REVIEW

2.1. Importance of emergency room:

The emergency department is the most important sections in the hospitals, which can receive different situations ranging from the serious infectious to non-serious cases. Where the study of the United Nations "Children's" The infant mortality up to (102) death of the (1000) live births in Yemen, pointing out that this ratio makes Yemen ranked (46) of the (129) State-infested. The phenomenon of the death of infants under the age of five in the world.

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2.2 Child mortality:

Child mortality, also known as under-5 mortality, refers to the death of infants and children under the age of five. In 2011, 6.9 million children under five died. down from 7.6 million in 2010, 8.1 million in 2009. and 12.4 million in 1990. About half of child deaths occur in Sub-Saharan Africa. Reduction of child mortality is the fourth of the United Nations' Millennium Development Goals.

Child Mortality Rate is the highest in low-income countries, such as most countries in Sub-Saharan Africa. A child's death is emotionally and physically damaging for the mourning parents. Many deaths in the third world go unnoticed since many poor families cannot afford to register their babies in the government registry.

The under-5 mortality rate is the number of children who die by the age of five, per thousand live births per year. In 2011, the world average was 51 (5.1%), down from 87 (8.7%) in 1990. The average was 7 in developed countries and 57 developing countries, including 109 in sub-Saharan Africa. Likewise, there are disparities between wealthy and poor households in developing countries. According to a Save the Children paper, children from the poorest households in India are three times more likely to die before their fifth birthday than those from the richest households.[10] However, there are also limitations in calculating an accurate rate in developing countries, especially in rural areas. An ethnographic study in Pac tuba, Brazil, found that the under-5 mortality rate only accounted for 44.4% of the actual deaths that occurred in the community. High travel costs, lost labor, and a withdrawal of socio-economic benefits are factors as to why deaths may not be reported to government vital statistics agencies within a country.

Highest rates in the world In 2009, there were 31 countries reported in which at least 10% of children under five died. All were in Africa, except for Afghanistan.

A child's risk of dying is highest in the neonatal period, the first 28 days of life. Safe childbirth and effective neonatal care are essential to prevent these deaths. 43% of child deaths under the age of five take place during the neonatal period.

Preterm birth, intrapartum-related complications (birth asphyxia or lack of breathing at birth), and infections cause most neonatal deaths. From the end of the neonatal period and through the first five years of life, the main causes of death are pneumonia, diarrhea and malaria. Malnutrition is the underlying contributing factor in over one third of all child deaths, making children more vulnerable to severe diseases.

Overall, substantial progress has been made towards achieving Millennium Development Goal (MDG). Since 1990 the global under-five mortality rate has dropped from 87 deaths per 1 000 live births in 1990 to 51 in 2011. But the rate of this reduction in under-five mortality is still insufficient to reach the MDG target of a two-thirds reduction of 1990 mortality levels by the year 2015.

2.3 Clinical causes of death:

All countries need sound epidemiological information to priorities plan, and implement public health interventions. Vital event registration that includes cause of death data is used to establish the cause structure of mortality in high-income and some middle-income countries, but these are generally not available for the countries where 90% of child deaths take place. Of these countries, only Mexico records more than 95% of causes of death [27]. Where coverage is incomplete, the poorer segments of the population, which have higher mortality and might have different causes of death, are often underrepresented. 28 India and China have attempted to establish sample registration systems, but it is not yet clear whether they are truly representative and correctly classify causes of child deaths. Classification of cause of death in vital registration systems is difficult when large proportions of child deaths are not medically attended, and interviews with family members are needed to establish the cause of death [44].

Alternatives to the reporting of vital events are use of data from nationally-representative surveys and special study populations. With these, ascertainment of death is usually very complete and post-mortem interviews with family members are used to establish causes of death.

Although post-mortem interviews have only moderate sensitivity or specificity for some diagnoses, standard methods for data collection and analysis can improve diagnostic accuracy and comparability.

2.4 Neonatal disorders:

Of the 10.8 million deaths worldwide of children younger than 5 years, 3.9 million occur in the first 28 days of life, the neonatal period. The proportion of deaths that occur in this age interval varies systematically according to the overall rate of mortality. For example, our analysis of results from 44 demographic and health surveys 30 showed that in populations with the highest child mortality rates, just over 20% of all child deaths occurred in the neonatal period, but in countries with mortality rates lower than 35 per 1000 live births more than 50% of child deaths were in neonates. Regression of the proportion of deaths in the neonatal period on the proportion of child deaths due to AIDS in that country showed a strong association. We used a combination of the natural logarithm of the rate of deaths in children younger than 5 years and the proportion of such deaths attributable to AIDS to predict the proportion of deaths in the neonatal period ($r^2=0.76$). Predicted deaths were deducted from the neonatal-plus-other category of deaths.

There is a paucity of information about the direct causes of neonatal deaths in low-income communities, but it has been estimated that 24% are caused by severe infections, 29% by birth asphyxia, 24% by complications of prematurity, and 7% by tetanus.

2.5 Distribution of causes of death globally:

Past studies used a prediction model to estimate the distribution of deaths in children younger than 5 years by cause for the 42 countries with 90% of all such deaths in 2000.³² Estimates and uncertainty bounds were: 22% of deaths attributed to diarrhea (14–30%), 21% to pneumonia (14–24%), 9% to malaria (6–13%), 1% to measles (1–9%), 3% to AIDS, 33% to neonatal causes (29–36%), 9% to other causes, and fewer than 1% to unknown causes. No uncertainty bounds are available for the AIDS estimate because the model did not produce these data (country-level estimates from UNAIDS were used). also shows the fraction of deaths attributed to various causes in which the underlying cause was being underweight. Underlying causes of death WHO's work on the global burden of disease, consistent with the International Classification of Diseases (ICD) stipulates one cause of death, which is considered to be the "disease or injury which initiated the train of morbid events leading directly to death".

This measure ensures that the sum of deaths from all possible causes will not exceed the total number of child deaths. However, such a classification oversimplifies the situation in low-income and middle-income countries where serious illnesses commonly occur sequentially or concurrently before death.

Measles is often complicated by pneumonia or diarrhea. In studies in Bangladesh, the Philippines, and Uganda it was noted that in children with an illness serious enough to require admission to hospital, 50–79% of measles cases were followed by pneumonia or diarrhea, which were the reasons for admission. Decreases in the immune and non-immune

host defenses as a consequence of measles lead to a high rate of these subsequent infectious diseases, and also to a higher case fatality rate when they do occur. Likewise, children with AIDS have increased susceptibility to diarrhea, pneumonia, tuberculosis, and other infections. These diseases also have a higher case fatality rate in people with AIDS compared with those without AIDS. In these examples, measles or AIDS would be judged by ICD rules to be the underlying cause of death and subsequent infections would be associated causes of death. Underweight status (one SD or more below the weight expected for that age in an international reference population) and micronutrient deficiencies also cause decreases in immune and non-immune host defenses, and should be classified as underlying causes of death if followed by infectious diseases that are the terminal associated causes. An analysis of ten longitudinal community-based studies of children younger than 5 years showed that being underweight conferred an additional risk of mortality from infectious diseases. The fraction of disease attributable to being underweight was 61% for diarrhea, 57% for malaria, 53% for pneumonia, 45% for measles, and 53% for other infectious diseases. Fetal malnutrition, manifested in low birth weight, might contribute in a similar way to neonatal mortality [24]

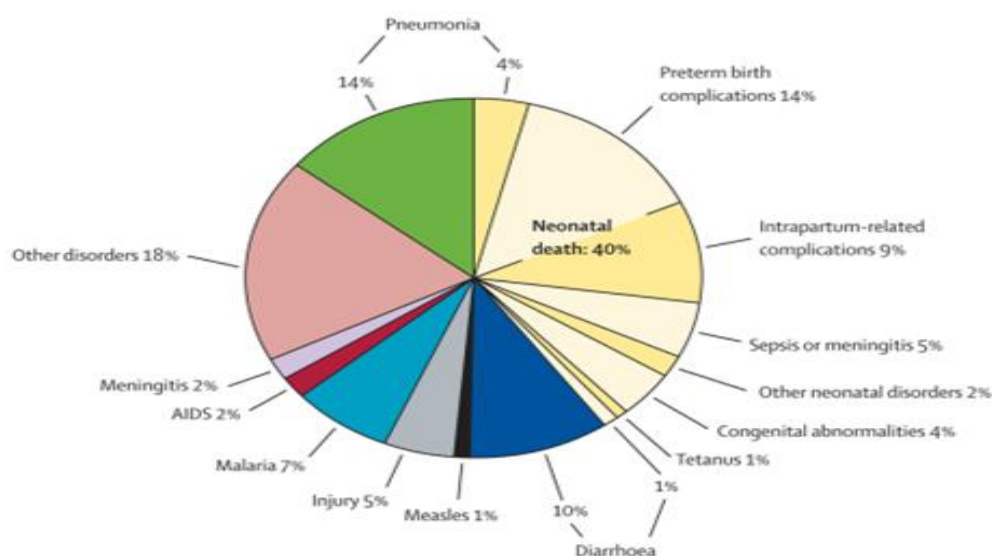
According to UNICEF. Most child deaths (and 70% in developing countries). Result from one the following five causes or a combination there of :

- Acute respiratory infections –
- Diarrhea -
- Measles -
- Malaria –
- Malnutrition -

2.6 Leading causes of death in children under five in the world – 2011:

The following table and figure showed the common causes of children death and their percentage.

THE CAUSES	PERCENTAGE
Pneumonia	%18
Preterm birth complication	%14
Diarrhea	%11
Birth asphyxia	%9
Malaria	%7
Other causes	%41



New Global Causes of Child Mortality Data Released in Lancet, May 2012.

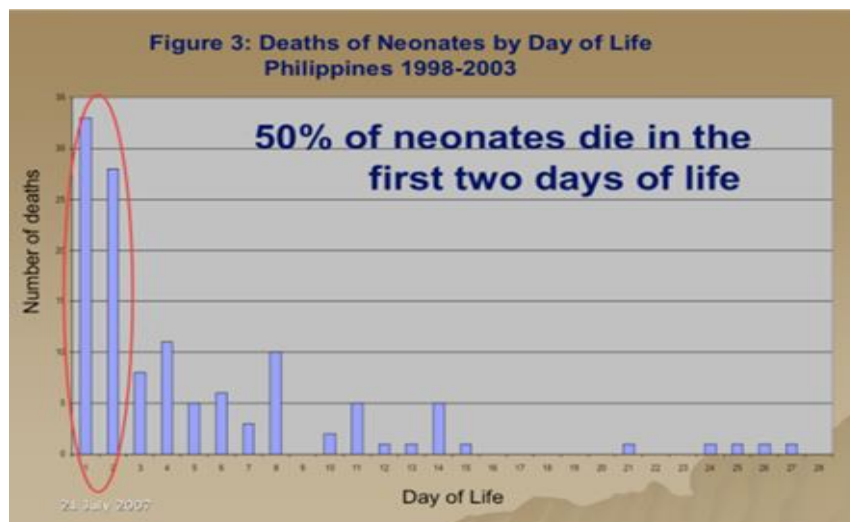
(Reference: Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. (2012) The Lancet, Early Online Publication, 11 May 2012 doi:10.1016/S0140-6736(12)60560-1)

2.7 NEONATAL MORTALITY HIGHEST CONTRIBUTOR TO CHILD MORTALITY:

The majority of mortality is being contributed by the newly born population. Perinatal mortality has been defined as mortality of either of the mother-infant dyad during the perinatal period, which is defined as the period from 20th week of gestation to seven days after birth. Infants dying in their first week of life then highly speaks of the quality of prenatal care their mothers received. On the other hand, infant deaths occurring between seventh to the 30th day reflects the quality of infant care and may not necessarily a sequel of prenatal care.

A good question to ask is, when do these neonates die? In a data review of the deaths of neonates by day locally, it showed that most infants do not survive more than 48 hours, with a declining incidence towards the end of neonatal period. This first 48 hours of life still coincides with the perinatal period, which then clearly underscores the fact that majority of our mothers are not receiving optimum and adequate prenatal care thus leading to their demise.

There has been increasing preterm birth in the last few years, and preterm birth complications have contributed significantly to mortality burden among children before their fifth birthday. Locally, pregnancies are terminated prematurely because of urogenital infection (triggering preterm labor), uncontrolled maternal hypertensive disorders, abnormal bleeding (placenta previa, abruptio placenta). Having adequate access to mother-child care providers will significantly improve this saddening statistics. The PhilHealth recently reported that out of the 1400 plus cities and municipalities, only 607 cities and municipalities have mother-child care facilities; Less than 50%.



Deaths of Neonates by Days, Philippines 1998-2003. (MA Silvestre, 2009).

2.8 PNEUMONIA, SECOND HIGHEST CONTRIBUTOR TO CHILD’S MORTALITY:

The peak incidence of mortality from pneumonia is the first six months of life. Pneumonia is a vaccine-preventable disease. There are currently two conjugated and one polysaccharide pneumococcal vaccines available in the market. Of these, it’s the conjugated vaccines that can protect the infant from pneumococcal death during the first six months of life, as the polysaccharide vaccine can only be administered when the child is at least 2 years of age. Unfortunately, the conjugated pneumococcal vaccine is not available in health centers due to its high cost. Majority of the population that flock to the government vaccination centers, who cannot avail of the said vaccine, are therefore vulnerable to succumb to this disease. The newly born infant’s immune system is inexperienced, thus any infection immediately at birth may lead to infant’s death. During pregnancy, whatever antibodies the mother has through vaccination or active infection are shared to the fetus through the placenta. (Problem lies when the mother never had infection nor vaccination, there would be nil to share). These antibodies may be the only armamentarium the infant has, however do not confer absolute protection after birth, and wanes by around six months of life. However, mother also continues to provide additional antibodies to the baby after birth during breastfeeding; a process cow milk formula can and will never duplicate.

A person has two manners of acquiring antibodies – active: by producing during vaccination or active infection; and passive: through infusion of already formed antibodies during pregnancy, breastfeeding and infusion of immunoglobulin concentrate. Vaccination is a process whereby a weakened antigen (whether the organism itself or its by-product) is introduced to the individual in an attempt to trigger his immune system to produce antibodies against the offending

organism, but the antigen is not strong enough to cause infection or disease by itself. Pneumococcal vaccination should then be accomplished during the infant's first six months of life to preclude this peak incidence of death from pneumonia during this period.

What has been noticeable though, according to the article, was the mention of how breastfeeding is playing a crucial role in the survival of these infants.

2.9 Causes of child mortality for the year 2010:

2.9.1 Situation:

Globally, the four major killers of children under age five were pneumonia (18%), prematurity (16%: 14% during the neonatal period and 2% in the post-neonatal period), diarrheal diseases (11%), and birth asphyxia (10%: 9% during the neonatal period and 1% in the post-neonatal period). Malaria was still a major killer in Sub-Saharan Africa, causing about 15 percent of under-five deaths in the region.

Of the total 7.6 million children who died before 5 years of age, 4.4 million (58%) died of infectious diseases. Of all infections, pneumonia (1.4 million), diarrhea (800 000) and malaria (563 000) were the leading causes of death, accounting together for 36% of all under-five deaths worldwide. The majority of these deaths can be prevented by known, simple, affordable and low cost interventions such as exclusive breastfeeding up to 6 months of age, immunization, appropriate use of antibiotics, oral rehydration therapy and zinc, insecticide treated bed nets, and anti-malarial.

About 40% of deaths in children younger than 5 years occurred before 28 days of life – the neonatal period. The most important cause of death was preterm birth complications. Birth asphyxia and sepsis were the second and third major causes of death in this early period of life, responsible together for 1.2 million deaths. The risk of dying from these conditions can be mitigated with quality care during pregnancy, safe and clean delivery by a skilled attendant, and immediate postnatal care, including neonatal resuscitation, extra care of low birth weight babies, attention to baby warmth, treatment of neonatal sepsis and early initiation of breastfeeding.

2.9.2 Distribution:

Patterns of the distribution of causes of child deaths vary widely between regions. The lowest proportion of neonatal deaths (30%) occurred in the African Region. On the other hand 96% of all under-five deaths due to malaria and 89% of all deaths due to HIV/AIDS worldwide happened in the African Region. In the remaining five WHO regions, high proportions of under-five child deaths occurred during the neonatal period, ranging from 42% in the Eastern Mediterranean Region to 54% in the Western Pacific Region. The proportion of deaths from pneumonia is lowest in the Americas and Europe. Deaths due to diarrheal diseases were responsible for only 4% of deaths in these same regions.

2.9.3 Trends:

The number of under-five deaths worldwide dropped from 12 million in 1990 to 9.6 million in the year 2000 to 7.6 in 2010. Nearly 60% of the 2 million lives saved in the past decade were due to reductions of deaths caused by pneumonia (455 000 fewer deaths), measles (363 000 fewer deaths), and diarrhea (361 000 fewer deaths). India, Nigeria, Democratic Republic of the Congo, Pakistan, and China contributed to half the mortality attributable to infections and more than half due to neonatal causes worldwide.

2.10 Comparison with WHO estimates:

Estimates of mortality rates in children younger than 5 years in 2000 by cause are published on the WHO website. and are being revised. Estimates available at the time of writing attribute 13% of deaths to diarrhea, 19% to pneumonia, 9% to malaria, 5% to measles, 3% to AIDS, 42% to neonatal causes (birth asphyxia, low birth weight, and disorders arising in the perinatal period), and 9% to miscellaneous other causes, including non-communicable diseases and injury. Uncertainty bounds for the WHO estimates are not available. Our estimates are not comparable with those of WHO, because WHO's estimates include all WHO member states rather than only 42 countries. Nevertheless, both sets of estimates are generally consistent.

2.11 Risk factors for child mortality:

Unhygienic and unsafe environments place children at risk of death.^{2,12} Ingestion of unsafe water, inadequate availability of water for hygiene, and lack of access to sanitation contribute to about 1.5 million child deaths an around 88% of deaths

from diarrhea. Other health related behaviors, such as birth spacing, are also important risk factors for child mortality. Infants aged 0–5 months who are not breastfed have seven-fold and five-fold increased risks of death from diarrhea and pneumonia, respectively, compared with infants who are exclusively breastfed. At the same age, non-exclusive rather than exclusive breastfeeding results in more than two-fold increased risks of dying from diarrhea or pneumonia, at 6–11-month-old infants who are not breastfed also have an increased risk of such deaths. Relative risks for mortality in children younger than 5 years derived from the ten studies assessed have been used to estimate that 53% of all child deaths could be attributed to being underweight. Of these, 35% of all child deaths are due to the effect of underweight status on diarrhea, pneumonia, measles, and malaria and relative risks of low maternal body-mass index for fetal growth retardation and its risks for selected neonatal causes of deaths. In children with vitamin A deficiency, the risk of dying from diarrhea, measles, and malaria is increased by 20–24%. Likewise, zinc deficiency increases the risk of mortality from diarrhea, pneumonia, and malaria by 13–21%. The fraction of these infectious-disease deaths that are attributable to nutritional deficiencies varies with the prevalence of deficiencies; the highest attributable fractions are in sub-Saharan Africa, south Asia, and Andean Latin America. Correct classification of under nutrition and vitamin A and zinc deficiencies as underlying causes of death will permit a true estimate of the importance of these conditions and recognition that interventions can target both the nutritional condition and the resulting terminal infectious diseases.

Child deaths are commonly the result of several risk factors. In the future, the joint effects of two or more risk factors on each underlying or associated cause of death should be estimated together. Thus, the total effect of interventions to prevent or mitigate the effects of various sets of risk factors could be established.

2.12 Prevention:

Two-thirds of child deaths are preventable. Most of the children who die each year could be saved by low-tech, evidence-based, cost-effective measures such as vaccines, antibiotics, micronutrient supplementation, insecticide-treated bed nets, improved family care and breastfeeding practices, and oral rehydration therapy. Empowering women, removing financial and social barriers to accessing basic services, developing innovations that make the supply of critical services more available to the poor and increasing local accountability of health systems are policy interventions that have allowed health systems to improve equity and reduce mortality. For some of the most deadly childhood diseases, such as measles, polio, diphtheria, tetanus, pertussis, pneumonia due to *Haemophilus influenzae* type B and *Streptococcus pneumoniae* and diarrhea due to rotavirus, vaccines are available and can protect children from illness and death.

UNICEF responds by, Providing high-impact health and nutrition intervention.

In partnership with governments, WHO and others, UNICEF aims to scale up proven, high-impact, cost-effective health and nutrition interventions to reduce the number of neonatal and young child deaths from preventable and easily treatable causes.

UNICEF is the world's largest purchaser of vaccines, procuring more than 40 per cent of all vaccines used in the developing world. While global immunization rates have risen from less than 20 per cent in the 1970s to about 74 per cent in 2002, millions of children must still be reached. UNICEF negotiates favorable prices and forecasts vaccines requirements to ensure sustainable supplies. Targets include increasing immunization coverage to at least 90 per cent at the national level and 80 per cent in all districts, with particular focus on reaching population groups with low coverage levels, and the final eradication of polio.

When delivering vaccines UNICEF adds micronutrient supplements to offset malnutrition, another critical factor in child survival. Supplements of vitamin A taken every four to six months can reduce child mortality from all causes by as much as 23 per cent, measles deaths by 50 per cent and deaths from diarrhea by 33 per cent.

Another target in this area is increasing the rate of children sleeping under mosquito nets to at least 60 percent in malaria-endemic areas. Malaria is responsible for 10 per cent of all under-five deaths in developing countries. According to the World Health Organization (WHO), poor neonatal conditions are the most prominent cause of young deaths. Four million babies per year die in the first week of life. In response, UNICEF advocates for and promotes programs to increase rates of exclusive breastfeeding. The strongest foundation of baby health is nutrition, and the best food for newborns is breast milk. Breastfeeding protects babies from diarrhea and acute respiratory infections, stimulates their immune systems and improves response to vaccinations, and contains many hundreds of health-enhancing molecules, enzymes, proteins and hormones.

A mother's health is also critical to newborns, particularly in light of new research that suggests a sound neonatal environment is an important predictor of future health. Together with the WHO and United Nations Population Fund (UNFPA), UNICEF advocates and lends technical and financial support to comprehensive community health programs for expectant women. This would ideally include providing micronutrient supplements, vaccines, anti-malarial drugs and insecticide-treated bed nets.

Improving family care practices: About 80 per cent of health care in developing countries occurs in the home – and the majority of children who die do so at home, without being seen by a health worker. Meanwhile, proper infant feeding and breast feeding are still not practiced by many families. As many as 40 per cent of child deaths could be prevented with improved family and community care – not high-tech health equipment, but access to solid knowledge, support and basic supplies.

Working with governments, health providers and communities in the field, UNICEF helps families learn essential skills and basic health knowledge, particularly in the care of newborns. This includes best practices in breastfeeding and complementary feeding, hygiene and safe feces disposal.

UNICEF also works for better integration among systems that deliver basic supplies and health services to the poorest families. Health and outreach workers are enabled to support better parenting, the care of mothers, infant feeding, care-seeking practices among families and communities in favor of disease prevention, and optimal management of childhood illness.

These include treatment for diarrhea, including the use of oral re-hydration salts, and for acute respiratory infections such as pneumonia.

Increasing access to improved water and sanitation. UNICEF helps develop systems to control water-borne diseases like Guinea worm and cholera that undermine child survival and development, reduce productivity and raise health-care costs. Struggles to find water and hygiene resources also primarily increase burdens on girls and women.

Working closely with governments, UNICEF also helps strengthen policies and budgets and support technical capacities in programs for hygiene promotion, sanitation, cost-effective water supply options and water quality, particularly for poor rural and urban families. These activities also aim toward fulfilling Millennium Goals 4 and 7.

UNICEF also helps develop partnerships that pool competencies and resources, particularly in its role as advocate, facilitator and coordinator in emergencies.

Responding rapidly to emergencies. UNICEF is also one of the first aid organizations on the scene following the outbreak of a crisis, helping to establish monitoring systems, organize partnerships and provide vaccinations and vitamin A supplementation. UNICEF also helps fund and build fresh water and sanitation facilities, helping stem the spread of water-borne diseases.

By providing supplies, personnel and assistance with facilities and sanitation, UNICEF also helps get children Back to School, which supports a number of Goals. As well as being registered and accounted for, and supervised by adults, children can also access health care, food and sanitation resources at a school.

Progress:

In its sixty years of existence, UNICEF has seen a fifty per cent reduction in under-five mortality between 1960 and 2002. We've seen that vitamin A supplementation can save over a quarter million lives a year; oral rehydration therapy can prevent 1 million deaths, and immunization programs can protect the lives of nearly 4 million children. But progress in meeting this Millennium Goal is the most off track of any. In 2002, 7 of every 1,000 children in industrialized countries died before they were five. In South Asia, 97 of 1,000 children died before they were five. And in sub-Saharan Africa, that number is 174 of every 1,000 children.

Ninety countries, 53 of them from developing nations, should be able to meet the 2015 Goal of reducing child mortality by two-thirds, if they maintain their current annual reduction rate. But 91 developing countries lag far behind. Many have seen mortality rates rise since 1990, countries from sub-Saharan Africa as well as Iraq and former members of the Soviet Union.

The number of children orphaned and made vulnerable by HIV/AIDS is projected to reach 25 million by the end of the decade, 18 million of them in sub-Saharan Africa. This, along with only modest progress fighting malaria, means the threats facing child survival are as grave as ever.

2.13 Global response:

Millennium Development Goals 4 and 5 The Millennium Development Goals adopted by the United Nations in 2000 aim to decrease child and maternal deaths worldwide by 2015. The fourth Millennium Development Goal (MDG) is to reduce the 1990 mortality rate among under-five children by two thirds. Child mortality is also closely linked to MDG 5 to improve maternal health.

Since more than one third of all child deaths occur within the first month of life, providing skilled care to mothers during pregnancy, as well as during and after birth, greatly contributes to child survival. Member States have set targets and developed specific strategies to reduce child mortality and monitor progress.

Aim of the work:

General objective:

To determine the main causes of death in pediatric emergency room at al-Sabin hospital- Sana'a.

Specific objectives:

- To evaluate the quality of pediatric emergency room at al-Sabin hospital- Sana'a.
- To determine the risk factor of death in pediatric emergency room at al-Sabin hospital- Sana'a.
- To determine the best way of prevention for causes of death in pediatric emergency room at al-Sabin hospital- Sana'a.

3. SUBJECTS AND METHODS

Study design:

Study area:

Pediatric Emergency room in Al Sabin hospital-Sana'a city was the study area to conduct the present study from the patients who attending the emergency room.

Study Design and study period:

A retrospective study was carried out to determine the main causes of death in pediatric emergency room at Al-Sabin hospital- Sana'a. A pre-designed questionnaire sheet were filled from 300 children who attending pediatric emergency room at Al-Sabin hospital during the period from July 2012 to August 2012.

Study target group:

Childhood of all age group including:

- 1: infancy (up to 1 year of age)
 - a. Neonatal period (first 28 days of life)
 - b. Post neonatal period (28th days to 1 year)
- 2: pre-school age 1-4 years
- 3: school age
- 4 adolescent

Methods:

Data collection:

A pre-designed questionnaire sheet which was contained a detailed inquiry about personal, demographic and clinical history data.

Data collection techniques:

1. Interview with doctors.
2. Interview with nurses.
3. Interview with relative to patient.
4. Interview with patient (if possible).

5. Questionnaire.
6. Visit to hospital.
7. Research in hospital data.

Data analysis:

Questionnaires were reviewed for consistency and completeness. Editing and coding started during the fieldwork. The Statistical package for social Sciences (SPSS) (Version 15) was utilized for processing, tabulation and statistical analysis. Results were expressed as arithmetic mean (as a measure of central tendency and standard deviation as measure of dispersion).

The agreement between the tests was determined by using the Pearson Chi-square. All analyzed data was presented as cross-tabulation tables.

Consideration:

1. This study was presented by approval and supervision of research committee at Sana'a university , department of community medicine
2. The approval from al-Sabin hospital for women and children , were taken .
3. Approval were taken from all patients before the search is to involve them in the study.

Confidentiality of information:

Any of the research materials will adhere to strict confidentiality without publishing any names or destinations

Collaborators:

- 1- Sana'a university , faculty of medicine and health sciences , department of community medicine
- 2- al-Sabin hospital for women and children –Sana'a city
- 3- Medical library – Sana'a university
- 4- Great library –Sana'a university
- 5- Library for the world health organization – the ministry of health and population – Sana'a city

4. STUDIED CASES

Description of the studied cases:

A total number of 300 cases of various age-groups were enrolled in this study. The age of collected cases ranged between 0-15 years. Out of 300 collected cases were 199 (66.3 %) who aged between 0-1 year; 78 (24.2%) of them aged from 1 - 5 years; 13 (2.31%) of them aged from 5 - 10 years and 10 (2.10%) of them aged from 10 - 15 years.

As regards sex (or gender), out of the 300 cases, 185 (61.7%) were males and 115 (38.3%) were females (Mean is (1.3) and standard deviation is (0.48).

The distribution of studied cases:

The distributions of all cases (300) in studied area were as the following:

The distribution of death during the studied area (2 months) was 16.3 % (49 cases), the distribution of admission during the studied area was 49 % (147 cases) and the distribution of cure during the studied area was 34.7% (104) (Table 1) (Figure I).

Table (1) and Figure (I). The distribution of studied cases

Studied cases	No.	%
<i>Death</i>	49	16.3
<i>Admission</i>	147	49
<i>Cure</i>	104	34.7
Total	300	100

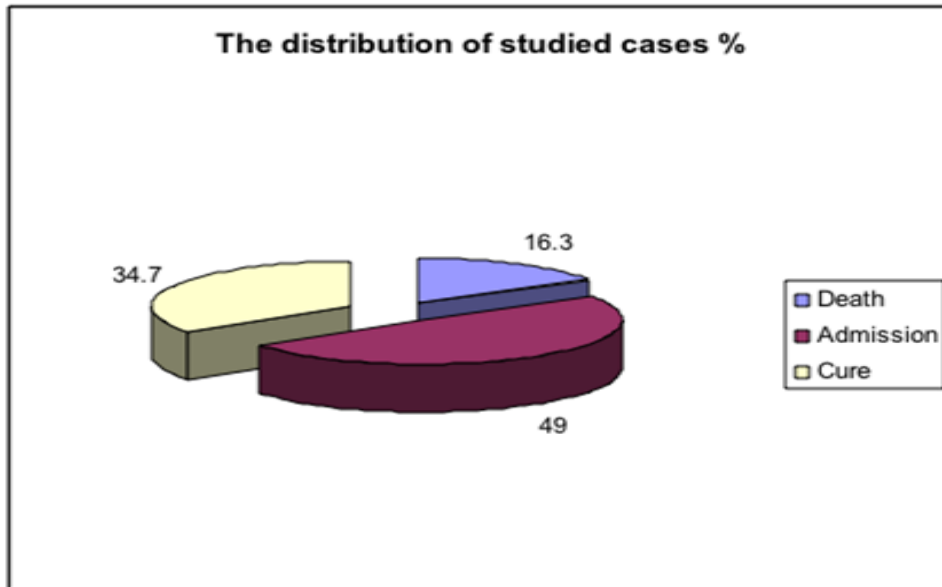


Figure (I)

The distribution of death according to age:

Table (2) and (Figure II) shows distribution of death cases according to age was 45 (91.8%) for their age between 0-5 year; 3 (61.3%) of them aged from 5 – 10 years; 1 (2.04%) of them aged from 10 - 15 years.

Table (2) and Figure (II). The distribution of death cases according to age.

Age-groups (Years)	The distribution of death	
	NO.	%
0-5	45	91.8
5-10	3	61.3
10-15	1	2.04
Total	49	100

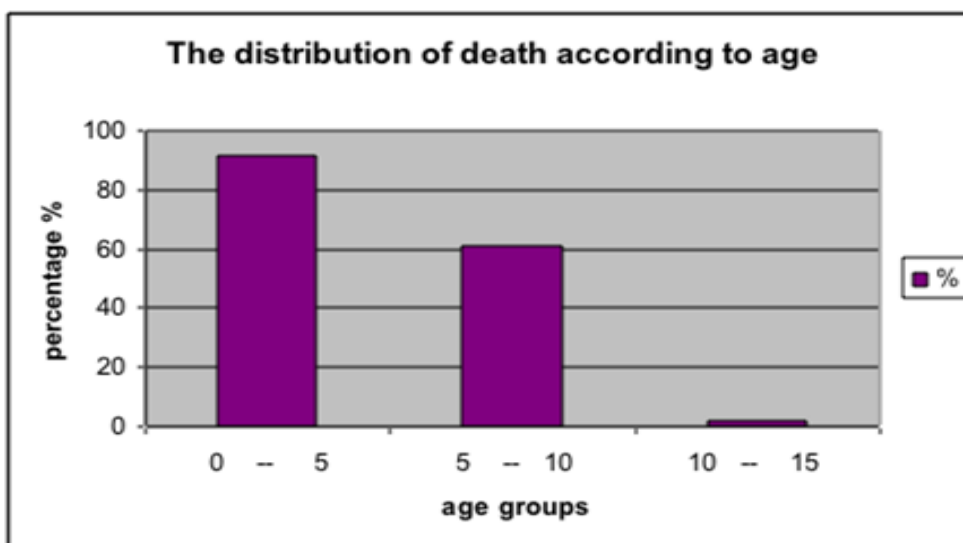


Figure (II)

The distribution of death according to sex:

Table (3) and (Figure III) shows distribution of death cases according to sex was 33 (67.3%) among males and 16 (32.7%) among females.

Table (3) and Figure (III). The distribution of death cases according to sex.

Type of sex	The distribution of death	
	NO.	%
Male	33	67.3
Female	16	32.7
Total	49	100

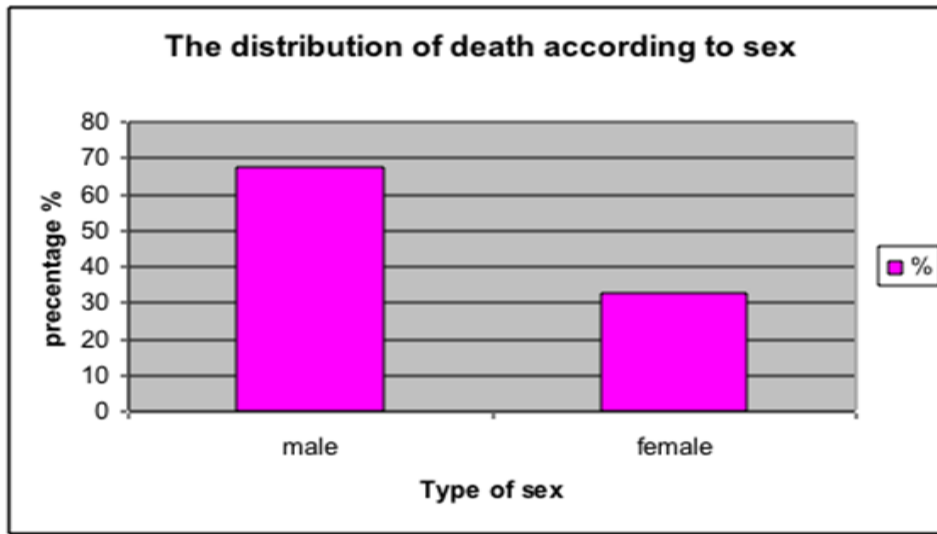


Figure (III)

The distribution of death according to causes

Table (4) demonstrates the distribution of death according to the causes where the various causes of death in the pediatric emergency room were as follows:

Chest infections (16) (5.3 %), malnutrition (11) (3.7%), dehydration (11) (3.7%),, gastroenteritis (2)(0.7%) ,unknown causes (3) (1.0%), complicated cases (3) (1.0%),family uncared (2) (0.7%). and emergency uncared (1) (0.3%).

Table(4) and Figure (IV).The distribution of causes of death.

Causes of death	The distribution	
	No.	%
Chest infections	16	5.3
Malnutrition	11	3.7
Dehydration	11	3.7
Gastroenteritis	2	0.7
Unknown causes	3	1.0
Complicated cases	3	1.0
Family uncared	2	0.7
E.R uncared	1	0.3
Total	49	100

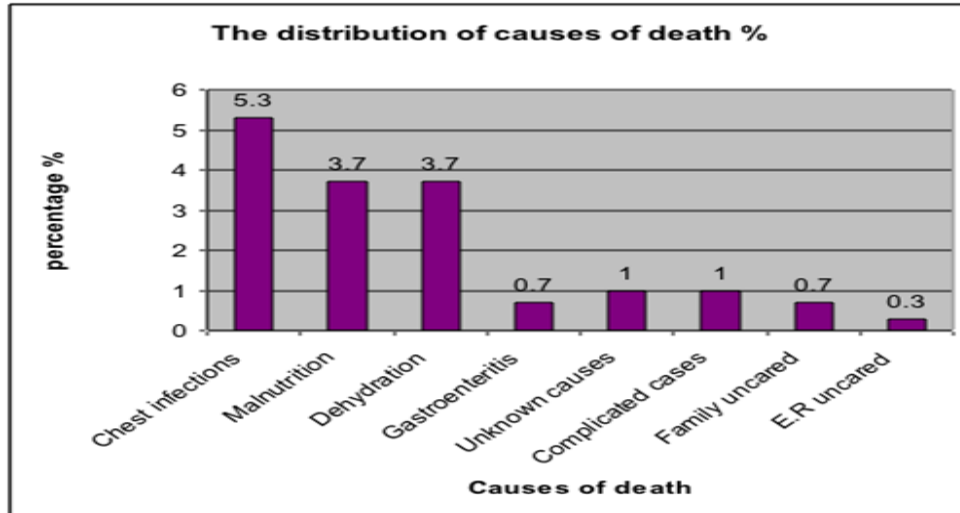


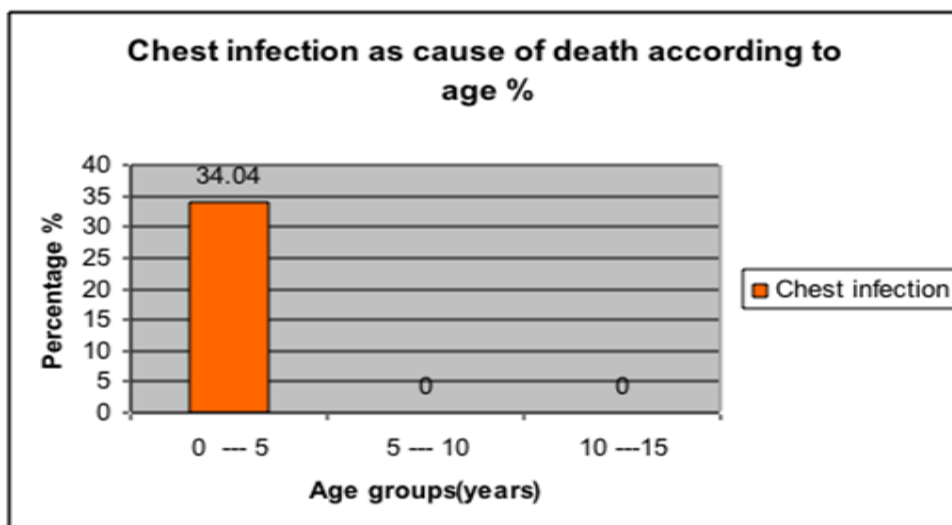
Figure (IV)

The distribution of causes of death according to age:

Table (5) and (Figure V) shows distribution of causes of death according to age where the most common cause of death among age between 0-5 year was chest infection with percent (34.04%); dehydration cause with percent (2.1%) of who aged from 5 – 10 years and also dehydration with percent (2.1%) of who aged from 10 - 15 years.

Table (5) and Figure (V). The distribution of causes of death cases according to age.

Age-groups (Years)	Causes of death								Total No. (%)
	Chest infection	Malnutrition	Dehydration	Unknown causes	Complicated cases	Family uncared	E.R uncared	Gastroenteritis	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
0-5	16 (34.04)	11 (23.4)	9 (19.1)	3 (6.3)	3 (6.3)	2 (4.2)	1 (2.1)	2 (4.2)	47 (99.8)
5-10	0 (0)	0 (0)	1 (2.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
10-15	0 (0)	0 (0)	1 (2.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Total No.(%)	16 (5.3)	11 (3.7)	11 (3.7)	3 (6.3)	3 (6.3)	2 (4.2)	1 (2.1)	2 (4.2)	49 (100)



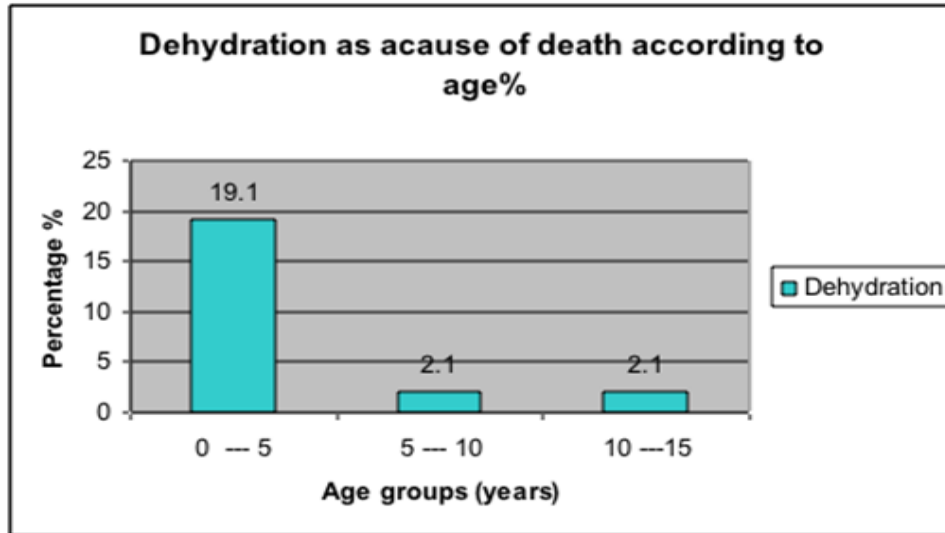


Figure (V)

The distribution of causes of death according to sex:

Table (6) and (Figure VI) shows distribution of causes of death according to sex where the most common cause of death for males was chest infection with percent (48.2%) and the most common cause of death for females also was chest infection percent (40.8%).

Table (6) and Figure (VI). The distribution of causes of death cases according to age

Age-groups (Years)	Causes of death								Total No. (%)
	Chest infection	Malnutrition	Dehydration	Unknown causes	Complicated cases	Family uncared	E.R uncared	Gastroenteritis	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
Male	14 (48.2)	5 (17.3)	8 (27.6)	1 (3.4)	1 (3.4)	0(0)	0 (0)	0 (0)	29 (59.2)
Female	6 (30)	4 (20)	2 (10)	2 (10)	1(5)	2 (10)	1(5)	2 (2.1)	20 (40.8)
Total No.(%)	20 (40.8)	9 (18.4)	10(20.4)	3 (6.1)	2 (4.1)	2 (4.1)	1 (2.04)	2 (4.1)	49 (100)

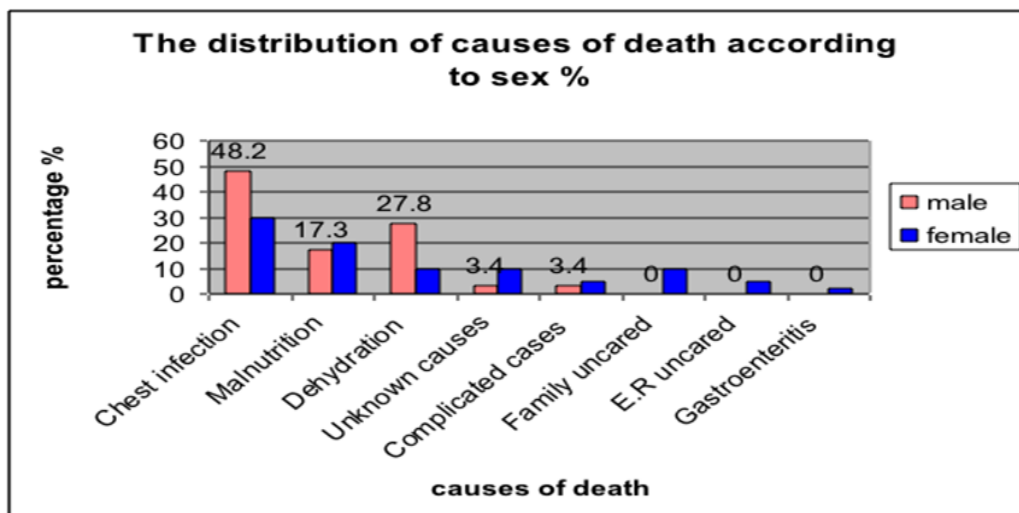


Figure (VI)

The frequency of cases with main complains (symptoms):

Table (8) and (Figure VIII) shows frequency of studied cases with main complains was 26 (8.7%) for fever, 78 (26%) for fever, vomiting and diarrhea, 75 (25%) for dyspnea, 53 (17.7%) for convulsion, 25 (8.3%) for cough, 12 (4 %) for abdominal distension, 8 (2.7%) for jaundice, 8 (2.7%) for diarrhea , 5 (1.7%) for vomiting, (2.0 %) for fever, 3 (1.0%) for fever and bleeding and 1 (0.3%) for loss of consciousness.

Table (8) and Figure (VIII). The Frequency of studied cases with main complains (symptoms).

Main complain(symptoms)	The frequency	
	%	NO.
fever	8.7	26
diarrhea	2.7	8
cough	8.3	25
dyspnea	25	75
convulsion	17.7	53
vomiting	1.7	5
loss of conscious	0.3	1
abdominal distension	4	12
fever and bleeding	1	3
Fever ,diarrhea and vomiting	26	78
generalized edema	2	6
jaundice	2.7	8
Total	100	300

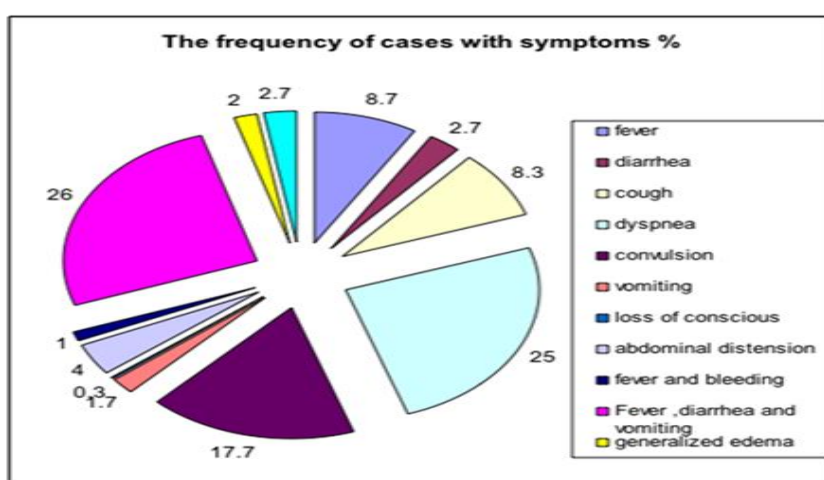


Figure (VIII)

The frequency of cases with main complains (symptoms) according to age:

Table (9) and (Figure IX) shows frequency of studied cases with main complains according to age where the most common distributed symptoms was among age between 0-5 year with 181 (60%); then 85 (28.3%) of who aged from 5 – 10 years and 34 (11.3%) of who aged from 10 - 15 years .

Table (9) and Figure (IX). The Frequency of studied cases with main complains (symptoms) according to age

Main complain(symptoms)	Age groups (years)			Total No.(%)
	0--5 NO. (%)	5--10 NO. (%)	10--15 NO. (%)	
fever	16 (61.5)	6 (23.1)	4 (15.4)	26 (100)
diarrhea	4 (50)	3 (37.5)	1(12.5)	8(100)
cough	14(56)	9(36)	2(8)	25(100)
dyspnea	43(57.3)	22(29.3)	10(13.3)	75(100)
convulsion	38(71.7)	13(24.5)	2(3.8)	53(100)
vomiting	2(40)	2(40)	1(20)	5(100)
loss of conscious	1(100)	0(0)	0(0)	1(100)
abdominal distension	8(66.7)	2(16.7)	2(16.7)	12(100)
fever and bleeding	0(0)	2(66.7)	1(33.3)	3(100)
Fever ,diarrhea and vomiting	46(58.9)	22(28.2)	10(12.8)	78(100)
generalized edema	2(33.3)	3(50)	1(16.7)	6(100)
jaundice	7(87.5)	1(12.5)	0(0)	8(100)
Total No. (%)	181(60.3)	85(28.3)	34(11.3)	300(100)

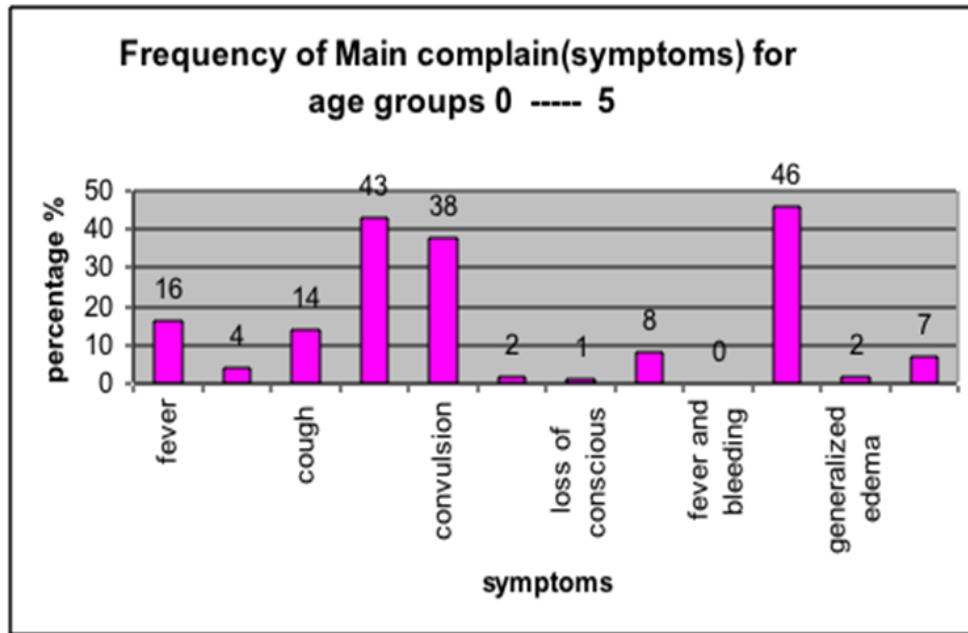


Figure (IX)

The frequency of cases with emergency efforts:

Table (10) and (Figure X) shows frequency of studied cases with emergency efforts was 245 (81.7%) and frequency of studied cases without emergency efforts was 55 (18.3%).

Table (10) and Figure (X). The Frequency of admitted cases with emergency efforts

Type of efforts	The frequency of cases	
	NO.	%
Emergency Treatment	245	81.7
No Emergency treatment	55	18.3
Total	300	100

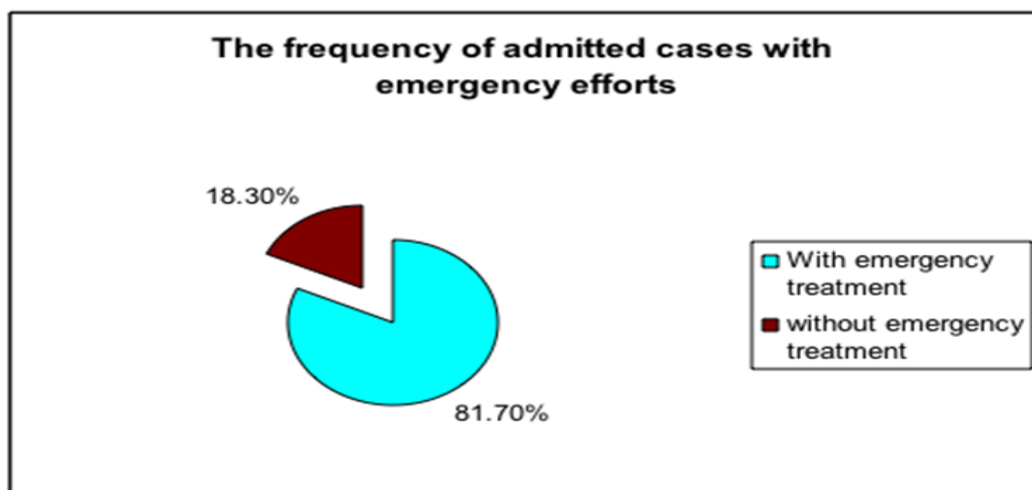


Figure (X)

The frequency of dead cases with other symptoms:

Table (11) and (Figure XI) show frequency of dead cases with other symptoms was 1 (0.3%) and frequency of dead cases without other symptoms was 48 (16.0%).

Table (11) and Figure (XI). The Frequency of admitted cases with emergency efforts

Type of efforts	The frequency of cases	
	NO.	%
With Other symptoms	1	0.3
Without Other symptoms	48	16
Total	49	16.3

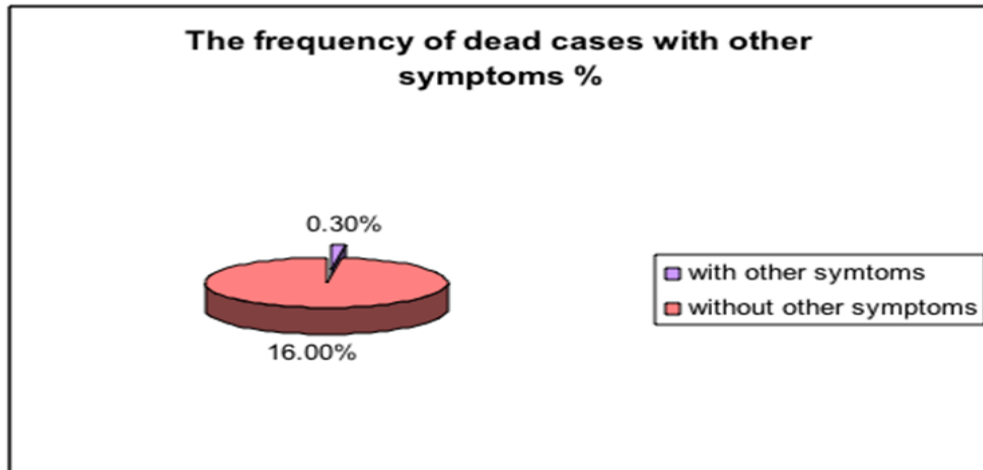


Figure (XI)

The frequency of admitted cases with Vaccination:

Table (12) and (Figure XII) shows frequency of admitted cases with vaccination were 38 (12.7%) and frequency of admitted cases without vaccination was 262 (87.3%).

Table (12) and Figure (XII). The frequency of cases with vaccination

	The frequency of cases	
	NO.	%
With vaccination	38	12.7
Without vaccination	262	87.3
Total	300	100

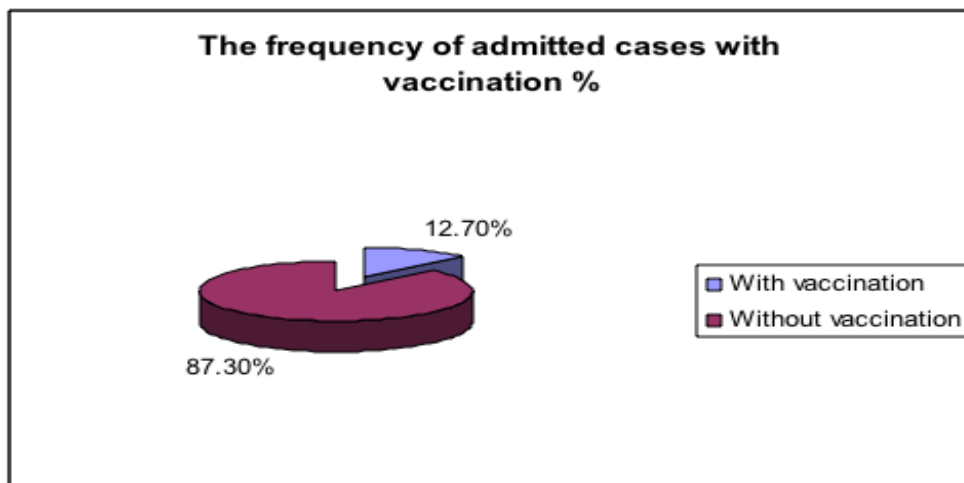


Figure (XII)

The frequency of admitted cases with breast feeding:

Table (13) and (Figure XIII) shows frequency of studied cases with breast feeding were 35 (11.7%) and frequency of studied cases without breast feeding was 265 (88.3%).

Table (13) and Figure (XIII). The frequency of cases with breast feeding

	The frequency of cases	
	NO.	%
With breast feeding	35	11.7
Without breast feeding	265	88.3
Total	300	100

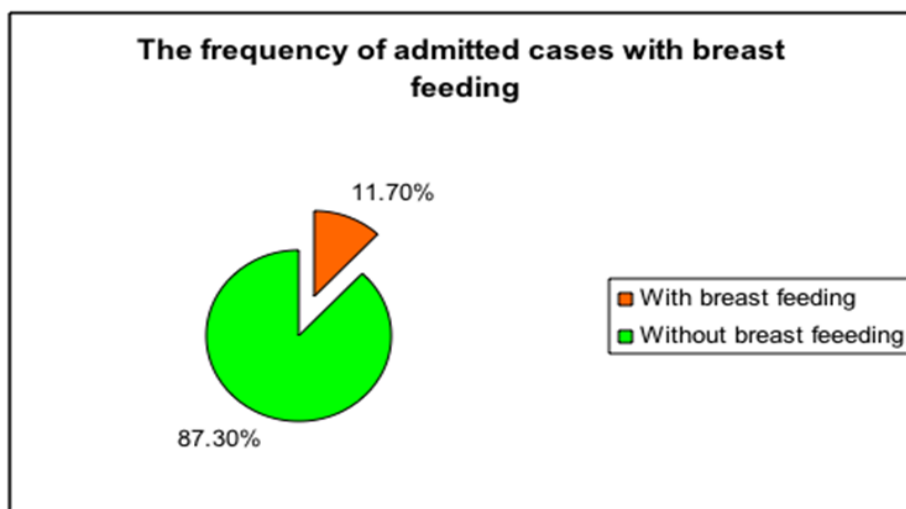


Figure (XIII)

The frequency of admitted cases with prenatal period.

Table (14) and (Figure XIV) shows frequency of studied cases with smoothly natal period feeding were 275 (91.7%) ,the frequency of studied cases with bleeding was 10 (3.3%), 14 (4.7%) and one case of preeclampsia with percent of 1 (0.3%).

Table (14) and Figure (XIV). The frequency of cases with prenatal period.

	The frequency of cases	
	NO.	%
With smoothly natal period	275	91.7
With bleeding	10	3.3
With infection	14	4.7
With preeclampsia	1	0.3
Total	300	100

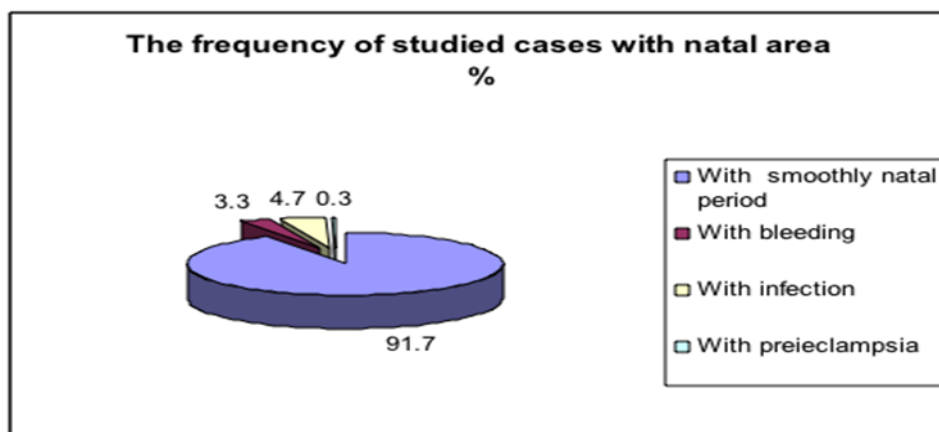


Figure XIV

The distribution of causes of death with introduced treatment:

Table (15) demonstrates the distribution of causes of death with introduced treatment.

Table (15) The distribution of causes of death with introduced treatment.

Causes of death	The introduced services	The introduced treatment
Chest infections	taking blood sample for Investigation (CBC+CRP+ASO) Insert canula Send to take Chest X-ray Give O2	Give antibiotic +I.V fluids + Antipyretic Oxygen
Malnutrition	Taking blood sample for Investigation (CBC+KFT) Insert canula Give O2	Give antibiotic +I.V fluids + vitamins + Oxygen
Dehydration	Taking blood sample for Investigation (CBC+KFT) Insert canula	Give antibiotic +I.V fluids + Vitamins +Oxygen
Gastroenteritis	Taking blood sample for Investigation (CBC+CRP+KFT) Insert canula Give O2	Give antibiotic +I.V fluids + Antipyretic Oxygen
Unknown causes	Taking blood sample for Investigation (Brofile blood examination) Insert canula Send to take Chest X-ray Give O2	Give antibiotic +I.V fluids + Oxygen
Complicated cases	Taking blood sample for Investigation (CBC+KFT+LFT) Insert canula Send to take Chest X-ray	Give antibiotic +I.V fluids
Family uncared	Taking blood sample for Investigation (CBC+KFT) Insert canula	Give antibiotic +I.V fluids
E.R uncared	Taking blood sample for Investigation (CBC+KFT)	Give antibiotic +I.V fluids + Oxygen but cutting off

The frequency of studied cases with their diseased brothers:

Table (16) and (Figure XVI) shows frequency of studied cases with their diseased brothers was 40 (13.3%) and frequency of studied cases without their diseased brothers was 260 (86.7%).

Table (16) and Figure (XVI). The frequency of cases with their diseased brothers

	The frequency of cases	
	NO.	%
With their diseased brothers	40	13.3
Without their diseased brothers	260	86.7
Total	300	100

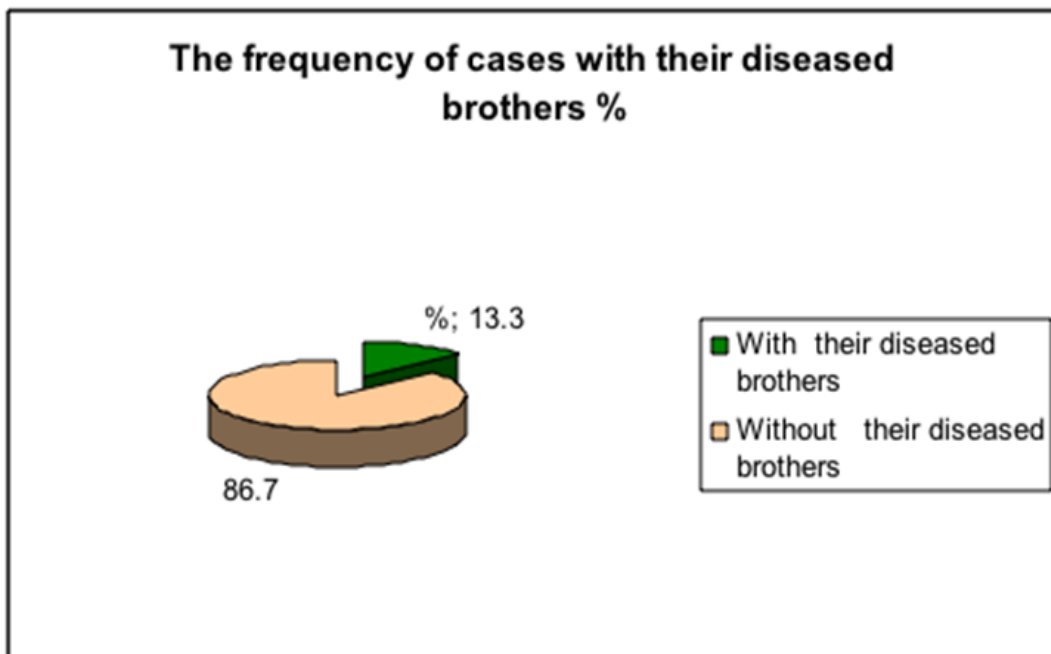


Figure (XVI)

The frequency of studied cases with congenital diseases:

Table (17) and (Figure XVII) shows frequency of studied cases with congenital diseases was 6 (2%) and frequency of studied cases without congenital diseases was 294 (98%).

Table (17) and Figure (XVII). The frequency of cases with congenital diseases

	The frequency of cases	
	NO.	%
With congenital diseases	6	2.0
Without congenital diseases	298	98.0
Total	300	100

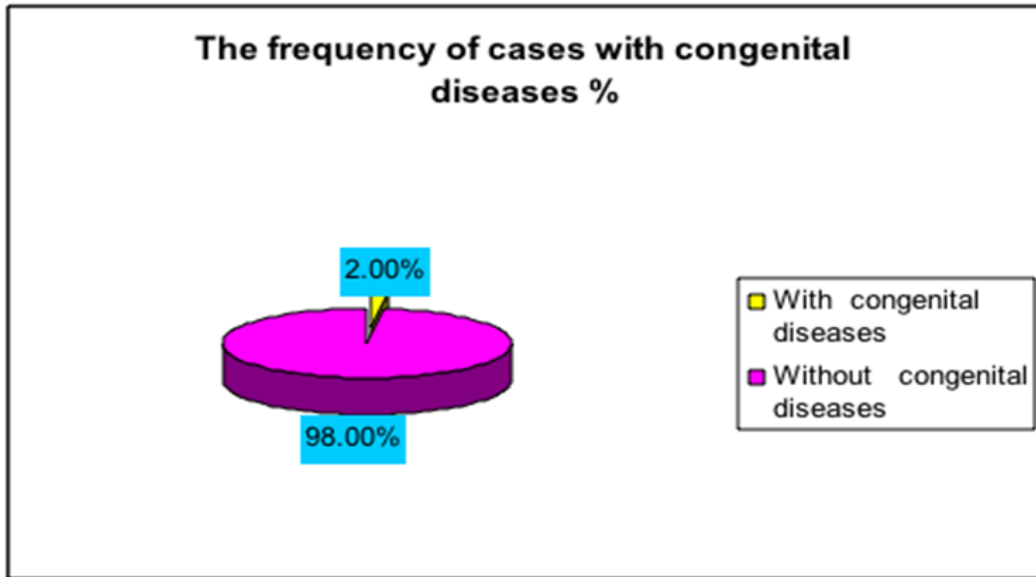


Figure (XVII)

The frequency of studied cases with treatment at home:

Table (18) and (Figure XVIII) shows frequency of studied cases with treatment at home was 73 (25.7%) and frequency of studied cases without treatment at home was 227 (75.3%).

Table (18) and Figure (XVIII). The frequency of cases with treatment at home.

	The frequency of cases	
	NO.	%
With treatment at home	73	25.7
Without treatment at home	227	75.3
Total	300	100

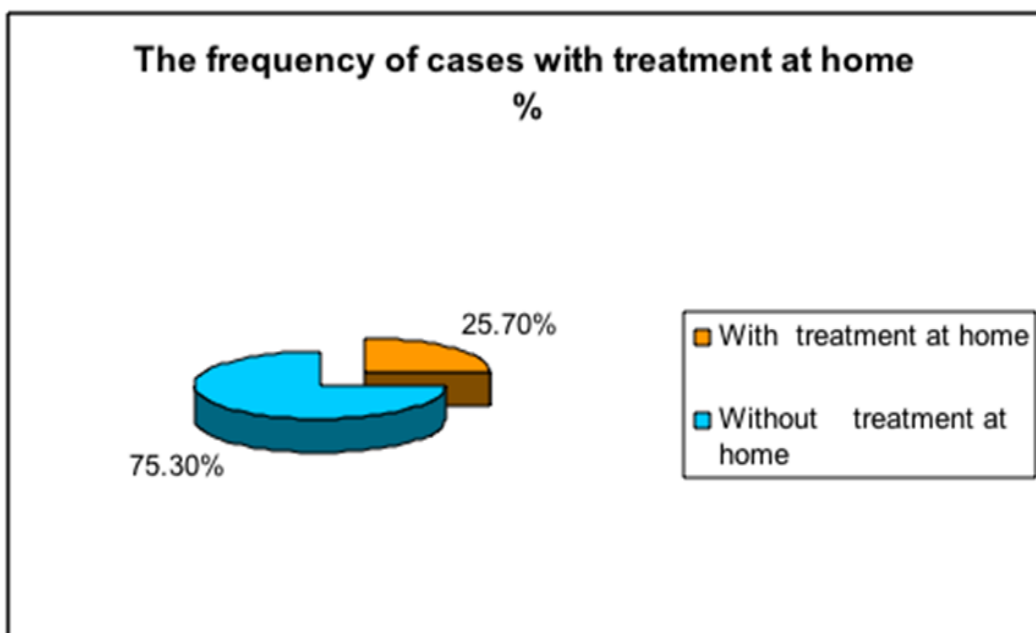


Figure (XVIII)

The comparison between our study and other studies about causes of children death:

Table (19) Comparison between our study and other studies about causes of children death

Causes of death	The frequency (our study)	Dr. Banja (2006)	UNICEF (2008)	WHO (2000-2003)
	%	%	%	%
Chest infections	5.3	Respiratory distress(63.8)	Pneumonia (18.0)	Pneumonia (19.0)
Malnutrition	3.7	Birth asphyxia (15.0)	Diarrhea (15)	Diarrhea (18)
Dehydration	3.7	Preterm (24.6)	Malaria (8)	Malaria (8)
Gastroenteritis	0.7	Early neonatal death (42.2)	Neonate (41)	Neonate (54)
Unknown causes	1.0		Birth asphyxia (9)	
Complicated cases	1.0		Sepsis (6)	Sepsis (10)
Family uncared	0.7			
E.R uncared	0.3			
Total	100			

5. DISCUSSION

Sana'a is the capital of Yemen; there are 1.2 to 2 million people live in this area. Pediatric Emergency room at Al-Sabin hospital is a 10 bedded room and it is one of the important hospitals for mothers and children in Sana'a. The health status of people is closely related to their access to safe drinking water and adequate sanitation facilities. In our country, the poor situation of fresh water sources along with severe shortages in sewerage systems are related to the emergence and spread of contagious diseases. The connection between water sources and water borne diseases is not currently monitored. Less than half the population has access to safe water and sanitation. Only half of Yemen's water sources are to be considered safe, others need either treatment or should be completely avoided. Access to sanitation is very limited. For defecation, 45% of the population use an open pit or none at all. Although 92% of the urban population have access to some sort of sanitation facility, this is the case for only 43.2% of the rural population. The coverage of primary health care services is not comprehensive. They reach approximately 42% of the population, with a significant gap between urban (75%) and rural areas (24%) [18]. In rural areas, they are staffed by inadequately trained personnel, poorly equipped and have insufficient availability of drugs and medical supplies. Out-of-pocket expenses by Yemeni health care consumers are high and prove to be an important constraint to accessing health care. In Yemen, there is one physician for every 4,650 people, one nurse for every 2,913 and only one trained midwife for every 14,465.18 The system of outreach/emergency activities is insufficiently developed. Monitoring and registering epidemics and spread of leading infectious diseases or disease patterns (malaria, tuberculosis, human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), Rift Valley Fever, and so forth) needs considerable improvement; furthermore, one-third of all deaths among <5 years occur due to vaccine preventable diseases. An estimated 12% of children suffer from disabilities, and there are few specialized facilities for children with disabilities. The proportion of the dead among children ever born to every-married women aged 45-49 is 0.20, compared with 0.13 for women aged 15-19. The <5-year-old child mortality has dropped from 203 deaths per 1,000 live births during the period of 15-19 years preceding the survey to 105 deaths during the 5 years prior to the survey.

Female mortality is higher than male among children aged 1-4 years [19]. The neonatal mortality decreased by 49% and post neonatal by 65%. Infant mortality has decreased from 186 deaths per 1,000 live births to 75 deaths per 1,000 live births, while children's mortality rate (1-4 years) has decreased from 91 deaths per 1,000 live births during the period 20-24 years preceding the survey to 32 deaths per 1,000 live births during the 5-years preceding the survey. The major risk

factors affecting the high mortality rates among our children are residency, mother's education, medical maternal antenatal care, Qat and tobacco smoking, child's gender, maternal age at birth, birth order and birth space. Mortality rates are higher in rural areas than in urban areas. The infant mortality rate is 94 deaths per 1,000 live births in rural areas, compared with 75 deaths per 1,000 live births in urban areas.

The <5 mortality rate in rural areas is 128 deaths per 1,000 live births, compared with 96 deaths per 1,000 in urban areas. The <5 mortality rates in the Coastal region were 137, Mountainous were 122, and Plateau and Desert regions were 113 deaths per 1,000 live births. Injuries and deaths due to road accidents and fire arms are particularly high in Yemen, but few reliable statistics are available. As a whole, the low levels of awareness with respect to health and hygiene and public health education is an important need that must be addressed.¹⁸ The infant mortality rate for children born to illiterate mothers was 93 per 1,000 live births and decreased to 62 deaths per 1,000 for children born to mothers who completed primary education and this further drop to 52 deaths per 1,000 births for children born to mothers with secondary or higher education. The <5 mortality rate decreased from 113 deaths per 1,000 live births for children born to mothers who received no medical maternal care to 101 deaths per 1,000 born to mothers who received medical maternal care during either pregnancy or delivery.

Al-Barakani indicate that 79-84 deaths per 1,000 live births compared with 70 deaths per 1,000 live births occur among mothers who neither chew qat nor smoke tobacco. Infant mortality is higher for boys than for girls (98 versus 80 deaths per 1,000 live births). The pattern reverses slightly in child mortality and shows higher mortality in girls than boys (36 versus 33 deaths per 1,000 live births). This reversal suggests that there may be preference for boys and some tendency to provide greater care for boys than for girls during ages 1-4^[19]. Mortality <5 is higher for children born to women in the youngest age group (161 deaths per 1,000 live births) compared with 112-116 deaths per 1,000 for children born to other women. Maternal mortality and morbidity are high because of limited pre-, period post-natal care and also because of exceptionally high fertility, early pregnancy, and low rates of using modern contraceptive. Only 22% of women give birth with the assistance of a skilled birth attendant. There is a serious lack of female medical staff. Because of culturally determined gender roles, women in Yemen can be discouraged from visiting male medical staff. The infant mortality rate is 110 deaths per 1,000 live births for first births, and decreased to 76 per 1,000 for fourth to sixth order births, then increases for birth order 7 or higher.¹⁹ Infant mortality decreases from 124 deaths per 1,000 live births for birth intervals <2 years to 36-55 deaths per 1,000 for birth intervals of >2 years^[19]. The common causes of deaths as the results presented indicate that fever (25%), vomiting (20%), and difficult breathing and convulsions (18-19%) are the most common symptoms during the neonatal period. During the post neonatal period, the probable causes of child death are fever (69%), diarrhea (58%), vomiting (56%), and cough/difficult breathing (42%). For children >1 year, fever was again the most common symptom, associated with 74% of all deaths in that age group^[19]. This study has shown that children's mortality rate was 16.3% in the emergency pediatric room. This result is variably higher than a study which was carried out in AL-Thwra Hospital, Yemen between January 2000 to December 2003, which was 13.96% and the common of children mortality were infections (18.1%), respiratory diseases (17.7%), central nervous system (CNS) problems (12%), renal (9.7%), malignancy (9.5%), shock (8%), cardiac (7.3%), malnutrition/anemia (5.3%), liver diseases (5.9%), bleeding tendencies (1.4%), and others 30 cases (foreign body aspiration 8, diabetic ketoacidosis 6, poison 7) ^[126], compared to our study in the emergency pediatric room; chest infection 5.3%, dehydration 3.7 %, malnutrition 3.7% then gastroenteritis 0.7% and late treatment was 2.10 %. This mortality rate is also higher comparatively to a similar study which was recorded in Ilorin-Western Nigeria, which was 11.6% and very much higher compare to causes of deaths in infants and children in the United States of America which were mainly due to congenital heart defects and was 0.02 per 1000 population. We do not have any reliable recorded data of pediatric human immunodeficiency virus or AIDS infections causing mortality among our children and even no prevalence record inside our community.

Among the total 300 children death inside the emergency pediatric room, was (67.3%) among males and 16 (32.7%) among females, the highest prevalence (91.8%) for their age between 0-5 year; 3 (61.3%) of them aged from 5 – 10 years; 1 (2.04%) of them aged from 10 - 15 years, comparatively to a similar study which was carried out in AL-Thwra Hospital, Yemen between January 2000 to December 2003 Among the total 639 children death inside the pediatric unit, 66.7% were <2 years of age (group 1), 24% of 2.1-5 years (group 2) and 9.2% were seen in those >5.1 years (group 3). It has also been noted that, the total children deaths in general emergency, pediatric emergency, pediatric unit and in the nursery in 4 years were 3006 (33.7% in general emergency [mainly due to road traffic accidents, gun shots, general trauma, 27.4% in the nursery, 21.2% in the pediatric unit and 17.6% in pediatric emergency).

In our study noted that the most common cause of death for who age between 0-5 year was chest infection with percent of (34.04%); then dehydration cause with percent of (2.1%) with who aged from 5 – 10 years and also dehydration with

percent of (2.1%) of who aged from 10 - 15 years so the highest prevalence with chest infection among children less than 5 years.

We also proved in our study the most common cause of death for males was chest infection with percent of (48.6%) and the most common cause of death for females also was chest infection percent %30.

The frequency of admitted cases with emergency efforts was 245 (81.7%) and frequency of admitted cases without emergency efforts was 55 (18.3%) but there are limited procedures, drugs and machines which are very important in emergency cases.

In our study among 300 children admitted to emergency room the frequency of admitted cases with vaccination was (12.7%) and frequency of admitted cases without vaccination was (87.3%) so the non-vaccinated children more than vaccinated and the non-vaccinated children labile to infection more the vaccinated one.

The frequency of admitted cases with breast feeding was (11.7%) and frequency of admitted cases without breast feeding was (88.3%) also non breast feed children labile to infection more the breast feed one.

The frequency of studied cases who pass with smoothly natal period was 19.7% compared to cases who complains of bleeding with percent of 3.3% ,4.7% with infection, and 0.3% with preeclampsia

The frequency of studied cases with their diseased sibling was 13.3% , and those of 98 % who was without having a diseased sibling. And those with congenital disease was 2% , compared to those of 98% who was without a congenital disease.

Also the children who received primary treatment at home were 25.7 % compared to those of 75.3% who was without treatment at home

In our study among 300 children admitted to emergency room we demonstrate that the provided and introduced treatment and service in order to show and to clear emergency department(equipment and staff) role in being one of the most common involved causes of death , in which it is regarded as the keystone in the process of prevention and controlling of leading causes of death in the pediatric emergency

Other studies about causes of children death was carried out by WHO in 2000-2003 , and by UNICEF in 2008 , in which in the UNICEF study showed the common causes of death were pneumonia 18% , diarrhea was 15% , malaria 8% ,birth asphyxia 9% ,sepsis was 6% , while WHO in 2000-2003 were pneumonia 19% , diarrhea was 18% malaria 8% , while the sepsis was 10% .

6. CONCLUSION

Collectively, the most important causes of death in children younger than 5 years was chest infection diseases, especially pneumonia the diarrhea and vomiting the can cause severe dehydration in most cases. The most important single causes of death were pneumonia. Numbers of deaths varied widely across WHO regions, with most deaths recorded in Africa and southeast Asia.

Despite a continuing increase in the population of children younger than 5 years, the mortality rate is declining: 8.795 million deaths occurred in 2008 versus 10.6 million per year during 2000—03.1, 5 With greater declines in mortality in children aged 1—59 months than in neonates, the proportion of deaths in neonates has increased from 37% in 2000—03,5 to 41% (3.575 million) of 8.795 million deaths in children younger than 5 years in 2008. Thus, the main causes of death in the neonatal period preterm birth complications, birth asphyxia, and sepsis and pneumonia have become even more important [44], but in our study the mortality rate still high .

In children aged 5—15 years, the two most important causes of death remain the same as in previous estimates, (dehydration) diarrhea and (chest infection) pneumonia, but the percentage of deaths in children younger than 5 years attributable to each cause has reduced by 20-25%. This reduction is partly due to the smaller proportion of deaths occurring in children aged 5—15 years, but also to new data showing that the previous estimate of deaths due to diarrhea in China was probably too high (12% vs. new estimate of 3.1% [0.011 million/0.369 million]).27, 28 Caution is essential with any comparison between previous and 2008 estimates of causes of death because additional data and changes in analytical methods could result in increased accuracy of estimates, but not a true indication of a time trend for certain diseases .

Under nutrition, including stunting, severe wasting, deficiencies of vitamin A and zinc, and suboptimum breastfeeding, is not presented as a direct cause of death in these statistics, but has been found to be an underlying cause in a third of deaths in children younger than 5 years [46]. In countries with adequate vital registration data, malnutrition was rarely listed as a cause of death, and verbal autopsy classification systems greatly underestimate the role of these nutritional deficiencies. Thus, we chose to allocate the few deaths reported to be caused by malnutrition to major infectious diseases that often precipitate severe wasting . .

This study proved the prevalence of non-vaccinated and non-breast feed children remain high in Yemen .

7. RECOMMENDATIONS

- 1- Improvement the emergency room and providing the most important procedures and machines.
- 2- Improve family and community care.
- 3- Working with governments, health providers and communities in the field to help families learn essential skills and basic health knowledge, in newborns. practices in breastfeeding and complementary feeding, hygiene and safe feces dispose.
- 4- Deliver basic supplies and health services to the poorest families.
- 5- Implementation of the novel assays to detect most infectious diseases in early phases.
- 6- Health education, safe water supply, sewage sanitary disposal, covered drainage and irrigation systems are the fundamental basis for infectious diseases control.
- 7- Prevention strategies of infections should target the high-risk groups.
- 8- Every hospital with a PICU or neonatal intensive care unit (ICU) should plan and prepare to provide PEMCC at least double the PICU bed capacity and at least triple the usual ICU capability.
- 9- Patient care assignments for units should be managed by the most experienced clinician available.
- 10-Systematic efforts to reduce care variability, procedure complications, and errors of omission must be used when possible.
- 11-Hospitals and government authorities must be prepared to credential incoming teams expeditiously.
- 12-Hospital staff (physicians, nurses, nurse practitioners, physicians assistants) with experience in care of pediatric patients (may include emergency medicine, anesthesia, otolaryngology, trauma surgery, general surgery)
- 13-PEMCC should include, when applicable, the following:
 - Mechanical ventilation. -
 - Intravenous fluid resuscitation-
 - Vasopressor administration-
 - Antidote or antimicrobial administration for specific disease
 - Sedation and analgesia-
- 14-To optimize medication availability and safe administration, the Task Force recommends that modified processes of care should be considered before an event, such as the following:
 - Rules for medication substitutions-
 - Rules for safe dose or drug frequency reduction
 - Rules for conversion from parenteral administration to oral/enteral when possible.
 - Rules for medication restriction (e.g., oseltamivir if in short supply during an influenza pandemic)
 - Guidelines for medication shelf-life extension.

Safety Inside the Home

- Smoke detectors should be placed in the proper locations throughout the house.
- Escape plans should be thought about in advance, and fire extinguishers should be readily available.
- Gates should be positioned at the top and bottom of stairs.
- Outlet covers that are not a choking hazard should be placed over sockets to prevent your grandchild from putting herself at risk of an electrical shock.
- Soft covers or bumpers should be positioned around sharp or solid furniture.

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